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These reports of the Kansas State Mine Inspector mostly concern coal mining, though by 1929 the scope of the reports broadens to include metal mines. The content of individual reports will vary. The reports address mining laws and mining districts; industry production and earnings; fatal and non-fatal accidents; accident investigations and transcripts of oral interviews; labor strikes; mine locations; mining companies and operators; and proceedings of mining conventions. The reports document the political, economic, social, and environmental impacts of more than seventy years of mining in southeastern Kansas.

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such an appropriation has never been made in Kansas, excepting for stationery, the expressage of which has been paid by the Inspector.

Under the present state of affairs the Inspector may go on discharging the duties of the office intrusted to him faithfully and honestly, and at the end of his term he will have spent for expenses the larger portion of his salary for dear living and travel. The law fails even to provide him with an office or postage, which I think it should certainly do. In all other States, to my knowledge, State Inspectors are provided with an office in the capitol building, like all other State officials. While this is so, it might be impracticable in this State; that is, taking a view of the matter from an economical standpoint.

The capital in this State, although near to some small mining interests, is not as convenient for an office as it would be in the heart of a coal district of any magnitude, for the reason that but few of the mines can be reached without livery hire. So that it would be more economical for the Inspector to live in the immediate vicinity of one of the largest coal districts, and keep and own a horse and buggy which costs him $120 per year for feed and attention. It would be cheaper for him to do this than to hire livery when inspecting this district, and it is also more convenient, as he can go and come when he pleases, late or early. But when he goes into other districts, the liverymen have no mercy upon him any more than they have upon others.

In view of these facts, as an encouragement to the Inspector to aid him in keeping up with the growing coal business, I would suggest that the Legislature make some appropriation to defray the expenses incurred by him in the honest and faithful discharge of his duties.

SCALES.

Much dissatisfaction exists among miners, at times, at mines where the coal is weighed before being credited to them, in regard to the alleged inaccuracy of the scales. They complain that the scales do not weigh accurately, and that they are being cheated out of their earnings by this means. I will not attempt to vouch for the truth of such complaints. It may only be the miner's suspicion, and it may be true. However, it would be a great satisfaction to the miner, and I don't think would be disapproved by the operator, if the Legislature would pass a law giving some person authority to act as sealer of weights and measures for the coal miners. In some States the inspectors are given this authority, with the instruments and weights necessary to act as such. A separate fund is appropriated to defray the expense incurred through hauling the weights, etc., from one mine to another. Such a law might be passed in this State, with due regard to the present duties of the Inspector, and which would bring about a better feeling between miner and operator in this respect.

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SCREENS.

There are but three counties in the State that screen the coal before it is credited to the miner: namely, Crawford, Cherokee, and Leavenworth. In the two former, the miners get an average of 3¾ cents per bushel the year around; in the latter they are paid 4 cents the year around. In the two former counties, however, there are a few places where the miner gets pay for the coal before it passes over the screen. In those cases, they only get 2¾ cents per bushel the year around, a difference of 1 cent per bushel between screened and unscreened coal. Much dissatisfaction exists among the miners in regard to the coal being screened before it is credited to them. Some claim that they could do better at 2¾ cents the year around, and not have it screened, than 3¾ cents the year around, and have it screened. The operators claim that to do this puts the unskillful miners on a level with the skillful, inasmuch as the coal has all to be blasted out of the solid. The skillful miners, in most instances, mine their coal more or less, and gauge their powder so as to make as big coal as possible, while the unskillful miners blow it all to pieces, and still get the same weight and credit for their slack coal that the skillful miners get for their lump and marketable coal.

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THE COAL DEPOSITS OF KANSAS.

CHEROKEE AND CRAWFORD COUNTY'S COAL FIELDS.

The coal vein most extensively mined now in these two counties is that deposit known by coal men as the Cherokee vein. It is the thickest and most valuable deposit of any coal yet discovered in the State. It ranges in thickness from three feet two inches to three feet nine inches, attaining its greatest thickness in the vicinity of Weir City and Scammonville, Cherokee county. In a few localities in this vicinity it has attained a uniform thickness of four feet, and in a few exceptional places it has been found to measure five feet. This latter deposit is mostly found along-side of horse-backs or clay-seams, which are very numerous in this vein. They will be found running throughout the vein in every conceivable direction, resembling an unevenly-spaced net-work, cutting the coal out completely in every instance, from the top to the bottom. In most places they are composed of pure fire-clay; in others, a mixture of fire-clay and hard boulders.

This coal seems to possess superior quality over most other bituminous coals coming into the same market, and is sold at a higher price. This is evidence of its superior quality. It is a coal of a very highly coking nature, makes a fair quality of coke, and is a good gas coal. As evidence of this fact, it is being used very generally by the gas companies of this State.

The cropping out of the eastern edge of this valuable deposit of coal can be seen along a line in a southwestern direction from Mulberry, Kansas, and Morerod, Missouri, passing through Litchfield, Pittsburg and Weir City, to Columbus, a distance of 30 miles, varying to the east and west in conformity to the undulations of the surface. It is being mined by shaft, slope, drift, and strip-bank openings, at intervals at and between these points.

This vein is probably the same deposit that is found at Walnut, Bates county, Mo., but the most valuable part of it, so far discovered, seems to be in Kansas. Beyond the vicinity of Columbus, to the southwest into the Neosho river basin, this vein has been lost sight of. It has probably been cut out by the low lands of the river, and will come to view again southwest from Columbus, in the Indian Territory.

The general dip or declivity of this deposit is found bearing to the north and westward. As evidence of this fact, so far as this coal has been developed, it is found deeper and deeper the further we get in that direction, so that the extent of the deposit is much greater than was surmised a few years ago. It seems to dip towards the interior of the State, varying with the undulations of the surface, at the rate of fifteen to thirty feet to the mile;

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whether it keeps this inclination or not, is not known. Of course it will be observed that the general surface of the State rises to the north and west, but local developments have proven that the measures also dip.

In the vicinity of Pittsburg there is a shaft located about three-fourths of a mile west from the crop line, that is thirty feet in depth. Three miles due northwest of this shaft, at a place called Lone Oak, in ground having comparatively the same elevation, will be found a shaft working the same vein 116 feet from the surface. At Weir City, Cherokee county, there are shafts also within a mile and a half from the crop, that are forty-five feet deep. Four miles north and west of these shafts, near the city of Cherokee, will be found a shaft working the same vein 140 feet in depth, and on ground having comparatively the same surface elevation. This proves beyond a doubt, that the strata decline in that direction. There are also other small veins of coal which have taken on successively between the crop of this larger vein and where it is now being mined in these deep openings. One of these has attained the thickness of twenty-six inches. This vein can be found cropping out between the deep shaft at Cherokee, and the other, not so deep, at Weir City, and between the deep shaft at Lone Oak, and the one not so deep, at Pittsburg. It is being stripped at Coalvale, northwest of Mulberry, and is being mined at a shaft opening at Arcadia. It is also being mined at J. M. Baird's shaft, at Cherokee City, in Crawford county; is being stripped and drifted on Cherry creek, northwest of Columbus, and is being mined from two shaft openings near Hallowell, due west of Columbus. This vein no doubt will make a valuable seam for long wall work in the near future. In the hands of a good company having managers who understand this system of work, this vein could be mined with profit, and compete in the market with other coals, as there seem to be no troubles or faults in it.

Other smaller veins, evidently above this deposit, are being mined near Oswego, in Labette county. There is no scarcity of coal in this part of the country. The deposits are in a manner inexhaustible. It is only a question of sinking the shafts a few feet deeper, when the shallower parts are worked out.

OSAGE, SHAWNEE AND COFFEY COUNTY COAL FIELDS.

The outcropping of this coal can be seen in a similar manner to that found in Cherokee and Crawford counties, the eastern edge of the deposit varying to the east and west, owing to the undulations of the surface. It comes to view at intervals on the surface, on a line in a southwestern direction from a point three miles west of Topeka, passing through Carbondale and east of Scranton, Burlingame, Dragoon, Peterton, Osage City, Barclay, and Arvonia, through Lebo, in Coffey county, and to a point near Neosho Rapids, in Lyon county, showing an extent of country sixty-five miles long, between the Kansas and Neosho rivers, where coal is being mined at intervals. The

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breadth of this deposit is not known. The inclination of the including strata and the deposits to the north and west carries the vein gradually deeper and deeper in that direction.

This coal ranges in thickness from 12 to 20 inches, having attained its greatest thickness at Scranton, and from here gradually thinning down to the northeast as it approaches the Kansas river, and to the southwest as it approaches the Neosho river. Beginning in Shawnee county, west of Topeka, we find it 12 inches; at Carbondale, 17 to 18 inches; at Scranton, 20 inches; at Burlingame, 18 inches; at Dragoon, in narrow troughs, but only local, 3 feet; at Peterton and Osage City, 14 to 15 inches; at Barclay, 13 to 14 inches; at Arvonia, 13 inches; at Lebo, 12 inches; near Neosho Rapids, in Lyon county, 10 to 11 inches. Four miles west of North Topeka, I am informed, a drill-hole was put down forty feet, passing through an 18-inch vein of coal. This is probably the same vein as above, but it is a little thicker than would be expected in that locality. Being only a few miles north, across the Kansas river, from where it is found only twelve inches thick, it shows an exaggeration, but it may be nevertheless true. Some few years ago coal was being mined in Shawnee county by the stripping process, but it is now being mined from shaft openings. At Carbondale, in Osage county, it is being mined from both strip banks and shafts. Mining operations are going on, on high land, above the town called Carbon Hill. At Scranton it is found deeper, being further to the northwest. There it has been stripped only in a few places on low land, the mining operations now going on being shaft openings. At Burlingame, which is farthest to the northwest of all, it is found, and is being mined from shaft openings ranging from 85 to 103 feet deep, and from shafts at Dragoon, Peterton and Osage City, but not quite so deep, as those places are not so far to the northwest as Burlingame. It is being mined by shafts east of Barclay; from strip-works and drifts at Arvonia; from strip-works, drifts and shaft openings at Lebo; and from strip-works near Neosho Rapids. There is no scarcity of coal here, as an inexhaustible supply will be only a question of sinking shafts a little deeper for it, as the shallow part of the deposit is worked out.

NEOSHO COUNTY COAL FIELD.

The coal in this county, within profitable mining reach, is confined to a very small portion of the county. Two miles south of Thayer the mining operations are going on. There is a very small amount of coal shipped from there, the most being sold to country trade. This coal is 14 inches thick, and is found on low land, drawing to the Neosho river. It is being mined by the drifting process, having from one to six men in a drift, in the winter months. In the summer season very little coal is mined or sold. Some miners work the whole year round, stacking their coal in summer and selling it in winter. The coal being found on low places, about ten miles west of the Neosho river, probably accounts for its being seen only in one

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place. It is very probable that it extends over a great deal more country to the north and west than it gets credit for. The extent of country so far developed, by easy reach, covers about four square miles, and is dotted here and there by a one-man drift.

FRANKLIN COUNTY COAL FIELD.

This coal seems to be a different vein from that in either Linn, Bourbon or Neosho counties. It is found cropping out at Ransomville, and to the southwest at Williamsburg. A shaft at Sibley, in Douglas county, is probably sunk to the same coal. Characteristic with all other veins in the State, it is found deeper to the northwest of its crop line, running southwest and northeast, varying with the undulations of the surface. This is proven by the shafts now in operation at Ransomville, the furthest one to the northwest of the crop being the deepest, which shows that the coal field is of larger area than is surmised. The thickness of the coal ranges from 16 to 18 inches, and has a good roof, but generally a hard bottom, with a little fire-clay mining in local places. The best mining is found where the coal is shallow. The conditions are favorable for long-wall work, which is the prevailing system, and is successfully practiced.

BOURBON AND LINN COUNTY COAL FIELDS.

The coal found cropping out in Bourbon county, which is being mined by the drifting and stripping process, is probably the same vein that is being mined in Linn county by deep shafts. At LaCygne, Pleasanton, Mound City and Orchard this coal ranges from eighteen inches to two feet thick, with local developments as high as three feet. I am informed that coal has been found at Paola, Miami county, at 150 feet from the surface. This is probably the same vein, and it might be said that it is this or some vein near to it that is found in Leavenworth county, at Leavenworth and Lansing.

Developments have proven the Leavenworth coal vein to be wavey. It has been found as thick as three feet at Leavenworth. To account for the difference in depth, Leavenworth is found farthest to the north and west of the southeastern crop of the formation. Be that as it may, I do not think there is a particle of doubt that the vein now being mined at Leavenworth and Lansing can be found at Lawrence at comparatively the same depth from the surface that it is found at Leavenworth and Lansing, taking the difference in elevation of the two cities. From the apparent fall of the two rivers, it would give this indication. Accompanying this, and as characteristic with all the other coal veins of the State, this Leavenworth shaft coal is found to the southwest at Lansing at the same depth and on comparatively the same level and surface elevation. To prove this theory, if levels were taken in either the Leavenworth coal shaft or in the one at Lansing, from the face of the workings in the mine on the east to the face

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of the workings in the mine on the west side, I will venture to assert that the coal would be found to support this theory, by digging to the north and west. Possibly it might vary in thickness if found at Lawrence; it might be thicker, and it might be thinner. Should this theory prove to be correct, it is possible that the eastern part of Kansas is underlaid by thicker and more valuable veins of coal than it gets credit for, and they will be found by going deeper for them.

COAL FIELDS OF THE CENTER COUNTIES OF THE STATE.

In the center of the State, in the counties of Russell, Ellsworth, Lincoln, Mitchell, Cloud, Republic, and Jewell, there is found an inferior vein of lignite or brown coal, which burns very much like wood, has a white smoke, and makes no soot, but the parties using it have to carry out about as much as they carry in, after it is burned. It is being mined by the drifting process on the south side of the Smoky Hill river, south of Wilson, in Ellsworth county. The drifts follow the vein into the side of the bluffs about 100 or 150 feet above the bed of the river. It is next found in Ellsworth county, on the high land, in the northeastern part, near Ben's ranch and Delight post office, where it is being mined by the drifting process. It is found to average 22 inches in thickness, with instances as low as 8 inches and as high as 3 feet. It is next found in shaft openings in Lincoln county, on low lands near Denmark, Pottenberg, Ingalls, and Beacon post offices. Next it is found at Minersville, on the division line of Cloud and Republic counties, where it is found in slope and shaft openings, 45 feet from the surface, and on very low land it has been stripped. Here it has a clay seam between the veins, varying from 1 to 6 inches thick, but no more clean coal than in the above described. At Omio, Jewell county, this same vein is discovered at 150 feet in depth from the surface.

Before this shaft was sunk it was reported by the drillers to be 3 feet thick and of a fine bituminous quality, but since it has been developed by the shaft, it is found to be the same quality of coal, and it only shows up 16 to 18 inches. It is however of a somewhat better quality than the coal in the above places, which is due principally, I presume, to its having more cover on it. At Homer, in Russell county, it is found in a shaft over 100 feet in depth, about the same thickness and quality as at Omio, Jewell county. This bears out the theory advanced, that, like all other coals of the State, it may be found deeper the farther you go to the north and west of where it is found cropping out, as on the hills in Ellsworth and other counties. It has no value as a competitor with coals from Colorado or those of the eastern part of the State, but off from railroad points, as is the case at most all the above places, it is being mined with profit, and will no doubt continue to be mined with profit until railroad facilities will lay the coal down for less money with due regard to quality, etc.

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SYSTEM OF WORKING OUT COAL IN KANSAS COAL MINES.

ROOM-AND-PILLAR SYSTEM.

The coal mines of Crawford and Cherokee counties are worked on what is known as the room-and-pillar system. First, a narrow entry is driven from the shaft or slope, as the case may be, called the main entry, ranging from six to twelve feet wide, according to the character and firmness of the roof. Off this main entry, when the coal vein is comparatively level, at intervals of 300 feet and at right angles to the main entry, cross-entries are driven off, and off these cross-entries at right angles rooms are turned off to the right and to the left. If the cross-entry is driven single, and if they are driven double to secure the better ventilation of the mine, rooms are turned on the right-hand entry to the right, and on the left-hand entry to the left.

The size of the pillars left in, and the distance from one room center to the next room center, is governed mainly by the thickness of the superincumbent strata above the coal which has to be supported, and slightly by the noticeable firmness and texture of the coal to stand a heavy weight without crushing, the softness or hardness of the bottom, and firmness of the roof—these things have all to be considered. In the greater portion of the mines in these two counties, now in operation, the superincumbent strata range from twenty to fifty feet in thickness above the coal. A sufficient pillar in these mines to support this weight without giving is from three to six feet, and the width of the rooms from eighteen to twenty feet, according to the character of the roof.

This would allow the rooms to be broken off on the entries at a distance from center to center of 24 to 26 feet. However, we have one mine in Crawford county, 116 feet deep, and one in Cherokee county, 140 feet deep. The superincumbent strata in these mines need pillars much larger than the above mentioned — at least twice the thickness.

The rooms, after being turned off these cross-entries, are driven out 150 feet, taking one-half of the coal between the cross-entries; the rooms on the other cross-entry driving back and taking out the remaining 150 feet. Thus all the 300 feet of coal left between the entries, excepting the pillars, is taken out. In the shallow mines, where the superincumbent strata would break down, leaving an open rent from the surface to the interior of the mine, so that water would get in from the surface every rain, the pillars have to be left in to avoid this, although they do not do it in all instances, as rooms will sometimes cave between them. But this is tried to be avoided as much as possible.

Thus it will be seen, a part of the coal is left, and is never recovered.

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In the deep mines now in operation, and in those that will be put in operation in the future, this pillar-coal need not be left in. After a new panel or section of work is opened up, and the rooms from one parallel entry to those of another have been driven to their meetings, the pillars can be drawn back without any danger of letting in surface water. Thus all the coal can be excavated without any loss in the deep mines. Of course it will need a little additional outlay at first for the entry work, but the operator will be sufficiently compensated for this when the pillars are drawn back.

The room-and-pillar system of work is only carried on in two other counties of this State outside of the above mentioned, namely, Linn and Lincoln. In all the other counties, the long-wall system prevails, which will be described further on in this report.

Before leaving this description of room-and-pillar work, I wish to give a brief account of some of the irregularities and difficulties that have to be contended with, and which cut into the system in this field, and hinder and prevent the superintendent or mine boss from economically carrying out the system to perfection, or practically, in the manner above described. In a number of cases previous to this writing, there has been found along the out-cropping edges of this coal field, and in some instances a good ways into the interior, a soft roof and poor coal, which runs in serpentine or stream-like streaks, varying in thickness from a few feet to hundreds of feet in localities. Where such faults are found they are not often found singly, but in nests, resembling that of a country cut up with draws and ravines. Very unlucky is the management of a coal mine that has these natural disadvantages to contend with, and endeavors to get coal out at a price low enough to compete with the neighboring management of some other mine which has no soft roof or poor coal to contend with.

There is also found in this coal vein horse backs, or clay-veins, as they are sometimes called, which are general prevailing faults in this coal field. These vary in thickness from a few inches to as high as fifteen feet. Go where you please, wherever this coal vein is being developed, and you will find these clay seams. They cut the coal entirely out in every instance, even in cases where they are but a few inches thick, leaving the coal its full thickness, and in most cases a little thicker on each side. They will be found running throughout the whole coal field in stream-like fashion, and in every conceivable direction, so that as before stated, instead of being able with economy to turn rooms and drive them at right angles from the entries of the mine, you have to drive them in a direction with those horsebacks, to avoid cutting them and to dodge them if you can profitably do so. If not, you turn your room and cut square through them, six feet wide, and open your room up again to its width on the other side. Thus it will be seen, that true systematical mining never can be practiced and carried out in this vein of coal.

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In mines that have good roof and good coal each side of the horseback, they are considered in a manner now no objection, as every one in the coal business has them. Although they are evidently a natural disadvantage to the whole surrounding mining community, yet all are on a square footing, so that one operator has no advantage over his neighbor in this direction. And although we have this natural disadvantage to contend with, as before described, in this our greatest Kansas coal deposit, yet I will venture to say that mining operations are carried on and will continue to be carried on as successfully, all other things being considered, as in any other coal field of our neighboring States. Our miners make as good wages, and I believe, if steady employment could be given them, they would do better than in any other district of our neighboring States. I omitted to mention in the above description of the room-and-pillar system, that in coal veins that are not of sufficient height to admit of mules 14 or 15 hands high in the entries, after the coal has been mined away the roof of the entries is wedged or blasted down to make the height desired. This work is called in the mining language, "brushing" the roof down, which term will be seen frequently in the tables of this report.

LONG-WALL SYSTEM OF WORKING OUT COAL.

In the mines of Leavenworth, Osage, Franklin, Douglas, Neosho, Bourbon, Shawnee, Coffey, Ellsworth, Cloud, Republic, Jewell and Russell counties, the long-wall system of working out the coal prevails. The miner removes all the coal as the workings progress forward, and allows all the incumbent strata to fall down behind. This is considered the best system of all, but is only applicable to seams of moderate height, and with favorable accompanying conditions. Mines opened up on this system in seams of coal varying from 2½ to 4 feet in thickness are generally opened up by narrow work. Large pillars of coal, varying in size to suit the incumbent strata, are left in for short supports. After the pillars are all cut around, rooms are started off at intervals of forty or fifty feet. They are again driven in narrow, six or seven feet wide, for a distance of five to ten yards as entry-supports. Then each room is widened out to the right and to the left until all are connected around the mine. Then from this point the whole coal is removed, allowing the incumbent strata to come down gradually behind and over the workmen. The roofs of the rooms, roads and entries are brushed down, and pack-walls, masonry-like, are built with it along the roads as a support for the roof, and to keep it from brushing down other than gradually, and to keep the roadways as permanent as possible, until a distance of 150 or 200 feet is reached. Then a cross-entry or heading is cut across the face of those rooms, renewing them again, and so on until the mine is so far advanced from the shaft that the distance to haul the coal is too great for economical production. Then the mine is abandoned, and the plant moved to another field.

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The coal seams in the mines of the counties above mentioned in this State, are thin, ranging from twelve to twenty-two inches thick; therefore these mines can be opened upon this system much more economically than upon that before described. No large pillars for shaft supports are left in. The entire coal is excavated away from the shaft at once, and in every direction in a circle, as evenly and as quickly as possible. Props are set up and pack-walls are put in with the roof brushed down from the entry and room-roads, and as much ground is excavated as possible in every direction before the first break comes on, so as to allow the machinery and plant above the shaft to settle down as evenly as possible. After the first break is over, and the coal-face all opened up again, but little trouble is had to keep the mine in order if all things are properly attended to and the conditions in the first place were favorable for this system of work.

This system can be seen working to perfection in the mines of the Osage Carbon Co. at Osage City, Peterton and Scranton, and in a few other mines at these places; also in both of the deep mines in Leavenworth county, and in J. H. Ransom's new mine in Franklin county. Every avenue in these mines is driven by the points of the compass, and is as straight as an arrow. The mines of Leavenworth county have the most favorable conditions of any of the mines in our State for this system of work, and I can say, so far as I know, of any mines in the United States. They have a hard, dry slate roof, which needs very little timbering in the entries generally; a good fire-clay undermining, and a good rock bottom; a good heavy weight above the coal, which breaks it down after it is undermined, and if not properly watched will shell the coal over the mining and make considerable small coal. The mines of Osage, Franklin, Neosho, Coffey and Shawnee counties get the coal out in the largest pieces, making comparatively no slack. In other mines the coal is more or less broken by the time it reaches the railroad cars or pit-tops.

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CRAWFORD COUNTY COAL MINING.

IMPROVEMENTS, EXTENSIONS AND DEVELOPMENTS DURING THE YEAR 1885.

The Rogers Coal Co. sunk a new shaft, called No. 9, with separate air and escapement shafts, at Litchfield, connected by railroad with the Litchfield branch of the St. Louis & San Francisco Railroad. This plant has the usual improvements over former constructions in this district, with the addition of a second steam-boiler and a Crawford & McCrimmon 10-foot mine-ventilating fan, capable of producing 40,000 cubic feet of air if required.

This shaft commenced taking out coal in the month of February, 1885. It has now a capacity of 100,000 bushels of coal per month, if worked steadily. They have a revolving tipple for delivering coal in chute. About the middle of the year they pumped out the water in the old Bedford slope, close by, which had been abandoned for years. They made connections with it from this mine, cleaned out the old slope, and have now a good traveling-way for both men and mules to go in or out of the mine, which is a great improvement over hoisting or lowering men or mules by the machinery at the hoisting-shaft. In November, they erected a rotary screen, which they say works to their entire satisfaction. They have also inclosed the shaft and screens, so that workmen are not subjected so much to the effects of disagreeable weather.

The Pittsburg and Midway Coal Co., a new firm, have sunk two new hoisting shafts, Nos. 1 and 2, respectively, and two new air shafts, at Midway, Crawford county. They are connected by rail with the Cherryvale branch of the Kansas City, Fort Scott & Gulf Railway. The parties making up this company are the members formerly constituting the Pittsburg Coal Co., of Pittsburg, who, in the first half of this year, reorganized, with the addition of a few more members, and gave it its present name. The large double railroad mining plant, formerly occupying the grounds of the Pittsburg Coal Co.'s shaft, at Pittsburg, which is now abandoned—all the coal having been worked out,—was taken down, moved to Midway, remodeled, and the present two shafts partially built from it. A new set of mine cars of a first-class type, with Watt's patent self-oiling car wheel, was put in at both places; also a new Crawford & McCrimmon mine-ventilating fan, ten feet in diameter, at each place, which is capable of producing all the ventilation that will be wanted in those mines. Those two shafts, when fully developed, will have a capacity of at least 100,000 bushels of coal per month, if worked full time. Bennett Brown, formerly Superintendent for the Rich Hill Coal Co., is the Superintendent.

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At the Rogers Coal Co.'s No. 5 gin shaft, at Litchfield, Crawford county, a large steam plant has been constructed, instead of a horse-power gin arrangement. The machinery put up here was formerly used on the Company's old No. 1 shaft, at Pittsburg, which was abandoned in 1882. The engine was fitted up with a new and larger cylinder and put up at their No. 4 slope, near Pittsburg. There it worked about two years, when that place was also abandoned The plant at the slope was taken down and moved to Litchfield, the material of which helped to build the present plant at No. 5.

This shaft, in my predecessor's time, was called No. 5; since it was rebuilt it has been called No. 10. This change of number was made principally to avoid confusion in accounts, as the same management has a No. 5 shaft at Weir City, but belonging to the Oswego Coal Co. In addition to the old machinery, a new boiler has been put up, which now makes two at this place. There has also been erected a new Crawford & McCrimmon 10-foot mine-ventilating fan, a great improvement over the furnace formerly used there for ventilation. A revolving tipple is used at this shaft for delivering coal from the pit cars into the chute. They have lately put up a new kind of nut coal, incline screen, which is an improvement over the old style. So long as the coal to be screened is kept free from water, it requires less manual labor to attend to it, but if the coal cannot be kept dry I am afraid it will be a nuisance in cold, freezing weather. To overcome this difficulty to a certain extent, they have inclosed the shaft around the screens, which will make it more comfortable in cold and stormy weather, and perhaps keep the screens from freezing. Through the summer months they sunk a slope, so that men and mules can enter and go out of the mine at will, without the aid of machinery. This is something that deserves encouragement, especially in shallow mines that are subject to inundation in rainy weather, as men and mules can be easily withdrawn in the event of an inburst of surface-water. This shaft has now a capacity of over 100,000 bushels per month when working steadily. It has connections with the Litchfield Branch of the St. Louis & San Francisco Railroad.

At Girard, the county seat of Crawford county, the Pittsburg & Midway Coal Co., or some of the members of that firm, erected a first-class mining plant upon a shaft sunk by the citizens of that city two years ago. After putting the machinery all up, with a view to commence operations, they pumped the water all out of the shaft, and to their surprise did not find the coal in paying quantities, as it was represented to them before they commenced the erection of their plant. If I am correctly informed, the project so far is a complete failure.

I never visited this shaft personally, but I learned from a reliable source that the coal was of good quality, nineteen inches thick, the roof overlying it for about twelve or eighteen inches being what my informant called iron rock, and the bottom below the coal a hard, white slate. I believe the company was informed that a good fire-clay, suitable for undermining in, was underlying the coal, and that a good, hard blue slate was overlying it, and

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that the coal was twenty-two inches thick. Had this been the condition, no doubt coal could have been mined with profit to the company, by the long-wall system, as no horsebacks or troubles were found in their prospect entry, similar to what is found in the coal fields of the Pittsburg or Cherokee district, which would go a great way towards offsetting the larger cost for mining. This, with other natural advantages, would have made a mine capable of competing in the surrounding markets with other coals.

At the Rogers Coal Company's No. 3 shaft, at Pittsburg, Crawford county, two new air-shafts have been sunk; one acting as a down-cast, the other as an up-cast. In the former, a good, substantial and convenient stairway has been placed for the accommodation of the miners to enter and come out of the mine, thus doing away with the hoisting and lowering of men by machinery. At the other shaft, a ventilating furnace sufficient for all demands of the mine until it is worked out, has been erected. In September last this shaft was inundated by the heavy rains. To aid them in getting the water out as soon as possible, a pump shaft was sunk to tap the dip workings, and in it was placed a Chinese belt pump. Until the water from the flood was taken out of the mine, this pump was driven by a thrashing machine engine; at the present it is worked by horse power when needed, and is raising water fifty feet vertically.

In June last a slope was sunk, tapping the workings at a place where it was but fourteen feet to the coal from the surface, and a traveling-way made for mules to enter and come out of the mine. The shaft and screens at this place have all been inclosed, this fall, which will help to keep the screens from freezing in cold weather, and be a good shelter to workmen in and around the top.

At Litchfield, Crawford county, the Rogers Coal Co. have sunk another new hoisting shaft, called No. 11, at which they have also sunk an air-shaft. This is the largest and most extensive mining plant in the State, excepting those in Leavenworth county. The screens are so constructed that they make automatically four grades of coal—lump, nut, pea, and slack. A railroad car of each is being loaded at the same time. A separate railroad switch is put in for each grade, and with the work of two car-trimmers the coal is delivered and assorted in all the four cars. Each grade is separated to a nicety. The arrangement works admirably at present with dry coal; with wet coal, in hard, freezing weather, it is questionable how it will work. This is the only coal plant in the State where four separate grades of coal are made.

They have also erected at this mine a new Crawford & McCrimmon ten-foot mine-ventilating fan, which, beyond a doubt, will be of sufficient power to produce all the air required until the mine is worked out. I can say in behalf of this fan, that the casing is the best constructed in regard to scientific principles of any now in use in the whole State. It has nearer equal

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chances in acting as a suction or a forcer than any in the State. It can be changed from a suction to a forcer, or *vica versa*, by one man, in less than one minute's time. The foul air is discharged from the mine through an expanding chimney, about fifteen feet above the cut-off, while acting as a suction. It is just turned upside down when forcing pure air into the mine. So near alike are its chances at the cut-off that it would be hard to tell, without an actual test, which way would give the best results. When I visited this mine last, they had not the connections made so that a test could be made, or I should have made mention of it here.

The machinery at this mine, except the addition of a new boiler, which now makes two at this place, was formerly used at this company's No. 2 shaft, which was abandoned in March, 1885. The plant at No. 2 was taken down and moved to this place and used in helping to erect this new construction. They have put in a new set of pit cars, with the Perkins celebrated self-oiling car wheel, and the pit boss declares that they run so easily that it takes a man as strong as a mule to push any one of them. They have also put in a patent, double-revolving tipple, for delivering the coal from the pit cars into the chute. By this arrangement they have a straight run from each cage to the chute, and also a less distance between the cage and tip, which is quite an object when only one pit car is used on top, as is very generally the case throughout this district.

While sinking this shaft, it was made large enough for a chamber to be partitioned off from the cageway, in which to build a stairway for the accommodation of the miners in going in or out of the mine. They have now erected a fine winding stairway in the chamber, which will do away with hoisting the miners with machinery. Great credit is due this company for supplying stair and escapement shafts, other than their air and hoisting shafts. Of course it is to their benefit to provide a good stairway, as they can hoist coal from the time the whistle blows in the morning until it blows at night, without being interrupted once with a signal to hoist men. It also does away with all liability of men getting hurt while on the cage being hoisted. In shallow shafts, the men prefer and appreciate this mode of ingress and egress.

This plant also has its screens inclosed. It has railroad connections with the St. Louis & San Francisco R. R. When fully developed it will have a capacity of 150,000 bushels per month, steady work.

At the Lone Oak Coal Company's shaft, at Lone Oak, Crawford county, which is 120 feet deep, they have put in a second patent safety-catch cage, as a further precaution against accidents from the breaking of a rope. They have also put on new gates or *policemen*, at the pit-top, which moves up and down upon the cage guides, closing up the shaft when the cage is not on the top, and thus preventing any one from falling into the shaft. They have also put in a stairway in their separate ventilating fan shaft. Although

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the shaft is too deep for men to go up and down the stairs at all times, still they are there, and can be used as a means of ingress and egress in the event of the machinery breaking down.

They have also lately erected a rotary screen, which makes 3 separate grades of small coal from what comes through their lump-coal screen; but, as their plant was only built to make three grades of coal including lump, they cannot deliver into the railroad cars the three grades of smaller coals without the aid of a tramway, which requires additional help.

In the vicinity of Pittsburg, Crawford county, the Diamond Coal Co. have just sunk a new hoisting-shaft, at which they have also sunk an air-shaft. At this writing, the two openings have just been connected. This shaft will be operated by horse power. The company have purchased the gin plant of the Oswego Coal Co.'s No. 6 shaft, at Weir City, Cherokee county, which is now abandoned, and have just about completed the erection of the same at their shaft. They have no railroad connections at present, at this place. The most of the coal to be mined this winter will be sold to local trade. Probably there will be some shipped, but it will have to be hauled in wagons to the railroad, a distance of one and a half miles. The leading men in this company are Messrs. Kilholing and Hickman.

Duff & Wade have sunk a single shaft on the Russell farm, two miles from Pittsburg, and are operating the same by horse power. They have no railroad connections. They sell some coal to the local trade, and ship some by rail by hauling it to the railroad cars, at Pittsburg, in wagons. They have no separate air-shaft as yet, but say they will have one before the time specified by the law expires.

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CRAWFORD COUNTY COAL MINES.

NAME OF OPERATOR.	Name or number of mine.	P. O. address.	Thickness of vein. Feet.	Thickness of vein. Inches.	Depth of shaft from surface, in feet.	What kind of opening.	By what power operated.	By what power ventilated.	What kind of coal.	Is coal weighed or blasting coal.	Shipping or local trade, or both.
Rogers Coal Company	2	Litchfield	3	5	38	Shaft	Steam	Furnace	Bituminous	Blasting	Shipping.
Rogers Coal Company	3	Pittsburg	3	6	38	Shaft	Steam	Furnace	Bituminous	Blasting	Shipping.
Rogers Coal Company	4	Pittsburg	3	6	.....	Slope	Steam	Furnace	Bituminous	Wedging	Shipping.
Rogers Coal Company	8	Pittsburg	3	6	22	Shaft	Steam	Furnace	Bituminous	Wedging	Shipping.
Rogers Coal Company	9	Litchfield	3	4	22	Shaft	Steam	Fan	Bituminous	Blasting	Shipping.
Rogers Coal Company	10	Litchfield	3	4	23	Shaft	Steam	Fan	Bituminous	Blasting	Shipping.
Rogers Coal Company	11	Litchfield	3	5	43	Shaft	Steam	Fan	Bituminous	Blasting	Shipping.
Pittsburg Coal Company	A	Pittsburg	3	7	29	Shaft	Steam	Furnace	Bituminous	Blasting	Shipping.
Pittsburg and Midway Coal Company	1	Midway	3	3	42	Shaft	Steam	Fan	Bituminous	Blasting	Shipping.
Pittsburg and Midway Coal Company	2	Midway	3	3	35	Shaft	Steam	Fan	Bituminous	Blasting	Shipping.
Pittsburg and Midway Coal Company	O	Midway	3	4	.....	Drift	Horse	Furnace	Bituminous	Blasting	Shipping.
Lone Oak Coal Company	1	Pittsburg	3	0	116	Shaft	Steam	Fan	Bituminous	Blasting	Shipping.
Diamond Coal Company	1	Pittsburg	3	7	40	Shaft	Horse	Natural	Bituminous	Blasting	Both.
Duff & Wade	1	Pittsburg	3	5	15	Shaft	Horse	Natural	Bituminous	Wedging	Both.
Baird & Sons	1	Cherokee	2	1	36	Shaft	Horse	Furnace	Bituminous	Wedging	Both.
Arcadia Coal Mine	1	Arcadia	2	6	.....	Shaft	Horse	Furnace	Bituminous	Blasting	Local.
Girard Coal Company	1	Girard	1	7	*112	Shaft	.....	.....	.....	.....	.....
Warren Coal Mine	1	Pittsburg	3	2	*24	Shaft	.....	.....	.....	.....	.....
Anderson Coal Mine	1	Pittsburg	.....	.....	*.....	Shaft	.....	.....	.....	.....	.....
Charles Stotts	1	Pittsburg	.....	.....	*.....	Drift	.....	.....	.....	.....	.....
Mr. Combs	1	Cherokee	3	6	.....	Drift	.....	.....	.....	.....	.....
Wm. Ellwood	1	McCune	1	4	.....	Shaft	.....	.....	.....	.....	.....

*Mines not working.

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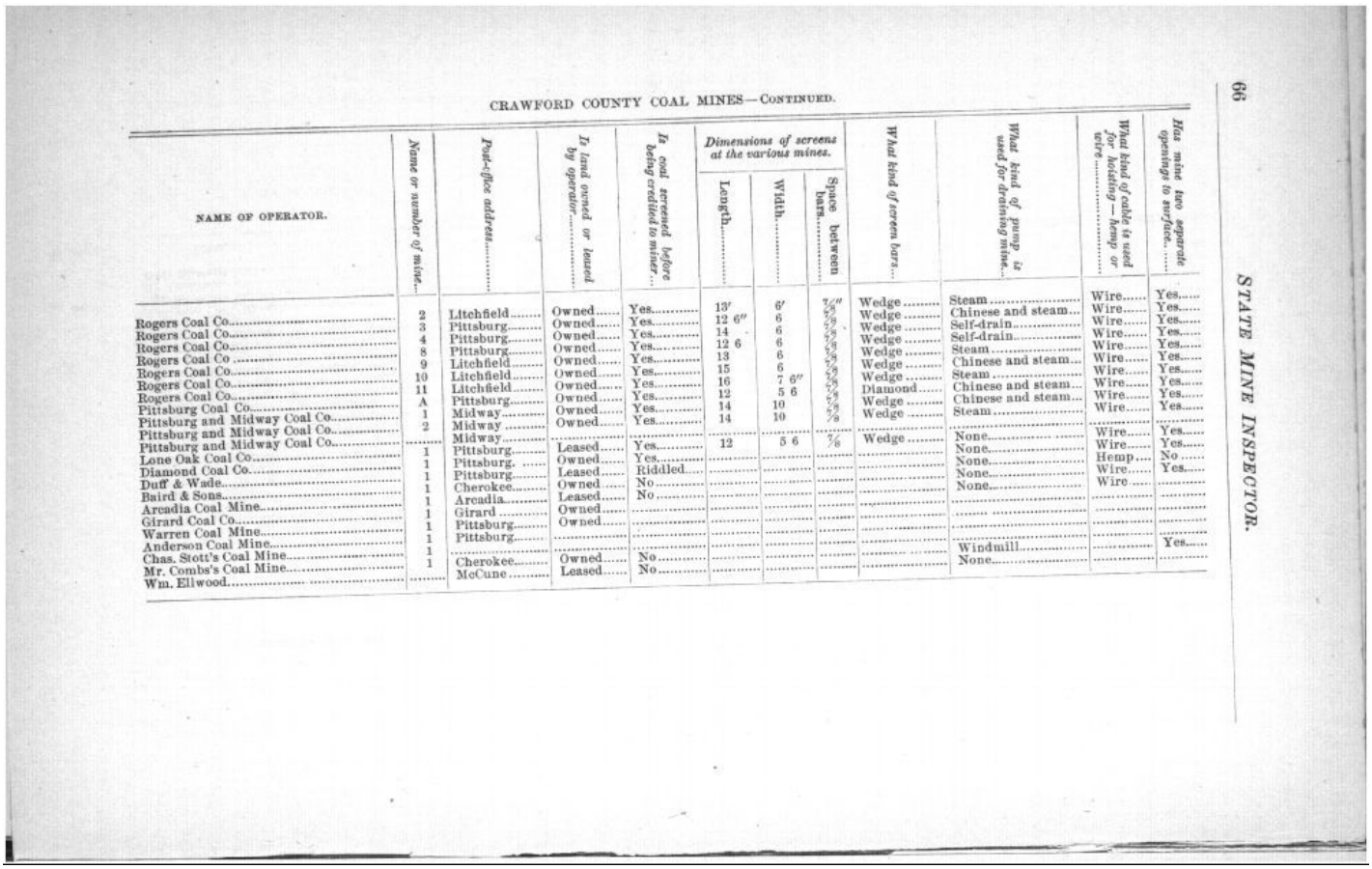
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CRAWFORD COUNTY COAL MINES—CONTINUED.

NAME OF OPERATOR.	Number of keys of pounder used during the year 1886.	Average number of day hands employed during year 1886.	Average number of full days worked at each mine during year	Average rate per day paid to day hands during year	Total amount money earned by day hands for total number of days during year	Average number of miners employed at each mine during year	Total number of bushels of coal mined at each mine, during the year 1886	Price paid per bushel for mining. Summer price.	Price paid per bushel for mining. Winter price.	Average price paid per bushel for year	Total value of product to miner	Average number of bushels of coal making a fair day's work at different mines	Capital invested by the companies
								Cts.	Cts.	Cts.			
Rogers Coal Company	314	15	52	$2 00	$1,500 00	50	156,935	3½	4	3¾	$5,885 06	60	
Rogers Coal Company	1,758	22	135	2 00	5,940 00	97	721,061	3½	4	3¾	27,039 81	55	
Rogers Coal Company	.....	3	90	2 00	540 00	6	35,184	3½	4	3¾	1,319 40	65	
Rogers Coal Company	.....	17	160	2 00	5,440 00	80	830,632	3½	4	3¾	31,148 70	65	$200,000 00
Rogers Coal Company	984	19	109	2 00	4,142 00	75	492,019	3½	4	3¾	18,450 71	60	
Rogers Coal Company	1,114	20	87	2 00	3,480 00	110	572,248	3½	4	3¾	21,459 30	60	
Rogers Coal Company	53	10	13	2 00	260 00	35	26,455	3½	4	3¾	992 06	60	
Pittsburg Coal Company	286	7	66	2 00	924 00	35	143,000	3½	4	3¾	5,362 50	60	
Pittsburg and Midway Coal Company	469	14	101	2 00	2,828 00	40	234,737	3½	4	3¾	8,802 64	58	100,000 00
Pittsburg and Midway Coal Company	65	11	28	2 00	616 00	20	32,550	3½	4	3¾	1,220 63	58	
Pittsburg and Midway Coal Company	229	7	76	2 00	1,074 00	26	114,620	3½	4	3¾	4,298 25	58	
Lone Oak Coal Company	898	13	167	2 00	4,324 00	40	367,953	4	4¼	4¼	15,638 60	55	20,000 00
Diamond Coal Company	10	2	21	2 00	84 00	4	5,000	3½	4	3¾	187 50	60	6,000 00
Duff & Wade	19	1	20	2 00	40 00	8	13,000	2½	3	2¾	325 00	80	500 00
Baird & Sons	152	5	9	2 00	90 00	13	55,323	5	5	5	2,766 15	45	2,000 00
Arcadia Coal Mine	5	3	5	2 00	30 00	8	3,000	3	3	3	90 00	75	1,000 00
Girard Coal Company	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren Coal Mine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anderson Coal Mine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charles Stotts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mr. Combs	36	3	39	2 00	234 00	8	25,000	2½	3	2¾	687 50	80	2,000 00
Wm. Ellwood	11	1	23	2 00	46 00	4	4,000	5	5	5	200 00	43	600 00
Total	6,403	.....	.....	.....	$31,592 00	.....	3,832,717	.....	.....	.....	$145,873 21	.....	$332,100 00

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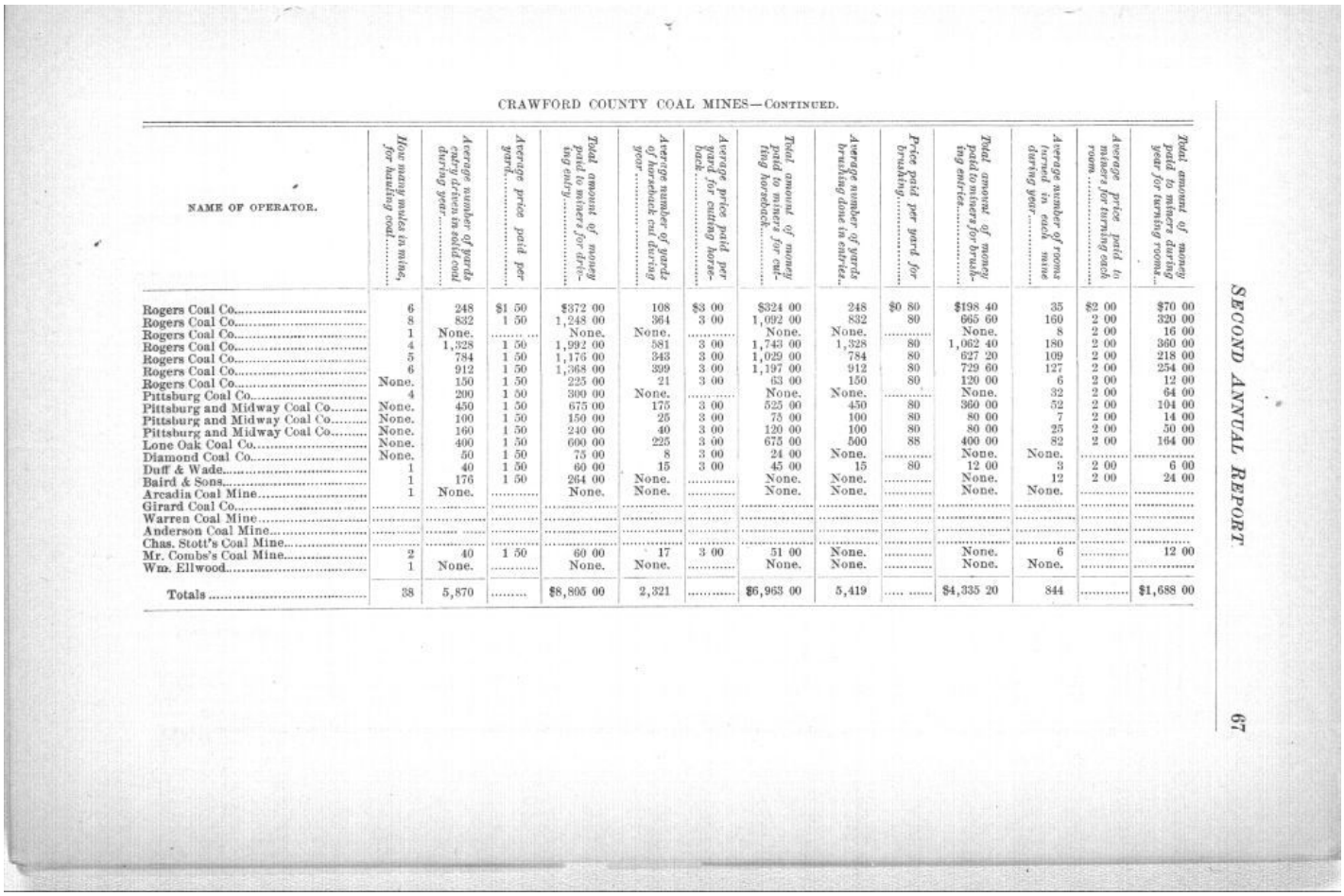
CRAWFORD COUNTY COAL MINES—CONTINUED.

NAME OF OPERATOR.	Name or number of mine	Post-office address	Is land owned or leased by operator	Is coal screened before being credited to miner	Dimensions of screens at the various mines. Length	Width	Space between bars	What kind of screen bars	What kind of pump is used for draining mine	What kind of cable is used for hoisting—hemp or wire	Has mine two separate openings to surface
Rogers Coal Co	2	Litchfield	Owned	Yes	13′	6′	7/8″	Wedge	Steam	Wire	Yes
Rogers Coal Co	3	Pittsburg	Owned	Yes	12 6″	6	7/8	Wedge	Chinese and steam	Wire	Yes
Rogers Coal Co	4	Pittsburg	Owned	Yes	14	6	7/8	Wedge	Self-drain	Wire	Yes
Rogers Coal Co	8	Pittsburg	Owned	Yes	12 6	6	7/8	Wedge	Self-drain	Wire	Yes
Rogers Coal Co	9	Litchfield	Owned	Yes	13	6	7/8	Wedge	Steam	Wire	Yes
Rogers Coal Co	10	Litchfield	Owned	Yes	15	6	7/8	Wedge	Chinese and steam	Wire	Yes
Rogers Coal Co	11	Litchfield	Owned	Yes	16	7 6″	7/8	Diamond	Steam	Wire	Yes
Rogers Coal Co	A	Pittsburg	Owned	Yes	12	5 6	7/8	Wedge	Chinese and steam	Wire	Yes
Pittsburg Coal Co	1	Midway	Owned	Yes	14	10	7/8	Wedge	Steam	Wire	Yes
Pittsburg and Midway Coal Co	2	Midway	Owned	Yes	14	10	7/8	Wedge			
Pittsburg and Midway Coal Co		Midway							None	Wire	Yes
Lone Oak Coal Co	1	Pittsburg	Leased	Yes	12	5 6	7/8	Wedge	None	Wire	Yes
Diamond Coal Co	1	Pittsburg	Owned	Yes					None	Hemp	No
Duff & Wade	1	Pittsburg	Leased	Riddled					None	Wire	Yes
Baird & Sons	1	Cherokee	Owned	No					None	Wire	
Arcadia Coal Mine	1	Arcadia	Leased	No							
Girard Coal Co	1	Girard	Owned								
Warren Coal Mine	1	Pittsburg	Owned								
Anderson Coal Mine	1	Pittsburg									
Chas. Stott's Coal Mine	1								Windmill		Yes
Mr. Combs's Coal Mine	1	Cherokee	Owned	No					None		
Wm. Ellwood		McCune	Leased	No							

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CRAWFORD COUNTY COAL MINES—CONTINUED.

NAME OF OPERATOR.	How many miles in mine, for hauling coal	Average number of yards entry driven in solid coal during year	Average price paid per yard	Total amount of money paid to miners for driving entry	Average number of yards of horseback cut during year	Average price paid per yard for cutting horseback	Total amount of money paid to miners for cutting horseback	Average number of yards brushing done in entries	Price paid per yard for brushing	Total amount of money paid to miners for brushing entries	Average number of rooms turned in each mine during year	Average price paid to miners for turning each room	Total amount of money paid to miners during year for turning rooms
Rogers Coal Co.	6	248	$1 50	$372 00	108	$3 00	$324 00	248	$0 80	$198 40	35	$2 00	$70 00
Rogers Coal Co.	8	832	1 50	1,248 00	364	3 00	1,092 00	832	80	665 60	160	2 00	320 00
Rogers Coal Co.	1	None.	.....	None.	None.	.....	None.	None.	.....	None.	8	2 00	16 00
Rogers Coal Co.	4	1,328	1 50	1,992 00	581	3 00	1,743 00	1,328	80	1,062 40	180	2 00	360 00
Rogers Coal Co.	5	784	1 50	1,176 00	343	3 00	1,029 00	784	80	627 20	109	2 00	218 00
Rogers Coal Co.	6	912	1 50	1,368 00	399	3 00	1,197 00	912	80	729 60	127	2 00	254 00
Rogers Coal Co.	None.	150	1 50	225 00	21	3 00	63 00	150	80	120 00	6	2 00	12 00
Pittsburg Coal Co.	4	200	1 50	300 00	None.	.....	None.	None.	.....	None.	32	2 00	64 00
Pittsburg and Midway Coal Co.	None.	450	1 50	675 00	175	3 00	525 00	450	80	360 00	52	2 00	104 00
Pittsburg and Midway Coal Co.	None.	100	1 50	150 00	25	3 00	75 00	100	80	80 00	7	2 00	14 00
Pittsburg and Midway Coal Co.	None.	160	1 50	240 00	40	3 00	120 00	100	80	80 00	25	2 00	50 00
Lone Oak Coal Co.	None.	400	1 50	600 00	225	3 00	675 00	500	88	400 00	82	2 00	164 00
Diamond Coal Co.	None.	50	1 50	75 00	8	3 00	24 00	None.	.....	None.	None.	.....	.....
Duff & Wade	1	40	1 50	60 00	15	3 00	45 00	15	80	12 00	3	2 00	6 00
Baird & Sons	1	176	1 50	264 00	None.	.....	None.	None.	.....	None.	12	2 00	24 00
Arcadia Coal Mine	1	None.	.....	None.	None.	.....	None.	None.	.....	None.	None.	.....	.....
Girard Coal Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren Coal Mine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Anderson Coal Mine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chas. Stott's Coal Mine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mr. Combs's Coal Mine	2	40	1 50	60 00	17	3 00	51 00	None.	.....	None.	6	.....	12 00
Wm. Ellwood	1	None.	.....	None.	None.	.....	None.	None.	.....	None.	None.	.....	.....
Totals	38	5,870	.....	$8,895 00	2,321	.....	$6,963 00	5,419	....	$4,335 20	844	.....	$1,688 00

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TABLE showing the number of miners and other employés engaged in and about the coal mines of Crawford county in 1885, showing number for each month.

Name of operator.	Name or number of mine.	P. O. address.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		General average number of miners for 12 months of the year 1885	General average of day hands for 12 months of the year 1885
			Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners	Day men	Miners		
Rogers Coal Co	2	Litchfield													25	90	27	90	24	73	20	82	21	101	23	97		
Rogers Coal Co	3	Pittsburg															3	6	3	6	3	6	3	6	3	6		
Rogers Coal Co	4	Pittsburg													25	75	20	73	14	67	13	59	13	47	13	39		
Rogers Coal Co	8	Pittsburg							61	303	65	317	60	293	19	73	24	82	17	46	15	70	14	71	16	75		
Rogers Coal Co	9	Litchfield					100	501									21	67	23	130	19	126	19	88	23	95		
Rogers Coal Co	10	Litchfield	90	491	90	488																			12	35		
Rogers Coal Co	11	Litchfield					12	35																				
Pittsburg Coal Co	A	Pittsburg	10	26	10	26									8	20	11	30	14	40	14	40	14	40	14	40		
Pittsburg & Midway Coal Co	1	Midway																			6	20	7	25	8	30		
Pittsburg & Midway Coal Co	2	Midway																										
Pittsburg & Midway Coal Co	O	Midway	3	26	3	26	3	26	3	26	3	26	3	26														
Lone Oak Coal Co	1	Pittsburg	4	8	8	20			9	31	6	15	7	18	15	35	12	27	13	45	13	39	14	44	16	46		
Diamond Coal Co	....	Pittsburg																					2	4	2	4		
Duff & Wade	....	Pittsburg																			1	6	1	6	1	9		
Baird & Sons	....	Cherokee	4	9	4	13	1	4	1	2	2	6	2	4	3	9	3	9	5	13	4	13	7	16	6	16		
Arcadia Coal Mines	....	Arcadia																										
Girard Coal Co	....	Girard																										
Warren Coal Mine	....	Pittsburg																										
Anderson Coal Mine	....	Pittsburg																										
Charles Stotts	....	Pittsburg																										
Mr. Combs	....	Cherokee	3	8	3	8	3	8																				
Wm. Ellwood	....	McCune	1	4	1	4	1	4																				
Total	....		115	572	119	585	120	578	74	362	76	364	72	341	95	302	121	384	113	420	108	461	115	448	137	492	105	442
Increase over the year 1884																											52	107

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State inspector of coal mines reports

TABLE showing the wages made by employés for the year 1885, in Crawford county; also the proportion for each month, for the 12 months of the year 1885, etc.

Classification of labor performed by employés employed in county, etc.	Total amount paid to day hands, for labor	Total amount paid to miners, for mining coal	Total amount paid to miners, for room turning	Total amount paid to miners, for driving entries in solid coal	Total amount paid to miners, for brushing down roof	Total amount paid to miners, for cutting horseback or rolls	Average gross earnings of miners and day hands for the year	Average amount expended by miners for powder, squibs, oil, and blacksmith	Average yearly net earnings of each hand and miner	Av. cost price per ton, on R. R. cars, after labor is paid	Av. net earnings of each employé per month for the year	Non-fatal	Fatal	Number of tons
Paid to an average of 105 day hands, for labor in and around the mines, for an average of 150¼ days, for the year 1885, at an average wage of $2 per day	$31,592						$31,592							
Paid to an average of 442 miners, for mining 3,832,717 bushels of coal, in an average of 150¼ full days' work, in the year 1885		$145,873					145,873							
Amount paid to miners for turning 844 rooms, at $2 each			$1,688				1,688							
Amount paid to miners for driving 5,870 yards of entry in solid coal, at $1.50 per yard				$8,805			8,805							
Amount paid to miners for brushing 5,419 yards of entry, at 80 cents per yard					$4,335		4,335							
Amount paid to miners for cutting 2,321 yards of horseback or rolls, at $3 per yard						$6,963	6,963							
Average earnings of day hands									$300 87		$25 07			
Average earnings of miners									329 02		27 42			
Average cost price of coal to company, per bu										$0.05.20				
Average amount for wear and tear on tools								$530						
Average amount for blacksmith								2,652						
Average amount for oil								3,048						
Average amount for powder and squibs								16,007						
Number of non-fatal and fatal accidents												8	5	
Amount of coal mined per life lost														47,545
Total amount paid out by the various companies for labor, etc., for the year 1885							$199,256	$22,237						

Capital invested in all mines of the county, $332,100.
Amount of coal mined in the county for the year, not including strip works, 3,832,717 bushels; strip coal of county, 1,760,816 bushels; total, 5,593,533 bushels.
Amount of money for superintendents' and clerks' wages, props, rails, etc., not estimated.

NOTE.—The wear and tear of tools of each mine is estimated at 20 cents per month per man; have worked a short 6 months.—The use of oil is calculated at ¼ pint per day per man, at 75 cents per gallon; have worked 150¼ days of this year, 1885.—Blacksmithing is paid for at the rate of $1 per month from each man, for 6 months of this year, 1885.—The number of kegs of powder used at each mine in this county, as seen on other tables preceding this in this report, is calculated at $2.50 per keg; this price is sufficient to pay for both powder and squibs.

It will be seen by the above table that the day hands, if they had steady work the year round, would make a little over $50 per month, and the miners, on an average (poor and good classed together), would make about $60 per month, after paying expenses. There were too many men in the county this year for the coal consumed. Employés are all paid by the month in this county.

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STRIP COAL MINED IN CRAWFORD COUNTY, AND VALUE OF SAME WHEN READY FOR MARKET.

NAME OF OPERATOR.	P. O. address.	Average thickness of earth removed to get out coal for the market—feet	Average thickness of vein after stripped. Feet	Inches	Total number of bushels of coal mined by each operator	Average cost price for putting coal on board of cars or for hauling and unloading it a distance of one mile	Total value of the product at the least price, ready for shipping
Rogers Coal Company	Pittsburg	12	3	4	542,557	5½c	
Row Brothers	"	12	3	4	11,616	5½	
J. K. Bevins	"	12	3	4	8,019	5½	
H. S. Dray	"	12	3	4	4,108	5½	
O. T. Boaz	"	12	3	4	788	5½	
C. Christain	"	12	3	4	18,836	5½	
Higgins & Tucker	"	12	3	4	4,536	5½	
W. C. Beck	"	12	3	4	15,227	5½	
C. S. Beadle	"	12	3	4	1,655	5½	
Mr. Witt	"	12	3	4	11,240	5½	
John Kahrs	"	12	3	4	2,669	5½	
Gains & Graham	"	12	3	4	237,553	5½	
C. L. Stotts	"	12	3	4	60,212	5½	
Gray & Giller	"	12	3	4	22,223	5½	
John Dunkerly	"	12	3	4	1,594	5½	
H. Brown	"	12	3	4	2,836	5½	
Bevins & Sprauge	"	12	3	4	3,633	5½	
Jasper Graham	"	12	3	4	29,654	5½	
Henry Bevens	"	12	3	4	1,125	5½	
George W. Pearson	"	12	3	4	21,000	5½	
S. D. Lane & Co	"	12	3	4	41,000	5½	
C. F. Jennings	"	12	3	4	108,750	5½	
James & Short	"	12	3	4	43,500	5½	
C. A. Cave	"	12	3	4	36,000	5½	
J. W. Ash	"	12	3	4	5,600	5½	
Warren & Baker	"	12	3	4	4,550	5½	
M. M. Shukey	"	12	3	4	1,000	5½	
W. C. Beck, No. 2	"	12	3	4	3,000	5½	
C. L. Beasley	Litchfield	12	3	4	57,041	5½	
Frank R. Gray	"	12	3	4	14,936	5½	
E. J. Arnold	"	12	3	4	9,491	5½	
Pinkerton Bros	"	12	3	4	19,009	5½	
Barr Brothers	"	12	3	4	2,293	5½	
S. M. Thayer	"	12	3	4	2,063	5½	
Keith & Perry Coal Company	Mulberry	12	3	4	203,102	5½	
James Huston	"	12	3	4	152,400	5½	
Henry Jernain	Cherokee	12	3	4	56,000	5½	
Total					1,760,816	5½c	$96,844 88

STRIP COAL, CHEROKEE COUNTY.

NAME OF OPERATOR.	P. O. address.	Average thickness of earth removed to get out coal for market—feet	Average thickness of vein after stripped. Feet	Inches	Total number of bushels of coal mined by each operator	Average cost price for putting coal on board of cars or for hauling and unloading it a distance of one mile	Total value of the product at the cost price, ready for shipment
Geo. Robinson	Columbus	8			15,000	5½c	$825 00
T. F. Sheppard	Cherry	8			22,574	6½	1,467 31
Total					37,574		$2,292 31

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CONDITION OF THE MINES OF CRAWFORD COUNTY.

ROGERS COAL COMPANY'S SHAFT NO. 3.

This mine is located about three-quarters of a mile southwest of Pittsburg, on a spur connected with the Joplin and Girard branch of the St. Louis & San Francisco railroad. It is worked on the double-entry system, and ventilated by furnace. The air is generally good throughout the mine. This mine was drowned out on the 7th of September, and a period of six weeks passed before all the water was pumped out and they commenced hoisting coal again. Pit Boss, Wm. Eggsley; Superintendent, D. Ramsy.

ROGERS COAL COMPANY SLOPE NO. 4.

This mine is located about one and one-half miles southwest of Pittsburg, on a switch connecting with the Joplin and Girard branch of the St. Louis & San Francisco Railroad. It is a slope, and has a water-level. The mine is driven from a lower level on the surface, so that no pump is needed. Water runs out of the mine of its own accord. Some time in the fore part of 1885, the company abandoned this mine and moved the machinery, as the out-put was too small to continue work; but as the coal was not all taken out, they leased it to Robert Ratcliff & Co., who have taken out the remainder of the coal, and it is now abandoned.

ROGERS COAL COMPANY'S SHAFT NO. 2.

This mine is located about one mile southwest of the town of Litchfield, on a railroad switch connecting with the Litchfield branch of the Joplin branch of the St. L. & San Francisco Railroad. It was worked on the double-entry system. In the forepart of 1885 it was worked out, and is now abandoned, the plant and machinery being moved to what is now called the No. 11 shaft of this company.

ROGERS COAL COMPANY'S SHAFT NO. 8.

This mine is located about 1¼ miles southwest of Pittsburg, on a switch connecting with the Joplin and Girard branch of the St. L. & San Francisco Railroad. It is worked on the single-entry system, and has a water-level ditch from a lower level on the surface, so that no mine pump is used, the water running out of the mine of its own accord. The air is fair throughout the mine, which is ventilated by natural force.

This is the only mine in this county that mines coal without the use of powder. It is near the surface, and the coal has open, vertical seams in it, resembling block coal. Being near the surface, air-shafts are put down at

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intervals along the entries for ventilation. It is much cheaper to do this than to cut horsebacks and keep up air-courses in the mine. What air the miners do get from this system is generally fresh and pure. The roadways are in fair condition. Richard Marsden, Pit Boss; D. Ramsy, Superintendent.

ROGERS COAL COMPANY'S SHAFT NO. 9.

This mine is located one-fourth of a mile east of Litchfield, on a switch connecting with the Litchfield branch of the Joplin and Girard branch of the St. Louis & San Francisco Railroad. It is worked on the double-entry system, and is ventilated by a 10-foot ventilating fan. The air is good. The mine was filled with water on the 7th of September, 1885, and was idle upon that account for one month. Peter Sherman, Pit Boss; D. Ramsy, Superintendent.

ROGERS COAL COMPANY'S SHAFT NO. 10.

This mine is located a few hundred feet west of the west line of the town of Litchfield, on a switch connecting with the Litchfield branch of the Joplin and Girard branch of the St. Louis & San Francisco Railroad. It was formerly operated by horse power, but during the first half of 1885 steam power was put in. The mine is ventilated by a 10-foot ventilating fan. The air is generally good throughout the mine. Some parts of the roadways are not in a very good condition for getting out coal. D. Arnott, Pit Boss; D. Ramsy, Superintendent.

ROGERS COAL COMPANY'S SHAFT NO. 11.

This mine is located three-fourths of a mile southwest of the town of Litchfield, on a switch connecting with the Litchfield branch of the Joplin and Girard branch of the St. Louis & San Francisco Railroad. It is ventilated by a 10-foot ventilating fan, and is a new mine, not sufficiently advanced underground for inspection at this time. John Barrowman, Pit Boss; D. Ramsey, Superintendent.

PITTSBURG COAL COMPANY'S SHAFT A.

This mine, located three-fourths of a mile south of the center stone of the original city of Pittsburg, is on a switch connecting with the Joplin & Girard branch of the St. Louis & San Francisco Railroad, and a switch connecting with the Cherryvale branch of the K. C., Ft. Scott & Gulf Railroad. It was abandoned in the first half of 1885, the machinery and plant being then moved to the vicinity of Midway. James Kilholand, Pit Boss; R. G. Rombour, Superintendent.

PITTSBURG AND MIDWAY COAL CO.'S SHAFT NO. 1.

This shaft is located one-fourth of a mile southwest of Midway, on a switch connecting with the Cherryvale branch of the K. C., Ft. Scott & Gulf Rail-

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road. It is ventilated by a ten-foot ventilating fan. It is a new mine, not sufficiently advanced at this time for inspection. Thomas Jones, Pit Boss; Bennett Brown, Superintendent.

PITTSBURG AND MIDWAY COAL CO.'S SHAFT NO. 2.

This mine is located a few hundred yards west of the Missouri line and half a mile northeast of Midway, on a switch connecting with the Cherryvale branch of the K. C., Ft. Scott & Gulf Railroad. It is ventilated with a ten-foot ventilating fan. It is a new mine, and not sufficiently advanced at this time for inspection. James Duffey, Pit Boss; Bennett Brown, Superintendent.

LONE OAK COAL COMPANY'S SHAFT NO. 1.

This mine is located about three miles northwest of Pittsburg, on a switch connecting with the Joplin and Girard branch of the St. Louis & San Francisco Railroad. It is ventilated by a ten-foot ventilating fan. The air was good generally throughout the mine. The break-throughs, or air passages, from the one working-place to the other, were left too small for permanent practical purposes. I ordered the pit boss to have them made larger in the future, so that as the mine was extended, a sufficient volume of air could be circulated in the mine, without a break-down effort from the ventilating fan.

There is some fire-damp given off in this mine, the Inspector having lit it in several places as it blew out from the crevices of the coal. I lit it in one place to see if it would exhaust itself, letting it burn for about five minutes. It set fire to the coal and had to be put out. This little experiment went to show that the inflow of gas was continual, although I do not think there would be enough given off to accumulate, even with natural ventilation, to cause an explosion of any violence; but I thought a sufficient inflammable mixture might accumulate to burn a person, so, as a precaution and safe-guard against accidents, I ordered the company to have a fireman go down every morning and examine the working-places before the workmen went into the mine.

Since the above was written, I was called to examine this mine by one of the parties interested. On my arrival there, I found that the mine had taken a crush, and was a total wreck. At least 80 per cent. of the coal had been mined away from under a superincumbent stratum of 120 feet, so that a sufficient amount of coal was not left in to support it. The mine was worked on the single-entry system. Entries were driven eighteen or twenty feet wide, and the rooms were broken off the full width from them. No entry-stumps were left along the entries, other than the thin ribs of coal left between each room, so that when the crush came on, it was a general thing over all the excavated ground.

This mine is little more than a year old. The largest part of the coal has been mined on the east side of the mine during its operation. The west

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side of the mine has just been newly opened up, so that there is not a large area of excavation on that side. It can be reopened without a great deal of expense. There were in the neighborhood of four or five acres of ground excavated in the mine. In nearly all the area the roof and floor have met together. This unexpected and costly practical experience will teach the mining community of this part of the State that a superincumbent stratum of 120 feet needs a larger pillar-support than a mine with a superincumbent stratum of thirty or forty feet. I understand that the company has changed hands since the wreck. The lessee of the land on the west side of the mine and some other parties are going to reopen and operate the mines hereafter.

DIAMOND COAL COMPANY'S SHAFT NO. 1.

This mine is located 1¼ miles north of the center stone of the original city of Pittsburg. It has no railroad connections at this writing, and is operated by horse-power. It is a new mine, and is not sufficiently advanced for inspection. But little coal has been taken out of it. It is rumored that the company have sold out a one-quarter interest to the Granby Mining & Smelting Co., and that they contemplate putting in machinery and railroad track, preparatory to doing an extensive coal business in the near future. John Kilholand is the Superintendent.

DUFF & WADE COAL COMPANY.

This mine is located about two miles northeast of Pittsburg, on the Russell farm, and has no railroad connections. It is operated by horse-power, and does a local and shipping business. The coal is hauled to Pittsburg on wagons. The coal shipped is sold to other parties, and by them shipped and sold at the different railroad points. This is a new shaft, and was not sufficiently advanced on my visit there for inspection.

MR. COMBS'S DRIFT.

This mine is located about five miles southwest of Pittsburg, one-quarter of a mile from the Cherryvale branch of the K. C., Ft. S. & Gulf Railroad. It does a local and shipping business. It has a side-track put in to a horse-power elevator built along side of said railroad. The coal is hauled from the mines on a tram-way with horses to elevator, is hoisted to a landing and dumped over a screen into the railroad cars for shipment. This mine has not been in operation since the beginning of my term of office, but, so far as I can learn, is not abandoned.

BAIRD & SONS.

This mine is located on the north side of the city of Cherokee. It has no railroad connections, but is situated near the Cherryvale branch of the Ft. Scott & Gulf Railroad, and is operated by horse power. It does a local and shipping business.

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The ventilation of the mine is very poor. They did not even have arrangements to take advantage of the natural forces. They had a poorly-constructed furnace right at the bottom of a wet air-shaft. The air-stack on top of the air-shaft was only about eight feet in height, and very poorly constructed. It was lower than the surrounding buildings, so that the wind had to be in a certain direction to get the necessary air into the mine. If the wind was not favorable, the furnace had to be put out, as the wind would blow down the air-stack and smother the miners with the smoke.

This disagreeable condition of affairs occurred while I was visiting the mine, and I ordered the owners to construct an air-stack high enough, and leave doors at the bottom of it, so that it would be outside of the action of whirlwinds, caused by the stoppages of the wind by other buildings around the works. Thus in the future they could maintain a current of air continually in the one direction at their command, or *vice versa* in the winter-time, when the natural force would be sufficient to ventilate the mine for the number of men employed. By opening the doors at the bottom of their air-stack, they could use the hoisting-shaft as an up-cast and keep it from freezing, so that there would be no hindrance to the raising of coal by ice accumulating in severe weather.

ELWOOD COAL SHAFT.

This mine is located a mile or so north of McCune, a few hundred feet west of the Cherryvale branch of the K. C., Ft. S. & Gulf Railroad. It has no railroad communications. It did a local business, and is sunk to an 18-inch vein of coal. For some cause not known to the Inspector, it was not operated the last half of the year 1885, and apparently had done but very little before. It is probably abandoned.

ARCADIA COAL MINE.

This mine is located in the town of Arcadia, in the northeast corner of Crawford county. It is operated by horse-power, and has no railroad connections, but is near the main line of the K. C., Ft. S. & Gulf, Springfield & Memphis Railroad. It does a local business. This mine was idle before the beginning of my term of office, and only began operating again in the latter part of November, 1885. The present operators have not worked long enough to need the Inspector's attention.

GIRARD COAL SHAFT.

A description of this mine will be found elsewhere in this report, under the head of "Improvements and Developments."

WARREN COAL MINE.

This shaft is owned by Frank Playter, and is run by horse-power. It is located one mile northwest of the center stone of the original city of Pitts

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burg. It has no railroad connections. It is not now in operation, but is not abandoned.

ANDERSON COAL SHAFT.

This shaft is located one and a half miles northwest of Pittsburg, near the Joplin and Girard branch of the St. Louis & San Francisco Railroad. For some cause not known to the Inspector, it has never been equipped with a plant, or operated in any way since it was sunk to the coal.

CHARLES STOTT'S DRIFT.

This mine is located one-half mile north and one-half mile west of the center stone of the original city of Pittsburg. It does a local and shipping business. The coal shipped is first sold to the Rogers Coal Co. It is just a new opening.

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CHEROKEE COUNTY.

IMPROVEMENTS, EXTENSIONS AND DEVELOPMENTS MADE DURING THE YEAR 1885.

CHEROKEE COAL-MINING COMPANY.

In Cherokee county, in the vicinity of Cherokee, a shaft 140 feet deep was sunk by a cöoperative company of miners, in my predecessor's time, but as he did not make any mention of this place in his annual report, I regard an account of the same here as new information, as the company has recently been reorganized, and more capital put into the business by new members, the old firm still holding their interest in the concern. The firm-name of the old company was, *The Cherokee Coal and Mining Company;* it is now called *The Cherokee Coal-Mining Company.*

The coal here is reached at a much greater depth than at any other mine either in Crawford or Cherokee counties, with the exception of one shaft at Lone Oak, in Crawford county, 3½ miles northwest of Pittsburg, where it is 116 feet to coal. This is the same vein, this shaft being the farthest northwest by at least one mile, from the line of the out-crop. As the stratum dips in that direction at the rate of twenty-five to thirty feet to the mile, we have the reason for the coal being found at a greater depth in this locality. The difference of the elevations of the two places no doubt makes some difference, but is not perceptible to the eye.

While sinking this shaft to the vein now being worked, other small veins of coal were passed through, the first at a depth of 16 feet from the surface, thickness 12 inches; the second at a depth of 40 feet, thickness 2 feet 2 inches; the third at a depth of 76 feet, thickness 10 inches; the fourth at a depth of 100 and odd feet, thickness 12 inches; the fifth and present vein is worked at 140 feet, thickness 3½ feet.

The reason assigned for these new measures is, that they take on between where coal is being mined nearer the crop-line and this locality The stratum dipping towards this place, as I said before, at the rate of 25 to 30 feet per mile, vein after vein is taken on, and I presume, from the best evidence I can procure, it keeps on doing so until some basin is reached. Where that basin, or stopping-place, is, no one yet seems to know. I think a geological survey is the only means of finding out.

Previous to the reorganizing of this company, the old company, for the lack of necessary means to purchase and put up machinery to develop this vein, after completing the shaft to its present depth, commenced to develop the two-feet-two-inch vein at a depth of 40 feet from the surface, hoisting the coal from there with a horse-power gin. For a time they sold all,