

SCRANTON, PA., *March 24, 1884.*

The following improvements have been made in coal department of the Lackawanna Iron and Coal Company during the year 1883 :

At the Pine Brook colliery there has been driven a rock tunnel seven by sixteen feet, for a distance of five hundred feet at an angle of ten degrees; same has been driven from No. 4, or second, below Clark to Clark vein, cutting one vein of coal about midway. The object of this tunnel being to run all Clark vein coal to one common foot located in second vein below Clark. The tunnel or plane will be provided with double track for letting or lowering down coal in the ordinary way. Our connections have been made with old workings of Clark vein, hence with mule-way or man-way. The man-way upon the surface has been extended towards the breaker some distance by building side walls, and covering with large and substantial flag-stones, making a very complete and easy man-way from lower vein to surface. Above constitutes about all the important improvements made in coal department during year 1883.

R. G. BROOKS, *Superintendent.*

PATRICK BLEWITT, Esq.,

Inspector of Mines :

DEAR SIR: The New York, Susquehanna and Western Railroad Company have in the Lackawanna valley about seven and one half miles of railroad completed and in active operation, and about three and one half miles now under construction. When finished shipments will be made over this road from nine different collieries. Of these, the Greenwood and Sibley collieries have been for a long time in operation. The Dunn is a new operation completed during the last year at a cost of \$100,000, and is now rapidly increasing its out-put. Jermyn No. 6, also completed during the last year, is a shaft colliery, having a shaft two hundred and twenty feet deep, cutting two veins of coal, and a very fine, large breaker and commodious out-buildings have also been erected. The cost of this plant is about \$120,000. The Winton colliery is now being rapidly developed by a drift of about two thousand feet in length, one thousand four hundred feet of which have already been driven. The breaker foundations have been erected, and the timber for the breaker has been framed, and is ready to be raised. The Dolph colliery is now nearly ready for shipping coal. The plant consists of a very fine breaker and machinery, with suitable out-buildings, and the mine will be operated by a drift and inside gravity plain. The cost of development will be about \$80,000.

The Spencer colliery is partly a new operation, and being rapidly completed. The breaker has been framed and raised, and the machinery is now being put in. The mine opening consists of a shaft which has been sunk through four seams of coal—three of which are so far developed as to insure an out-put of eight hundred tons per day from the very start. Coal will doubtless be shipped from this colliery about the 1st of May. The

DUNMORE, PA., *March 8, 1884.*

DEAR SIR: Our breaker stands on the tract in the warrantee name of Elizabeth Rought, Winton borough, and the drift for coal starts on same tract, near the corner of said tract, Sarah Dana and William Rawle tracts, object being to mine coal from the two latter tracts, principally from the Rawle. Breaker presumed to be ready for business in April and of six hundred tons' capacity. Coal intended to be shipped over a branch railroad now being constructed in the interest of the New York, Susquehanna and Western Railroad Company, and may be ready for coal freights at our place some time in May next, judging from present rate of progression. Estimated coal area about three hundred acres, of the Archbald vein.

Respectfully submitted,

EDWARD DOLPH.

P. BLEWITT, Esq.,

Inspector of Mines.

Shaft No. 5.

Sunk on Wilkins property, seventy-five feet from north-west line of the Burschell and about one hundred and forty feet from lower north-west corner of same. Shaft about three hundred and three feet in depth and cutting four veins of coal. Carpenters are now lining shaft. The putting in of machinery in breaker is about completed. I gave you a report of the sinking of this shaft in table No. 7, for 1882.

Yours respectfully,

JAMES YOUNG,
Mine Superintendent.

PENNSYLVANIA COAL COMPANY'S OFFICE,
DUNMORE, *January 26, 1884.*

Church Mine.

A new slope has been sunk from the surface to the coal.

Grassey Island Mines.

They have driven a new drift to open up the slope vein of coal.

Dolph Colliery.

There have been new lump coal schutes built on breaker.

Edgerton Mine.

Two air shafts have been sunk, one 35 feet deep, the other 41 feet deep; sectional area of each, 100 square feet.

Peckville Colliery.

This is a new colliery, located in Winton borough, on the south-east side of the Lackawanna river. Coal can be shipped by the Delaware, Lackawanna and Western railroad or the Delaware and Hudson Canal Company's railroad. It is owned and operated by the Peckville Coal Company. They have one drift driven 200 feet into the coal, and opening right and left of the main heading. There is another drift 600 feet south of breaker. A new breaker is being built which will have a capacity of 600 tons per day. They will be ready to ship coal in about three months. An air shaft is also being sunk.

Pierce Mines.

The slope from the surface has been sunk 700 feet in 1886. Sectional area, 100 square feet.

Erie Colliery.

On November 16, 1886, Erie breaker was destroyed by fire. It is now being rebuilt, and will be ready for the preparation of coal about March 1, 1887. Sunk one pumping shaft 225 feet deep; sectional area, 48 square feet. Two new shafts are being sunk, one to top vein and one to bottom vein. Size of shafts, 12×30 feet. A breaker is to be erected for the preparation of coal and is now ready for the superstructure.

Keystone Mine.

One self-acting plane, 450 feet long, sectional area, 96 square feet, has been built and in operation.

Brennan's Mines.

A new breaker has been erected; a drift has been opened and an air shaft has been sunk in 1886.

Belmont Mines.

A new drift has been driven for a distance of 300 feet, for the purpose of drainage. Sectional area, 42 square feet.

Total number of employés,	21,260
Tons of coal mined for each employé,	401
Total number of persons working in mines,	14,729
Tons of coal mined for each,	579
Total number of miners and laborers,	10,199
Number of tons of coal mined for each,	836
Ratio of employés per life lost,	373
Ratio of employés for each personal injury,	95

Respectfully submitted.

PATRICK BLEWITT,
Inspector of Mines.

Colliery Improvements During 1887.

Delaware, Lackawanna and Western Railroad Company.—This company reports but very few improvements during the year, except driving headings and airways to open up their different mines, so as to mine sufficient coal to supply the market.

Cayuga Shaft.—The company is sinking a new shaft about one mile north-east of the main shaft for a supply shaft and for the purpose of lowering and hoisting persons into and out of the mines.

Sloan Shaft.—Sunk a new slope in coal in mine; and are also building a new plane in mine.

Storr's Shaft.—Are sinking a new shaft for second opening and supply shaft.

Delaware and Hudson Canal Company have not reported any improvements during the year 1887, except the usual advancement of their workings to supply the coal demand and sinking the two shafts at Dixon mines from G or Big to Clark vein of coal.

A. Langdon & Co.—*Belmount Colliery* put in place three new boilers, erected a double elevator and built two new pockets in breaker.

Bridge Coal Company—Bridge Shaft Mines.—This company made second opening in new County vein, and are now finishing new foot for same.

Lackawanna Iron and Coal Company—Capouse Shaft Mines.—This company is driving a tunnel from rock to Diamond vein; size, 14x6 feet.

Dolph Coal Company—Dolph Mine.—This company is driving a rock tunnel.

Hillside Coal and Iron Company—Forest City Mines.—The shaft reported as being sunk 160 feet to bottom vein in last year's report (1886), has reached a depth of 199 feet. Suspension of work for some months accounts for it not being finished. Work is now going rapidly forward to completion.

face at shaft and roadbed of tunnel, at which point it is dumped and the coarse coal separated from the fine, the coarse coal to be shipped direct to market and the fine to Bunker Hill breaker. A 90 horse-power engine will be used for hoisting the coal. Three boilers are in place, each 36' long and 30" diameter for the present furnish sufficient steam for hoisting and for one No. 4 Knowls pump at bottom of shaft.

Yours, very respectfully,

JAMES YOUNG,
Mine Superintendent.

Capouse shaft, Lackawanna Iron and Coal Company.—Have constructed a new plane between G and Rock veins 369' long; sectional area equal 96 square feet and on an angle of 15°.

Pine Brook shaft.—Finished plane 1,500' long; sectional area, 6'x14', equal 84 square feet on a pitch of 15°.

Clifford shaft.—Finished one new plane 887' long; sectional area equal 72 square feet on an angle of 6°.

Forest City mines.—Finished a new slope 400' long; sectional area, 84 square feet on an angle of 9°.

Glenwood mines.—Constructed a slope 400' long; sectional area, 48 square feet on an angle of 14°.

Keystone tunnel.—Finished a new plane 1,100' long; sectional area equal 98 square feet on a pitch of 7°.

Elk Creek drifts.—Constructed a plane 80' long; sectional area, 5'x16', equal 80 square feet on an angle of 38°.

Eaton tunnel.—Extended slope 500 feet; sectional area, 6'x14', equal 84 square feet on a dip of 1 in 9.

Edgerton Coal Company is opening a new drift into bottom coal $1\frac{1}{2}$ miles north of Edgerton No. 2, close to where the old Hendricks breaker stood and on the same tract of land.

Dolph tunnel.—Finished plane No. 5, 525' long and on a pitch of 3°; also plane No. 6, 300' long on an angle of 3½°.

Grassy Island colliery.—Sunk second opening shaft from Grassy island to Clark vein, a depth of 157' feet; sectional area, 308 square feet; also new air shaft for drift workings and built a new furnace.

Jermyn No. 3 slope.—This colliery is located in Dickson City borough about 2,000' northwest of Jermyn shaft No. 4; it consists of a slope and breaker; the slope is sunk. From surface to first vein of coal is 600' and to second vein of coal 800'. It is connected with mine workings of Jermyn No. 4 and is ventilated at present by the fan at Jermyn No. 4. They are sinking a fan shaft northeast from mouth of slope; it is now down about 175'; they are also erecting a fan. The breaker is new and located 200' southeast of slope mouth; it has a capacity of 1,000 ton of coal per day and is furnished with all the modern improvements.

Lackawanna shaft.—Finished a plane 300' long; sectional area, 8'x18'

6'x17', equal to 112 square feet. We are, also, driving a rock tunnel from one split to the other in the Clark vein, 330' long.

Providence shaft.—Finished new slope 300' long; sectional area 6'x10', equal to 60 square feet on a dip of 1' in 5'.

Richmond colliery No. 3.—Commenced sinking shaft in October, 1888, through quicksand. Reached rock at a depth of 93'. Shaft opening 12'x24', when finished will be 11'x21'. Expect to mine Diamond, G and all the veins below, on the Pulaski Carter estate. Intend to build breaker with a capacity for preparing for market 1,000 tons of coal per day. Have boiler house built with six (6) cylinder boilers 40'x34" in diameter. Also, set in place one locomotive boiler rated at 100 horse-power. Have nine pumps in position, but are not all in use at the same time.

Rushbrook shaft.—Are driving both sides of shaft, testing the coal. Finished second opening shaft.

S. V. White tunnel.—Constructed one new plane 800' long.

Simpson colliery.—Built one mile of railroad track for mine locomotive between breaker and coal slope. Finished building a new side on breaker. Drilled an 8" bore-hole from surface to bottom of Carbondale vein, in basin which is now being used to pump water through to surface. Are erecting a nest of three new boilers; also, sinking a new slope on dip of vein, which is now down 1,500'. Expect to reach basin in 550' more. Sectional area of slope 7'x14', equal to 98 square feet. The dip is on an angle of 6°.

I wish to call your attention to Bunker Hill breaker; while the breaker itself is situated in the Second anthracite district, the coal is prepared and accounted for in the Third or McDonald's district. The breaker for the present is used only to screen coal that has already been prepared in excess of the market's demands, the same coal having already been prepared at the several breakers near the mines and shipped to the company's dumping grounds near this breaker.

Yours very respectfully,

JAMES YOUNG,
Mine Superintendent.

Dolph Tunnel.—Inside slope or dip being driven to crop at south end of property, and operated by a pair of hoisting engines located on surface; rope through bore-hole. Opening being driven from crop, up to meet said slope. Electricity is used for signaling.

Marshwood Slope and Tunnel.—Additional traveling way made on eastern crop of vein for men and mules, thus avoiding the use of the air shaft by miners and laborers and the slope for mules. No. 3 drift in Upper Dunmore gangway and airway driven in 350'. No. 4 drift in Upper Dunmore gangway and airway driven in 125'. Pennsylvania slope, in new territory, acquired from Pennsylvania Coal Company, sunk 300'.

Jones, Simpson & Co.—Set new boilers at breaker.

Pancoast Shaft.—Continued tunneling vein towards old slope workings which were filled with water, when 80' from old workings, water was tapped from two headings with 2½" holes and is now being pumped out.

Rushbrook Mines.—Have graded and laid 1¼ miles of track, 3' gauge, with 40 pounds railroad iron; built new boiler house 21'×55', engine house 27'×34', and fan house 14'×31', with tower 13'×16' and 36' high.

Spencer's Shaft.—Driving slope through strata from middle to bottom vein on an incline of 15' to 100' horizontal.

There were no improvements reported from any of the other collieries except what were necessary to provide for keeping the workings in such a condition as to provide for the quantity of coal required.

Two new tunnels have been driven at Coal Brook, one from the top vein to the surface, a distance of one hundred and sixty feet, and one from the third vein to the surface, a distance of one hundred and seventy-five feet.

At Clinton two new slopes have been driven; one is 3,100 feet long, the other 700 feet. The first has an average grade of 8 feet in 100, the other 6 feet in 100.

Richmond No. 3 shaft has been sunk from the Clark to Dunmore Nos. 1 and 2 veins, a distance of 132 feet. Its size is 10x22 feet.

At Richmond No. 4 a new plane 800 feet long has been made.

At Mt. Jessup a tunnel 464 feet long has been completed from the Clark to the No. 3 Dunmore vein.

Near their No. 1 colliery the Pennsylvania Coal Company has erected six Babcock and Wilcox water tube boilers of 900 horse power. The pressure carried per square inch is 110 pounds.

Steam is supplied for No. 1 colliery breaker and shaft, to Gypsy Grove colliery breaker and its two shafts, and have supplanted the 27 cylindrical boilers 36x30 feet formerly used at these places.

The Lackawanna Coal Company has sunk an air shaft, having a sectional area of 120 feet and a dept of 55 feet.

A new air shaft was sunk from the surface to the Dunmore vein by the Johnson Coal Company. Its depth is 310 feet and has 120 feet area.

A tunnel 7x14 feet and 1,300 feet long has been driven from the big vein to the Dunmore.

At Pancoast a new slope 800 feet long has been sunk in Clark vein and another is being sunk in No. 3 vein.

The Dolph Coal Company has sunk two new slopes, one 350 and the other 650 feet deep. One is 6x16 and the other 6x12. They have also made a new plane 500 feet long, and sunk two new air shafts each 62 feet deep.

The Riverside Coal Company has made a new slope 900 feet long.

Many other small air shafts, tunnels, slopes and planes have been made during the year for the purpose of properly ventilating the workings and to keep up the output of coal, but they are not reported.

A FEW REMARKS ON THE STATISTICS FOR FIVE YEARS.

By a retrospective glance at the mining statistics of this district for the five years ending December 31, 1896, we find that there were 30,702,284 tons of coal produced and 29,367,733 tons shipped; 79,645 persons were employed for 939 days, during which time 1,056,055 kegs of powder of 25 pounds each, were consumed.

Of the total number employed 243, or a small fraction more than three-tenths of one per cent. were killed. Of the 243 killed, 154 lost

to the Red Ash vein, a distance of 514 feet from the surface. A pair of 26x48 inch first motion hoisting engines has been erected to operate this shaft. An 800 horse power, water tube boiler plant, has been installed near this shaft. Also a new fan has been erected, Guibal pattern 8x25 feet to ventilate the Red Ash vein. Both the empty and loaded trestles at the breaker have been rebuilt. The breaker structure has been renewed and reinforced and breaker pockets practically rebuilt.

DOLPH COAL COMPANY, LIMITED

Extensive repairs and improvements in breaker enlarged the capacity and changed the method of handling the coal on the outside. A new chain hoist has been put in which elevates the empty cars sufficiently to run by gravity from the breaker to a point where they are then taken to the mine by an electric motor, which has also been installed. This dispenses with all mules formerly used for this purpose and is a decided improvement. The new air shaft to the Clark vein has been enlarged and timbered. One 300 horse power Babcock and Wilson water tube boiler has been added to the boiler plant.

PRICE-PANCOAST COAL COMPANY

The Pancoast colliery was totally destroyed by fire on the evening of March 11. It has been replaced by a much larger and more modern breaker, capacity 2,500 tons per day, with all the latest improved machinery for cleaning and preparing coal. The breaker is connected by a steel bridge 46 feet long to a steel tower built over the shaft, which is 160 feet in height. A concrete wall 3 feet in thickness has been put around the shaft to take the place of timber which was used as cribbing prior to the destruction of breaker. A new building has been erected that contains a carpenter shop 50 feet square, blacksmith shop 36 feet square, machine shop 80x36 feet with steel roof and concrete floor, making them almost absolutely fire-proof. A new wash house has been erected of brick material 20x14 feet with stationary tubs, hot and cold water for the convenience of employes. The breaker is lighted by 250 incandescent lights and 20 arc lights and heated throughout by steam. A new automatic water spray arrangement is being placed throughout the breaker as a protection against fire. A new Guibal fan 20 feet in diameter has been erected for the purpose of ventilating Nos. 1, 2 and 3 veins; also a 35 foot Guibal fan to ventilate the Clark and Dunmore veins.

In the Diamond vein the gravity plane has been extended 200 feet, and a new foot in shaft to replace old one in No. 3 vein.

No. 2 Shaft, Inside.—The new engine plane that was commenced in 1904, has been completed and is now in operation. A new air-bridge has been built on engine plane, sectional area, 120 square feet.

STERRICK CREEK COAL COMPANY

Sterrick Creek.—The Dunmore fan, which was located above the Clark vein water level, about 4,000 feet east of breaker, was removed to the Clark vein air shaft, a distance of 3,000 feet south westerly. The new location is 400 feet from the Dunmore haulage engines and the fan receives its steam from the pipe line which supplies these engines. The friction is reduced by this change, three thousand feet, and the efficiency of the fan increased.

A ten inch bore hole was driven from the surface to the Clark vein, depth 265 feet, and 2,000 feet of 6 inch wooden pipe laid to carry the culm from the breaker to the Clark vein workings. Eight new shaking screens were installed in the breaker with decks ranging from 18 to 24 feet in length, to take the place of eight 12 foot shakers, which were inadequate with the increased output.

Three balance planes above the water level in the Dunmore vein were changed to one plane, and a pair of 12x12 inch engines installed to operate the same.

DOLPH COAL COMPANY

Air shaft completed from the surface to the Clark vein. A new ventilating fan, 20 feet in diameter, erected at head of air shaft. Extensive improvements were made outside. Previous to 1905, no box cars could be run under the breakers, owing to their height. With the improvements made, this condition is changed. The new chain hoist at head of breaker works very satisfactorily, and with the electric motor which conveys the mine cars to and from the "chain hoist," a great many mules are dispensed with, and all trouble in this line eliminated.

MT. JESSUP COAL COMPANY

A new ventilating fan has been erected at the head of the "North pitch" air shaft to ventilate the Clark vein workings. The diameter of fan is 14 feet.

HILLSIDE COAL AND IRON COMPANY

Erie.—One new 900 H. P. Sterling type water tube boiler plant with Sturdevant cold air blast and exhaust steam boiler feed heater.

Two 12x6x12 inch duplex plunger pumps for boiler feed and fire protection in boiler plant. One new washery; capacity 800 tons per day. New steam plane 7x12 inch in area and 4,200 feet in length. The same is equipped with a pair of engines 16x20 inch cylinder.

Blue Ridge Tunnel.—Condition as to safety good, drainage and ventilation fair. They are robbing pillars.

Richmond No. 3 Colliery.—Condition as to safety good, drainage fair, ventilation good.

DELAWARE AND HUDSON COMPANY

Olyphant Colliery No. 2 Shaft.—Condition as to safety and drainage good, ventilation generally good.

Grassy Island Slope.—Condition as to safety and drainage good, ventilation good with the exception of the Four Foot vein. This vein is very difficult to ventilate as it is thin and the roof is continually falling in the air courses.

Grassy Island Shaft.—Condition as to safety and drainage good, ventilation fair. There is room for improvement.

Eddy Creek Colliery, Birds Eye Mines.—Condition as to safety, drainage and ventilation good.

No. 4 Drift.—Condition as to safety good, drainage and ventilation fair.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery No. 1 Shaft.—Condition as to safety, drainage and ventilation good.

No. 2 Shaft.—Condition as to safety and drainage good, ventilation fair. There is room for improvement.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery No. 1 Shaft.—Condition as to safety and drainage good, ventilation fair.

No. 2 Shaft.—Condition as to safety and drainage good, ventilation fair.

Gipsy Grove Colliery.—Condition as to safety, drainage and ventilation good. This mine has been very much improved.

STERRICK CREEK COAL COMPANY

Sterrick Creek Colliery.—Condition as to safety, drainage and ventilation good. Six air bridges were built during the year, which improved the ventilation.

LACKAWANNA COAL COMPANY

Lackawanna Colliery.—Condition as to safety, drainage and ventilation good.

DOLPH COAL COMPANY

Dolph Colliery, Hackley Slope.—Condition as to safety, drainage and ventilation good.

Hannah Bell.—Condition as to safety good, drainage and ventilation fair.

MOUNT JESSUP COAL COMPANY

Mount Jessup Colliery, Peck's Shaft.—Condition as to safety good, drainage fair, ventilation good.