TOWNS AND MINERALS IN SOUTHEASTERN

KANSAS

A STUDY IN REGIONAL INDUSTRIALIZATION

1890-1930

by JOHN G. CLARK

Special Distribution Publication 52

State Geological Survey of Kansas
1970

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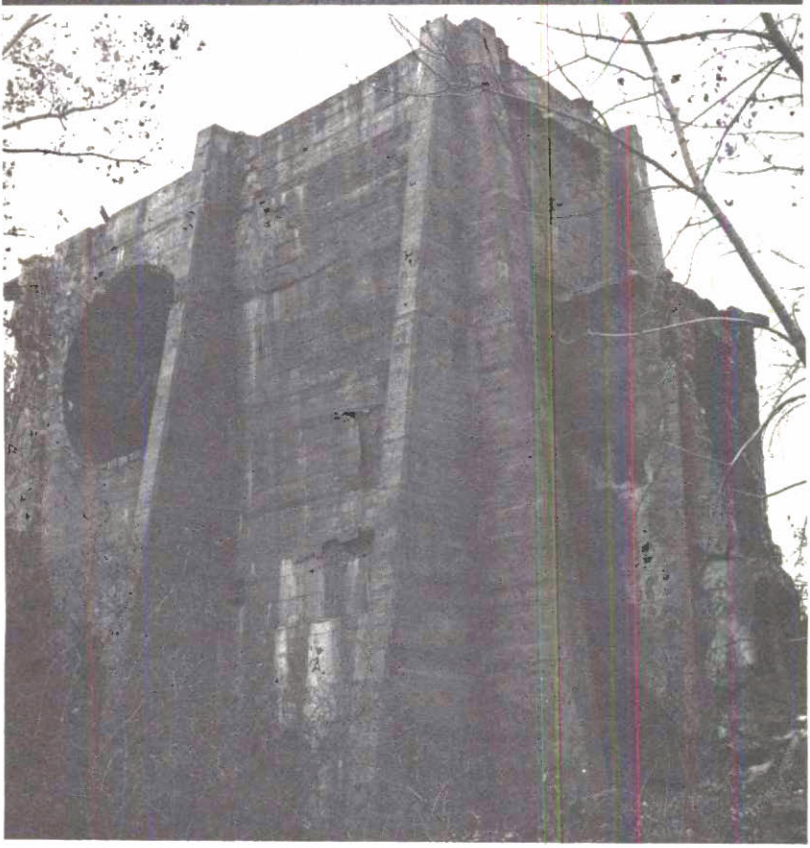

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TO GARRY, STEVE, AND LARISA

Frontispiece: Vestiges of Consolidated Cement's plant at Mildred, Kansas.

Photographs by Doris Zeller.

This book is set in 10 point Baskerville, leaded 2 points.

Foreword

This issue is as different from our regular scientific publications as was the aspect of the terrain on Moon when compared with that on Earth. Yet it bears a certain resemblance, in that it deals with the natural resources of Kansas—coal, natural gas, limestone and shale, lead and zinc, and glass sand—raw materials which were the basis of a brief flurry of industrial activity with which this historical reconstruction is concerned. A few companies survived and are presently operating in southeastern Kansas, or elsewhere. Some are enshrined in ruins, as is the Consolidated Cement Corporation at Mildred, or in the memories of, by now, but a handful of individuals. Others have vanished from the face of the earth, leaving only a trace of their existence in records of the period.

Handling the myriad facets of this publication has been a challenge and a privilege. I am grateful to members of the University of Kansas Printing Service for their helpfulness.

To those who relish history, I heartily recommend this book. I am certain that it will find a place in the archives of the State Historical Society of Kansas and similar organizations.

Doris E. Zeller
Editor

Lawrence, Kansas
October 1970

Preface

I had been intrigued for some time with the stories of a thriving glass industry in southeastern Kansas at the turn of the century, and had been nagged with the small notion that this industry might be revived. Conversation with friends in Fredonia and Chanute indicated that the industry had been large, that its birth and death depended fundamentally upon the discovery and exhaustion of natural gas, that skilled glass blowers still resided in the area, and that the peak of importance of the industry coincided with a rather major surge in industrial development for the region. But questions about the source of material for the glass industry, why alternative fuels had not been developed, the magnitude of the industry, and other reasons for precipitous demise remained unanswered.

Chance acquaintance with Professor John G. Clark, an economic historian in the Department of History at The University of Kansas, led to conversation about my interest in the area, and John Clark's delight was obvious upon finding someone who not only appreciated economic history but also was willing to pay for it.

This encounter was not unusual because the Geological Survey has long sought the assistance and guidance of scholars from many fields in its efforts to develop mineral resources in Kansas. Oftentimes these efforts have combined appropriate talent involving studies of resource location, product development and materials science, market analysis and studies of capitalization, cost and profitability, and even location theory. With respect to a potential glass industry, we had previously directed the attention of geologists, engineers, and even a ceramic artist to the problem. Professor Sheldon Carey, of the School of Fine Arts at The University of Kansas, was already producing beautiful hand-blown glass. More importantly, he had discovered that addition of as much as 30 percent volcanic ash, a nearly pure form of silica which had been the object of our attention for other purposes, could upgrade our low quality glass sands to a batch formulation that now was worthy of his skill and artistic insights. But we still needed to know something about the now-vanished glass industry in Kansas, and John Clark provided the missing ingredient.

As he undertook his studies, John found that the glass industry was inextricably linked with brick and tile, cement and zinc smelting, and so he expanded his sphere of interest to include the more comprehensive study which is presented here. The account is revealing, fascinating, instructive, and at all times a reflection of the Clark style of scholarship and dry humor. He reveals that Kansas was third in the nation in the

value of portland cement produced in 1910, and that in 1909 Kansas produced almost 10 percent of the window glass in the United States. I had not realized that the industry in southeastern Kansas had reached this magnitude. I think that John Clark enjoyed doing this study, and he certainly became acquainted with sources of information in southeastern Kansas. For example, he applauds the wealth of information preserved in the archives of the old Victorian courthouses, but deplores the thoughtless disposal of archival materials upon construction of new county courthouses containing few of the nooks and crannies of their predecessors.

I found little comfort in his conclusion that it was the ill luck of southeastern Kansas to launch its industrial career by adopting the method and technology of an industrial structure that already was obsolete, or his warning that "Kansas, striving valiantly to enter the industrial world, may again be on the threshold of a present already antique." I judge that this study by John Clark is a significant contribution to understanding the economic history of Kansas, and I trust that its perceptions will guide the work of the Geological Survey. I do know that I enjoyed having John Clark as a member of our staff for a short time.

William W. Hambleton
State Geologist and Director
State Geological Survey of Kansas

Lawrence, Kansas
September 1970

A Note on the Sources

The footnotes serve as an adequate indication of the specific sources used. Two or three particular groups of materials that were especially useful merit further attention. One group, the county archives, is located in the county courthouse of each county seat. As I wandered about from courthouse to courthouse, the fortunate recipient of courtesies and favors from each one visited, it became apparent that the newer buildings housed smaller quantities of archival materials than older structures (pre-New Deal). Much valuable county data had obviously not made the trip from the old to the new buildings. The Montgomery County archives, for instance, contained many more different types of data than did the Allen County archives. Space is more often lacking in the newer facilities, whereas the Victorian courthouses of Kansas with enormous basements, attics, vaults, and other chambers, are sufficiently commodious to store the older materials. They are stacked, piled, and stuffed, to be sure, but at least they are available to researchers. It is hoped that county clerks, treasurers, commissioners, and other officials will preserve their valuable materials from the dangers of a subsequent move. If space is a problem, county officials might consult with the Kansas State Historical Society and the librarians of neighboring colleges and universities in order to obtain adequate storage for these precious historical records. Spencer Research Library at the University of Kansas would be a perfect depository for the older and more fragile county records.

The county records contain a wealth of information relating to the political, economic, and social history of the counties. While tax and real estate assessment rolls were most relevant to this study, voting registration ledgers, school district information, cattle-brand books, and other types of data exist in some of the courthouses. Land sales can be traced easily with the aid of Range Indexes through the deed and mortgage records. Population mobility studies could be done on the basis of county (by township and city) records. Studies undertaken to assess the growth potential of Kansas towns or cities would inevitably be grounded on an historical framework reconstructed in part from county and community records.

The question, then, is not whether these records should be preserved but rather who should be responsible. It is not only a county responsibility. The counties can barely afford the expense of moving from their architectural relics to modern facilities, which are normally too small by the time they are ready for occupation. Since the county archives form part of the general archives of the State, the latter might properly allocate funds to meet construction costs of space set aside for the housing of

county records. Members of the State Legislature frequently call up the past to prove this or that point. How better could they demonstrate their sincere regard for the State's history than to provide the means to preserve the written record?

A second important group of records, involving bankruptcies, is in good hands and is readily accessible to researchers. I utilized but a small portion of this data in a rather specialized manner, which hardly reflects the more general purposes that the data might serve. Historians of particular business firms, communities, industries, and of economic development in general are coming to recognize the value of such records housed in Federal Records Centers. See Gerald T. White, "Government Archives Afield: The Federal Records Centers and the Historian," *The Journal of American History,* 55 (March, 1969), 833-842. The Federal Records Center-GSA, 2306 East Bannister Road, Kansas City, Missouri, is one of this group and, in addition to the District Court Records of North and South Dakota, Nebraska, Missouri, Minnesota, and Kansas, houses important collections of Indian affairs records and soil conservation information.

A third group of significant records consists of the business archives of the Lehigh and Ash Grove Portland Cement companies. Their significance rests in part on the fact that they were the only ones that I located during my travels in southeastern Kansas. Businesses frequently destroy their old records on the assumption that they are of little value to anyone.

They are in fact, of great value to historians seeking to piece together the economic history of the nation. It would be most appropriate for business firms in Kansas to deposit noncurrent records with one or another of the major research libraries in the State. While not everything is worth preserving, there are numerous individuals in the State with sufficient experience in the use of business records to provide some guidance in a program of selective preservation.

Every historian who has worked on some aspect of Kansas history is indebted to the professionalism of the staff at the Kansas State Historical Society and the utility of its numerous collections. Of particular value were the newspaper files, undoubtedly one of the finest collections of state newspapers in the nation, and the comprehensive index to the Kansas Corporation Charters. The Historical Society and the Regional Collection at Spencer Research Library both contain excellent collections of county histories, gazetteers, various kinds of "boomer" literature, and the published reports of various state agencies. The Montgomery County Historical Society, Independence, also yielded important information.

Acknowledgments

Numerous individuals contributed to this study. Thanks are due county clerks and treasurers, who generously unlocked their vaults and attics. I wish to thank also: The Ozarks Regional Commission; Mr. H. W. Guth, Plant Manager, Lehigh Portland Cement Company, Iola; Mr. George W. Wells and Mr. Gene Billings, Ash Grove Cement Company; Mr. Elmer R. Ligon, W. S. Dickey Clay Manufacturing Company; Reed Whitaker, archivist, Federal Records Center, Kansas City, Mo.; and Mr. Leon Sherwood, Montgomery County Historical Society. Particular thanks are due William W. Hambleton, Director, and Mr. Ronald G. Hardy, Chief, Mineral Resources Section, both of the State Geological Survey of Kansas, and their staffs. Mr. Hambleton and Mr. Hardy placed a long-shot bet on the belief that a historian could serve an immediate, functional purpose. The outcome is still in doubt. While the experience that I derived from this study has been invaluable, not least because of contacts with Survey people, the value of this study to the Survey is not so immediately apparent to me. I hope that they find it not only interesting but of some use in their constant efforts to bring together minerals and industries in Kansas.

John G. Clark
Associate Professor
Department of History
The University of Kansas

Lawrence, Kansas
Summer 1970

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I

Agriculture and Industry in Southeastern Kansas, 1890-1930

Mrs. Mary Ellen Lease in the course of over 100 speeches delivered during the Kansas congressional campaign of 1890 may well have faced an audience of parchment-skinned faces and faded calico and said: "What you farmers need to do is raise less corn and more Hell." With corn at 50 cents a bushel in the Chicago market and the farmer's profit margin diminishing under the pressure of increasing costs of production, high interest rates, speculative indiscretions, high freight rates, and overproduction, Mrs. Lease may have been right. Not for all of Kansas, of course, for in the western counties a green sprout was indeed a rare sight. Torrid, rainless summers and brutal winters so demoralized the settlers that half of the population departed between 1888 and 1892. The intensity of drought, crop failures, and other natural calamities that are the burden of the farmer trailed-off from west to east. In the central counties most of the inhabitants remained, even though suffering from lack of adequate rain, embittered by man-made evils which exacerbated their condition, and thus participated actively in the Populist movement. In the eastern counties, where most of the corn was grown and where adequate rainfall could normally be anticipated, a more stable farming population was better prepared to ride out the bad times.[1]

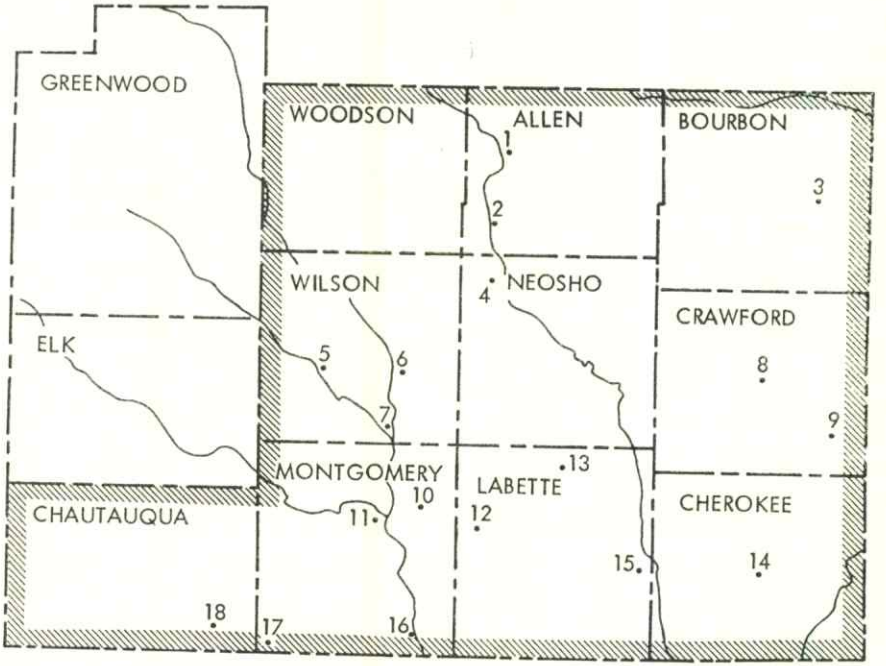
The collapse of the boom in the late 1880's and the decade of hard times that followed affected all of Kansas as well as the contiguous agricultural states and the rest of the nation. Since Kansas was overwhelmingly agricultural and large portions of the State were either underdeveloped or in a rudimentary stage of development, it is unlikely that many people escaped the effects of the depressed conditions. But some areas of the State were more highly developed agriculturally than others, and therefore were more vulnerable to the severe price fluctuations of staple crops that marked the last quarter of the Nineteenth Century. So the intensity of the depression varied from region to region and did not necessarily spring from the same causes. The best of times would barely have ameliorated the prolonged periods of drought in western Kansas; ideal growing conditions in the east could bring no price relief to the farmer. And as is frequently noted, urban industrialization did not proceed quickly enough in Kansas or the Plains states to absorb the agrarians displaced by either hard times or mechanization.[2] Indeed, as James C. Malin observed, the depression of the nineties shattered the morale of the rural community and the small towns that served them[3]—towns that may have contained the potential for further growth.

In certain respects the pattern of growth in Kansas was fixed or relatively complete by the time economic disaster struck. Railroad mileage reached 8,806 miles in 1890—made possible in part by almost $75 million dollars of state and local assistance—an increase of some 5,400 miles over 1880. Another 582 miles were laid over the next two decades while the network was augmented by an additional 561 miles of electric railroad.[4] Kansas City, Kansas, and Topeka had emerged as two of the three largest urban units. In the meantime, the third, Wichita, crept ahead of its closest rival, Leavenworth, between 1890 and 1900 and left the Missouri River town far behind by 1910, replacing Topeka as the State's second city. Moreover, and most significantly, an increasingly well-balanced agriculture was the single most important activity in all regions of the State save one and in all of the counties save a dozen or so. It is this single regional exception—southeastern Kansas—and one sector of nonagricultural enterprise within that section—the "low-value" mineral industries—with which this study is concerned.[5]

The mineral industries include clay products (primarily brick and tile), cement, glass, and zinc smelting. All but the latter are ceramics involving the manufacture of various types of products from earthy materials through the application of high temperatures for their baking or firing, and they may also be defined as industrial, nonmetallic, and nonfuel minerals. In all four industries, the raw materials utilized are heavy, bulky, low-value minerals to which the manufacturing process adds sufficient value to justify manufacture and shipment.[6] Southeastern Kansas, with a virtual or actual monopoly of these industries for several decades, developed economic patterns considerably different from the rest of the State. With the exception of Wyandotte and Sedgwick counties, certain of the southeastern counties were the most heavily industrialized in the State and if industries dependent upon and supportive of agriculture are eliminated, the southeastern counties were the most industrialized.

Southeastern Kansas (Fig. 1) experienced its greatest growth between 1890 and 1910, although not all counties participated equally. By 1890 Crawford, Bourbon, and Cherokee counties—the most easterly—were the most heavily populated. Fort Scott, in Bourbon County, was the largest city in the region; Pittsburg, Crawford County, the second largest; and Cherokee, containing a swarming population of lead and zinc miners and those who serviced their needs, experienced a boom in the 1890's that caused its population to rise from 27,300 to 42,600. However, the population of Bourbon County declined in each decade after 1890 and in Cherokee County in each decade after 1900.

The percentage population changes between census years for the ten counties (Table 1; Fig. 2) demonstrates clearly that these counties were



1-Iola(Gas City), La Harpe
2-Humboldt
3-Fort Scott
4-Chanute
5-Fredonia
6-Altoona
7-Neodesha
8-Girard
9-Pittsburg
10-Cherryvale
11-Independence
12-Mound Valley
13-Parsons
14-Columbus
15-Oswego
16-Coffeyville
17-Caney
18-Peru

FIGURE 1.—Ten counties in southeastern Kansas.

growing more rapidly than the states in the Plains Region and almost as rapidly as the nation between 1890 and 1910. During those 20 years, the urban population of the ten counties increased even more rapidly, continued to do so through 1920, and then fell off less sharply than the region's population after 1920.[7] The most notable period of population growth corresponds quite closely with the period in which the mineral industries achieved their flowering within the region. While it is clear that the mineral industries contributed to this growth, it is more difficult to ascertain the magnitude of the contribution, whether absolutely, or relative to other industrial groups.

While agriculture was the dominant economic activity in Kansas, and agriculturally oriented industries such as meat packing, flour milling, and dairy products were ascendant in manufacturing, this was not altogether the case in southeastern Kansas. In 1884, Labette County, the leading pro-

TABLE 1.—Rank order of ten counties in southeastern Kansas by decennial percentage increase or decrease of population, 1890-1900 to 1920-1930.

Rank	1890-1900	1900-1910	1910-1920	1920-1930
1	Cherokee +56	Montgomery +71	Crawford +21	Montgomery +3
2	Allen +43	Allen +41	Labette +8	Bourbon −3
3	Crawford +28	Crawford +32	Wilson +6	Woodson −5
4	Montgomery +24	Wilson +26	Neosho +1	Cherokee −6
5	Woodson +11	Neosho +23	Montgomery +>1	Neosho −6
6	Neosho +3	Labette +15	Chautauqua +<1	Labette −8
7	Wilson +1	Bourbon −<1	Bourbon −3	Allen −9
8	Labette −<1	Chautauqua −3	Woodson −4	Chautauqua −11
9	Chautauqua −4	Woodson −5	Cherokee −13	Wilson −13
10	Bourbon −15	Cherokee −12	Allen −17	Crawford −25
Ten-county percentage	+16	+20	+2	−8
Kansas	+1	+17	+5	+4
Plains Region	+16	+12	+8	+6
U.S.	+21	+21	+15	+16

SOURCE: For Kansas, Appendix Table A; for the Plains Region and the U.S., Perloff [2], *Regions and Economic Growth*, Table 22, 133, Table 79, 223.

ducer of wheat and corn in the region, ranked 25th and 14th respectively among all Kansas counties in the production of those crops. Montgomery County ranked 28th and 22nd; Crawford, 30th and 24th; and Cherokee, 24th and 28th.[8] After 1890, the region's contribution to the agricultural economy of Kansas declined. From the perspective of the State, then, the region became less important agriculturally (Table 2).

The spread between regional and state agricultural outputs, narrowest in 1890, widened with each decade, reflecting in the early decades a shift in emphasis induced in part by opportunities to exploit the industrial mineral deposits located within the region. This shift was to a large degree made possible initially by discoveries of major natural-gas pools in the region, although in the pre-gas period, as will be seen, major coal deposits in the eastern counties fueled the zinc smelting industry and the scattered, small-scale brick and tile plants.

While the importance of the region's agricultural sector declined relative to the agricultural sector of the State, the total value of farm products

FIGURE 2.—Population of Kansas, of ten counties in southeastern Kansas, and of towns over 2,500 in those counties, 1890-1930. (See Appendix Table A.)

AGRICULTURE AND INDUSTRY

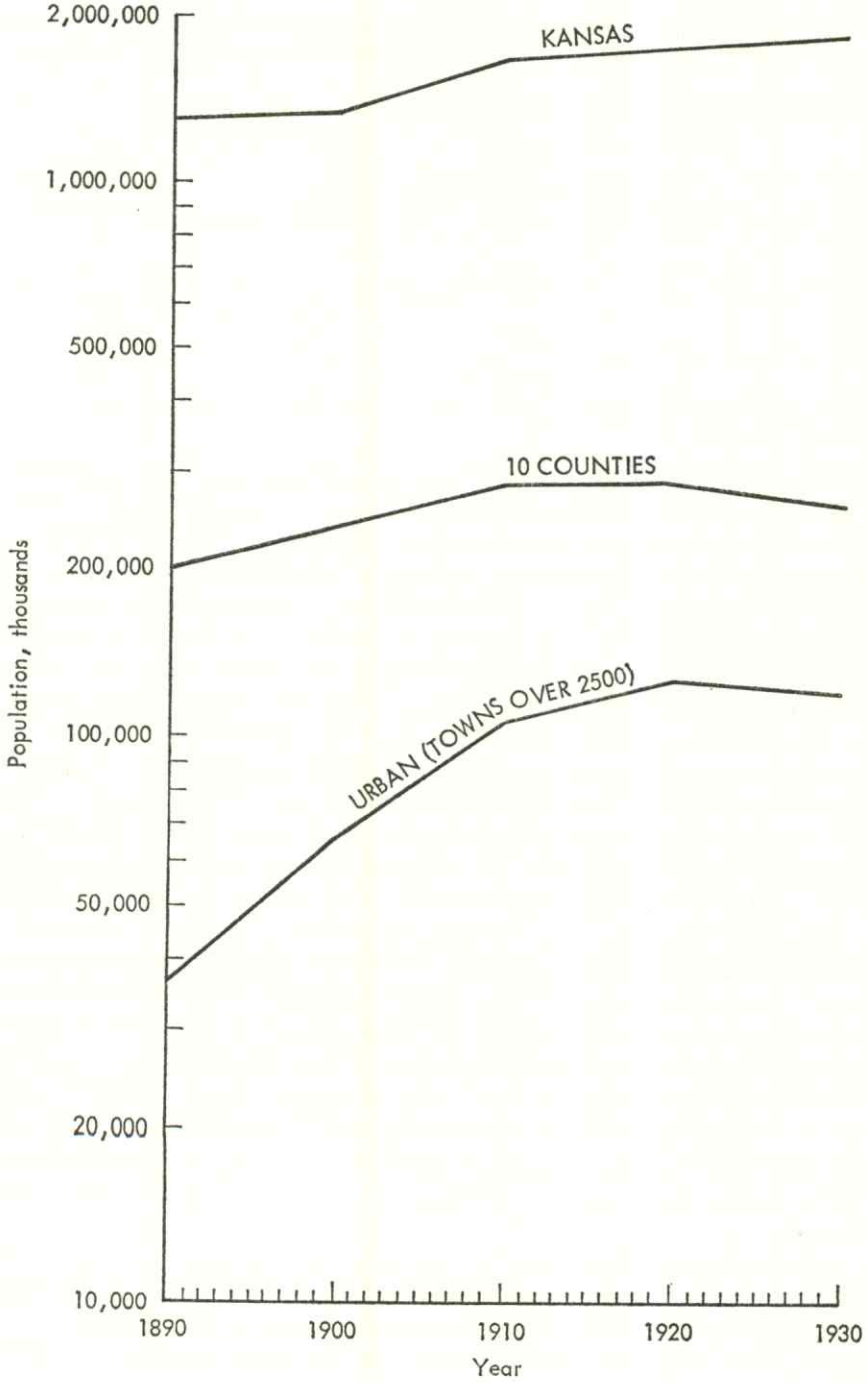


TABLE 2.—Regional percentage share of state population, state value of farm product (VFP), and regional and state dollar value of farm product per capita, 1890-1930.

Year	Region			State
	Percentage of state population	Percentage of state value of farm product	Value of farm product per capita, $	Value of farm product per capita, $
1890	14	11	71	85
1900	17	9	73	130
1910	17	7	77	181
1914	17	7	91	225
1920	16	8	181	392
1930	15	6	123	329

SOURCE: Appendix Tables A and B.

(VFP) in the region did increase steadily through 1930 (see Appendix Table B). However, for the first half of the period 1890-1910, the increase of VFP was a direct result of a concomitant rise in population rather than any perceptible improvement in agricultural efficiency or yield per acre. Within the region, the importance of farming varied among the counties, while being pursued to some degree in all of them. In 1890, five counties enjoyed a VFP per capita in excess of the State's while only one county exceeded the state figure by 1910, and none did so in 1920 or 1930 (Table 3). Moreover, a general stability relative to the significance of agriculture was maintained within the region. From 1900 to 1930, three counties—Cherokee, Crawford, and Montgomery—filled the last three ranks while two counties—Chautauqua and Woodson—were either first or second in VFP per capita. These latter two counties were of no industrial significance, while Montgomery became the leading industrial county by 1910.

Agriculture was virtually the only occupation or source of income for the population of Chautauqua and Woodson counties, but this is not the same as saying that these counties made the largest relative contributions to the agricultural economy of the region. Cherokee, Crawford, and Montgomery counties consistently appear among the lower ranks (Table 4) while the upper ranks are shared by several counties, notably Allen and Bourbon, both of which also developed a sizable industrial complex.[9] In the latter counties (Table 6), both agriculture and industry sustained the economy, and the counties were of significance in both areas within the region.

The industrial sector of the Kansas economy included two basic components. First, and largest, was the industrial plant directly servicing agriculture such as meat packing, flour milling, dairy products, and leather goods. This component also included such secondary industries as agri-

TABLE 3.—Rank order of ten counties in southeastern Kansas, by dollar value of farm products (VFP) per capita (in dollars), 1890-1930. (Actual value of farm products in thousands of dollars in parentheses.)

Rank	1890 County	1900	1910	1920	1930
1	Neosho 110 (2036)	Chautauqua ..139 (1629)	Woodson 182 (1721)	Woodson 349 (3140)	Woodson 253 (2153)
2	Allen 104 (1409)	Woodson 122 (1224)	Chautauqua ..139 (1489)	Chautauqua ..282 (3172)	Chautauqua ..212 (2191)
3	Woodson 101 (912)	Neosho 105 (2026)	Wilson 106 (2103)	Bourbon 250 (5800)	Allen 204 (4363)
4	Chautauqua 95 (1166)	Allen 88 (1718)	Bourbon 103 (2488)	Wilson 224 (4802)	Bourbon 184 (4127)
5	Wilson 90 (1360)	Bourbon 83 (2059)	Neosho 100 (2372)	Allen 223 (5247)	Wilson 144 (2779)
6	Bourbon 66 (1899)	Wilson 80 (1252)	Labette 98 (2855)	Labette 213 (7221)	Neosho 139 (3138)
7	Crawford .. 63 (1916)	Labette 73 (2012)	Allen 73 (2023)	Neosho 200 (4803)	Labette 111 (4751)
8	Labette 54 (1499)	Montgomery .. 71 (2063)	Cherokee 63 (2398)	Cherokee 127 (4280)	Cherokee 77 (2435)
9	Cherokee 53 (1435)	Crawford 48 (1877)	Crawford 52 (2661)	Montgomery .. 97 (4859)	Montgomery .. 73 (3769)
10	Montgomery 44 (1014)	Cherokee 36 (1522)	Montgomery .. 44 (2162)	Crawford 75 (4648)	Crawford 63 (3103)
	Region 71	 73	 77	181	123
	Kansas 85	130	181	392	339

SOURCE: Appendix Tables A and B.

TABLE 4.—Index of comparative importance of agriculture in ten southeastern Kansas counties, by rank order.

County	1890	1900	1910	1920	1930
Neosho	176.0	Neosho 115.5	Bourbon 113.3	Labette 213.0	Allen 142.8
Allen	114.4	Chautauqua 111.2	Neosho 110.0	Bourbon 200.0	Bourbon 128.8
Bourbon	99.0	Bourbon 91.3	Woodson 109.2	Wilson 156.8	Labette 88.8
Wilson	99.0	Montgomery 85.2	Labette 98.0	Allen 156.1	Woodson 75.9
Crawford	94.5	Labette 80.3	Wilson 74.2	Chautauqua 141.0	Neosho 69.5
Chautauqua	85.5	Woodson 73.2	Chautauqua 69.5	Neosho 140.0	Chautauqua 63.6
Woodson	70.7	Allen 70.4	Cherokee 50.4	Woodson 139.6	Wilson 57.6
Labette	64.8	Wilson 56.0	Crawford 46.8	Cherokee 76.2	Montgomery 43.8
Cherokee	58.3	Crawford 48.0	Allen 51.1	Montgomery 67.9	Cherokee 30.8
Montgomery	35.2	Cherokee 25.2	Montgomery 38.8	Crawford 52.5	Crawford 25.2

SOURCE: Appendix Tables A and B.

cultural implements and machine shops and foundries, which constructed and maintained equipment in mills, dairies, and packing houses. It might also encompass a major portion of the output of the railroad industry and its supporting machine shops, foundries, and yards, which earned a major portion of their intrastate income through hauling agricultural goods to processing plants, and thence to consumer markets. Although the total contribution of Kansas industry to the total industrial output of the nation might be negligible, Kansas performed favorably within the agriculturally oriented industries.

Kansas' role in the increasingly industrialized life of the nation was further enhanced by the presence and exploitation of valuable mineral deposits—the second of the basic industrial components. This industrial complex—mainly in southeastern Kansas—represented a group that did not function primarily as a service to agriculture (except insofar as farmers, millers, etc. were consumers of cement, glass, clay products, metals, and mineral fuels) but did service the consumer directly or indirectly through the manufacture of consumer or industrial goods.

Kansas was a major producer of minerals in the U.S., ranking sixteenth in 1903, with a mineral production valued at $27 million, and eighth in 1929, with a production valued at over $127 million. In 1911, coal contributed 38 percent of a product valued at $25 million, natural gas about 19 percent, and petroleum 2 percent. In 1925, petroleum contributed about 50 percent of a total value of $141 million. By 1929, cement and zinc were both more important than coal and roughly equivalent to natural gas. In 1929, Kansas ranked second in the U.S. in production of zinc ore, fourth in petroleum, and ninth in both natural gas and cement.[10]

The agriculturally oriented industries dominated the manufacturing scene in Kansas in terms of the value of manufactured product (VMP) and the number of workers employed during the entire 40 years under discussion. Meat packing, the largest in both areas, was concentrated in Kansas City, Kansas, with a smaller number of plants in Wichita and Topeka. Flour milling was fairly well distributed, with 67 towns, mostly in the western half of the State, having at least one mill by 1920. Dairy processing plants were located in 40 towns, mostly in the eastern half of the State.[11] In many towns throughout Kansas, the mill, elevator, and creamery dominated the scene both physically and economically, but in southeastern Kansas their presence was dwarfed by sprawling zinc smelters and cement plants, numerous brick plants, and, for a time, glass factories.

Unlike VFP, the region's share of the total state VMP increased with each decade, advancing from 5 percent in 1890, to 8 percent in 1900, 10 percent in 1920, and 12 percent in 1930 (Appendix Table B). Also, unlike the agricultural sector (VFP), the spread in VMP between the counties

widened dramatically with each decade. As Table 5 shows, the VMP of the leading manufacturing county in 1890 was 50 times greater than the VMP of the lowest-ranking county while some clustering was apparent among the leaders. But in 1930, the leading county's VMP was over three times greater than the second-ranking county and 800 times greater than the lowest-ranking county. Clustering occurred at a level far below that of Montgomery County and considerably lower than Wilson County. Suffice it to note here that Montgomery County possessed the largest concentration of the low-value mineral industries. With few exceptions, the rank order among the ten counties for VMP and VMP per capita corresponds quite closely, obviating the necessity of developing an index of importance for manufacturing such as is attempted for agriculture (Table 4).

The leading manufacturing counties in southeastern Kansas were consistently among the leading counties in the State. At this level of comparison, the gap between the leading county and the next in order was as marked as the differential within the ten counties. The following listing is a rank order of counties with a larger VMP than the county ranked second in southeastern Kansas (southeastern counties are in small capitals):[12]

1920		1930	
	(In thousands of dollars)		
Wyandotte	474,267	Wyandotte	316,874
Sedgwick	76,503	Sedgwick	84,990
Shawnee	45,813	MONTGOMERY	42,746
MONTGOMERY	38,119	Shawnee	39,458
Cowley	22,797	Cowley	32,430
Saline	18,925	Butler	28,161
Chase	16,835	Reno	19,795
WILSON	15,142	Saline	19,348
		Atchison	15,676
		WILSON	13,544

The spread between Wyandotte and Sedgwick counties and Montgomery and Wilson counties is explicable in terms of the type of industries located therein. In 1930, for example, Wyandotte County produced 83 percent of meat packing VMP, and this accounted for 71 percent of that county's VMP.[13] Although the industries of specific concern in southeastern Kansas had declined in importance by 1930 (glass manufacturing had disappeared), other nonagriculturally oriented industries had replaced them and thus maintained the region's position in manufacturing.

Before turning to an analysis of the industries *per se,* let us examine the general position of agriculture and manufacturing within the ten counties. Table 6 indicates the preponderant position of manufacturing

TABLE 5.—Rank order of ten counties in southeastern Kansas by value of manufactured product (VMP) per capita, 1890-1930 (actual value of manufactured product in thousands of dollars in parentheses.)

Rank	County 1890	1900	1910*	1920	1930
1	Bourbon 55 (1556)	Allen 199 (3897)	Montgomery 748 (38119)	Montgomery 831 (42746)	
2	Crawford 53 (1606)	Montgomery 87 (2547)	Wilson 715 (15142)	Wilson 730 (13554)	
3	Labette 47 (1287)	Crawford 65 (2448)	Allen 307 (9230)	Allen 424 (9130)	
4	Cherokee 24 (659)	Labette 63 (1726)	Bourbon 216 (5019)	Neosho 251 (5877)	
5	Montgomery 22 (515)	Bourbon 42 (1040)	Neosho 199 (4777)	Labette 220 (6908)	
6	Allen 11 (153)	Cherokee 34 (1457)	Labette 163 (5574)	Bourbon 212 (4751)	
7	Neosho 9 (174)	Wilson 25 (380)	Crawford 122 (7549)	Crawford 150 (7396)	
8	Wilson 6 (92)	Neosho 21 (404)	Cherokee 113 (3798)	Cherokee(?) (3798 in 1920)	
9	Chautauqua 5 (58)	Woodson 13 (134)	Chautauqua 16 (186)	Chautauqua 23 (242)	
10	Woodson 3 (30)	Chautauqua 9 (113)	Woodson 9 (78)	Woodson 6 (53)	

* No data available for 1910.
SOURCE: Appendix Tables A and B.

TABLE 6.—Rank order of ten counties in southeastern Kansas by total value of manufactured products and farm products per capita (in dollars), 1890-1930. (Percentage derived from manufacturing in parentheses.)

1890		1900		1910*	1920		1930	
County	Value	County	Value		County	Value	County	Value
Bourbon	121 (46)	Allen	287 (69)		Wilson	939 (76)	Montgomery	904 (92)
Crawford	116 (46)	Montgomery	158 (55)		Montgomery	845 (89)	Wilson	874 (83)
Allen	115 (9)	Chautauqua	148 (6)		Allen	530 (58)	Allen	628 (67)
Neosho	110 (8)	Labette	136 (46)		Bourbon	466 (46)	Bourbon	396 (53)
Woodson	104 (3)	Woodson	135 (9)		Neosho	399 (50)	Neosho	390 (64)
Labette	101 (46)	Neosho	126 (17)		Labette	376 (43)	Labette	331 (66)
Wilson	96 (6)	Bourbon	125 (34)		Woodson	358 (3)	Woodson	259 (2)
Chautauqua	95 (5)	Crawford	113 (57)		Chautauqua	298 (5)	Chautauqua	235 (9)
Cherokee	77 (31)	Wilson	105 (24)		Cherokee	240 (47)	Crawford	213 (70)
Montgomery	66 (33)	Cherokee	70 (49)		Crawford	197 (62)	Cherokee	†
Kansas	162 (47)		247 (47)	307 (52)		905 (57)		727 (54)

* No data available for 1910.
† Data not reliable.
SOURCE: Appendix Tables A and B.

in Montgomery and Wilson counties, the two whose per capita figures exceeded the State's, while it also marks an economic decline in Crawford County, and in lieu of per capita income figures, further suggests a greater prosperity among those counties in which manufacturing was relatively more substantial.

For purposes of comparison and analysis, manufacturing industries in Kansas were segregated into four groups: (1) meat packing, flour milling, and dairying (the farm-oriented industries); (2) railroad shops, yards, construction, and repair and foundry and machine shops; (3) petroleum refining; and (4) cement, clay products, glass, and zinc smelting.

While Kansas is generally treated as an agricultural state, its manufacturing sector was significant, and, in fact, the VMP in Kansas surpassed the VFP—as Figure 3 indicates—prior to 1910, and the differential increased through 1920. While a large portion of the Kansas VMP included the products of Group 1, the ascendancy of this Group declined steadily after 1910 in both VMP and value added by manufacturing (VA). Figure 4 shows the percentage distribution of VMP and VA among the four manufacturing groups. By 1930, the VA of the three nonfarm-oriented groups, surpassed that of Group 1. While this does not mean that industry replaced agriculture as the primary economic activity of the State—any more than does the fact that VMP surpassed VFP—it does indicate that a proportionately greater return was obtained per dollar of raw material consumed in the manufacturing process of nonfarm-oriented industries. Furthermore, in the export sector, the nonfarm industries brought proportionately more dollars into the Kansas economy through the sale of their products than did Group 1 simply because fewer dollars were invested in each unit of manufactured product than in each unit of processed farm product. This was particularly advantageous to southeastern Kansas for a time, since it was the scene of major capital investment in groups 2-4.

Group 4 industries experienced an accelerated rate of growth between 1890 and 1910, growing more rapidly than the other groups or than Kansas industry as a whole. During the period 1920-1930, VMP in Kansas declined, after 30 years of steady growth; VMP for Group 1 dropped precipitously; Group 2 VMP reached a plateau; and only petroleum refining (Group 3) advanced at a faster rate than Group 4. The rapid upward movement of Group 4 VMP was almost matched by the region's VMP through 1910 (Fig. 3). At all levels, state, regional, and group, VMP rose more sharply than VFP.[14]

Southeastern Kansas became the center of a large industrial complex between 1890 and 1910, based on the presence of large deposits of metallic, nonmetallic, fuel, and nonfuel minerals. It was the first—perhaps the

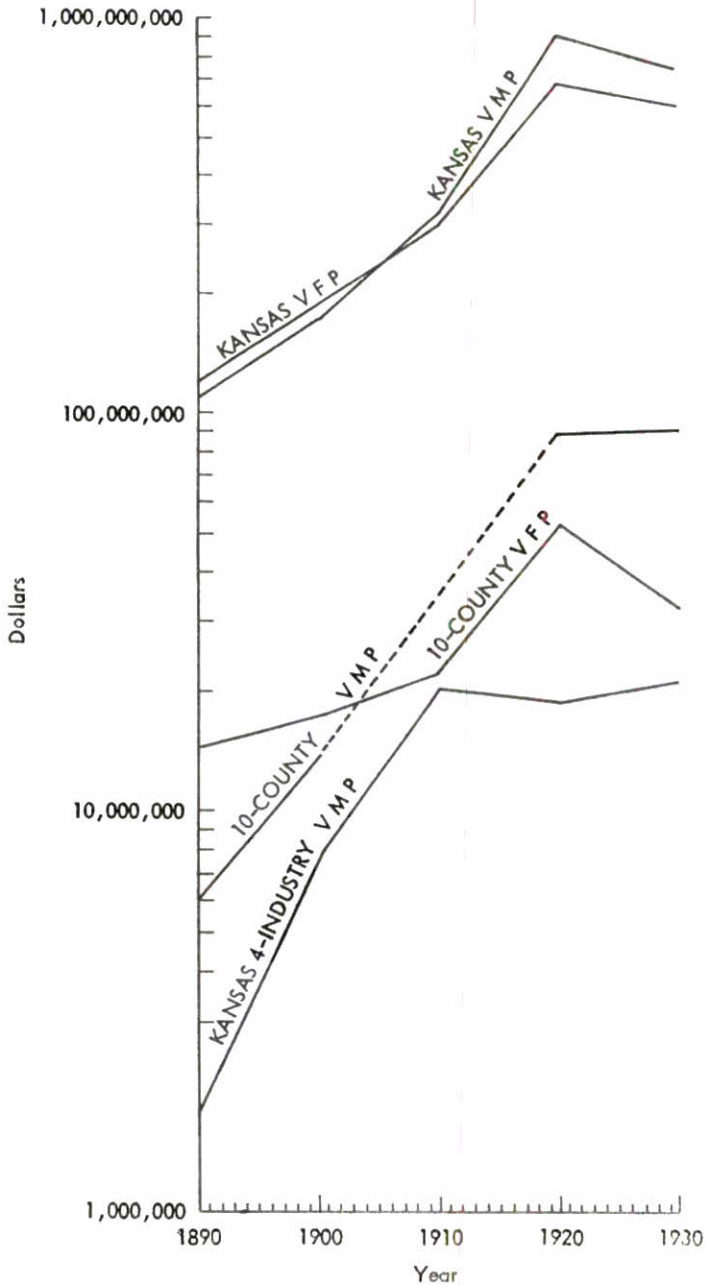


FIGURE 3.—Value of manufactured product (VMP) for Kansas, for ten counties in southeastern Kansas, for four industries (cement, clay products, glass, zinc smelting), and value of farm product (VFP) for Kansas and for ten counties, 1890-1930. (See Appendix Tables A, B, C.)

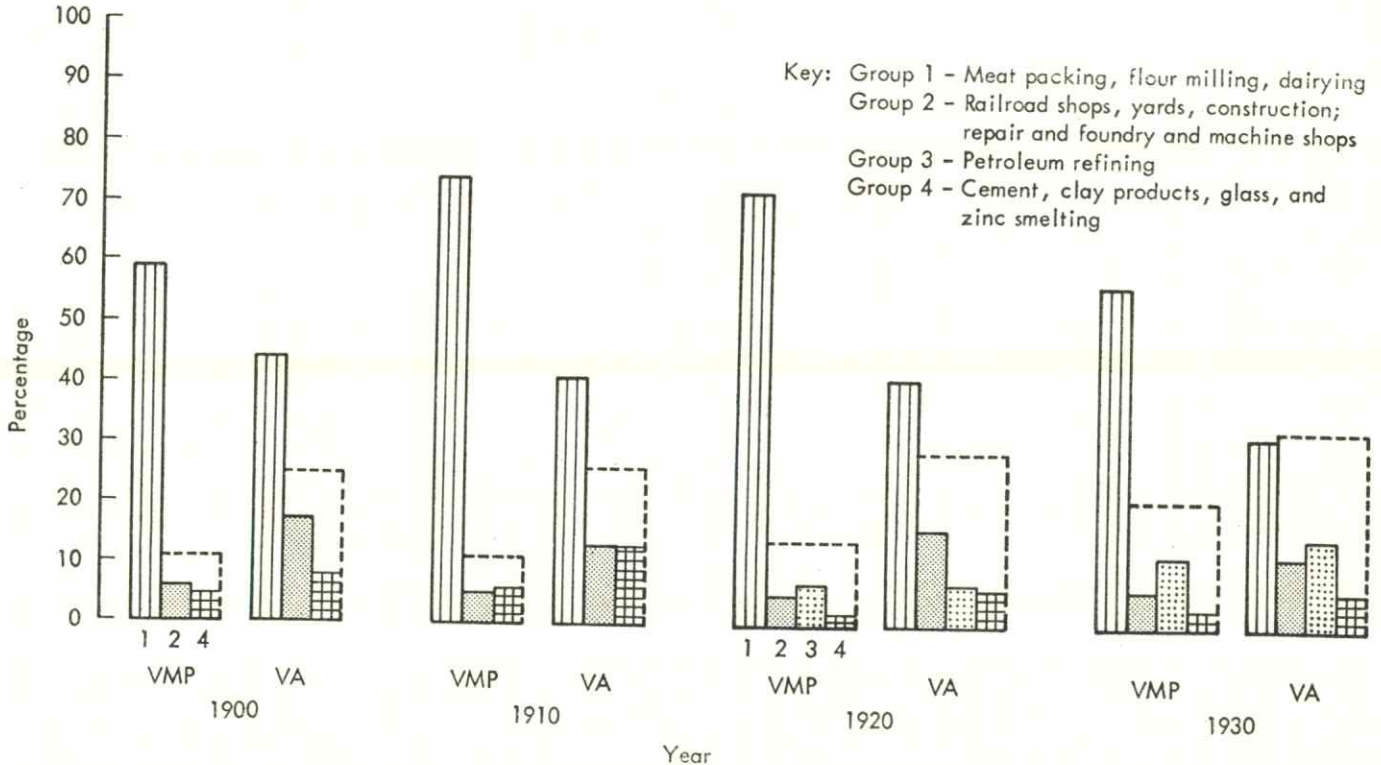


FIGURE 4.—Percentage of total Kansas value of manufactured product (VMP) and value added by manufacture (VA) for four groups of Kansas industries and cumulative percentage for groups 2, 3, and 4 (dashed line), 1900-1930. (See Appendix Table C.)

only—region in Kansas to experience the kind of industrialization that transformed portions of New England, the Middle Atlantic, and Great Lakes states into the industrial heartland of the world. To be sure, the size of the complex in southeastern Kansas could hardly compare with that developing between New York City and Philadelphia or between Gary, Indiana, Chicago, and Milwaukee. Yet its size was large considering the area within which it functioned, and its impact was great both in its rise and in its decline.

The mineral industries were not foreign to the region in 1890. Coal had been mined in Kansas since before the Civil War. By 1890, it was the most valuable mining product in the State and was centered in Crawford and Cherokee counties. Zinc and lead ore, located in a small triangle of about 30 square miles in the area of Galena, Cherokee County, yielded a product second only to coal—and that by but a small margin. The lead and zinc deposits formed only a part of the Joplin-Galena lead and zinc district and sustained the relatively small zinc smelting industry that had developed in the region between 1873 and the early 1890's. Kansas clay industries were also concentrated in the region, drawn not only because of suitable clays, but, as in the case of zinc smelting, of proximity to the coal beds of Pittsburg.[15] In two of the industries, metallic zinc (spelter) and clay products, the remarkable growth of the 1900's sprang from a preexisting base. Portland cement and glass were new to the area. In all four industries, Kansas developed a plant capacity and achieved a level of production that propelled it into the top rank of producers nationally (*the* top rank in the case of zinc smelting). Figure 5 and Table 14 measure the productive shares of each industry relative to one another both in the long run and during a portion of the early—for glass the only—period of growth.

Zinc smelting, for a time, was the largest nonfood product industry in Kansas and formed the largest concentration of metallic zinc producers in the U.S. While the position of zinc smelting in Kansas declined after 1910 relative to other mineral industries (Fig. 5) and declined nationally after 1910 relative to other centers of bar zinc (spelter) production (Table 7), Kansas improved its position as a source of zinc ore. During the period 1906-1910, Kansas produced about 4 percent of the ore mined in the United States, while it smelted over 40 percent of the nation's metallic zinc. In 1910, Kansas mines yielded 10,220 short tons of ore of a domestic yield of 252,479 and in 1915, 14,365 short tons of 586,491. Its smelters, in that year, produced 105,697 short tons of metal, of a domestic production of 269,184. By 1920, Kansas mines yielded 61,000 short tons of ore and in 1929, 110,000 short tons.[16] This unsought-after development amounted to a net loss to the industrial strength of

tion and evaluation of the geographical location and geological conditions from both a commercial and an engineering viewpoint, the latter's purview including raw materials, water and fuel supply, railroad facilities, labor supply, and living conditions. Part two contained schematics for buildings and machinery. Part three described the projected organizational structure, the process of manufacture, the labor organization, with job descriptions, the records system, and other particulars.

Of all the factors analyzed, markets received the most general and least impressive treatment. It was assumed that the Iola product was marketable in an area bounded on the west by Santa Fe, on the south by New Orleans, on the east by Birmingham, and on the north by Chicago and Minneapolis. The promoters were assured that Asian and European markets also were easily accessible. Iola's location on two trunk-line railroads, the Missouri Pacific and the Atchison, Topeka, and Santa Fe (ATSF)—both of which built spurs to the plant site—was also noted, but the greatest emphasis and the most thorough scrutiny was reserved for the fuel supply and the availability of raw materials.

The site chosen contained 300 acres of high-quality Iola limestone outcropping at the surface and a thick bed of shale. On the basis of calculations fixing the proportion of raw materials necessary to produce a barrel of cement at 74 percent limestone, 24 percent shale, and 2 percent gypsum, the cubic footage of cut required was determined per hour, day, and year. The quarrying operation also was calculated according to differing depths of cut. Since the company intended to employ the wet process of manufacturing, plans for a dam and pumping station were included.

Fuel requirements and supplies bulked large in the study, the more so since the wet process entailed higher fuel costs than the dry. While natural gas was a prime factor, the study pointed out that both petroleum and coal could be obtained at low cost. A good vein of coal was located on company property. But it was gas that made the difference, for the wells on company property would provide the fuel at practically no cost and save the company almost $155,000 annually (the equivalent cost of coal), or 17 cents per barrel of cement.

The cultural environment was examined along with the physical. It was concluded that Iola was a nice, progressive town about to embark on a program of internal improvements that would bring water works and electric lights to the community. The Great Western Company came to similar conclusions in deciding to build at Iola, but Ash Grove thought Chanute the best location. Similar decisions, some perhaps based on less rigorous study, brought cement plants to seven other Kansas towns located in four counties in southeastern Kansas. At its peak,

tured glass from sands discovered near Fredonia, and, in the same year, the *Caney Chronicle* reported that five glass plants in Montgomery County had organized to develop glass-sand deposits in Wilson County. The organization intended to invest $20,000 in machinery to crush the sandstone. Apparently the results were unsatisfactory, for glass companies continued to import glass sands from Illinois and Missouri. As for other ingredients, Coffeyville plants obtained lime for fluxing from nearby quarries, soda from Michigan, and potash from South America, and the Schwartz Glass Company at Peru, Chautauqua County, even imported its lime from Indiana.[20] Since a local resource base was not developed, the depletion of the Kansas gas fields was accompanied by the emigration of the glass industry, in part to Oklahoma.

Fuel costs were equally important in the portland cement industry. Thirty to 40 percent of the total manufacturing cost was chargeable to fuel supplies. Unlike glass and the generally unintegrated smelting companies of the time, it was uneconomical for a cement plant to purchase all of its primary ingredients. Cement plants were expensive undertakings and manufacturers were unwilling to establish plants unless they fully controlled at least a 20-year supply of raw materials.

Limestone was the most essential raw material, forming more than 85 percent of the weight of clinker.[21] All of the Kansas cement plants owned limestone quarries and, in most cases, a deposit of another essential, shale, was interstratified with the limestone. Promotional literature advertising the securities of the Ash Grove Lime and Portland Cement Company and the Great Western Portland Cement Company emphasized the presence of limestone deposits at or near the surface (thus reducing the cost of removing overburden) and deposits of shale just below the limestone. Great Western estimated its holdings to contain 21 million tons of limestone and 49 million tons of shale or enough to manufacture 90 million barrels (376 pounds per barrel) of cement.

Gypsum was a critical substance missing from the region, but extensive deposits located in other parts of Kansas were exploited. The Iola Portland Cement Company purchased gypsum from the U.S. Gypsum Company, but shortages forced the suspension of operations frequently enough to warrent the purchase of gypsum lands in Oklahoma.[22]

The cement companies that seriously intended to manufacture cement, rather than securities, investigated local conditions thoroughly before selecting a spot. Criteria for locating such plants acceptable by today's standards were utilized in the decision-making process.[23] In 1900, the promoters of the Iola Portland Cement Company received a volume entitled "Selection Site and Location of Iola Portland Cement Company's Plant."[24] Part one of the study contained a general descrip-

glass plants came with such a rush in that year that this fact hardly matters. Nine glass plants were located in the region by 1904; 18 in 1905; and 23 in 1909. While it remained the smallest of the four mineral industries in VMP (Fig. 5), it was the most specialized of the group, required a large proportion of highly skilled labor in the manufacturing process, and, in paying out the highest ratio of wages to VMP, was the most labor intensive of the four (Table 10). Since glassmaking consumed much fuel per unit of product, economies in the manufacturing procedure were not achieved through mechanization until a later time. Kansas was attractive to glassmakers because natural gas was available in the region at little or no cost during the early years.

The introduction of gas furnaces in glass manufacturing in the 1880's influenced the location of the industry and increased its migratory capacity as did its character as a relatively small-scale, small-investment enterprise. The natural gas fields of Indiana and their relative proximity to glass sands stimulated an increase in Indiana glass plants from 21 in 1890 to 110 in 1900 while a similar concentration of an older vintage existed in the Pennsylvanian-West Virginia-southeastern Ohio area. When the gas fields of Indiana showed signs of depletion in 1900, glassmen looked for other locations. Sufficient advantages were present in Kansas to merit the attention of the industry, and, in 1901 and subsequent years, numerous parties of glassmakers journeyed to Kansas to inspect the gas fields and negotiate advantageous contracts with Kansas towns and railroads for the relocation of some plants and the erection of new plants. There was also talk of exploiting Kansas sands and eliminating the expense involved in shipping glass sand from Illinois.[19]

Practically all of the raw materials used in glassmaking were originally shipped into the region. It was reported in 1902 that an Indiana glassman connected with the Coffeyville Window Glass Company was investigating the suitability of Arkansas City sands for glassmaking. In 1903, the Midland Glass Company of Independence actually manufac-

TABLE 10.—Ratio of value of manufactured product (VMP) to total wages for four mineral industries in Kansas, and for all industries in Kansas, 1904-1914.

Industry	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Glass	2.1	1.7	2.1	2.4	2.2	2.1	1.7	2.5	2.2	1.9	1.9
Brick and tile	2.3	2.5	2.1	2.0	2.4	2.6	2.4	2.1	2.2	2.4	2.7
Cement	3.6	3.5	3.4	3.4	2.8	3.4	3.3	3.6	3.5	3.5	4.7
Zinc	6.9	7.1	7.4	6.3	8.4	9.4	9.4	9.6	10.2	7.8	8.3
All Kansas industries	10.2	7.3	7.6	8.4	12.5	8.5	9.0	9.3	9.3	12.4	

SOURCE: Kansas Bureau of Labor and Industry, *AR 1904-1914*.

sources.[16] Evidence from the small area of southeastern Kansas does not entirely support this view. There was certainly a general clustering of industry around the ores and minerals, the result of many millions of dollars of investment in land, factories, refineries, foundries and machine shops, and railroad yards. Towns grew; services expanded with the influx of population to man the plants; new schools were built; beltline railroads were completed; but when the boom ended, the dislocation left many towns larger and more prosperous than before. Subsequent problems in major regional centers such as Coffeyville or Iola were as much a product of the 1920's and 1930's as of the big gas boom which undoubtedly left the towns better able to survive the rapid shifts and turns of succeeding decades.

Within the region, the few who counseled moderation in the use of gas—frequently, in the case of the towns, only in order to secure it for their own untrammeled use—were vastly outnumbered by those wishing to exploit gas to the full. Discovered near Iola in 1873, the potential uses of gas went unappreciated until the 1890's. Development of the Iola field was rapid thereafter with the most productive wells located in Allen, Montgomery, and Neosho counties. The number of gas producers increased from ten in 1897, to 80 in 1902, and 204 in 1910, while the known value of metered gas to domestic consumers (at $659,000 in 1901) rose to over $8 million in 1909 and then declined rapidly. Industrial consumption in 1910, was estimated at about 16 percent of total usage and was valued at $1.3 million. In 1915, at the end of the gas boom, which was protracted by the onset of World War I, nearly 14 billion cubic feet was supplied to industry compared with 8 billion in 1919. In the period after 1915, much of the gas was piped from Oklahoma.[17]

Once the value of gas was recognized, the regional response was immediate. Towns, railroads, industries, and speculators all joined in the search for and use of the energy source. A Chanute prospecting company drilled two productive wells in 1899 and formed the Chanute Vitrified Brick and Clay Manufacturing Company. The Cherryvale Gas Company, with leases on 75,000 acres, laid pipes into the city and contracted to supply the Cherryvale Brick Company. Brush and Wadsworth brick yards at Iola drew from their own wells while similar developments occurred at Coffeyville, Caney, Neodesha, Humboldt and other towns.[18] As noted above, zinc figured in this expansion, with the Iola area the major beneficiary. Within a short time, glass and cement manufacturers joined the march to the gas fields.

Caney claimed the distinction of being the first glass-manufacturing town in Kansas with a small factory in operation early in 1902. But

containers, particularly fruit jars. In other words, glass, clay and cement, in addition to being "material-oriented," or "input-oriented," as Harvey Perloff prefers, were population-oriented.[13] They reflected the truth, as stated recently, that "it is the presence of a center of population that determines whether a nonmetallic formation will become an 'ore deposit.' "[14] The relevant populations were not only in southeastern Kansas, but in Kansas and the Plains area in general, all of which experienced rapid population growth between 1900 and 1910 (Table 1).

Although the nonmetallic industries expanded to meet a demand generated at a different level than zinc, the rationale behind location in Kansas was basically the same. Given the low initial value and bulkiness of the resources extracted for further processing and manufacturing in zinc, clay products, and cement, it was most economical to locate the plants in close proximity to the raw materials consumed. All four industries, moreover, required large quantities of fuel per unit of output. Local coal was first used in zinc smelting. The discovery and utilization of natural gas allowed additional economy in the refining of zinc and the manufacture of brick and tile, and such great economy in the manufacture of cement and glass that the latter industries established large-scale operations in southeastern Kansas. The primary advantage of location in Kansas seems to have been the availability of natural gas, since it appeared in 1900 to provide an energy base sufficient for long-term growth. From the perspective of the individual industries, then, the resource endowment of the region was rich indeed.

The point has been made that areas narrowly specialized in the production of natural fuels may find that these products actually retard economic growth if the depletion of reserves proceeds more rapidly than discovery.[15] The discovery-depletion cycle was certainly unfavorable immediately following 1907 in southeastern Kansas. In 1907 the Iola field had a measured potential flow of 1 billion cubic feet daily and use amounted to only 75 million, but there was no way of determining the extent of the underground reserves. Worked to full capacity, the gas might last only one day. Many believed it would last for decades. As it turned out, the resource lasted until 1910. But this is not to say that the experience was entirely without dividends or that, in the longrun, the region enjoyed no benefit from the temporary conjunction of gas and factory.

The logic of the point discussed above rests in part on the assumption that fairly limited and localized linkages with other economic activities characterize minerals in general, both fuel and nonfuel; that minerals exhibit no particular propensity to induce locational linkage—the extent to which other activities cluster in the same general area as the re-

occurred in 1902 and 1903. The new plants operated at full capacity and expanded that capacity during the next few years. Robert Lanyon Company led the way in Iola in 1896-1897 and then built a large smelter at La Harpe, just west of Iola. In 1898, W. & J. Lanyon constructed a smelter at Iola with 1,800 retorts and added 1,400 retorts in 1901. These two Lanyon firms merged in 1902 as Lanyon Zinc Company and erected rolling mills at La Harpe in 1902. The Cherokee Zinc Company (later to merge with Lanyon Zinc) built at Gas City (Iola); Edgar Zinc Co. located at Cherryvale and Granby Mining and Smelting Company operated at Neodesha using both coal and gas as fuels. By 1899, 11 smelters were located and operating in the region, and in 1908, 16 producing firms, capitalized at over $12 million, sold $11.2 million worth of spelter, and funneled close to $2 million in wages into three or four counties within the region.[11]

The smelting industry, then, responding to trends at the national level and exploiting favorable local conditions initiated its last phase of expansion in Kansas. The cement industry responded in much the same way to a great increase in national demand for structural materials and established a new center in Kansas in order to tap the growing markets of the Trans-Missouri west. The clay products industry expanded its capacity to supply similar, although more localized, construction needs. The response of the glass industry, leading to its establishment in southeastern Kansas, was less a reaction to the burgeoning needs of an urbanizing and industrializing society than to insurmountable problems in old centers of production and unique advantages present in Kansas. Most shifts in the location of any specific industry are, as Edgar M. Hoover notes, essentially geographic differentials in the rate of growth rather than the actual physical relocation of firms.[12] The glass industry, as will become apparent in Chapter 3, was an exception, for in many instances plants and labor actually moved from Indiana to Kansas.

Although similar general reasons partially explain the expansion of the zinc and clay products industries, the establishment of cement plants, the relocation of a segment of Indiana's glass industry in Kansas, and the construction of new glassmaking facilities in Kansas, a certain critical dissimilarity distinguished zinc from the others. Zinc was dependent upon national and international markets. Cement and clay products filled a demand generated in Kansas and a few contiguous states and territories, with clay products the more localized of the two. The glassmaking industry marketed in roughly the same area as cement and filled urban demand for window glass while at the same time it was tied closely to the western agricultural economy through the sale of

LOCATION OF MINERAL INDUSTRIES

As American industry enlarged its productive capacity, developed new materials and new uses for old materials, the nature of industrial organization changed also. Merger and concentration, sophistication of bureaucratic organizations through the employment of rationalized cost-accounting and marketing techniques, and vertical integration of the new industrial giants all mark the history of an industrially developing America in the decades after 1890. Four zinc companies merged in 1897 into the New Jersey Zinc Company, the major consolidation in the industry, while in the same period several large corporations were formed, including Anaconda Copper Mining Company and American Zinc, Lead, and Smelting Company. The latter unit, initially a speculative mining venture, moved into smelting with the purchase of a smelter at La Harpe, Kansas. Mergers also took place among the existing Kansas smelters, and the American Steel and Wire Company, a constituent of U.S. Steel, purchased the Edgar Zinc Company in Cherryvale.[10]

Physical expansion in Kansas mining and smelting was rapid. Price increases accompanied the rise in demand, stimulating new and heavy investment in zinc properties, milling, and smelting. Estimates of the volume of investment range from $25 million in the Tri-State Area (Arkansas, Missouri, and Kansas) to $12 million in the Joplin area alone. It is likely that 40 to 50 percent of the investment took place in Kansas, which received a smaller share than Missouri of the capital necessary to double the number of custom mills, and it received virtually all of the capital that was invested in smelting.

Although the bottom fell out of the zinc market in 1900 and 1901, with prices in 1901 dropping to a level not reached again until the 1930's, the expansion in smelting capacity continued without noticeable abeyance. Much money was undoubtedly lost in the mining districts where many properties had sold at from two to five times their actual value during the peak of the boom. But the smelters were hurt less severely than the mine operators due to a milder fluctuation of spelter prices, the failure of organizations of ore producers to maintain the price of ore or gear it to spelter prices, labor disputes in the ore mines (which were met with wage increases rather than the closure of the mines), mine closures in 1900 which had no influence on prices, and the significant savings in fuel costs resulting from the removal of the smelting industry from the coal to the natural-gas fields.

With spelter prices plunging by almost 30 percent between 1899 and 1901, the move to the gas fields, which reduced smelting costs by nearly an equivalent percentage, came at a most propitious moment. Although the smelters at Pittsburg all closed, the savings probably enabled some of the new facilities to survive and profit from the rise in prices that

low price of 70 to 80 cents per ton, fuel costs amounted to about $9 per ton. Zinc ore, F.O.B. mines, normally ran at approximately $20 per ton in addition to nominal transportation charges. Since it required 3 tons of ore to produce 1 ton of slab zinc, the cost of raw materials came to about $70 per ton. Even though numerous observers pointed to the backwardness of the mining and smelting technology in Kansas, spelter prices rose from $70 per ton in 1893—the trough in a series of price declines beginning in 1890 and 1891—to $115 per ton in 1899, apparently providing a sufficient margin of profit to induce new smelters to enter the field.

The smelting operations of the 1890's were not vertically integrated firms. Only the Granby Company worked its own mines, and it was joined by one other firm during the 1900's, the American Zinc, Lead, and Smelting Company. Smelters purchased ore at the mines from large mining companies such as South Side Mining and Manufacturing and Battlefield Mining (jointly producing 25 percent of the ore in 1892-1893), and a host of smaller companies. Most of the mining was carried out under the lease or royalty system with the larger companies operating the crusher or custom mills that supplied the smelters.[8]

A combination of circumstances at the national level stimulated a dramatic expansion of the zinc industry in southeastern Kansas while developments in the region greatly influenced the precise configuration of the expansion. Zinc spelter production in the United States increased by 41 percent from 1890 to 1895 and 38 percent from 1895 to 1900, while in Kansas the percentage increases for the two periods were 69 and 142. Kansas produced 24 percent of the national total in 1890, and 50 percent in 1900 (Table 7).

This phenomenal rise in zinc production was a minor phase of a general expansion within the producers' goods industries induced in part by rapid urbanization. Cities replaced the railroads as the primary markets for industrial goods taking "ever growing quantities of electric lighting apparatus, telephones, copper wire, newsprint, streetcars, coal, and iron, steel, copper, and lead piping, structures and fixtures. . . . Carnegie's decision in 1887 to shift the Homestead Works, the nation's largest and most modern steel plant from rails to structures, symbolized the coming change in the market."[9] Electricians utilized great quantities of zinc; zinc roofing and galvanized water pipes and other conduits became common; galvanizing plants sprang up which consumed 7 tons of spelter daily. In 1899, galvanizing used 50 percent of the spelter produced, brassmakers almost 25 percent, and sheet zinc, 20 percent. Most of the new zinc output was mined in Missouri and Kansas and smelted in southeastern Kansas.

more frequently corporate organizations.[5] For example, the average capitalization of the 87 firms reported in 1890 was $9,057; in 1900, the average was $13,226; and in 1910, $71,450.[6]

Although the portland cement industry was absent from the Kansas scene in 1900, two hydraulic cement plants were located in Fort Scott. This "natural" cement was made from impure limestone burned in kilns and ground after calcination with no additional ingredients. Good deposits of the proper limestone were located near Fort Scott, the manufacturing process was inexpensive, and the finished product so cheap that it replaced lime mortar in brick and stone work. A sufficiently large market existed in Kansas City and states adjacent to Kansas to support two companies in Fort Scott. The first to organize, the Kansas City and Fort Scott Cement Company opened in 1868 as the Kansas Cement Works, passed through several reorganizations, and was finally acquired by a second company, the Fort Scott Hydraulic Cement Company, chartered in 1887 and known today as Fort Scott Cement Products, Inc.[7]

Zinc smelting, like clay and natural cement, required the application of intense heat in the processing of the raw ore. The discovery of zinc ore in 1872 and the exploitation of coal in Cherokee and Crawford counties supplied two of the basic prerequisites for a smelting industry. The first smelter west of St. Louis was erected at Weir City by the Cherokee Zinc Company, and in 1878, one year after the discovery of lead and zinc at Galena, the smelting industry moved into Pittsburg where it centered until the turn of the century.

By the 1890's, six smelters were located at Pittsburg, including Robert Lanyon and Company, Granby Mining and Smelting Co., S. H. Lanyon Co., and W. and J. Lanyon Co. As evident from this list, the various branches of the Lanyon family were instrumental in the establishment of the industry and among them, Robert Lanyon, who came from Peoria in 1878, was particularly active. Not only did he invest large sums of money in the industry but he was largely responsible for introducing gas as a fuel at Iola in 1895, thereby setting the stage for the migration of smelting into the natural-gas fields. That the migration did not transpire until 1899-1900 may also be attributed to Lanyon, who introduced the wrong type of furnaces at Iola, thus postponing the recognition of the advantages of natural gas over coal and allowing the coal smelters to compete for a short time longer. The Edgar Zinc Company at Cherryvale was the first to install efficient gas furnaces. By 1901 only the smelter at Girard utilized coal.

Pittsburg possessed 25 percent of the nation's smelting capacity in the 1890's and through 1898 sought to augment capacity by offering attractive bonuses and sites to prospective firms. With slack coal at the

II

Location of the Mineral Industries in Southeastern Kansas to 1900

Southeastern Kansas boomed during the latter 1890's and the first years of the new century while the rest of the State moved more slowly into a time of prosperity in which most of the damage and dislocation resulting from hard times was repaired. Positive and progressive attitudes were pervasive and nowhere more loudly articulated than in the southeast. In the midst of the boom and as the Iola gas field was approaching a productive capacity of 1 billion cubic feet daily, an Independence editor announced that factory owners located near older gas fields would be forced to come to Kansas or go out of business.[1] Not all were intoxicated by the possibilities of the big gas boom. One expert, Walter R. Ingalls, noting the migration of smelters to the Iola field around 1900, predicted in 1902 that the gas fields would soon be depleted. Returning to the subject in 1908, he noted the pronounced weakening of gas pressure in Iola and warned of a migration of industry from the area.[2] Ingalls, however, was exceptional in his foresight, for the boom ran its course; that is, until the gas was depleted.

Gas was not the sole explanation for the period of industrial expansion experienced by the region. In clay products and zinc, new growth was added—at an accelerating rate after 1895—to previous foundations, attracted to the region by proximity to raw materials, the presence of cheap fuel supplies (coal before gas), a growing demand for lead and zinc products nationally, a constantly rising demand for building materials within the State and by its neighbors, and a railroad system originally built to carry settlers of railroad and public lands in, and their farm produce out. Moreover, the railroads, willing to lay new track to meet new transportation needs, penetrated the Joplin-Galena ore district shortly after 1880.[3]

By the 1890's most towns in eastern Kansas had, or once had, a brick factory, and 87 such establishments were recorded by census takers in 1890. Parsons had as many as three in 1882 while Oswego had two in 1883.[4] Most of these were small, family-owned, and of relatively short duration. None of those identified before 1890 were in operation in 1900, while only a few encountered during the 1890's managed to make it into the new century. Two of the largest, the Coffeyville Vitrified Brick and Tile Company and the Pittsburg Vitrified Paving Brick Company, did originate in the 1890's, but for the most part the firms which flourished in the 1900's were creations of that decade, larger, and much

Planning Series, "Regional Delineation of Kansas," Kansas Department of Economic Development, Report No. 513 (Topeka, 1967).

6. Occasional mention also will be made of the lead industry and stone (sandstone and limestone) quarrying.

7. The single word "region" designates the ten counties in southeastern Kansas.

8. [Kansas] State Board of Agriculture, *Kansas. A Brief Account of Its Geographical Position . . . Railroads, Manufactures and Mineral Resources; Agricultural . . . Statistics for 1883 and 1884 . . .* (Topeka, 1885), *passim.*

9. In an attempt to integrate for each census period the rank of each county in terms of the absolute measurement of the total value of farm products (VFP) and the rank of each county in terms of the more relative measurement of VFP per capita, the index was calculated by multiplying the county percentage of the state VFP by the county VFP per capita. The method, while rough, did give results compatible with a subjective ranking of the counties.

10. American Institute of Mining, Metallurgical, and Petroleum Engineers, *Transactions,* 18 (1912), 144-145; Report of the Kansas State Board of Agriculture . . . 1926, R. C. Moore and K. K. Landes, "Underground Resources of Kansas," State Geological Survey of Kansas [hereafter SGSK], *Bulletin 13* (Topeka, 1927), *passim; Directory of Kansas Manufacturers, 1932 . . .* (Topeka, 1932), 9.

11. P. F. Walker, *Industrial Development of Kansas. Section 1 and 2 (Bulletin of the University of Kansas,* vol. 23. *Engineering Bulletin No. 12)* (Topeka, 1922), I, Table 2, 18-19, 21.

12. U.S. Bureau of the Census, *Fourteenth Census of the United States, 1920. Vol. 9. Manufactures. 1919. Reports for States, with Statistics for Principal Cities* (Washington, 1923); U.S. Bureau of the Census, *Fifteenth Census of the United States. Manufactures: 1929. Vol. 3. Reports by States. Statistics for Industrial Areas, Counties, and Cities* (Washington, 1933).

13. *15 Census. Manufactures: 1929, Vol. 3.*

14. The period 1910-1920 was exceptional in the region and within Group 4. The disappearance of glass and most of the zinc smelters and readjustments in cement caused a temporary reversal of the growth pattern.

15. Erasmus Haworth, *Annual Bulletin of Mineral Resources of Kansas for 1897* (Lawrence, Kansas, 1898), 13, 31, 38, 81.

16. U.S. Geological Survey, *Mineral Resources of the United States . . . 1910. Pt. 1—Metals* (Washington, 1911), 264 [hereafter USGS]; *Statistical Abstract, U.S.,* 1930, 767.

17. Charles A. Dilley, *The Development of the Portland Cement Industry in Kansas* (MA thesis, University of Kansas, 1931), 5.

18. *Rock Products* (May, 1969), 49, 52-54.

19. There is some doubt as to the terminal date of the glass industry. Walker, *Industrial Development of Kansas, I,* table 1, 15, uses the census of 1920 figure in listing a glass value of manufactured product (VMP) of $2,133 million in 1920. But there were 18 fewer plants in Kansas in 1920 than a decade earlier while those remaining in 1920 had not increased their plant size or production capacity and no new plants had been constructed. Even operating at full capacity and over a long season, it is highly improbable that the five plants existing in 1920 manufactured such a high VMP. It is likely that a large part of the published VMP is attributable to secondary processing operations rather than primary glass manufacturing.

20. See Pearce Davis, *The Development of the American Glass Industry* (Cambridge, Mass., 1949).

21. USGS, *Mineral Resources, 1905,* 955, *1910.* II, 861-871; *12 Census. Vol. 9. 1900. Manufactures. Pt. 3,* 902.

22. See Edgar M. Hoover, *The Location of Economic Activity* (New York, 1948), 193 and *passim.*; Perloff, *Regions and Economic Growth,* 59-60 contains an analysis of economic-sector theory which views economic growth as primarily an internal evolution of specialization and division of labor and the merging of this with location theory to produce an amalgam, the theory of developmental stages.

23. Export-base theory may provide such a control although it is normally viewed as a competitive theory. See Douglas C. North, "Agriculture in Regional Economic Growth," *Journal of Farm Economics,* 41 (December, 1959), 943-958 and *The Economic Growth of the United States, 1790-1860* (Englewood Cliffs, N.J., 1961).

cement and zinc), and acquired some stability and maturity during the 1920's.

The industries categorized as groups 3 and 4 (Fig. 4) in addition to natural gas, coal, and lead, are precisely those which the "location of economic activity theory" requires in the so-called "second stage of industrialization," a stage once-removed from a primary stage which, itself, advanced from self-sufficient subsistence agriculture to commercial and interregionally focused agriculture.[22] While generally applied to larger "regional" units than treated here and frequently applied to national units, especially to those less developed, the theory of developmental stages may be relevant to southeastern Kansas at the turn of the century if some control is exercised against a focus which is either overly internalized or which denies to agriculture a role in the growth process.[23]

While not wishing to pursue the theoretical question further at this point, it is sufficient to observe that Group 4 industries did appear in strength in Kansas at a time when agriculture was highly commercialized and under severe pressure; when internal population shifts were pronounced, especially from west to east, and just prior to the last significant spurt in state population; when national consumer and industrial demand called for precisely those products which Kansas could provide; and when technology and science were in the early stages of a process which revolutionized the domestic and industrial uses and needs of fuel and energy. Demand existed for the products, labor was available to produce them, the necessary raw materials were abundant and close by, transfer costs appeared favorable, investment capital was plentiful, and small but ambitious towns clamored to house the factories. Such a happy conjunction of circumstances—unfortunately and unpredictably temporary—combined to generate an industrial revolution in southeastern Kansas.

I

Notes

1. John D. Hicks, *The Populist Revolt. A History of the Farmers' Alliance and the People's Party* (Lincoln, Nebraska, 1961), 32-35.
2. Harvey S. Perloff, *et al., Regions, Resources, and Economic Growth* (Baltimore, 1960), 144.
3. James C. Malin, *Confounded Rot About Napoleon. Reflections Upon Science and Technology, Nationalism, World Depression of the Eighteen-Nineties, and Afterwards* (Lawrence, Kansas, 1961), 37.
4. Hicks, *The Populist Revolt,* 69; U.S. Department of Commerce, *Statistical Abstract of the United States,* 1930 (Washington, 1930), 393; U.S. Bureau of the Census, *Census of Electrical Industries: 1917. Electric Railways* (Washington, 1920), 120.
5. The counties involved are: Woodson, Allen, Bourbon, Wilson, Neosho, Crawford, Montgomery, Labette, Cherokee, and Chautauqua. All but Chautauqua were designated the "Southeast Region" in Kansas State University Center for Community

industry was the smallest of the four in VMP in both Kansas and the U.S., while the clay products industry was the most widely distributed of Group 4 nationally and was the smallest in terms of the average size and product of single plants. Glass, moreover, enjoyed but a brief tenure in Kansas—roughly 1902 to 1920—while the clay industry, albeit in a primitive form, dated back to the early years of settlement.[19] Kansas ranked ninth in national glass production in 1911, concentrating essentially on containers and window glass, but fell off rapidly into insignificance within a decade. By 1930, no trace of the original industry remained.[20]

The clay products industry was widely dispersed throughout the U.S., and each state produced at least a small portion of its own requirements. Kansas (as Table 9 indicates) produced but a tiny fraction of the national total. As one might expect, the greatest production occurred in the states with the largest populations such as Ohio, Pennsylvania, New York, New Jersey, and Illinois, ranked in that order in 1905. While Kansas never ranked in the top ten in VMP, the State did advance from 28 in 1890 to 12 in 1904 and 13 in 1915, and housed within its borders two of the largest of the brick and tile companies.[21] The comparison in Table 9 between the VMP per capita of the clay industry in the United States and Kansas provides a superior gauge of the relative growth of the Kansas industry. The industry reflected quite accurately the actual pattern of growth within the State insofar as pronounced expansion was achieved between 1900 and 1920. The industry developed a large capacity during the period 1900-1910, experienced a boom during World War I, underwent considerable concentration from 1910 to 1920 (as did

TABLE 9.—Clay industry value of manufactured product (VMP) and value of manufactured product per capita in Kansas and the U.S. during selected years, 1889-1929.

Year	VMP, thousands of dollars		VMP, dollars per capita	
	Kansas	U.S.	Kansas	U.S.
1889	690	89,828	0.48	1.45
1899	829	95,534	0.57	1.30
1904	1,907	135,353	.....	.....
1909	2,709	168,895	1.59	1.48
1914	1,953	174,750	.....	.....
1919	4,083	288,636	2.24	2.76
1929	3,275	408,502	1.77	3.35

SOURCE: A. Hamilton Chute, *Marketing Burned-Clay Products, Including an Analysis of Location, Importance and Development of the Industry* (Columbus, Ohio, 1939), table 14; USGS, *Mineral Resources, 1905*, 953, *1910, II*, 568; "Underground Resources of Kansas," *SGSK, Bulletin 13* (1927), 41; *15 Census. Manufactures: 1929, Vol. 3.*

Kansas and the region in which smelting was centered. Today, a rusty and deteriorating plant surrounded by heaps of bluish-yellow slag mars the landscape just north of Cherryvale—all that remains of this once-flourishing industry.

As zinc smelting declined in importance in southeastern Kansas, the portland cement industry, established in Kansas in 1902, surpassed zinc in VA by 1910 and VMP by 1920 (Fig. 5). First manufactured successfully in the U.S. in 1875 with its center in Pennsylvania,[17] the portland cement industry produced 17.2 million barrels in 1902, of which Kansas, in the first year of production, manufactured 830,000 barrels (Table 8). By 1910, Kansas ranked third in production with 7 percent of the total, behind Indiana with 9 percent, and Pennsylvania with 35 percent.

TABLE 8.—Production of portland cement in Kansas and the U.S. during selected years, 1902-1969.

Year	Kansas	U.S.	Year	Kansas	U.S.
		(thousands bbl)			
1902	830	17,230	1914	3,431	88,230
1906	3,020	46,463	1915	3,580	85,914
1907	3,353	48,785	1916	4,212	91,521
1908	3,854	51,073	1917	4,015	92,814
1909	5,357	62,508	1918	2,499	71,081
1910	5,655	76,549	1925	6,511	161,658
1911	4,871	78,528	1928	6,574	176,298
1912	3,225	82,438	1929	6,012	170,646
1913	3,374	92,097	1969	13,300	511,600

SOURCE: USGS, *The Cement Industry in the United States in [1907-1930]* (Washington, 1907-1930); USGS, *Mineral Resources, 1905*; *Rock Products* (May, 1969), 49, 52-54.

Production in Kansas did not exceed the 1910 figure until 1924, and peak production of the period came in 1929 with 6,739,000 barrels, or 3.3 percent of the national total. Pennsylvania at that date still ranked first with 23 percent of the total, while eight other states outproduced Kansas.

The cement industry in Kansas, then, retained and augmented its position as a major sector of the State's industrial plant and as the largest industry within the region. At the national level, Kansas portland dropped behind other states until 1969, when it ranked twelfth with 2.5 percent of national production. By that time, California's production had passed Pennsylvania's while Texas was not far behind. Production in Kansas doubled between 1930 and 1969, but the number of mills located in Kansas was halved.[18]

Of the two remaining industries, glass and clay products, the glass

TABLE 7.—Production of bar zinc (spelter) in Kansas and the U.S. and the percentage of U.S. production in Kansas during selected years, 1890-1930.

Year	Spelter production, short tons		Production in Kansas, %	Year	Spelter production, short tons		Production in Kansas, %
	Kansas	U.S.			Kansas	U.S.	
1890	15,199	63,683	24	1908	99,298	210,424	47
1895	25,775	89,686	29	1909	103,299	255,760	40
1900	62,136	123,886	50	1910	105,697	269,184	39
1901	72,240	140,822	51	1911	98,443	286,526	34
1902	86,564	159,927	54	1912	101,104	338,806	30
1903	88,388	159,219	56	1913	74,106	346,676	21
1904	107,048	186,702	57	1914	44,510	353,049	13
1905	114,287	203,849	56	1915	101,423	489,519	21
1906	129,564	224,770	53	1920	41,044	463,377	9
1907	134,108	249,860	54	1930	13,682	498,045	3

SOURCE: USGS, *Mineral Resources, 1905,* 28-40; *1910, I,* 264; *1915, I,* 853; *1930, II,* 435; Kansas Bureau of Labor and Industry [name of department varies], *Annual Reports [1904-1914]*;Haworth, *Annual Bulletin of the Mineral Resources of Kansas,* 1903, table 7, 18; Walker, *Industrial Development of Kansas,* I, 14.

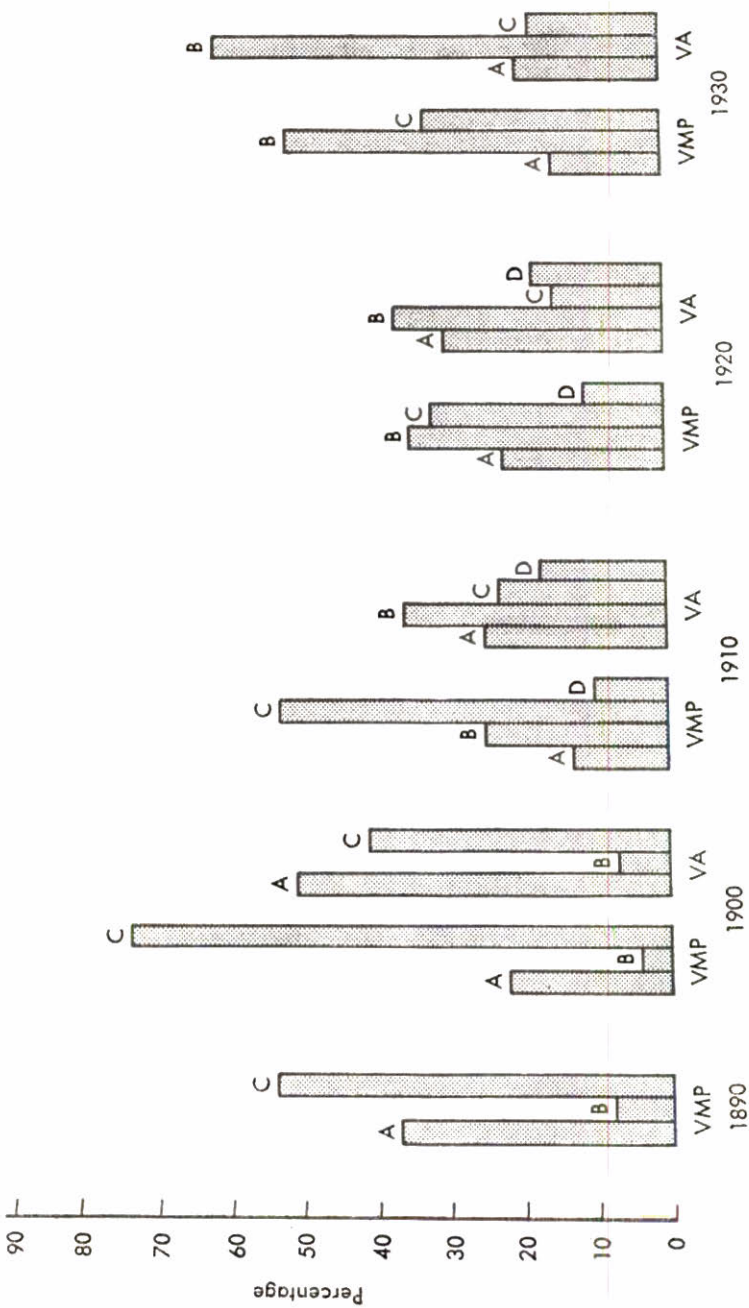


FIGURE 5.—Percentage of total value of manufactured product (VMP) and value added by manufacture (VA) contributed by four industries (*A*, clay products; *B*, cement; *C*, zinc smelting; and *D*, glass) in Kansas, 1890-1930. (See Appendix Table C.)

the industry was the most heavily capitalized—over 10 percent of the state industrial figure in 1906-1910—of the four mineral industries.[25]

While the industries examined sites for resource and other locational requirements, seeking the best combination of factors available, southeastern Kansas towns—hamlets in some cases and cornfields in others—vied with one another in showing themselves to maximum advantage when the peripatetic representatives or disbursers of industrial capital passed through town. While some communities had more to offer than others and some netted more than others, most of the region's communities entered the competition and many succeeded. That the success in most cases would be ephemeral could not be foreseen.

II

Notes

1. Independence, Kansas, *South Kansas Tribune,* April 15, 1903; Angelo Scott, "How Natural Gas Came to Kansas," *Kansas Historical Quarterly,* 21 (Winter, 1954), 233-246.

2. Walter R. Ingalls, *Production and Properties of Zinc* (New York, 1902), 39-41 and *Lead and Zinc in the United States; Comprising an Economic History of the Mining and Smelting of the Metals and the . . . Development of the Industries* (New York, 1908), 330-332.

3. Ingalls, *Lead and Zinc,* 293. The Missouri Pacific, St. Louis and San Francisco, and Kansas City, Fort Scott, and Gulf railroads built branches to Joplin, Webb City, and Galena.

4. *11 Census: 1890 Manufacturing Part I;* Abstract of Statistical Rolls. County of Labette 1882, 1883. Labette County Court House. Oswego, Kansas.

5. Information regarding the career of each of the firms dealt with in later pages was derived from such a multitude of sources that full citation of each stated fact relative to a firm is impractical. Only points particularly germane to any given company will be cited in the notes; the Pittsburg Company was chartered in 1890. [Kansas] Secretary of State, Corporation Charters, vol. 35, 400. Archives Division, Kansas State Historical Society, Topeka. The Coffeyville firm grew out of the Francis Brick Company, established in 1893.

6. *11 Census: 1890 Manufacturing Part I; 12 Census: 1900. Manufacturing Vol. 8 Part II; 13 Census: 1910. Manufacturing. Vol. 9.*

7. More detailed information on both firms is in Haworth, *Mineral Resources of Kansas, 1903,* table 17, 42; Abstract of Statistical Rolls. County of Bourbon. 1893 through 1906 and Deed Records and Mortgage Records. Bourbon County Courthouse. Fort Scott, Kansas.

8. To this point, the discussion of smelting is based upon: Kansas Bureau of Labor and Industry, *AR 7 (1892),* 207; John R. Holibaugh, *The Lead and Zinc Mining Industry of Southwest Missouri and Southeast Kansas* (New York, 1895), 5-7, 32; Nathaniel Thompson Allison, ed. and comp. *History of Cherokee County, Kansas and Representative Citizens* (Chicago, 1904), 114-117; *A Twentieth Century History and Biographical Record of Crawford County, Kansas, by Home Authors* (Chicago, 1905), 39-41, 198; Haworth, *Mineral Resources of Kansas, 1903,* table 7, 18 and Haworth, *et al., Special Report on Lead and Zinc* (The University Geological Survey of Kansas, Vol. 8) (Topeka, 1904), 106, 219; Ingalls, *Production of Zinc,* 289, 318, 327-329; Frederick Noble Howell, *Pittsburg, Kansas, and Its Industries* (M.A. thesis, University of Kansas, 1930), 49-54; James D. Norris, *AZn. A History of the American Zinc Company* (Madison, Wis., 1968), 23-26.

9. Alfred D. Chandler, Jr., "The Beginnings of 'Big Business' in American Industry," *Business History Review,* 33 (Spring, 1959).

10. These matters will be treated in more detail in a subsequent chapter.

11. Sources used for the section on zinc following note 8 include: Kansas Bureau

of Labor and Industry, *AR 14 (1898)*, 327, *AR 16 (1900)*, 225; Walter Barlow Stevens, *The Ozark Uplift—Statistical Information Concerning the Zinc and Lead Mining Industries Tributary to the Frisco Line* (St. Louis, 1900), 3-5; Haworth, *Mineral Resources of Kansas, 1898*, 26-27, 38-39 and *Report on Lead and Zinc, 31;* George I. Adams, *et al., Economic Geology of the Iola Quadrangle, Kansas* (USGS, *Bulletin* No. 238) (Washington, 1904), 40-41; Abstracts of Statistical Rolls. County of Wilson, Kansas. 1903. Wilson County Courthouse. Fredonia, Kansas; Ingalls, *Production of Zinc*, 49; Norris, *AZn*, 3-5, 26.

12. Hoover, *Location of Economic Activity*, 150.

13. Perloff, *Regions and Economic Growth*, 76, suggests this term since there is often orientation to inputs, such as labor, that are distinctly nonmaterial in character.

14. Ian Campbell, "Geological Research Relative to Mineral Raw Materials," *Forum on Long Range Planning for Kansas Mineral Resource Development* (Kansas Planning for Development, Report No. 23) (Topeka, 1968), 5.

15. Harvey S. Perloff and Lowdan Wingo, Jr., "Natural Resource Endowment and Regional Economic Growth," in Joseph J. Spengler, ed., *Natural Resources and Economic Growth* (Washington, 1961), 202.

16. *Ibid.*, 203.

17. Adams, *Iola Quadrangle*, 11, 20-31; USGS, *Mineral Resources, 1910*, II, 308-318; Alfred M. Leeston, *et al., The Dynamic Natural Gas Industry. The Description of an American Industry from the Historical, Technical, Legal, Financial, and Economic Standpoints* (Norman, Okla., 1963) 8, dismisses the early Kansas experience as insignificant because of the sparseness of population and the supposed primary role of Kansas City and St. Louis as trading centers with vast agricultural hinterlands. This work leaves the field wide open to the business, resource, or general economic historian.

18. Haworth, *Annual Bulletin of the Mineral Resources of Kansas, 1899* (Lawrence, Kansas, 1900), 57-58; Frank Charles Schrader and Erasmus Haworth, *Economic Geology of the Independence Quadrangle, Kansas* (USGS, *Bulletin* 296) (Washington, 1906), 40-42; *Pittsburg Kansan*, March 15, 1900.

19. Davis, *American Glass Industry*, 41-43, 123-125, 175; Richard H. Slavin, "The Pressed and Blown Glassware Industry," *West Virginia University Business and Economic Studies*, 8 (May, 1963), 36-37; *Coffeyville Daily Journal*, October 7, 1902.

20. *Coffeyville Journal* [weekly], February 7, 1902; *South Kansas Tribune*, July 22, 1903; *Caney Chronicle*, October 2, 1903; Kansas Bureau of Labor and Industry, *AR 1905*, 26; Schrader, *Independence Quadrangle*, 52-53; Schedule of Assets and Liabilities of the Schwartz Glass Company, February 28, 1910. Bankruptcy File. The Schwartz Glass Co. Case # 518. Federal District Court. Fort Scott, Kansas. Federal Records Center, Kansas City, Mo. The court records used in this study are all housed at the Bannister Road facility; USGS, *Mineral Resources 1915*, II, 223, noted that the glass sands near Caney, Independence, and Fredonia were not utilized.

21. Clinker is the product discharged from the kilns after having undergone a chemical change in the kiln. When clinker is ground with gypsum, the product is cement.

22. Haworth, *Mineral Resources of Kansas, 1897*, 60-61; *Securities of the Ash Grove Lime and Portland Cement Company* (Kansas City, Mo., [1907] and *Prospectus of the Great Western Portland Cement Company* (1908). Ash Grove Cement Company Library, Kansas City, Mo.; Iola Portland Cement Company Record, January 1, 1903-August, 1907, ms. and clipping, *Iola Register*, May 29, 1914 in Iola Portland Cement Company Scrapbook. Lehigh Portland Cement Company Plant Office, Iola, Kansas; Edwin C. Eckel, *Cement Materials and Industry of the United States* (USGS, *Bulletin* 243) (Washington, 1905), 40; "Underground Resources of Kansas," SGSK *Bulletin* 13, 37-39; J. C. Witt, *Portland Cement Technology* (New York, 1966), 4-5, 31-32.

23. Witt, *Portland Cement*, 28-29 lists several: composition, uniformity and physical characteristics of the raw materials; overburden; quantity; location; topography; transportation; and unit cost. Dilley, *Cement Industry in Kansas*, 9, notes that in order of importance the dominant factors are markets, raw materials, and cheap fuel. These should probably be reversed. Markets were as easily accessible from Topeka as Iola but the other factors were lacking.

24. Selection of Site and Location of Iola Portland Cement Company's Plant. Ms. Lehigh Portland Cement Company Plant Office, Iola, Kansas.

25. Kansas Bureau of Labor and Industry, *AR, 1906 to 1910*.

III

Search for an Industrial Base

In late February, 1903, The Beggar Prince Opera Company played to a large audience in the Gas City Opera House. Three years earlier, the site of the town—just east of Iola—was a waving field of corn.[1] In 1899, the lure of cheap gas prompted the Cherokee-Lanyon Zinc Company and Prime Western Spelter Company to begin the construction of smelters east of Iola, joined in 1901 by a third, the A. B. Cockerill Zinc Company. Town lots were platted and sold; residences went up; stores appeared; and within a few years nearly 1,200 people called Gas City home.

While the coming of industry to the region created few towns, it did transform many existing communities from small farm-market towns to small industrial cities. The region's towns actively sought such transformation and competed for the industrial vehicles of change, each town believing that the magic of industrialization guaranteed progress and prosperity and an unexampled future. Boomers and boosters flourished in each town, organized, schemed and plotted to obtain this or that plant, wrote articles describing the virtual certainty of this or that firm's location in their town, hoping that frequent and loud repetition would bring the wanted results. Peru, in Chautauqua County, in searching for a smelter and in an effort to engage the attention of smeltermen, floated rumors that a large smelter was about to be constructed there.[2]

Rumors and promoters abounded. A large body of ore, it was said, was discovered near Xenia, in northwestern Bourbon County; another report described a discovery in Linn County; the Monarch Brick and Tile Company had settled on Caney; Mound Valley was to be the site of a large vitrified post plant. None of this was true. Towns, unsuccessful in one venture or another, criticized the successful ones. Coffeyville's newspaper reacted to reports that property owners in Independence charged glassworkers exorbitant rents by crying, "Shame on a place that will resort to such unreasonable methods." Cherryvale thought it immoral that brick manufactured by the Cherryvale plant of the Coffeyville Vitrified Brick and Tile Company should have "Coffeyville" stamped on the product.[3]

The discovery of a large gas well near Caney convinced the town's boosters that it would soon become the most important manufacturing center in the gas belt. Many of the region's towns expressed a similar optimism and set to work to achieve their aspirations. Some had certain strengths to build on: they were county seats, rail centers, and market

towns; they had dairies, creameries, flour and grist mills, lumber yards, and brick plants; retail and banking services were available; and they had essential public utilities such as electric, telephone, water, and gas companies. All of the towns had considerable space in which to expand.

Building on such strengths as they possessed and cognizant of the region's suitability in regard to the needs of the mineral industries, each town sought to maximize its advantages by the pooling of resources. Local groups were organized as commercial, industrial, or improvement clubs, charged with the coordination of campaigns launched to attract industry to the respective towns and empowered to some degree to work closely with railroads and gas companies and local men of means in negotiating location agreements with specific firms.

Iola, for example, moved rapidly after 1890 to exploit its gas resources by forming the Iola Gas Company in 1895 and the City Improvement Company shortly thereafter. Both worked closely with the ATSF and the Iola city council to get through an $80,000 bond issue to provide the city with water and electric lights, to obtain another $50,000 in bonds necessary to secure the location of a bridge manufacturing company (this effort failed), and to negotiate successfully with a number of smelter companies and cement plants and unsuccessfully with some Indiana glass interests.[4]

Other towns operated in essentially the same manner. Pittsburg's Chamber of Commerce succeeded in luring a boiler and machinery company to town in 1890 and an iron works in 1903; commercial clubs in Oswego, Columbus, and Fort Scott competed for the attention of the same Indiana glassmen in 1901, and the latter community sought the relocation of an Iowa manufacturer of gasoline engines in 1899. Chanute's Board of Trade and the City Council established a joint committee that journeyed to Joplin, Missouri, in late 1899 to investigate the chances of getting a smelter while Neodesha and Cherryvale actively sought the same smelter. Commercial clubs at Caney and Cherryvale, which had fallen into lethargy in 1901 and 1902, were reinvigorated in 1903, partly because of the success of other towns in attracting glass factories. By 1910, these towns and others in the region had developed two basic types of local economic organizations: the commercial clubs, which actively sought bona fide industry, and local associations of merchants concerned with retail promotion and other marketing problems. By the end of World War I many of these groups had joined forces in local Chambers of Commerce concerned with most aspects of a town's economic present and future.[5]

In the negotiations between town and industry, the latter sought to extract the most favorable conditions and preferments possible, while

the towns, anxious to succeed and envious of one another's success, offered just enough to maintain competition and then countered with proposals as necessary. Industry, in the meantime, took the proposal of one town and challenged a second and a third town to surpass it. The process, with its various moves and countermoves, forced the towns not only to centralize and coordinate their efforts but also to evaluate their capabilities so as to guard against overextending themselves. The fact that the towns were ambitious and expansionist, jingoistic and competitive toward one another—in athletics as much as in the search for industry—did not mean that they frequently passed the limits of reason in offering package deals to industry.

Of the four industrial groups, the most heavily capitalized and largest productive units, smelting and cement, generally required the least in tangible inducements. Good transfer facilities, cheap and plenteous fuel supplies, adequate water, and, with cement, abundant raw materials were the major desiderata. A town and its immediate environs either possessed these requirements, or it did not. If it did, it could only guarantee easy access to industry through the construction of rail spurs to plants, the leasing of gas lands to turn over to the interested companys, and the furnishing of a convenient site for the location of the plants. Neodesha captured a Lanyon smelter in 1902 by supplying a tract of land and drilling a gas well that flowed at the rate of 4 million cubic feet a day. Neodesha invested $1,000 to secure an industrial payroll of about $110,000 annually.[6] Coffeyville obtained the Ozark Smelting and Mining Company—a unit of Sherwin-Williams Paint Company—in 1905 through the offer of a 60-acre tract. In 1925, when the firm wished to expand, the Chamber of Commerce turned over to the company a 40-acre tract adjacent to the smelter on which the company constructed several hundred thousand dollars worth of new plants.[7]

As a rule, cement and smelter firms demanded little more than the proper combination of physical resources and transportation. The much smaller clay products industry had similar interests and was in many cases promoted by local capital to exploit local clay and gas resources already under the control of the organizers. The glass industry was the most demanding of the four in regard to both physical and financial endowments. Although the individual glass factory represented a much smaller capital investment than an individual smelter or cement plant, the number of employees was not much smaller per plant, but the payroll was proportionately higher because of the skill required in the unmechanized manufacturing process. Moreover, competition between towns waxed the warmer when it appeared—as it did in 1903-1905—that the entire Indiana glass industry was on the verge of removal to Kansas.

With small squads of glassmen, some representing established firms, others newly organized companies seeking a location, and still others looking for capital, company, and location, making the circuit of southeastern Kansas, the towns entered into a competition that brought all the locational factors into play. Towns became highly conscious of their measurable assets and sensitive to liabilities that were generally believed vulnerable to better organization and cooperation. Success was interpreted as the reward of the quick and the just; failure, the result of local greed or alien and unethical combinations or industrial obtuseness. Coffeyville's highly successful campaign to secure glass factories revealed some of the community attitudes and strategies that evolved during the early stages of industrialization.

Coffeyville initiated an organized effort to attract industry in 1896 with the chartering of a commercial club which worked closely with officials of the local gas company and the Missouri Pacific, ATSF, and Missouri, Kansas, and Texas (MKT) railroads. But success came grudgingly and plans to obtain a sugar mill and a cotton mill failed to materialize. In 1902, Coffeyville viewed its accomplishments with dismay, the more so because of the obvious success of Iola, Chanute, Cherryvale, and Independence. The success of Independence in landing a glass plant was particularly irritating, for Coffeyville had bid and been rejected. The *Coffeyville Daily Journal,* satisfied that it had found the answer, printed an editorial (May 2, 1902) which stimulated a vigorous debate and inspired the town to redouble its efforts.

Far from contributing strength to the town, the Coffeyville Gas Company, according to the paper, charged such high industrial rates for gas that Coffeyville could not compete with Iola or Independence. Why, asked the editor, cannot the local gas company offer gas at the same rates as other cities? C. H. Welch, a gas company official, in a reasoned reply answered on May 3. According to Welch, the Company could treat the gas field in one of two ways: cater to the smelters, cement, and glass plants by getting the gas out quickly and at such low rates "that the largest part of the factories' profits comes from the saving in fuel costs, by which saving this class of factories can earn back its investment and abandon its plant and the depleted gas field, in two or three years . . ."; or allot the gas over a 10- to 12-year period while taking on no more obligations than consistent with the allotment and establishing rates to sustain the gas company. Welch counseled Coffeyville not to emulate Iola in giving away gas at ruinous rates on a meterless system and maintained that six cents per cubic foot was a reasonable rate for established firms. Gas companies, he said, cannot manage on a three-cent rate.

Two days later, J. C. McGrew of the McGrew Milling Company

accused the gas company of setting extortionary rates, pointing out that a securities prospectus issued by the company showed net earnings in 1902 to be 43 percent of the capital invested. Rates, he said, could easily be lowered, and, as for the life of the gas field, the prospectus estimated the field would be safe for 25 years. On May 14 a communication from the Commercial Club alleged that a glass plant and sugar plant had both rejected Coffeyville because of the high gas rates. The letter also informed the public that a group within the Club had recently chartered the People's Gas Company for the sole purpose of supplying industries with gas at cost. On September 15, People's Gas bought out the Coffeyville Gas Company and in conjunction with the Commercial Club set out to sell Coffeyville to industrial promoters.[8]

Even before these events had transpired, Coffeyville had landed its first glass factory—the Kansas Glass Company—by donating $4,000 in cash and a tract of five acres. These negotiations had succeeded in spite of the fact that the newly organized People's Gas Company refused to guarantee a gas supply for five years as the glassmen demanded. After negotiations in other towns the glassmen realized that there were no such guarantees to be had and accepted Coffeyville's offer. The Commercial Club in 1901 engaged in a successful fund-raising campaign to finance its efforts to attract industries. It purchased 239 town lots for a small down payment—the banks cooperated by supplying the down payment and financing subsequent purchasers at less than going interest rates—and secured options on large tracts of land south of Coffeyville upon which to locate industries (Fig. 6). After securing the agreement of ATSF and MKT for a beltline railroad along the northern and western edges of the town, the club auctioned off its lots at $125 each. Within a month in May-June, 1901, $20,000 had been raised and the Ozark Smelting and Refining Company had been secured for Coffeyville. By 1906, the Club had granted $75,000 in bonuses to new industries.[9]

Many of the other towns used similar methods to raise cash and acquire lands. Independence in 1903 negotiated simultaneously with two glass factories, a rolling mill, a smelter, and a cement company, selling town lots to raise the money required. Each of the glass companies was offered 30 acres and gas leases on three tracts of 1,000 acres each. An earlier glass company—the one Coffeyville had missed—received 20 acres free, 15 acres at cost, $3,000 cash to defray the moving expenses of 50 families from Indiana to Independence, and gas land leased from the Independence Gas Company.[10]

There is some information available about the negotiations between 15 glass companies and the towns in which they located. In each case free factory sites were donated and cash bonuses ranging from $2,000 to

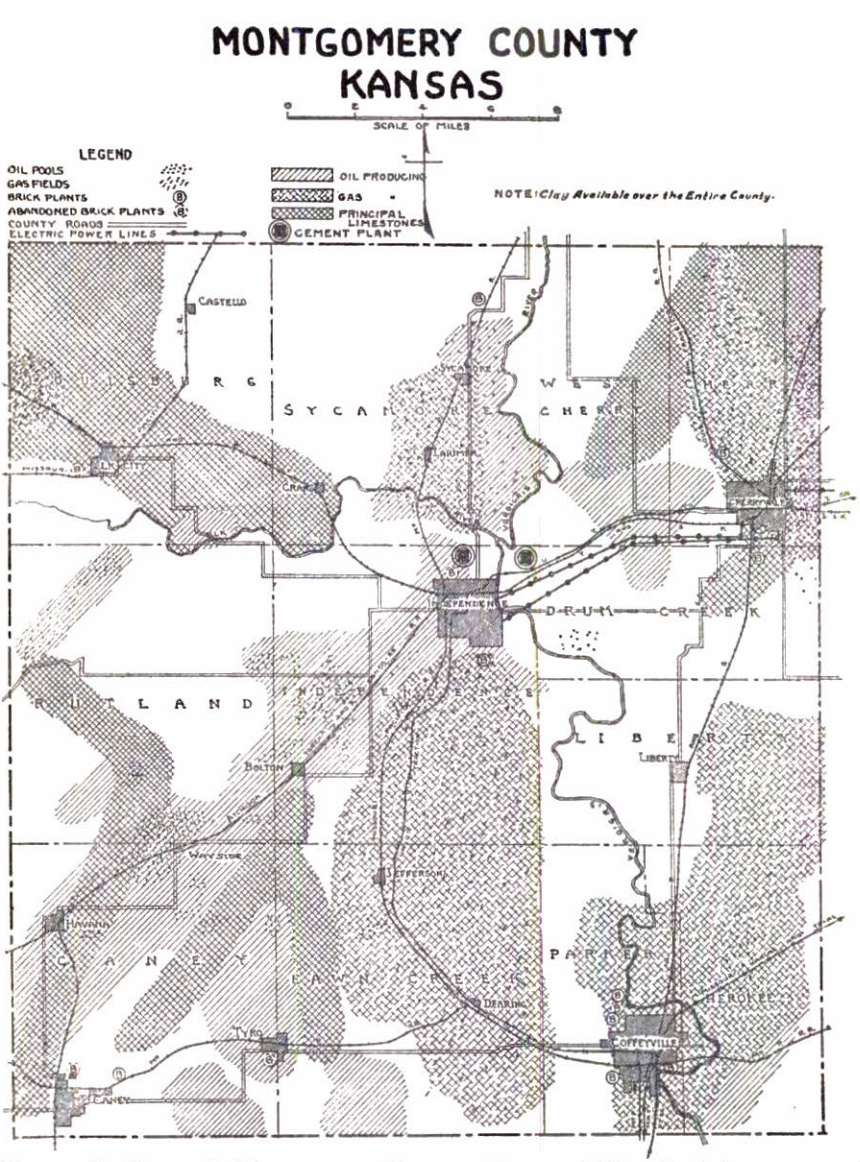


FIGURE 6.—Map of Montgomery County, Kansas, 1920 (includes towns of Coffeyville, Independence, and Iola). (From Walker, *Industrial Development of Kansas,* II, 42.)

$4,500 were granted. In each case, fuel arrangements favorable to the company were agreed upon. At Tyro, a break in the road between Coffeyville and Caney, the town agreed to pay the cost of removing an entire glass plant and to donate a site. The Missouri Pacific—the town's

only railroad—promised favorable freight rates; the Tyro State Bank and others donated 170 town lots to provide funds for the move; and the Fawn Valley Gas Company agreed to supply gas at two cents for 15 years.[11] In at least two cases, the glassmen insisted that local capital be invested in the project and sent promoters in to give speeches to various local groups. And at Caney, when negotiations collapsed with the Heller Brothers of Coffeyville (they had brought in Coffeyville's first plant), the local commercial club organized its own glass company and purchased an entire plant in Indiana for removal to Caney.[12]

Of the 36 glass companies in southeastern Kansas between 1900 and 1920, only the Fredonia Glass Company is known to have owned and used its own gas field.[13] Company ownership was a common practice in the other three mineral industries and, indeed, when feasible, was considered the preferable practice. It freed the companies from dependence upon outside sources in a most critical area and, as the Iola location study concluded, resulted in considerable savings. The productive wells owned by the various companies were in some cases, depending upon their location, used to supply other factories or towns as well as the needs of the operator. When the Granby Mining and Smelting Company purchased a smelter in Neodesha, it already possessed gas leases on 20 acres of land within the city limits and by 1904 had obtained leases on over 1,200 acres in Neodesha and Newark townships. The Granby Company then committed itself to supply gas to Neodesha.[14] Such arrangements could cause complications, as in the dispute (discussed in Chapter IV) between Altoona and the Altoona Portland Cement Company.

In Montgomery County, in 1907, 466 gas wells were reported as productive. Of these, 205 were controlled by Kansas Natural Gas Company and 126 others were distributed as follows: Edgar Zinc Company, 84; Caney Zinc Company, 15; Independence Kansas Portland Cement Company, 14; Federal Betterment Company, 10; and Coffeyville Vitrified Brick and Tile Company, 3.[15] These companies were also holders of gas properties in other counties in prior and subsequent years. Edgar Zinc held leases in 1,000 acres in Wilson County in 1904, 1,800 acres with 25 productive wells in Labette County in 1906 and 1907, and, in 1909 owned 89 working wells in Montgomery County, 59 drilled within the year. The Coffeyville brick firm organized the Charlotte Oil Company in 1903 with seven producing wells, owned oil and gas rights south of Chanute which it sold to another party in 1904, and owned nine wells in 1905, 18 in 1907, in Labette County on 3,000 acres. Federal Betterment Company, in 1904, controlled gas rights on 28 different tracts in Wilson County and in 1909 reported 18 producers in Montgomery

County.[16] As long as the gas lasted these and other companies in other counties enjoyed considerable self-sufficiency and, in many cases, income from the sale of gas to others. Few individuals or firms foresaw the day in August 1912 when the Kansas Natural Gas Company was to shut off the gas supply to the Ozark Mining and Smelting Company.

The movement of industry into the region to exploit the cheap fuel and plentiful mineral resources was facilitated by the railroad services available in 1900 and was encouraged by the railroad officials of the major lines. All of the major towns in the region were located on at least two of the following main-line roads: ATSF, Missouri Pacific, MKT, Kansas, Ft. Scott, and Memphis (now Kansas City Southern Railway), St. Louis and San Francisco, and the Kansas City, Pittsburg, and Gulf. Fort Scott, Pittsburg, and Coffeyville were each on three lines.

For the individual companies, cheap freight rates were almost as necessary as cheap fuel, and in the negotiations between a firm and a particular town, railroad officials assumed a prominent role. In most cases, the locating firms were assured favorable rates while the railroads not infrequently contributed portions of the acreage donated to the firms. The railroads generally committed themselves to the conctruction of sidings and switches to handle the traffic of the new firms, although it is not clear who bore the cost of such projects. The *Caney News,* on August 14, 1908, criticized the position of the ATSF in building a loading switch at the Baker Brothers Glass Company in Caney and forcing the firm to pay for the equipment, materials, and wages. In the same year, the Missouri Pacific assumed the cost of laying track to the yards of the American Vitrified Brick Company at Caney.[17] And at both Coffeyville and Independence, the ATSF and Missouri Pacific cooperated with the commercial clubs and the city council in constructing beltlines through areas set aside for industrial development.[18]

It was, of course, to the advantage of the railroads to cooperate with the communities in developing the industrial potential of the area. Since the network was essentially complete with major railroad shops and yards already located at Pittsburg, Fort Scott, Parsons, Chanute, and Coffeyville, the construction of sidetracks and switching facilities required a small investment relative to the potential returns in freight. Iola, for example, ranked third as a freight point among all the cities on the Missouri Pacific lines in 1906. In the case of both the ATSF and the MKT, the cement (including lime) and brick industries accounted for a substantial share of their total intrastate tonnage. For the ATSF, such traffic amounted to 9.7 percent in 1911 and 7.6 in 1914; for the MKT, 14.2 percent in 1911 and 14.7 percent in 1914.[19]

The major transportation development in the period between the

completion of the steam railroad networks and the onslaught of the automobile occurred in the field of electric (traction) railways. By 1920, Kansas had 561 miles of electric railroad, most of it in eastern Kansas, and most of that in the Kansas City metropolitan area. Southeastern Kansas had at least 134 miles of interurban line by 1911. Building continued at Coffeyville; Parsons was connected with Cherryvale in 1912; promoters were actively seeking support for a line between Independence, Neodesha, and Topeka; and in 1914-15 lines were pushing into the lead and zinc district of Kansas between Galena, Baxter Springs, and Picher, Oklahoma.

Two lines dominated the scene during most of the period: the Joplin and Pittsburg Railway Company and the Union Traction Company. Union Traction, which was organized in 1904, operated between Coffeyville and Independence by 1907, and in 1915 connected the above towns with Nowata, Oklahoma, to the south and Cherryvale and Parsons to the northeast. The Pittsburg and Joplin line was formed in 1909 through the acquisition of completed lines in Kansas and the subsequent construction of the Joplin link.

The interurbans were principally passenger carriers, connecting town with town and linking city cores, suburbs, and industrial sites. Freight, mostly packages or parcels, contributed 7 percent of the Union Traction Company's revenue in 1911 and 18 percent in 1917. Their real significance, preempted by the less efficient automobile after 1920, was in extending the retail marketing areas of the larger towns into villages and smaller towns along the line and in providing rapid and inexpensive transportation between home and factory or office. In granting a franchise to the Union Traction Company, Coffeyville stipulated that the railway must provide regularly scheduled cars at five cents a fare to and from any establishment employing one hundred or more workers located on or near the line within 5 miles of Coffeyville.[20]

On paydays Union Traction did a good business between Dearing, just west of Coffeyville, and the location of an American Zinc, Lead, and Smelting Company plant, carrying shoppers to and fro. At the same time, many smeltermen commuted to Dearing from Coffeyville where a five-mile beltline connected all points with the center of town as well as outlying areas. Union Traction's system at Independence similarly serviced major industries while the Iola Electric Railroad Company connected Iola with the smelters at Gas City and La Harpe and ran branches to nearby cement and brick plants.[21]

An adequate and regular water supply was as necessary as fuel, raw materials, or transportation, particularly in glass and cement manufacturing. The Iola Portland Cement Company, the cement plants at

Independence, the Coffeyville Vitrified Brick and Tile Company, and probably others provided for their own needs with pumping plants and water storage facilities. The Caney Brick Company dug its own wells in 1911 in order to achieve self-sufficiency in this area. Some were not so fortunate and on occasion were compelled to suspend production because of water shortages. The Kelly Glass plant at Tyro, a town with no natural water supplies, shut down for a considerable period of time in 1911 due to a water shortage. Coffeyville, with its municipal water works drawing from the Verdigris River, was the more attractive to glassmen because of the speed with which the city connected the plants to the city's mains and the equitable rates levied. Independence was equally well situated with regard to water resources.[22]

Other utilities and transportation services that were increasingly important to industrial development were commercially generated electricity, telephone systems, and paved roads. Several towns, such as Cherryvale, Chanute, Fort Scott, and Humboldt, possessed electric light companies before 1905, but the wattage generated was insufficient for industrial purposes. Factories and interurbans normally generated their own electricity and, as with gas, frequently sold a portion to other users. As late as 1925, few power companies existed in Kansas that were prepared to serve more than local needs. The Kansas Gas and Electric Company, headquartered in Wichita, owned lines serving the Independence-Cherryvale area and purchased power from the Empire District Power Company, which operated mainly in the Galena-Joplin lead and zinc district.[23]

For industrial purposes, the road system of the region was of less consequence than the railroads until the 1920's, and it was only at that time that systematic efforts were launched to build an adequate highway system. Until that time, the county roads were mostly dirt and gravel with some macadamized routes in a few counties and brick roads north and south of Pittsburg. As of 1920, there were probably fewer than 15 miles of concrete road in the region and Neosho County was just getting around to graveling the road between Altoona and Fredonia and Altoona and Neodesha.[24] The cities in the area constructed many miles of brick streets between 1900 and 1910. Although concrete roads were introduced in the U.S. in 1894, it was only with the rapid increase of automobiles, the passage of the Federal Highways Act of 1916, and the end of World War I that highway construction expanded markedly.

With certain qualifications, the resources of southeastern Kansas proved highly compatible with the requirements of the low-value mineral industries. Land, energy, raw materials, and transportation existed in combinations sufficient to attract entrepreneurs with organizational

talents and investment capital both from within the region and the State as well as other parts of the nation. Industry discovered the region and moved into it. Regional communities, possessed of limited capital resources, had abundant energy, restless ambition, unbounded optimism in their future, and organizational abilities adequate for the promotional tasks required to obtain industry. While the towns in 1900 were less cautious and less preservationist than they might have wished in 1910 toward the region's natural gas endowment, they did maximize the exploitation of other resources quite successfully.

It is true that the industrial cornucopia slipped from the grasp of many of the towns within a decade or so, causing grave dislocations and crises in local finances and economic life. But the alternative, once the mineral industries had chosen to locate in the region, was to let the horn pass into the hands of others. Given the boomer attitudes characteristic of these and other western towns from their birth, this was no alternative at all. So the towns grabbed what they could and, while the ability of many to retain their conquests proved temporary, other towns, more tenacious and better endowed initially, hung on long enough to experience both the good and the bad of industrialization.

III

Notes

1. *Caney Chronicle,* February 27, 1903.
2. *Coffeyville Daily Journal,* May 10, 1901.
3. Haworth, *Mineral Resources of Kansas, 1899,* 22-23; *Fort Scott Daily Monitor,* July 2, 1899; *Caney Chronicle,* March 10, 1905; *Mound Valley Journal,* November 29, 1906; *Coffeyville Daily Journal,* March 10, 1903; *Cherryvale Republican,* December 9, 1904.
4. Site and Location of Iola Cement Plant; *Coffeyville Daily Journal,* May 15, October 23, November 22, 1901; L. Wallace Duncan, ed., *History of Allen and Woodson Counties, Kansas . . .* (Iola, Kansas, 1901), 75; Adams, *Iola Quadrangle,* 20-31; Dilley, *Cement Industry in Kansas,* 20-21.
5. Howell, *Pittsburg and Its Industries,* 68-76; *Fort Scott Daily Monitor,* July 9, 1899; *Coffeyville Daily Journal,* October 21-22, 1901; *Chanute Daily Tribune,* November 27-28, 1899; *Caney Chronicle,* May 1, September 4, 1903; *Cherryvale Republican,* June 26, October 16, 1903; *Souvenir Album of Cherryvale, the Big Gas Town in the Big Gas Belt of Kansas,* edited by the W.O.W. Drill Team (Cherryvale, Kan., 1907), n.p.
6. *Coffeyville Journal,* April 18, 1902.
7. Charles Clayton Drake, *"Who's Who," A History of Kansas and Montgomery County, including . . . Coffeyville, Independence, Cherryvale, and Caney . . .* (Coffeyville, Kan., 1943), 106-107.
8. *Coffeyville Daily Journal,* May 2, 3, 5, 14, September 15, 1902.
9. *Ibid.,* May 24-25, June 9-10, 1902; Drake, *Montgomery County,* 101-104.
10. *Coffeyville Journal,* May 2, 1902; *South Kansas Tribune,* March 11, 1903.
11. *Mound Valley Journal,* January 4, 1907; *Tyro Herald* [title varies], May 24, 1907, September 18, October 2, November 13, 1908.
12. *South Kansas Tribune,* March 18, 1903; *Caney Chronicle,* February 12, March 11, July 1, 1904.
13. *Ibid.,* August 11, 1911. There were fewer than 36 plants since some of the firms took over existing facilities.

14. Schrader, *Independence Quadrangle,* 46; Assessment Roll, 1903. Neodesha Township, Wilson County, Kansas and Tax Roll, 1904. No. 1. Oil and Gas Leases. Wilson County. Wilson County Courthouse, Fredonia, Kansas.

15. Coffeyville Daily Journal, *Supplement to the Coffeyville Daily Journal* (souvenir edition) (Coffeyville, Kansas, 1907), 37.

16. Oil and Gas Leases. Wilson County. 1904; Abstracts of Statistical Rolls. County of Montgomery, Kansas. 1909. Montgomery County Court House. Independence, Kansas; Abstracts, Labette County. 1905 and 1907; Tax Roll. 1906. Mound Valley Township. Labette County. Labette County Courthouse. Oswego, Kansas; *South Kansas Tribune,* May 20, 1903; *Coffeyville Daily Journal,* November 4, 1904.

17. *Caney News,* October 16, 1908. In its first annual report, the Kansas Public Utilities Commission made the point (in connection with nothing in particular) that under existing laws, it had no power to order railroads to build sidetracks to industries other than mills and elevators, *First Report of the Public Utilities Commission, State of Kansas* . . . 1911 to . . . 1912 (Topeka, 1913), 12.

18. *South Kansas Tribune,* July 15, 1903; Drake, *Montgomery County,* 114; *Independence, The Heart of the Kansas Gas and Oil Fields* (Independence, Kan., 1907), 17. Freight rates and marketing patterns will be treated in a subsequent chapter.

19. Scott, "How Natural Gas Came to Kansas," 241-242; *Kansas Public Utilities Commission, 1911-1912,* 220. The other lines did not report while these statistics were given only for the entire line in subsequent years.

20. City of Coffeyville, Council Proceedings. Vol. H. December 3, 1903. Coffeyville City Hall. Coffeyville, Kansas.

21. The discussion of the interurbans was based upon: *Coffeyville Weekly Journal,* February 23, 1912, January 17, 1913; *Kansas Public Utilities Commission, 1911-1912,* 172, 249; *ibid.,* 1916-1918; USGS, *Mineral Resources. 1915. I,* 886; *Polk's Kansas State Gazetteer and Business Directory* . . . (Detroit, 1912), 12; *The Parsons Sun, Down Through the Years with Parsons' Pioneer Firms* (Parsons, Kansas, 1938), n.p.; Drake, *Montgomery County,* 115; Howell, *Pittsburg and Its Industries,* 115; see also George W. Hilton and John F. Due, *The Electric Interurban Railways in America* (Stanford, Calif., 1960).

22. *Caney Chronicle,* January 13, 1911; *Caney News,* July 21, 1911; *Supplement to the Coffeyville Daily Journal,* 7; Coffeyville Council Proceedings. Vol. G. July 2, 1902, September 17, 1902, January 21, 1903, Vol. H. December 2, 1903.

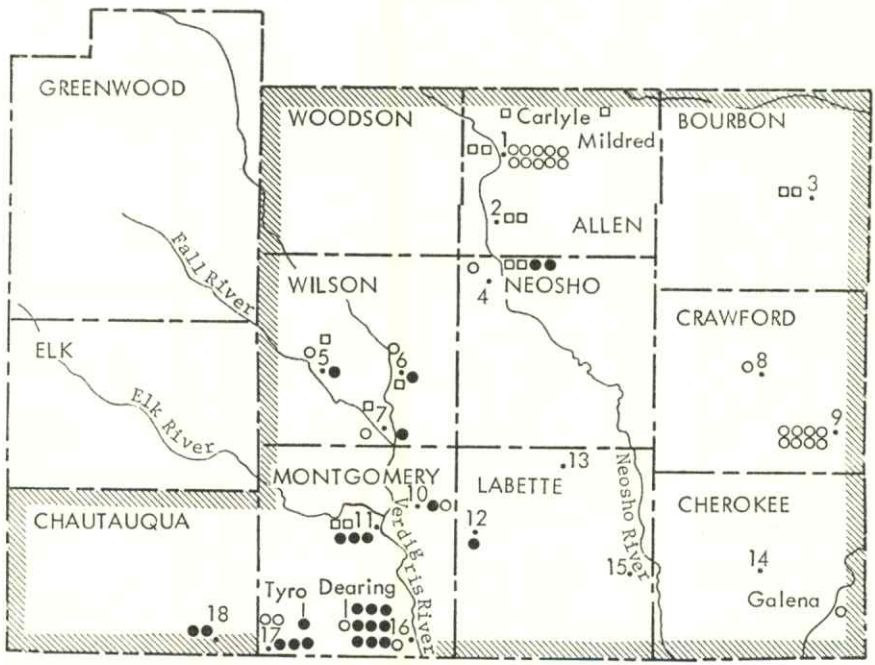
23. Walker, *Industrial Development of Kansas,* I, 48-50.

24. *Ibid.,* II, *passim.,* Road construction will be treated in Chapter 8 in connection with the cement industry.

IV

Distribution of the Mineral Industries in the Region, 1900-1930

The location of glass and cement industries in southeastern Kansas, the shift of smelters from Pittsburg to the gas fields, and the expansion of the clay products industry created an industrial belt stretching from Iola (Gas City and La Harpe) and Humboldt in Allen County through Chanute, Neosho County, to Altoona, Fredonia, and Neodesha in Wilson County, and south to the Montgomery County towns of Cherryvale, Independence, Coffeyville, and Caney (Fig. 6). Excepting the zinc complex in Pittsburg, which operated only intermittently after 1900, smelting was heavily concentrated in and around Iola with secondary concentrations in Wilson and Montgomery counties (Fig. 7, 8). The primary

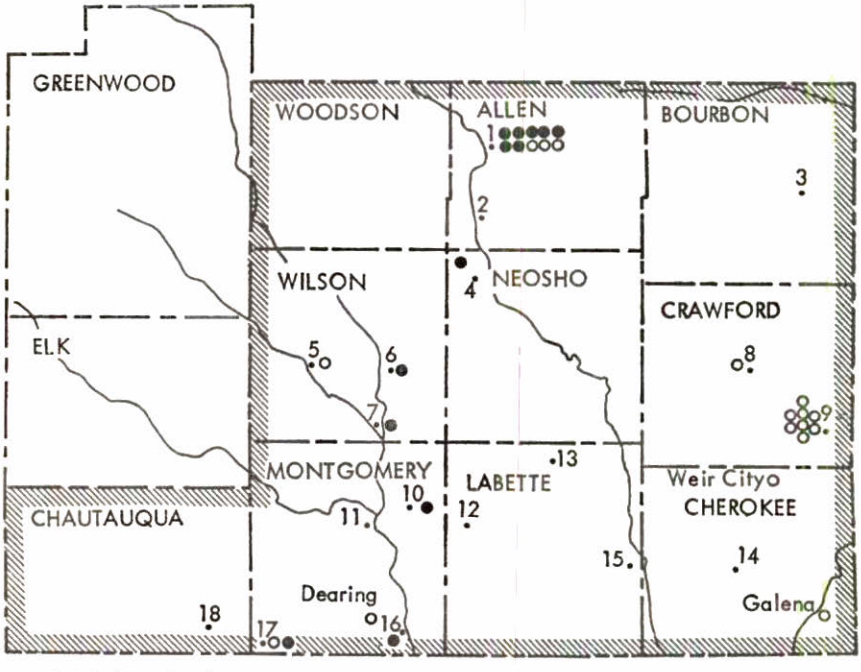


1-Iola(Gas City), La Harpe
2-Humboldt
3-Fort Scott
4-Chanute
5-Fredonia
6-Altoona
7-Neodesha
8-Girard
9-Pittsburg
10-Cherryvale
11-Independence
12-Mound Valley
13-Parsons
14-Columbus
15-Oswego
16-Coffeyville
17-Caney
18-Peru
□-Cement plants
●-Glass plants
o-Smelters

FIGURE 7.—Location of cement, glass, and zinc plants in Kansas, 1890-1930.

cement complex was located in Allen County, including Chanute, and secondarily in the Fredonia-Altoona-Neodesha triangle and Independence (Fig. 9). Zinc and cement tended to concentrate more heavily in the Iola-Humboldt-Chanute strip and the Neodesha triangle or in the northern half of the region.

The glass industry clustered in the southern half of the region with its major center at Coffeyville, and secondary centers at Independence and Caney (spilling over into Labette and Chautauqua counties) and the Neodesha triangle. Chanute was the northern outpost of the industry (Fig. 10). Clay products, the most widely distributed of the mineral industries, developed major production centers in Wilson, Montgomery, and Crawford counties. With the exception of clay products, Woodson, Bourbon, and Cherokee counties did not share the regional industrializa-



1-Iola(Gas City), La Harpe
2-Humboldt
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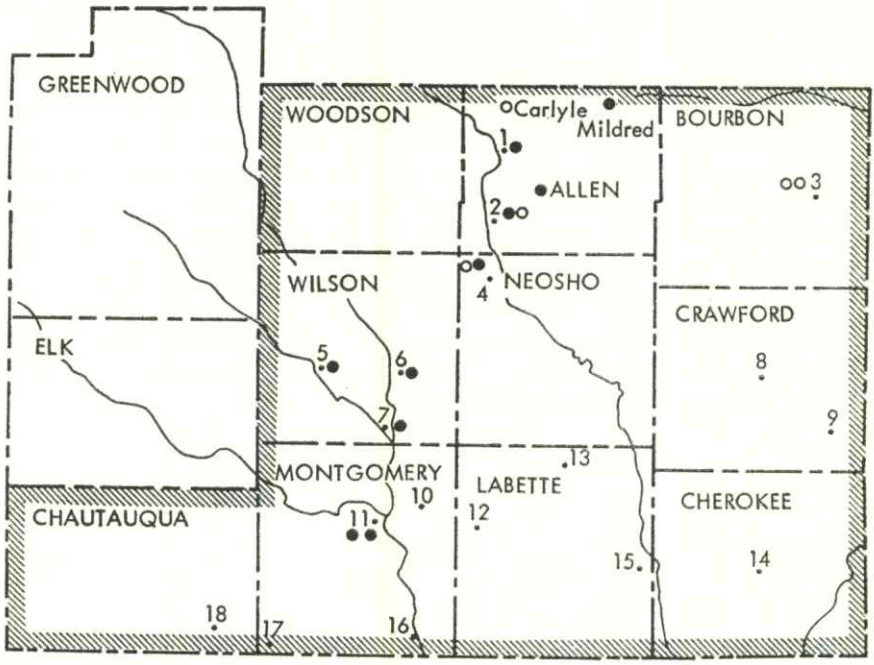
4-Chanute
5-Fredonia
6-Altoona
7-Neodesha
8-Girard
9-Pittsburg
10-Cherryvale
11-Independence
12-Mound Valley
13-Parsons
14-Columbus
15-Oswego
16-Coffeyville
17-Caney
18-Peru
o-Plants
●-Plants in operation, 1906-1907

FIGURE 8.—Location of zinc smelters in Kansas, 1890-1930.



1-Iola(Gas City), La Harpe
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9-Pittsburg
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11-Independence
12-Mound Valley
13-Parsons
14-Columbus
15-Oswego
16-Coffeyville
17-Caney
18-Peru
o-Plants
●-Plants in operation, 1910

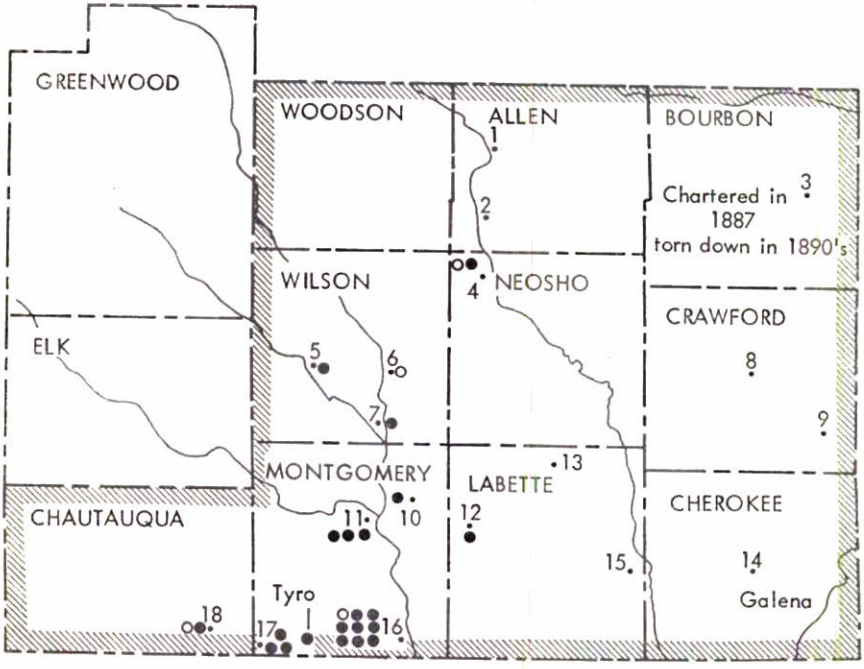
FIGURE 9.—Location of cement plants in Kansas, 1890-1930.

tion during the period, and except for glass plants at Peru and Mound Valley, neither did Chautauqua or Labette counties. These counties were in the lower half of the regional ranking in VMP and VFP (Tables 5 and 6), while in 1900 and thereafter, Woodson and Chautauqua ranked first and second in VFP per capita (Table 3).

The location of these industries corresponded exactly with the areas in which productive natural gas wells were found. The Iola field extended southward through Chanute. Each of the towns in the Neodesha triangle developed fields, as did Cherryvale and Mound Valley. The Independence field extended to the south on the west side of the Verdigris River, meeting the Coffeyville field, mostly east of the Verdigris, at Dearing. Caney and Peru also developed their own gas supplies.[1]

As noted in Chapter 3, zinc smelting led the way into the gas fields, clustering heavily in the vicinity of Iola-Gas City-La Harpe. Pittsburg's

smelters were all closed in 1900 and at least three of the city's eight plants (Fig. 7 and 8) were torn down in 1900-1901. Thereafter, Pittsburg's remaining smelters operated only when the price margin between ore and spelter was great enough to allow the firing up of the coal smelters, as in 1905 and again in 1915 when the war in Europe stimulated a demand for American zinc.[2] By 1915, the companies that had introduced smelting to Pittsburg—A. B. Cockerill Zinc Co., Granby Mining and Smelting Company, Cherokee Zinc Company, and the various Lanyon firms—were no longer operating in Pittsburg, and the American Spelter Company and the Joplin Ore and Spelter Company, among others, leased the plants whenever market conditions warranted increased production. The Pittsburg Zinc Company remained in the city, operating intermittently between 1905 and 1916.



1-Iola(Gas City), La Harpe
2-Humboldt
3-Fort Scott
4-Chanute
5-Fredonia
6-Altoona
7-Neodesha
8-Girard
9-Pittsburg
10-Cherryvale
11-Independence
12-Mound Valley
13-Parsons
14-Columbus
15-Oswego
16-Coffeyville
17-Caney
18-Peru
o-Plants
●-Plants in operation, 1910

FIGURE 10.—Location of glass plants in Kansas, 1890-1930.

With the shift of smelting to the gas fields in 1898-1900, the industry initiated a period of dynamic expansion. Cherokee Zinc Company, Robert Lanyon and Company, A. B. Cockerill, George E. Nicholson Smelting Company, and United Zinc and Chemical Company all constructed plants in and near Iola by 1902; Edgar Zinc started construction in Cherryvale; the Girard smelter moved to Chanute; Lanyon Brothers Spelter Company broke ground at Neodesha for a plant in 1902. By 1904, new plants were added at Caney and Altoona, construction of the American Zinc, Lead, and Smelting Company facility at Dearing was under way in 1906, and the Ozark Smelting and Refining zinc oxide plant at Coffeyville went into production in 1906.[3]

Those companies that moved first to Iola benefited from the location of gas pools directly under the railroad tracks in or near town, which enabled them to build alongside the railroads and obtain gas within the bounds of the factory site. Gas City owed its existence to this fortuitous circumstance. In 1898 the owner of a tract adjacent to the Missouri-Pacific right-of-way sunk a well and obtained a large flow of gas. Zinc companies immediately purchased acreage and erected smelters while the original owner laid out the remaining land in town lots. Similar locational advantages led to the construction of smelters at La Harpe, a few miles east of Gas City. After a few years, however, the gas flow from the original wells diminished and the older smelters, as well as those located after the initial spurt, were compelled to purchase or lease new gas lands, drill new wells, and pipe the flow to the smelters. The cost of smelting, which had dropped to about $7 per ton by virtue of cheap fuel, rose to about $8.50 per ton by 1904-1905, thus reducing the competitive advantage of gas over coal.[4]

The total number of smelters constructed in Kansas between 1900 and 1930 was 31 (Fig. 8). Not all were operative in any single year, and a number were torn down at intervals throughout the period. The years 1906-1907 were chosen for depiction because of the accurate information available on operative plants and because spelter production peaked in those two years (Table 7). Thereafter, production fell sharply until temporarily revived by World War I. Among all the communities with zinc plants, Iola felt the drop most intensely. By 1910, only four plants produced spelter, and, in 1914, only two operated sporadically. These managed to survive until zinc prices mounted but were compelled to shut down for good in 1918. Others throughout the region had closed earlier. Ironically, America's entrance into World War I damaged the zinc smelting industry, due to the preemption for military use of much steel that was formerly galvanized, and forced the closing of all but one or two of the remaining smelters in Kansas, including the American

Zinc, Lead, and Smelting Company plants at Caney and Dearing. By 1925, the Edgar Zinc Company (U.S. Steel) at Cherryvale and a smelter at Weir City were the only primary zinc plants remaining in the State.[5]

Cement (as Figure 9 indicates) was about as widely distributed throughout the region as zinc. Thirteen towns possessed smelters while ten towns in the same area (excepting Pittsburg and Galena) had cement plants. Two cities, Iola and Pittsburg, dominated the zinc industry, and no town had more than two operating cement plants. In the case of cement, the word "operating" is an important qualifier, for the promoting of cement plants became a favorite speculative endeavor and many were projected and chartered that never produced an ounce of cement.

Among the counties, Allen was the leading cement producer with six plants. Iola had two. The earliest, the Iola Portland Cement Company, incorporated in 1899 and purchased by the Lehigh Portland Cement Company in 1917, is still in operation. The Kansas Portland Cement Company constructed a mill between Iola and Gas City in 1903, and was reorganized as the United Kansas Portland Cement Company in 1908 in a consolidation that included the Indian Portland Cement Company plant at Neodesha and the Independence Kansas Portland Cement Company. Following bankruptcy in 1914, the company was purchased by the Sunflower Portland Cement Company, which folded during the 1920's. At Carlyle, north of Iola, Lumberman's Cement & Brick Company enjoyed a brief existence between 1911 and 1915, while, to the east, at Mildred, the Great Western Portland Cement Company, incorporated in 1908, produced throughout the 1920's. At Humboldt, the Monarch Portland Cement Company (Monarch Cement Company, 1913-1969) was incorporated in 1907, while the Humboldt Portland Cement Company, incorporated in 1907, appears to have been purely a stock-jobbing promotion much like the Middle-West Portland Cement Company of Iola.

Neosho County's two plants were both located at Chanute. The Ash Grove White Lime Association, reorganized as the Ash Grove Lime and Portland Cement Company, erected it's Chanute plant in 1908. The Chanute Cement Company, organized in 1908, never completed its plant, and produced at best small quantities of cement between 1915 and 1917 in a plant valued at under $100,000.

Each of the communities in the Neodesha triangle attracted a cement plant during the decade 1900-1910. The Altoona Cement Company, constructed in 1907, was bankrupt by 1913, and, although reorganized in 1916, was inoperative after that date. The Fredonia Portland Cement Company manufactured its first cement in 1908 and was dismantled in

1931, following its purchase in 1925 (along with the Great Western firm at Mildred) by the Consolidated Cement Company of Chicago. Neodesha's plant (mentioned above in connection with the United Kansas consolidation) was constructed in 1905, closed in 1912, and was dismantled in 1915. Another firm, the American Portland Cement Company, planned to locate in Neodesha and even purchased land in Neodesha township in 1906, but nothing came of it.

Montgomery County's cement industry located at Independence. Western State Portland Cement Company constructed its plant in 1904 1 mile southeast of town and was purchased by the Atlas Portland Cement Company during the early 1920's. In 1929, it became part of U.S. Steel as the Universal-Atlas Cement Company. The second Independence plant was involved in the United Kansas merger and the subsequent purchase by the Sunflower Portland Cement Company. In 1907, contracts were let to construct a third plant for the Ajax Portland Cement Company, to connect with the ATSF, and, in addition, lands and gas rights were secured by three other companies: the Interstate, the Central, and the Inter-Ocean cement companies. Nothing materialized with any of those firms.

Out of 30 or more plants projected for southeastern Kansas, 13 were actually constructed before 1908 and only seven survived the decade 1910-1920 (along with The Lone Star Cement Corporation plant at Bonner Springs). By 1969, there were five plants in the region: Ash Grove, Lehigh, Monarch, Universal Atlas, and General Portland Cement Company at Fredonia. The cement industry in Kansas survived overproduction, price fluctuations, and the steady depletion of the gas supply, all of which struck during the first decade of its existence, much more successfully than did the zinc industry.

Locational concentration was much more the rule in the glass industry than in the cement or zinc industries (Fig. 13). Although 11 towns claimed at least one of the 25 glass plants constructed in the region, Coffeyville had 35 percent and Montgomery County 68 percent of the total in southeastern Kansas. The Cherryvale Glass Company, which opened early in 1902, was the first in Kansas while Coffeyville's glass industry was initiated when the Kansas Glass Company opened a plant there toward the end of 1902. The Midland Glass Company at Independence went into production at about this same time. Seven of Coffeyville's plants were constructed in 1902 and 1903, with the remaining two coming in 1905 and 1906. Twenty plants went up in the region during the five years 1902-1906. Within another six years eight had either failed or moved, as others were to do, until by 1916 Coffey-

ville's industry had vanished. In 1920, five glass plants were reported in the region and in 1930, none.

Brick and tile, relying more heavily on local or in-state markets than zinc, cement, or glass, was the most widely distributed of the four industries throughout the region. With 60 plants (Fig. 11) located in the region at one time or another during the period 1900-1930, southeastern Kansas probably produced close to 90 percent of the State's output. The proper clays were readily available in eastern and southeastern Kansas in general, but were found more rarely in the western areas of the State.[6]

It is difficult to obtain an accurate estimate of the actual degree of domination exercised by the region on the clay products industry, due to conflicting figures published by the federal census and the Kansas Bureau of Labor and Industry and the virtual impossibility of determin-

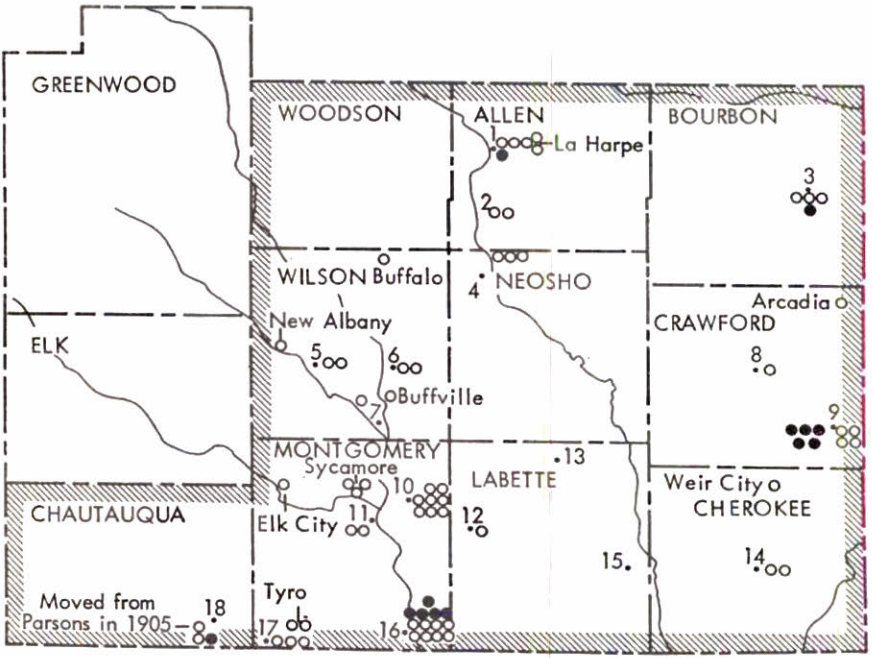


FIGURE 11.—Location of brick plants and tile, pottery, and other clay product plants in Kansas, 1890-1930.

TABLE 11.—Number of clay products plants operating in Kansas during the years 1900-1930, and during designated five-year periods.

Year	Reported in Federal Census, 1900, 1905, 1910, 1920, 1930	Reported in KBLI,* *AR*, 1904-1914	Largest no. of firms operating in southeastern Kansas during 5-year periods	
1900	57	....		
			1900-1904	38
1905	65	58		
1906	....	56		
1907	....	54		
1908	....	49		
1909	....	55		
			1905-1909	48
1910	55	43		
1911	....	38		
1912	....	30		
1913	....	26		
1914	....	29		
			1910-1914	45
			1915-1919	29
1920	58	....		
			1920-1924	26
			1925-1929	21
1930	23	....		

* Kansas Bureau of Labor and Industry.

SOURCE: *12 Census. Manufacturing: 1900 Vol. 8. Part 2; Census. Manufacturing. 1910. Vol. 9; 14 Census. Manufacturing: 1919. Vol. 9; 15 Census. 1930. Vol. 3 Manufactures;* Kansas Bureau of Labor and Industry, *AR*, 1904-1914; column 3 based on data gathered from a multitude of sources.

ing which plants were actually operative during any given year. Table 11 is offered as a best estimate of the number of operating plants during this period. Federal figures suggest a long-term stability in the number of plants while the state figures indicate a rapid drop subsequent to 1910. The federal data are believed to be more accurate than the state data from 1910 to 1915, while the data in column three reflect conditions in the region with reasonable accuracy.

A drop in the number of operating firms in both Kansas and the region was most pronounced after 1920. At this time, the dominance of the region becomes clear. But the region's share of the industry was only slightly less in the earlier decades even though it possessed only 55 to 65 percent of the State's firms. The productive capacity of firms in the region was greater than those in other areas while the region also contained the second largest firm in the U.S., the Coffeyville Vitrified Brick and Tile Company, and the output of the Pittsburg Vitrified Paving Brick Company was nearly as great. The Coffeyville firm, with

plants at Coffeyville, Independence, Cherryvale, and Chanute by 1903 (and a plant at Fort Smith, Arkansas, by 1910) produced at least 10 percent of the State's brick output and the Pittsburg firm about 5 percent.[7]

Coffeyville and Pittsburg also controlled most of the pottery, stoneware, and tile production in the State. Two of the three largest tile producers were located at Coffeyville. The Dennison Clay Company produced a hollow building tile and roofing tile that was popular because of an interlocking feature which the company had patented; the Western Roofing Tile Company, incorporated in 1903, was purchased by the Ludowici-Celadon Roofing Tile Company in 1909, reputedly the largest producer of high-grade ornamental clay roofing tile in the U.S. through the 1940's. Ludowici also erected a plant at Peru, which had about the same capacity as the Coffeyville facility. At Pittsburg, W. S. Dickey Manufacturing Company (still operative) specialized in the production of sewer tile, as did a smaller firm, the Pittsburg Sewer Pipe and Conduit Company. The Dickey firm, in 1902, inspected Coffeyville for the location of a plant and made clay tests near by but chose a location near Chanute. There, Dickey and the Coffeyville Vitrified Brick and Tile Company engaged in a bitter dispute over the lands which the former purchased and on which the Coffeyville firm held gas leases. Dickey maintained a small army on the ground to prevent trespass but lost the lands in a judicial battle that went to the Kansas Supreme Court.[8]

Chanute lost the Dickey tile plant but prospered nonetheless, the town's population doubling between 1900 and 1910 and containing 45 percent of Neosho County's population by 1930. The VMP of Chanute's industries rose from $280,000 in 1900, derived largely from the output of three large creameries and the machine shops attached to the ATSF divisional headquarters,[9] to over $1 million in 1907 and $3.1 million in 1913 (Table 13). In that year, Chanute's mineral industries, assessed for tax purposes at $444,775, were capitalized at $3 million and owned personal and real property worth an estimated $1.5 million.[10] This growth rate was not maintained, and although Chanute lost valuable industries after 1913, she retained a portion also. Other towns experienced similar growth and decline. In following chapters an attempt will be made to evaluate the industrial strength of the principal towns in the region and the contribution of the four mineral industries to that strength, and to discuss certain critical problems that resulted from industrialization.

IV

Notes

1. Haworth, *Mineral Resources of Kansas, 1903*, plate 1; Walker, *Industrial Development of Kansas*, II, 42.

2. *Pittsburg Kansan*, December 6, 1900; USGS, *Mineral Resources, 1905*, 382, *1915*, I, 954; Ingalls, *Production of Zinc*, 38.

3. Ingalls, *Production of Zinc*, 20-21; Norris, *AZn*, 30; Kansas Bureau of Labor and Industry, *22AR* (1906), 188; USGS, *Mineral Resources, 1905*, 372-373, 382.

4. Duncan, ed., *History of Allen and Woodson Counties*, 75-79; Adams, *Iola Quadrangle*, 37-50; Ingalls, *Lead and Zinc*, 330-332.

5. G. P. Grinsley, *Kansas Mineral Industries* (Topeka, 1902), 5; "Underground Resources of Kansas," *SGSK Bulletin*, 13, 60; Howell, *Pittsburg and Its Industries*, 55-56; Norris, *AZn*, 68-70; Felix Edgar Wormser, "Slab Zinc and Zinc Concentrates" in Josiah Edward Spurr and Wormser, eds., *The Marketing of Metals and Minerals* (New York, 1925), 228-230.

6. "Underground Resources of Kansas," *SGSK Bulletin 13*, 41-42.

7. *Coffeyville Daily Journal*, March 9, 1901; *Coffeyville Weekly Journal*, January 5, 1912; Grinsley, *Kansas Mineral Industries*.

8. S. F. Emmons and C. W. Hayes, eds., *Contributions to Economic Geology, 1904* (USGS, *Bulletin No.* 260) (Washington, 1905); 548-549; *Supplement to the Coffeyville Daily Journal; Cherryvale Weekly Republican*, April 5, 1903; *Coffeyville Daily Journal*, May 7, July 19, 1902; *Coffeyville Journal*, April 18, 1902; *Coffeyville Weekly Journal*, January 19, March 1, 1912, January 17, 1913; Drake, *Montgomery County*, 106; Howell, *Pittsburg and Its Industries*, 86.

9. Harvey Nelson, *An Economic History of Chanute, Kansas* (MA thesis, University of Kansas, 1939), 12, 32-34.

10. Tax Roll. 1913. Lands. Neosho County. Neosho County Courthouse, Erie, Kansas.

V

Towns and Industries: The Experience of Southeastern Kansas

Urbanites in southeastern Kansas pursued the "American Dream" of prosperity and the "good life" through the acquisition of material wealth with as much verve and optimism as their counterparts across the nation. The authors of *Out There at Chanute, Kansas; Chanute's Business Proclamation* (1904) and its alliterative equivalent, *Prosperous Pittsburg Pictorially Portrayed* (1915), were fully convinced that their towns and the region had entered the Industrial Age at the same time and pace as the rest of the country. Their conceptualization of the "good life" was eminently proper, that is to say, traditional.

A town was a lively main street embellished with electrified lamp posts, criss-crossing and sparking trolley lines, and flanked on either side by amply stocked shops owned and managed by the contemporary version of "Mr. Clean"—pillar of society, faithful husband, doting father, giver to good causes, and regular attendant at divine services Sunday and secular versions Wednesday at the local Chamber of Commerce and every-other-Thursday, at the W.O.W. Hall. The rural-urban vision called for jostling downtown crowds on Saturday, sedate, family-oriented Sundays, and, during the week, full lunch pails, school bags, and business luncheons, which if held on a spring day in 1907 might have included some speculation about how that young Humboldt lad, Walter Johnson, might do in his first season with the Washington, D.C., baseball team.

A town was a street with great elms shading great white balloon-frame Victorian homes. A town, in the mind's eye, was a row of towering smokestacks rising out of massive elongated steel buildings born of the happy marriage of entrepreneur and investor and employing multitudes of contented and industrious souls whose wives jostled one another each Saturday morning in the course of shopping at "Mr. Clean's."

It has been suggested with reference to static societies and nations and regions termed "undeveloped" that a major obstacle to economic development may be an image of change which fails to allow for the rapid and flexible decision-making necessary for an efficient exploitation of newly valued resources or other existing potential. This was not an obstructing factor in southeastern Kansas. If anything, the reverse was true. The prevalent image was based upon empirical observation—at least nationally—and rooted in the assumption that change was inevitable and good. This image knew no bounds. Chanute, instead of valuing certain of the qualities inherent in smallness, wished it were Kansas City.

Kansas City thought it was New York, and the latter marvelled at its diversity, elegance, and magnitude and had forgotten its "Chanute" origins.

So the small towns sought industry as the "open sesame" to the future. Cherryvale took pride in its industrial labor force (and payroll) which comprised over 10 percent of the population in 1910. Independence boasted of bank deposits in excess of $2.5 million, a labor force of 2,000, industrial investment of $4 million, and, in 1907, anticipated an additional investment of $3 million and 2,000 new jobs within two years. Coffeyville emphasized its unlimited supplies of natural gas and industries capitalized at $10 million, while Mound Valley thought it was on the way with the coming of a brick and a glass plant.[1]

None of the region's towns became an important metropolitan area, but virtually all demonstrated a capacity for early growth, meaning in most cases a transformation from a rural backwater to a busy little community. Of the towns, only three in 1890 amounted to much: Fort Scott, Pittsburg, and Parsons. All three were railroad centers, with the Kansas City Southern shops at Pittsburg, the MKT shop at Parsons, and the Missouri Pacific and St. Louis and San Francisco facilities at Fort Scott.

Fort Scott, the largest in the region through 1900, possessed two hydraulic cement plants, a sugar-beet refinery, and a few small brickyards but did not experience much population or industrial growth through 1930. Parsons' population grew steadily between 1890 and 1900, and, by 1920, Parsons was the second largest city in the region and the third largest in 1930. None of this growth is attributable to the mineral industries but rather to the location of an International Harvester plant, the state hospital, a Swift meat-packing plant, and various other smaller manufacturing (and milling) establishments. Pittsburg, the largest city in the region by 1910, retained in 1930 a large share of the brick and tile industry that developed earlier and, although losing its smelters, possessed a large milling complex, several large iron and steel works, and a state normal school.[2]

As Table 12 indicates (see also Fig. 2), the urban population (towns over 2,500) rose most sharply between 1890 and 1910; 44 percent from 1890 to 1900, compared with 16 percent for the region as a whole (Table 1), and 48 percent from 1900 to 1910, compared with 19 percent for the region. Though population growth slowed considerably in the next decade, it was still greater than regional growth, while the decline from 1920 to 1930 was less than half that experienced by the region. Moreover, two of the most active mineral industry towns, Coffeyville and

TABLE 12. Towns with population of over 2,500 and percentage of county population, 1890-1930, southeastern Kansas.

	1890		1900		1910		1920		1930	
	Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage	Population	Percentage
Humboldt	1,361	10.7	1,402	7.2	2,548	9.2	2,525	10.7	2,558	11.9
Iola (+Gas)	1,706	12.6	5,791	29.6	10,313	32.6	8,874	36.2	7,160	33.5
La Harpe	877	6.5	610	3.1	2,080	7.5	1,010	4.3	756	3.5
Fort Scott	11,946	42.2	10,322	41.7	10,643	43.5	10,693	46.1	10,763	48.1
Baxter Springs	1,248	4.5	1,641	3.8	1,598	4.1	3,608	11.1	4,541	13.6
Columbus	2,160	7.8	2,310	5.4	3,064	8.0	3,155	9.3	3,235	10.2
Galena	2,496	9.1	10,155	23.8	6,096	15.9	4,712	14.0	4,736	15.0
Weir City	2,138	7.8	2,977	7.0	2,289	6.0	1,945	5.7	1,115	3.3
Girard	2,541	8.3	2,473	6.4	2,446	4.7	3,161	5.1	2,442	4.9
Pittsburg	6,697	22.1	10,112	26.1	14,755	28.8	18,052	29.2	18,145	36.8
Oswego	2,574	9.3	2,208	8.1	2,317	7.4	2,407	7.1	1,845	5.9
Parsons	6,736	24.4	7,682	28.0	12,463	40.0	16,028	47.1	14,903	47.5
Caney	542	2.3	887	3.0	3,597	7.3	3,427	6.9	2,794	5.4
Cherryvale	2,104	9.1	3,472	11.9	4,304	8.7	4,698	9.5	4,251	8.3
Coffeyville	2,282	9.8	4,953	17.0	12,687	25.6	13,452	27.0	16,198	31.5
Independence	3,127	13.5	4,851	16.6	10,480	21.2	11,920	24.0	12,782	24.8
Chanute	2,862	15.2	4,208	21.3	9,272	39.0	10,286	42.8	10,277	45.3
Fredonia	1,515	9.9	1,650	10.6	3,040	15.3	3,954	20.8	3,446	18.5
Neodesha	1,528	10.0	1,772	11.3	2,872	14.5	3,943	20.6	3,381	18.1
Yates Center	1,305	14.4	1,634	16.3	2,024	21.4	2,800	31.4	2,013	23.7
Total for towns of over 2,500	36,483		64,523		106,134		125,288		119,080	
Percent of regional population		17.5		27.6		37.0		44.4		40.7

Source: Federal Census. Population, above dates; Appendix Table A.

Independence, continued to expand even during the 1920's, while the others remained fairly stable or lost population.

It can be seen that the towns represented in Table 13, on the average, tripled their VMP and that those towns with the sharpest increase enjoyed an equally marked augmentation of population. The growth in manufacturing (reflected in Table 13) also serves to explain the more rapid rise in urban versus rural population in the region as a whole and in Montgomery, Wilson, and Allen counties in particular. Montgomery County's four major towns, Caney, Cherryvale, Independence, and Coffeyville, contained 35 percent of the county's population in 1890, 48 percent in 1900, and 64 percent in 1910 (Fig. 12). Fredonia and Neodesha had 21 percent of Wilson County's population in 1900 and 30 percent a decade later. In 1920, 50 percent of Allen County's residents lived in Iola (Gas City), La Harpe, and Humboldt compared with 30 percent in 1890. Crawford County's urban population remained relatively stable until 1920-1930, and then the percentage of urban population increased significantly only because of a less rapid decline in urban (compared to rural) population.

The towns and counties which experienced the most dramatic growth between 1890 and 1910 were those experiencing the greatest influx of mineral industries. There is, unhappily, no direct way to measure the contribution of the four industries to that growth. Such indices as do exist for the period, VMP, VA, capitalization, or number of employees are presented either in county or industry totals. VMP for the counties and certain cities (Table 13) are known. Labor force, capitalization, VA, and VMP are known for each of the four industries, but the county or city shares are not known.[3]

The towns believed that industry was essential to growth and outbid one another in their rush to obtain factories. Newspaper reports give the impression that more energy and money was expended in the pursuit of a cement or glass plant than a flour mill or slaughterhouse. While iron and steel foundries, machine tool plants, and other similar industries were valued as highly as smelters or cement and glass plants, the towns had little to offer the former in the way of raw materials, and fuel was less of a factor in production costs. The mineral industries came to the region; in question was the precise location of individual plants. Once located and in production, the advantages and benefits of the industries were manifest to the eyes of the townspeople.

Seven glass factories located at Coffeyville in 1902 and 1903, creating a grave housing shortage, pushing the price of lots up sharply, and stimulating a boom in construction which attracted construction workers from surrounding towns, whose labor supply was thus depleted and,

TABLE 13.—Value of manufactured product (VMP) for various southeastern Kansas towns during the period 1900-1930 (in thousands of dollars).

Town	1900	1907	1908	1909	1911	1912	1913	1914	1920	1930
Coffeyville	1066	3358	3095	3993	4637	4029	5428	5555	16655	20031
Pittsburg	1616	4000	4680	3455	3894	4114	4635	5091	5271	5135
Parsons	1025	856	1990	1551	1800	1975	2236	2787	4854	6234
Fort Scott	943	1641	1664	1593	2432	2040	1841	1668	4251	ND
Galena	563	ND	ND	ND	ND	ND	ND	ND	ND	ND
Girard	511	ND	ND	ND	ND	ND	ND	ND	ND	ND
Independence	417	2766	1713	2028	3123	2164	3534	2909	1046	1525
Chanute	280	1042	1004	1643	1620	1821	3135	3051	1089	855
Iola	ND	8161	3735	4352	2244	2018	ND	ND	ND	ND
Total	6421	21824	17881	18615	19750	18161	20809	21061	33166	33780
Regional VMP, %	45	.....	.....	.....	.....	.....	.....	.....	37	37

SOURCE: Federal Census. Manufacturing. 1900, 1920, 1930; Kansas Bureau of Labor and Industry, *AR*, 1907-1909, 1911-1914.

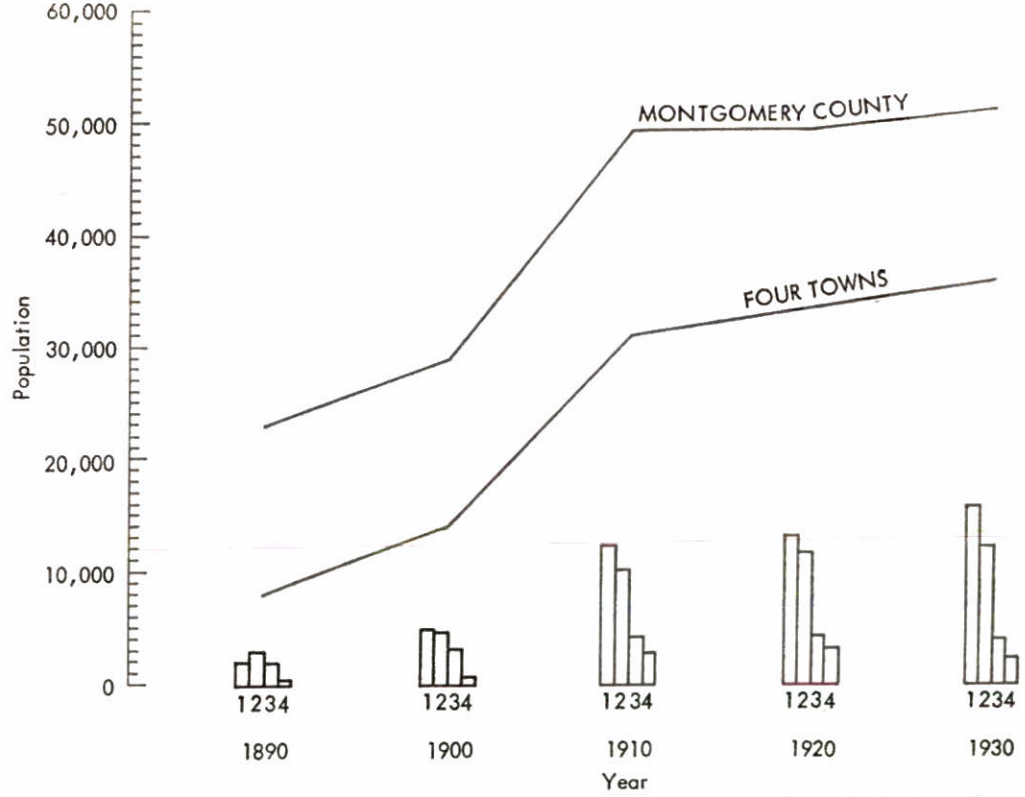


FIGURE 12.—Population of Montgomery County, Kansas, and of Coffeyville (1), Independence (2), Cherryvale (3), and Caney (4), 1890-1930.

who, in competing with Coffeyville to fill their own labor needs, forced wages up. The influx of highly paid glassworkers, the attendant creation of new jobs to put up the new plants, wage and salary increases resulting in demands for new, better, and more services, which created more jobs—these occurrences were observed and experienced by the residents in general, and not only in Coffeyville but in Independence or Iola-La Harpe with its ten smelters and two cement plants.[4]

When operating at full capacity, Coffeyville's glass plants employed 1,640 workers and pumped $109,000 monthly in wages into the local economy while the zinc oxide plant and nine clay products firms added another 765 employees and $37,000 in monthly wages. Annual wages to 2,400 employees in the above three industries approached $1.8 million. Such neutral statistics become less so when it is pointed out that Coffeyville's population in 1910 was only 12,687 and probably around 10,000 in 1907, at which time the above labor force would have comprised 24 percent of the total population. In the Iola-Gas City-La Harpe district similar results obtained from the location of numerous smelters and two cement plants. As with Coffeyville, a condition of full production and full employment was achieved most nearly in 1907. In that year, 3,000 workers in the Iola district earned $2.3 million in wages in zinc, cement, and brick and tile plants (5 percent of employment and 3 percent of wages were in brick and tile plants). The labor force constituted 20 percent of the population of the district in 1910. Such visible effects were accentuated in a town such as Caney which obtained within a few years after 1900 two smelters, three glass factories, and three brickyards. The employees of these firms alone—925—accounted for 34 percent of the town's increase in population between 1900 and 1910.

Other tangible evidence of growth included a great increase in bank deposits at Iola and in Montgomery County,[5] improved and expanded public utilities and interurban transit service, accelerated street, road, and sidewalk construction, especially within the cities, and of direct benefit to brick and paving-stone manufacturers and cement plants. Such internal improvements were probably financed largely through taxes levied on local industry. In Iola township, the taxable valuation of the mineral industries in 1908 equaled 68 percent of the total township valuation, and, in adjacent Elm Township, the assessment equaled 60 percent. On their part, the industries consistently protested valuations and resisted assessments.[6]

The clustering of the four industries in the region, combined with the exploitation of gas and oil resources, attracted to the scene supporting industries, which frequently replaced the original firms as the major industrial component in the towns. The availability of cement and con-

struction demands largely induced by the sudden influx of industry and concomitant population increases created a situation favorable to the establishment of concrete block companies in many communities. The relative density of brick plants in Coffeyville and Montgomery County led the American Clay Brick Machinery Company of Ohio to designate Coffeyville as its distribution point for the Southwest and Plains regions. Several iron works, including the United Iron Works Company plants at Iola, Pittsburg, and Independence, the Cherryvale Iron Works, and machine shops at Coffeyville, were originally initiated to service brick and cement plants and smelters and developed an extensive business in manufacturing oil-field and coal-mining equipment. Machine shops in the lead and zinc district shipped machinery to markets across the country. Oil and gas drilling equipment, in heavy demand during the 1900's, was manufactured locally, one of the larger companies being located at Chanute. The production of Chanute's oil field and those in Wilson and Allen counties was piped directly to refineries in Erie, Coffeyville, Independence, Humboldt, and elsewhere in the region. The Standard Asphalt and Rubber Company at Independence piped raw oil directly from the field and operated a refinery at Paola, while Coffeyville, by 1922, possessed three manufacturers of oil tank cars, one of which evolved from an earlier machine shop.[7]

Linkages between the mineral industries and other industries and the benefits accruing therefrom were observable by the man on the street and, if these were threatened, defensive reactions were evoked from the citizenry. Local assumptions concerning the tandem relationship between the four mineral industries and prosperity are substantiated by available statistical data including those in Tables 12 and 13. In Table 14, total annual wages and VMP are given for the four industries during the period 1904-1914, along with the contribution of the four industries to state totals. There are no data for county VMP in 1910 or inter-census years, but in 1900, prior to glass and in the early stage of cement, three industries provided 48 percent of the region's VMP. In 1930, with no glass industry and with a much reduced smelting component, these industries still contributed 24 percent of the region's VMP.

In the absence of directly comparable figures indicative of the four industries' share in regional growth, indirect methods, spiced with assumptions and guesswork, must be resorted to and the subject narrowed to the field in which the most data exists, in this case Montgomery County and its major towns.

In 1900, Montgomery County's VMP was $2,547,000 (Table 5), of which Coffeyville and Independence contributed 58 percent (Table 13). It is assumed that county VMP increased through 1910 at the same rate

TABLE 14.—Total wages and value of manufactured product (VMP) for four mineral industries (in thousands of dollars), 1900, 1904-1914, 1930, and comparison of four industries and Kansas (in percent).

Year	Brick and Tile		Cement		Smelting		Glass		Comparison of total of four industries and total for Kansas	
	Total wages	VMP	Total wages	VMP	Total wages	VMP	Total wages	VMP	Total wages, %	VMP, %
1900	314	724	60	314	705	5790	.....	.....	5.0	3.9
1904	840	1907	402	1475	1473	10149	447	958	....	....
1905	834	2098	523	1844	1398	10004	910	1560	18.1	7.5
1906	980	2120	1404	4756	1922	14373	855	1792	15.6	9.5
1907	940	1926	886	2969	1428	9030	513	1211	12.3	6.4
1908	863	2107	1155	3197	1337	11205	722	1573	13.0	6.8
1909	911	2336	1359	4682	1136	10857	986	2037	16.9	6.1
1910	873	2092	1530	5084	1162	11007	772	1352	12.7	6.7
1911	843	1772	808	2925	1415	13768	513	1260	10.8	6.6
1912	726	1737	1106	3846	1214	12474	316	695	9.8	5.8
1913	714	1708	766	2790	887	6926	364	695	8.0	3.7
1914	723	1953	673	3162	633	5259	367	729	9.2	3.4
1930	1190	3275	1563	11242	771	6941	.....	.....	5.5	2.8

SOURCE: Federal Census. Manufactures. 1900, 1930; Kansas Bureau of Labor and Industry, *AR*, 1904-1914.

as that of the two cities, which would yield a county VMP of $8.5 million. The VMP is known for about 80 percent of Coffeyville's mineral industries, reaching $1 million in 1909, or 25 percent of the town's total VMP, and with the unknown firms probably close to 30 percent. The minerals group produced a VMP of $2 million at Independence, or 75 percent of the city's total, while Cherryvale's $2.5 million VMP represented 100 percent of industrial production, as did Caney's $1 million VMP. The mineral group was most important to Caney and Cherryvale, least important to Coffeyville, and produced at least 75 percent of the county VMP in 1910. The mineral complex accounted for virtually the whole VMP in the Iola district and in excess of 80 percent of Allen County's VMP, to which must be added an unknown VMP from Humboldt. At a lower order of magnitude, the significance of the four mineral industries to Wilson County falls between Montgomery and Allen counties.[8]

Pittsburg and Girard produced the total VMP for Crawford County, of which clay products contributed about 10 percent, a figure that rose precipitously to around 70 percent whenever the smelters were activated. During the 1920's, clay products yielded about 15 percent of Pittsburg's VMP, serving as a stabilizing factor in an era marked by numerous business failures and a steady decline in population lasting through 1940.[9] Chanute, accounting for the bulk of Neosho County's VMP, possessed mineral industries whose share of VMP ranged from 60 to 65 percent. At the low end of the scale, Fort Scott's mineral industries, including the two natural cement plants, amounted to about 15 percent of the city and the county total, while the minerals VMP in Labette County was probably under 10 percent and in Woodson County practically nil. Little is known about Chautauqua County, but with the lowest VMP, save for Woodson County, the glass and brick factories at Peru undoubtedly yielded the larger part of the county VMP.[10]

Other indices of the position of the mineral industries, leave the same general impression as gained from Table 14—that of productivity peaking during the decade 1900-1910, declining from 1910 to 1920, and rising, most dramatically for cement, between 1920 and 1930. Depleted gas pools and rising fuel costs proved the undoing of the region's glass industry and created serious problems for the clay industry, while that situation, in addition to overproduction, eliminated all but the most efficient cement plants in the region. Improvements in zinc metallurgy and processing techniques had made it possible for smelters in eastern coal fields to compete with gas-fired smelters. That and other difficulties, combined with rising fuel costs in Kansas and the prospect of costly

plant fuel conversion, induced the smelting companies to discontinue production in the region.

A fuel crisis was presaged in 1905 when the Coffeyville Vitrified Brick and Tile Company closed its Chanute branch plant due to a gas scarcity and again four years later when the city of Chanute, reacting to decreasing gas pressure, increased gas rates to factories.[11] Even earlier, citizens of Montgomery County, acutely aware of the value of the county's gas pools fought a losing battle with Kansas Natural Gas Company (KNG) to prevent the piping of gas out of the gas belt.

Early in 1904, KNG began laying pipelines from the Independence field to Kansas City and other northern points. Reacting swiftly, local citizens organized the Gas Protective Association to fight KNG. Montgomery County officials sought court injunctions against further construction, Montgomery County farmers refused to sell rights-of-way to KNG, workers were terrorized and driven from the line, and on December 19, 1904, 50 masked men blew up large sections of the line at seven different places. KNG was victorious, in spite of the Association and the camaraderie inspired when 200 grown men leaped to their feet as one, chanting the Coffeyville "Gas Fight" song:[12]

> Coffeyville! Coffeyville! glass glass, glass!
> Kansas! Kansas! gas, gas, gas!
> Coffeyville! Coffeyville! brick, brick, brick!
> Piping out gas makes the brick man sick.
> Coffeyville! Coffeyville! flour, flour, flour!
> Piping out gas makes the flour man sour.
> Real estate, real estate, Kansas soil!
> Leave the gas and pipe the oil!

The future substantiated the presentiments of glassmen, flourmen, and brickmen. KNG purchased the People's Gas Company in 1905 and formed a new company, the Coffeyville Gas and Fuel Company. KNG also absorbed the Independence Gas Company and the Consolidated Oil, Gas, and Manufacturing Company, all of whom received their gas from KNG and set prices established by KNG. Prices rose thereafter from the 3 cents per cubic foot rate initially established. KNG, serving 75 percent of the consumers in the region, attempted to stop the sale of gas to factories at the low rates agreed upon. The communities involved blamed KNG for both increased rates, diminishing gas supplies, and the withdrawal of industry from the region. However, after going into receivership in 1912, KNG was discovered to be practically bankrupt, a condition caused by the law rates initially contracted for by large industrial consumers and by the costs of pushing pipelines into Oklahoma to compensate for diminishing supplies in Kansas.

No one could profit from the situation. In 1911-1912, ten cases were successfully presented before the Kansas Public Utilities Commission to prevent KNG from raising rates. In order to meet industrial contracts, KNG resorted to stopping the flow to various communities—in the winter. This was intolerable, and the courts prevented KNG from such arbitrary procedures. But in 1911, gas pressure was too low to allow the glass plants to operate. Glassmen spoke openly of removal to Oklahoma. The Coffeyville Window Glass Company offered in 1911 to pay higher rates for a guaranteed supply, but KNG could promise little.

Rates for boiler gas (industrial gas) reached 10 cents in 1913 at Coffeyville, 13 cents at Independence, and 20 cents in the rest of the region while domestic rates (city delivery) rose to 20, 23, and 30 cents respectively and by 1917 were 30 cents in Montgomery County. Even at these rates the receivers of KNG complained that the business was unremunerative. And long before these rates were reached, glass manufacturers had fled the region and the end of the smelting era was at hand.[13]

Faced with similar problems, which KNG was unable to resolve, Caney, in 1911, sought to forestall the closure of its brick and glass factories by issuing $30,000 worth of bonds for the laying of a pipeline to a gas field southwest of town. Caney lost its smelters but did retain one of the glass plants and one of the brickyards. Cherryvale, experiencing a gas shortage in 1913, went to court to compel the Portland Gas and Pipeline Company to supply gas for the town's needs (Fig. 13). This company, connected with the United Kansas Portland Cement Company which owned some 45 percent of the pipeline stock, was under contract to furnish gas to the Cherryvale Light, Gas, and Power Company. The pipeline, in spite of, and at the expense of, Cherryvale's needs, continued to supply the cement company's plant at Independence until a federal court ordered the diversion of gas to Cherryvale. Cherryvale's major industry, the Edgar Zinc Company, piped in most of its own gas and only utilized the city system in emergencies, so its needs were not immediately involved in the dispute.[14]

Altoona, more directly than Cherryvale, was dependent upon a cement company for its gas supplies, as were a number of local industries. Constructed in 1907, the Altoona Portland Cement Company was neither simply a stockjobbing venture nor a bona fide cement plant but a cement company that earned more from the sale of gas than from cement. When the firm was incorporated in 1907 it represented a merger between the promoters of the cement plant and the Richardson Gas and Oil Company, which was committed to supply Altoona with gas and which owned the gas distributing plant, gas leases and gas lands,

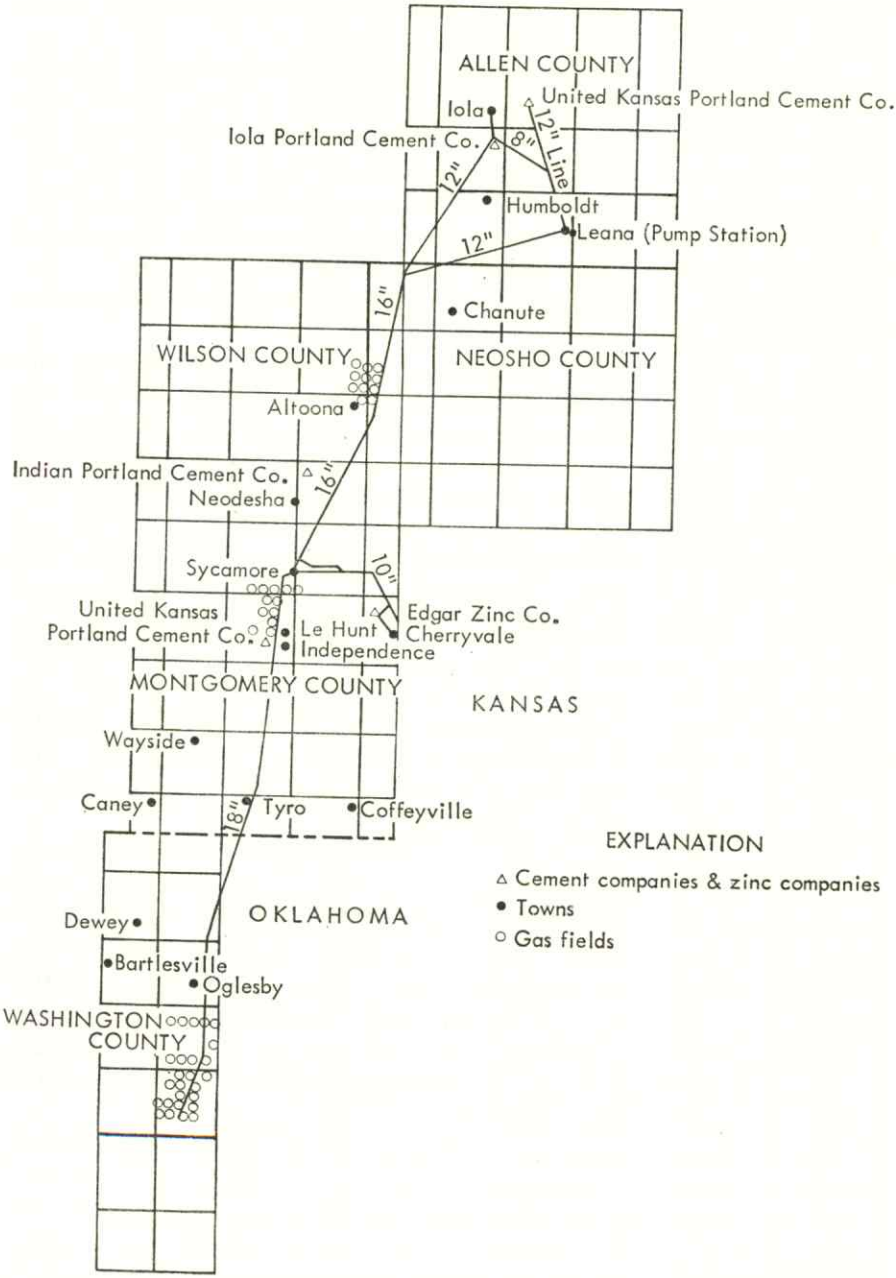


FIGURE 13.—Map of Allen, Neosho, Wilson, and Montgomery counties, Kansas, and Washington County, Oklahoma, showing Portland Gas and Pipeline Company's gas pipe line.

and the connecting pipelines. The cement company assumed the obligations of the gas company as well as its properties.

The city of Altoona maintained that the cement company failed to supply adequate gas to the city while supplying the zinc smelter, glass plant, and brickyard at Altoona and its own needs as well. Moreover, the company was charged with tapping the gas lines which fed the city and refusing to drill new wells for the city's needs on proven gas lands leased or owned by them. Lastly, Altoona complained that the company allowed its plant to deteriorate, demonstrated no interest in the production of cement, and filed bankruptcy with the intention of defrauding local stockholders.

All of the charges were basically true. Indeed, the company had gone further than the city realized by disposing of valuable gas leases to prominent stockholders and directors and was considering trading others for stock as part of an arrangement to merge with the United Kansas Portland Cement Company. Gas represented the only tangible product sold by the company, and net earnings in 1910 reached $84,000 and approached that figure in 1911. These earnings provided funds for basic maintenance of the plant and dividends on the preferred capital stock of the corporation amounting to $600,000. The relinquishment of gas lands lowered earnings and also dividends. The court prevented the further alienation of gas lands, and the receivers renewed gas leases and attempted to operate the plant until its forced sale in 1913. After the forced sale, Altoona received gas from KNG at much higher rates. Although reorganized as the Altoona Cement Company in 1916, the company failed to operate successfully.

Altoona's major industries were forced to the wall during the controversy. The Altoona Zinc Smelting Company was dissolved in 1913; the Altoona Vitrified Brick Company declared bankruptcy in 1913; and the Kerr Glass Company, leasing the plant of the defunct Altoona Cooperative Glass Company, was unable to commence production in 1913 due to the uncertain fuel supply. With its industry gone, Altoona experienced a loss of more than 40 percent of its population between 1915 and 1930. Even at that, the 800 remaining were twice the number present when the century began.[15]

Of the towns involved in the development of the mineral industries only Coffeyville's population grew as rapidly as, and actually faster than, the nation's between 1920 and 1930 while Pittsburg's rate equaled the national rate between 1910 and 1920, and the growth rate of Independence matched that of the Plains Region during the same decade. For the remainder of the towns, population declined or remained fairly stable (Tables 1, 12). Coffeyville's population growth is in close correla-

tion with the high VMP noted in Table 13. The degree to which this can be attributed to the strengths and profits accrued during the mineral phase is problematical. Residual effects would include a pool of skilled labor left behind when the glass industry left and a transportation network much improved by the construction of steam and electric beltlines and attendant railroad facilities such as the shops of the Union Traction Company. Machine shops and fabricated metal goods plants, refineries, and chemical plants drew on these resources. Utilities, streets, schools, and other services were superior in 1910 to those of 1900, and much of the improvement was made possible by taxes levied on the mineral industries.

All in all, Coffeyville managed a successful transition from primary to secondary industry, an achievement in part due to those factors mentioned above as well as a capacity for organization and management that was not so manifest in other towns in the region. Coffeyville could, when necessary, act efficiently as a community.

The smaller towns in the region lost everything when the mineral industries retrenched or abandoned local operations. Tyro and Sycamore returned to the prior status of rural hamlets servicing diminishing numbers of farmers. Towns a little larger, such as Caney, Cherryvale, and Altoona, were larger than in 1890 or 1900, but this was not necessarily a sign of augmented strength, for employment opportunities within the communities were severely limited. It is difficult to see any lasting benefits accruing to these towns as a result of their experience with industrialization. Even today they manage only a marginal existence. Unless they offer, or have the potential to offer, to residents the opportunity to live a kind of life superior, qualitatively, to the life experienced in larger communities, they have little future.

Communities such as Iola and Independence, intermediate in size between Coffeyville and Girard or Caney, gained much in population and stability between 1890 and 1910. Unlike Coffeyville, they were unable to replace all that they lost when the mineral boom came to a close, though they did retain certain industries from that era. The pace of life slowed down and catalysts were not present, as they were in Coffeyville, to quicken the tempo of reaction to a changing world.

One takes for granted the differences in life styles and growth patterns found in New York, New Orleans, Chicago, Kansas City, and Los Angeles. Within a more restricted setting, similar contrasts are observable between such Kansas towns as Goodland, Medicine Lodge, and Lawrence. Climate, topography, differing origins, immigration-emigration patterns, and luck, among other factors, account for existing differences. How, though, is one to account for attitudinal diversity between

communities that are neighbors? Coffeyville and Independence started as equals in 1890, operating in the same environment, seeking the same goals, and facing the same problems. Why was Coffeyville more successful than Independence in accommodating to the losses of the 1910's and the opportunities of the War and post-War periods? Why was Independence more successful than Cherryvale? Compounded basically of the same ingredients, the chemistry of the towns differed. Why? Little can be done by outside agencies to induce permanent growth unless the structure of such communities and the patterns of life of their residents are systematically described and thoroughly analyzed.

V
Notes

1. Prewitt-Dunham Directory Co., *Cherryvale, Kansas. City Directory for 1905 . . . With a Complete Classified Business Directory and Householder's Guide* (Springfield, Mo., 1905); *Independence, Heart of the Kansas Gas and Oil Field,* 7-11; *Supplement to the Coffeyville Daily Journal,* 13; *Mound Valley Journal,* October 19, 1906, January 4, 1907.

2. *Seventh Biennial Report of the Kansas State Board of Agriculture . . . 1889-1890* (Topeka, 1891), 14-15; *Parsons: Its Past, Present and Future* (Parsons, Kansas, 1901); Pittsburg Chamber of Commerce, *Prosperous Pittsburg Pictorially Portrayed* (Pittsburg, Kansas, 1915). Walker, *Industrial Development of Kansas,* II, 9, 20, 21; Howell, *Pittsburg and Its Industries,* 68-76, 101.

3. I place no great faith in the absolute accuracy of the figures in Table 13 but it is believed that they possess some value as general indicators if used comparatively.

4. *Coffeyville Daily Journal,* February 28, June 22, 1902; *Supplement to the Coffeyville Daily Journal,* 26, 46, gave the total industrial payroll at $500,000 monthly, a greatly inflated figure. Even the figures in the text are inflated since they assume full production and full employment for each firm during a given year, a condition achieved only in 1907.

5. Scott, "How Natural Gas Came to Kansas," 241-242 states that bank deposits in Iola increased from $500,000 in 1900 to $16 million in 1906 or over $1,000 per capita for the Iola district and $530 per capita for Allen County. This is highly improbable. Montgomery County as a whole is credited with deposits of $5 million, or $100 per capita for the county, *Supplement to the Coffeyville Daily Journal,* 13.

6. Tax Roll. 1908. Lands. Iola, Elm, Elsmore Townships. Allen County. Allen County Court House, Iola, Kansas; *South Kansas Tribune,* February 11, 1903; Commissioners Journal N. Montgomery County Board of Equalization. May 28, 1926, 242, 244, 249, 250, May 29, 1930, 925-935. Montgomery County Court House, Independence, Kansas.

7. *Tyro Herald,* January 25, 1907; *Coffeyville Journal,* June 24, 1910; *Weekly Journal,* February 16, 1912; Kansas Corporation Charters. Vol. 69: 222; Stevens, *Ozark Uplift,* 4; Chanute Daily Tribune, *Out There at Chanute, Kansas; Chanute's Business Proclamation* (Chanute, Kansas, 1904); *Independence, Heart of the Kansas Gas and Oil Fields,* 9; Walker, *Industrial Development of Kansas,* I, 42; Nelson, *Chanute,* 75-77.

8. VMP from Tyro, Dearing, and Sycamore would augment the total contributions of the four industries to Montgomery County as would Buffalo, Buffville, and New Albany in Wilson County and Carlyle and Mildred in Allen County.

9. Pittsburg Chamber of Commerce, *Prosperous Pittsburg;* Howell, *Pittsburg and Its Industries,* 78; Gabriel Nacarrato, *A Study of the Business Changes and Discontinuances in the City of Pittsburg . . . 1914-1940 . . .* (M.S. Thesis, Kansas State Teachers College, Pittsburg, 1941).

10. VMP figures for the individual industries were compiled from numerous and varied sources and in some cases were derived from production-price data or even from capacity data if it was known how many months the plant operated. No claim is made for the absolute accuracy of the figures.

11. *Coffeyville Daily Journal,* January 13, 1905; *Chanute Tribune,* October 5, 1909, in Ash Grove Cement Company Clippings and Scrapbook. Ash Grove Cement Company Library. Kansas City, Mo.

12. *Coffeyville Daily Journal,* December 12, 1904.

13. *Caney Chronicle,* November 9, 1911; *Coffeyville Weekly Journal,* January 26, 1912, January 3, February 21, 1913, January 9, 1914; *Kansas Public Utilities Commission, 1911-1912,* 15; *1914-1916,* 154-158, 195; *1916-1918,* 14.

14. *Caney Chronicle,* September 22, October 6, November 24, 1911; *Caney News,* October 27, 1911; *Cherryvale Light, Gas and Power Company* v *Portland Gas and Pipeline Company.* Case #18N. Federal District Court. Fort Scott, Kansas.

15. *City of Altoona* v *The Altoona Portland Cement Co.* et al. Case #66. Bankruptcy File; *Altoona Portland Cement Company.* Case #'s 663 and 800. Bankruptcy File; *Altoona Vitrified Brick Company.* Case #649. Federal District Court. Fort Scott, Kansas.

VI

Structural Changes in the Mineral Industries

Industrialism was America's "Pandora's Box." It came laden with promises of better jobs, higher pay, and improved standards of living in general, which Americans in all regions coveted almost as a birthright. Not all regions, however, possessed the prerequisites necessary for intense industrialization and so were forced out of the main current of national life while those regions that were suitable soon discovered that grave problems as well as magnificent opportunities flew forth when the box was opened. While rising numbers of urban Americans earned more money than ever before, moved into better housing, and possessed as necessities items that their parents viewed as luxuries, other Americans were thrust into ugly, sprawling urban ghettoes or factory towns. Scraping along from "hand-to-mouth," vulnerable to the rising cost of living, possessed of low-paying jobs that could be arbitrarily terminated without recompense, they were unable to avail themselves of the opportunities inherent in a dynamic society and promised by democratic rhetoric.

In the Mississippi and Missouri River valleys, the agricultural heartland of the nation, industrialization came more slowly, sporadically, and in smaller draughts than to the Atlantic and Great Lakes states. But the impact of urban and industrial growth was felt keenly in the West and perhaps with more apprehension than elsewhere, although for many it was largely an unseen presence. Industrialism provoked responses in the West which, although varying in emphasis from one area to another, were a blend of two basic elements.[1] Railroads, as the most visible representative of the industrial complex, were attacked by such groups as the Grangers and the Populists with the greatest fervor and for the longest duration with pragmatic, political weapons, while other interests, less powerful than the railroads, such as milling and grain-storage companies, gas and oil pipeline companies, and meat-packing houses, were assaulted less consistently and with less elan.[2]

The second element in the generalized response included the belief that the system developing in the United States, of which railroads were a part, relegated the West to the position of a colony, exploited by the East. Monopolies and trusts, hard money and high interest rates, discriminatory freight rates, collusion between eastern politicians and eastern and European capitalists—all combined to stifle industrial development in the West and degrade the agrarian. Eastern capital conspired, it was believed, to keep the prices of farm products low and the

prices of manufactured products high, thus imperiling the independence of farmer, laborer, and urban middle-class white-collar worker. Industrialism, controlled by the East for the benefit of the moneyed class, generated inequities not only between various segments of the population but between the major regions of the nation. Too great a portion of Midwestern wealth, it was maintained, went into the larders of other sections, notably the Northeast. Democratic egalitarian rhetoric constituted a major weapon used by Westerners to defend themselves against such arrogant exploitation.

Norman Pollack is persuasive in his interpretation of Populist responses as prospective (toward a better America) in emphasis and humanistic in tone even though some of their solutions were traditional and ill-suited to the new problems facing the nation. In any event, the rhetoric of Populism and of Progressionism in the 1900's was less important at the grass-roots level than the concrete measures enacted by Congress and state legislatures to ameliorate, if not resolve, the tensions of an industrializing society. All-inclusive theories designed to eradicate evil and perfect human nature are fascinating to analyze, but of less importance than the selective approach to pressing local problems evidenced at state and local levels.[3] The Coffeyville "Gas Fight" song possessed an immediate psychological significance that a reading of Ignatius Donnelly's *Caesar's Column* (1891) could not equal.

As responses to industrialism varied among the states so did they—at least in Kansas (Chapter I)—among the regions of the State. Southeastern Kansas responded by trying to get on the band wagon, thus adopting the values and techniques of the wave of the future. The reaction of the region to the problems which came in the wake of industry appear to be less militant, less theoretical, and more selective than in much of the State while some of the general charges leveled at capitalism had an empirical relevance in the region quite different from that implied in theory or political rhetoric.

Inseparable from and complimentary to western and southern opposition to the economic colonialism practiced by the East and supported by the general government was opposition to the pronounced tendency toward industrial concentration that emerged around the turn of the century. Monopolies and trusts created industrial units of such size and power that they called into question the ability of democratic and representative institutions to adequately guarantee that the new power would serve rather than subordinate the public welfare. Attacks mounted against concentration from the less developed regions normally emphasized the degree of control exercised over regional economies as a result of the injection of alien capital and alien management.

CHANGES IN MINERAL INDUSTRIES

A serious problem in southeastern Kansas, as in Kansas in general and other western states, was the scarcity of investment capital. Major industrial developments could not be financed from local resources. Railroads, mining enterprises, and other large-scale endeavors depended upon outside capital. And with such capital ". . . came 'foreign' control. The new businessmen, agents and retainers of northern industry, returned their profits to stockholders who lived outside the West or South."[4] Southeastern Kansas actively lured capital into the region which, once obtained, became, to a remarkable degree in the glass industry, local capital seeking local investment opportunity and bearing a large share of the burden of local self-improvement costs. Although the "well ran dry" after a season, some communities gained permanent benefits.

It is not possible to trace the origins of each dollar of risk capital that financed the erection of each glass, cement, zinc, or brick plant. Enough is known, however, to support some analysis of each industry. Glass was the least capitalized of the four industries, followed by clay products, zinc, and cement. The discussion will proceed in that order, based on frequently conflicting data derived from the federal census and the Kansas Bureau of Labor and Industry, local sources, and supplemented by information derived from the charters of the corporations involved. Table 15 points out the variance, which is relatively extreme, for glass during the period of its greatest activity.

The glass industry is one that in its beginnings was financed mainly through investment capital from non-Kansans who received substantial monetary and other aids from the communities in which the industries located. Even in the early stages though, residents of the various communities were induced to invest funds in the enterprises. The Midland Glass Company of Independence was organized in 1903 by a group of Indiana glassmen and Independence gas and oil interests while similar combinations occurred in Coffeyville and Caney. Of the $30,000 initially invested in the Pioneer Flint Glass Company of Coffeyville, 80 percent was from Indiana and the remainder from Coffeyville.[5] The corporation charters studied indicate that the ratio of outside to local capital for the new glass firms was about four to one, except in the cooperatives.

A number of cooperatives were established prior to 1906, including the Kansas Glass Company (Coffeyville's first), the Sunflower Glass Company of Coffeyville, and the Altoona Cooperative Glass Company. Most of the employees of Kansas Glass were stockholders, who during the negotiations had stated that they would only move to Kansas to work in a cooperative. Each of the seven directors of the Sunflower company was a skilled glassworker; the President was a blower, the Secretary, a

cutter, and the Vice-President and the Treasurer were gatherers. The cooperatives all appear to have been internally financed.[6]

The success of the early firms attracted others to the region, and Kansans invested more heavily in the second round of development. Moreover, there was a capital spin-off from the original firms, most of whose directors and investors established residence in the town where the plant was located. They were no longer outsiders and whatever entrepreneurial skills and financial connections they possessed became a part of the community's resources. Some of the new companies were established by individuals who obtained both local and outside financing while retaining full local control of the operation.

Two of the chief promoters of the Kansas Glass Company, C. J. Hoffman and Alfred Felton, sold their interests and organized the Coffeyville Window Glass Company in 1903, reputedly the largest glass plant in the West. Hoffman and Felton raised half the necessary funds in Coffeyville, including their own investment, and the remainder in Indiana and the East. Two of their colleagues at Kansas Glass, J. A. Withers and Arthur Doolittle, sold out, established the Coffeyville Glass Novelty Company in 1903 with the help of a $2,500 bonus from the Coffeyville Commercial Club, sold that out when the plant was operative, and organized the Coffeyville Bottle and Glass Company.

TABLE 15.—Estimates of average capitalization of clay products and glass firms in Kansas and in southeastern Kansas, 1900-1929 (in dollars).

	Clay Products			Glass		
Year	Federal census	KBLI*	Other†	Federal census	KBLI*	Other†
1900	13,228	.....	.....	.....	.....	.....
1900-04	.....	.....	35,210	.....	.....	43,461
1905	51,990	.....	.....	66,666	.....	.....
1905-09	.....	.....	65,419	.....	.....	49,304
1904-14	.....	75,158	.....	.....	83,520	.....
1910	61,445	.....	.....	76,913	.....	.....
1910-14	.....	.....	77,822	.....	.....	49,950
1915-19	.....	.....	105,517	.....	.....	75,000
1920	146,258	.....	.....	195,200	.....	.....
1920-24	.....	.....	121,134	.....	.....	.....
1925-29	.....	.....	124,190	.....	.....	.....

* KBLI=Kansas Bureau of Labor and Industry.

† SOURCE: Federal Census. Manufactures. 1900, 1910, 1920 and Kansas Bureau of Labor and Industry, *AR*, 1904-1914. Estimates from these sources include all of Kansas but this has relevance only to clay products since there were no glass plants outside of southeastern Kansas; the column headed "other" derived its data largely from charters, stock circulars, newspapers, and local "boomer" literature. It reflects the average capitalization per firm of the largest number of firms in operation during the designated five-year periods.

Doolittle, then, as a separate enterprise, opened negotiations with the Caney Commercial Club, which led to the organization and construction of the Caney Glass Company, capitalized at $50,000 and financed largely in Coffeyville and Caney.[7]

In this process the initial outside capital was naturalized along with the glassmen. New outside capital entered the region to supplement the capital generated locally by the success of the firms and retained locally as Kansans became an increasing fraction of the investors. At the same time, a kind of floating glass entrepreneur evolved in the region, typified by individuals such as Doolittle or James Harbough. Harbough was known as a professional glass promoter and industrial consultant who contracted with various towns to obtain glass factories and received a commission for his services. Harbough was instrumental in obtaining glass plants for Caney, Fredonia, and Peru.[8]

Most of the companies were established on a sound basis with the authorized capitalization generally sufficient to meet initial construction and operating needs and the stock issues normally paid-up shortly after organization. There were, of course, failures within the industry explicable in terms of overcapitalization and debt encumbrances. These generally were the result of mismanagement of the firms during the promotional and early operational stages. The Cherryvale Glass Company, incorporated in 1904, was threatened with failure in its first year due to the inept use of its resources, and only the infusion of new local capital and new management saved the company.[9] The failure of the Premium Glass Company of Coffeyville, forced into involuntary bankruptcy in 1910, was attributed by a court-appointed investigator to the "slip-shod" way business was conducted. The officers of the firm, touted in its promotional literature as the only effective competitor of Ball Brothers (manufacturers of the Mason Fruit Jar), did little, the investigator reported, but dash ". . . around over the country in their frantic efforts to sell bonds."[10]

A recent study of the tendencies of American industry toward the concentration of production and distribution in a few large firms within individual industries concluded that stone, glass, and clay composed an industrial group that experienced significant concentration as the Twentieth Century progressed. Of this group, glass, with a complex technology, was more concentrated than brick or stone, which had a less complex technology.[11] While the glass industry remained in Kansas for less than 20 years, those enterprises in Coffeyville reflected national trends only to a degree. In 1904, Ball Brothers of Indiana acquired the Marion Fruit Jar and Bottle Company at Coffeyville along with plants in Indiana and Illinois. This purchase gave Ball Brothers all the fruit-

jar factories west of the Appalachians save one, the Pioneer Flint Glass Company at Coffeyville. Ball Brothers controlled 75 percent of the nation's fruit-jar production. In 1913, Ball Brothers purchased the plant of the recently dissolved Sunflower Glass Company but moved it to Oklahoma the next year. Reaction in Coffeyville to the appearance of Ball Brothers was favorable since the firm set about immediately to expand productive capacity at the fruit-jar plant and doubled the work force.[12]

With the exception of Ball Brothers, the glass plants in Kansas remained relatively small-scale operations, owned and managed by newcomers who established residence in the various communities, and they gradually came under the control of purely local interests who managed to raise local capital to operate them. This development occurred at the eleventh hour of the industry's history in the region and generally after internal expansion of production capabilities had been carried through. Control by local capital did not result in the construction of new plants. In most cases, at least one experienced glassman was part of the new ownership, which in some communities amounted to a final effort to keep the plant operative.

Failures and dissolutions accompanied by the abandonment or removal of the physical plants occurred with increasing frequency after 1909 and was virtually complete by 1913. The region lost an industry whose initial investment approximated $2 million, of which Montgomery County received about 50 percent. Capital expenditure must have approached another $1 million, since at least half the plants reported the expansion of productive capacities by one-third to one-half. The loss was not total, as some plants moved intact, mostly to Oklahoma, and local investors, if they retained their stock, may have received dividends from operations in the new location. Moreover, during the peak production years (1905-1911) profits were apparently satisfactory even though labor costs were quite high (Table 10). At the least, returns were sufficiently remunerative to motivate residents of the glass towns to avail themselves of opportunities to purchase stock in and control over the various firms.

The pattern of ownership in clay products was the reverse of glass. The industry developed from one of numerous, small units owned by local individuals, families, or partners who invested a modest capital in land and physical plant to an industry composed of fewer, larger, more heavily capitalized, corporately organized firms, frequently owned by non-Kansans. This process, as Table 15 indicates, began in the period 1900-1905 and was completed in the 1920's.

In 1900, 61 percent of the brick and tile establishments in Kansas was owned and managed by individual or family groups such as the

Francis family of Coffeyville and the Nesch family of Pittsburg. Of the remaining establishments, 21 percent were partnerships and 18 percent corporations. By 1905, 57 percent were corporations, 28 percent partnerships, and 15 percent individually or family owned. The corporate firms employed 89 percent of the total capital invested in the industry, employed 85 percent of the workers, and produced 85 percent of the VMP.[13] There were few, if any, unincorporated firms operating in southeastern Kansas after 1905.

Incorporation did not reduce local control and in the case of individually owned firms or partnerships, the shift to a corporate form was often accompanied by fresh capital investment in the operation. In newly organized corporate firms, significant increases in capitalization frequently occurred within a few years of incorporation. In firms in the region for which data are available it appears that the entire amount of new investment went into capital goods and that ownership, initially, was primarily in the hands of local people.

Information regarding original ownership of 55 clay products corporations operating intermittently in the region between 1895 and 1930 indicates that stock issued by 14 firms was wholly owned by individuals from the county in which the plant was located. For 36 other firms, 76 percent was controlled by residents of the region, 10 percent by other Kansans and only 14 percent by non-Kansans, largely Missourians. The capital of five firms—among the largest in the State—originated largely outside of Kansas.[14] With the exception of Ludowici-Celadon, these firms appeared subsequent to the completion of the industry's physical plant while United Brick and Tile and United Clay Products were representative of the pattern of concentration described in Professor Chandler's article.[15]

The experience of the Coffeyville Vitrified Brick and Tile Company, the largest in Kansas and one of the largest in the nation, is illuminating because it adhered fairly closely to the design sketched in the above paragraphs.[16] Incorporated in 1898 and capitalized at $80,000, the firm evolved from a merger of the Francis Brick Company with the Coffeyville Vitrified Brick Company. The company's directors, all from Coffeyville, had been at the helm of the original firms. In 1901, the company increased its capitalization to $240,000 and in 1903 to $600,000, or 17 percent of the total capitalization in the Kansas clay industry. The charter was amended to extend the purposes of the company to include the operation of machine shops and founderies and the marketing of the final product.

These developments allowed the firm to expand its operations dramatically. By 1901 it had purchased the plant and real property of

the Chanute Vitrified Brick and Tile Company and constructed new plants at Independence and Cherryvale and had doubled the capacity of the Coffeyville facility. The new plants accounted for a capital expenditure in excess of $200,000. Steps toward limited diversification were taken in 1902 when the company decided to locate at Cherryvale foundry and machine shops for the manufacture and repair of brick machinery. The firm then operated with little change through 1916 when the Chanute plant was closed, as was the Independence plant by 1922. The firm retained ownership of both properties.

Coffeyville interests relinquished control of the company in 1925-1926 in a merger involving 31 other companies, which resulted in the formation of United Brick and Tile Company, a holding company headquartered in Chicago. Included in the merger were two other Coffeyville firms, Coffeyville Shale Products Company and Dennison Clay Company.[17] By 1940, United Brick and Tile had dismantled the plants of Coffeyville Vitrified Brick and Tile and Coffeyville Shale Products while operating the Dennison plant during the spring and summer building seasons. Elsewhere in the region, United Brick obtained the stock and holdings of Kansas Buff Brick and Manufacturing Company, Buffville, and Pittsburg Vitrified Paving Brick Company with plants at Pittsburg and Sycamore. By 1932, the holdings of United Brick were merged with the Kansas holdings of United Clay Products Corporation at Coffeyville, Iola, and Weir City to which were added, in 1932, plants at Neodesha and Wichita. The capital resources of United Clay surpassed $9 million with about $2 million accounted for by its ownership of 12 plants in Kansas.[18]

By 1932, one corporation controlled 12 of the 23 brick and tile plants reported in the 1930 census of manufactures and probably well over half the productive capacity of the industry. In 1904, 65 plants were identified in the State. Few survived the 1920's and fewer still remain in business today, but they remain for the most part concentrated within the region. Among those which trace their origins to the formative period are W. S. Dickey Company, Humboldt Brick and Tile Company, and Excelsior Brick Company at Fredonia. As of 1930, the Humboldt firm was controlled by local people while about 40 percent of the stock issued by Excelsior was owned by non-Kansans.[19] The firms that failed or dissolved during the 1920's were in the hands of regional residents when they went out of business.

The clay products industry, particularly pottery, which remained the smallest branch of the industry, was largely a local enterprise exploiting local mineral, capital, labor, and managerial resources. It was an important stimulus to the development of indigenous entrepreneurial

talents. As in most communities, such talents lie dormant until catalyzed by opportunities which may be seized within a societal framework that allows a reasonable chance for success. Robert Nesch secured a contract from the city of Pittsburg in the 1890's to pave Broadway Street and then organized a brick company which by 1905 owned three plants. A prominent Iola gas promoter, Alfred W. Beck, experimented successfully with local shale by constructing miniature kilns and then with the aid of the Northrups organized the Iola Brick Company. George E. Nicholson recognized the industrial possibilities of gas through his experience with the brick industry at Iola, organized the Kansas Portland Cement Company, and supervised the mergers that formed the United Kansas Portland Cement Company.[20] Nicholson was as exceptional in cement as he was typical in brick, for the capital requirements of the former were so large as to almost preclude the kind of individual and local initiatives which contributed to the success of the clay industry.

The productive capacity of today's cement manufacturers is ten times greater than in 1900-1910 and three times greater than in the late 1920's. Eighty-eight plants owned by 78 companies in 1905 have increased to 182 plants owned by 53 companies in 1969, but production is no more concentrated than in 1905. In that year, 15 companies produced about two-thirds of the national output and seven produced one-half of the output. In 1969, seven companies produced one-half of the cement and 14 companies, two-thirds. Of the six cement plants in Kansas, five are located in the southeast and were constructed prior to 1908. Only two of the five, Ash Grove and Monarch, are independents while the plants at Fredonia, Independence, and Iola are owned by the fourth, third, and eighth largest corporations respectively.[21]

The average capitalization of operating plants in Kansas varied from $1 million to $1.3 million between 1906 and 1911, a sum beyond the reach of local capitalists. However, so successful were the first three or four plants that a number of companies were incorporated and promoted with basically local capital. These promotions invariably failed as did the projections of a large number of non-Kansan investors.

During the industry's bright years prior to 1908, cement promotions in Kansas were well-received by the investing public and extravagant claims were made in its behalf by promoters. Potential investors were given the privilege to subscribe to firms which could have produced enough cement to transform into a sidewalk every mile of railroad that was ever projected. The Great Western Portland Cement Company, actually building at Mildred, and Ash Grove Lime and Portland Cement Company promised investors a yearly earning of $300 for each $1,000 invested in preferred stock. "Can you imagine," the Ash Grove brochure

asked, "a more profitable and at the same time *as safe* an investment as this?"[22]

Both Great Western and Ash Grove were legitimate companies with competent managements. Ash Grove, initially in the lime industry, branched out into cement with 25 years of successful business experience behind it.[23] At the same time, flimsy or fraudulent schemes were afoot such as Uncle Sam Portland Cement Company, Gutherie Mountain Portland Cement Company, Chanute Cement and Clay Products, and Altoona Portland Cement Company. They were competing for investment dollars along with firms that seriously intended to operate while those plants already operational by 1907 or 1908 produced more cement than the market justified. All firms, operative or prospective, suffered grave, often fatal, injury during the Panic of 1907 and ensuing depression which coincided with a period of overproduction in the Midwest. With prices plunging to 60 or 70 cents a barrel (often below the cost of production) and only reaching 78 cents in Kansas in 1911, the end came to many a promotional venture while even those solidly established frequently became insolvent and went into receivership. A specialist in the securities of operating cement plants estimated that not over five percent of the Kansas companies paid dividends during this period. The market, moreover, was loaded with the securities of investors who wished to get out.[24]

The Altoona Portland Cement Company went into bankruptcy in 1913. As pointed out in a previous chapter, the Altoona company sold more gas than cement, paid dividends from gas receipts, and, through the alienation of gas properties to directors and major stockholders, conspired to benefit that group at the expense of other stockholders. The company's problems did not end there. Deficiencies in the performance of the plant's power plant and grinding machinery cut the actual capacity to half that projected and paid for. To bring the plant up to capacity, that is, to increase the capacity of the grinding operation to that of the kilns, added $200,000 to the $400,000 estimated cost of construction and forced the company to issue $300,000 in bonds, secured by mortgages on its real and personal property and gas leases.[25]

The company was under considerable financial pressure in 1907-1909, for at the same time the bonds were issued, the company was trying to sell the remainder of a $600,000 issue of preferred stock, all to meet costs of construction and operation, at just the time cement prices collapsed. Compounding the problem were the expenses incurred in selling the stock which ran 15 to 18 percent. Ten percent was the normal commission through an agent, but the directors, on their own account, hired agents who received the usual ten percent while the

directors also received a commission. As a result the company received $30,000 to $45,000 less from stock sales than it should have. Proceeds from gas sales were used to pay dividends on the preferred stock—held largely by a group of insiders—but the company sold insufficient cement to meet bond obligations, defaulted, and was forced into bankruptcy with liabilities of $531,000.[26]

Altoona Cement failed partially because of the mismanagement and opportunism of its directors, partially as a result of an engineering failure, and partially from economic pressures impinging on the nation and on the industry. Humboldt Portland Cement Company was incorporated in 1907 with a capitalization of $2 million by Kansans already involved in the Humboldt Brick Manufacturing Company and failed in 1912 because of inadequate capital resources. The major failure of the period, United Kansas Portland Cement Company, involved plants at Neodesha, Concreto (near Iola) and Le Hunt (outside Independence).

United Kansas owned about 40 percent of the State's productive capacity in 1906. The firm was founded in 1903 by George E. Nicholson, an Iola brickman, with the construction of a plant at Concreto. In 1905-1906, Nicholson doubled the capacity of the original plant, constructed a large plant at Le Hunt, and purchased the Indian Portland Cement Company plant at Neodesha. Low prices in 1908 forced suspension of production at the Neodesha plant, apparently convincing Nicholson and his associates that an enlarged combination of plants and the closing of the least efficient ones would bring some stability to the industry. Negotiations were initiated with companies in Kansas, Texas, Iowa, and other states and with improved prices in 1909, United Kansas undertook the improvement of the Le Hunt plant and the laying of gas pipelines to the fields in Oklahoma, financed through a bond issue of $1.5 million. Bright prospects vanished when prices again dropped in 1910 and 1911. The Concreto plant closed in 1912 and the Le Hunt plant in 1913.[27]

United Kansas went into receivership in 1914. Of its plants, only the Le Hunt facility was worth salvaging but required modernization—not completed in 1909. However, improvement funds were not available. In 1915, the company's properties were sold for $200,000 to a group, including George E. Nicholson, associated with the Sunflower Portland Cement Company. It was intended to maintain the Le Hunt plant in case conditions warranted renewed production, but there is no evidence that this ever occurred.[28]

A strong segment of the industry survived these and subsequent hard times. Monarch Cement Company presently operates a plant at Humboldt with a capacity of 2.5 million barrels annually. Ash Grove ex-

panded its Chanute plant to its present capacity of 2.8 million barrels annually, which is double its original size, and constructed a plant at Louisville, Nebraska, in 1929. Universal Atlas continues to manufacture at Independence, and the Fredonia plant is part of General Cement Company, a firm with eight plants in five states. In 1917, Lehigh Portland Cement Company, which in 1969 operates ten plants in nine states, purchased the Iola Portland Cement Company plant, and since then has greatly expanded its storage capacity. Outside of the region, the Bonner Springs plant is part of the Lone Star Cement Company, the second largest producer in the industry with 11 plants in eight states.[29] Cement still remains a major factor in the economic life of southeastern Kansas.

On the average, zinc was a less heavily capitalized industry than cement while individual zinc smelters required less capital investment than cement plants. In 1906, a peak year of spelter production in Kansas, capitalization of the four mineral industries was 23 percent of the State's total. Cement accounted for 11 percent and zinc, 8 percent. Financing the construction of a plant such as the Chanute Spelter Company (moved to Chanute from Girard in 1903) required about $100,000 and was well within the range of local investors. Individuals from the region did enter the field and were joined, indeed were preceded, in the venture by men moving into Kansas from older smelting areas in the Middle West. The Lanyons were the most prominent of the latter group while George F. Braun, Allen County, erected a plant at La Harpe in 1902 (or 1903), George E. Nicholson (the brick and cement promoter) built at Iola in 1899, and A. B. Cockerill, a Pittsburg coal, zinc, and land sales operator, added to his smelter holdings by building at Iola (Gas City) in 1901.[30]

Corporate organizations based elsewhere than Kansas also moved in early. Edgar Zinc Company, St. Louis, built a $300,000 plant at Cherryvale in 1899. Standard Acid Company, merged in 1902 with Southwestern Chemical Company, constructed a smelter at Iola and a rolling mill at La Harpe between 1900 and 1903. In 1904, William Lanyon, then president of the Iola State Bank, was also the manager of Standard Acid's smelter at Iola. The connection between this firm and the Lanyon Zinc Company—formed by the merger of Cherokee Zinc Company, Robert Lanyon's Sons Company, W. and J. Lanyon Company, and the Palmer Oil and Gas Company—is not known. Indeed, there is much that is not known about the actual management and ownership of the region's smelters, particularly after 1900. Ownership changed hands frequently, but the basic sources for the period often fail to distinguish between actual changes in ownership and lease agreements.

It appears, however, that firms owned originally by individuals were gathered into the hands of larger corporations in the decade following

1900. The Braun smelter at La Harpe was acquired by American Zinc, Lead, and Smelting Company in 1903, a transaction in which Walter R. Ingalls served as a consultant. It was sold in 1905. George F. Braun remained president and general manager of the La Harpe plant, which probably became part of the A. B. Cockerill Smelting Company. But there is no certainty as to the precise configuration of the Cockerill organization at this time. The U.S. Geological Survey, *Mineral Resources, 1905,* lists the Gas City plant as among the Cockerill holdings, but this plant had been purchased by Prime Western Spelter Company in 1902 along with the Nicholson plant at Iola. In the same year, Prime Western was purchased by New Jersey Zinc Company, the largest of the zinc smelting corporations. Sometime between 1906 and 1910, Cockerill regained control of the Gas City plant, which along with plants at Altoona and La Harpe were under lease to another firm.[31]

The Cockerill Zinc Company failed in 1910 and was reorganized as the Kansas Zinc Company, but the plants were either sold or dismantled shortly thereafter. The Lanyon Zinc Company, in receivership by 1908, had leased its plants to the American Metal Company and in 1910 all of the properties were sold and the firm was dissolved. The equipment from one of the Iola works went to Oklahoma while the La Harpe plant was stripped for transfer to Illinois. Another Lanyon plant at Iola was purchased by the United States Smelting Company, which also purchased the Cockerill facility at Altoona. In 1916, the J. B. Kirk Gas and Smelting Company traded its plant at Checotah, Oklahoma, for the U.S. Smelting Company plant at Iola.[32]

Smelting in Kansas experienced a brief flurry of renewed investment activity in 1915-1917, and then its gradual deterioration resumed. The investments were prompted by the European war and by the discovery of great new ore bodies in the area between Baxter Springs and Treece, Kansas, and Picher, Oklahoma. By 1917, over 1,000 rigs were at work in this area searching for new deposits, many of them operated by the Miami Zinc Syndicate and partly financed by American Zinc, Lead, and Smelting Company. So successful were the new mining operations, that the new field produced 93 percent of the State's zinc and lead ore in 1924.[33]

American Zinc, which had moved into Wisconsin and Tennessee by 1910 and which operated smelters at Caney and Dearing and owned mines in the Missouri Zinc district, purchased the entire holdings of the Granby Mining and Smelting Company in 1916. Included in the purchase were three smelters, one at Neodesha, which American Zinc intended to fire up in order to take advantage of wartime prices. Success was great in 1916 and 1917, as the firm reported net profits of $9.3 million and $1.5 million. Over the next 28 years, profits reached only

$1 million in 1929, losses were reported in five years, and profits were less than $500,000 in 13 years.[34]

In the meantime, a major new firm entered the field. Eagle White Lead Company merged with Picher Lead Company in 1915 to form Eagle-Picher Company. The new firm combined mining and smelting at plants in Missouri, Illinois, and Galena, Kansas, with the manufacture of lead and zinc derivatives for use in the chemical, construction, and storage-battery industries, functions carried on at plants in Cincinnati and Newark, New Jersey. Eagle-Picher represented the last permanent addition to zinc and lead smelting in Kansas.[35]

In smelting, corporations that were largely individual enterprises gave way to multi-state and institutionalized concerns. The institutional enterprises presided over the demise of the industry after World War I. The ownership of glass firms remained, by and large, in the hands of individuals or closely-knit groups, although assuming corporate form. Cement was highly institutionalized from the beginning. Brick and tile progressed from noncorporate individual and family units to corporations marked by home-ownership and management and then, by means of various forms of combination, to more institutionalized organizations.

Residents of the region were less involved in the cement industry as investors or managers than in clay products, glass, or zinc, and in the latter the role of local individuals and capital was soon replaced by non-Kansas equivalents. There was nothing new or surprising in this since it conformed to national patterns and is explicable in terms of the economic requirements of each industry.

Clay and glass demanded a relatively small capital investment compared to zinc and cement. The manufacturing process for brick and tile was simple and the market localized enough to tempt men with little or no experience to enter the field. In glassmaking, the equipment was sufficiently simple that the movement of highly skilled workers and entire plants to Kansas was possible. Glass workers became Kansans, providing the skills and part of the capital necessary to establish new plants while the success of the first enterprises attracted other Kansans into the industry.

From a socio-economic viewpoint, the glass industry may have been more valuable to the region than its short tenure and lower VMP imply. Its workers were more highly skilled and more highly paid. Even excluding the cooperative firms, worker involvement in the firms as investors and managers was as common in glass as it was uncommon in the other industries. Coffeyville claimed a large number of glass workers as residents, and this may very well have contributed to the city's rapid

and successful adjustment to the sudden disappearance of its major industry.

Be that as it may—and it is only a subjective impression—zinc and cement did account for 78 percent of the four-industry VMP in 1910 (Fig. 5). During the ten years 1904-1914 zinc contributed 62 percent of total VMP, cement, 19 percent, clay products, 11 percent, and glass, 8 percent. The objective conditions, fluctuating and unpredictable, internally and externally generated, within which goods were produced and marketed, must now be dealt with.

VI
Notes

1. For detailed analysis see Hicks, *Populist Revolt* and its sequel, Theodore Saloutos and Hicks, *Twentieth Century Populism. Agricultural Discontent in the Middle West, 1900-1939* (Lincoln, Nebraska, n.d., originally published, 1951) and for more general analysis Samuel P. Hayes, *The Response to Industrialism, 1885-1914* (Chicago, 1957) and Norman Pollack, *The Populist Response to Industrial America. Midwest Populist Thought* (New York, 1966).

2. For one phase see Francis W. Schruben "The Kansas State Refinery Law of 1905," *The Kansas Historical Quarterly,* XXXIV (Autumn, 1968), 299-324.

3. See Richard Hofstadter, *The Age of Reform. From Bryan to F.D.R.* (New York, 1960), Chapter 11, for the best statement of Populism as retrospective and reactionary in its emphases. See also Alan G. Bogue, "To Shape a Western State: Some Dimensions of the Kansas Search for Capital, 1865-1893," in *The Frontier Challenge. Essays in honor of George L. Anderson,* edited by John G. Clark (Lawrence, Kansas, 1970) for suggestions relative to the local institutional elements of agrarian reform.

4. Hays, *Response to Industrialism,* 129.

5. *Coffeyville Daily Journal,* June 9, October 4, 1902; *South Kansas Tribune,* February 4, 1903; Kansas Corporation Charters, vol. 65: 117; Charter of the Pioneer Flint Glass Company, 24 November 1903. Bankruptcy File. Premium Glass Company. Case # 534. Federal District Court. Fort Scott, Kansas. Premium bought out Pioneer in 1907.

6. Supplement to the *Coffeyville Daily Journal,* 30; Kansas Corporation Charters. Vol. 61:257, Vol. 65:66, Vol. 69:99.

7. *Ibid.,* Vol. 61:14, Vol. 63:290, Vol. 66:195. *Coffeyville Daily Journal,* January 31, 1902, March 17, April 3, May 15, 1903; *Caney Chronicle,* January 13, 1905.

8. *Ibid.,* February 24, 1905.

9. Kansas Corporation Charters. Vol. 66:233; *Cherryvale Weekly Republican,* September 2, 23, 1904.

10. John Bertenshaw to [Judge] C. E. Cory June 14, 1910, Independence, Kansas. Bankruptcy File. Premium Glass Company.

11. Alfred D. Chandler, Jr., "The Structure of American Industry in the Twentieth Century: A Historical Overview," *Business History Review,* XLIII (Autumn, 1969), 258-261.

12. *Coffeyville Daily Journal,* November 23, December 22, 1904; Montgomery County Clippings. Vol. 4. Kansas State Historical Society, Topeka. The Kansas Glass Company was absorbed by National Sash and Door in 1904 and moved to Independence in 1916 by which time it was a finishing rather than primary producing plant. Kansas Corporation Charters. Vol. 61:257; *Coffeyville Weekly Journal,* February 9, 1912.

13. Kansas Bureau of Labor and Industry, *AR* (1905), 29-31.

14. The five firms include: Ludowici-Celadon Company which acquired Coffeyville's Western Roofing Tile Company plant in 1909; W. S. Dickey Clay Manufacturing Company, operating in Pittsburg since at least 1915; Dennision Clay Company incorporated in Kansas in 1912, and located in Coffeyville; United Brick and Tile Company, Coffeyville 1926; and United Clay Products, Coffeyville, 1926.

15. Chandler, "Structure of American Industry."

16. For the Coffeyville Vitrified Brick and Tile Company: Kansas Corporation Charters. Vol. 50:250, Vol. 57:286, Vol. A2: 500, Vol. A3: 12,89, 153, Vol. 14B: 266, *Chanute Daily Tribune,* December 7, 20, 1899; *Coffeyville Daily Journal,* May 11, 1901; *Coffeyville Journal,* January 24, 1902; *South Kansas Tribune,* February 11, 1903; *Out There at Chanute,* np; Drake, *Montgomery County,* 107; *Atlas and Plat Book of Montgomery County, Kansas . . .* (Independence, Kansas, 1916), 14, 36-37; Assessment Roll. 1922-1926. Independence City, Montgomery County. Montgomery County Court House. Independence, Kansas; Real Estate Assessment Roll, Chanute, Neosho County, 1922-1925. Neosho County Court House. Erie, Kansas.

17. Coffeyville Shale Products was incorporated in 1902 as Coffeyville Shale Brick and Roofing Tile Company, reorganized in 1904 as Coffeyville Shale Brick Company, and assumed its final form in 1914. Kansas Corporation Charters. Vol. 61:398, Vol. A3: 463, Vol. A9: 277, Vol. A37: 132.

18. *Ibid.,* Vol. 93:278, Vol. 113A:77, Vol. 115A:160; Real Estate Assessment. 1926-1929. Coffeyville. Montgomery County. Montgomery County Courthouse. Independence, Kansas; Real Estate Assessment Rolls. 1926-1929. Cherokee, Parker Townships. Cherokee County. Cherokee County Courthouse. Columbus, Kansas.

19. Consult the card index at K.S.H.S. to the Kansas Corporation Charters for details on the Humboldt and Fredonia firms.

20. Duncan, *Allen and Woodson Counties; Twentieth Century History of Crawford County,* 41; *Kansas City Star,* January 11, 1910 in Ash Grove Cement Company Scrapbook.

21. USGS. *Mineral Resources, 1905,* 923; *Rock Products,* May, 1969, 49, 53.

22. *Securities of the Ash Grove Lime and Portland Cement Company* (Kansas City, Mo., 1907); *Prospectus of the Great Western Portland Cement Company* (Kansas City, Mo., 1908).

23. Robert Sunderland, *"Seventy Five Years of Continuous Growth . . . A History of Ash Grove Progress"* (January, 1958). Ash Grove Cement Company Library. Kansas City, Mo.

24. [E. W. Stanfield], *The Cement Bubble—Has it Burst?* (Kansas City, Mo., 1916), np; Dilley, *Cement Industry in Kansas,* 30-41, 44-45; *Iola Register,* November 4, 1913 in Iola Portland Cement Company Scrapbook.

25. Of the 59 bondholders, 10 Kansans held $17,000, 11 Missourians, $56,000, and 38 Iowans $200,000.

26. Testimony before and reports of the Special Master in re Altoona Portland Cement Company. Bankrupt, June 1913-May 1915. Bankruptcy File. Altoona Portland Cement Company. Cases #663 and #800.

27. Kansas Corporation Charters. Vol. 71:292, Vol. A4:466, Vol. A8:551.

28. *Ibid.,* Vol. 86:35; *South Kansas Tribune,* April 20, 1910; *Kansas City Star,* January 11, 1910 and *The Cement Record,* October, 1910 in Ash Grove Cement Company Scrapbook; *Iola Register,* November 12, 1913 and January 20, 1914 in Iola Portland Cement Company Scrapbook; Kansas Bureau of Labor and Industry, *AR* (1917-1920), 60.

29. Notes in Iola Portland Cement Company Scrapbook; Sunderland, "A History of Ash Grove Progress"; *Rock Products,* May, 1969.

30. *Out There at Chanute;* Ingalls, *Production of Zinc,* 20-21; USGS, *Mineral Resources,* 1910, I, 2, 85; *Polks' Kansas Gazetteer,* Vol. 8 (1894), Vol. 10 (1904), Vol. 11 (1908).

31. Ingalls, *Production of Zinc,* 20-21; Norris, *AZn,* 23, 29; Assessment Roll. 1908. Cedar Township, Wilson County.

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33. USGS, *Mineral Resources,* 1915, I, 885-886; "Underground Resources of Kansas: *SGSK Bulletin 13,* 55, 60.

34. *Caney Chronicle,* June 2, 1911; USGS, *Mineral Resources, 1915,* I, 954; Norris, *AZn,* 38-44, 67, 73, 121.

35. Eagle-Picher, approached in 1929 and 1937 by American Zinc to explore merger possibilities, became a highly diversified manufactures (producer goods) manufacturer receiving only 25 percent of its revenues from lead and zinc production. "Eagle-Picher Company," *Management Audit,* Special Audit No. 158, vol. 8 no. 1 (January, 1959) and "Eagle-Picher, Industries, Inc., Second Management Audit," *Ibid.,* Vol. 10 no. 2 (1968); USGS, *Mineral Resources, 1915,* I, 194; Norris, *AZn,* 99, 136.

VII

Labor and Labor Costs in the Mineral Industries

The splendid resource endowment of southeastern Kansas and the economic activism of its towns drew the mineral industries to the region in such a rush that the 15 years of growth subsequent to 1890 effected enduring changes within the area. From a region with little nonagricultural industry save coal mining (confined largely to Crawford and Cherokee counties) and of marginal agricultural productivity, located to one side of the main line of development within the State and containing only one town of over 10,000 population, the fuel and nonfuel mineral industries fashioned a manufacturing complex and spawned industrial towns whose problems bore little relationship to the agriculturally oriented economy of the State.

Thousands of newcomers flocked into the region between 1890 and 1910 competing for jobs in smelters, glass, cement, and brick plants while other parts of Kansas lost population. While the state at large focused its attention on wheat, corn, and livestock prices, southeastern Kansas concerned itself with the condition of metal and glass markets and the building trades. If segments of the State's agrarian population joined in the condemnation of such industrial tactics as price-fixing and controlled production, manufacturers in southeastern Kansas energetically pursued such practices in a futile effort to stabilize conditions. If Kansans responded with alarm and incomprehension to the Homestead Massacre (1892), the Pullman strike (1894) led by Eugene V. Debs, or the United Mine Workers strike against the anthracite operators in 1902, they had only to glance at southeastern Kansas to learn that the State was not immune to the violence and bitterness engendered by the struggle between labor and capital.

The region learned that industrialization carried with it problems as well as opportunities and that the road to progress and prosperity was filled with chuckholes, detours, and washed-out bridges. Industry, too, learned that initial success frequently led to excessive emulation and thus overproduction, that cheap resources and fuel provided no impenetrable defense against quakes in the national economy, and that insufferable working conditions or arbitrary acts of injustice against employees occasioned the same responses in Kansas as elsewhere. Industry and the regional community discovered together that industrial beginnings were no guarantee of permanence and that the region was neither the location of, nor industry the path to, utopia. But in the excitement of the moment, it was perhaps too much to expect Chanute to recognize that its growth possibilities were finite or for the promoters

of Gutherie Mountain Portland Cement Company to analyze dispassionately the potential marketability of their product.

While natural gas supplies were a crucial factor in attracting industry to the region it was not *the* determinant in clay products, cement, or smelting, and it was not *the* determinant in the ultimate success or failure of those industries, or even of the glass industry. Clay products plants and smelters were established prior to the exploitation of gas as a fuel and, as in the manufacture of cement, required large quantities of readily accessible raw materials. Moreover, remnants of all three industries survived the exhaustion of the gas fields. Only glass manufacturing had disappeared entirely before 1920 and the emigration of this industry is as much attributable to labor costs and technological developments as to the depletion of gas.

Labor requirements varied among the four industries from the skilled blowers and flateners in the glass industry to the unskilled laborers preponderant in the brick and tile plants. Each of the four industries, of course, had their corps of highly trained operatives, but the proportion of these to the total labor force was considerably higher in glass than in the other three industries, and higher in cement and zinc than in brick and tile industries. Tables 10 and 16 summarize data relative to labor costs in the four mineral industries.

In the glass and brick and tile industries, at opposite ends of the spectrum in terms of skilled labor requirements, labor costs (Table 10) frequently exceeded 50 percent of total production costs in the former and were generally over 40 percent in the latter. Labor costs in cement ran about 35 percent over all and between 15 and 20 percent in smelting. These conditions are also reflected in the data presented in Table 16 where it can be seen that the VMP per employee in zinc smelting was three to four times higher than in glass and clay products. Zinc was the only mineral industry that even approximated the low average labor costs achieved by the State's total industrial complex.

TABLE 16.—Value of manufactured product (VMP) per employee in four mineral industries in Kansas, 1905 to 1930 (in dollars).

Industry	1905	1907	1909	1914	1920	1930
Glass	1028	812	1421	2003	3840	.....
Brick and tile	1226	938	1284	1606	3000	2974
Cement	2067	1841	2185	3155	6181	9559
Zinc	4474	3719	5962	6484	8241	12757
All Kansas	6396	4473	7352	7834	14966	16710

SOURCE: Kansas Bureau of Labor and Industry, *AR*, 1905, 1907, 1909, 1914; Federal Census. Manufacturing. 1920 and 1930.

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Another measure of comparison is available at the national level between glass and clay and meat packing and milling, the latter two being the largest industries in Kansas. In 1914, the ratio of wages to VMP in meat packing was 3.76 percent, in milling 2.8, in clay 41.35, and in glass 39.53 percent. This meant, for example, that while milling's VMP was over six times larger than that for glass, total wages in glass were twice those in milling.[1]

Labor costs were relatively high in glass and clay products for reasons basically explicable in terms of skilled labor inputs in the manufacturing process, the technology involved, and the volume of output possible from the existing combination of labor and technology. Other factors included the degree of labor organization attained in both industries and the location of and the competition encountered in the markets in which brick and glass plants sold their products.

Skilled workers in the glass industry were among the highest paid employees in the nation. Glass blowers received the highest hourly wages and flatteners and moldmakers were not far behind. Pressers and gatherers received wages well above the 22 cents per hour that the Kansas Bureau of Labor and Industry cited as the national average in 1914. In a typical Kansas glass plant employing 100 men, 24 were blowers, 24 gatherers or pressers depending upon the product, and 6 were flatteners. Forty to 50 percent of the total compliment, then, were skilled workers drawing above-average wages.[2] A much larger percentage of glass workers fell into the high wage brackets than in the other three groups (Table 17). At the same time, the nature of the unskilled labor required—cleaning, polishing, packing—allowed the glass industry to employ women and this accounts for the relatively high percentage of employees in the low wage bracket.[3]

Most Kansas factories manufactured window glass or containers. Factories in the older centers of the industry on the western slope of the Appalachians were in the process of converting from hand to machine production but the advanced technology did not make rapid progress in Kansas. All of the window glass in Kansas was hand-blown even after the introduction in 1903 of the Lubbers Cylinder window-glass machine, which dispensed entirely with the costly services of blowers and gatherers. The cooperative companies, owned principally by the blowers and gatherers, had little reason to voluntarily cast themselves into technological unemployment. The other window-glass companies did not control sufficient capital to finance extensive retooling and experienced little motivation to do so as long as they could compete in western markets. Well-organized unions in Kansas plants also resisted mechanization.[4]

TABLE 17.—Wage earners in various wage brackets in four mineral industries in Kansas, 1908, 1911, and 1913 (in percent), and total for Kansas for 1913.

Industry	1908 Dollars per week				1911 Dollars per week				1913 Dollars per week			
	0-9	10-15	16-20	21+	0-9	10-15	16-20	21+	0-9	10-15	16-20	21+
Glass	31	29	19	21	8	31	18	43	24	33	8	35
Brick and tile	51	40	7	2	25	55	14	6	23	60	12	5
Cement	15	58	21	6	8	49	32	11	15	48	28	9
Zinc	16	53	25	6	4	62	27	7	1	65	28	7
All Kansas	....	....	....	....	....	....	....	....	20	44	21	15

SOURCE: Kansas Bureau of Labor and Industry, *AR* (1908, 1911, 1913, 1914).

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The new technology was received more readily by the larger firms within the container branch of the glass industry. Through the 1890's bottlemaking remained a highly skilled manual art, but machine production gained ground just before the turn of the century. A fully automatic machine that performed the basic molding operation was introduced in 1903. It required only one operator. Improved techniques were introduced thereafter until by 1920 almost any type of bottle could be made better and more cheaply by machine than by hand. While, in 1905, by far the larger number of bottles were produced by hand, in 1917, 50 percent were machine-made. As in the manufacture of window glass, mechanization caused grave disruptions within the hiearchy of glass container workers.[5]

Marion Fruit Jar Company (owned by Ball Brothers) and Mason Fruit Jar Company, the two largest container plants in the State, both introduced automatic machinery while the Premium Glass Company and the Caney Glass Company installed semiautomatic machinery. Mason Fruit Jar purchased six machines that formed the molten glass into jars. Marion Fruit Jar followed suit and in addition installed equipment to make fruit-jar liners. Premium Glass owned the patent for a glass top, which was much cheaper to produce than the metal lid normally used, and developed a semiautomatic machine to manufacture it. So far as is known, these were the only Kansas glass companies that adopted the new technology.[6]

Advancing technology in the glass industry had a marked effect on the Kansas component. Machine production forced hand manufacturers to search for ways to reduce production costs and the only factor in production susceptible to reduction were wages. Wage reductions were not easily achieved because of strong national unions and their Kansas affiliates. Window-glass workers belonged to the National Window Glass Workers Union, formerly the Amalgamated Window Glass Workers of America, while the American Flint Glass Workers Union represented most employees in pressed and blown glassware, and the Glass Bottle Blower's Association included in its ranks both skilled and unskilled container workers. During the pre-machine period, the skilled blowers and gatherers controlled the organizations and evinced little concern over the working conditions of their less skilled colleagues. But the advent of machine production reduced the level of skill necessary and gradually equalized the economic power of groups within the various unions.[7]

The glass-workers unions, especially in window glass, exercised much control over production schedules. Limits of production were set per hour and the number of boxes produced during a four-week period was

prescribed. The apprenticeship system was rigidly controlled and open exclusively to the male kin of journeymen. Annual wage agreements were negotiated between groups of regional manufacturers, often affiliated with industry-wide associations, and representatives of the local unions.[8] Machine technology and resultant price wars between hand and machine manufacturers broke down the rigid union system and also forced employees to accept either wage reductions or shortened production seasons.

In 1907 and 1908, machine manufacturers touched off a price war by reducing prices below the cost of hand production. Most Kansas unions agreed to a reduction in wages in order to remain competitive and operative. Some splinter groups, however, refusing to accept wage cuts, demanded wage increases instead, and the workers at the Caney plant struck when the owner refused to negotiate the issue. Several locals contributed strike funds to aid the dissidents at Caney while the strike spread to Coffeyville. The dispute was settled when the owners of several Coffeyville plants acceded to union demands. The manufacturers, however, were certain that profits were not possible at the wage levels agreed upon and were proven correct in their analysis, as many plants curtailed production after a short run. By 1910 and 1911, the workers were forced to accept wage cuts as the only means of assuring the operation of the plants. When conditions improved in 1912, manufacturers in Kansas readily agreed to increase wages to pre-1910 levels. By this time, however, many Kansas plants either had been abandoned or removed to other locations.[9]

Glassworkers, or at least the elite among them, did exert considerable leverage on policy decisions within the industry. It was necessary to obtain the approval of blowers and gatherers before the industry could consider locating in Kansas. Once general approval was forthcoming, hastened by diminishing profits and employment opportunities in the East and in spite of prohibition, groups of touring glassworkers visited the various Kansas towns, negotiated along with the owners with community representatives, and participated in the decision as to final location. After the plant was established, the skilled workers participated in production decisions and, of course, wage settlements, on a par with the owners. The highly skilled among the workers looked after their own interests and, in at least one instance, forced the less skilled snappers to strike over a threatened wage cut. At the Caney plant, blowers hired the snappers, who were paid per box of product and whose salaries were therefore dependent upon the output of the blowers. The snappers demanded a minimum weekly wage; the blowers, realizing that snapping was a task easily learned in a few days, refused and forced

a strike, with the eventual replacement of the strikers by new workers. So much for union solidarity within the Kansas glass industry.[10]

Since most glass companies in Kansas were ventures of low capitalization and since the most influential workers were antagonistic to the introduction of machine technology, it was inevitable that the industry eventually left Kansas. The Kansas complex dominated the market west of the Missouri River as long as the eastern branch remained a hand industry. But with machinery reducing the cost of production by eliminating the need for highly skilled and paid workers, eastern manufacturers were able to penetrate western markets and undersell the Kansas competitors. Kansas manufacturers were compelled to seek locations which duplicated as closely as possible the early conditions in Kansas. Some found an hospitable environment in the gas fields of Oklahoma and Texas.

Glass was unique among the industries located in Kansas in that it had to import the major elements of its labor supply. Other industries were able to draw from the general labor pool, which was adequate to meet the specific purposes of each industry. As industries sprang up in the region, jobseekers from within and without the State moved into the area. Since most of the jobs in clay products, cement, and smelting did not require extensive training and experience, an increasing local labor supply was well-suited to the labor requirements of those industries during the period of expansion. The average number of employees in the mineral industries in 1900 was 2,581, or 6 percent of the State's manufacturing labor force. By 1906, total employment in the four industries reached 9,187, or 17 percent of the state total. From 1907 through 1910, employment in the mineral industries averaged between 6,500 and 7,500, 10 to 15 percent of the state force. Thereafter, employment declined in the four industries, notably in glass and smelting, to somewhat over 3,000 workers and less than 10 percent of the labor force in Kansas.[11]

The clay products industry, requiring little skill except among the supervisory personnel, recruited entirely from the local or regional pool. Brick and tile plants were scattered throughout the region in fairly large numbers. It is probable that men drifted into and out of the production phase as conditions warranted and that there was some trading of labor between the pits of brick plants and cement plants. Brickyards were occasionally compelled to cease production during harvest time as workers were needed for harvesting, in some cases in their own fields.[12]

The low level of skill required in brick plants, the smaller number of employees per establishment vis-a-vis glass, cement, and zinc (see Table 18), and the availability of local labor precluded the evolution of

strong unions in the industry. Nearly 53 percent of brickyard employees, in 1910, worked in establishments employing fewer than 50 men compared to 17 percent in glass, four percent in zinc, and two percent in cement. In the face of these difficulties, a local of the International Brick, Tile, and Terracotta Workers Union was organized in Coffeyville by 1901. Efforts were made to organize other locals in the region, and, failing in this, organizers worked on the plants of the Coffeyville Vitrified Brick and Tile Company. While several small strikes resulted from demands for wage increases by the union, the major issue seems to have been the all-too-frequent production stoppages and lay-offs caused by machinery breaking down or the installation of new machinery.[13]

Wages for clay products employees did improve both nationally and in Kansas between 1900 and the 1920's. Between 1908 and 1913 the percentage of employees in the lowest bracket (shown in Table 17) declined while increasing in the two middle brackets. Wages in the region were on a par with those reported nationally. In 1900, annual wages averaged $350 in Kansas and $380 nationally. Taken in the above order, average annual wages were $470 and $450 in 1904; $500 and $500 in 1909; $590 and $570 in 1914; and during the decade of the 1920's about $1,100 and $1,260.[14]

Brick and tile plants, like cement, owned the natural resources from which the finished product was fashioned. Most of the labor input was expended in digging or blasting the raw materials from the earth, moving these heavy materials to the plant, and, following the firing, moving the finished product to the yards, preparatory to shipment. Conveyance systems in both industries were critical to the over-all per-

TABLE 18.—Labor force of plants in four mineral industries in Kansas in 1910.

Industry	Number of employees					
	1-20	21-50	51-100	101-250	251-500	501-1000
Glass						
Number of plants	4	7	7	5	.....	.....
Average number workers	11	240	532	652	.....	.....
Brick and tile						
Number of plants	18	25	12	.....	.....	.....
Average number workers	107	861	851	.....	.....	.....
Cement						
Number of plants	1	1	3	3	3	1
Average number workers	15	26	222	511	819	550
Zinc						
Number of plants	.....	2	2	7	1	.....
Average number workers	.....	76	160	1290	295	.....

SOURCE: 13 Census. Vol. 2, Population. 1910.

formance of the plant. The capacity of the machines that ground, crushed, or mixed the raw materials or the capacity of the kilns and ovens was an academic question if sufficient materials could not be delivered to operate them at full capacity. And the conveyance system itself, if automatic, was only efficient if mechanics, machinists, or millrights kept it in a good state of repair. It was at this occupational level that both cement and brick required the services of skilled labor.

Performance in cement seems to have been of a much higher order than in brick and tile. Machinery in the brickyards broke down frequently, but whether this was due to engineering or maintenance failures is unknown. Nor did the brickyards, except for Coffeyville Vitrified, adopt the fully mechanized conveyance systems available at the time. Most of the heavy materials were dug by hand, shoveled into horse-drawn wagons, unloaded manually, and again handled manually in the storage and shipment stages. A disproportionately large number of men was required to perform these tasks given the low market value of the final product, a fact attested to in Tables 10 and 16.

The cement industry was considerably more progressive in utilizing automation than either the glass or clay products industries. Although the most striking advances were made in the post-World War I years, productivity per worker in the solidly established factories rose at a quicker pace than was reflected in the industry-wide figures used in Tables 10 and 16. This meant, of course, diminishing employment opportunities in cement because of the decline in the number of plants between 1910 and 1930 and the replacement of men by machines. Employment in cement dropped from a peak of 2,361 in 1910 to 1,176 in 1930 while VMP rose from $5 million to $11.2 million.[15]

Cement companies were among the most heavily capitalized enterprises in Kansas, and in firms such as the United Kansas, Ash Grove, Monarch, and Iola cement companies large portions of the original investment were committed to internal delivery systems and the maintenance and repair of machinery. In the typical cement plant, the raw materials were handled no fewer than a dozen different times before portland cement was produced. Conveyance systems operated between the quarry and the crushing, grinding, and pulverizing equipment and each intermediate step thereafter. Storage facilities were also developed at intermediate points in the production process while a great advance was achieved with the introduction of the rotary kiln coupled with automatic feed and discharge.[16]

All along the production line, beginning with the substitution of machines for hand quarrying, mechanization destroyed jobs. Packaging, for example, absorbed much labor, and the cloth sacks used were so

expensive that much time was consumed by producer and consumer in returning sacks to the plant, sorting them, and repairing the damaged ones for further use. Substantial savings were accomplished by the substitution of disposable paper sacks and the introduction of automatic bagging machines. One man, in the 1920's, could fill 500 sacks an hour by machine whereas it formerly required a gang of four men working ten hours to fill 1,600 sacks. Further reductions in packaging costs were achieved as bulk shipments became common during the 1930's.[17] When Iola Portland started production in 1899-1900, 500 men were required to produce 3,000 barrels of cement daily. By the time Lehigh Portland Cement Company obtained the plant in 1917, 300 men produced 4,000 barrels of cement daily. A similar increase in productivity per worker occurred between the time the Western States Portland Cement Company started production in 1904-1905 and its absorption, in 1923, by the Atlas Portland Cement Company.

Output per worker rose rapidly in smelting after 1908, but little is known about the reasons for the increase in output in the three Kansas smelters operative during the 1920's.[18] Most of the zinc companies pulled out of Kansas before 1920, and there is no evidence that those remaining improved the efficiency of their production processes. Increases in VMP per worker might be accounted for by an upward movement in the price of spelter in the 1920's compared with the pre-World War I price, if the advance was not negated by an equivalent increase in wages. Spelter prices were higher in the 1920's, averaging 6.6 cents per pound for the eight years 1922-1929, with a low of 5.7 cents and a high of 7.7 cents. For the eight years 1907-1914, prices averaged 5.6 cents per pound, with a low of 4.6 cents and a high of 6.9 cents.[19]

Average annual wages per worker, on the other hand, rose from $640 in the peak production and employment year of 1906, to $780 in 1914 for a force less than one-third that of 1906, to $1,230 in 1920, and $1,410 in 1930. The labor force in the latter year was one-third smaller than that of 1914.[20] Kansas smelting experienced increases in both prices and wages in the 1920's compared with the pre-war years, while the volume of production in Kansas remained fairly stable. Rising prices probably explain the marked advance of VMP per employee more satisfactorily than an increased efficiency in production.

Average annual wages in Kansas were consistently higher in smelting than in cement. Smeltermens' wages were 5 percent higher than cement workers' in 1906; 10 percent in 1910; 14 percent in 1914, and then fell to an insignificant advantage of 1 percent in 1920 and 5 percent in 1930.[21] The increasing differential of the pre-war period may be partly attributed to the greater union activity and more frequent strikes in

smelting than in cement. The management of cement and zinc firms both resisted union organization. Cement companies, however, were generally more successful in obstructing the organization of their workers. Although the AFL affiliate, American Brotherhood of Cement Workers, maintained offices in the region, it failed to enlist more than a small fraction of the cement workers, and the Kansas branch of the industry remained largely unorganized through the 1920's.

The few known instances of labor strife in the cement industry in Kansas did not result from wage disputes but over the attempt of management to hire foreigners or Negroes. At the Iola Portland Cement plant, native American workers forced 33 newly employed Italian workers out of town in 1900. This firm also constructed—as did the Edgar Zinc Company and the Great Western Cement Company—a company town, called Bassett, on lots contiguous to the plant. Black employees lived in a segregated section, attended separate schools, and received the seasonal bestowals of management gratitude for their services in all-black Thanksgiving and Christmas parties. Intermittent outbreaks of racial strife shattered the tranquility of the community, in one case caused by a black housewife doing her laundry above a section of the stream reserved for whites.[22]

Racial violence was not an uncommon occurrence in southeastern Kansas before World War I, and it was frequently connected with labor troubles in the coal, lead, and zinc-mining and the smelting industries. Coal companies resorted to the importation of blacks to break strikes and the strikers often reacted violently. In 1899, strikes at the Kansas and Texas Coal Company mines at Weir City and the Central Coal and Coke Company mines at Scammon resulted in company efforts to bring in Alabama Negroes to operate the mines. Trainloads of blacks were brought into the State protected by armed guards while the strikers destroyed railroad bridges and other property. Smeltermen at Iola struck Prime Western in 1906 and 1907 over the company's policy of hiring Mexicans as a hedge against work stoppages and small bands of smeltermen attacked the homes of the Mexicans.[23]

For the most part, smeltermen went on strike over wages or related issues. Edgar Zinc Company was struck in 1902, 1905, and 1908, and Lanyon Zinc Company, Cockerill Zinc Company, Prime Western Spelter Company, and American Zinc, Lead, and Smelting Company were similarly plagued with work stoppages. In most cases, management attempted to use scabs to maintain production and resorted to court injunctions to prevent strikers or unions from preventing men from working. Wage increases were gained in many cases, but union recognition was not. Other labor grievances were redressed after workers

resorted to the strike weapon. Prime Western went out in 1909 to protest the company's practice of charging 10 percent interest on money advanced to workers between regular paydays and over their refusal to restore wages to pre-Panic-of-1908 levels. The workers won both points with the aid of mediators from the Kansas Bureau of Labor and Industry. Smeltermen at Edgar Zinc succeeded in 1905 in reducing the power of foremen, some of whom were selling promotions.[24]

An important confrontation occurred in 1911 between the American Zinc, Lead, and Smelting Company and workers at the firm's Caney and Dearing smelters. At issue in the strike initiated at Caney was the right to organize, to which management refused to accede. Some of the strikers were members of the Western Federation of Miners; others belonged to the Caney Smeltermen's Union; others were unorganized. Representatives from the state AFL headquarters cooperated with the strikers, who also sought unsuccessfully to enlist the aid of the Caney City Council. American Zinc sought and obtained an injunction against the strikers and their representatives, which severely limited the actions that the strikers could take. When violence occurred as a result of the importation of scabs, American Zinc appealed to the State for aid and Kansas National Guardsmen appeared at the smelter in Caney and then at Dearing when its workers walked off the job.

At the same time, the AFL instituted a suit under the Kansas Coercion Act charging management with discharging workers because of union membership prior to the strike. The act provided penalties against employers who coerced or made unreasonable demands upon workers, such as agreeing not to join a union. The court held the act unconstitutional. Strikers drifted back to their jobs at the smelters or sought other employment, and the struggle ended with the "status quo antibellum" restored.[25]

Average annual wages increased by over 200 percent in the cement industry between 1900 and 1914 and by over 60 percent in each of the other three. The dollar differentials in wages separating the industries in 1900 were little changed in 1914, reflecting the dissimilar needs of each industry for skilled workers and, in glass, the dominance of hand manufacture. Wages moved upward very rapidly between 1914 and 1920, leveling off during the 1920's at figures double those in 1914 in each of the industries excepting glass, which was no longer located in Kansas.

What this meant in terms of the standard of living in southeastern Kansas is extremely difficult to determine. Indexes relevant to the national economy indicate an increase in the cost-of-living of two to three times from 1900 to 1920, with the greatest inflation occurring

during and immediately after World War I.[26] In the region, isolated bits of information hint at a roughly comparable rise in living costs. Advertisements in newspapers document an increase in rents of 70 to 100 percent in Coffeyville and Independence. In 1904, the Kansas Bureau of Labor and Industry reported the cost-of-living in Crawford and Cherokee counties at $44 per month or $528 yearly.[27] Assuming that the percentages in Table 17 for 1908 are roughly applicable to 1904, it is apparent that less than half of the employees in the mineral industries were earning this sum. Moreover, in 1904 the average annual wage in clay products was $500; in cement $560; in glass, $620; and in zinc, $630. Few workers lived "high on the hog" before World War I, and wage increases gained during and after the war were probably wiped out by inflation.[28]

VMP per worker rose at the same pace as earnings in smelting (much reduced in the number of units), a faster rate in cement, and a slower rate in clay products and glass (also reduced). Average wage scales were generally higher in Kansas than nationally while the initial advantage of low-cost fuel proved but a temporary condition. High labor costs could be absorbed if other production costs were low or if individual firms could maintain a competitive position without new investment in capital goods. As early as 1910 it was apparent that the survival of the glass industry in Kansas required conversion to a higher-priced fuel and mechanization. Instead, glassmen chose to abandon the region. The zinc industry, too, chose to emigrate, finding it more economical to locate closer to industrial consumers of metallic zinc than to remain close to ore supplies and absorb substantial increases in fuel costs. Manufacturers of clay products and cement survived by adjusting productive capacity to the demands of a more localized market buttressed by a constant minimum demand for construction materials. The cement industry improved its situation by energetically advertising new uses for its product.

There is no evidence that regional labor costs influenced in any way the decision of the smelting companies to move. The reduction of labor costs in cement manufacturing through mechanization and the discovery of major new uses for the product enabled the industry to convert to a more expensive fuel without difficulty. As for the brick industry, the needs of builders, the superior natural resources of the region, and its low value per unit of weight virtually dictated that the industry remain in the region. The magnitude of the industry would be determined by economic conditions within its market area and its ability to improve the quality of and discover new uses for its products as well as to resist replacement by competing products.

VII

Notes

1. U.S. Bureau of Foreign and Domestic Commerce, *The Glass Industry. Report on the Cost of Production of Glass in the United States (Miscellaneous Series 60)* (Washington, D.C., 1917), 244-245.

2. *Ibid.*, 246-247; Kansas Bureau of Labor and Industry, *Bulletin* (1905), 26-27, AR (1914), 29; *Caney Chronicle*, January 13, 1905.

3. Kansas Bureau of Labor and Industry, *AR* (1913), 79.

4. U.S. Bureau of Foreign and Domestic Commerce, *The Glass Industry*, 191; Davis, *American Glass Industry*, 182-188; The experience in window glass resembles that of the western wool manufacturing industry as described in Norman L. Crockett, "The Westward Movement and the Transit of American Machine Technology: The Case of Wool Manufacturing," *Nebraska Journal of Economics and Business*, 8 (Summer, 1969), 116-117.

5. Davis, *American Glass Industry*, 141-143, 206-213; Slavin, "Pressed and Blown Glassware Industry," 2-3.

6. *Coffeyville Daily Journal*, January 14, 1905; *Supplement to the Coffeyville Daily Journal*, 31; *Caney News*, November 20, 1908; Stock Circular of the Premium Glass Company. Bankruptcy File. Premium Glass Company. Case #534. Federal District Court. Fort Scott, Kansas.

7. Kansas Bureau of Labor and Industry, *AR* (1908), 33; Davis, *American Glass Industry*, 186-188, 219; Slavin, "Pressed and Blown Glassware Industry," 23.

8. Davis, *American Glass Industry*, 128, 188.

9. *Caney News*, October 2, December 18, 1908; *Caney Chronicle*, February 21, 1911; *Coffeyville Weekly Journal*, March 20, 1912.

10. *Coffeyville Daily Journal*, June 7, 1901; *Caney Chronicle*, January 6, March 31, October 6, 13, 1905.

11. Kansas Bureau of Labor and Industry, *AR* (1904-1914); *11 Census. Manufacturing: 1890. Part 1; 12 Census. Manufacturing: 1900. Vol. 8 Part 2; 14 Census. 1920. Vol. 9. Manufacturing. 1919; 15 Census. 1930. Vol. 3. Manufactures.*

12. *Coffeyville Journal*, June 10, 1910.

13. *Ibid.*, April 18, 1902; *Coffeyville Daily Journal*, June 28, July 13, 25, 26, 1901; Kansas Bureau of Labor and Industry *AR* (1905), 132.

14. Chute, *Burned-Clay Products*, Table 2, p. 5; Kansas Bureau of Labor and Industry, *AR* (1904-1914); *12 Census. Manufacturing: 1900. Vol. 8. Part 2; 14 Census. 1920. Vol. 9. Manufacturing 1919; 15 Census. 1930. Vol. 3. Manufactures.*

15. Kansas Bureau of Labor and Industry, *AR* (1910); *15 Census. 1930. Vol. 3. Manufactures.*

16. L. N. Duryea, "Handling 42,000,000 Tons of Raw Material a Year. Mechanical Conveying Methods in the Cement Industry," *Management and Administration in Manufacturing Industries*, 8 (July, 1924), 155-160; Dilley, *Cement Industry in Kansas*, 59-61; Site and Location of Iola Cement Plant.

17. Duryea, "Conveying Methods in the Cement Industry," 159; Dilley, *Cement Industry in Kansas*, 66-67, 76-77.

18. Norris, *AZn* is of little help in tracing the technological progress or the labor history of the industry partially because of its rigid chronological organization. Its usefulness is further impaired by the inadequate index which, for instance, contains no separate entry for prices or a sub-entry for prices under the category "zinc industry." Moreover, a table of contents for the tables and graphs is also lacking.

19. *Ibid.*, Figure 1, 38, Figure 2, 76.

20. Kansas Bureau of Labor and Industry, *AR* (1906, 1914); *14 Census. 1920. Vol. 9. Manufacturing 1919; 15 Census. 1930. Vol. 3. Manufactures.*

21. Same as note 20. Average annual wages for zinc and cement were $640 and $610 in 1906; $720 and $650 in 1910; $780 and $670 in 1914; $1,230 and $1,210 in 1920; and $1,410 and $1,340 in 1930.

22. Iola Portland Cement Company Record; Kansas Bureau of Labor and Industry, *AR* (1900), 264-265, *AR* (1911), 48; Dilley, *Cement Industry in Kansas*, 80.

23. Kansas Bureau of Labor and Industry, *AR* (1893), 13-15, *AR* (1906), 113-114; *Fort Scott Daily Monitor*, July 1, 18, 27, 28, 1899; Iola Portland Cement Company Record.

24. *Coffeyville Daily Journal,* June 12, 1902; Kansas Bureau of Labor and Industry, *AR* (1905), 98-99, *AR* (1906), 114, *AR* (1907), 219, *AR* (1908), 169-170, *AR* (1909), 102-103.

25. *Caney Chronicle,* August 4, 11, 25, 1911; *Caney News,* August 11, 18, September 15, December 29, 1911; Norris, *AZn,* 63-64.

26. U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1957* (Washington, D.C., 1960), Series E 158-159, p. 127.

27. Kansas Bureau of Labor and Industry, *Second Biennial Report* (1903-1904), 404-405.

28. Average annual earnings in the Kansas mineral industries were generally higher than the average for all U.S. manufacturing industries before 1915 and roughly the same during the 1920's, Bureau of the Census, *Historical Statistics,* Series D 605, p. 91, Series D 696, p. 95.

VIII

Production and Marketing in the Mineral Industries

Most of the firms engaged in mineral exploitation that were located in southeastern Kansas in the period 1890-1920 were legitimately, if occasionally too optimistically, conceived operations. Excepting the spurious promotions in the cement industry, the corporations established in the region were designed to manufacture marketable products for local, regional, and national markets, were properly capitalized, paid wages equal or superior to national averages, and were launched under the assumption that their location was fixed for the foreseeable future. None of the firms viewed themselves as migrants, entering a locale to hurriedly strip it of some resource and then, the ravage completed, moving on to repeat the same process in a virgin area.

That the consequences, in some cases, were in fact over-exploitive, resulting in scarred land and wasted resources does not warrant placing these industries in a category similar to, say, the antebellum tobacco planter in the Chesapeake Bay area or the general grain farmer in the northern transappalachian country or the coal companies in Pennsylvania, West Virginia, southeastern Kansas, and elsewhere. Within the limits of technology and the existing conventions and expectations of society, the mineral industries of southeastern Kansas were frugal—conservationist—in the use of natural resources.

Cement and the structural clay products industries, particularly the former, were aware that the use of resources must be spread out over a period sufficient to guarantee the full return of the initial investment. The long run was given serious consideration in terms of resource-use, production costs, and marketing expectations. Improvements in manufacturing techniques were introduced, new mineral lands were purchased, productive capacities were enlarged, and administrative reorganizations were launched. In a static world such wisdom would have guaranteed corporate immortality. But forces operative in the real world, forces generated within and without the region and across the seas, revolutionary forces generated by advancing technology, rampant industrialization and the attempted seizure of economic and productive power by small combinations of men, and the clash of aggressive nation-states, confused and destroyed the well-laid plans of the region's industrialists. Firms and industries designed to thrive and grow and to bring prosperity to the local community became in fact mere transitory enterprises.

Most of the cement and glass firms that located in Kansas between

1900 and 1906 as well as certain clay products firms and smelters that were already located in the region made satisfactory profits during those years. In 1907, however, VMP in all four industries declined for the first time since 1900 (Table 14). The decline was precipitous in cement and zinc and, in the former industry, presaged a time of troubles lasting, with only intermittent relief, through 1915-1916.

Overproduction of cement and zinc in Kansas coincided with the so-called "Banker's Panic" of 1907. This forced the prices of both products to lower levels than either circumstance would have done individually. In cement, for instance, excessive supply would have led to lower prices but not as low as they actually fell when the Panic and the sudden scarcity of credit compelled the cessation of many construction projects. Iola Portland Cement Company officials complained that prices of cement were below the mill cost of production, in some cases dropping as low as 60 cents per barrel in 1907. Average prices in Kansas did not rise to $1 per barrel until 1916.[1] At the same time spelter prices slumped, declining more rapidly than ore prices, thus narrowing the margin of profit for smelters. American Zinc, Lead, and Smelting ordered the closing of all of its mining operations and ran its smelters at half their capacity.[2]

Prices, after 1908, remained more satisfactory in zinc than in cement for the remainder of the pre-War period. In cement, overproduction, the Panic, and subsequent depressed conditions forced many of the weaker firms out of business and most of the stronger firms into temporary insolvency. While the *Prospectus of the Great Western Portland Cement Company* (1908), a stock circular, maintained that cement prices remained stable even though production increased, prices did not advance to the $1.06 accepted by Iola officials as the basic cost per barrel at the mill.[3] Neither glass nor clay products were greatly affected by the Panic. Although prices for structural clay products did decline between 1907 and 1908, these were largely offset by greater production in the more expensive items in the line.[4] Fruit-jar factories were reported suffering as a result of an almost total failure of the fruit crop.[5] Hard times for the glass industry, however, were not long in coming.

By 1914, three of the four mineral industries were in grave trouble, many firms already having liquidated their operations in Kansas. Increasingly stiff competition for markets from firms both within and without the region and the clustering of numerous firms within the region, attracted by the high profits of the first arrivals, forced firms out of business and compelled survivors to search for means to stabilize the situation. All four industries, for instance, at either the local, regional, or national level, sought through the device of manufacturers' associa-

tions to stabilize prices or prescribe industry-wide marketing procedures.

The cement industry, hard-hit by price reductions in 1907-1908, enjoyed some improvement in 1911-1913 when prices approached $1 per barrel. But a sudden decline to 75 cents upset the industry in late 1913, the poor conditions lingering on into mid-1915 when prices rose to over $1 per barrel. Slashed prices in 1913 cost the Iola Portland Cement Company $1,000 daily.[6] The stockholders of the bankrupt Altoona Portland Cement Company, deploring the low prices of early 1915, saw little prospect of early improvement. Conditions were blamed on the financial stringency resulting from the World War and on ". . . over-production of cement in this territory; there being twelve plants in this field with a possible production aggregating forty to fifty percent more than the total consumption possible."[7] At the same time, the trustees of the bankrupt United Kansas Portland Cement Company shelved plans to reopen any of the plants due to the increased cost of money resulting from the European conflict. The market value of the property depreciated rapidly in 1914 while the estimated cost of renovation doubled.[8]

By 1916, with six plants operating in the region, demand and prices for cement had much improved and continued to do so through 1920 and 1921 when prices reached $2.08 and $1.99 respectively. Prices then gradually declined through the 1920's reaching $1.67 in 1925 and $1.47 in 1930. Production during the five years 1926-1930 averaged 6.3 million barrels compared with 3.6 million for the five years, 1916-1920[9] (see also Table 8 and Fig. 14).

Kansas cement found markets throughout the U.S. and occasionally abroad. But shipments to both coasts and the eastern Gulf states were minor and the largest markets were midwestern. Kansas itself consumed over 50 percent of recorded shipments from mills between 1917 and 1922 and no less than 34 percent from 1923 to 1930. In the pre-World War I period, consumption in Kansas averaged about 45 percent of shipments. The second largest market was the Kansas City metropolitan area and Missouri, while additional markets were found in Nebraska, Colorado, Oklahoma, Arkansas, and Texas.[10]

In the early years of the cement era in Kansas, the manufacturers obtained favorable shipping arrangements from the railroads. Both Iola Portland and Great Western were happy with the tariff schedules obtained. Freight rates, however, apparently increased by 1911 and 1912, resulting in the filing of several cases by Kansas cement companies against the railroads. Kansas manufacturers charged that producers east of the Missouri enjoyed more favorable rates to the eastern seaboard and also more favorable rates to western markets. Since there normally was little variation in the price of cement within Kansas and contiguous

states, the matter of freight rates assumed critical importance. Generally, mills distant from a particular market bid for jobs at prices equal to those producers nearer to the market, presumably absorbing a higher freight rate in order to remain competitive. Kansas manufacturers complained that cement producers farther away from such an important consuming area as Kansas City paid less per ton-mile than local producers, thus permitting distant manufacturers to penetrate the market. The validity of the charge is not known, but it does appear that freight rates for Kansas cement advanced from about 10 percent of the factory price to about 20 percent between 1915 and the 1920's.[11]

While on the subject of freight rates, it might be noted that elements of the glass and structural clay products industries also complained of discrimination by the railroads. In 1903, the president of the Midland Glass Company claimed that rates on glass from Pittsburgh, Pennsylvania, to the Pacific coast were about the same as from Independence and that there was little difference in the rates from the East to Kansas City than from Independence to Kansas City. Brick companies occasionally complained of overcharging on shipments into Texas. On the other hand, the Kansas Glass Company held that raw material and the finished product could be shipped as cheaply into and out of Coffeyville as from any other location in the nation.[12]

Until 1912, most Kansas cement companies marketed their products individually through distributors and local building supply dealers such as lumber companies, who then sold to contractors and charged a sales commission against the manufacturer. Dealers paid cash (f.o.b. factory) and were charged the cost of cloth bags, which when returned freight prepaid and in good condition were then credited to their accounts. The Altoona Portland Cement Company marketed its product through three major distributors, all of which went bankrupt along with the Company, while in 1912 the United Kansas Portland Cement Company negotiated a comprehensive sales contract with the Kansas Cement and Material Company of Kansas City, Missouri.

In this contract, the sales agent agreed to market at least 90 percent of the total output of the manufacturers' three plants with an option to market the remaining output. Shipments were made from the factory as the agent directed, prices and terms fixed by the manufacturer being competitive with other manufacturers. The agent agreed to establish new selling outlets for cement whenever possible. For these services, Kansas Cement received 10 percent commission on the factory price if under $1.00 and 5 percent on the excess above $1.00. On a more limited scale, the Coffeyville Lumber and Supply Company performed essentially the same service for the Iola Portland Cement Company.[13]

In an effort to reduce intra-industry price wars, efforts were made by cement manufacturers to adopt uniform marketing procedures, expand markets and the uses of cement, and otherwise introduce a modicum of stability into the industry. Producers organized on both national and multi-state levels to accomplish this. Kansas manufacturers in 1912 joined the Western Portland Cement Manufacturers Association (replaced by the Norcross Audit and Statistical Bureau in 1915) in an effort to fix prices in Missouri and Kansas and perhaps other states. Kansas brought suit against cement plants within the State in 1919, alleging the formation of a trust in restraint of trade, price-fixing, and discrimination between different communities in the State in pricing. The Lehigh mill at Iola—the base-price town—set the rate in Leavenworth; the mill in Hannibal, Missouri, set the price in Kansas City. Other plants in bidding for jobs in these areas did not bid below the price fixed by the base-pricing mill.

In 1922, the Norcross operation suspended activities. This may have been the result of a series of Supreme Court decisions that allowed associations to distribute information but prohibited the use of such data to set prices. Prior to 1925, the Federal Trade Commission also discouraged trade associations. Other organizations of cement manufacturers in the Midwest followed, but price wars in 1930 and 1931 destroyed the stability achieved during the 1920's and forced two Kansas mills out of business.[14]

During the 1920's trade associations were popular devices throughout industry, the more so since the merger movement of the pre-War years continued unabated in spite of new anti-trust legislation. At various times zinc producers, glassmen, and clay products companies either regionally or nationally, or both, aligned themselves with such organizations in an effort to ameliorate the consequences of unrestrained competition. At the national level, the most successful association affecting southeastern Kansas was the Association of American Portland Cement Manufacturers (AAPCM).[15]

The AAPCM was organized in 1902 as an industry-wide promotional and educational agency, and by 1908 it represented 66 cement corporations producing 92 percent of the total output. While the major task of the Association became one of promoting old and new uses of cement, educating potential customers as to its advantages, countering the adverse propaganda of competitive products, and seeking to create the most advantageous conditions for the marketing of cement, it did address itself occasionally to the stabilization of conditions within the industry. In 1908, the Committee on Trade Conditions suggested rules—generally accepted—to introduce some uniformity in the marketing of cement.

These proposals resulted from a meeting in 1907 of sales managers who had agreed that shipments should be made only on a contract basis in order to prevent dealers from speculating in the product. And the proposals led, in 1909, to a decision to withdraw from membership in the National Builders Supply Association, which was exerting pressure on cement manufacturers to sell only through members of that association.

Most of the Association's efforts were focused on increasing public acceptance of the product and exploiting the new opportunities for its use which accompanied the appearance of the automobile. The AAPCM launched campaigns designed to increase the consumption of cement by farmers and other local consumers. Advertisements were run in farm journals; bulletins were prepared dealing with the construction of concrete silos, water troughs, barn floors, and similar structures, and the mixing and laying of cement; and promotional literature was broadcast demonstrating the superiority of cement over brick and tile and other structural materials.

These efforts paid off in Kansas. Mr. L. T. Sunderland, Executive Vice-President and General Manager of the Ash Grove Lime and Portland Cement Company, informed the AAPCM in 1910 that cement sales for one of their largest local dealers, constituting two percent of total sales in 1905, had risen to 20 percent of total sales by 1910. In 1913, the *Coffeyville Weekly Journal* reported that farmers were building their windbreak fencing of concrete, paving exercise and feed lots and barn floors, and constructing concrete cisterns.[16] Consumption in Kansas increased from about 1 million barrels annually in 1905 to 2 million in 1915. Average cement consumption for the five years, 1916-1920 approached 2 million barrels, rose to 2.4 million in 1921-1925, and leveled off at that figure for the remainder of the decade.[17]

The AAPCM was especially energetic in advocating cement streets and sidewalks, thus stimulating direct competition with brick and stone producers while tile pipe producers met stiff competition from concrete drainage pipes and culverts.[18] Southeastern Kansas, well-endowed with flagstone, brick, and cement was the scene of intense competition between producers of the three materials. Flagstone quarries in Bourbon, Crawford, Cherokee, Neosho, and Labette counties shipped stone to Parsons, Galena, Girard, other eastern Kansas towns, and into western Missouri for streets, sidewalks, and curbing. With the great increase in brick production, especially pavers (paving brick), flagstone usage declined between 1900 and 1920.[19] By then brick, too, had been largely replaced for that use by concrete.

Brick and cement interests clashed directly in one confused incident involving a major street-paving project in Coffeyville. In 1904, the

Coffeyville City Council instructed the city engineer to make a cost estimate of paving using one layer of brick instead of two and a concrete base. The engineer's estimate and the council's conviction as to the superiority of this combination caused the city fathers to call for bids on the project that specified a six-inch-thick concrete base. The wrath of the brickmen descended on the innocent alderman. Cherryvale even got into the act—its newspaper published a long article on the absurdity of Coffeyville's decision and the failure to recognize the great importance of the brick industry in Coffeyville and Montgomery County. After chiding Coffeyville for ignoring its real economic interests, and without a pause, the newspaper then bitterly condemned the Coffeyville Vitrified Brick and Tile Company for shipping 100,000 bricks daily from its Cherryvale plant with "Coffeyville" stamped on them. Having attacked everyone in sight, the writer congratulated Cherryvale for ignoring the blandishments of the cement interests.

Coffeyville's beleaguered councilmen, in a master stroke, succeeded in piercing the united front of the brickmen by ordering the engineer to conduct comparative tests of the pavers of those interested in bidding on the project. Bricks were thrown into a device called a "rattler"—containing chunks of scrap metal—which banged them around for 30 minutes and then the weight "before" was compared with the weight "after." This strategem immediately pitted the two largest brick producers in town against one another. The brick of the Coffeyville Shale Brick and Tile Company lost less weight than the representative brick of the Coffeyville Vitrified Brick and Tile Company. The latter cried "foul," accused the engineer of tampering with the "rattler," and demanded a rematch. The antagonists forgot all about cement which was the real victor.[20]

The fruits of the victory were harvested in the post-War period as a direct result of the mass production of and price reduction on automobiles and trucks. Automobile production surpassed 1 million vehicles in 1916 and topped 3 million in 1923. By that time, motor vehicle registrations reached 15 million and exceeded 26 million by 1929. Among the revolutionary consequences to the American way of life implicit in those figures was the need for adequately surfaced roads to handle the increasing traffic of passenger cars and trucks, registrations of the latter reaching 1 million by 1920.[21]

The AAPCM and its successor, the Portland Cement Association (PCA), expended funds and great energy in order to convince the American public that concrete roads were the answer to the problem. The campaign was an unbounded success as far as the cement industry was concerned. One cannot be certain that smooth concrete roads im-

proved the piety or moral posture of Americans, but it is certain that more and more Americans were traveling such roads. The PCA rejoiced over the enactment of federal legislation in 1916 that provided federal financial aid to the states for the construction of arterial highways. Although this program did not really get under way until after the war, the results then were most encouraging. In 1918, about 5.5 percent of total U.S. cement production went to highway construction, and in 1922, 10 percent. By 1928, highway projects took almost 50 million barrels of cement, or 28 percent of total production. A large percentage of the increase in cement consumption in Kansas between 1915 and 1925 can be attributed to highway and city street construction.[22]

The AAPCM concerned itself with a multitude of other problems. It lobbied for higher tariff rates on foreign cement and kept its membership abreast of trade conditions in foreign areas.[23] It negotiated with large insurance companies in an effort to obtain more favorable rates for concrete buildings. It engaged in research on the chemistry of cement and sought and obtained acceptance of standard national specifications for the composition of the product and its performance. By the 1920's, the PCA had offices scattered throughout the nation, employing a large force of engineers engaged in inspection and research.[24]

Trade associations prevailed in the other mineral industries, also. In the brick and tile industries, the basically local nature of the market and the numerous plants in the region induced the brickmen to attempt to organize. Meetings were held (the initial one probably in 1901) and discussions centered on setting brick prices for local and other markets. Delegates also were appointed to negotiate rates with railroad officials. No evidence is extant that cooperation among manufacturers was particularly successful either in fixing prices, establishing uniform sizes and qualities of brick, or in resolving other common problems.[25]

The lack of effective cooperation among producers did not retard the growth of the clay products industry in Kansas. Kansas was a national leader in the industry prior to World War I and one of the more important producers thereafter. Clay products manufacturing was so diffused throughout the U.S. that in 1900 California ranked tenth in VMP, although this represented only 1.4 percent of the national VMP, and in 1930, Indiana ranked seventh, with 4.2 percent of total national VMP. Kansas, producing 1.4 percent of national VMP in 1904 and 1.0 percent in 1909, fell within the top fifteen producing states for all clay products.

If pottery is excluded, the position of Kansas assumes added importance. In 1909, Kansas produced 8 percent of the national VMP in paving brick and block and 5.6 percent in 1917. Kansas also produced

about 2 percent of the national VMP for common brick in the years before World War I. Exclusive of pottery, Kansas contributed 1.7 percent of national VMP in clay products in 1909. During the gas era, prices for brick in Kansas were among the lowest in the nation so that the percentage contribution of brick produced in Kansas to volume is in each case higher than the percentage contribution to value.[26]

At the national level, the contribution of pottery to the total VMP of the industry rose from 18 percent in 1899 to 24 percent in 1917, and 28 percent in 1924. Pottery was much less significant in Kansas, contributing 4 percent to state VMP in 1900, about 5 percent in 1904 and 1905, and certainly under 10 percent in 1910 and 1920. Brick and tile were the staples of the industry in Kansas. Of the types of brick manufactured in Kansas, common building brick and vitrified or paving brick were the most important. Of these two types, the value of common brick declined from 56 percent of industry VMP in 1900 and 1906 to 34 percent in 1910 while vitrified brick rose from 27 percent in 1906 to 40 percent in 1910 and 1915. Drainage tile increased in importance through 1917 and then went into decline due to competitive products. Sewer pipe production rose rapidly from 1900 to 1924 in spite of competition from cement pipe. W. S. Dickey entered this industry in 1905 by purchasing a hollow tile plant in Pittsburg and converting it to the production of pipe. Hollow building tile increased in usage very rapidly between 1900 and 1917 and experienced a second spurt during the mid-1920's. In Kansas, the Coffeyville Shale Brick Company (Coffeyville Shale Products Company, 1914) abandoned the manufacture of common brick in 1914 and retooled for the manufacture of hollow building tile.[27]

Brick and tile were sold within the same general area as cement—Kansas, contiguous states, and a few other, more distant states. A much larger proportion of clay products than cement was consumed in Kansas, with estimates of exports ranging from 25 to 35 percent of the volume manufactured. Products such as ornamental brick, facing brick, building and roofing tile, which cost considerably more than common brick or pavers, were also more likely to be exported since they could absorb greater transportation charges. Western Roofing Tile Company at Coffeyville shipped as many as six carloads per week to destinations in eastern Missouri, St. Louis, and all parts of Iowa. Out-of-state brick shipments generally went to Kansas City or south and west to Arkansas, Oklahoma, Texas, New Mexico, and Colorado. As these states developed their own capacities for the manufacture of brick, demand for the Kansas product declined proportionately and local markets became even more important.[28]

Kansas City and Missouri were the largest external markets for Kansas brick. As early as 1900, the Coffeyville Vitrified Brick and Tile Company supplied over 1,000 freight carloads of brick to the Cudahay Packing Company plant in Kansas City, Missouri. Caney Brick Company furnished 5 million bricks, about 500 carloads—or 16 to 20 good-sized freight trains—to the Missouri Pacific in 1905 for its new shops in Sedalia, Missouri, and in 1911, 1 million facing bricks for a new theater at 13th and McGee in Kansas City, Missouri.[29] Shipments such as these were typical and demanded the ready availability of large numbers of freight cars to deliver the brick according to contractual agreements. Shortage of freight cars was not altogether unusual, occurring in 1903, 1905, 1906, and 1907. Iola Portland Cement Company cancelled its night shift in October and November, 1905; Western States Portland Cement Company curtailed production in 1906-1907; both Nelson Vitrified Brick Company and Mound Valley Vitrified Brick Company shut down for periods of two days to a week at a time because freight cars were unobtainable.[30]

Brick and tile manufacturers sold directly to distributors, contractors, or individual consumers, with most sales through the two latter categories. Most of the independent firms in southeastern Kansas maintained an office or a representative in the Kansas City area. Coffeyville Shale Brick Company was exceptional in selling all its products through its Coffeyville office and employing no salesmen or agents. W. S. Dickey's plant in Pittsburg handled its own sales, most of the sewer pipe being hauled to jobs within a few miles of Pittsburg during its early years. By 1915, the firm shipped over 1,000 carloads annually, and sales were coordinated at the home office. Yoke Vitrified Brick Company engaged representatives in Amarillo, Texas, Fort Smith, Arkansas, Wichita, Leavenworth, and other cities. Its agent in Kansas City, Kansas, a dealer in coal, wood, and builders' materials, was salaried at $20 weekly and received a sales commission of 25 cents per thousand for common brick and 50 cents per thousand for facing brick.[31]

By the 1950's, and perhaps earlier, 90 percent of structural clay materials were sold at markets within a radius of 60 to 70 miles of the point of production which were easily accessible by water or truck. W. S. Dickey Clay Manufacturing Company first used trucking in about 1939, presumably not much later than other regional manufacturers.[32] Increasing rail freight rates, the spread of common brick manufacturing to each state, and the costs and operational requirements of company-owned trucks combined to force a contraction of potential marketing areas. The normal growth rate of the smaller marketing area provided an adequate market for a reduced number of producing firms.

Cementmen deplored the ". . . war being waged against concrete . . . by the brick and tile interests . . ." and took aggressive steps to counter what they considered an unethical condemnation of cement products.[33] Meanwhile, torn by internal strife caused by an excessive number of producers, burdened by high fuel costs and a domineering and highly paid labor force, the glass industry was on the verge of a technological revolution which turned confusion into chaos just at the time of its move to Kansas. In addition to the appeal of cheap natural gas, the movement into Kansas was possible and assumed large proportions because it was the "eve" of revolution rather than the "day after." A relatively small capital investment still was sufficient to establish a glass factory. Without a doubt, the proliferation of the industry in southeastern Kansas exacerbated the position of the industry nationally.

In 1904, nine Kansas glass factories produced 1.2 percent of the national industry's VMP. Seventeen firms produced 2.2 percent in 1909 while six firms produced 0.6 percent in 1914. Of the Kansas product in 1904, 47 percent of the value was in containers, 45 percent in window glass, and 8 percent in pressed and blown ware. The proportions in 1909, in the same order, were 32, 57, and 11 percent. Kansas' share of national VMP within each of the three branches of the industry rose from 1.2 percent to 1.8 percent in containers between 1904 and 1909; 3.2 percent to 9.6 percent in window glass; and 0.3 percent to 0.6 percent in pressed and blown ware.[34]

The region's window-glass firms were among the largest in the industry. Between 1906 and 1909, the Coffeyville Window Glass Company produced at least 2 percent of the national volume, which probably averaged 300 million square feet annually.[35] Sunflower Glass Company, in 1908-1909, contributed over 1 percent and Osage Window Glass of Independence about 1.5 percent of national production. These three firms produced glass worth more than $500,000 annually, over 3 percent of the national VMP. In the manufacture of containers, Marion Fruit Jar Company and Mason Fruit Jar Company, both in Coffeyville, accounted for over 90 percent of the Kansas product.[36]

During the first few years in Kansas, the glass industry enjoyed great success, production frequently failing to keep pace with incoming orders. Many of the plants enlarged their productive capacity. Midland Glass Company of Independence tripled its capacity during the regular summer shutdown in 1903. Mound Valley Glass Company added a stamping department to process special orders and went on two 12-hour shifts to fill large contracts for its tumblers, stemware, and gas and electric globes. Many of these contracts were a direct result of an intensive advertising campaign initiated in 1907 in which thousands of catalog sheets picturing

Mound Valley glassware were distributed to soda fountains, restaurants, hotels, and the like throughout Kansas and neighboring states. Large orders in 1904-1905 compelled Pioneer Flint Glass Company and Coffeyville Bottle and Glass Company to work overtime. The latter company shipped carload orders to Crumden-Martin Woodenware Company of St. Louis, one of the biggest bottle jobbers in the U.S. Crumden-Martin received orders from throughout the Midwest; one distributor in Fort Worth ordered eight carloads from the bottle company.[37]

The Kansas glass industry, however, was not immune to the disturbances and flux effecting marked changes in the character of the industry in the older centers. Much of the trouble in the window-glass industry arose from the proliferation of competing units, which led the industry to make repeated efforts to control production and prices.[38] From 1880 to 1895, window-glass manufacturers sought to control prices through the medium of the American Window Glass Manufacturers Association while the window-glass workers union established effective controls over production and wages. A series of price wars in 1893-1895 resulted in the organization of the American Glass Company, a selling pool for 85 percent of the window-glass firms in operation. This agency was, in turn, succeeded in 1899 by the American Window Glass Company, a $17-million corporation owning plants representing over 70 percent of the nation's total capacity.[39]

The remaining 30 percent of the manufacturers organized a selling agency, the Independence Glass Company, while the window-glass union split into two, one working the plants associated with the Independent Glass Company. By 1901, the two monopolistic organizations had agreed to cooperate by marketing all output through the National Wholesale Glass Jobbers Association. But this agreement was subjected to great pressure and competition from new independents and cooperatives attracted to the industry by the moderate capital investment required. In 1902, the Imperial Glass Company withdrew from the arrangement and the American Window Glass Company joined forces with the Federation Window Glass Company, a selling agency organized by the cooperatives. Under the pressure of serious overproduction, the various agreements all collapsed in 1903, just at the time mechanization hit the industry and just at the time the industry moved into Kansas.[40]

Between 1902 and 1904 mechanization brought about a division of the window-glass industry into the machine manufacturers and the hand manufacturers, the latter including the firms in southeastern Kansas. By 1907, machine producers were able to cut prices below the cost of production in most of the hand-blown glass plants. Kansas producers remained temporarily competitive because of the low cost of fuel and

the great demand for glass in the trans-Missouri region, which resulted in back orders enabling the manufacturers to weather the Panic of 1907. However, when the industry resumed production in the fall of 1908, conditions in the industry compelled Kansas producers to institute price cuts.[41] Happy times for glass in Kansas were over, and the situation was aggravated by indications that the gas fields in the region contained something less than an infinite supply.

Manufacturers of window glass in Kansas organized at least as early as 1905 in order to secure better prices and freight rates and with the intention of putting a selling agency in the field. From 1906 through 1908-1909, Kansans controlled the Southwestern Glass Company, a marketing pool that handled production over and above that contracted for by individual purchasers, dealers, wholesale houses, and other distributors. Agents of Southwestern Glass Company worked closely with groups of distributors such as the Western Jobbers Association, attending meetings, visiting the association's members, and apportioning orders among the Kansas manufacturers according to specialty, existing inventories, prior contractual commitments, and so forth.[42]

Price cuts initiated by machine producers, the vulnerability of the Kansas marketing area to lower-priced goods, and the residual effects of the Panic on the building industry in the same area forced Kansas glassmen to focus their attention on the national scene and involve themselves in projects designed to maintain the competitive position of hand production. A meeting of the glass manufacturers in Independence in August, 1908, led to price reductions on window glass and a decision to organize an association of manufacturers of hand-blown window glass. A general call went out for a meeting at Pittsburgh, Pennsylvania, in October at which Howard Baker of Baker Brothers Glass Company of Caney presided. Another meeting at Columbus, Ohio, in April, 1909, attended by Baker and A. Hudson, owner of the Chanute Glass Company, resulted in the formation of the Imperial Window Glass Association, a selling agency eventually including all but six of the manufacturers of hand-blown glass.[43]

The new association revived the fortunes of window glass in Kansas and elsewhere. Kansas window-glass plants, many of them closed for long periods in 1908 and early 1909, renewed production and sold their goods through Imperial. The respite was but temporary. Cheyenne Window Glass Company of Caney, cutting back on window-glass production and branching out into hand-made, high-quality beveled glass, a product as yet unthreatened by machine competition, may have sensed the impermanence of the revival. Overproduction caught up with the industry in 1910 and broke the market. Concurrently, the Imperial

Window Glass Association was indicted in the federal courts as a conspiracy in restraint of trade and was forced to dissolve in 1910. Efforts by the hand-producers to reorganize occurred in 1911 in meetings at Columbus and Cleveland in which workers and owners attempted to negotiate wages that would allow hand-operatives to compete. But it was too late for Kansas and the industry "melted away."[44]

Market conditions forced several bankruptcies in 1910 and 1911. Other plants shut down in the middle of the season or operated with much reduced production schedules. Caney's glass plants in 1911 shipped less than one-third the volume they did in 1910. Chanute Glass Company banked its fires, as did plants in Mound Valley, Tyro, Coffeyville, and Independence.[45] A few glass manufacturers perservered in Kansas after 1912—none in window glass—but for the most part only the empty shells of abandoned factories or the concrete foundations of factories, which were moved lock, stock, and barrel, served as a reminder of past industrial glory. A similar fate befell the once prosperous and powerful zinc smelting industry in Kansas.

Kansas was credited with 17 smelters in 1916. Not all were operative, but most were, and probably producing at close to three-fourths capacity.[46] The lease on life supplied by the European war was short-lived. Production in 1917 was half that of 1916 and was reduced another 42 percent by 1920. In that year only three plants—Weir Smelting Company, Caney, Edgar Zinc Company, Cherryvale, and Prime Western Spelter Company, Iola—were reported as producing spelter. Prime Western disposed of its plant in 1920 after having been idle most of the season. In 1921, the remaining smelters produced 16,573 tons of primary zinc compared to 41,044 in 1920 (Table 7). Through 1929, production fluctuated between a low of 24,167 tons in 1922 and a high of 37,795 in 1929, with an average annual production for the eight years at 31,138 tons.[47]

The economic collapse in 1929 forced the Weir Smelting Company into bankruptcy and the Edgar Zinc Company to close for part of 1930 and to reduce production still further in 1931. Spelter production in Kansas plunged to 13,682 tons in 1930 and 4,660 tons in 1931. In 1932, for the first time since 1877, Kansas produced no primary zinc. By 1940, the Edgar Zinc Company (at this time part of the National Zinc Company) resumed operation, but it was no longer a primary zinc producer.[48]

The zinc industry in Kansas was declining rapidly when the "Great War" saved it (Table 7). The prediction of Walter R. Ingalls in 1908 that zinc smelting would not be a permanent industry in Kansas was in the process of fulfillment by 1914.[49] It had become apparent by then that a modern zinc smelter in the coal fields of Illinois or farther east

could compete on equal terms with a gas-fired smelter in Kansas. It was also apparent by 1908 that a coal-fired smelter in Kansas could compete only during periods when the differential between the price of metallic zinc and zinc blende was great. Thus, in 1903, with metallic zinc at 5.4 cents per pound compared to 4 cents in 1901 and with the differential between ore and spelter at $72 per ton compared to $53 in 1901, Pittsburg's coal smelters found it profitable to operate for a season. Similar conditions returned in 1914.[50]

Favorable conditions from 1901 to 1906 disappeared with slumping prices in 1907 and 1908, forcing curtailment of production in Kansas for the remainder of the pre-war period to levels slightly higher than those of 1901-1903, but about 25 percent lower than the peaks achieved in 1906 and 1907. A drastic decline occurred from 1912 to 1913 and from 1913 to 1914 (Table 7). The demand for zinc rose sharply in 1915 and 1916. U.S. zinc exports, less than 6,000 tons annually prior to the war, amounted to 60,000 tons during the last six months of 1914 and to 78,000 tons during the first half of 1916. The importance of exports —to a war-devastated Europe—continued into the post-War world of the 1920's, sustaining high prices in London. At the same time the Fordney-McCumber tariff of 1922 set higher schedules for imported zinc ore and metals. But the ". . . domestic smelter capacity exceeded the demand, and since the United States continually exported more than it imported, the duties never effectively raised zinc prices in the United States."[51]

These developments had but little impact on the severely attenuated industry in Kansas. The great crash of 1929 did. Prices fell radically, reaching an historic low of 2.8 cents per pound in 1932, a sufficiently precipitous decline to remove zinc smelting from the ranks of Kansas' industries.[52]

The zinc industry, no less than the cement and glass industries, was plagued by overproduction at various times during the period of greatest smelting activity in Kansas. This had nothing to do with local demand. Although Kansans consumed zinc products, this market comprised only a small fraction of a generalized and national demand.[53] Prices for metallic zinc and zinc ore were unaffected by local demand. It was theoretically possible for cement manufacturers in Kansas to exercise some control over prices by establishing production quotas geared to local demand, in part predictable by close attention to trends in the building industry. Cement and glassmen might associate themselves, as they did, with regional organizations designed to stabilize the trade within a limited geographical area. This approach was impractical for smeltermen whose problems, moreover, were complicated by the need to concern themselves with ore prices as well as spelter prices.

Ore producers were more active in associating to control prices and production than were the smelting companies. Associations of miners such as the Missouri and Kansas Lead and Zinc Miners Association in the late 1890's and the Joplin Zinc Ore Producers in later years attempted to reduce the fluctuation of ore prices as compared to spelter prices. Two methods were generally used. In 1895 and 1899, the mines were closed at various times in order to reduce the ore surplus, but this tactic was without apparent effect upon demand or prices for metallic zinc. Production controls were generally implemented during periods of declining demand for spelter, a demand which had little relationship to ore production, and were thus ineffective.[54] Miners also developed various formulas designed to establish a constant price relationship between ore and spelter.

In the Paxton scale of 1899, the mine price per ton of ore assaying 60 percent zinc equaled 700 × P (value of spelter in cents per pound). Prices were raised or lowered as the assay varied from 60 percent. Other scales were proposed at various times, but none were accepted with enthusiasm by the smelters. In 1910, the Joplin Zinc Ore Producers Association implemented a sliding price-scale contract system in which prices were tied to the zinc content of the ore with 60 percent as the standard. About half the ore tonnage of the Missouri-Kansas district was contracted for under this scale in 1910 and 1911.[55]

Smelter companies were unable to formulate a method to establish metallic zinc prices or to control production. In 1907-1908, A. B. Cockerill, president of Cockerill Zinc Company, failed in his effort to establish a combination of Kansas smelters to regulate production. Nor did mergers or attempted mergers of zinc producers offer much hope of stability, since they did not or would not have controlled productive capacity sufficiently to affect zinc prices. The American Zinc Institute, formed in 1921, was unable to improve domestic market conditions through production controls or through dumping surplus zinc on the world market. The difficulty of devising effective procedures to control production and stabilize prices was enhanced by U.S. Steel's control, by 1905, of one-fifth of the nation's metallic zinc output and its control of the galvanizing industry.[56]

Unlike the cement and glass industries, demand in smelting was not governed by conditions in local or other subnational areas. In the cement and glass industries and even more so in clay products, the national market was an abstraction representing simply an aggregate of the trade in a host of local and regional markets stretching from coast to coast. For instance, it was theoretically possible for the cement industry in a given region to be in a consistently precarious state while

the cement industry as a whole prospered. Fluctuations in the production of cement between 1910 and 1920 were much greater in Kansas than in the nation (Fig. 14).

As consumers, it mattered to Kansans and their neighbors that there were cement and brick plants in southeastern Kansas, for a demand existed there that could be satisfied most economically from that region. When these conditions—demand and supply and locational economics—changed in their relationship to one another, a corresponding industrial readjustment was required. Thus, overproduction in the cement industry in Kansas forced a reduction in the number of producing units and the achievement of a new equilibrium with market demands. In the glass industry, the inability of the Kansas component to mechanize erased the advantages of a location in Kansas. Demand did not abate,

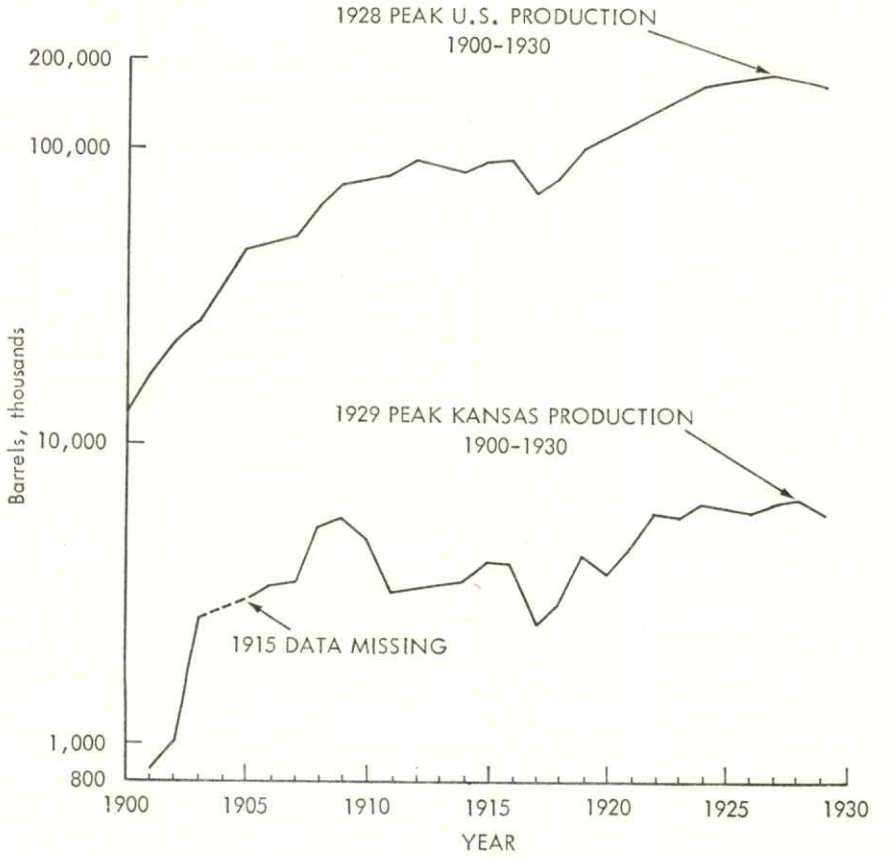

FIGURE 14.—Cement production in U.S. and Kansas, 1900-1930. (USGS, *The Cement Industry in the United States in [1902-1930]*.)

but it was filled, at a somewhat higher cost to the buyer, from other areas of the country. As for zinc smelting, demand for zinc products in Kansas was irrelevant. Proximity to the ore bodies became less compelling to the smelting industry than a secure supply of cheap fuel, so the center of smelting shifted to the coal fields in the East. This was of no significance to the Kansas consumer since the cost of importing galvanized materials, brass, or sheet zinc was in no way determined by the location of the smelters.

VIII

Notes

1. *Iola Register,* October 30, 1913, in Iola Portland Cement Company Scrapbook; Dilley, *Cement Industry in Kansas,* 44-48; USGS, *The Cement Industry,* [1904-1916].
2. Norris, *AZn,* 33-36.
3. Stanfield, *The Cement Bubble.*
4. USGS, *Mineral Resources, 1910.* II, 568.
5. *Mound Valley Journal,* October 4, 1907.
6. USGS, *The Cement Industry,* [1907-1908, 1911-1913]; *Iola Register,* November 4, 1913, August 16, 1915, in Iola Portland Cement Company Scrapbook.
7. Bankruptcy File. Altoona Portland Cement Company. Case #800; Bankruptcy File. United Kansas Portland Cement Company. Case #208. Federal District Court, Fort Scott, Kansas.
8. *Ibid.*
9. USGS, *The Cement Industry,* [1916-1930].
10. Entry, June 30, 1904 in Iola Portland Cement Company Record; *South Kansas Tribune,* February 6, 1910; Bankruptcy File. Altoona Portland Cement Company. Case #663. Federal District Court, Fort Scott, Kansas.
11. Site and Location of Iola Cement Plant; *Prospectus of the Great Western Portland Cement Company* (1908) 8-12; Stanfield, *The Cement Bubble; Kansas Public Utilities Commission, 1911-1912,* notes cases filed against railroads by the Ash Grove and Western States cement companies. Unfortunately, these files are not extant; Dilley, *Cement Industry in Kansas,* 48-50, 73.
12. *Coffeyville Daily Journal,* March 15, 1901, October 7, 1902; *South Kansas Tribune,* July 29, 1903; *Kansas Public Utilities Commission, 1911-1912,* 17-18; *The Galveston, Harrisburg & San Antonio Railroad Company* v *The Coffeyville Vitrified Brick and Tile Company.* Case #278. Federal District Court, Fort Scott, Kansas.
13. *Coffeyville Daily Journal,* December 20, 1904; Bankruptcy File. Altoona Portland Cement Company. Case #663 and Bankruptcy File. United Kansas Portland Cement Company. Case #724. Federal District Court, Fort Scott, Kansas; Dilley, *Cement Industry in Kansas,* 70-72.
14. Dilley, *Cement Industry in Kansas,* 95-113; William E. Leuchtenburg, *The Perils of Prosperity, 1914-1932* (Chicago, 1958) 190; Thomas C. Cochran, *The American Business System. A Historical Perspective 1900-1955* (New York, 1962), 57-58.
15. Unless and until otherwise noted the following is based on: AAPCM, *Minutes of [Annual, Quarterly] Meetings,* 1907-1913. By 1921, the AAPCM had become the Portland Cement Association. Ash Grove Cement Company Library. Kansas City, Missouri.
16. February 14, 1913.
17. USGS, *The Cement Industry* [1915-1930]; Walker, *Industrial Development of Kansas,* I, 36.
18. Elmer R. Ligon, Vice-President and Director, Research Development, W. S. Dickey Clay Manufacturing Company to John G. Clark, Pittsburg, Kansas, July 8, 1969.
19. Haworth, *Mineral Resources of Kansas, 1897,* 72-73; USGS *Mineral Resources, 1915, II,* 771-772; *12 Census. Manufacturing: 1900. Vol. VIII Part II; 14 Census. 1920. Vol. IX. Manufacturing 1919;* Chute, *Burned-Clay Products,* notes that the

absence of suitable stone for paving purposes in many prairie districts created a demand for paving brick.

20. Coffeyville Council Proceedings. Vol. H. Sept. 7, 22, 28, October 26, November 10, 1904, Vol. I. April 20, 1905; *Cherryvale Weekly Republican,* December 9, 1904; *Coffeyville Daily Journal,* November 23, 26, December 8, 27, 1904, January 2, 1905.

21. Bureau of the Census, *Historical Statistics,* Series Q, 310, 315, 317.

22. *Progress Review of Twenty Years. Issued by the Portland Cement Association in Commemoration of Its Twentieth Anniversary Meeting* (n.p., 1922), 9; *The Cement Industry in 1923. Reprinted from the Annalist of January 8, 1923* (New York, n.d.); *Address of President J. T. Sunderland . . .* (Portland Cement Association, 1921), 8; Address of President G. S. Brown . . . November 21, 1928 (Chicago, 1928). 5. These items are all located in the Ash Grove Cement Company Library, Kansas City, Missouri; "Underground Resources of Kansas," *SGSK Bulletin 13,* 37-39.

23. Cement officials believed that high rates were necessary to prevent foreign imports. Foreign imports were very small regardless of the particular schedule in effect. In window glass, however, the domestic share of the market increased with high tariffs and decreased with low. Window glass enjoyed heavy protection from 1860 to 1890, which was essential to domestic manufacturers because foreign glass was cheaper. When tariff rates were low, as under the Payne-Aldrich tariff (1909) and the Underwood tariff (1913), foreign competition was intense on the east coast. Part of the advantage of the Belgian glass industry, for instance, was its earlier adoption of new manufacturing techniques. Also, transportation charges on Belgian glass were cheaper to New York, New Orleans, and San Francisco than domestic rates from home producing areas to those points, Davis, *American Glass Industry,* 133-139, 200-204.

24. Ash Grove Lime and Portland Cement Company established a two-year fellowship at the University of Kansas in 1910 worth $1,500 annually for research on methods of manufacturing and using lime and cement, *Kansas City Star,* January 20, 1910, in Ash Grove Cement Company Scrapbook.

25. *Coffeyville Daily Journal,* February 1, March 15, 1901, December 1, 1904; Chute, *Burned-Clay Products,* 4 writes: "The burned-clay-products industries, in general, have been characterized by retarded industrial development and conservative management, by lack of adequate cost systems, suitable plant layout or labor-saving equipment, and by a mere passive hostility to the growing competition from substitute products." Since World War II, research and development has much improved. Research is centering on the development of light-weight ceramic building materials and new and improved methods for the use of reinforced masonry, *Brick and Tile,* 19 (July-August, 1962), 12-22 is a publication of the Humboldt Brick and Tile Company, Humboldt, Kansas.

26. USGS, *Mineral Resources, 1905,* 951, 953, 963; *ibid., 1910,* II, 538-550, 568; *ibid., 1915,* II, 893; Chute, *Burned-Clay Products,* Tables 4 and 7.

27. See sources in note 25; *Prosperous Pittsburg; Coffeyville Weekly Journal,* January 16, 1914; Ligon to Clark, Pittsburg, Kansas, July 8, 1969.

28. Kansas Bureau of Labor and Industry. *AR* (1897), 142-143; *AR* (1905), 25; *Coffeyville Daily Journal,* January 7, 1905; Emmons and Hays, eds., *Contributions,* 548-549; Schrader, *Independence Quadrangle,* 61; *Caney Chronicle,* March 7, 1911, reported heavy orders in Oklahoma for Caney brick; Bankruptcy File. The Yoke Vitrified Brick Company. Case #494 and Bankruptcy File. Altoona Vitrified Brick Company. Case #649. Federal District Court, Fort Scott, Kansas.

29. *Southwest Developer, Coffeyville, Kansas* (Kansas City, 1900), *South Kansas Tribune,* Industrial Edition, *The City of Independence, Kansas and the Great Gas and Oil Field of Montgomery County . . .* (Independence, Kansas, 1903); *Caney Chronicle,* January 13, 1905; *Caney News,* January 5, 1911.

30. *Coffeyville Daily Journal,* January 29, February 2, 1903; *Caney Chronicle,* July 31, 1903; *Mound Valley Journal,* October 19, 1906, January 11, 1907, March 8, 1907; entries October and November, 1905 in Iola Portland Cement Company Record; *Independence, Heart of Kansas Gas and Oil Field,* 19.

31. *Supplement to the Coffeyville Daily Journal,* 32; *Prosperous Pittsburg;* Bankruptcy File. The Yoke Vitrified Brick Company. Case #494 Federal District Court, Fort Scott, Kansas; Ligon to Clark, Pittsburg, Kansas, July 8, 1969; Chute, *Burned-Clay Products,* 148.

32. Chute, *Burned-Clay Products,* 6-13, 144; Ligon to Clark, Pittsburg, Kansas, July 8, 1969.

33. AAPCM, *Minutes of Annual Meeting*, December, 1911, 19.

34. U.S. Bureau of Foreign and Domestic Commerce, *The Glass Industry*, 24-28; Davis, *American Glass Industry*, Tables 15, 19, 20.

35. *Supplement to the Coffeyville Daily Journal*, 29. The firm was capable of producing 2,800 boxes of 50 square feet of window glass each week or a capacity approaching 3 percent of actual national production.

36. *Ibid.*, 30; Abstracts of Statistical Rolls, Montgomery County, 1903, 1909; Schrader, *Independence Quadrangle*, 46.

37. *South Kansas Tribune*, July 8, 1903; *Mound Valley Journal*, January 4, March 15, 29, 1907; *Coffeyville Daily Journal*, October 21, 30, 1902, November 4, December 3, 1904, January 7, 1905; *Caney Chronicle*, October 6, 1905.

38. The discussion is confined largely to window glass which faced great difficulties due to overproduction and an extreme inelasticity of demand for its product. Davis, *American Glass Industry*, 131, points out that the market for window glass was almost exclusively in the building industry and the amount purchased depended upon the amount of construction. Glass was but a minor portion of the cost of any structure. Fluctuations in the price of so small an item had no appreciable effect on building costs or demand for glass.

39. *Ibid.*, 175-176.

40. *Ibid.*, 177-180.

41. *Ibid.*, 186-189; *Caney News*, September 25, 1908.

42. *Caney Chronicle*, February 17, 1905; *Caney News*, June 25, August 14, 1908.

43. *Caney News*, August 21, September 25, October 16, 23, 1908, April 16, 1909.

44. *Ibid.*, July 2, 1909, September 1, 1911; *South Kansas Tribune*, April 20, 1910; *Caney Chronicle*, January 31, 1911; Abstracts of Statistical Rolls. Montgomery County. 1909; U.S. Bureau of Foreign and Domestic Commerce, *The Glass Industry*, 190.

45. *Caney Chronicle*, January 17, 20, March 7, June 23, 1911; *Caney News*, July 21, 1911; *Coffeyville Weekly Journal*, February 2, 12, 1912.

46. USGS, *Mineral Resources. 1915*, I, 950-951 reported 42,870 retorts in Kansas. That number of retorts each producing 24 pounds of spelter daily would yield 187,610 tons in 365 days. Kansas produced 141,286 tons, *Ibid. 1925*, II, 330.

47. *Ibid. 1920*, II, 228, *1925*, II, 330, *1930*, II, 435.

48. *Ibid. 1930, II*, 445; Bureau of Mines, *Minerals Yearbook, 1935* (Washington, D.C., 1935), 103.

49. Ingalls, *Lead and Zinc*, 332.

50. Haworth, *Mineral Resources of Kansas*, 1903, Tables 6 and 7.

51. Norris, *AZn*, 78; USGS, *Mineral Resources, 1915*, I, 957-959; Wormser, "Slab Zinc and Slab Concentrates," 231.

52. Norris, *AZn*, 121; USGS, *Mineral Resources, 1930*, II, 432, 475.

53. Zinc was chiefly used by the galvanizing, brass, and sheet zinc industries with galvanizing consuming 40 to 60 percent of metallic zinc. Conditions in the iron and steel industry were a barometer of conditions in the zinc market and most galvanizers were located near or in the large steel centers, Wormser, "Slab Zinc and Zinc Concentrates," 219-223, 227. Lanyon Zinc Company did erect a sheet zinc rolling mill at La Harpe in 1902 which may have filled some local demand. The La Harpe mill was operated in 1910 by Ball Brothers Glass Manufacturing Company for the production of lids for fruit jars.

54. *Fort Scott Daily Monitor*, July 24, 1899; Holibaugh, *Lead and Zinc Industry of Missouri and Kansas*, 10-11; Haworth, *Mineral Resources of Kansas, 1899*, 18-19; Ingalls, *Production of Zinc*, 83.

55. Ingalls, *Production of Zinc*, 309; USGS, *Mineral Resources, 1910*, I, 303.

56. Norris, *AZn*, 33-36, 73, 80-81; USGS, *Mineral Resources, 1905*, 215.

IX

The Mineral Industries and Regional Growth

During the bankruptcy proceedings of the United Kansas Portland Cement Company in 1915, Charles F. Scott, a former director, testified as to the obsolescence of the Company's plants. He spoke nostalgically of the halcyon days of the industry—only a decade earlier—when gas was cheap, markets plentiful, and prices high. All of this had changed within a dozen or so years. Gas was neither cheap nor readily available. Indeed, a contributing factor in United's bankruptcy was its decision in 1910 to float $1.5 million in bonds to purchase gas lands in Oklahoma and lay a pipe line, costing $10,000 per mile, from the fields to Independence. Cement production in Kansas far exceeded demand and prices were below the cost of production. Moreover, improvements in technology, which would enable plants to reduce production costs, were enormously expensive to introduce. Conversion of the power plants to coal required additional expense. Scott was willing to admit that the cement industry would retain a place in the region's economy but was dubious about United's role in that future.[1]

Scott's description of the alteration in the operational conditions of the cement industry in Kansas between 1900 and 1915 can be applied with minor qualifications to the glass, zinc smelting, and structural clay industries. In Kansas all four industries suffered, in varying degrees, at about the same time from the consequences of fundamental changes occurring in the structure of American industry and technology. This is not to say that such change did not open up fruitful new opportunities for these industries in their national configurations. This is obviously not the case in the light of new uses and increased demand for such mineral products. It is to say that conditions in the America of 1900 were more conducive to the optimal use of the relevant resources in Kansas than in the America of 1915.

The problems referred to in Scott's testimony confronted the mineral industries in rapid succession and with a cumulative effect. Overproduction in cement and zinc caused the less efficient firms to be highly vulnerable to the Panic of 1907 and subsequent violent price fluctuations. Low-cost machine-produced glass weakened the competitive position of hand-made ware in the latter's primary markets. Brick and glass firms neglected to adopt improved production techniques, absorbing in the process unnecessarily high labor costs that reduced the rate of capital formation and the marginal efficiency of capital already employed. When it became apparent that the gas fields were playing out, the

capital resources of such firms were too slender to allow the adoption of the new technology.

Dwindling reservoirs of gas compelled the firms to choose from several options available to them. If they chose to remain, they could continue to use gas or convert to coal or oil. An option for gas implied fuel costs three to four times higher in 1910 than in 1903. Conversion involved even higher costs, but at least it would have guaranteed a regular fuel supply. Other courses open to companies were to move elsewhere or simply to abandon the operation, salvaging whatever machinery was possible. Each of the firms had to select one of these options. Each firm did so, several moving sequentially from one to another.

None of the glass companies converted to another form of fuel except for the Chanute Window Glass Company.[2] Perhaps the theoretical option to convert was no real choice at all given their small capital resources, antiquated technology, and high production costs. In 1910 and 1911, most glass factories sought gas supplies from whatever source was available. Some purchased gas from other industries that owned their own pipelines. In 1911, Caney's glass plants were able, for a short time, to obtain fuel from the American Zinc, Lead, and Smelting Company while the Altoona Portland Cement Company provided fuel to the local glass plant. Kelly Glass Company at Tyro negotiated a new contract with the Tyro Oil and Gas Company.[3] In these cases and others, the relief was temporary.

At Coffeyville, the center of the glass industry, gas shortages forced shutdowns in late 1911, which were followed by an exodus of glassworkers. Coffeyville Window Glass Company, unable to obtain any assurances from Kansas Natural Gas Company, opened negotiations with several Oklahoma towns interested in seating the firm. Through late 1911 and early 1912, the firm operated only three days per week. An attempt in the spring to lay a pipeline to South Coffeyville was abandoned, and in July, 1912, the management announced its decision to move to Oklahoma. Sunflower Window Glass Company had already moved to Texas and the rest of the firms either moved or abandoned the field.[4]

A similar sequence of events occurred in other glass centers. At Caney, local businessmen put up the cash to reopen the Cheyenne Glass Company, ran a new pipeline to nearby wells, and managed for five months to fill the many empty houses in town with glassworkers. Overproduction and a dull market compelled closure in May 1912, and the plant never reopened. The Caney Glass Company was similarly reopened for a season, in 1911, under the supervision of Andrew Hudson,

owner of the Chanute Glass Company. This was its last season. Kelly Glass Company of Tyro moved to Oklahoma in 1911, following a dispute with the gas company over the irregularity of supply. At Mound Valley local efforts in 1911 and 1912 to raise funds to pay off bonds floated in 1907 to finance an ambitious program of expansion and to operate the plant failed to prevent closure and forced sale in 1912. Fredonia's glass plant managed a last season also in 1911. Through the efforts of C. F. Lutes of the Coffeyville Window Glass Company and a group of Fredonians, gas wells were leased, pipelines run, and the fires started. This particular plant remained in use at least through 1929, under four different managements, but not as a primary producer.[5]

Firms in the other mineral industries did not flee so hastily, and many firms in cement and clay products survived the crisis. Brick and other clay manufacturers generally converted soon after 1910, as at Caney where brick manufacturers shared in the problems of the glass operators. Brick plants at Cherryvale switched to oil as early as 1910, while the Coffeyville Stoneware Company rebuilt its kilns in 1913 and converted to coal. Ludowici-Celadon Roofing Tile Company actively sought new gas supplies in 1914 and constructed lines to new fields. These fields were dry by 1915, and the plant turned to oil and coal. The Chanute Brick and Tile Company ran out of gas only in 1918, converting then to coal. W. S. Dickey used coal until 1920 when oil was substituted, not because it was cheaper but because delivery was more regular due to recurrent strikes in the coal fields.[6]

Exhausted gas pools forced the smelters that remained in Kansas to convert, although some attempted to pipe gas in from Oklahoma. The smelters that operated in Pittsburg during the first years of the European war changed to the use of coal as did the Granby Mining and Smelting plant at Neodesha. Fuel costs, however, were still quite low at the Granby plant with coal charges in 1911 amounting to less than 5 percent of the average price of spelter. Wage costs at the same time, were slightly more than 10 percent of the market value of the product (slightly under at Edgar Zinc Company, 1911). Edgar Zinc Company in 1911 converted to crude oil purchased from a Prairie Oil and Gas Company line running from Sycamore to Cherryvale. There is no reason to believe that crude oil costs at the Edgar smelter were significantly different than coal costs at the Granby plant.[7] Thus, in both cases, two of the major components of production costs were less than 15 percent of the market value of the finished product.

It was not the exhaustion of natural gas alone that prompted the exodus of smelters from Kansas noted by the U.S. Geological Survey in 1910.[8] Those that remained were able to absorb nominal increases in

the cost of fuel. Those enterprises that terminated, representing a part of the excessive productive capacity in the industry, were responding to pressures other than increased fuel costs. It was remarked earlier that zinc, unlike cement, clay, or glass, was not a population-oriented industry; that changes in demand within market areas accessible from Kansas did not affect the zinc industry. The zinc industry did, however, become consumer-oriented, demonstrating a propensity to cluster near manufacturers that used metallic zinc in the production of other goods. Locations near the direct consumers of spelter proved superior to locations in Kansas near ore supplies.

The cement industry in Kansas completed its conversion from gas to coal between 1912 and 1915. In 1913, most of the 3.3 million barrels produced in Kansas was burned by natural gas drawn from fields in Oklahoma. Within another year, no more than 8 percent of production issued from gas-fired kilns, apparently all from Ash Grove in Chanute. In 1915, Ash Grove converted to coal. Coal-burning predominated in the next decade. Irregularity in the supply of coal hampered cement-plant operations. Shortages of railroad cars delayed delivery periodically, while strikes and coal embargoes added to the uncertainty. By 1922-1923, with the opening of new gas and oil fields in southwestern Kansas, Oklahoma, and Texas, most of the companies in Kansas happily abandoned coal-burning and turned to the use of gas and some oil as kiln fuel.[9] A diminution of the cement industry in Kansas occurred only in the number of producing units, for cement production increased during the 1920's over earlier periods. The cement industry came to Kansas for a number of reasons, including cheap natural gas, but the difficulties experienced between 1907 and 1915 were far less due to scarce fuel supplies than to overproduction.

Each of the four industries treated herein, were subjected to pressures generated by external markets. Each contributed to the growth of southeastern Kansas in so far as they successfully penetrated external markets at any given time. Structural clay products, with the most restricted geographical market, conducted an interstate trade until its outside markets became more or less self-sufficient. It was, for a time, both an export and a residentiary industry, as were cement and glass.

The four industries contributed significantly and directly to the growth of southeastern Kansas between 1890 and 1910, accounting for as much as 55 percent of the region's VMP in 1900 and probably no less than 40 percent in 1910 (Fig. 3). While the four-industry share declined thereafter, it was still large (23 percent in 1930) and, during the entire period, had supported and induced the formation of other industrial enterprises. In 1930, industrial wages in the region formed

20 percent of the State's total while wages paid in the four industries (minus glass) made up 28 percent of the regional total. Figure 4 summarizes the relationship of the four industries (designated Group 4) to the industrial performance of the State. Figure 15 indicates the correspondence between the industrial growth of three leading industrial counties in the region and the mineral industries, which was particularly marked from 1890 to 1910 and then again from 1920 to 1930. As noted earlier, these industries in 1909-1910 produced 80 percent of VMP in Allen, Montgomery, and Wilson counties.

The cement, glass, and clay industries developed in part, and smelting fully, because a demand for their products existed outside of the region in which they located. Capital was attracted by the potential of external markets while the proceeds of sales beyond the region returned to it in the form of wages, local and state taxes, costs of plant expansion, and certain direct and indirect social-overhead expenditures. Regional growth was further stimulated through the influx of labor to fill growing numbers of jobs, the improvement and augmentation of local entrepreneurial skills, and the fostering of other manufacturing and service industries. The four industries stimulated regional growth in so far as they widened the differential between the value of exports of all goods and service plus capital formation and the cost of all imports plus capital exports.

While a recent commentator divides Kansas resources into two groups, ". . . those which can serve as an engine of growth, and those [the self-consumed minerals] which will be used as a consequence of growth . . . ," such a precise delineation was not appropriate for the early Twentieth Century and may not be now.[10] With the exception of zinc, the growth of the industries was accelerated because external demands were supplemented by internal or local demands. It may not be clear, for instance, whether the region benefited more from the export of natural gas than from its use within the region as an industrial fuel, but it is clear that cement production in Kansas provided a new base for the construction industry and that prosperous farmers were more likely to build concrete silos than were marginal farmers. Nor is it certain that simply because Kansas has suitable silica sand and an ample natural gas supply that a new glass industry is necessary.[11]

It is generally agreed that the resource endowment of underdeveloped nations, regions, and, perhaps, subregions, such as southeastern Kansas, determines the composition of exports. While the absolute dependence of regional growth upon the export sector vis-a-vis internal development remains a matter of some contention, a rapidly expanding export sector did seem to accelerate economic development in southeastern Kansas.

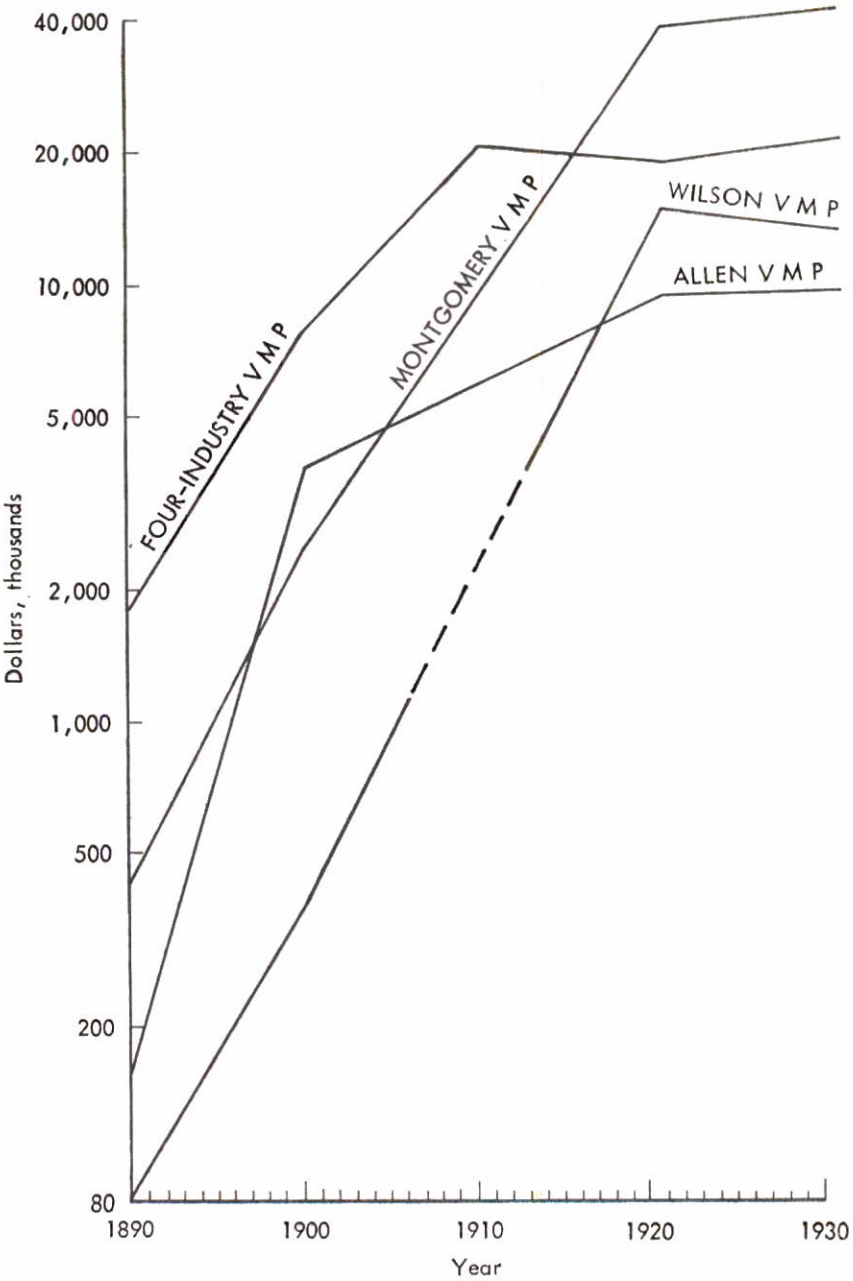

FIGURE 15.—Value of manufactured product (VMP) for Montgomery, Wilson, and Allen counties, Kansas, and for four mineral industries, 1890-1930. (See Federal Census, Manufacturing, above dates.)

Rich deposits of fuel and nonfuel minerals supported the vigorous manufacture of zinc, glass, cement, and clay products as well as the production of coal and oil. That sustained regional growth was not achieved was due in part to the impermanence of the original complex. Certain industrial and service activities initially generated by the mineral industries endured, but they were heavily concentrated in one town and one county in the region. It was to some extent a matter of critical historical timing that precluded achievement of a more lasting nature—a matter of timing unfortunately invisible to contemporaries.

In a sense, it was the ill luck of southeastern Kansas to launch its industrial career by adopting the method and technology of an industrial structure that was already obsolete, in decay, and in the process of replacement by new processes. Entry into the field through the adoption of traditional technology and organization was easily accomplished. By the same token, however, almost immediate conversion to new procedures became an inevitable and costly prerequisite for survival. Technological and methodological obsolescence occurs so swiftly, for such complicated reasons, and with such portentous implications for the future that the mind grows weary in the futility of seeking to keep abreast of change. Kansas, striving valiantly to enter the industrial world, may again be on the threshhold of a present which is already antique.

IX

Notes

1. Bankruptcy File. United Kansas Portland Cement Company. Case #208. Federal District Court, Fort Scott, Kansas; *South Kansas Tribune,* April 20, 1910.

2. *Coffeyville Weekly Journal,* January 10, 1913 reported that the firm converted to fuel oil.

3. *Caney News,* January 12, 1912; *Caney Chronicle,* February 24, March 10, May 19, June 2, 9, 1911.

4. *Caney News,* November 10, December 1, 1911; *Caney Chronicle,* November 9, 1911; *Coffeyville Weekly Journal,* March 29, 1912; Drake, *Montgomery County,* 104-105.

5. For Caney: Kansas Corporation Charters. Vol. 78:36; *Caney Chronicle,* January 17, 1911; *Caney News,* January 12, 1912; for Tyro: *Caney Chronicle,* February 24, June 2, 1911; for Mound Valley: *Mound Valley Journal,* May 17, 1907; Mortgage Record. No. 69:548, No. 67:48-50, Deed Record No. 84:79, 84 and *Mound Valley Glass Company* v *Kansas Trust Company.* Case #7440. Labette County District Court. Labette County Court House. Oswego, Kansas; for Fredonia: *Caney Chronicle,* August 11, December 8, 1911. The four Fredonia firms in order of date of incorporation were the C. S. Lutes Glass Company (1919), Monarch Glass Machinery Company (1912), Lariaux Glass Company (1925), and Fredonia Flat Glass Company (1929), Kansas Corporation Charters. Vol. 95:342, Vol. 107A:181, Vol. 116:264, and Vol. 116A:27.

6. *Caney Chronicle,* January 17, October 27, November 24, 1911; *Coffeyville Weekly Journal,* January 10, 1913, January 30, 1914; Howell, *Pittsburg and Its Industries,* 87; Nelson, *Chanute,* 69.

7. *Caney Chronicle,* January 17, March 10, 1911; Abstracts of Statistical Rolls. Wilson County. 1911; Abstracts of Statistical Rolls. Montgomery County. 1911.

8. *Mineral Resources,* 1910, I, 262.

9. Stanfield, *The Cement Bubble; Cement Industry in 1923;* Dilley, *Cement Industry in Kansas,* 63-64; Nelson, *Chanute,* 71.

10. William A. Vogely, "Concept of a Planning System," *Kansas Mineral Resource Development,* 8-9.

11. Earl K. Nixon and others, "The Cheyenne Sandstone of Barber, Comanche and Kiowa Counties, Kansas, as Raw Materials for Glass Manufacture," SGSK, *Bulletin* 86, Part 3 (Lawrence, 1950), 43.

APPENDIX

APPENDIX TABLE A.—County, region, and state population, 1890-1930.

County	1890	1900	1910	1920	1930
Allen	13,509	19,507	27,640	23,509	21,391
Bourbon	28,575	24,712	24,007	23,198	22,386
Chautauqua	12,297	11,804	11,429	11,598	10,352
Cherokee	27,349	42,694	38,162	33,609	31,457
Crawford	30,286	38,809	51,178	61,800	49,329
Labette	27,586	27,387	31,423	34,047	31,346
Montgomery	23,104	29,039	49,474	49,645	51,411
Neosho	18,561	19,254	23,754	24,000	22,665
Wilson	15,286	15,621	19,810	21,157	18,646
Woodson	9,021	10,022	9,450	8,984	8,526
Ten-county region	205,574	238,849	286,327	291,547	267,509
Kansas	1,427,096	1,468,469	1,696,361	1,779,936	1,851,024

SOURCE: Biennial Reports of the Kansas State Board of Agriculture, 7 (1889-1890), 12 (1899-1900), 17 (1909-1910), 27 (1929-1930).

APPENDIX TABLE B.—Value of farm product (VFP) and value of manufactured product (VMP) for ten counties in southeastern Kansas 1890-1930 (in thousands of dollars).

County	Value of farm product					Value of manufactured product				
	1890	1900	1910	1920	1930	1890	1900	1910*	1920	1930
Allen	1,409	1,718	2,023	5,247	4,363	153	3,897		9,230	9,130
Bourbon	1,899	2,059	2,488	5,800	4,127	1,556	1,040		5,019	4,751
Chautauqua	1,166	1,629	1,489	3,172	2,191	58	113		186	242
Cherokee	1,435	1,522	2,398	4,280	2,435	659	1,457		3,798	.....†
Crawford	1,916	1,877	2,661	4,648	3,103	1,606	2,448		7,549	7,396
Labette	1,499	2,012	2,855	7,221	4,751	1,287	1,726		5,574	6,908
Montgomery	1,014	2,063	2,162	4,859	3,769	515	2,547		38,119	42,746
Neosho	2,036	2,026	2,372	4,803	3,138	174	404		4,777	5,877
Wilson	1,360	1,252	2,103	4,802	2,779	92	380		15,142	13,554
Woodson	912	1,224	1,721	3,140	2,153	30	134		78	53
Ten-county total	14,646	17,382	22,272	47,972	32,809	6,130	14,146		89,472	90,657
Kansas	121,127	187,796	304,914	699,170	617,155	110,219	172,129		913,667	751,613

* No data available for 1910.
† No data available for 1930 in Cherokee County.
SOURCE: Same as Appendix Table A; Federal Census. Population 1890, Federal Census. Manufacturing 1900, 1920-1930.

APPENDIX TABLE C.—Value of manufactured product (VMP) and value added by manufacture (VA) for various industries in Kansas, 1890-1930 (in thousands of dollars).

Industry	VMP					VA				
	1890	1900	1910	1920	1930	1890*	1900	1910	1920	1930
Cement	146	314	4,682	6,700	11,242		.....	3,126	3,338	7,574
Clay	690	753	2,714	3,407	4,042		591	2,109	2,709	2,500
Glass	.....	.....	2,037	2,133	.....		.....	1,365	1,527	.....
Zinc	963	5,790	10,857	6,038	6,941		1,111	1,980	1,374	2,198
Total of four industries ..	1,799	6,857	20,290	18,278	22,225		1,702	8,580	8,948	12,272
Milling	17,420	21,927	68,476	206,881	121,366		3,198	8,037	24,557	24,420
Meat packing	44,593	76,829	165,361	427,663	273,587		9,503	17,715	39,804	33,100
Dairy products	920	3,653	6,071	24,444	34,580		591	1,120	3,288	7,245
Total of three industries	62,933	102,409	239,908	658,988	429,533		13,292	26,872	67,649	64,765
Railroad shops, foundries, machine shops	6,401	9,621	17,112	43,254	42,662		5,109	8,859	25,949	25,047
Petroleum refining	.....	.....	.....	63,786	98,329		.....	.....	12,450	32,285
Total of nine industries ..	71,133	118,887	277,310	784,306	592,749		20,103	44,311	114,996	134,369
All Kansas industries	110,219	172,129	325,104	913,667	751,613		30,000	66,220	163,579	205,377

SOURCE: Federal Census. Manufacturing, above dates.
* No data available for 1890.

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