Kansas. Resources, population, industries, opportunities and climate

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Spring Hill has several small wells, used for light and heat in the town, and the development at this town is interesting because of the northward extension of the territory, and it is usually omitted in the descriptions of gas fields of the State.

The Iola field has attracted more attention and the gas has been utilized to a greater extent than any other field. The first gas was found in the Acres mineral well in 1871, but the development came in 1894. The developed area is twelve by six miles, with over seventy producing wells. These vary in volume from 2,000,000 to 10,000,000 cubic feet in twenty-four hours. The wells are drilled to a depth of 815 to 920 feet, and had an original rock pressure of 325 pounds.

The gas is used at the zinc smelters.

To the south of Iola, at Humboldt, gas is found, and is used at the brick works, mills, and for household use in the town. These wells reach the Iola limestone at thirty feet, and pass through it in forty feet more. The Cherokee shales were struck at 635 feet, and the well at 970 feet was still in these shales. The first oil sand was struck at 796 feet, and other oil sands at 894 and 915 feet. Humboldt is now noted for its oil field, which is a continuation of the Chanute field. At the present time there are over sixty wells producing oil, owned by twelve companies. Few dry holes have been encountered.

The early prospecting carried on at Chanute was not successful, but the gas development has been followed by the oil, and together the Chanute district is the great Kansas oil field. In this area there are not far from 200 producing oil wells, with a flow of twenty-five barrels after sixty days. The field now has probably 300 miles of pipe lines, and 100 drills are at work extending the developed area. The daily capacity can not be determined, as none of the wells are pumped to their flowing capacity. This fact has led to some low estimates of the field. The present production, with a considerable number of wells not yet connected with the tanks, is about 2,500 barrels, and the oil passes through a pipe line directly to the Neodesha refinery.

The Thayer field was developed by the Standard Oil Company, and there are now seventeen wells, from which the oil is carried by a pipe line to the Neodesha refinery.

Near Cherryvale, there are over eighty gas wells, ranging in volume from 1,500,000 to 10,000,000 cubic feet. These now supply gas to the largest brick plant in the State, to the largest iron foundry in southeastern Kansas, to the largest zinc smelter in the world, to the glass works, and other manufacturing plants. The gas development alone would be sufficient to mark this area as an important field, without any reference to oil. In some of these early gas wells oil was found in considerable quantity, and was used at the brick works, and for other local uses. In drilling for gas northwest of town, oil was found in several wells, and the Federal Gas and Oil Company was organized, and drilled a number of good oil wells. In June, 1902, the Illinois Valley Company secured leases on the top of the mound, above the Federal leases, and it has twelve wells on the so-called "Spindle Top." This group of derricks, high on the hill, is a conspicuous landmark, visible for miles. Ten other companies are developing oil fields near Cherryvale. There are about forty oil wells, and ten

drills at work on new wells. The wells are drilled 650 to 900 feet, and the oil sand reaches twenty to forty feet in thickness. The gas wells will probably average 4,000,000 cubic feet, and the oil wells average fifteen to twenty barrels. The developed field is about six to ten miles, and but few dry holes are found.

In the Coffeyville area, the wells vary in depth from 460 feet, at the north, to 1,007 feet, at the south. The volumes vary from 100,000 to 5,000,000 cubic feet, with an average of about 2,000,000. The rock pressure varies from 200 to 270 pounds. A new gas area was developed a few years ago, which begins about three miles west of the city and is about four by fifteen miles in area, as estimated. The gas sand is found about 150 feet lower than in the old field, and the volumes run from 7,000,000 to 10,000,000 cubic feet, with a pressure of 450 pounds. Nine additional wells have been drilled in this area. All the gas companies at Coffeyville are now owned by the People's Gas Company, and there are nearly 200 miles of pipe line in the field. The gas is used at the town and in the brick plant, pottery, glass works and mills. A promising oil field has recently been opened at Coffeyville.

A number of shallow wells of low pressure have been found near Chetopa, and these are supplying gas to that town.

There are nine oil wells near Erie and eighteen gas wells. The gas sand runs from twenty-five to forty-eight feet, and the wells are drilled to a depth of 514 to 840 feet. The best gas sand is found between 490 and 555 feet, and the oil at 550 to 675 feet. So far in the present year, eight wells have been drilled, and only two of these were dry holes. Gas is supplied to the town of Erie, and only a portion of the available supply is used.

Gas has been used at Fredonia, which was piped from near Neodesha. Drilling near the town has proved unsuccessful, but in July, 1903, three wells were drilled west, north and east of town, at a distance of one-half to three miles, and gas was found at a depth of a few hundred feet. Some of the early wells, which did not yield enough gas for use, have been shot and are producing oil. This area is now in process of development.

Prospecting for gas was carried on at Independence in 1890 by McBride & Bloom, and gas was found in small amounts in four wells. In 1892 the first strong well was found, with a daily flow of 3,000,000 cubic feet and a pressure of 315 pounds. The Independence Oil and Gas Company was organized and now has nearly thirty gas wells supplying the town and various factories. Two cement mills are now planned for the coming year, and the company supplies gas to the new brick works at Sycamore, and also to the ornamental brick works at Independence. In January, 1903, attention was directed to the previous finds of oil in some of these wells, and active prospect work was started to develop an oil field. The depth of the wells is 1,000 to 1,200 feet, and the sand runs from five to fifty feet. The maximum rock pressure found is 500 pounds, and the maximum gas flow is 16,000,000 cubic feet. The Independence Gas Company has leased 80,000 acres. The oil field southwest of Independence, at Bolton, opened in October, 1903, has shown remarkable volumes, and is probably the richest oil area in the State. Three wells in the section have a record of 600 barrels a day, after three months' run. The

average yield of wells in this pool is not far from 100 barrels a day. One well made 1,000 barrels in the first twenty-four hours.

Neodesha is also known as one of the best oil fields in the State. There are about fifty wells located not far from this town, with an average flow of about eight barrels. The oil sand is fifteen to twenty-five feet thick, and is found 800 feet below the surface. At Neodesha is located the only oil refinery in the State.

In 1885 Guffey & Galey drilled a well near Caney for Mr. Kellogg, a miller, and found both gas and oil. This well was afterwards abandoned, and at the present time flows some oil. In 1896 a well was drilled east of town and produced oil, but it was never used to any extent. This well today is flowing some oil, and new drills near it are producing. In 1901 the Caney Oil and Gas Company was organized and drilled three or four wells, two of which are still in use. They show the highest rock pressure yet found in the Kansas field—660 pounds. One of these wells had a volume of 4,000,000 cubic feet, and the other 14,000,000, and the wells were drilled 1,400 feet in depth. The oil is found at from 950 to 1,300 feet, and it is of good quality and volume.

Going west from Caney, one passes into Chautauqua County, which is now attracting favorable attention. Near Chautauqua Springs two oil wells have been drilled; one of which is estimated to flow thirty barrels a day. At Niotaze gas was struck at 450 feet, with a flow of 3,000,000 cubic feet, and it is used at the town. The sand is eighteen to forty feet. Other wells are being drilled. At Rogers, a small oil well was recently drilled. At Cedarville a well was drilled 1,400 feet deep, finding twenty-five feet of sand, with oil in the upper portion. At Peru is the best developed oil field in the county. There are over thirty wells and ten rigs at work. The oil sand is found at 850 to 1,000 feet, and the sand in places is fifty feet thick. Nearly every well finds oil and gas.

Twenty-five oil wells have been drilled at Buffalo and are small producers. The sand is struck at 1,000 to 1,014 feet. There are over thirty wells in this area.

A number of good gas wells have been drilled at Benedict.

Gas has been found at Winfield, but not in paying quantities, and it is reported that a small flow has been encountered at Dexter. Gas or oil is also found at Shaw, Sycamore, Havana, Guilford, Coyville, Larimer, Neosho Falls, Moline, Toronto, Bolton, Le Roy, Moran, Elk Falls, Mound Valley, and Spring Hill.

SALT.

It is only a few years since salt was discovered at Wellington, in Sumner County. Immediately following the discovery, deep wells were put down in Harper, Kingman, Reno, Rice and other counties, all of which penetrated heavy beds of rock salt. A great industry immediately sprang up, which produced as great an influence on the markets of the Mississippi Valley, as anything which has occurred within the last quarter of a century. Rock salt of the best quality exists in such great quantities that were the markets of the world supplied from this one area for a thousand years, it would hardly

produce an appreciable effect upon the whole amount. Beds of solid salt, from 300 to 400 feet in thickness, cover an area from the southern limit of the State, reaching northward as far as prospecting has been carried, and westward almost to the western limit of the State, covering a known area of from 15,000 to 20,000 square miles, with probably much more which might be added. With such extensive deposits the only question with the salt industry of Kansas is that of the cost of production and the capacity of the market. The mines are now yielding about two million barrels per annum.

Kansas now holds third rank among the States of the Union in the production of salt, being surpassed in its output by New York and Michigan. In the early days of the State's history, salt was obtained by evaporation in kettles of the water from the salt marshes, which were located near the border of the present salt area in Republic, Cloud and Jewell Counties. In 1867 salt brine was obtained for local use from the well seventy-five feet deep at Solomon City, and it was evaporated by the sun's heat. A second plant in the same region was built in 1874, and these were the only wells in the State where salt was obtained by solar evaporation.

Out of the wreck resulting from disastrous boom excitement in Kansas in 1887–8 there came many benefits, one of which was the development of the Kansas salt industry. In the former year in Lyons, prospect holes were drilled for gas and oil. These fuel elements were not met with, but at a depth of 800 feet a deposit of rock salt was found, which was over 300 feet thick, made up of salt veins and shale layers. In 1891 the Lyons Rock Salt Company was formed, and a shaft seven by sixteen feet was put down 1,065 feet through 260 feet of salt. A vein of good quality was selected, and thirteen feet of this is mined in rooms fifty feet square by undercutting the rock with compressed air-channeling machines. The rock is shot down, loaded in two ton cars, and hoisted to the top of a five-story mill, where it is run through crushers and screened into different commercial sizes. The capacity of this mine is 1,000 tons in ten hours, though the average output is but thirty tons per day, employing 100 men. By analysis the rock is 99.93 per cent pure. The salt is shipped as far west as California, and it is distributed over a large territory. The offices of the company are in St. Louis.

A second rock salt mine is operated north of Lyons at Kanopolis. Two rock salt mines are found at Kingman, although only one is operated.

Over 90 per cent of the salt of the United States comes from evaporation of brine from deep wells. This is the method used in Kansas at Hutchinson, Sterling, Ellsworth, Wellington and Anthony. The wells are drilled eight inches in diameter and cased down 150 feet, or below the horizon of fresh water; then a six-inch hole is drilled down to the salt rock, and cased to the top of the rock. A two-inch pipe is placed inside, down to within fifteen feet of the bottom. Fresh water from shallow wells is forced down the inner pipe, and this forces the saturated brine through the outer larger pipe into the storage tanks. From these tanks the brine flows down into the evaporating tanks, which are of three types, namely, the ordinary flat kind, with the heat directed against the bottom; the granier pan, in which steam is used in pipes in the pan; and the vacuum pan. The fineness or coarseness of the salt in all of

these methods is regulated by the amount of heat supplied. The greater the heat the more rapidly the salt crystalizes from the brine and the finer the grain of the salt. The largest salt evaporating plant in this country is located at Hutchinson, and is known as the Morton plant of the Hutchinson, Kan., Salt Company. It covers three acres, and its daily capacity is 1,100 barrels. This company makes a special feature of a table salt known as the R. S. V. P. brand, which has a good sale even in the eastern markets.

The area of the salt rock in Kansas extends from Ellsworth and Saline Counties southward to the southern line of the State, and in breadth covers from two to three counties, with indications of salt outside of this area. The thickness of the rock runs from 300 to 370 feet, and it is of exceptional purity, running 97 to 98½ per cent of salt. In 1888, the first year of the industry in the State, Kansas ranked seventh in production, and from 1899 it has ranked third. In 1888 the production of salt in the State was 155,000 barrels and at the present time it is about 2,000,000 barrels.

GYPSUM.

Gypsum, or the sulphate of lime, is found in the State of Kansas in five forms, namely:

1. The earthy form, gray in color, composed of loose ashlike particles, rather light in weight and formed from solution and subsequent deposition in water, known as gypsum earth or gypsite.
2. The compact variety, known as alabaster and massive gypsum.
3. Fibrous gypsum or satin-spar, usually found in layers in the form of needles and prisms.
4. Foliated gypsum, usually in the form of small concretionary masses.
5. Spar gypsum or selenite, found in transparent glass-like crystals in veins or fissures in the massive gypsum and through the gypsum clays of Barber County.

Gypsum rock is quarried in sixteen states and territories and the amount quarried in the United States is over 600,000 tons a year. Of this amount, Kansas, Iowa and Michigan produce 75 per cent. In 1903, Kansas produced 75,000, ranking third, after Michigan and Iowa in tonnage, but holding second rank in the value of the finished product.

The gypsum deposits of Kansas occur in the belts trending northeast southwest across the State. The belt of exposed rock varies in width from five miles at the north to fourteen in the central part and thirty-six miles near the southern line, with a length of 230 miles. This area is naturally divided into three districts: The northern, or Blue Rapids, area in Marshall County; the central area in Dickinson, Clay, Marion and Saline Counties; the southern, or Medicine Lodge area, in Barber and Comanche Counties. From an examination of a map of the west central United States with the gypsum deposits marked thereon it will be seen that if the northeast line of the Kansas deposits is extended it will strike the Fort Dodge area in Iowa and if continued to the southwest it will strike the extensive deposits of the Canadian River country in Oklahoma and Texas. These deposits have been described in detail in volume five of the University Geological Survey Reports.

Kansas has enough gypsum to produce hard plaster in sufficient quantity

to plaster all the walls of every building in the world. The gypsum occurs in two forms: First, in the rock form; second, in the so-called gypsum "dirt" or granulated.

The rock gypsum is mined extensively at Blue Rapids, in Marshall County, near Hope in Dickinson County, and in the vicinity of Medicine Lodge in Barber County. It is well known that immense quantities of gypsum rock exist in these counties and others. In Barber County millions of acres are underlaid with it, lying at the surface of the ground whence it can be quarried as cheaply as limestone or sandstone in the most convenient stone quarries. With the market sufficient, and were railroad facilities convenient, no place in the world could obtain the rock gypsum more cheaply or more abundantly than Kansas.

The "dirt" deposits furnish the gypsum in the form of loose dirt or sandy masses composed of minute crystals of gypsum with a small percentage of soil and clay intermingled. The dirt deposits, therefore, can be handled more cheaply than the rock gypsum. It is only necessary to pass over the ground with a disc harrow such as farmers use in the cultivation of land, and then scrape the loose material up with horse-scrapers and wheel it to the factory, which is usually only a few rods away. Such material can often be placed at the factory at a cost as low as ten cents a ton. The "dirt" gypsum produces a plaster grayish in color, but of a superior quality for plastering walls. It can, therefore, be shipped a great distance and compete with the plaster made from the rock gypsum. Statistics show that the value of the product of rock gypsum from Kansas for 1894, 1895 and 1896 was greater than that from any other State in the Union, reaching the magnificent sum of $300,000 a year at the factory.

It is difficult to estimate the value of the gypsum industry in the future in Kansas. So much depends upon the markets of America which, in turn, are governed largely by the demand for plastering materials; or, in other words, by the extent of building during the next decade. With every indication of a long continued period of prosperity, it is not unreasonable to hope that the demand for building material will be greater than ever before in the nation's history. Should this be the case, it is practically certain that the gypsum fields of Kansas will have a greatly increased output until the total value of the product will reach over $1,000,000 per annum.

The deposits cover such a wide extent of the State's domain that a large proportion of its citizenship will be benefited greatly thereby.

HYDRAULIC CEMENT.

When an ordinary limestone is burned it forms a lime which will not set under water, but disintegrates. It was early discovered that certain limestones, when burned, formed a lime which would set under water, and such limes were called hydraulic cements. A cement limestone is one which is impure, containing about twenty-five per cent of sand and clay. Limestones of this kind are not uncommon in nature, but they usually run so irregular in their composition, even in the same quarry, that they can not be used for the manufacture of cement. There are, in fact, few good localities where uniform rock of this kind can be found. The United States leads the world

in the manufacture of this cement, on account of the high quality of the natural rock and the skill in manipulation.

At the present time Fort Scott is the only locality in Kansas where natural cement is made. Here the deposit of rock is of good extent and of high grade, and it is burned into a cement of excellent quality, to be compared with the best of American cements. The manufacture started at this place in 1869 and the first shipment was in 1870. The rock used at Fort Scott is a fine-grained limestone, of a blue-gray color, four or five feet thick, and found three feet below the Fort Scott coal, which is fourteen inches thick. The rock and coal are placed in alternate layers in the kilns and fired from the bottom. The shipping facilities are excellent over three lines of railroad. The Fort Scott mills are equipped with the latest and most improved machinery and appliances for the production of cement of the highest quality at the lowest cost price. The mills are owned and operated by the Kansas City & Fort Scott Cement Company and the Fort Scott Hydraulic Cement Company, and have a daily capacity of about 1,000 barrels. The product of these mills is marketed by the Fort Scott Cement Association, with general offices at Kansas City, Mo.

IOLA PORTLAND CEMENT.

For certain kinds of work, an artificial hydraulic cement is better than a natural. Such cements were made a hundred years ago in England by burning the chalk and the river clays. When it set in the form of rock it resembled closely the famous Portland stone, used in Westminster Abbey and other buildings, and was called Portland cement. Not many years ago all the product used in this country was imported from England and Germany, but it is now made at many places in this country equal to the best imported product. The industry has grown at a wonderful rate, and many new and large plants are now in process of erection. One of the large plants in Kansas is located at Iola.

The plant of the Iola Portland Cement Company, representing an important addition to the mineral resources of the State, deserves special attention. The first cement was made at this mill on June 16, 1900. Over 1,000 cars of building material and machinery were brought to Iola for this structure, and the plan of the mill is a model of compactness, neatness and adaptability for rapid and thorough work. The buildings are constructed of steel and cement and are four in number.

BRICK MANUFACTURE.

Clay or shales found in Kansas are used at Iola for the Portland cement manfuacture, and at Fort Scott and Coffeyville for pottery. The greatest clay industry is, however, the manufacture of brick and tile. The brick companies of the State represent an investment of over a million dollars. The value of the product runs about two million dollars annually. In a year 75,000,000 common bricks are made, also 50,000,000 paving bricks, and 10,000,000 fancy bricks—giving a total of 135,000,000. These bricks are burned with coal and gas at a fuel cost of $175,000. If the Kansas plants would work at their full capacity, they could produce in one day 1,500,000 bricks.

The Kansas brick industry already is more valuable than all the mineral products mined twenty years ago in the State, and it is rapidly increasing. There are forty plants of considerable size, not including many small, one-kiln yards, which supply a limited local demand. Of these fifteen are using gas for fuel.

In this State shales are used more than clay, the shale representing a clay which has hardened into a more solid form of rock, and is made up of layers. This shale is removed from the bank or pit by blasting and shoveling the broken material into cars or carts which are hauled to the mill, located usually close to the deposit.

BLUE VITRIOL.

The only plant in the United States manufacturing blue vitriol by itself, and not as a by-product in other work, is at Argentine, the property of the Southwest Chemical Company. On account of the closing down of the Argentine smelter this plant is also idle, but it is hoped that the closing of a valuable industry is only temporary.

SULPHURIC ACID MANUFACTURE.

The plant of the United Zinc & Chemical Company is located on the bank of the Kansas River, about one and one-half miles southwest of the Argentine railroad station. The plant was started some years ago to make sulphuric acid, and has been enlarged from time to time until it is a factor in the sulphuric a.id manufacture of the West. Nitric and hydrochloric acids are also made.

The method used in the manufacture of sulphuric acid is practically the same as in the various other works in this country, with certain improvements in machinery and manipulation designed by the able chemist of the company, Mr. Ottokar Hofmann.

At Iola there has recently been constructed a sulphuric acid plant, using the natural gas for fuel. This has been constructed under the direction of Mr. E. Nesbitt and Mr. Otto Preelss. The zinc ore is roasted in a mechanical continuous roaster, made up of a seven-row muffle kiln, capable of roasting ore enough for a three-block 1728 retort zinc smelter, or forty-five tons a day. The sulphur fumes pass into a flue, where some of the dust is deposited, and the sulphur then passes to a square condensing tower, forty-nine feet high, and the heat it carries is used to concentrate some of the weaker acid. The sulphur gas is then carried through a three-foot pipe into six chambers, connected tandem, one behind the other. Steam is admitted into these, and condensation takes place. From the last chamber another lead flue carries the gas to the absorbing tower, and then downward into a second absorbing tower; both of these recover as many of the nitrogen compounds as possible. These compounds are added in the condensing tower in the form of nitric acid (HNO_3) to give oxygen needed. These absorbing towers are lined with lead, and are filled with a checker-work of bricks, which are chemically free from lime, iron and alkalis. Four hundred tons of lead were used in the construction of this plant, and the daily capacity is about fifty tons. The finished product is pumped into storage tanks, and from there runs by gravity into tank cars

of 65,000 pounds capacity. The buildings are frame, and cover twenty acres of ground. The main building is 526 feet long, sixty-five feet wide, seventy feet high, with an L 111 feet long. The sulphuric acid is used for the manufacture of fertilizer, for refining petroleum, manufacture of nitro-glycerine, alum, soda, ash, ammonia, sulphate and blue vitriol.

MINERAL WATERS.

Kansas is well equipped with springs of mineral water, a number of which are of more than local renown. There are over one hundred of these in the State, which have attracted more or less attention. Analyses show that these waters compare favorably in quantity of constituents and in variety with waters of the same class found elsewhere. One of the largest of these springs is the Waconda or Great Spirit spring, in the central part of the State. It is situated on a mound, and is thirty-five feet in depth and fifty-six feet across. Its waters belong to the chlor-sulphate group. The spring from which the most water is shipped to other points is the famous Abilena, near Abilene. It was discovered in 1897, and three years later the property was purchased by the present Abilena company. The water is a natural cathartic and holds a high reputation among the chemists and physicians of the West.

Space will not permit a description of the other noted Kansas mineral springs, but Volume VII of the University Geological Survey gives a complete account of these springs, with analyses of their waters.

OTHER PRODUCTS.

The foregoing are some of the principal products obtained from the mines of Kansas. In addition to these, this young commonwealth has a considerable income from its ochres or mineral paints, and other products. There are quarries in a hundred places, yielding the best qualities of building stone, both sandstone and limestone, and clay beds, which are already producing millions of the best grades of vitrified brick and other products.

These industries have not yet been extensively developed, largely because the markets of the State have not encouraged their development. In the near future, however, it is reasonable to hope for an increased production, particularly along the line of cements, building stone and clay commodities, which will materially augment the output of the mineral wealth of the State.

MANUFACTURES

ENORMOUS GAIN IN PRODUCTS.

Kansas, with a population of 107,000 in 1860, had grown to 996,096 in 1880, and in 1908 to 1,656,799. With this increase of population there has been an increase of manufacturing establishments, which well deserves attention. The value of products made in Kansas mills and factories has increased from $4,357,408 in 1860 to $233,984,332 in 1908. Almost two-thirds of these products are made from the agricultural resources of the State.

Among the manufacturing States of the Union, Kansas ranks twenty-ninth in capital invested, twenty-eighth in number of wage-earners, twenty-fifth in output of products.

Meat packing represents the leading of these industries, and centers especially in Kansas City, which is the second largest meat packing city in the country with the largest single house in the world, having a total of ninety acres of floor space.

State Commissioner Johnson of the Kansas Bureau of Labor and Industry, in his report for 1908, makes the following statement regarding industrial conditions during the year:

"In the coal-mining industry, sixty-four establishments made reports, showing a total investment of $9,393,608. The average number of wage-earners for these establishments was 10,336. The total wages paid these wage-earners for the year was $6,714,063; while the total value of products for the year from these sixty-four concerns was $8,134,282. The total number of establishments covered in the entire inquiry was 1,633. This was a reduction of 116 establishments from the number reporting for the year 1907. This reduction in the number of establishments is due, doubtless, in part, to consolidation of certain classes of industries, while many other establishments were closed down part of the time on account of the financial panic extending through the earlier part of 1908, during which eighty-eight establishments formerly in business reported that they were 'out of business.' Twenty-eight establishments report 'no factory in connection with this business as formerly.' Forty establishments report being closed down temporarily. This apparently accounts for practically all of the decrease in the number of returns.

"This investigation covered eighty-nine separate and distinct branches of industry. The total capital invested was $125,875,848, or 4.91 per cent increase over 1907. The average number of wage-earners was 52,309, a decrease of 2.35 per cent. The total wages paid to these wage-earners was $30,497,667, a decrease, as compared with 1907, of 7.96 per cent. The total cost of materials and supplies used in the operation of these manufactories and industrial concerns was $178,959,544, a decrease of 1.52 per cent as compared with 1907. The total value of products for these 1,653 establishments was $233,984,332, a decrease of 3.29 per cent as compared with the previous year.

"It will be noted that there are very slight changes in the returns as compared with the previous year. Most of the changes, however, show a reduc tion indicating forcibly the panicky conditions existing in the latter part of 1907 and the early part of 1908."

MANUFACTURING STATISTICS.

A table is appended which shows a summary for the year 1908 as compared with 1907, giving in full the returns of the more important features of the inquiry, including investments, averages and other data.

	1908	1907	Increase or Decrease Per Cent
Number of establishments	1,653	1,769	inc. 6.56
Capital invested	$125,875,848	$119,983,322	dec. 4.91
Number of salaried officials, clerks, etc	5,292	5,644	inc. 6.24
Salaries	$5,507,842	$5,407,263	dec. 1.86
Average number of wage-earners	52,309	53,543	inc. 2.35
Total wages	$30,497,667	$33,135,052	inc. 7.96
Miscellaneous expense	$11,028,142	$10,722,141	dec. 2.85
Cost of material used	$178,959,544	$181,726,766	inc. 1.52
Value of product, including custom-work and repairing	$233,984,332	$241,943,553	inc. 3.29

Another table presents a comparative summary of urban and rural communities with regard to the distribution as to location of the manufacturers within the State.

The urban communities are designated as the sixteen municipalities having a population of 8,000 and over. The rural are designated as the smaller municipalities, under 8,000 population, and country districts, in the State. The most important points of interest in this table are that 54.9 per cent of the total number of manufactories are in the rural communities and only 45.1 per cent in the urban communities; and that in the matter of wage-earners employed in these industries, 33,919 are employed in the urban communities and 18,390, or only a trifle over half the number, in the rural communities. In the distribution of wages as between the two communities, it is found that in the urban $19,128,844 was paid, while in the rural $11,368,823 was paid. A similar increased proportion is shown in the cost of materials and supplies used in the urban industries, which was $148,390,188, or 82.97 per cent of the total; while for the rural industries the amount was $30,569,356, or 17 per cent of the total. The value of products, including custom-work and repairing, for urban industries, was $178,809,521, or 76.42 of the total. The same in rural industries was $55,174,811, or 23.6 per cent of the total for the State.

A third table presents a comparative summary for eighteen leading industries for the year 1908 as compared with 1907. The grouping of these brings out not only the chief industries of the State, but the extent or proportion of such industries to the total, and enables the student to determine the classes of industries that predominate. In these eighteen industries there are 1,126 establishments, a decrease of 5.9 per cent as compared with 1907. The total capital invested for these specific industries was $103,600,003, or an increase of 3.2 per cent as compared with the previous year. The capital invested also constitutes 82.2 per cent of the total for the State. The total average number of wage-earners was 46,192, being a decrease of 3.5 per cent of the number employed the previous year. This number constitutes 88.3 per cent of the total for the State. The total wages paid these wage-earners was $27,483,714, a decrease of 9.5 per cent as compared with the amount paid by these industries for the preceding year. This amount constitutes 90.1 per cent of the total wages reported for the State. The total cost of supplies and materials used in the operation of these industries was $172,-

205,051, a decrease of 2.3 per cent, as compared with the same industries during the previous year. This amount constitutes 96.2 per cent of the total for the State. The total value of products, including custom-work and repairing, for these eighteen industries was $221,458,794, or a decrease of 4.3 per cent as compared with the total products of these eighteen industries for the previous year. This amount constitutes 94.64 per cent of the total products for the State.

PRINCIPAL MANUFACTURING CITIES.

In another table are presented the manufacturing and industrial concerns, by specified industries, located in municipalities having a population of at least 20,000. The data are segregated by cities, showing information for Kansas City, Topeka, Leavenworth and Wichita. The more important data indicated by the table are as follows:

KANSAS CITY.—Total capital invested for the seventy-eight industries reporting is $29,126,193, as compared with $26,390,911 for 1907. The total amount of wage-earners reported was 12,551, as compared with 12,377 for 1907. The total wages paid for the year to these wage-earners amounted to $7,383,041, as compared with $7,237,644 for 1907. The total value of products, including custom-work and repairing, for the industries reporting, was $123,076,511, as compared with $134,195,531 for 1907, being a decrease of $11,118,990, or 8.5 per cent.

LEAVENWORTH.—Reports were received from 67 industries, which report the total investment of $3,741,221, as compared with $3,206,751 for 1907. The average number of wage-earners was 2,143, as compared with 1,091 for 1907. The wages paid to these wage-earners was $1,156,543, as compared with $1,047,670 for 1907. The total value of products was $4,691,314 as compared with $4,860,195 for 1907.

TOPEKA.—The city of Topeka reports one hundred and twenty-seven industries, being a reduction of twenty industries as compared with 1907. The capital invested was $6,294,114, as compared with $7,096,279 for 1907, a decrease in the amount of investments of $702,165, which is, perhaps, accounted for in the reduction of the number of industries reporting. The total number of wage-earners reported was 4,101, as compared with 5,257 in 147 industries for 1907. The total wages paid amounted to $2,406,660, being a slight reduction compared with the previous year. The value of products, including custom-work and repairing, was $13,651,141, as compared with $14,145,466 for the previous year.

WICHITA.—Ninety-four industries reported from the city of Wichita, showing a total capital invested of $6,280,716, as compared with $4,855,897 for 1907. This is a substantial increase in the investments. The average number of wage-earners employed in these industries was 1,977 as compared with 1,838 for 1907. The wages paid to these employes amounted to $1,050,-833, as compared with $889,887 for 1907. The total value of products, including custom-work and repairing, is seen to be $13,890,351, as compared with $9,855,175 for 1907, or an increase of 28.9 per cent.

It will be noted that in the above analysis for the various cities the general rule indicates a reduction in the operation of manufacturing industries. This

is due apparently to the limited output of manufactures during the previous year and can be accounted for in no other way than resulting from the financial flurry during the fiscal year ending June 30,1908, for which fiscal year these data were secured. It also may be remembered that the manufactories investigated are those operating machinery as distinguished from mercantile establishments.

In the comparisons, however, the city of Wichita shows a substantial increase in all of the items named, indicating that it suffered less from the financial panic than any of the other cities in the State.

The following table gives a comparative summary of certain cities of 8,000 population and over, and the percentage of increase or decrease in total value of products for 1908 over 1907:

City	Year	Number of Establishments	Wage-Earners		Total Value of Products	Increase or Decrease Per Cent
			Average Number	Total Wages		
Kansas City	1908	78	12,551	$7,283,041	$123,076.541	dec. 8.29
	1907	78	12,377	7,237,624	134,195,531	
Leavenworth	1908	67	2,143	1,156,543	4,691,314	dec. 3.37
	1907	64	1,991	1,047,670	4,860,195	
Topeka	1908	127	4,101	2,406,660	13,651,141	dec. 3.49
	1907	147	5,257	2,801,490	14,145,466	
Wichita	1908	94	1,977	1,050,833	13,890,351	inc. 40.95
	1907	103	1,838	889,887	9,855,175	
Arkansas City	1908	25	437	275,999	2,027,506	inc. 84.81
	1907	24	174	101,256	1,097,067	
Atchison	1908	45	946	483,180	4,021,361	dec. 4.89
	1907	49	1,261	675,757	4,227,915	
Chanute	1908	30	617	316,554	1,003,903	dec. 3.62
	1907	29	361	182,052	1,041,592	
Coffeyville	1908	35	1,325	577,391	3,095,309	dec. 7.83
	1907	36	1,478	774,474	3,358,388	
Emporia	1908	22	309	179,222	678,638	inc. 28.82
	1907	21	115	61,991	526,826	
Fort Scott	1908	30	881	499,249	1,663,721	inc. 1.40
	1907	37	1,062	576,250	1,640,719	
Hutchinson	1908	32	535	307,358	2,716,093	dec. 42.97
	1907	34	653	432,088	4,762,565	
Independence	1908	26	1,009	519,349	1,713,058	dec. 38.06
	1907	28	1,591	956,738	2,765,789	
Iola	1908	24	1,530	908,824	3,735,293	dec. 54.23
	1907	27	2,138	1,359,768	8,161,289	
Lawrence	1908	11	308	110,906	422,048	dec. 47.94
	1907	12	309	149,291	810,723	
Parsons	1908	19	1,538	1,043,784	1,989,829	inc. 56.99
	1907	18	772	500,827	855,812	
Pittsburg	1908	44	3,350	1,686,259	4,680,021	inc. 14.53
	1907	49	3,938	2,063,719	3,999,909	
Salina	1908	20	219	125,176	2,541,683	inc. 17.81
	1907	20	175	103,912	3,092,293	
Winfield	1908	18	143	98,520	1,384,042	inc. 9.15
	1907	15	131	91,462	1,257,408	
Totals for 1908		747	33,919	$19,128,844	$178,809,521	
Percentage of totals to totals for the State		45.19	64.65	62.72	76.42	

ELEVATIONS

The appended table shows the elevation above sea level of towns indicated:

	Feet		Feet
Alida	1,048	Lawrence Junction	749
Asherville	1,285	Leavenworth Junction	697
Assaria	1,222	Lee	985
Axtell	1,363	Leona	918
Baileyville	1,294	Leonardville	1,322
Bavaria	1,205	Lincoln Center	1,616
Beattie	1,293	Lindsborg	1,270
Belleville	1,490	Lindsey	1,181
Beloit	1,322	Lisbon	3,079
Bennington	1,162	Lucas	1,651
Beverly	1,262	Manhattan	955
Big Stranger	770	Mannville	973
Blaine	1,450	Marysville	1,155
Blairs	897	McPherson	1,430
Blue Rapids	1,098	Milford	1,041
Bridgeport	1,240	Miltonvale	1,319
Brittsville	1,273	Minneapolis	1,195
Brookville	1,287	Monotony	3,741
Broughton	1,122	Monument	3,107
Buffalo Park	2,695	Moores	851
Bunker Hill	1,802	Morganville	1,177
Carneiro	1,503	Morrill	1,098
Christie	1,280	Norway	1,042
Circleville	1,043	Oakley	2,981
Clay Center	1,142	Ogallah	2,318
Clifton	1,216	Oketo	1,157
Clyde	1,238	Olsburg	1,374
Collyer	2,517	Onaga	1,040
Concordia	1,305	Oneida	1,219
Culver	1,203	Pleasant Ridge	1,028
Delphos	1,239	Randolph	1,047
Drake	919	Reno	764
Easton	850	Robinson	850
Ellis	2,056	Russell	1,765
Ellsworth	1,471	Ryans	892
Elwood	817	Sabetha	1,308
Fairmount	891	Savannah	1,051
Fostoria	1,394	Seneca	1,152
Garrison	1,005	Severance	903
Garrison Crossing	1,004	Sharon Springs	3,419
Glasco	1,258	Soldier	1,131
Grainfield	2,743	South Leavenworth	699
Green	1,234	Sumnerville	1,224
Grinnell	2,843	Talmo	1,304
Hamlin	1,984	Tescott	1,235
Hanover	1,225	Tonganoxie	787
Havensville	1,112	Troy	1,093
Hays	1,936	TroyJunction	1,110
Herkimer	1,238	Valley Falls	858
Hiawatha	995	Verdi	1,141
Hoge	790	Victoria	1,851
Holton	959	Vining	1,216
Home	1,339	Wakeeney	2,391
Hund	777	Wakefield	1,091
Indiana	1,200	Wallace	3,286
Irving	1,084	Wathena	818
Kanopolis	1,513	Wilson	1,627
Lakin	885	Winchester	1,105
Lansing	728	Winona	3,303
Lawrenceburg	1,268		

COST OF LIVING

THE DEMAND FOR LABORERS.

Skilled workmen in all departments of industry throughout the State have no difficulty in finding employment at good wages, while unskilled labor also is in great demand. Living expenses are not as high in Kansas as in the Eastern States, and taken as a whole wage-earners here live better and have a greater opportunity to improve their condition than in the crowded centers of the East.

Below appears a table showing the different classes of workmen, their wages by the hour, day, week, or month; also the average number of persons in their families, their average monthly rental, their average annual earnings and their average annual cost of living:

Occupation	Average Rate	Average No. in Family	Average Monthly Rent	Average Annual Earnings	Av. Ann. Cost of Living
Railroad Brakemen	2.3c per mile	2.9	$ 9.12	$ 766.26	$532.90
Railroad Conductors	3.4c per mile	3.7	14.50	1283.78	560.49
Locomotive Engineers	4.1c per mile	3.5	13.00	1274.33	520.91
Locomotive Firemen	2.5c per mile	2.1	10.50	688.40	393.86
Blacksmiths	$2.25 per day	4.3	8.12	775.37	442.78
Boilermakers	3.06 per day	3.8	11.00	932.33	558.50
Boilermaker's Helpers	1.70 per day	4.5	6.00	440.91	332.67
Carmen	1.85 per day	3.7	7.66	598.21	394.95
Machinists	.33 per hour	3.4	11.29	926.29	492.08
Carpenters	2.62 per day	4.	8.42	611.37	410.98
Common Labor	1.69 per day	3.	5.88	551.62	312.80
Painters	2.76 per day	2.7	8.09	590.45	343.67
Stone Masons	3.33 per day	4.	5.50	488.88	382.69
Brick Masons	5.79 per day	3.4	9.91	824.19	398.98
Barbers	12.37 per week	3.3	7.93	669.95	417.84
Bakers	14.66 per week	4.	9.40	636.86	431.76
Cigar Makers	10.90 per week	2.3	12.00	562.24	403.70
Retail Clerks	10.86 per week	2.3	8.40	547.22	281.76
Coopers	2.20 per day	4.6	9.80	682.50	618.46
Iron Moulders	2.83 per day	5.4	9.83	625.33	366.50
Harness Makers	2.17 per day	3.4	8.64	626.48	399.50
Miners	.82 per ton	4.1	5.69	529.33	358.65
Mine Day Workers	2.39 per day	4.3	5.53	660.15	413.06
Beef Butchers	2.63 per day	2.1	11.28	453.25	348.86
Printers	3.07 per day	3.2	11.00	849.12	466.67
Stationery Engineers	67.17 per month	4.	8.00	781.07	394.50
Printing Pressmen	2.90 per day	2.6	6.00	754.52	330.12
Teamsters	2.81 per day	4.2	4.78	646.29	301.20
Team Drivers	1.76 per day	3.1	5.25	504.62	418.70
Horse Shoers	2.50 per day	2.	16.00	770.00	320.00
Mill Employes	1.85 per day	3.6	7.80	596.84	308.80
Sheet Metal Workers	2.42 per day	4.	8.50	716.00	510.75
Mattress Workers	1.50 per day	3.3	8.50	515.00	430.40

The country through which the Union Pacific and its branches extend offers special inducements either to the farmer or investor. Here are all the advantages of railways, markets, schools, churches, society and neighbors that can be found in an old settled country, with the additional advantage of cheap lands, unsurpassed in fertility, and a climate of acknowledged healthfulness. To the man who is the possessor of a few hundred dollars, this country presents better opportunities for securing a home and a competency that it is possible for any government land district with its free lands to offer. It

is not necessary to say why the above statement is true; for a little thought on the part of any intelligent farmer will convince him of its accuracy. The man who has experienced the hardships incident to the homesteader's and pre-emptor's life, in a country remote from railways, markets, schools, and society; the increased expense for provisions and fuel, will find, at the end of five years' residence, that he has expended more than the purchase money of a quarter-section of land where all the conveniences and advantages referred to above are already at hand.

RAILROADS

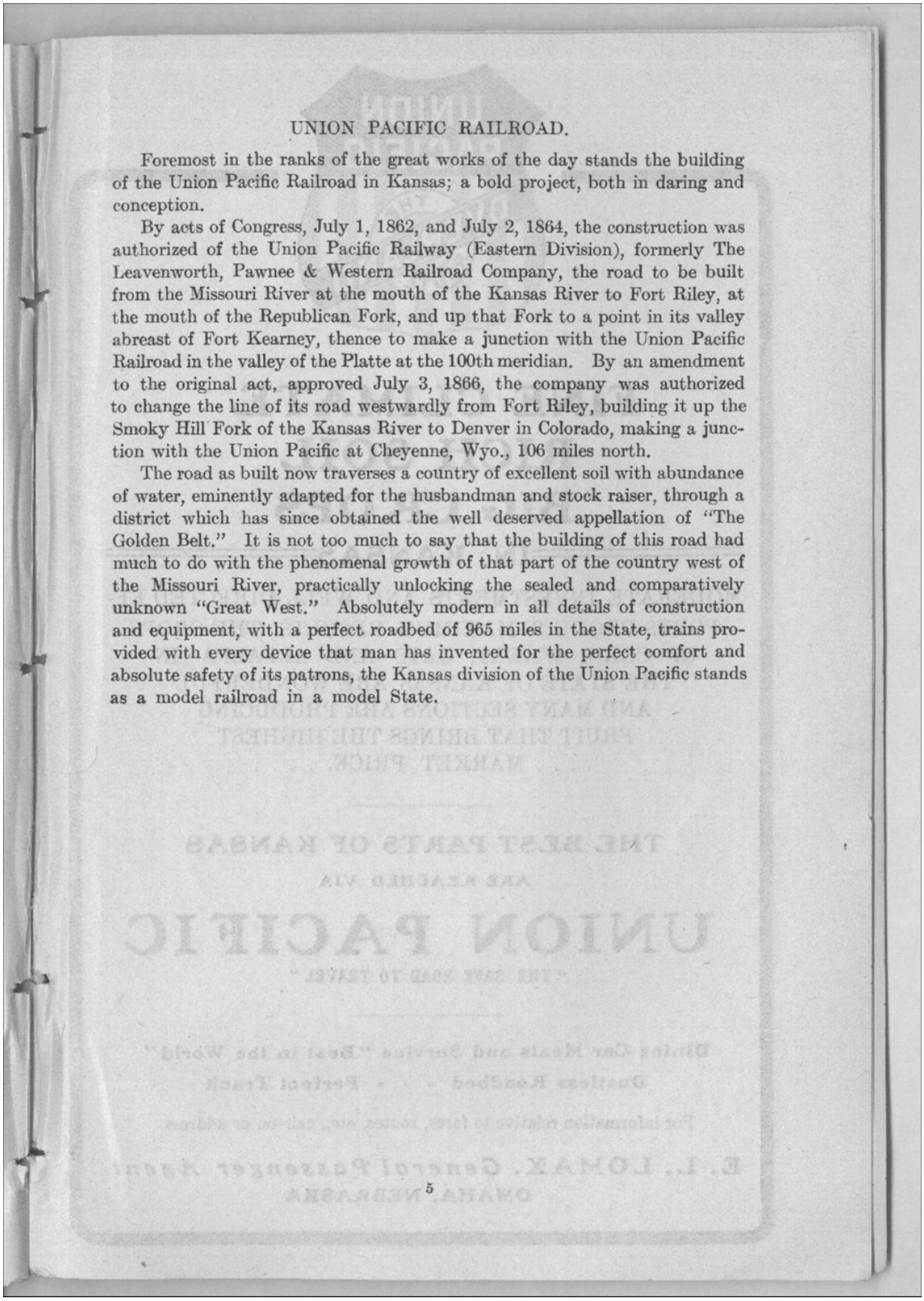
LARGE RAILROAD MILEAGE.

Of railroads, Kansas has a trifle more than 10,250 miles. This mileage is exceeded in two and, perhaps, in three other States. It is about the same as Italy, not quite half that of Great Britain and Ireland combined, slightly less than that of Spain and Switzerland together and one-third that of all Germany. Of the 105 counties, 100 have one or more railroads, and, excepting seven, all county seats have one or more. There is an average of a mile of railway for each 145 of the inhabitants. The main lines are maintained in excellent condition, and the service is as good as may be found anywhere. The main line track has been well ballasted with gravel, stone, cinders, slag or other superior material. Their earlier and lighter rails have been replaced by those of heavier steel, joined by the best modern devices, so that the average speed found in any part of the country is here obtained with perfect safety, as the main line of the Union Pacific in the State of Kansas is protected by the now famous electric automatic Block Signal System. This system is fully described in the new publication issued by the Union Pacific, entitled "Making Travel Safe," which will be sent to any address upon application to any of the agencies mentioned on the inside cover page of this book, or to Mr. E. L. Lomax, General Passenger Agent Union Pacific Railroad Company, Omaha, Neb. The rolling stock compares favorably with that in use in any country; and generally, so far as railroads are concerned, Kansas challenges comparison with any.

From Kansas City, Kan., where the Kansas River joins the Missouri, at the east line of the State, the distance by rail to the various ports, east south and west, is about as follows:

	Miles
To New York	1,340
To Savannah	1,187
To New Orleans	878
To Port Arthur	786
To Galveston	800
To Chicago	458
To San Francisco	2,010
To Seattle	2,056

Kansas. Resources, population, industries, opportunities and climate



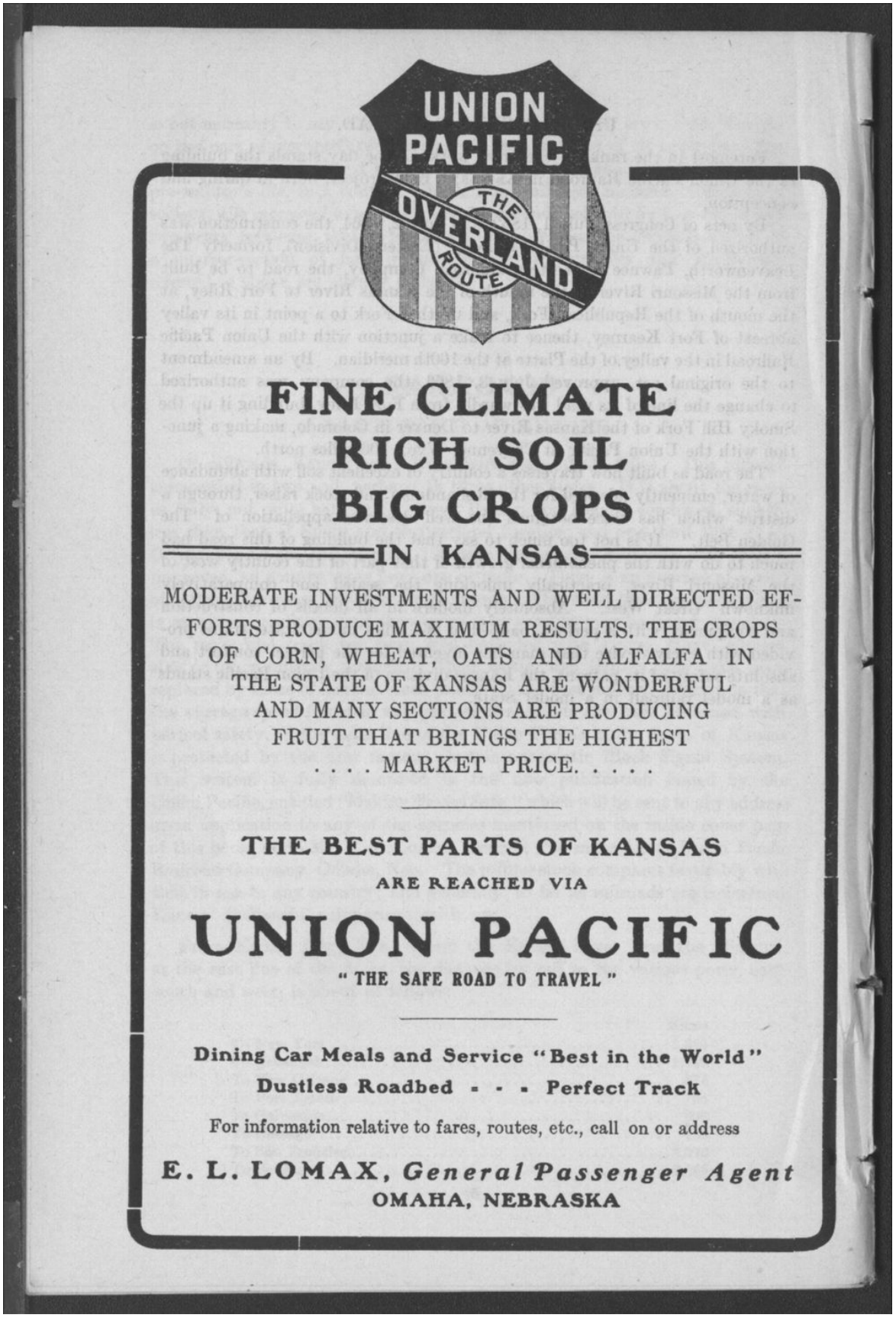
UNION PACIFIC RAILROAD.

Foremost in the ranks of the great works of the day stands the building of the Union Pacific Railroad in Kansas; a bold project, both in daring and conception.

By acts of Congress, July 1, 1862, and July 2, 1864, the construction was authorized of the Union Pacific Railway (Eastern Division), formerly The Leavenworth, Pawnee & Western Railroad Company, the road to be built from the Missouri River at the mouth of the Kansas River to Fort Riley, at the mouth of the Republican Fork, and up that Fork to a point in its valley abreast of Fort Kearney, thence to make a junction with the Union Pacific Railroad in the valley of the Platte at the 100th meridian. By an amendment to the original act, approved July 3, 1866, the company was authorized to change the line of its road westwardly from Fort Riley, building it up the Smoky Hill Fork of the Kansas River to Denver in Colorado, making a junction with the Union Pacific at Cheyenne, Wyo., 106 miles north.

The road as built now traverses a country of excellent soil with abundance of water, eminently adapted for the husbandman and stock raiser, through a district which has since obtained the well deserved appellation of "The Golden Belt." It is not too much to say that the building of this road had much to do with the phenomenal growth of that part of the country west of the Missouri River, practically unlocking the sealed and comparatively unknown "Great West." Absolutely modern in all details of construction and equipment, with a perfect roadbed of 965 miles in the State, trains provided with every device that man has invented for the perfect comfort and absolute safety of its patrons, the Kansas division of the Union Pacific stands as a model railroad in a model State.

Kansas. Resources, population, industries, opportunities and climate



Kansas. Resources, population, industries, opportunities and climate

Kansas. Resources, population, industries, opportunities and climate

KANSAS

RESOURCES, POPULATION, INDUSTRIES, OPPORTUNITIES, AND CLIMATE . . . . . .

UNION PACIFIC
THE OVERLAND ROUTE

Revised to August, 1909