

but that, as I have already shown, is no defence. In the three collieries first named they have relied entirely through all these long years on natural ventilation for a supply of air for their workmen. They have done literally nothing to assist nature to do the work, and as the workings extend from year to year the ventilation gets worse and worse.

Soon after I entered upon the duties of my office, I gave No. 3 shaft, Carbondale, my particular attention; and after making a thorough examination of the workings I immediately called the attention of A. H. Vandling, Esq., general agent for the company, to the condition of the colliery, and in reply to my communication Mr. Vandling assured me that the matter would be attended to immediately. His note is couched in the following words:

“Noting your favor of the 4th inst. (December, 1876,) concerning ventilation in our Carbondale mines—the results of your examinations and conclusions are surprising, for the reason that I was not previously aware of such deficiency or sufficient cause for complaint. The matter will have our due and immediate attention.”

I am happy to state that improvements were projected immediately after this correspondence, which, when perfected, will remove all cause for complaint, and will put those collieries on an equality, regarding ventilation, with the best ventilated collieries in the district. An air-shaft is to be sunk for No. 3 shaft, and a fan is to be placed there; and I expect this will be followed with another fan for No. 1 shaft, and another for the Coal Brook colliery in place of the miserable little furnaces they now have there at the bottom of very shallow shafts, and hence almost worthless. I feel under great obligation to A. H. Vandling, Esq., general superintendent, for his prompt co-operation and manly course in relation to my efforts to enforce the mine ventilation law; and I am certain that the miners at Carbondale, before another year ends, will have cause to bless him for his prompt action in the premises.

MISCELLANEOUS COMPANIES AND OPERATORS.

The collieries of the smaller companies, in regard to ventilation, may be divided into three classes—the first class having good and satisfactory ventilation, the second class having middling, and the third class having poor and very unsatisfactory ventilation. The first class consists of the following collieries: Roaring Brook colliery, Dunmore; Jermyn's shaft, Green Ridge; Mt. Pleasant slope, Hyde Park; Pine Brook shaft, Scranton; Green Ridge slope, Dunmore; Capouse shaft, Hyde Park; and Meadow Brook collieries, Scranton. The second class consists of the following: Erie shaft, Carbondale township; Phoenix shaft, Ravine shaft, Twin shaft, Seneca slope, and Butler shaft, Pittston; Hillside colliery, Pleasant Valley; Filer & Livey's collieries, Winton; Greenwood colliery, Lackawanna township; Columbia colliery, and Beaver mines, Pittston. The following make up the third class: Sibley shaft, Old Forge township; Everhart colliery, Jenkins township; Jermyn's slope and shaft, Jermyn; Park coal company's slope, Hyde Park; Fair Lawn slope, Scranton; Jones & Simpson's colliery, Archbald; and Tompkins shaft, Pittston. All are graded, as regards merit, in the order in which they are named in each class. The collieries which are not named in the above classification, I as yet know comparatively nothing about. I have suggested important improvements in many of the collieries in the third class, and the owners and agents have shown a ready disposition to act on the suggestions given. Some of them, it is true, complain of the hard times and consequent lack of funds to provide themselves with the necessary mechanical power to properly ventilate their mines, but all admit that the improvements demanded are sorely needed. I deeply sym-

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tional area of 84 square feet for a distance of 650 feet, on a pitch of about 8°, at which point a fault was encountered, cutting the vein out entirely. The sinking at this point was abandoned until a drill hole was bored with a diamond drill from the surface down. The reason for boring from the surface was for the purpose of ascertaining the thickness of rock overlying the vein, as there is a considerable depth of quick sand in that locality, and also to find the extent of the fault. The vein was found to have gone up 8 or 9 feet, and it was also found that the strata of rock was ample in thickness to proceed in safety with the slope to get the vein again. Therefore the sinking was resumed in the rock with a grade of 1 in 20 feet for a distance of 145 feet, at which point the vein was again tapped and the slope sunk in the vein 400 feet from the fault, and gangways opened up east and west. The second opening was also completed through the fault, and the air connections completed.

The endless or tail-rope system has been placed in this slope for hoisting, which is giving great satisfaction. The motive power is a pair of second motion steam engines, located in No. 1 tunnel. Cylinders 16" by 30", which takes all the coal from the Baltimore seam through No. 1 tunnel to the foot of the eleven-foot slope, a distance of 3,100 feet.

A new steam pump of Goyon Bros., of Ashland, Pa. make, was put in at the foot of the shaft to take care of the water, of which there is a large supply. Steam cylinders 26" by 37", which is giving good results.

Butler Coal Company, Limited.

This company has started a new colliery called the Fernwood, a half mile north of the old Everhart or Boston colliery, located in Jenkins' township. The openings consist of two shafts sunk from the surface to the Red Ash seam, a depth of 100 feet. The main or hoisting shaft is 11x18 feet, the other 11x12 feet in area. The connections between the shafts are not completed at this writing.

A new breaker has been built about five hundred feet north of the shafts, to clean and prepare the coal coming from these openings as well as the coal coming from the Boston tunnels which is taken around the mountain by a track more than 2,000 feet long to be prepared for market in the new breaker. Capacity of breaker about 800 tons per day.

At the **Phoenix Colliery** the old breaker which has been idle for a number of years was taken down and replaced by a new one which is built on the site of the old one. The machinery in this breaker is of the best for cleaning and preparing coal for market; the capacity is about 800 tons per day. It is heated all through by steam and all the dangerous parts of the machinery boxed or fenced off. The shaft has been re-timbered and placed in good condition for hoisting coal. A new 20-foot Guibal fan has been erected on the air shaft to ventilate the workings of the shaft.

Delaware and Hudson Canal Company.

In the Delaware shaft a tunnel was driven from the top split of the Baltimore to the bottom split, a distance of 105 feet. It is used for transporting coal. Sectional area 7x9 feet.

The Laurel Run Colliery, located in the borough of Parson's, which had been operated by the Delaware and Hudson Canal Company since 1869, passed into the possession of the Laurel Run Coal Company on the 1st day of April, 1895, on account of the expiration of the lease.

Newton Coal Mining Company.

Three rock tunnels were driven in this company's colliery from the sixth to the fifth seam a distance of 300 feet each, which are used for the transportation of coal.

Old Forge Coal Mining Company.

An underground slope was sunk in this company's Columbia shaft, a distance of 200 feet; sectional area, 84 feet.

In the **Phoenix shaft** a tunnel was driven through a fault or roll in the Red Ash seam, a distance of 200 feet; area 7x10 feet. A new plane was erected 500 feet in length with gradient of one foot in five.

A new fan 20 feet in diameter was erected at the Columbia shaft to ventilate the workings of the sixth, or Red Ash seam in both of those shafts which are connected with the upcast to fan. While running 60 revolutions, 164,462 cubic feet of air per minute is exhausted.

Delaware, Lackawanna and Western Railroad Company.

An underground slope was sunk in the Hallstead colliery of this company to a depth of 1,000 feet; 6x12 feet area. A rock tunnel was driven a distance of 398 feet, 6x12 feet which has not tapped the coal at this writing.

In the Pettebone shaft a tunnel was driven 138 feet sectional area, 128 feet. An underground slope was sunk 86 feet on a 25 degree pitch. A new fan 35 feet in diameter, 9 feet face with two inlets enclosed in brick work was put in place. At a speed of 43 revolutions per minute 129,960 cubic feet of air is exhausted with a water gauge of 1 9-10 inches.

Florence Coal Company, Limited.

At the No. 2 shaft the second opening to the Marcy seam was driven to the surface, a distance of 120 feet.

new column complete, installed in Red ash district. New fire proof pump room built for same.

New safety gates built at Red Ash shaft.

New carpenter-blacksmith shop, 52x56 completed.

Seneca Colliery

Several other improvements are under way, but as they are not completed you probably will not care for them. They are as follows:

Two tunnels, one 200 the other 300, through fault in property known as "Old Forge 88," in Twin shaft.

Two bore-holes, one 12 inch, the other 14 inch from surface to the Red Ash vein for drainage purposes. It is proposed to pump the water from this vein through these holes and do away with column pipes in shaft.

A shaft has been started to tap the Pittston vein about 500 feet below the Seneca breaker.

Seneca

Which includes the New or Coxey, the Twin, the Columbia, and the Phoenix shafts.

1st. At the Twin shaft the old wood fan-house was replaced by one of corrugated iron. This insures greater safety from fire, for owing to its proximity to the D., L. & W. R. R. danger from this source was always present with the old structure.

2d. The cribbing in the Twin shaft consisted of a single line of 12x12 hemlock timber. Upon this rested the shaft tower, sixty feet in height. The coal cars landed on fans and run off on a trestle twenty-five (25) feet above the ground. The said trestle extends a sufficient distance east of shaft to allow the passage of empty cars which are hauled from the breaker by a 12½ ton locomotive. The cribbing having been in place between nine and ten years began to crush and bulge into the shaft under the weight of the shaft-tower and trestle. Owing to these conditions it was decided to replace the old cribbing with one of concrete, and if possible, without delaying the operation of the shaft. This was successfully accomplished in the following manner.

The inside dimensions of the cribbing (old) was 12x17x35 in depth. In the line of old buntons several hard wood buntons one on another were placed in good hitches cut in the rock at foot of old cribbing. On these buntons rested a line of posts, six in all, which reached to a point above the top of old cribbing. By means of hydraulic jacks the overhead weight was taken off the old cribbing and placed on 12x16x40 oak timber that was put across the shaft, on top of posts,

Avoca Shaft.—The tracks in the Avoca mine have been narrowed to the gauge of Laws shaft. Rock was taken down on some heading roads to accommodate the Central mine cars. All the coal in the Avoca mine will be footed at Laws shaft and prepared in Central breaker, when operations are resumed.

Old Forge Colliery.—The addition to the washery is nearly complete; jigs to prepare buck, pea and nut coal have been erected and will be in operation in two weeks.

No. 1 shaft was thoroughly repaired during the year; the old wood cribbing was taken out and replaced with concrete; the wood engine house was torn down, and replaced with a brick building; all buntons, guides and brattice work were renewed and the shaft remodeled.

Six, seven and one-half ton cable reel motors have been added to the electrical equipment, as follows: two at No. 2 shaft, two at No. 1 shaft, and two in the Clark Mountain drift. At Old Forge No. 2 shaft a new mine hospital and foreman's office has been built in the Five Foot vein.

The ventilation is being continually improved. A new air shaft to be sunk near the most advanced workings will give another outlet and an abundance of air.

The Old Forge mines are in good condition.

LEHIGH VALLEY COAL COMPANY

William A. Colliery.—The company drove a plane in the Red Ash vein, connecting the Lawrence and the William A. mines and installed an oil burning locomotive for inside transportation between Babylon and William A. All the coal from the Lawrence shaft workings and drift workings and also from the Babylon shaft workings and drift workings, is being conducted underground to the foot of William A. shaft and prepared in the William A. breaker.

The condition of the Lehigh Valley collieries in this district is such that a great deal of care is required on the part of the Inspector which is very annoying to the officials in charge.

Seneca Colliery.—The No. 9 slope in the Twin Shaft, Marcy vein, has been driven to the 5th and 6th veins, which are being developed near Scovel Island.

Rapsons tunnel has been driven through the big fault near or on the Phoenix lease, and the Marcy veins are being developed on the west side of this line of disturbance; the new air returns for the Columbia shaft workings and the Twin Marcy slope have been completed; a very modern concrete mule barn to accommodate 60 mules has been built, and also a concrete station house inside for the ambulance car. A pump house is being built at the foot of the Marcy vein slope for the installation of some heavy pumping machinery.

In the Pittston vein, the thickness of roof cover is the problem. The workings are parallel to and under the Susquehanna river, and the quantity of sand wash over the vein is a condition sufficiently serious to impress the company with the advisability of keeping the development of this vein isolated from their other workings, and advancing only when a bore-hole, sunk ahead, proves the thick-

A new 3-stage Norwalk high pressure air compressor, 600 cubic feet capacity, was installed in a brick building erected east of the boiler house. A new tower was erected over the Knight shaft. Washery walls rebuilt, jigs renewed; and washery was given a general overhauling.

Installed dust exhaust fan at breaker.

Constructed a 75,000 gallon capacity colliery emergency reservoir.

Westmoreland Colliery.—A new second opening plane had been driven for a manway from the Marcy to the Pittston vein; also a tunnel through the fault in the Pittston vein for a manway.

Electric haulage has been installed in the Marcy and Pittston veins with great success. A concrete and steel over-cast was built in Marcy vein.

Several drainage bore holes have been driven from Pittston to Marcy veins to drain water to the central pumping plant. Silting is being successfully done in the old workings of the Marcy vein.

Maltby Colliery.—Two drainage holes have been driven from Baltimore to Six Foot vein. Old cribbing in No. 1 Shaft was renewed. Steel roof supports are about to be placed at foot of No. 2 Shaft.

A new 800 gallon electric-driven pump was placed in west No. 4 lift, and main return airways have been enlarged generally through the mines.

The old Six Foot gangways are being reopened to connect with Hunt shaft workings.

Seneca Colliery.—A new pumping plant was installed in the Marcy vein at the basin. A Jeansville Duplex pump, size 28 x 12 inches, fed by steam dropped from surface through new bore hole, lifts 2,000,000 gallons of water per day through a 16 inch bore hole lined with 12 inch terra cotta pipe cemented, a height of 275 feet, to the surface, where it discharges near the west bank of the Lackawanna river and flows to the river. This improvement over numerous local pumps and drainage holes, with the main pumping station in the Bottom or Sixth vein, has proven satisfactory.

No. 6 Slope in the Bottom Marcy vein has been graded through the dividing rock and top Marcy vein, so as to connect the head with main motor road, thus reducing the haul between head of slope and the shaft 2,500 feet. This slope extends to No. 11 tunnel, driven through the main fault, and is operated by 12 x 16 inch engines with tandem drums and tail rope.

At the Sixth vein landing of the shaft a concrete arch has been built and all timbers removed. This affords ample room to work and has stopped the flow of water previously known.

No. 12 Rock Slope has been sunk from the Marcy vein to the Clark vein, which will develop the Clark vein at a lower level and west of the present Clark vein workings at Phoenix.

The **Phoenix Shaft** was concreted from the rock, thus replacing the old cribbing. These concrete walls were built to a height of six and one-half feet above the ground, thus replacing the wooden fence that previously enclosed the shaft and making any inflow of water impossible.

William A. Colliery.—At William A. Colliery, in the Red Ash vein, the method of pumping is being changed to handle the water while robbing the pillars at the foot of No. 3 Slope or at the southern corner of the Flagg-Drake property. A Jeansville pump, size 22 x 18 x 10 inches, has been placed on the lower gangway off No. 3 Slope