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# Recent Coal Developments.

BY T. B. BANCROFT.

[Read at January meeting, 1888, and being a part of Annual Report for 1887.]

Within the past year Muskingum county has come rapidly to the front as a coal producing county, and developments have been made within its borders that give promise of opening up a large and profitable coal field, in the near future. Hitherto the mining operations of the county have been mainly conducted in the lower and middle Kittanning veins (Nos. 5 and 6). These veins have varied in thickness from three to four feet, often being below three feet, and seldom rising to four. From lack of railroad facilities the mines have been generally of small capacity and their product has been mainly consumed in their vicinity, being hauled in wagons from the mines to Zanesville, the principal market. The recent extension of the Columbus & Eastern Railroad into Brush Creek township, and the building of the Zanesville & Ohio Railroad along the Muskingum river, from Zanesville to Malta, have opened up an outlet for large bodies of coal that have hitherto been neglected. The result is that in this county, where there were a year ago but nine mines that any time of the year employed more than ten men each, there are now twenty-four regular shipping mines of large capacity.

A branch of the Columbus & Eastern Railroad leaves the main line at Darlington, and, following the river for a short distance, pushes back into Brush Creek township and reaches what is now the centre of a new field, at Cannelville, a thriving mining town, which is rapidly building up, and where, a year ago, hardly a house marked the spot. Within a mile of Cannelville there are at present eight openings fully equipped and working. This district has not as yet suffered from want of cars, and work is constant and steady, the only drawback to a rapidly increasing product being the lack of miners, and of houses for their accommodation. The veins of the district are the middle Kittanning (No. 6) and the upper Freeport (No. 7). The former is found about the level of the streams, and is three and one-half feet thick. This vein thickens as it goes south from the Muskingum River, and is probably a foot thicker about Cannelville than it is at the river. It is, however, not being worked here, as attention is mainly confined to the upper Freeport (No. 7), which hereabouts develops a large body of cannel coal of excellent quality. The cannel lies above the bituminous, without parting between them, and takes the place of the black band ore at Iron Point, in

Perry county, and at Port Washington, and other points in Tuscarawas county.

The bituminous coal of the vein varies here from 18 inches to  $4\frac{1}{2}$  feet, while the cannel runs from nothing up to 12 feet in thickness, and it is found that where either of the coals increase in thickness the other correspondingly decreases, and vice versa. While the cannel coal is not always present, yet the area covered by the deposit is large and embraces sections 5, 6, 25, 26 and 27, of Brush Creek township. It is very abundant also on Turkey Run (in section 25, about one mile north from Cannelville), and can be reached here by a branch up the run, between Stovertown and Cannelville. The Chicago and Columbus Coal Company have two openings on the vein, about three-fourths of a mile south of Cannelville. Here the bituminous varies from 18 inches to 4 feet in thickness, while the cannel runs from nothing up to 7 feet. To the north of the town, and within a mile of it, are six openings now in operation, viz., two owned by Manley & Co., one by the Cannelville Coal and Iron Company, one by the Columbus and Brush Creek Coal Company, and two by the Brush Creek Coal Company. The Qualey mine, owned by the Cannelville Coal and Iron Company, is in about 200 hundred yards. The cannel coal only is worked only in this mine, the bituminous being but 18 inches thick, and is only dug in undermining. At this mine the cannel shows up 11 feet face, but only about 7 feet of it is being worked, the balance not being sufficiently pure to warrant sending it to market. At the head of the hollow, we find the two openings of the Brush Creek Coal Company. Here both coals are worked, being separated by the miner before shipment, as is the case in all these mines except the Qualey. On the east side of the Brush Creek Company's mine the cannel coal is found 12 feet thick, the bituminous running from 20 inches to  $2\frac{1}{2}$  feet, while on the west side the bituminous shows from 4 to  $4\frac{1}{2}$  feet of coal, and the cannel thins out until it disappears altogether as the operations get farther west. The description of these mines will serve for the whole of this district, and it only remains to be said that the quality of both these coals is excellent; that a market, ever increasing in its demands, has been found for the product, and that the latter has so far only been limited by the supply of the miners.

Equally flattering prospects are shown in another portion of Brush Creek township, along the line of the Zanesville & Ohio Railroad, in section 13. The only mine, however, yet opened here from which any practical information can be gathered is that of Mr. W. H. Seelover. He has opened upon the upper Freeport (No. 7) vein, showing a face of 6 feet of most excellent coal, but without the cannel that accompanies it at Cannelville. Other mines are being opened in this neighborhood, but none of them are as yet sufficiently advanced to judge of their character. The

same vein, and of the same thickness, can, however, be traced back in the hills in a southeasterly direction, to Duncan Run, a distance of more than two miles. The middle Kittanning (No. 6) is also found here, running from 3 feet, at the river, to from 4 to 5 feet back in the hills, and is above the creek levels. These hills have never been developed, most of the mining hereabouts having been done along the river. Both these veins are found along Duncan Run, and are evidently present in the northwest corner of Harrison and the northeast corner of Brush Creek townships.

Extensive developments of the Massillon coal field, in comparatively new territories, have also been made during the year, which go far to explode the theory that the deposits of this celebrated coal are about exhausted; and from what is shown by these explorations, it may be assumed that for all practical purposes the supply of this coal will continue to be kept up for years to come. In what is known as the Sippo Valley, near Massillon, there are in all six mines opened, or being opened this year. Prominent among these is the Anderson mine, owned by the Howells Coal Company, and located five miles west of Massillon, on the Wheeling & Lake Erie Railway.

Their shaft is 178 feet deep, with five feet of coal of most excellent quality. The drillings here show a large basin, and of very uniform thickness, being from four and one-half to five feet in the several drill-holes. They are now putting in their hoisting-derricks, chutes, tracks, etc., and in a few weeks will be shipping coal. This is expected to be one of the best producing mines in the valley, and will in a few months have a capacity of 300 tons per day.

The same company are now drilling upon other land, about one mile south of the Anderson shaft. Seven holes have been sunk at this point, showing coal from four to five feet in thickness, and giving promise of an excellent basin. This is the deepest coal ever found in the Massillon district, the bore-holes running from 190 to 225 feet in depth.

The West Massillon Coal Company and the Pigeon Run Coal Company have also opened new and extensive mines in the Massillon district during the year, while, near Dalton, in Wayne county, a shaft that has been in progress of sinking for some time past now gives promise of early completion.

In Lawrence township, Stark county, near the line of Wayne county, Messrs. Ridgway & Burton have discovered, and are about to open, a large deposit of coal which had previously not been known to exist. This basin lies about two miles northwest of the Minglewood mine, and between it and the old Fox Lake mine, and is perhaps a continuation of the Minglewood basin, although drill-holes had previously been sunk all *around* the new basin without touching it, and the land upon which it is found was not supposed to contain coal at all. The coal is found here at about 150

feet in depth, and the holes show from four to five feet of excellent coal. A mine of large capacity is expected to be in operation here at an early day.

In the Mahoning Valley the celebrated Brier Hill, or block coal, has long been supposed to be exhausted; but recent developments have shown this not to be the case. Messrs. Morris & Stambaugh have, during the past summer, been prospecting on the land of John Wolf, in Liberty township, Trumbull county, near the line of Mahoning county, and about two miles north of Youngstown. At a depth varying from 190 to 215 feet coal has been found, which is beyond doubt the Brier Hill coal, and runs from three and a-half to four and a half feet in thickness. Thirteen holes have been sunk, in eight of which coal has been found, and the indications are favorable for an extensive basin, although the prospecting has not yet been sufficient to determine its full area. It is the intention to commence opening this mine early in the spring.

Another territory, developed during the year, and which bids fair to become a large coke producing district, is on the lands of the Federal Valley Coal Company, in Berne township, Athens county. This company have opened two mines, on Federal Creek, near the mouth of Marietta Run, on the Pittsburgh (No. 8) vein, which shows an unusually large development, and runs, in this neighborhood, from nine to twelve feet thick, with a fire clay parting in the middle from eight inches to one foot in thickness. The seam is about equally divided by this parting, and in the mines of this company shows rather more than four feet of coal (remarkably free from impurities) both above and below the parting. It is safe to say that the upper and lower benches will *average* four feet thick each. There is no other parting in the vein, and the roof is a strong sand rock and stands up well without posts. The cementing properties of this coal have long been known, but hitherto no attempt has been made to utilize it in the manufacture of coke. In 1875 the writer was shown samples of coke made here in ricks, by one who was entirely ignorant of practical cokeing, which were superior in appearance to any he had seen made from Ohio coal, and that warranted the assumption that in the hands of an expert coker results might be obtained which would make this coke a formidable competitor with those of Pennsylvania and West Virginia.

The Federal Valley Coal Company commenced experimenting with this coal in the early part of the present year, but coking operations did not assume a practical form until some time in August last. Before going into the venture permanently the services of an expert coker (Mr. N. W. Musgrave, of West Virginia) were secured, who, after some weeks spent in thoroughly examining the coal and its surroundings, gave his opinion that all the requisites for making a coke of sufficient purity for furnace use

were present, and that the enterprise possessed all the elements of success. Following upon this the company erected six ovens at their No. 1 mine, and eighteen others are in process of erection at mine No. 2. The ovens are the latest type of bee-hive, and those now in operation are producing about 1,000 bushels per day of coke of most excellent appearance and hardness. All the ovens are not yet fired, nor are those in operation yet thoroughly dried or sufficiently hot for the best results, and it is expected that the quality of the coke will improve as the ovens get in better working condition. At mine No. 1 slack only is used, while at mine No. 2 the run of the mine is utilized. At both mines the coal is coked for forty-eight hours. It is the intention of the company to insure greater purity and freedom from sulphur by crushing and washing the coal before coking, and the improvements for so doing will be erected in the near future.

From the magnitude of this vein, the cheapness with which it can be mined, and the cementing properties of the coal, I am of the opinion that, with judicious management in the operations, this valley bids fair to become the coke producing district of the State. Nowhere else are the conditions so favorable for this result. So far as known, the territory containing this coal will be found in Berne and Ames townships, in Athens county, and Marion and Homer townships, in Morgan county, and possibly in the western part of Wesley township, in Washington county, and lies on Federal Creek and its tributary, Marietta Run. The indications go to show that the deposit is not extensive in Ames township, west of Federal Creek east. The dip of the strata is toward the southeast, and while at the mines on Federal Creek the openings are high enough in the hill to accommodate the ovens and tipples, the vein goes under cover to the east, on Marietta Run, below the mouth of the Jerry Run. From this it will be seen that for natural drainage the openings should be made on Marietta Run, where it will be necessary to open by shaft. These shafts, however, will not exceed fifty to sixty feet in depth, and I am informed that the best development of the vein is found where it passes under cover on this run.

Some analyses of the coals of this section are given in Vol. V. of the Geological Survey, and are as follows:

	Moisture.	Volatile combustible matter.	Fixed carbon.	Ash.	Sulphur.
Lower Bench—W. W. Wickham's bank, Berne township.....	3.85	41.12	47.99	7.04	4.07
Lower Bench—W. Hogshead's bank, Homer township.....	5.30	40.18	48.50	6.02	2.87
John Staffy's bank, Homer township.....	5.39	41.18	46.32	7.11	4.16
Petroleum Co.'s bank, Homer township.....	4.55	39.99	45.86	10.00	4.89

It will be observed that the sulphur shown in these analyses varies considerably, and is high. The same can be said of the ash. They were made from samplings of the whole seam, as sent to market, exclusive of partings, and the variation would seem to show considerable difference, locally, in the character of the coal. It is believed, however, that much of this objectionable matter is found in the natural impurities of the vein, and can be removed by first crushing and washing the coal. There is no doubt as to the cementing properties of this vein in the Federal Creek Valley, and the sulphur seems to be the greatest difficulty in the way of its successful coking. If this can be overcome, by mechanical appliances, the saving to consumers in cost of transportation will be sufficient to insure profitable returns for any capital that may be invested in coking operations in the valley. The coke now being made (with the ovens not yet in perfect conditions) is equal in appearance and density to the average now on the market, and it is the opinion of experts and those having the operations in charge, that the sulphur removed by washing, together with that which passes off in the process of coking, and which is a component part of the coal, will be sufficient to bring it up to standard in this respect.