

KANSAS INDUSTRIAL POTENTIAL

by

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INTRODUCTION

Purpose

The purpose of this study is to secure insight into the economic future of Kansas particularly with respect to the possibilities for expansion of its manufacturing industries.

The people of Kansas and many of its agencies, in recent years, have shown a continued and intense desire to diversify their economy by developing additional industries and thus reducing their reliance upon agriculture as their chief basic industry. The Kansas Industrial Development Commission, the Kansas Engineering Experiment Station, State and local Chambers of Commerce and other agencies are attempting to assist the people of Kansas in their efforts to develop their industrial potential.

The author's thesis is that Kansas is capable of continuing, and perhaps accelerating, the unusually large rate of growth which has occurred in its manufacturing industries since 1940. In this study the present situation in Kansas with respect to markets, resources, labor, transportation, and other factors is analyzed for the purpose of ascertaining the actual capacity of Kansas as an area to sustain a continued rate of growth in manufacturing industries and revealing some of the more specific lines of activity which show the most promise of contributing to industrial expansion in Kansas.

Method of Procedure

An intensive search has been made over several years' time to determine what literature is available on the subject of past, present, and potential industry in Kansas. Also an attempt has been made to determine what kind of information is available on this subject in other States.

Statistical publications by the U. S. Government and by the various State agencies have been examined to determine what information is available from these sources.

Three formal surveys have been made by the author among persons now engaged in operating or managing manufacturing industries in Kansas. Numerous conversations have also been carried on with owners and managers of Kansas industrial firms. It was felt that these were the people who had the best personal knowledge of the factors and problems involved in the location, operation, and management of industry in Kansas.

The first of these formal surveys was conducted in the summer of 1952 for the Kansas City, Kansas Chamber of Commerce and covered wages in the Kansas City, Kansas area. The findings of this survey were contained in Kansas City, Kansas, A Summary of Wage Survey, August 1952 (Clifton, 6) released by the Kansas Engineering Experiment Station.

Another survey in the summer of 1953 dealt primarily with locating factors. Part of the information obtained has been

reported in Factors Affecting Industrial Location, Kansas Engineering Experiment Station Circular No. 6, March 1954 (Clifton, 5).

In the summer of 1955 a survey was conducted which was primarily designed to obtain an inventory of the capacity of Kansas firms to handle subcontracts for machine work. The conclusions from this survey have not yet been published.

Information obtained on these surveys and from other conversations with Kansas industrialists form the basis for many statements in this report.

Review of Literature

The aroused interest of the people of Kansas in the subject of industrialization in recent years has resulted in the publication of considerable information. Yet there is still much information to be accumulated concerning the potential of the State of Kansas as an area.

The Kansas Industrial Development Commission, the Kansas Engineering Experiment Station, State and local Chambers of Commerce and other agencies have extensively catalogued the economic and social factors of the entire State and many cities.

Probably the most exhaustive study made of the industrial potential of Kansas as a whole was done by the Midwest Research Institute, Kansas City, Missouri, for the Kansas Industrial Development Commission. Their final technical report entitled A Survey for the Development of the Industrial Potential of

Kansas (15) contains much data and information which has been used in the preparation of this report.

INDUSTRIAL TRENDS IN KANSAS

Industrial Growth in Kansas

Kansas has long been considered to be preponderantly an agricultural state. However, because of the changing economic conditions in the eastern portion of the United States, modern farming techniques which release labor for other activities, and the fact that Kansas is especially suited for certain types of industry, there has been a steady increase in industrial growth since the year 1940.

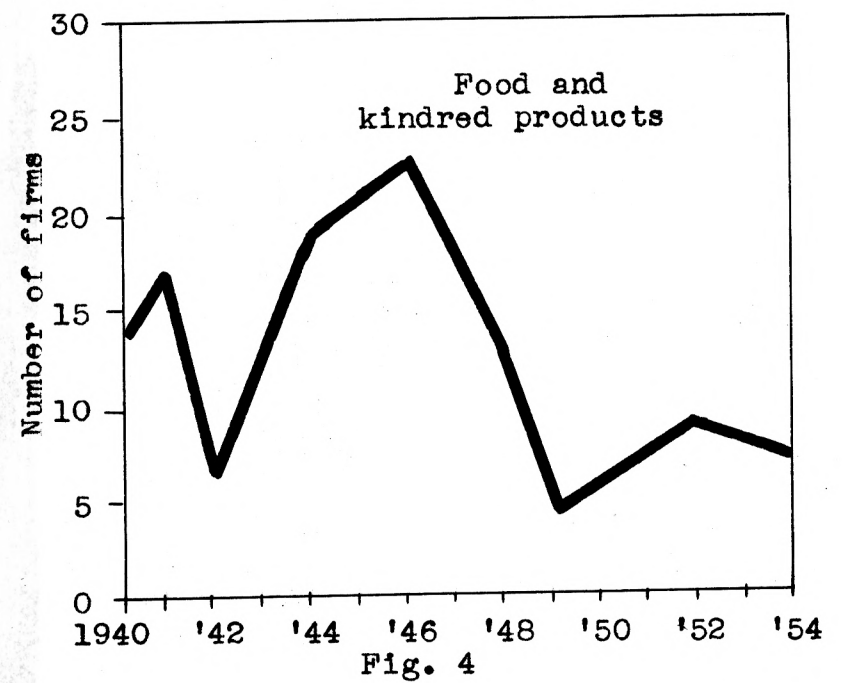
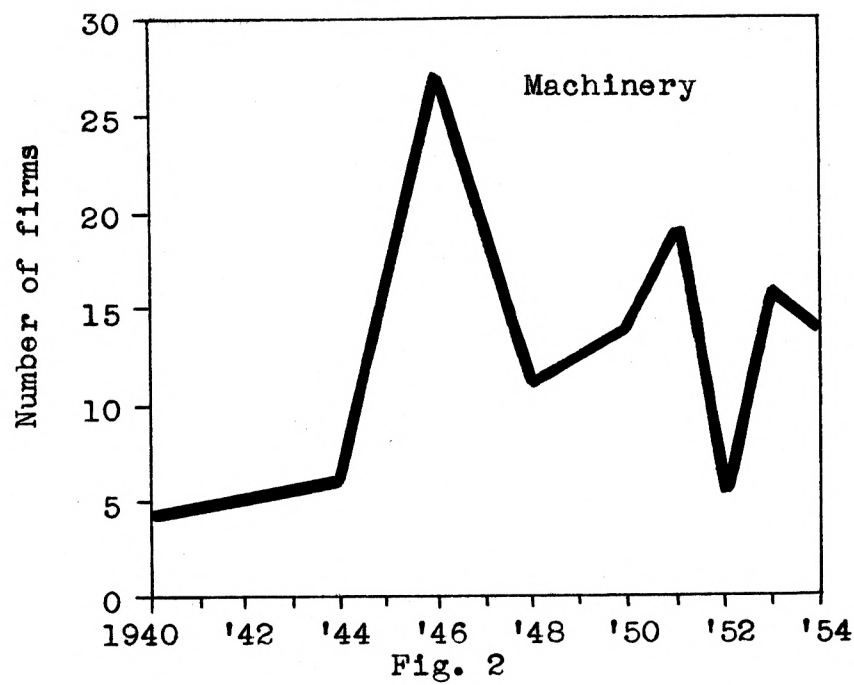
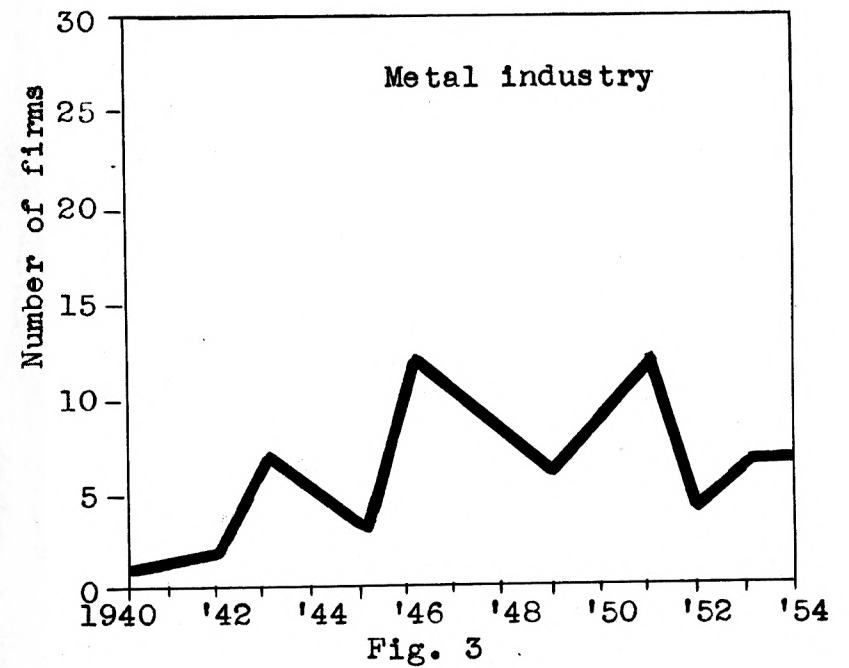
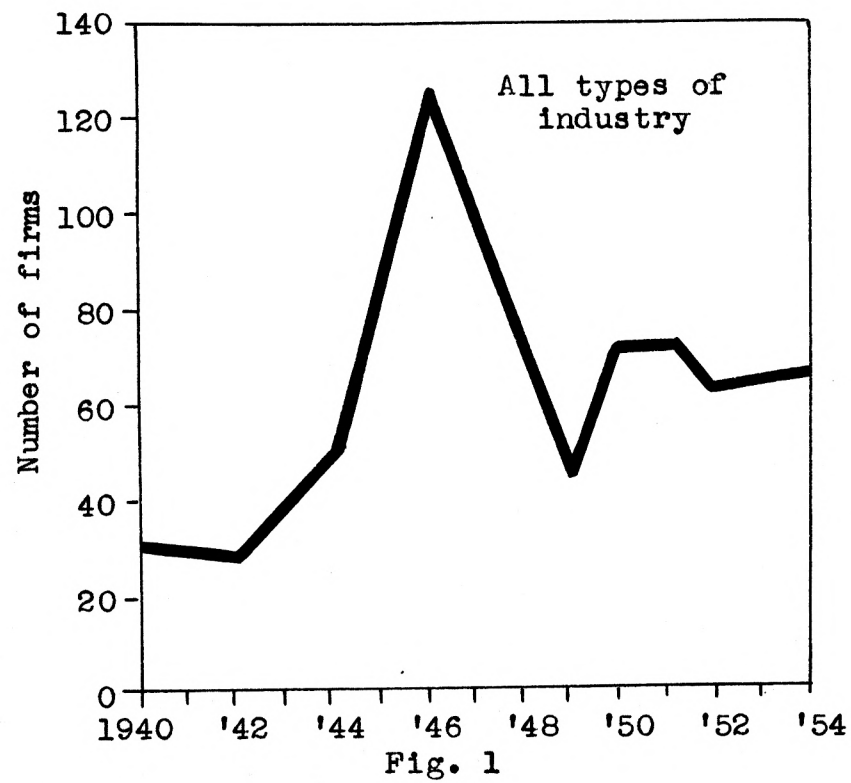
While industrial growth in terms of the number of firms starting has been constant since 1940, it may be seen from Fig. 1 that there were two main peaks. One occurred in 1946 and one in 1951. The growth from 1940 to 1945 was stimulated by World War II, and the peak occurring in 1951 was, doubtless, stimulated by the Korean War. The continued growth from 1945 to the 1946 peak was probably brought about by postwar possibilities for durable goods.

Also, it is shown in Figs. 2 and 3 that the growth of the machinery industry and the metal industry followed rather closely the pattern of all industry while the decline in the growth rate of food and allied products (Fig. 4) after 1946 was much greater and did not show a very significant recovery with the advent of the Korean War. This indicates to some

EXPLANATION OF PLATE I

- Fig. 1. Number of manufacturing firms starting in Kansas, all types of industry, 1940-1953.
- Fig. 2. Number of manufacturing firms starting in Kansas, machinery industry, 1940-1953.
- Fig. 3. Number of manufacturing firms starting in Kansas, metal industry, 1940-1953.
- Fig. 4. Number of manufacturing firms starting in Kansas, food and kindred products industry, 1940-1953.

PLATE I



extent that the most significant field of industrial growth was in the metal goods and machinery industries. Other industrial fields such as transportation equipment, chemicals, wearing apparel, and wood products show a decline in growth rate very similar to that of food and kindred products.

Quite naturally, all firms starting in the period since 1940 have not remained in business. A publication by Fisher (9) in 1954 indicated that the drop-out percentage for all new Kansas industries was somewhat lower than the national average which is about 24 percent. As may be seen in Table 1, made up from the data in Fisher's report and subsequent information from the Kansas Industrial Development Commission, out of 307 firms starting in the period from 1949 to 1953, 16.3 percent, or 50 firms, discontinued operation. Table 1 also shows that the stability of the firms varied with the size of the firms employee-wise. That is, a smaller percentage of the larger firms went out of business than did the smaller firms. The range was from 9.5 percent for firms with 100 or more employees to 20.1 percent for firms with 10 or less employees. The implication is that firms starting business on a larger scale tend to protect themselves against the many business risks involved more than do the smaller firms. The same point could be made on the basis of money invested.

Besides the drop-out percentage rate there are other indicators of excess capacity. In some specific fields of industry more firms are in operation than the market will

Table 1. Drop-out rate of manufacturing firms starting operations, 1949-1953.

Size of firm (No. of employees)	No. of firms starting operations (Responding firms)	No. of drop-outs	Drop-out rate Percent
Less than 10	164	33	20.1
10 to 24	86	11	12.8
25 to 99	36	4	11.1
100 or more	21	2	9.5
Total	307	50	16.3

Source: Fisher, Walter D., The New Manufacturing Industries of Kansas, Kansas Engineering Experiment Station Bul. No. 73, August 1954, p. 6.

support. This fact was disclosed in the author's partial survey in the summer of 1955, the results of which will be published later. The city of Wichita alone had in the neighborhood of 50 independent machine shops, ranging in size from 2 to over 100 employees, that were established for the sole purpose of doing job-order or contract machining, the intent being to catch the over-flow parts and tool work from the aircraft companies plus what farmed-out and miscellaneous jobs might be available from other sources. As of July 1955, approximately 90 percent of these shops were working at 50 percent capacity or less.

While no numerical data have been prepared, it appears that there is an overcrowded situation in connection with the manufacture of many farm equipment items. There is a strong tendency for manufacturers in this field to jump onto every idea for a new item that some other manufacturer brings out. Then new operators starting up, usually small, tend to jump into an already overcrowded field, as it relates to a specific item, believing that they can produce and market the item at a cost that will insure a satisfactory portion of the market. As a result a large portion of the field of farm equipment appears to be overcrowded.

Financial Climate

Paralleling the growth of industry in Kansas is the improved situation of financial aid, especially to smaller firms.

Prior to 1940, there is no evidence of financial planning of aid to new industry, but largely through the efforts of the Kansas Chambers of Commerce and the Kansas Industrial Development Commission, the picture has become vastly improved.

According to data taken from the publication The Community Development Corporation in Kansas by the Bureau of Business Research, University of Kansas (18), there are 22 Kansas cities which have established an Industrial Development Corporation for the principal purpose of aiding new industry. This publication cites many specific instances in which these corporations have made it possible for some new firms to get started and others to move into the State. This represents 10 percent of the nation's total number of industrial development corporations known to exist at the time.

The study made by the author in the summer of 1953 (Clifton, 5) disclosed that of 72 firms covered, 32, or 44 percent, received some form of financial aid. It is realized that the firms covered constitute a very small segment of Kansas industry; however, the study was well spread as to type of industry and geography. It was found (Fig. 5) that 10 concerns were aided financially by industrial commissions or industrial development corporations. Eight other concerns were aided in obtaining their original capital by personal loans from local banks, and two were aided by the investment of insurance companies or individuals in buildings needed for the enterprises. Also, twelve others were assisted by the provision of buildings and






Type of aid	:Number: : of : : firms:	Percentage of 72 firms studied
All types disclosed	32	 44.4
Industrial commissions or industrial corporations	10	 13.9
Personal bank loans	8	 11.1
Insurance companies or individuals (provision of buildings)	2	 2.8
City provision of buildings and grounds	12	 16.6

Fig. 5. Kansas manufacturing firms receiving financial aid in getting started, as reported to the author in 1953 survey covering 72 firms having been in business from 1 to over 30 years.

grounds at nominal rents by the cities in which they chose to operate. In most cases, the properties provided by the cities were inactivated airfields. In a very few cases, cities made tax concessions of some sort, either tax exemption for a short period or light assessment.

Since this study was not aimed at disclosing financial information for other than reasons affecting plant location, the financing arrangements of many plants were not revealed. However, it was felt that a much higher percentage of firms received the kind of financial aid mentioned in getting started than was disclosed.

OWNERSHIP

While the data at hand give no real basis for such a conclusion, they do suggest that the advantages of the corporate form of enterprise in Kansas outweigh the advantages of single proprietorship or partnership since a preponderance of Kansas firms are incorporated regardless of size.

Fisher's study (9), covering about 450 firms which started operations between 1940 and 1953 and which responded to his questionnaires, disclosed, as shown in Fig. 6, that 24 percent were proprietorships, 18 percent were partnerships, while 57 percent were corporations. Forty-two percent of the firms were home office corporations for the most part financed by Kansas capital, while only 15 percent of the firms were subsidiaries of firms for the most part with home offices outside the State and financed from outside the State.

EXPLANATION OF PLATE II

- Fig. 6. Types of organization of Kansas manufacturing firms starting operations, 1940-1953, which responded to Fisher's questionnaires.
- Fig. 7. Types of organization of Kansas manufacturing firms as reported to the author in 1953 survey covering 72 firms having been in business from 1 to over 30 years.

PLATE II





Type of organization	:	Percent of 450 responding firms
Proprietorships		24
Partnerships		18
Corporations - Home		42
Corporations - Subsidiary		15

Fig. 6





Type of organization	:	Percent of 72 firms covered
Proprietorships		25
Partnerships		11
Corporations - Home		40
Corporations - Subsidiary		24

Fig. 7

Information from the author's study of 1953 (Clifton, 5) relative to locating factors, as shown in Fig. 7, does not agree exactly with Fisher's findings, but this probably could be explained by the fact that this study covered only 72 firms and the years in business ranged from 1 to over 25. Figure 7 shows that 64 percent of the firms were incorporated with 40 percent being home office firms and 24 percent subsidiaries. Twenty-five percent of the firms were proprietorships and 11 percent partnerships. However, a rather close parallel may be seen for the two sets of data.

INDUSTRIAL OPPORTUNITY

Midwest Research Institute of Kansas City, Missouri, in its 1953 survey (15) for the Kansas Industrial Development Commission studied 450 industries producing goods consumed in Kansas. Of those studied, there were 225 industries in which consumption by Kansas residents exceeded production of those goods by Kansas firms. This excess of consumption over production of goods in a given area is commonly referred to as a "deficit" for that area.

Fifty-seven industries showed an annual deficit of over 4 million dollars. These industries are listed in the Appendix.

When consideration was given to the need for huge production facilities, the availability of basic materials, the presence of large production facilities in bordering States and other location factors, 19 industries were found to have major opportunities in the Kansas area. Among these 19 were

a few industries such as steel and textile for which some locating factors are not quite suitable. But when considering the market and other advantages, great opportunity exists for specialized producers within the industries.

Fig. 8 shows deficits and production in the six State area of Arkansas, Oklahoma, Colorado, Nebraska, Missouri, and Iowa in the 19 industries said by Midwest Research Institute (15) to have major opportunities in Kansas. Fig. 9 shows deficits and production in the Kansas area for the same industries. Fig. 9 also shows the number of employees that the deficit represented in terms of the relation of total national production to total number of employees engaged in these industries. The industries are listed in Figs. 8 and 9 in the order of the size of deficit for Kansas.

The following analysis, by major industrial groups, of the 19 industries having major opportunities in Kansas is largely based upon the findings of the Midwest Research Institute.

Nondurable Manufactures

Canning and Preserving Food. The canning and preservation of food industry would have great possibilities in Kansas if more vegetables were grown in the State. The river and creek bottoms of the eastern third of Kansas are especially suited to the production of vegetables, and at one time a considerable amount of vegetables were grown in this area. But

Industry	:	Millions of dollars	:	Employee equivalent
1. Apparel	Deficit			
	Production	50	118	14,000
2. Steel works and rolling mills	Deficit		77	5,000
	Production	Negligible		
3. Cotton and rayon textiles	Deficit	49		7,000
	Production	1		
4. Paper and paper board	Deficit	42		2,200
	Production	6		
5. Canning and preserving food	Deficit	22		1,800
	Production	1.5		
6. Wood household furniture	Deficit	18.5		1,300
	Production	4		
7. Sheet metal stampings	Deficit	17		2,200
	Production	2		
8. Insulated wire and cable	Deficit	15		1,000
	Production	1.8		
9. Radios and re- lated products	Deficit	13.1		1,600
	Production	6.7		
10. Aluminum rolling and drawing	Deficit	12		900
	Production	0		
11. Drugs and medicines	Deficit	8.5		600
	Production	10.3		
12. Nuts, bolts and washers	Deficit	8		850
	Production	1		
13. Valves and fittings	Deficit	7		850
	Production	Negligible		
14. Telephone and telegraph equip.	Deficit	6		650
	Production	1		
15. Perfumes and cosmetics	Deficit	5.5		230
	Production	2		
16. Iron and steel forgings	Deficit	4.9		500
	Production	3.9		
17. Ball and roller bearings	Deficit	4.9		500
	Production	Negligible		
18. Mechanical power transmission	Deficit	4.4		460
	Production	0.8		
19. Metal working machinery	Deficit	4.2		300
	Production	0		
Total				42,360

Fig. 9. Kansas deficit and production for 19 industries with major opportunities in Kansas, 1953.

because of a larger income being obtainable from grain farming, vegetable production has fallen off greatly since 1940. However, a program to develop the canning industry in the State could change this situation.

Though fresh vegetables have been replaced at the grocers by frozen food to a large extent, canned foods have not suffered. In fact, national production has increased 30 percent since World War II. New techniques in food preservation, including frozen canned goods, have tended to insure continued use of canning processes.

Kansas had a deficit of 22 million dollars with only a token amount of production, which represented 1,800 employees. Also, the surrounding six State area deficit was about 125 million dollars with 53 million dollars production, centered principally in Iowa and Arkansas. The canning industry uses women mostly who desire part time or seasonal work and draws them from surrounding homes.

Cotton and Rayon Textiles. With the growing demand for cotton goods brought about by the development of new cotton textiles, it is expected that cotton goods will soon constitute well over 60 percent of the wearing apparel textiles, and it does not appear that Kansas can capture an appreciable amount of this industry since no cotton is produced in this State. However, with an annual deficit of 49 million dollars, an equivalent of 7,000 employees, it is well worth considering.

Also the deficit in the six State area for 1947 was 239 million dollars with a production of only 23 million dollars and the ratio probably has not changed much.

Even though the center of textile production will probably remain in the eastern and southern sections of the nation, there are possibilities for producers of special fabrics in both cotton and rayon.

Apparel. Despite the large production of wearing apparel in the surrounding States, it was estimated that Kansas had an annual deficit of 118 million dollars in apparel. This deficit if fully exploited would support approximately 14,000 employees.

The principal specialties that made up this deficit were: children's and infant's coats, corsets and allied garments, children's and infant's outerwear, and miscellaneous.

The author's study of 1953 (Clifton, 5) disclosed that there has been considerable movement into Kansas of firms producing women's dresses and suits and workmen's clothes. Kansas has one firm producing high grade children's outerwear for national consumption. The principal reasons given for these moves were to take advantage of labor availability. This industry uses women workers principally, and little training is required. It was found that Kansas homes hold many women who would like to work outside the home but, because of a certain amount of pride, hesitate to take employment which they consider to be beneath their dignity. However, many industrial

jobs, such as sewing for a garment firm, are quite acceptable.

Wood Household Furniture. While this industry has been in a state of growth for many years, there was some indication of a possible decline in some areas. Producers of kitchen cabinets, radio and television cabinets have developed a trend toward built-in wall units that are replacing the cabinet types in much new housing. However, the other categories will continue in growth so long as new housing development continues at a high level.

Market indications are that furniture production is strongly oriented around the market and that producing firms sell but little outside an area of 400 miles. Raw materials are not a major factor apparently, but labor cost is.

The Kansas deficit in household furniture was estimated at 18.5 million dollars with a production of 4 million dollars, the equivalent of 1,300 employees, which makes the industry well worth development consideration.

Paper and Paperboard. The Kansas deficit for this industry was estimated at 42 million dollars, an equivalent of 2,200 employees. The six State area deficit was 144 million dollars with about 45 million dollars production from mills located in this area. Also, Arkansas is a large producer of pulp paper. Kansas itself has a few small mills.

Since paper mills are usually integrated with pulp mills to avoid drying and shipping pulp, it does not appear likely

that Kansas would be suitable for the general field of paper production. However, for writing papers and high grade tissues there are economic advantages in having the mills located near the market which leaves this field open for consideration.

Drugs and Medicine. Because of the increased use and development of antibiotics and vitamins for both pharmaceutical and stock feeding purposes this industry has shown an increase of about 10 percent over the past two decades.

Since high unit prices of these commodities together with seasonal demand make the carrying of large retail stocks inadvisable, there are advantages in having near at hand sources of supply for quick delivery.

Coupled with the production of pharmaceuticals, antibiotics and vitamins is the nuturing of plants for isolating vitamins and the production of other biological materials from natural sources. Also, laboratories are needed for the development of these substances.

The Kansas area had a considerable output of drugs and medicines, about 10.3 million dollars of which was centered principally in Kansas City, but there still remained a deficit of about 8.5 million dollars in 1953, which in employee equivalent is about 600.

Perfumes, Cosmetics, and Other Toilet Preparations. Products of this industry are usually intended for national distribution through retailers, barber shops, and beauty parlors, and therefore do not have to depend on restricted area distribution. While many of these products remain popular for many

years, new products can break into the market if they have appeal and happen to strike the fancy of consumers. There are many duplications in the field, and products differ only by a single ingredient because complete patentability is so limited.

Since major location factors for plants producing these products are central location with respect to national markets, adequate transportation facilities, adequate distribution facilities and adequate labor supply, Kansas appears to be splendidly situated for this industry.

Though employment has remained static, the industry has grown rapidly over the past 15 years. The Kansas deficit was 5.5 million dollars, an equivalent of about 230 employees.

Primary Metal Industries

Steel Works and Rolling Mills. At present most of the steel for fabrication, except structural shapes, is brought into the Kansas area from St. Louis, Chicago, and points further east. The deficit was 77 million dollars for 1953, which represented an employee equivalent of 5,000. This seems to offer a good opportunity for steel works and rolling mills to convert pig iron, scrap iron, and scrap steel into plates, sheets, bar stock, and tubing. There is a steel mill at Pueblo, Colorado, which supplies some steel to Kansas, but the breaking point in freight rates between this point and Eastern points of supply seems to be on a line between Hutchinson and Salina, which

places any point in the central part of the State in a very strategic position in this respect. However, because of the nature of pig iron, it is desirable to eliminate all railroad and truck freight charges possible as well as extra handling. Therefore, with the Missouri River being developed for more dependable and extensive shipping, the eastern part of the Kansas area seems to be the most suitable area for future location of steel works. Shipping traffic on the Missouri River from Kansas City to Sioux City increased from 377,000 short tons in 1947 to 1,647,000 short tons in 1952 (17).

Aluminum Rolling and Drawing. While this industry has had a continuous growth since the early 1930's, its greatest development occurred during World War II and the Korean War because of the stepped up production of aircraft. Present defense production of aircraft has sustained this need for rolled and drawn aluminum. But since there is an increasing demand for strong, light metals in innumerable peacetime products, the growth is expected to continue.

Aluminum drawing and rolling mills are concentrated principally in the eastern third of the country, but the scattered locations of these mills indicate that they are not tied to primary metal producing plants.

The operations involved do require considerable skill; however, this skill could be developed readily among Kansas workers.

The nearest rolling and drawing mill is located at Davenport, Iowa, which leaves Kansas open for production to fill its own deficit plus much of the deficit in the six State area, and doubtless much of the aluminum being used by its own aircraft industry would be supplied by facilities within the State.

The Kansas deficit for 1953 was 12 million dollars, which represented about 900 employees.

Iron and Steel Forgings. Growth in this industry has been keeping pace with the engine and machinery industries. The national output for this industry in 1952 was 824 million dollars. The Kansas area has many customers for these products, and the number is increasing. They include industrial machine producers, construction firms, railroads, producers of oilfield machinery, tractor and earth moving equipment producers, and automobile and aircraft manufacturers.

While the Kansas deficit of 4.9 million dollars, an equivalent of 500 employees, was not great, the six State area deficit was 2.9 million dollars with production of only 8 million dollars, which gives Kansas a good opportunity in this field.

Also, according to the Midwest Research Institute (15), 65 percent of the market for these products was located within 200 miles of a producing plant and 95 percent within 400 miles. Firms specialize in products needed by consumers in their area of distribution.

Fabricated Metal Products

Sheet Metal Forming and Stamping. This industry has grown by leaps and bounds in the past two decades because of the new methods of manufacturing, especially in the aircraft, motor vehicle, and home appliance industries.

Though many firms in the industries just cited have sheet metal forming and stamping departments integrated with other production facilities, 40 percent of the nation's production in this field is in independent plants with less than 200 employees. Since the production per worker seems to be about equal regardless of the size of plant, there seems to be no size advantage. This plus the fact that very little operator skill is required in the industry makes for considerable location flexibility.

Nuts, Bolts, Rivets, and Washers. This industry has had a continuous and rapid growth for over 25 years because of increased production in all metal products but principally because of increased automobiles, aircraft, agricultural equipment, and earth moving equipment. While the industry continues to grow, there has been a slackening off in the growth rate since 1947.

The 1953 deficit for Kansas was estimated at 8 million dollars, an equivalent of 850 employees, and the six State area deficit for 1947 was 29 million dollars, which indicates that this might be a good industry for Kansas.

On the other hand, a partial survey conducted by the author in the summer of 1955 relative to machining facilities disclosed that at that period, there were many idle machines scattered among the numerous machine shops that could have taken care of any need for this type of production. One fair sized screw machine company in Wichita which is capable of around 150 operators on three shifts was working at about 30 percent capacity. Therefore, the real deficit as far as machining facilities are concerned is difficult to determine.

Machinery

Metal Working Machinery (Except Machine Tools). This industry, which includes all metal shaping and forming tools except machine tools requiring a cutting tool, for many years was dominated by a relatively few large firms, but of recent years has been invaded to quite an extent by many small firms. In fact, 28 percent of the national production was by firms with less than 100 employees. And some foreign products of this nature have been entering the country. Distribution is on a national basis, but new firms might find their principal market within a radius of perhaps 400 miles because of the desire of purchasers to reduce shipping costs.

Kansas has many firms using this type of equipment and should offer a good opportunity for this industry.

Mechanical Power Transmission. Kansas should offer good opportunity for this industry since consumers are industries in the general machinery field and are all growth industries.

The principal location factors seem to be nearness to market and an adequate supply of skilled and semi-skilled labor which this State can supply.

Valves and Fittings. This industry has shown considerable growth since 1940. In fact, it has just about doubled. It has increased about 10 percent in employment since 1947. This was brought about by the increases in aircraft construction, chemical, crude oil and natural gas production and the production of heating, cooling and cooking equipment.

While valve and valve fitting production is not complex or difficult, it has been concentrated in a few large and well known firms. All but about 10 percent of the national output is concentrated in these large firms.

The Kansas deficit for 1953 was 7 million dollars, the equivalent of about 850 employees with negligible production.

Ball and Roller Bearings. This industry is concentrated relative to production in a few large firms with firmly established reputations. However, there are many small firms with less than 100 employees. A young company in Salina specializes in ball bearings, constructed with purchased balls and has a large clientele among Kansas producers of agricultural and other equipment.

Though Kansas industry offers a good market for these products, it had negligible production and a deficit of 4.9 million dollars. The six State area had a deficit of 15

million dollars with a production of 800 thousand dollars. The Kansas deficit of 4.9 million dollars represented about 500 employees.

Insulated Wire and Cable. Like sheet metal forming and stamping, wire and cable insulating is often integrated with subsequent production operations. In this case the operation applies to large electrical manufacturing firms. However, with the ever growing increase of smaller operators in the field of electrical equipment and appliances, there is a growing need for independent insulated wire and cable producers. Also, building construction and aircraft production serve to increase the need.

Usually, insulated wire and cable is produced from purchased wire, since wire drawing is a specialized field and a considerable amount is produced in firms with under 100 employees.

This industry is not tied to raw material supply to any great extent and can easily be market oriented. While the processes do require some operator skill, mostly of a dexterity nature, they are highly automatized and in the case of small gage magnet wire are controlled by women.

The Kansas deficit was estimated at 15 million dollars, which was the equivalent of 1,000 employees.

Radio and Related Products. This industry has been in a state of constant growth since 1940 and the growth since World War II has been phenomenal because of pent-up demand brought about by military production. Television has served to create

a greater demand in the electronics field. Also, with the trend toward more electronic devices in defense equipment, electronic controls in manufacturing, electronic business machines, and with the many miscellaneous electronic devices being developed, there is little doubt but that the industry will continue to grow.

The Kansas deficit for 1953 was estimated at 13 million dollars, the equivalent of 1,600 employees, but the installation of a large plant in Kansas City has tended to fill this deficit to a large extent. However, this industry is growing rapidly with no indication of a slackening off in new development so that its future still looks especially bright.

Telephone and Telegraph Equipment. Since a preponderance of the production of conventional telephone and telegraph equipment is concentrated in one large plant located at Chicago, with however considerable amounts being produced in Minneapolis and even in the six State area, it appears that the best production opportunity in this field lies in the production of special equipment such as automatic receivers and speakers, telegraph converters, and specialties of this nature. However, there are numerous independent telephone exchanges in operation in Kansas, especially in rural areas, and this situation is not likely to change for some years to come.

The Kansas deficit for 1953 was 6 million dollars with 1 million dollars production. This represented about 650 employees. However, for 1947, the six State area deficit was

only 11 million dollars with 17 million dollars production, which eliminates out-of-State markets to a large extent.

There are numerous other industries that might have been added to the 19 chosen as having major opportunities were it not for certain production factors that may make Kansas impractical for location. Among these are the production of cigarettes, distilled malt liquors, woolen and worsted fabrics, sugar refining, planing and sawing mills, and others.

Then there are many other smaller industries, having deficits ranging from 4 million dollars to 100 thousand dollars annually, which have opportunity in Kansas. Many of them are expanding locally at present. Among these are producers of oleomargarine, prepared animal feeds, plastic materials, fertilizers, flat glass and blown glass.

RESOURCES

Mineral Resources

The growth of mineral industries in Kansas during the period of 1940 to 1953 was truly remarkable. As shown in Fig. 10, mineral production, as estimated by the Kansas Geological Survey, increased from 102 million dollars, in 1940 to about 430 million dollars in 1953, an increase of 328 million dollars over the 13 year period (Midwest Research Institute, 15). In 1950 with a production of 377 million dollars, Kansas ranked ninth among the states in the nation in mineral production. This amounted to 3.11 percent of the national

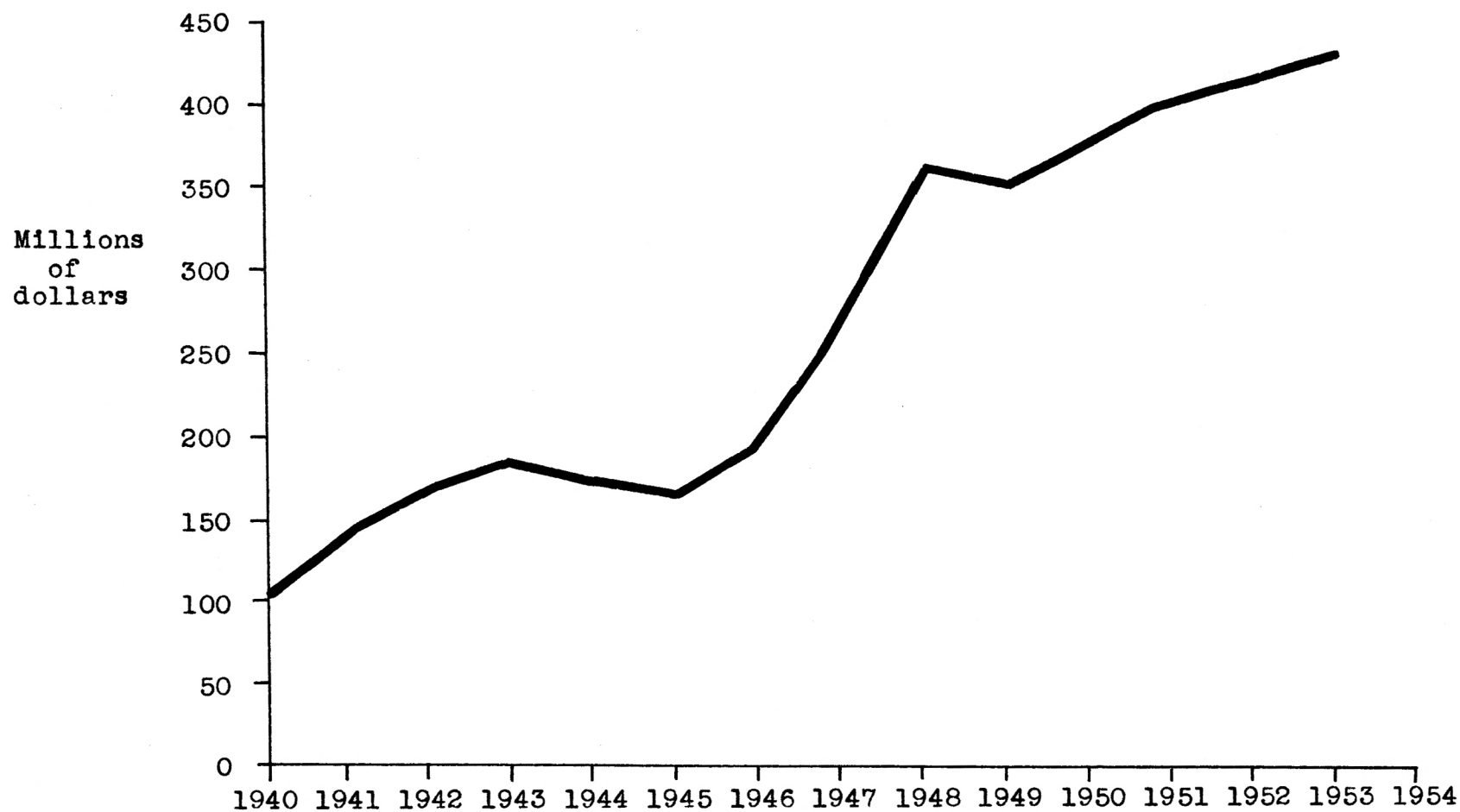


Fig. 10. Value of annual mineral production in Kansas, 1940 to 1953.

Source: Estimates by the Kansas Geological Survey, 1954.

output. Crude petroleum is by far the most important mineral product with an estimated production in 1953 of 430 million dollars or 72 percent of the State's total mineral output. Table 2 shows the production of the most important Kansas minerals as compared to total national production. Fig. 11 shows Kansas mineral production in percent of the total State production.

It was estimated that mineral fuels comprised 35 percent of the Kansas mineral production in 1953. These fuels consisted of crude petroleum, natural gas, natural gasoline and LPG and coal. Crude petroleum and natural gas accounted for 95 percent of the fuel production. In 1954 it was predicted that slight increases in crude petroleum and natural gas would occur in the next five to ten years, but current publicity indicates that crude petroleum production will be limited by government regulation.

Coal production in Kansas has been declining for the past several years as it has all over the nation and probably will continue in that direction. Kansas coal reserves were estimated to be 18 billion tons in 1950, a 9,000 year supply.

Almost unlimited supplies for the manufacture of Portland cement are available in Kansas, and there has been an annual increase in production every year since World War II except in 1949.

In 1953, the cement industry was considered to be the second most important mineral industry in Kansas with a production

Table 2. Value of mineral production for Kansas and the United States, 1953.

Product	: Kansas value : of production : in million dollars	: U. S. value : of production : in million dollars
Crude petroleum	310	6,369
Natural gas	37	716
Portland cement	21	700
Stone	16	300
Natural gas liquids	12	No estimate
Clay	8.5	No estimate
Salt	7.5	71
Bituminous coal	6.5	2,241
Sand and gravel	5	450
Zinc	2.5	118
Lead	1	90
Miscellaneous (including gypsum and all others for Kansas, gypsum only for the U. S.)	3	24

Source: Midwest Research Institute, A Survey for the Development of the Industrial Potential of Kansas, Book III, Kansas City, Mo.: Midwest Research Institute, June 1954, p. 327.

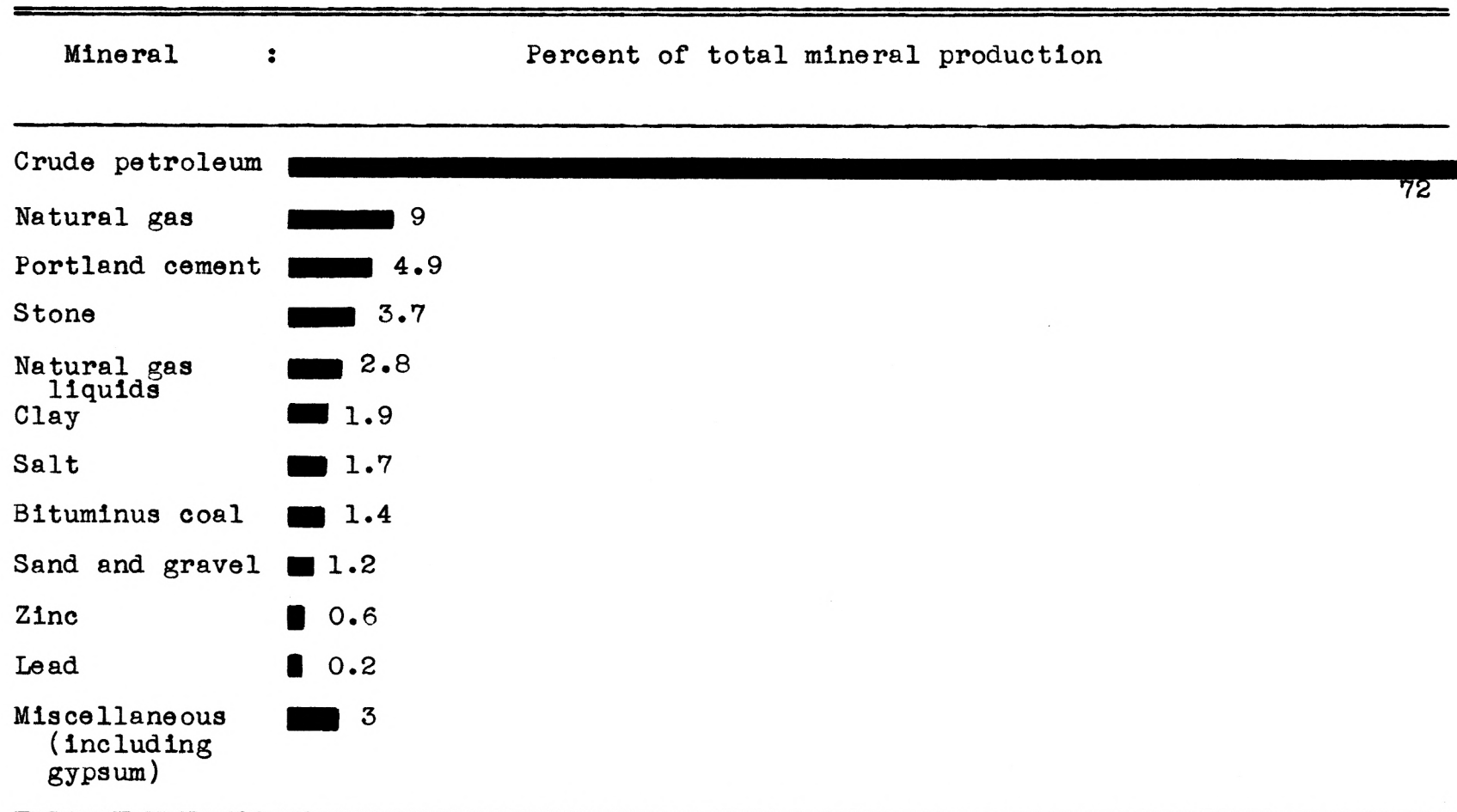


Fig. 11. Kansas mineral production in percent of total, 1953.

of nearly 50 percent of the total mineral income for the State.

Since building, road, dam, and other construction is on an upward trend, it is almost certain that cement production will continue to increase. However, the increased production will probably occur in existing plants.

The metallic ores industry, of which lead and zinc are the most significant, is not especially important in Kansas in terms of total mineral income. All metallic ore production amounted to only about 2 percent of total mineral income in 1953, of which 0.9 percent was lead and zinc.

Like Portland cement, stone production parallels construction trends and is expected to increase for the next five to ten years. Also raw material sources are almost unlimited. This industry ranked fourth in 1953 with a production of 3.7 percent of total mineral income. In the same category are clay and sand and gravel with a combined percentage of 3.1 percent of the total State mineral income.

Large reserves of salt exist in Kansas, but very little increased production is expected unless chemical plants using salt come into existence in the State area.

Salt production in Kansas is quite significant in terms of tons. Its production amounted to 912 thousand tons (Midwest Research Institute, 15) in 1952 or about 5 percent of the national production for that year. However, in terms of income, it amounted to only about 1.5 percent of the total State mineral income.

Beside salt, many raw materials are available in the State for the chemical industry. Among these are limestone fillers and filters, agricultural lime, and gypsum. Many chemicals require a filler as a vehicle for the active ingredients, and of these Kansas has a plentiful supply. A list of these may be found in Table 3. At present, the only material being mined for its value as a filler is the diatomaceous marl of Wallace County.

In addition to minerals needed in the chemical industry there are the by-products of natural gas and petroleum, and their importance is increasing. However, it is doubtful if Kansas can secure a very important position in the petrochemical field since the center of this industry is located on the Texas Gulf Coast with facilities capable of dominating the field.

Water Resources

Contrary to popular belief, Kansas is well supplied with water to meet industrial demands. In fact, the eastern cities have water available from the Kansas and Missouri Rivers far in excess of industrial demands. These rivers supply the municipal requirements of many eastern cities as well. Also, a considerable amount of impounded water is available in the eastern part of the State.

In addition to surface water, cities in the eastern half of the State which are situated in the Missouri, Kansas, and Arkansas Valleys have access to groundwater in excess of 500

Table 3. Mineral fillers available in Kansas.

Mineral filler
Carbon black
Clays
Kaolin
Bentonite
Limestone
Dolomite
Crystalline silica
Sand
Sandstone
Tripoli
Diatomaceous marl
Portland cement
Gypsum
Volcanic ash
Stone (other than limestone and sandstone)
Shale
Loess
Granular industrial wastes

Source: Midwest Research Institute, A Survey for the Development of the Industrial Potential of Kansas, Book III, Kansas City, Mo.: Midwest Research Institute, June 1954, p. 400.

gallons per minute from shallow wells (Fig. 12), this flow being based on the placement of one well to a very limited area. Spreading out the placement of wells would increase the per minute flow of wells.

Western Kansas is deficient in surface water, having only two cities, Medicine Lodge and Russell, obtaining water from surface sources, but over 50 percent of the western half of the State has ground water available in excess of 500 gallons per minute.

Generally speaking, ground water in Kansas is relatively free of impurities and in many cities is distributed without treatment. The temperature ranges from 56 degrees to 58 degrees Fahrenheit in northern Kansas and from 58 degrees to 60 degrees Fahrenheit in southern Kansas.

While water resources over the years have proven to be very dependable during normal periods, it should be pointed out that during occasional extended droughts, such as that experienced from 1952 to 1955, total municipal and industrial needs for water have resulted in occasional restrictions on its use.

The Wichita area in recent years has had water difficulties caused by consumption of water supplies at a faster rate than they can be replenished during a drought period.

It should also be pointed out, however, that the water problem is not confined to Kansas. Increased urbanization and

industrialization have made the conservation of water resources a national problem.

LABOR

Availability

While the civilian population in Kansas increased 9.3 percent from 1,781,300 in 1940 to 1,946,200 in 1952, the civilian labor force increased 23.8 percent in the same period, or from 661,200 to 818,500 (Yohe, 21) as shown in Fig. 13. Since there were 75,400 unemployed in 1940 compared to only 14,650 in 1952, the percentage increase in those actually employed was 37.2 percent, or from 585,800 to 803,850 in the same period.

Those employed in agriculture, forestry and fishing decreased from 186,300 in 1940 to 173,250 in 1952 with the result that the increase in those employed in nonagricultural industries showed an even more significant increase as shown in Fig. 14.

The estimated number of employees in nonagricultural industries in Kansas, as shown in Table 4, increases 78.1 percent from 304.3 thousand in 1940 to 542.1 thousand in 1954. The breakdown of these figures indicates that the largest increase in numbers occurred in manufacturing industries with an increase of 83 thousand workers of 167.7 percent. When this increase is compared with the percentage increase in the civilian population and civilian labor force, it represents quite a

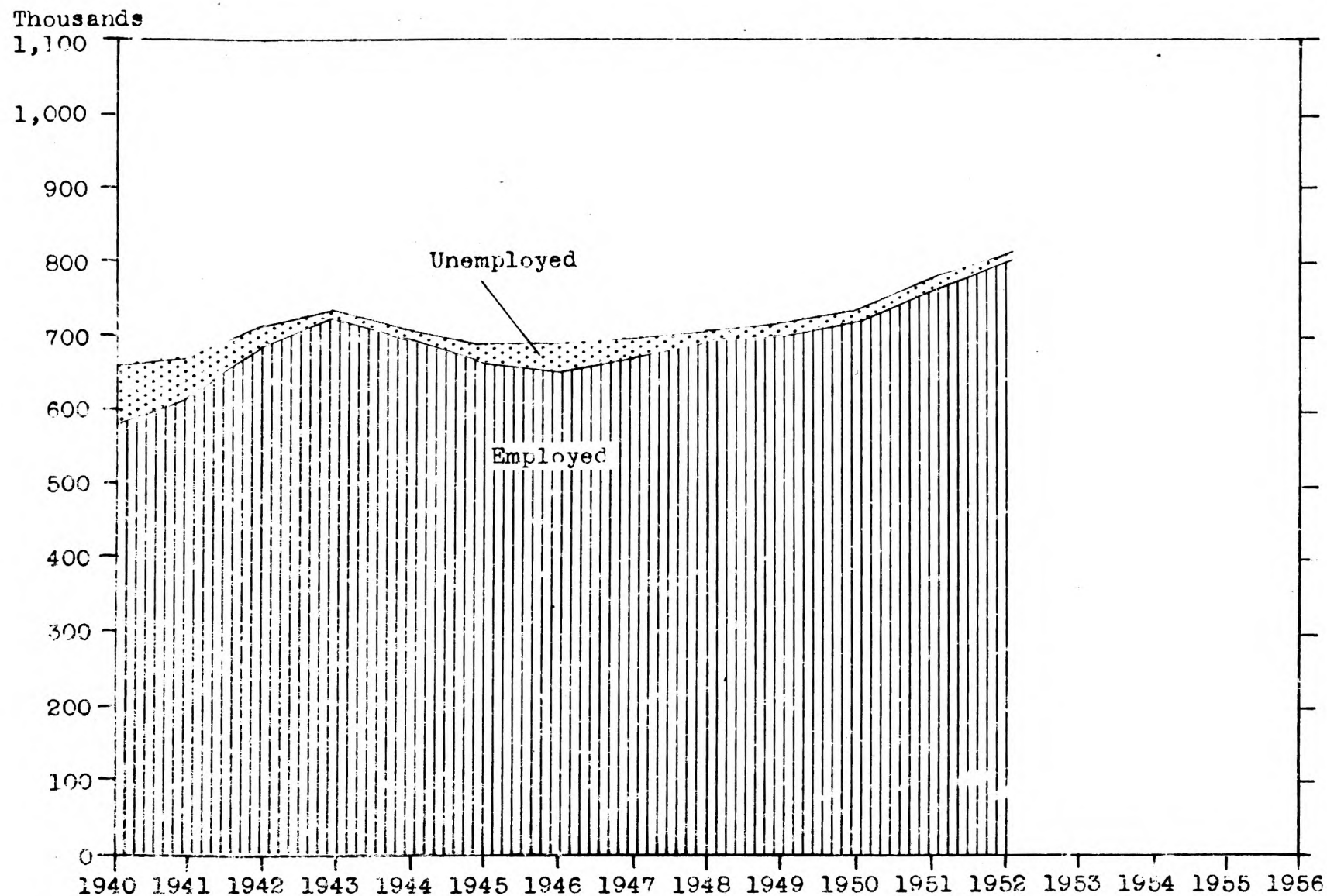


Fig. 13. Estimated labor force, Kansas, 1940-1952.

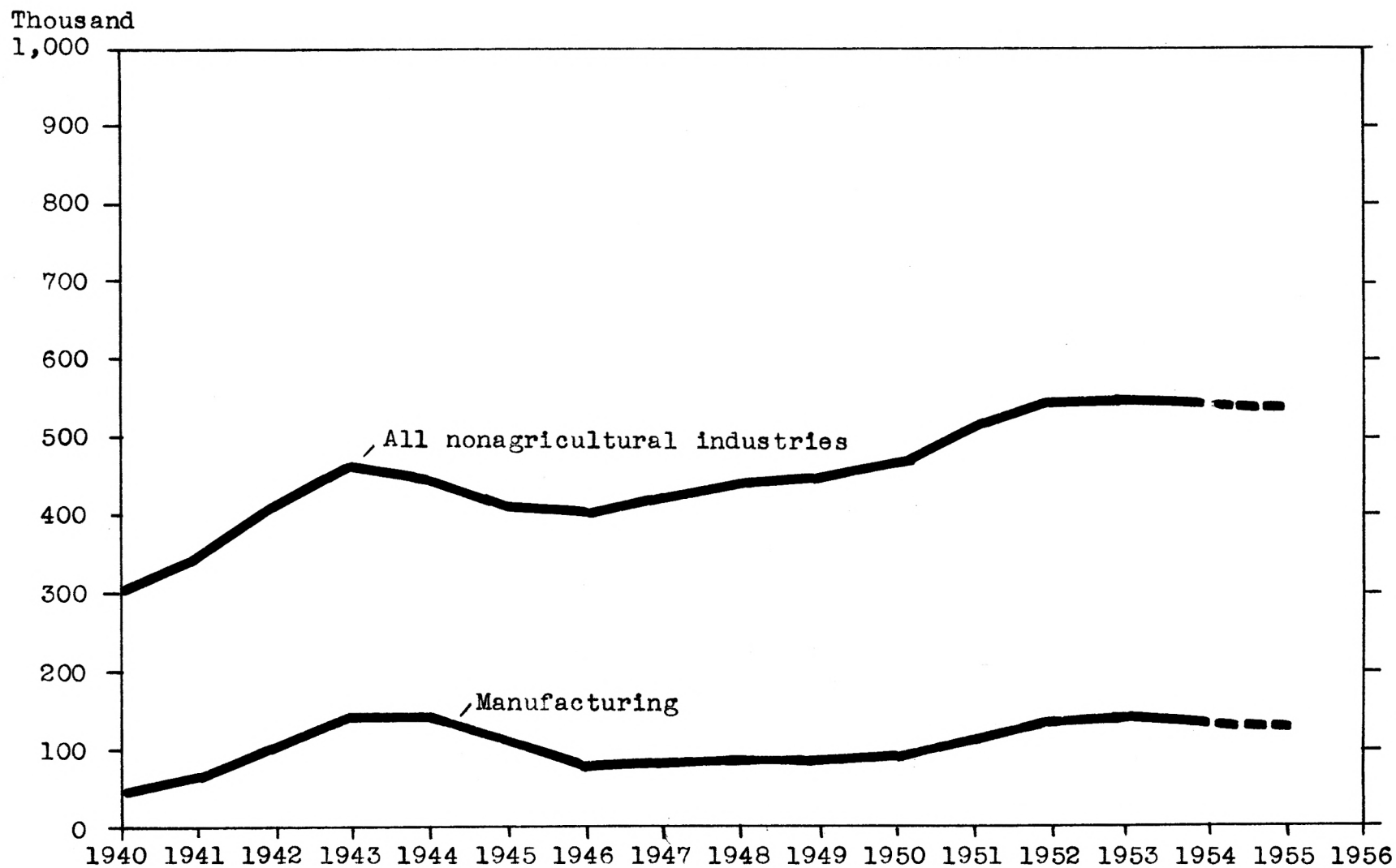


Fig. 14. Estimated number of employees in nonagricultural industries in Kansas, 1940-1955.

Table 4. Estimated number of employees in nonagricultural industries in Kansas, 1940 and 1954.

Industry	: : 1940 :	: : 1954 :	: : Percent : increase : Percent
	<u>Thousands</u>	<u>Thousands</u>	<u>Percent</u>
Manufacturing	49.5	132.5	167.7
Mining	16.3	18.5	13.5
Contract construction	11.7	37.5	220.5
Transportation, communication, and other public utilities	41.5	64.4	55.2
Trade	77.3	128.3	66.0
Finance, insurance, and real estate	10.6	18.6	75.5
Service industries	35.1	55.5	58.1
Government	62.3	86.9	39.5
All nonagricultural industries	304.3	542.1	78.1

Source: Kansas Labor and Industrial Bulletin, Kansas Department of Labor, August 1955, 25(8):5.

significant trend toward industrialization in Kansas. This expansion is also reflected in the 220.5 percent increase in contract construction workers from 1940 to 1954.

The increase in the number of employees in manufacturing industries in Kansas is even more significant when it is compared with the rate of growth for the United States.

The percentage increase from 1939 to 1954 in manufacturing employment for the United States was 58.9 percent and for

Kansas in the same period was 184.9 percent (Kansas Industrial Development Commission, 19). Kansas ranked fourth in the nation in this respect. Fig. 15 presenting the comparative rates of growth by States shows that Kansas was one of six States whose increase in manufacturing employment was twice or more than twice that of the national average.

The 19 industries offering major opportunities in Kansas discussed previously in this report under the heading "Industrial Opportunity" showed a deficit equivalent to 42,360 employees. If these were to be added to the 132,500 employees in manufacturing industries in Kansas in 1954, this would constitute a labor force of 174,900 in manufacturing industries.

This increase of 42,360 workers could be achieved by natural increases in the labor force, by immigration of labor from other States, from reductions in the number of unemployed, and from reductions in employees in agriculture. Since unemployment has been at a low rate in recent years, this source seems to offer little opportunity for increasing employment. As industry flows into the State, there most certainly will be some, but probably little, immigration of laborers from other States. The continued population growth and the continued decline in the number of workers needed on the farm would seem to indicate that the growth in the number of employees in manufacturing industries in the last 14 years can be maintained in the future without importation of many laborers and that the

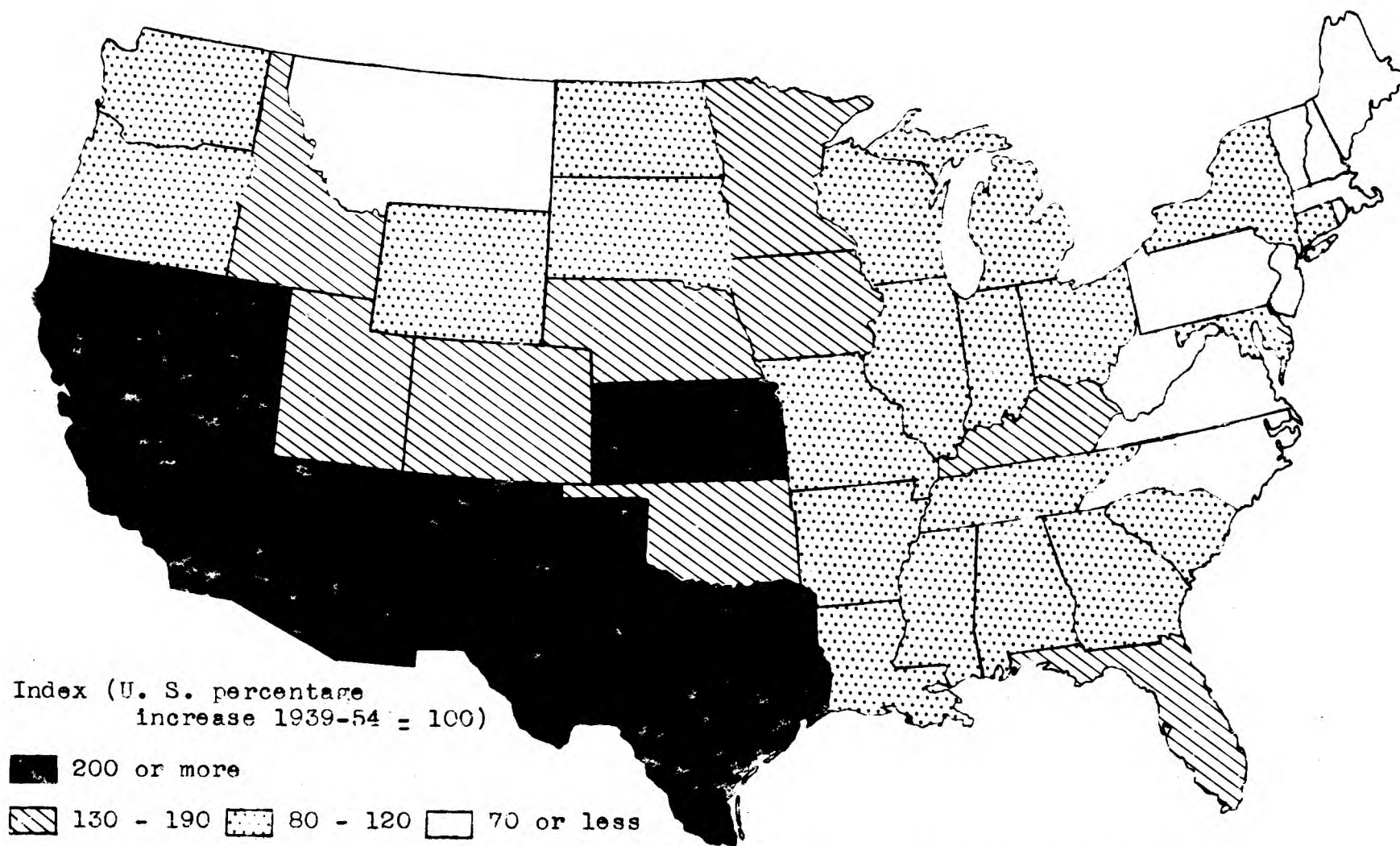


Fig. 15. Index of percentage increase in manufacturing employment, United States, 1939-1954.

increase of 42,360 workers could be accomplished within a relatively short time, perhaps within the next five years.

Wages

An examination of average earnings in manufacturing industries revealed that the same general level of wages tend to prevail in Kansas as in other industrial areas.

In 1953 the average weekly earnings of production workers in manufacturing industries in Kansas was \$74.18, as shown in Table 5. This was higher than for the States of Massachusetts (\$66.60), New York (\$71.12), and Pennsylvania (\$71.38). It was lower than for Illinois (\$76.39), Michigan (\$86.69), and New Jersey (\$74.32).

Average weekly earnings for these workers in Wichita in 1953 of \$76.33 were nearly \$10.00 higher than in Topeka. Wichita workers' earnings were higher than for workers in Boston, Kansas City, St. Louis, and New York City but were lower than in Chicago, Detroit, and Pittsburgh.

A comparison of average hourly earnings of men workers in machinery industries by occupations in 1951-1952, as shown in Table 6, also shows no significant differences between the Kansas City area and other major industrial areas.

Table 5. Average weekly earnings of production workers in manufacturing industries for selected States and areas, 1951, 1952, and 1953.

State or area	: 1951	: 1952	; 1953
KANSAS	\$67.84	\$71.42	\$74.18
Topeka	60.26	65.55	66.62
Wichita	75.44	76.73	76.33
Illinois	69.05	72.18	76.39
Chicago	Not available	74.84	79.82
Massachusetts	60.75	63.43	66.60
Boston	62.37	65.04	68.09
Michigan	74.55	81.34	86.69
Detroit	76.32	84.36	89.18
Missouri	59.94	64.21	67.56
Kansas City	65.80	69.60	74.53
St. Louis	63.11	67.27	71.60
New Jersey	67.28	71.02	74.32
New York	64.90	67.77	71.12
New York City	63.23	65.49	67.49
Pennsylvania	63.74	66.54	71.38
Pittsburgh	72.87	75.82	81.89

Source: Employment and Earnings, U. S. Dept. of Labor, Bureau of Labor Statistics, May 1954, pp. 108-116.

Table 6. Average hourly earnings of men workers in machinery industries, in selected areas, by occupation, 1951-1952.

Area	Welders, hand, Class B	Welders, hand, Class A	Tool and die makers	Machinists, production	Machine- tool operators, production, Class C	Machine- tool operators, production, Class B	Machine- tool operators, production, Class A	Assemblers, Class C	Assemblers, Class B	Assemblers, Class A
KANSAS CITY, KS.	\$ -	\$1.65	\$ -	\$1.85	\$1.73	\$1.68	\$1.98	\$2.19	\$1.65	\$1.55
Kansas City, Mo.	-	1.55	-	1.79	1.55	1.39	1.81	1.97	1.62	1.56
New York, N. Y.	1.95	1.70	1.38	1.90	1.60	1.35	2.02	2.13	1.84	1.82
Buffalo, N. Y.	1.74	1.59	1.49	1.81	1.65	1.51	-	1.96	1.93	1.67
Newark-Jersey City, N. J.	1.95	1.65	1.54	1.98	1.76	1.57	1.84	2.11	1.93	1.73
Worcester, Mass.	1.83	1.87	1.43	1.80	1.63	1.39	-	1.89	1.73	1.77
Philadelphia, Pa.	1.77	1.76	1.80	1.92	1.71	1.44	1.72	2.04	1.96	1.77
Pittsburgh, Pa.	1.97	1.87	-	1.92	1.72	1.66	1.93	2.04	1.85	1.63
Detroit, Mich.	2.15	1.85	1.78	2.35	1.89	1.69	-	2.27	2.10	1.94
Indianapolis, Ind.	1.69	1.54	1.67	1.89	1.68	1.38	1.74	2.05	1.75	1.60
Chicago, Ill.	1.85	1.71	1.41	1.86	1.67	1.47	1.89	2.11	1.87	1.73
Minneapolis, Minn.	1.75	1.71	1.36	1.85	1.61	1.26	1.74	2.04	1.75	1.66
St. Louis, Mo.	1.80	1.50	1.38	1.91	1.66	1.56	1.95	2.21	1.88	1.56
Houston, Tex.	1.79	1.63	1.36	1.85	1.76	1.48	1.95	2.12	1.97	-
Los Angeles, Calif.	1.83	1.59	1.31	1.91	1.65	1.36	1.98	2.12	1.91	1.71
San Francisco- Oakland, Calif.	1.96	1.70	1.65	1.98	1.77	1.66	1.98	2.38	2.00	-

Sources: John P. Clifton, Kansas City, Kansas, A Summary of Wage Survey, August 1952, Kansas Engineering Experiment Station, August 1952.

Occupational Wage Surveys, U. S. Dept. of Labor Bul. Nos. 1034, 1060, 1064, 1075, 1068, 1076, 1081, 1077, 1082, 1085, 1086, 1084, 1094, 1095, and 1101.

Work Stoppages

Kansas is in a good competitive position for attracting industry when consideration is given to the matter of work stoppages.

In 1954 of the 3,468 work stoppages in the United States, only 26 involved workers in Kansas, as shown in Table 7. By contrast, New York had 539 stoppages, Pennsylvania 387, Ohio 266, California 206, Illinois 206, and Michigan 204. A total of 31 States had a greater number of work stoppages than did Kansas.

In the United States 1,530,000 employees, or 1 in 32 workers in nonagricultural establishments, were involved in these work stoppages, while in Kansas only 5,670, or 1 in 97 workers in nonagricultural establishments, were involved. This compares with 1 in 12 in Oregon and Washington, 1 in 14 in Michigan, 1 in 16 in Tennessee, 1 in 19 in New Jersey, 1 in 20 in Kentucky, 1 in 22 in Pennsylvania, 1 in 23 in Ohio, 1 in 28 in Indiana, and 1 in 33 in Missouri and New York.

This situation in 1954 is, in general, characteristic of the history of labor disputes in Kansas. The Kansas Industrial Development Commission in A Kansas Atlas (11) made the following statement:

Reared on the farm or in small towns, Kansas labor is mostly native stock and has deep roots in Kansas. The state never has experienced a general strike and, except for local work stoppages of short duration, there has not been a serious strike for more than thirty years.

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Table 7. Work stoppages, by selected States and United States, 1954.

State	: Number of : stoppages : beginning : in 1954	: Number of : workers : involved	: Number of : man-days : idle during : 1954
KANSAS	26	5,670	205,000
Alabama	84	23,400	355,000
Arkansas	29	6,450	163,000
California	206	88,100	1,070,000
Colorado	30	7,440	98,300
Connecticut	62	19,800	448,000
Florida	62	8,020	65,200
Georgia	36	13,100	367,000
Illinois	206	56,300	737,000
Indiana	107	51,600	536,000
Iowa	47	19,700	235,000
Kentucky	103	31,600	160,000
Louisiana	40	16,900	394,000
Maryland	42	14,600	135,000
Massachusetts	113	23,400	300,000
Michigan	204	171,000	1,060,000
Minnesota	56	20,300	314,000
Missouri	87	38,300	862,000
New Jersey	198	95,900	791,000
New York	539	182,000	2,010,000
North Carolina	31	5,540	82,900
Ohio	266	134,000	1,830,000
Oklahoma	34	9,540	220,000
Oregon	38	39,000	1,810,000
Pennsylvania	387	174,000	3,030,000
Rhode Island	28	4,880	60,900
Tennessee	90	50,900	415,000
Texas	103	42,600	655,000
Virginia	43	7,840	97,500
Washington	70	63,600	2,120,000
West Virginia	107	29,300	266,000
Wisconsin	59	16,600	641,000
All other States	215	60,980	1,031,130
United States	3,468	1,530,000	22,600,000

Source: Analysis of Work Stoppages, 1954, U. S. Dept. of Labor Bul. No. 1184, June 1955, p. 17.

TRANSPORTATION

Kansas has excellent transportation facilities to offer industrial firms. Kansas, being in the geographical center of the United States, is on direct routes from east to west and from north to south.

In railroad mileage, Kansas ranked fifth in the nation (Table 8) with 8,450 miles of track in 1952 which were owned by 16 lines (Johnson, 11). Six major transcontinental routes provide excellent connections to all parts of the country.

In highway mileage Kansas is second only to Texas (Table 9). The State had 125,825 miles of highway in 1952 and is crossed by more transcontinental Federal highways than any other State.

There are 79 bus lines which operate 101 routes in Kansas (Johnson, 11). Truck line service is provided by 1,793 common carriers authorized to operate 1,884 routes in the State.

Five airlines serve Kansas, offering transcontinental service both north and south and east and west.

Water transportation is available along the Missouri River at Kansas City, Leavenworth, and Atchison.

AVAILABILITY OF PLANT SITES

Industrial firms in Kansas now are largely concentrated in Kansas City, Wichita, Topeka, and Hutchinson areas. The labor force likewise tends to be concentrated in and around

Table 8. Rank of States having 8,000 or more miles of steam railways in 1952.¹

State	:	Miles of road
1. Texas		15,576
2. Illinois		11,508
3. Pennsylvania		9,631
4. Iowa		8,537
5. KANSAS		8,450
6. Ohio		8,416
7. Minnesota		8,294
United States		222,508

¹Data are for actual length of line in each State without duplication.

Source: U. S. Dept. of Commerce, Statistical Abstract of the United States, 1954, Washington: Government Printing Office, 1954, p. 571.

Table 9. Rank of States having 100,000 or more miles of rural roads at end of 1952.¹

State	Total	Surfaced	Nonsurfaced
1. Texas	195,472	90,246	105,226
2. KANSAS	125,825	54,585	71,240
3. North Dakota	114,268	30,424	83,844
4. Minnesota	109,256	86,728	22,528
5. California	104,900	69,220	35,680
6. Illinois	102,469	89,130	13,339
7. Iowa	100,916	74,405	26,511
United States	2,993,600	1,782,475	1,211,125

¹Rural roads include roads outside incorporated areas and certain more populous unincorporated areas.

Source: U. S. Dept. of Commerce, Statistical Abstract of the United States, 1954, Washington: Government Printing Office, 1954, p. 555.

these cities (Johnson, 11). The extent to which these areas continue to be the primary centers of industrial activity in Kansas will depend to some extent upon the availability of plant sites for expansion of present industries and for the location of new ones.

In Kansas City there are two major industrial areas which are the result of promotional activities designed to attract manufacturing and industrial plants. These are the Fairfax Industrial District and the Argentine District. Railroad facilities, highways, water transportation, utilities, power, communications and other necessary facilities have been made available, and considerable effort has been exerted to make them suitable for the needs of industrial firms. While many plants are already located in these projects, many sites still remain available.

The period since the beginning of World War II has seen a tremendous expansion of industrial activity in the Wichita area. The topography of the land there offers almost unlimited possibilities for further development. The availability of building sites there seems to be limited only by the ability of the city to furnish transportation, communication, power and other utilities. The same is true of the Hutchinson area.

Topeka has had no major industrial areas which were the result of promotional activities to encourage the development of industry. The topography of the surrounding territory presents more of a problem than is the case in Wichita and

Hutchinson. However, large tracts of land exist near Topeka which could prove inviting as plant sites.

A number of smaller cities and towns in Kansas in recent years have undertaken programs to attract industry to their localities. There has been a decided trend in the direction of increased zonings so as to make these cities and towns better suited for industrial expansion. Again, in a large number of these municipalities the availability of plant sites is limited largely only by their ability to furnish the necessary transportation, communication, power, and other facilities.

LOCATION FACTORS

The preceding sections of this study have dealt with the basic factors involved in developing the industrial potential of Kansas as an area - industrial opportunity or demand factors, resources or raw materials, labor, availability of transportation, and the availability of plant sites. The reasons why certain enterprises choose certain cities in preference to other cities for the location of their plant must also be given attention. These considerations become especially important when two or more cities, on the surface at least, offer the same advantages.

In order to get some reliable firsthand information on this question, the previously mentioned tour of Kansas industries (Clifton, 5) was undertaken in the summer of 1953.

On this tour 72 plants in 24 cities were visited, all of which were situated in the eastern two-thirds of the State. The area covered extended from the Missouri boundary to Hays on the west and from the northern tier of counties to the Oklahoma border on the south. Kansas City, Topeka, and Wichita were not included in this survey because their larger population concentrations exert influences that are not general throughout the State.

Interest was centered on the smaller plants in this survey since they were thought to be the most foot-loose and therefore the most fertile field for industrial development. However, the plants visited ranged in size from 1 to 2,000 employees. The firms visited produced a wide range of products and the number of years in business varied from a few months to 75 years.

While every effort was made to obtain a random sample, it is difficult to determine whether the particular plants selected actually do constitute a representative sample of Kansas industries. So, while the conclusions which may be drawn from this survey must be regarded as tentative, the survey nevertheless revealed many aspects of the factors affecting location which merit consideration.

The survey disclosed that the most outstanding reason for plants being located where they are is that the enterprises were home grown and home financed. Individuals saw an opportunity to exploit local resources or a local demand for certain

products or services, and they entered business. In some cases the enterprises flourished to the extent that their products have taken on nation-wide importance. Of the plants visited, 53 percent were home grown, and the remaining 47 percent were established by interests outside the city in which they are located. Of this remaining 47 percent, 36 percent were branch plants of a larger organization, of which only two are Kansas companies.

The influence of local Chambers of Commerce was reflected by the fact that 28 concerns, not home grown, or 39 percent of all concerns visited, were definitely influenced by the Chambers of Commerce in selecting their locations or were materially aided by the Chamber of Commerce representatives in finding a suitable location or in obtaining financial support. Since only 47 percent of the concerns visited were not home grown, this indicates that considerable influence is being exerted by local Chambers of Commerce.

It appears that the two factors of utmost importance in the selection of plant locations by firms intending to move into the State are the attitudes of the inhabitants toward industry and the attractiveness of the city. In other words, are the cities nice places in which to live? Also, attractiveness of a city must include good schools, good hospital facilities, and good recreation facilities.

It is generally accepted that the prime considerations relative to plant location are the capital factors, production

factors, and market factors, and of course these must be satisfied in order to have a suitable location. However, it is not at all unusual for the prime factors to be completely satisfied by several cities, and the deciding factor relative to the selection of a location then usually boils down to the most desirable place to live.

Following is a short summary of the importance of a few general factors relative to the choice of plant location, as they affected the plants visited.

Housing appeared to get very little attention because the enterprises visited, for the most part, draw their help from the surrounding locality and do not bring into a town great numbers of new people suddenly.

The availability of a suitable building was important to 45 percent of the plants. The availability of buildings plus machinery was important to 14 percent.

Proximity to the source of raw materials was of major importance to 36 percent.

Proximity to the market or the exploitation of local markets was of major importance to 45 percent. It might seem that this should be more nearly 100 percent, but almost any part of Kansas would have been suitable market-wise for the remaining 55 percent. In this survey, the figures relate entirely to the selection of a particular Kansas town in preference to some other Kansas town.

The labor supply was important to 39 percent of which 14 percent use principally women workers. Labor costs did not seem to be much of an issue because they are fairly standard over the State with some appreciable differential between scales in the larger cities and the smaller places. And, of course, the minimum wage law puts on a lower limit. In a few cases, the plant owners wanted to keep away from the effects that might be felt by themselves from labor disturbances in the larger cities, which for the most part are strongly organized.

Transportation facilities did not carry much weight as a deciding factor because the system of railroads and highways provides adequate service throughout the State. About the only advantage in this respect lies in proximity to termini for long distance distribution where considerable weight is involved.

SUMMARY AND CONCLUSIONS

The people of Kansas have shown evidence of a desire to diversify their economy by developing additional industries to supplement agriculture as their principal basic industry.

Increased mechanization on the farm, the trend toward larger farms, and better farming practices combine to reduce the number of workers needed in agriculture and release laborers for other industries.

While previously most of Kansas industry was in connection with farm production, increased farm income since 1940 has

opened up markets for diversified manufacturing. This in turn has increased purchasing power in urban areas. Many national firms have found ready markets in Kansas, and many Kansas firms sell their products in regional and national markets.

Kansas is not only receptive to industry, but she is seriously trying to develop industry as much as possible. The Kansas Industrial Development Commission, the Kansas Engineering Experiment Station, State and local Chambers of Commerce and other agencies have been working industriously and effectively for some time to help the people of Kansas achieve this goal.

Because of present day development of transportation, power and fuel sources, industry is in constant movement seeking new markets and sources of raw materials. The present complexity of industry has made it economically desirable to locate as near the center of new markets and new sources of supply as possible. This is especially true in relation to terminal stages of production.

There has been a steady increase in industrial growth in Kansas since 1940 as measured in number of firms, number of employees, and value of output.

A stimulus to industrialization has been provided by the formation of local industrial commissions or industrial development corporations. There are 22 Kansas cities which have an industrial development corporations established for the principal purpose of aiding new industry, including the securing of adequate financing.

The study of the present situation in Kansas with respect to markets, resources, labor, transportation, and other factors revealed the following:

(1) The Midwest Research Institute of Kansas City, Missouri, in its 1953 survey for the Kansas Industrial Development Commission reported that of 450 industries screened, 225 were industries in which consumption by Kansas residents exceeded production of those goods by Kansas firms. Fifty-seven industries showed an annual deficit in 1953 of over 4 million dollars. When consideration was given to the need for huge production facilities, the availability of basic materials, the presence of large production facilities in bordering States and other factors, 19 industries were found to have major opportunities in the Kansas area.

Opportunities exist in both nondurable and durable manufactures. Of the 19 industries selected the one which showed the greatest excess of consumption over production in the Kansas area, both in terms of value of production and employees required for production, was the apparel industry. In recent years there has been a considerable movement into Kansas of firms producing women's dresses and suits and workmen's clothes, but Kansas still had an annual deficit in apparel of 118 million dollars which would support approximately 14,000 employees.

Other industries in the field of nondurable manufactures where large excesses of consumption over production existed were the cotton and rayon textiles industries having a deficit

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In the field of durable manufactures the greatest deficit was in steel works and rolling mills, having a deficit of 77 million dollars production, the equivalent of 5,000 employees. The central or eastern part of Kansas would seem to be a strategic area for steel works and rolling mills to convert pig iron, scrap iron, and scrap steel into plates, sheets, bar stock, and tubing.

Fabricated metal products industries have had a continuous and rapid growth in the past two decades because of increased production in all metal products and have major opportunities in Kansas, especially in sheet metal forming and stamping.

Machinery industries, including electrical machinery, as a group offer another area of major opportunities. Of the 19 industries selected by Midwest Research Institute, seven were machinery or machinery parts industries, having a total deficit of 54.6 million dollars production, the equivalent of 5,360 employees. The largest deficits were in insulated wire and cable and radios and related products. Industries in the general machinery field are nearly all growth industries. The principal location factors seem to be nearness to market and an adequate supply of skilled and semi-skilled labor, which Kansas can supply.

It should be pointed out that while opportunities in Kansas may look good for an industry, certain firms within an industry might not consider the state to be a good location. Also, a new firm cannot expect to capture the entire excess of consumption over production because there will always be some imports. However, past history of Kansas commerce shows that many Kansas firms sell a large part of their products outside the Kansas area. By "Kansas area" is meant Kansas plus the Kansas City, Missouri, area which is tied in too closely with Kansas business to be separated easily.

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(4) An adequate supply of labor is available for industrial expansion in Kansas. The estimated number of employees in nonagricultural industries in Kansas increased 78.1 percent from 304.3 thousand in 1940 to 542.1 thousand in 1954.

The 19 industries offering major opportunities in Kansas showed a deficit equivalent to 42,360 employees. If these were to be added to the 132,500 employees in manufacturing industries in Kansas in 1954, this would constitute a labor force of 174,900 in manufacturing industries. The continued population growth and the continued decline in the number of workers needed on the farm would seem to indicate that the growth in the number of employees in manufacturing industries in the last 15 years can be maintained in the future without importation of many laborers and that the increase of 42,360 workers could be accomplished within a relatively short time, perhaps within the next five years.

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(6) Kansas has excellent transportation facilities to offer industrial firms, ranking fifth in the nation in railroad mileage and second in highway mileage.

(7) In most areas of Kansas the availability of plant sites is limited only by the ability of the cities to furnish communication, power, and other utilities.

The results of the analyses undertaken in this study would seem to verify the author's thesis that Kansas is capable of continuing, and perhaps accelerating, the unusually large rate of growth which has occurred in its manufacturing industries since 1940.

Some of the more specific lines of activity which show the most promise of contributing to industrial expansion in Kansas were revealed in a survey concerning location factors which was conducted in 1953. Of the plants visited, 53 percent of the firms were home grown and home financed. The remaining 47 percent were established by interests outside the city in which they were located.

This would seem to indicate that industrial promoters should look first to their local possibilities and secondly to the possibility of attracting industry from out of the State.

The influence of local Chambers of Commerce was reflected by the fact that in this survey 28 concerns, not home grown, or 39 percent of all concerns visited, were definitely influenced by the Chambers of Commerce in selecting their locations or were materially aided by the Chamber of Commerce representatives in finding a suitable location or in obtaining financial support. Since only 47 percent of the concerns visited were not home grown, this indicates that considerable influence is being exerted by local Chambers of Commerce.

This survey revealed that when firms are choosing between two or more cities which meet the basic market, raw materials, and transportation requirements, the two factors of utmost importance are the attitudes of the inhabitants toward industry and the attractiveness of the city. Some of the things which industrial firms look for in a city are honest law enforcement, a high degree of civic pride, an adequate shopping district, adequate housing facilities, churches, adequate school facilities, recreational facilities, a progressive local newspaper, a realistic local tax structure, and a friendly attitude toward newcomers.

It may be concluded that the best possibilities for developing industry in Kansas are, first, through the development of

its own resources, ideas and markets, and, second, by making Kansas communities attractive to industry.

If Kansas cities are made attractive as places to live, if the attitude of the populace is receptive to new industry, if the cities have adequate facilities to support industry, and if the cities have active and helpful Chamber of Commerces, industry will seek out these cities.

Kansas, then, with its ready markets and preparation for industry, is a rich field for industrial development, and in order to experience a significant industrial growth in the next few years needs only to promote those industries that are economically and physically feasible, that are in a state of growth, and that fill the gap between consumption and production.

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Heartfelt appreciation is extended to my wife, Ruth E. Clifton, without whose help and encouragement the composition of this thesis would not have been accomplished.

REFERENCES

- (1) Analysis of Work Stoppages, 1954. U. S. Dept. of Labor Bul. No. 1184. June 1955. 34 p.
- (2) Bowers, Walter A.
Industrial Development in Kansas. Industrial Research Series No. 13. Lawrence, Kansas: University of Kansas Publications, 1948. 109 p.
- (3) Business Statistics, A Supplement to the Survey of Current Business, 1955 Biennial Edition. U. S. Dept. of Commerce. Washington: Government Printing Office, 1955.
- (4) Characteristics by Size of Place. 1950 Population Census Report P-E No. 5A. U. S. Census of Population, 1950. Washington: Government Printing Office, 1953. 64 p.
- (5) Clifton, John P.
Factors Affecting Industrial Location. Kansas Engineering Experiment Station Circ. No. 6. March 1954. 13 p.
- (6) Clifton, John P.
Kansas City, Kansas, A Summary of Wage Survey, August 1952. Kansas Engineering Experiment Station. August 1952.
- (7) Employment and Earnings. U. S. Dept. of Labor, Bureau of Labor Statistics. May 1954. 128 p.
- (8) Fact Book on Manpower. U. S. Dept. of Labor. January 1951. 34 p.
- (9) Fisher, Walter D.
The New Manufacturing Industries of Kansas. Kansas Engineering Experiment Station Bul. No. 73. August 1954. 24 p.
- (10) Handbook of Labor Statistics, 1950 Edition and 1951, 1952 and 1953 Supplements. U. S. Dept. of Labor Bul. No. 1016. 1951. 239 p.
- (11) Johnson, Roy H., and Charles J. Smith, Editors.
A Kansas Atlas. Topeka: Kansas Industrial Development Commission, 1952. 32 p.
- (12) Kansas Employment by Industry and Occupation. Occupational Outlook Information Series. U. S. Veterans Administration. June 1947. 12 p.

- (13) Kansas Labor and Industrial Bulletin. Kansas Dept. of Labor. August 1955.
- (14) Midwest Research Institute.
Industrial Opportunities in Kansas. Kansas City, Mo.: Midwest Research Institute, 1954. 25 p.
- (15) Midwest Research Institute.
A Survey for the Development of the Industrial Potential of Kansas. Books I, II, and III. Kansas City, Mo.: Midwest Research Institute, June 1954. 405 p.
- (16) Occupational Wage Surveys. U. S. Dept. of Labor Bul. Nos. 1034, 1060, 1064, 1068, 1075, 1076, 1077, 1081, 1082, 1084, 1085, 1086, 1094, 1095, and 1101. 1951 and 1952.
- (17) Statistical Abstract of the United States, 1954. U. S. Dept. of Commerce. Washington: Government Printing Office, 1954.
- (18) The Community Development Corporation in Kansas. University of Kansas, School of Business, Bureau of Business Research. January 1951. 48 p.
- (19) To the Stars. Kansas Industrial Development Commission. July-August 1955.
- (20) Wages and Related Benefits in the Machinery Industries. U. S. Dept. of Labor Bul. No. 1160. June 1954. 60 p.
- (21) Yohe, D. Spencer, Compiler.
Kansas Statistical Base Book. University of Kansas, School of Business, Bureau of Business Research. May 1954. 95 p.

APPENDIX

Table 1. Manufacturing industries showing more than 4 million dollars excess of consumption over production in the Kansas area in 1953.¹

Industry	Deficit	Production
1. Apparel	118.3	57.6
2. Steel works	75.8	18.1
3. Cotton and rayon textiles	48.5	-
4. Paper and board mills	42.0	9.4
5. Sawmills and planing mills	34.9	-
6. Footwear	28.7	-
7. Canning and preserving food	22.0	-
8. Cigarettes	18.7	-
9. Wood household furniture	18.5	3.4
10. Malt liquors	18.1	4.6
11. Copper rolling and drawing	17.4	-
12. Metal stampings	17.3	2.1
13. Sugar refining	16.5	-
14. Insulated wire and cable	15.1	1.6
15. Food preparations, not otherwise classified	13.7	12.8
16. Distilled liquors	13.4	-
17. Refrigeration machinery	13.3	-
18. Radios	13.1	6.7
19. Aluminum rolling and drawing	12.0	-
20. Confectionery products	11.6	5.5
21. Wirework not otherwise classified	10.3	-
22. Shortening and cooking oil	10.1	1.2
23. Explosives	9.0	1.3
24. Woolen and worsted fibers	8.7	-
25. Drugs and medicines	8.5	7.7
26. Secondary non-ferrous metals	8.3	3.7
27. Grease and tallow	8.2	5.1
28. Bolts, nuts, washers and rivets	8.1	-
29. Plywood plants	7.2	-
30. Valves and fittings	7.0	-
31. House furnishings not otherwise classified	6.9	2.1
32. Cottonseed oil mills	6.7	-
33. Tractors	6.5	-

Table I. (concl.)

Industry	Deficit	Production
34. Wool carpets and rugs	6.5	-
35. Blast furnaces	6.2	-
36. Aircraft propellers	6.2	-
37. Telephone and telegraph equipment	6.2	-
38. Vegetable oil mills not otherwise classified	5.9	-
39. Domestic laundry equipment	5.9	-
40. Synthetic rubber	5.8	-
41. Cigars	5.5	-
42. Pumps and compressors	5.5	-
43. Toilet preparations	5.5	2.0
44. Rubber industries not otherwise classified	5.4	-
45. Primary lead	5.1	-
46. Motors and generators	5.0	2.6
47. Watches and clocks	5.0	-
48. Iron and steel forgings	4.9	3.9
49. Canned sea food	4.9	-
50. Ball and roller bearings	4.9	-
51. Wood preserving	4.8	1.6
52. Iron and steel forgings	4.4	-
53. Pottery and related products	4.4	-
54. Power transmission equipment	4.4	-
55. Construction and mining machinery	4.3	1.1
56. Metalworking machinery	4.2	-
57. Steel foundries	4.1	-

¹A dash indicates that production was negligible.

Source: Midwest Research Institute, A Survey for the Development of the Industrial Potential of Kansas, Book II, Kansas City, Mo.: Midwest Research Institute, June 1954, p. 117-119.

KANSAS INDUSTRIAL POTENTIAL

by

JOHN PAUL CLIFTON

B. S. University of Kansas, 1929

AN ABSTRACT OF

A THESIS

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1955

KANSAS INDUSTRIAL POTENTIAL

The purpose of this study was to secure insight into the economic future of Kansas particularly with respect to the possibilities for expansion of its manufacturing industries.

The people of Kansas and many of its agencies in recent years have shown a continued and intense desire to diversify their economy by developing additional industries and thus reducing their reliance upon agriculture as their chief basic industry. The Kansas Industrial Development Commission, the Kansas Engineering Experiment Station, State and local Chambers of Commerce and other agencies are attempting to assist the people of Kansas in their efforts to develop their industrial potential.

The author's thesis is that Kansas is capable of continuing, and perhaps accelerating, the unusually large rate of growth which has occurred in its manufacturing industries since 1940. In this study the present situation in Kansas with respect to markets, resources, labor, transportation, and other factors is analyzed for the purpose of ascertaining the actual capacity of Kansas as an area to sustain a continued rate of growth in manufacturing industries and revealing some of the more specific lines of activity which show the most promise of contributing to industrial expansion in Kansas.

Increased mechanization on the farm, the trend toward larger farms, and better farming practices combine to reduce

the number of workers needed in agriculture and release laborers for other industries.

While previously most of Kansas industry was in connection with farm production, increased farm income since 1940 has opened up markets for diversified manufacturing. This in turn has increased purchasing power in urban areas. Many national firms have found ready markets in Kansas, and many Kansas firms sell their products in regional and national markets.

Kansas is not only receptive to industry, but she is seriously trying to develop industry as much as possible. The Kansas Industrial Development Commission, the Kansas Engineering Experiment Station, State and local Chambers of Commerce and other agencies have been working industriously and effectively for some time to help the people of Kansas achieve this goal.

Because of present day development of transportation, power and fuel sources, industry is in constant movement seeking new markets and sources of raw materials. The present complexity of industry has made it economically desirable to locate as near the center of new markets and new sources of supply as possible. This is especially true in relation to terminal stages of production.

There has been a steady increase in industrial growth in Kansas since 1940 as measured in number of firms, number of employees, and value of output.

A stimulus to industrialization has been provided by the formation of local industrial commissions or industrial development corporations. There are 22 Kansas cities which have an industrial development corporation established for the principal purpose of aiding new industry, including the securing of adequate financing.

The study of the present situation in Kansas with respect to markets, resources, labor, transportation, and other factors revealed the following:

(1) The Midwest Research Institute of Kansas City, Missouri, in its 1953 survey for the Kansas Industrial Development Commission reported that of 450 industries screened, 225 were industries in which consumption by Kansas residents exceeded production of those goods by Kansas firms. Fifty-seven industries showed an annual deficit in 1953 of over 4 million dollars. When consideration was given to the need for huge production facilities, the availability of basic materials, the presence of large production facilities in bordering States and other factors, 19 industries were found to have major opportunities in the Kansas area.

Opportunities exist in both nondurable and durable manufactures. Of the 19 industries selected the one which showed the greatest excess of consumption over production in the Kansas area, both in terms of value of production and employees required for production, was the apparel industry. In recent years there has been a considerable movement into Kansas of firms

producing women's dresses and suits and workmen's clothes, but Kansas still had an annual deficit in apparel of 118 million dollars which would support approximately 14,000 employees.

Other industries in the field of nondurable manufactures where large excesses of consumption over production existed were the cotton and rayon textiles industries having a deficit of 49 million dollars, equivalent to 7,000 employees; the paper and paper board industry having a deficit of 42 million dollars, an equivalent of 2,200 employees; the canning and preserving food industry with a deficit of 22 million dollars, equivalent to 1,800 employees; and the wood household furniture industry having a deficit of 18.5 million dollars, equivalent to 1,300 employees. In these industries nearness to markets are important considerations. To a large extent these industries would use women workers, and it is believed that Kansas homes hold many women who would become a part of the labor force if acceptable jobs in these industries are available. These factors would seem to indicate that the economic advantages of locating in Kansas point to considerable opportunities for expansion in these industries.

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