

roof; they leave cross-entrances about 50 feet apart, for the purpose of ventilation; the roof is sandstone rock; the mines are in a good working condition.

*Ventilation* is produced by the pressure of the atmosphere; the in-takes are located at mouth of tunnels, area 42 feet each; the out-casts are located in the air-shafts, area 35 feet each; the amount of pure air is 13,750 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one volume; ventilation is generally good.

*Machinery.*—They use 1 breaker engine and 1 hoisting engine at breaker, and 1 hoisting engine to hoist on the planes outside, 25-horse power each; the boilers have been cleaned and examined, and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off, so that operatives are safe; they require no machinery at the tunnels.

*Remarks.*—They have furnished a map of mines; they have a second opening for each tunnel; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; he has no fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be practical, competent and sober men; the parties having charge know their duty in case of death or serious accident.

*Ventilation* is produced by the action of the atmosphere, therefore the in-takes in winter will be the out-cast in summer; when the temperature is the same in the mines as it is outside, there cannot be any ventilation; there has been no complaints from the miners on account of bad air in the mines.

#### WHITE OAK COLLIERY.

This colliery is located at Archbald, in Blakeley township, and situated on the east bank of the Lackawanna river; the opening to the coal consists of 2 tunnels and a slope: it is operated by the Delaware and Hudson canal company. Nicholas George is mining boss, and Thomas Law is outside foreman.

*Description.*—There is a breaker connected with these mines, located about 600 feet from mouth of tunnels; they mine and prepare about 450 tons of coal per day; they employ 110 miners, 85 laborers, 33 drivers, 8 door-boys and 14 company men in the mines; 51 slate pickers, 4 head and plate men, 5 drivers, 4 company men, 7 mechanics and 2 bosses outside; in all 326 men and boys; they are working the Bottom vein of coal, average thickness 10 feet; they work headings 10, air-ways 14 and chambers 36 feet wide; they leave pillars from 12 to 14 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart for the purpose of ventilation; the roof is good rock; the mines are in a good working condition.

*Ventilation* is produced by means of a furnace; the in-take is located at mouth of tunnels, area 36 feet; the up-casts are located in furnace air-shaft, area 48 feet; the amount of pure air is 11,860 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; the air is circulated to the face of the workings in one split; the amount of ventilation has been measured and reported; ventilation is good.

*Machinery.*—They use 1 breaker engine, 61½-horse power; there is no machinery required at the tunnels.

*Remarks.*—They have furnished a map of mine; they have a second opening; they have no house for men to wash or change in; the mining boss seems to be a practical and competent man; there are no boys working in the mines under 12 years of age; the engineer seems to be a practical and sober man; the parties having charge know their duty in case of death or serious accident; the breaker machinery is boxed and fenced off so that operatives are safe; they have not opened any chambers in the slope yet; they are driving heading and air-way to find the basin of the coal.

others. This colliery evolves immense volumes of gas, but it is well provided with ventilators, and the ventilation is good. This company keeps its place at the head of the list, and from present indications it will hold its place there for all future time.

The Delaware and Hudson Canal Company have made some valuable and much needed improvements, but it has been like pulling teeth to get them to do anything. They have taken over a year to do what ought to have been done in two months at the furthest, but I am very grateful for what has been done. They have erected two new seventeen-foot fans at Carbondale, which are to ventilate No. 1 and No. 3 shafts and White Bridge tunnel. These are the first fans ever erected at Carbondale, and if the air courses are improved, so as to conduct the air properly through the face of the workings, they will inaugurate a new era in their ventilation.

The five tunnels, constituting the Coal Brook colliery, should and must have two fans in place of the three furnaces which are now robbing the company and cheating the workmen. **White Oak** mine, Archbald, and Grassy Island shaft, Olyphant, need a fan each, and then the Delaware and Hudson will go ahead of the Pennsylvania Coal Company, and take its place second on the list. They might be placed alongside of the D. L. & W. were it not that they will never have their air courses in as good condition as are those of the latter company. I expect the D. & H. C. Co. will go on making these other improvements during 1878.

The Pennsylvania Coal Company's collieries are not in as good condition as I could wish, taking them altogether. Where they have fans, the ventilation is satisfactory; but where they use furnaces it is far from being so, and in some of the collieries, especially in spring and autumn, when the season changes, it is very bad. The system of ventilation in their collieries in Jenkins township is very objectionable and injurious. Here, the No. 2 slope, No. 4, No. 5, No. 6, No. 7, and No. 11 shafts, and No. 4 slope, are all ventilated with one continuous current passing from one to the other, and carrying the impurities of one mine into the other for several miles. It is true that there are additions made here and there on the route, but nothing like enough to purify the air. The law requires that each mine or colliery shall be provided with "pure air," and every intelligent man knows that air passing from one mine into another cannot be "pure air," but must be heavily charged with "noxious and poisonous gases."

In the latter part of June, I traveled through all the workings of the above named collieries, and examined the system of ventilation with great care; and upon finding it as above stated, I made my views known to J. B. Smith, Esquire, and by his request wrote to Andrew Bryden, Esquire, demanding such improvements made as would remedy the evil. Messrs. Bryden and Law, the mine superintendents, did not admit that their mines were as I represented, and would do nothing until they had made an examination themselves. But on making the examination, they were forced

engines, one placed on each side of the shaft, and connected to the fans by direct motion.

**White Oak Colliery.**

They have completed an air shaft at this colliery. The shaft opening is twelve by twelve feet, and it is thirty feet deep from the surface. They are going to erect a fan, seventeen feet diameter by four feet face, over the air shaft opening, which is to be run by a single engine, connected by belt. They have also put in place one nest of three boilers; also put in place a steam-pump, and necessary connections, to pump water out of the slope. The slope is also graded, ready to hoist coal as soon as the water is pumped out.

**Jermyn, No. 1, Shaft.**

They are now sinking an air shaft. The opening is fourteen by fourteen feet. It is timbered down to the rock, a distance of seventeen feet from the surface. They have a bore-hole in the bottom of air shaft, so the water is going down into the old workings forty-seven feet through rock. They expect to erect a fan over air shaft, seventeen feet diameter by four feet face, to be run by a single engine, and connected to fan by a belt. They are also sinking a slope in coal inside for a third lift.

**RULES ADOPTED BY THE COAL OPERATORS AND MINE SUPERINTENDENTS OF THE EASTERN DISTRICT OF THE WYOMING AND LACKAWANNA COAL FIELDS, AT THE MINE INSPECTOR'S OFFICE, SCRANTON, PENNSYLVANIA, DECEMBER 24, 1881.**

**Preamble.**

All persons employed in or about this colliery are hereby notified that the following rules and regulations have been adopted for the purpose of preventing injury to persons or property from negligence or carelessness of the employés.

The attention of each class of workmen is hereby called to the duties assigned them; they are also requested to do all in their power to avoid all unnecessary risk in following their daily avocations.

**Mine Boss.**

It shall be the duty of the mine boss to direct and generally supervise the whole working of the mine. He shall instruct the workmen in their several duties and vocations.

It shall be his special duty to keep the work in proper shape as it advances. He shall keep a careful watch over the ventilating apparatus, airways, traveling-ways, pumps and sumps, and shall see that the miners timber their places properly as they advance, and see that they keep their places safe from danger of loose coal, slate, or rock falling upon them. If he shall find a place in a dangerous condition, it shall be his duty to give orders to have it secured by taking down or propping up the loose material, with the least possible delay; or, if necessary, he shall stop the mining of coal at once, until it is secured. He shall also see that the signaling ar-

## COLLIERY IMPROVEMENTS FOR YEAR 1888.

## Delaware, Lackawanna and Western Railroad Company.

*Bellevue Shaft.*—A new fan was erected close to the old one, size 16 feet diameter by 4½ feet width of face. A pair of new hoisting engines were put in place at head of inside slope 12"x30" to replace old ones removed.

*Bellevue Slope.*—A new tunnel was driven from Rock to Diamond vein, 150 feet long.

*Cayuga Shaft.*—A new shaft was sunk for second opening about one mile north from main shaft, size 10'x37½'; area of opening 375 square feet, and sunk to G or Big vein, a distance of 436 feet.

*Central Shaft.*—A new slope driven in G or Big Vein 500 feet long on a dip of 1' in 6'. Also a new pair of first motion hoisting engines 24"x60".

*Hyde Park Shaft.*—A new tunnel was driven from New County to Clark Vein.

*Pyne Shaft.*—A new fan 14 feet diameter by 4 feet face was put in to replace old fan which was not sufficient to ventilate the mine.

*Tripp Shaft.*—A new slope was driven in Clark vein about 500 feet in length. Dip is 1' in 6'. A new pair of engines, second motion, dimensions 10"x30", was placed outside at Diamond for hoisting culm.

## Delaware and Hudson Canal Company.

*Dickson Shaft.*—Built new fan 20 feet diameter by 5 feet face, closed periphery, run by direct motion engines, one on each end of shaft to replace a fan of 12 feet diameter and 3 feet face, which was not of sufficient capacity to ventilate the mines. They sunk a slope in Clark vein 600 feet in length and placed in position a pair of hoisting engines 12"x16" at head of slope.

*Leggetts' Creek Shaft.*—Sunk main shaft 10x26 feet, 177 feet from 14 feet or G to Clark vein and made connection with Von Storch mine workings for second opening.

*White Oak Mines.*—Reopened old No. 5 drift near head of No. 27 plane on the Gravity railroad with a tunnel through hard pan 365 feet in length to coal. Sunk an air-shaft in rock 11 feet in diameter and 36 feet deep to coal. Built a furnace with a fire surface of 64 square feet. Built 3,900 feet of railroad track to head of plane which plane is 1,328 feet long, having a gauge of 2½ feet, to take coal to the breaker, for which a small locomotive is used.

## Pennsylvania Coal Company.

*Shaft No. 1.*—A second opening has been made in "Top Vein" by making a connection with Shaft No. 3 or Gypsy Grove. An air-shaft was sunk from top to "Second Vein," giving a second opening to this

by a system of rope-haulage, sectional area of slope is 6'x12' equal 72 square feet.

*Jermyn No. 1 shaft.*—Finished new plane 400' long on a grade of 1' in 5'.

*No. 1 shaft, Carbondale.*—New tunnel driven from daylight to top coal 550' long, sectional area 63 square feet.

*White Oak mines.*—Opened up old No. 5 mines by means of two tunnels one 300' long, sectional area equal 60 square feet; also, another 100' feet long, area of opening 56 square feet; these openings are made to the Archbald vein of coal.

OFFICE OF THE PENNSYLVANIA COAL COMPANY,  
DUNMORE, PA., *February 8, 1890.*

MR. PATRICK BLEWITT:

DEAR SIR: The following are some of the improvements made during the year ending December 31, 1889:

*No. 5 shaft.*—A slope was started from northeast heading in second vein (First Dunmore) angle of slope located about 250' from shaft landing in this seam, we drove slope in vein on north 50 west course for a distance of 900' at which point we encountered a fault. The width of fault was ascertained by boring from top or Clark vein, and the slope again resumed in rock same course as above mentioned, and on a grade of 1' in 20', for a distance of 160', at which point we again opened up vein. The slope will terminate at the lower one, west end of Wilkins' tract. One pair small engines 40 horse-power, Pennsylvania Coal Company's make, located between heading and angle of slope will be used to hoist the coal. The plane on northeast side of shaft in third seam was finished and put in successful operation in February, 1889. The one in second seam was finished in June.

*No. 1 shaft.*—We resumed operations at this shaft in November, since which time we have been trying to increase the length of our headings and the capacity of lodgment.

*Bunker Hill No. 1.*—This new working is situated on line of Taylor tract near end of the E. & W. V. truss and about 600' east of Roaring Brook. At or near the point at which the shaft is sunk, a tunnel had been driven (about thirty-five years ago) into what is known as the Dunmore middle vein, and from this tunnel two narrow passages were driven in coal, one to the rise, south 39° east, and abandoned in coal, the other driven to daylight on a course of south 7° west. At this point, a furnace has been built for the purpose of ventilating this seam, our second opening will also be at this point. The shaft is 44' 8" deep and sunk to the Dunmore bottom vein. A second opening to shaft workings has been made close to the bank of Roaring Brook and almost directly under the track of the E. & W. V. railroad, driven in the coal of the Dunmore bottom vein about 500' feet east of shaft. The coal from both shaft and tunnel will be hoisted to an elevation of 30' above sur-



At the Marvine the Clark vein which is five feet 6 inches thick and of very good quality was opened up. The second opening slope which was begun in 1893 was completed from the 14-foot vein to the surface, a distance of 384 feet.

It has an area of 98 square feet and a grade of "one in four." It is also used for a down cast for air.

At the Grassy Island mine a new plane 400 feet long on a grade of 12 degrees was completed.

A new tunnel was driven from the surface to the number 2 vein at **White Oak**. It is 507 feet long.

The vein here is 3 feet 6 inches thick.

A new fan is also in course of erection to ventilate all the White Oak workings.

At Coal Brook, near the face of the present workings, a new shaft was sunk a distance of 87 feet, for the purpose of ventilation.

A new tunnel was also driven at this mine from the surface to the bottom coal, cutting a five-foot vein at a distance of 100 feet.

#### Lackawanna Coal Company.

A tunnel 550 long having a sectional area of 84 square feet was driven by this company from the surface to the lower Dunmore vein, which is four and one-half feet thick.

A shaft for the purpose of ventilation was also sunk from the surface to this vein, a distance of 190 feet.

#### Delaware, Lackawanna and Western Railroad Company.

At Storr's mine, a tunnel 6x12 and 750 feet long was driven from the "big" vein to the Diamond.

A new plane 450 feet long on a grade of 11 degrees was also made.

At Storrs No. 3 two new planes were made, one 450, the other 500 feet long.

#### John Jermyn.

At Jermyn No. 3 a tunnel is being driven north across the measure. It is now 600 feet long and is expected to go 900 feet more to cut the lower Dunmore vein.

The coal from this new opening will be brought to the surface through the slope.

A shaft through which the tunnel workings will be ventilated has been sunk to the vein, a distance of 120 feet.

The vein at this point is reported seven feet thick and of good quality.

A new plane 450 feet long has also been made in this mine. It has a pitch of 12 degrees.

A new plane fourteen hundred feet long has been made in the Grassy Island vein, taking the place of two shorter ones.

Another large tubular boiler was placed in position, as was also a ten-foot fan for making draft for boilers.

At Grassy Island slope, new first motion engines for hoisting from Diamond vein to surface were installed, and new engines are replacing old ones at Grassy Island shaft.

A new breaker has been built at **White Oak**, on site of the old one that was burned in July, and a new tunnel has been driven to bottom vein.

Jermyn No. 1, a new rock plane 650 feet long has been driven from Archbald to Grassy Island vein. A new slope has been made, and a branch to hold from 70 to 100 cars is being made at foot of shaft.

The breaker has been rebuilt and now has a capacity of 1,500 tons per day.

Also, a new plane 1,500 feet long has been driven on a light grade from foot of shaft to old workings, where it is proposed to rob pillars.

A tail rope system of haulage has been adopted in No. 1 shaft, which hauls a trip of fourteen cars 3,850 feet, replacing five mules and drivers. Also, a new slope has been sunk a distance of 400 feet to "third vein," and two gravity planes, 750 and 650 feet, respectively, have been made.

A new drift has been opened at Powderly, in Grassy Island vein, and a surface railroad 3,000 feet long has been built to convey the coal from the drift to the chutes, and another pump has been added, making three pumps delivering water to surface through a 16-inch bore hole. A new lowering plane 1,800 feet long is about completed.

At Racket Brook a new washery with a capacity of 600 tons per day has been erected.

A new breaker of 2,500 to 2,800 tons daily capacity has been built at Coal Brook. It is modern in every particular and has replaced the old Coal Brook and Racket Brook breakers. The coal from No. 1 shaft and tunnel, Powderly slope and tunnel and Coal Brook mines will be prepared by it.

A new drift, known as the Mills drift, has been opened up, and is ventilated by a new Guibal fan, ten feet diameter, driven by a gasoline engine, with very good results.

At Wilson Creek a new rock plane from bottom to top coal has been made. It is 250 feet long. Also, two gravity planes, 750 and 1,025 feet long, respectively, have been made, and a small air motor three feet high has been added in top coal drift, making three in all doing all the work for forty-five places, besides rendering rock blasting unnecessary, except that the vein becomes less than three and a half feet.

Carney and Brown Coal Company, fair.

Edgerton Coal Company, fair.

Finn Coal Company, good.

Black Diamond Coal Company.—This mine was in a very bad condition generally, but on my last visit I found the ventilation greatly improved.

### COLLIERY IMPROVEMENTS

By the Delaware and Hudson Company

Clinton.—Sinking new slope from surface to Grassy vein, section 7x14 feet, present depth 125 feet.

Extension of present haulage in old slope Top vein 2,400 feet begun.

Erection of supply store 16x28 feet and office for mine foreman 14x18 feet. Installation of 3 cylinder boilers, 90 horse power total.

New local sales pockets in Carbondale City of 4,500 to 5,000 tons capacity, with elevator and conveyor driven by 26 horse power gas engine.

Carbondale No. 1.—Air shaft from surface to top vein, 151 feet, completed.

One ten foot ventilating fan driven by 26 horse power gasoline engine.

Powderly No. 2.—Erection of new breaker and washery combined. Machinery driven by one pair of 16x36 inch engines, 150 horse power. Conveyors driven by one pair of 18x36 inch engines, 90 horse power. Washery supplied with one 18x12x18 inch Jeansville Duplex pump of 1,000 gallons capacity. Installed six new return tubular boilers of 150 horse power each.

Jermyn No. 1.—One direct current generator of 180 kilowatts driven by direct connected engine. Mines wired for electric haulage, and one electric locomotive of 12 tons weight put in use. One 24x14 x36 inch Jeansville Duplex pump of 1,800 gallons capacity installed, but now under water and not being operated.

One new gravity plane 1,200 feet long. Foot of shaft, head and foot of inside slope wired and light furnished by arc lamps.

White Oak.—One 17 foot fan erected, driven by 14x36 inch engine to ventilate the Dunmore vein.

New slope sunk 500 feet in Dunmore vein.

Proposed 3,000 feet haulage road begun.

Grassy Island.—One three stage air compressor with 16x11½x5 5-8 inch diameter air cylinders, 22 inch diameter steam cylinder by 24 inch stroke, 140 horse power. One locomotive type boiler installed, 250 horse power. Three small air motors sent to this mine, but not all in use.



## MT. JESSUP COAL COMPANY

Mt. Jessup.—Ventilation bad. Roads and drainage bad. Condition as to safety, fair.

## EDGERTON COAL COMPANY

Edgerton.—Ventilation fair. Roads and drainage fair. Condition as to safety, fair.

## CARNEY AND BROWN COAL COMPANY

Murray.—Ventilation, roads and drainage fair. Condition as to safety, fair.

## BLACK DIAMOND COAL COMPANY

Black Diamond.—Ventilation good. Roads and drainage fair. Condition as to safety, fair.

## FINN COAL COMPANY

Finn.—Ventilation fair. Roads and drainage fair. Condition as to safety, fair.

## IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

Clinton.—New slope in Grassy vein sunk to a depth of 1,000 feet. Also a second opening completed. Three thousand six hundred feet of track laid from Grassy slope to breaker with 40-lb rail. One 6-wheel, 12-ton locomotive added to haul the coal from Grassy slope to breaker. Three new cylinder boilers 30 inches by 50 feet added to boiler plant. Two thousand feet of tail rope for haulage in the main slope completed.

No. 1 Carbondale.—One 10 foot Guibal fan installed driven by direct engine 8x10 inch to ventilate third vein in No. 3 shaft. One 16 inch bore hole from foot of slope to surface for delivering water from slope pumps.

White Oak.—Three thousand six hundred feet of tail rope for haulage from the Clark vein to the surface completed. One pair of double engines 14x20 inch cylinders to operate the same. Slope in Dunmore vein sectional area 7x10 feet driven through "anticlinal" 250 feet completed.

Jermyn.—Rock plane section 7x14 feet driven from Grassy vein to the Clark vein, a distance of 400 feet. Also a second opening 600 feet in length driven to the surface.

Grassy Island.—The old shaft is being sunk from the 14 foot vein to the bottom split, a distance of 45 feet. The purpose is to make a second opening for the same vein in the new shaft. A large sump is being made to be used in emergency. A new brick engine room has been erected at new shaft for shaft engines, which are on the ground.

5—23—1904

## IMPROVEMENTS

DELAWARE AND HUDSON COMPANY

Clinton.—New tail rope installed 1,000 feet in length, with a pair of double engines 14x20 inch in River Side Slope to pull coal north and south. A new hospital "First Aid," and wash house has been erected outside for employes of the Dunmore vein. Two new ventilating fans erected, each 20 feet in diameter.

No. 1. Carbondale.—Tail rope has been extended 1,000 feet, delivering cars to main line.

Powderly.—New car shop, supply house and blacksmith shop erected.

Jermyn.—Rock tunnel completed from the Archbald vein to the Dunmore vein, distance 125 feet. New electric motor  $4\frac{1}{2}$  tons with 12x18 inch reel on top for lowering loaded and hoisting empty cars in chambers.

White Oak.—New car shop has been erected. New plane in Dunmore vein finished.

## PRICE-PANCOAST COAL COMPANY

A rock slope has been sunk in the Diamond vein over the "Anticlinal." A pair of double engines has been put in same vein to hoist the coal from this slope; size of engines 24x36 inch. In No. 3 vein a slope has been sunk 600 feet in length to the river line, and a pair of engines put in to hoist the coal, 12x12 inch in size. No. 2 Gravity Plane that was abandoned six years ago has been opened. In the Clark vein a new plane has been built, 600 feet in length. Dunmore No. 2 vein, the west slope, 900 feet in length, has been graded, and a pair of engines 12x12 inch in size erected outside to hoist the coal. One 250 horse power boiler was installed.

## PENNSYLVANIA COAL COMPANY

No. 1 Colliery, Outside—In 1904, work was commenced on the installation of 300 additional horse power "Babcock and Wilcox" boilers, and new 10 foot forced draft fan; also new "Cochrane" feed water heater and 12x8x12 inch "Duplex Scranton Pump" and new 50,000 gallon water tank. This work has all been completed during the year. The following buildings have been erected during the year. A new stone powder house 12x14 feet; a new stone oil house 12x12 feet 7 inch; also new brick wash house for miners 16x24 feet. Work is progressing on new brick building 16x36 feet to contain three rooms; office for outside foreman, shifting shanty for firemen, and shifting place for breaker men.

No. 2 Shaft, Outside.—The fan and head house, which was burned during the year, has been replaced by concrete buildings. A 12 inch concrete wall has been built between the down-cast and up-cast from foot of shaft to fan.

No. 1 Shaft, Inside.—Water tunnel from Lackawanna river to No. 1 Shaft. No. 1 Colliery has been driven in 1,600 feet during the year, and on the No. 1 end, 1,900 feet. Total distance driven since the tunnel was commenced, 5,200 feet. Distance yet to be driven, 1,600 feet. Another tunnel has been driven 675 feet from the third Dunmore vein to the second Dunmore vein, to carry the water to main tunnel, sectional area 6x9 inch.

## CONDITION OF COLLIERIES AND IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

Clinton Colliery.—A new slope was sunk from the surface to the Grassy vein, distance on pitch 1,800 feet. Coal hoisted to the surface by a pair of 14x20 Flory engines using tail rope system. Breaker has been overhauled and a new trestle 300 feet in length to head of breaker has been completed. Condition of mine roads good; drainage good; ventilation fair.

Coal Brook Colliery.—One six-ton electric motor has been added, making 8 air motors and 7 electric in use pulling coal, and one Turbine pump driven by an electric motor and delivering 2,500 gallons of water per minute to surface, has been added to equipment. A new opening to Grassy vein on the company farm connected by railroad 3,000 feet in length has been made. Also one new 16 ton mine locomotive for pulling coal from opening has been added. Ventilation fair; other conditions good.

No. 1 Carbondale Colliery.—New engine plane on east side No. 1 slope, 1,200 feet in length, delivering cars to foot of slope haulage road north of No. 3 shaft, has been rebuilt pulling cars to foot of No. 1 slope distance about 4,000 feet. Condition of colliery, ventilation, roads and drainage, good.

Powderly Colliery.—Locomotives has been placed on east side, pulling coal from Grassy opening to head of plane, a distance of 3,000 feet. Electric lights have been placed in breaker office and buildings. Ventilation fair; other conditions good.

Jermyn Colliery.—New 6-ton electric motor added for pulling coal, and one pair of 10x12 engines delivering supplies from surface to foot of shaft, a distance of 1,800 feet. A new washery, capacity 800 tons per day, equipped with the latest improved machinery, is near completion. Ventilation in many places is bad; other conditions good.

White Oak Colliery.—Slope driven through anticlinal 900 feet in length. Condition of colliery, fair.

## HILLSIDE COAL AND IRON COMPANY

Clifford Colliery.—A tail rope and engine plane combination haulage system has been installed. A transmission line has been run from the power house at No. 2 shaft over a mile away and through bore hole from the surface to the south section of Dunmore vein, for the purpose of haulage and pumping. One motor and one electric pump have been installed there. Condition of colliery, fair.

No. 2 Shaft Colliery.—A new fire-proof boiler house has been erected. One turbine pump of one thousand gallons capacity driven by electricity, and two triplex plunger pumps of 600 gallons capacity each, driven by electricity, have been installed in the Clark vein, the water being delivered to surface through boreholes. A saw mill has been erected, driven by steam power, for the purpose of cutting all prop timber, which is extensively used on account of so much robbing being done. A tunnel has been driven from the bottom Dunmore vein to the second one overlying the bottom, the distance between being 16 feet vertical, the length of tunnel 450 feet, the area 6 feet by 10 feet. Condition of colliery, fair.

Jermyn Colliery.—Plane in Grassy vein driven 800 feet. Plane in Archbald vein extended 600 feet. Rope haulage in Archbald vein extended 2,200 feet. A 17 foot Guibal fan has been built to ventilate the Grassy vein. A Dickson engine, 16 by 30 inch cylinder, operates the fan. An 8-inch bore hole driven 147 feet from the surface to the Archbald vein to convey steam to operate fan on the surface.

**White Oak** Colliery.—Tail rope haulage in Dunmore vein straightened and graded for a distance of 1,600 feet. No. 2 slope Dunmore vein extended 400 feet. Tunnel in Dunmore vein driven through fault 150 feet. No. 6 Tunnel re-opened, and 2,200 feet of tracks laid to operate it. No. 8 Tunnel to Dunmore vein re-opened and tracks laid preparatory to robbing.

#### HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—A two-story building of reinforced concrete 29 x 74 feet was erected for storehouse purposes. Three tubular boilers were installed equal to 300 horse power, or 1,200 in the aggregate. One 7½ ton electric motor. West side steam plane extended 400 feet. East side plane extended 1,400 feet. One 6-inch bore hole from surface to the Grassy vein for slushing purposes to recover pillars.

#### SCRANTON COAL COMPANY

Raymond Colliery.—The Raymond shaft has been sunk from the Clark to the Dunmore vein, a distance of 86 feet, cutting a four foot vein of excellent coal. The second opening has also been sunk from and to the same vein.

#### TEMPLE IRON COMPANY

Northwest Colliery.—An air shaft was sunk to Mills vein, a distance of 32 feet. A Guibal fan was erected on this shaft 20 feet in diameter for ventilation. It is driven by an electric motor. A 75 K. W. generator driven direct by a Taylor-Chandler engine was installed to generate current to supply the motor.

#### HUMBERT COAL COMPANY

Sunnyside Colliery.—A new vein of coal has been opened near top of mountain about 2,000 feet from the breaker. A new mule barn and a fireproof stone powder house were erected. Additional railroad tracks have been laid in order to meet the increased capacity of the colliery.

#### MORSS HILL COAL COMPANY

Morss Hill Colliery.—A slope was sunk from the surface to top vein, a distance of 125 feet, the average pitch twenty degrees and a steam hoist was installed. Water way was driven to Third vein. The breaker and trestle thoroughly repaired and new breaker engine, jigs, screen, etc., installed. A 65 K. W. generator, electric hoist, two motors for shop purposes and a complete system of electric lighting for breaker and offices were installed,



under the Lackawanna River to avoid dangers from flooding; a 30 inch pump hole, 130 feet deep drilled; a centrifugal slush pump, 36 inches in diameter, driven by single engine, 8 x 10 inches, installed.

Jermyn Colliery.—Brick boiler house addition, 54 x 70 feet, containing 4 Wickes boilers, 300 H. P. each, in course of construction; two 24 inch bore holes, 235 feet deep, drilled for pumping water to surface; two Scranton Compound Duplex pumps, 19 x 36 x 21 x 36 inches, capacity 5,000 gallons a minute, installed; new plane from Archbald vein to Grassy vein driven 350 feet; one six and one-half-ton motor with reels installed; an 8 inch bore hole, 120 feet deep, drilled for slushing purposes.

**White Oak** Colliery.—Two 10 inch bore holes drilled for exhaust steam and discharge from slope pump; one 19 inch bore hole drilled for pumping water to surface; one Scranton Plunger pump, 20 x 10 x 36 inches, capacity 800 gallons a minute, installed; one Allison Plunger pump, 20 x 10 x 24 inches, capacity 600 gallons a minute, installed.

#### HILLSIDE COAL AND IRON COMPANY

Forest City Colliery.—The old Forest City breaker washery was torn down and a new one, 68 feet wide, 100 feet 6 inches long and 130 feet 7 inches high, erected. The lower portion of this washery up to the machinery line, including the pockets, is of reinforced concrete. All mud coal, including chestnut, and all small sizes from buckwheat down, are prepared there, and ten double-compartment jigs are used in separating the impurities from the coal. Two additional boilers, 125 H. P., locomotive type, have been added to the Forest City breaker boiler room, and the water tunnel connecting the Clark vein workings at No. 2 shaft was completed by the Delaware and Hudson Company and connection made, which will drain the entire workings above that level. Clifford breaker was abandoned the latter part of the year and all the coal, including that from Clifford shaft, is now being prepared through the Forest City breaker and washery. A new Compound Duplex Plunger pump, 18 x 28 x 10 x 36 inches, has been installed in the dip workings in Clifford shaft to deliver water to the surface or to the new washery, as needed.

#### ARCHBALD COAL COMPANY

Tappans Colliery.—The coal from this colliery heretofore was delivered into the Delaware and Hudson railroad cars on a siding at Archbald, after being hauled in wagons a distance of one and a quarter miles. To eliminate this expense a new track has been laid, 6,600 feet in length, with 40 pound T iron rails, from the breaker to the top of an incline plane. A new incline has been built, 1,750 feet in length, with 40 pound iron; new coal pockets have been built at bottom of new plane where coal is dumped from special cars, built for the use of the colliery, and taken to and from the breaker by a new twenty-ton locomotive. A branch of the Delaware and Hudson Railroad is built from the main line nearly midway between Archbald and Winton to the new coal pockets. This is a decided improvement and reduces the cost of transportation from the colliery to the railroad, and will also be the means of increasing the output of the colliery. The old Pierce Coal Company's shaft has been reopened



locomotive to dispense with the dumping of coal at the chutes and transportation by means of large cars. A pump shaft was sunk 80 feet to the Top split of the Clark vein, where a single Goyne pump 22x16x36 inches was installed at the foot.

Jermyn Colliery.—A rock plane 700 feet in length was completed from the Archbald to the Grassy vein. To improve transportation on the inside, a 6-ton electric motor was installed. New hoisting engines with double drums of the Flory type, size 14x20 inches, were placed in the Archbald vein haulage extension and Grassy vein plane. *Outside.* A plane for rock dump was built, operated by a 25 horse power electric motor. To drain the upper veins of the West side workings, a concrete culvert 300 feet long, and an open ditch 350 feet in length were built. A new electric power house, 36x50 feet, was built of brick.

**White Oak** Colliery.—From the Archbald vein No. 6 tunnel a second opening or tunnel 250 feet long, 7 feet high and 12 feet wide, was driven to the surface, and a new return was driven for the installation of a fan. The rope haulage at the head of No. 8 plane, Dunmore vein, was extended 2,500 feet.

#### HILLSIDE COAL AND IRON COMPANY

Forest City Colliery.—A rock tunnel was driven 7 by 10 feet in section and 275 feet in length, to serve for a second opening for the "Ring" vein. A new 16-inch bore-hole was put down a depth of 225 feet, located 540 feet east of the shaft, and a 12-inch casing pipe inserted, to get rid of the excess water from the 2nd and 3rd Dunmore veins in rainy seasons. The same kind and size of bore-hole was put down near the Forest City Washery to supply the washery with water from the mine. One new 7½ ton cable reel electric motor was installed for the purpose of increasing the output.

The fan and air shaft at No. 2 Shaft are undergoing extensive repairs which have not yet been completed. A new concrete locomotive house was built, size 45 feet 2 inches x 57 feet 3 inches.

Erie Colliery.—The colliery has been shut down since August on account of extensive repairs to the breaker. The result will be better preparation and a larger output. New shaking screens and patent pickers are being added.

The shaft was overhauled, new buntings and guides placed, also new carriages installed. The East side fan was remodeled and rebuilt entirely on the old foundation.

Glenwood Colliery.—The breaker was abandoned May 3, 1909, and has been torn down, with the exception of the North wing, which will be used for a washery. The coal from the Glenwood mine will be transported underground to the Erie shaft and hoisted to the Erie breaker, where it will be prepared.

#### HUMBERT COAL COMPANY

Sunnyside Colliery.—Two new drifts were opened to the Dunmore vein. A new breaker is in course of erection, with a capacity of 800 tons per day, to replace the one destroyed by fire July 3, 1909. A new boiler plant has been erected of concrete 120 feet from new breaker.

## OUTLOOK COAL COMPANY

Outlook.—Ventilation, safety conditions and drainage fair.

## FALL BROOK COAL COMPANY

Murrins.—Ventilation, safety conditions and drainage good.

## CLINTON FALLS COAL COMPANY

Clinton Falls.—Ventilation bad; safety conditions and drainage fair.

## AINSLEY COAL COMPANY

Sunset.—Ventilation, safety conditions and drainage fair.

## IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY AND HUDSON COAL COMPANY

Coal Brook Colliery.—Six 6-ton electric motors added to present power for transporting coal inside, which dispenses with compressed air plant; 150 horse power electric hoist operating slope and plane 1,000 feet in length delivering coal to main locomotive road to breaker, 200 horse power electric motor for driving 20-foot fan, replacing steam engine power; 50 horse power electric hoist to replace a 10 by 12 inch double engine driven by compressed air. Concrete base for supply house 28 by 60 feet for storing supplies.

Powderly Colliery.—A 12-ton locomotive added to present power for hauling coal from No. 1 Carbondale mine to Powderly breaker. 2,000 feet of 6-inch pipe laid for slushing of culm under the Lackawanna river to secure the roof in this locality. Three 6-ton electric motors, with drum attachments, to draw up and lower cars from face of chambers, in Carbondale No. 1 mine, which dispenses with eighteen mules. Two rock tunnels, 7 by 12 feet in section and 600 feet long, driven through fault opening large track of coal on south side, No. 1 Carbondale mine; and one blacksmith shop, concrete base, 24 by 50 feet, erected at same mine.

Jermyn Colliery.—Rock plane, 7 by 15 feet in section and 200 feet long, driven through fault for developing coal on west side. Generator 250 horse power, 750 amperes, installed for furnishing additional power. Driving a rock plane from the bottom to top split of the Grassy vein 7 by 15 feet in section, 300 feet long at present time. 35 horse power electric hoist installed for lowering and hoisting supplies at east side opening, dispensing with double steam engine 10 by 12 inch cylinders.

Clinton Colliery.—Rock slope 7 by 12 feet in section and 300 feet long for extension of rope haulage from top to bottom vein. Slope in Clifford vein driven 800 feet to present time, to open new level of coal. One Duplex Jeanesville pump installed in River slope delivering water through a 12-inch bore hole to surface.

White Oak Colliery.—10-foot Buffalo steel fan installed, driven by a steam engine 14 x 16 inch cylinders at No. 6 tunnel. Slope 8 by 11 feet in section in progress of sinking. Fan shaft 12 by 12 in section and 65 feet deep for ventilation of this slope. Engine plane 1,000 feet long is being constructed to deliver coal to surface.

7 feet x 12 feet in area, was driven from Bottom to Third vein and equipped with a 65 H. P. electric hoist. A rock plane, 150 feet in length and 7x12 feet in area, was driven from Top to Grassy vein to improve ventilation. A drift, 7 feet x 12 feet in area and 200 feet in length, was driven from the surface to Third vein, and a 10-foot diameter fan installed driven by electricity.

Powderly Colliery.—At No. 1 tunnel a fan 10 feet in diameter, driven by a 35 H. P. electric engine, was installed for ventilating Third vein. A tunnel, 7 feet x 12 feet in area and 150 feet in length, was driven through a fault in the Top vein. The haulage 1,200 feet in length was converted into an electric motor road. A fan 10 feet in diameter, driven by electricity, was installed to ventilate No. 1 Slope. A 21-ton electric motor transports the coal from No. 1 Carbondale to Powderly breaker. 3,500 feet of rope haulage operated by a 12x15 double drum engine installed for Eastside coal.

Jermyn Colliery.—Norwalk air compressor transferred from Coal Brook. Rock plane, 500 feet in length and 7 feet x 12 feet in area, driven from Bottom to Top Split Grassy vein. Rock slope from surface to Clark vein 7x12 feet in area and 180 feet in length.

**White Oak** Colliery.—Foundations for new breaker completed. Brick boiler house 88 feet x 50 feet, containing 4 Sterling 300 H. P. boilers, was finished. Built blacksmith shop 36 feet by 24 feet; car shop 48 feet x 30 feet; and supply house 20 feet x 40 feet. No. 6 engine plane extended 500 feet, operated by 14-inch x 20-inch engine. Drove manway for No. 3 Slope 200 feet and concreted top, bottom and sides.

#### HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—A new culm scraper line has been installed between Erie washery and the old Keystone culm bank, for the purpose of conveying the same to the washery for preparation.

A new concrete building has been erected for storing lime, cement, feed and hay.

Two air compressors have been installed within a corrugated iron building, adjoining the fire room, the compressed air to be used for drilling the rock in New County vein.

A new concrete mule barn of twenty stalls, feed room, etc., has been constructed near the foot of Erie shaft, replacing the outside barn on West Side.

A Sullivan undercutting coal machine has been installed in the New County vein, East Side. Several new counter headings have been completed in this section, doing away with less satisfactory haulage roads.

Considerable culm has been slushed into the Clark vein workings underneath the Lackawanna River.

#### SCRANTON COAL COMPANY

Riverside Colliery.—Two large locomotive type boilers were installed, displacing nine old cylinder boilers.

Raymond Colliery.—Breaker burned down January 22, 1911, and replaced by a modern breaker of 1,000 tons capacity. The new breaker, which resumed operations December 4, is equipped with the latest improved machinery for the preparation of coal, and has an annex where all the smaller sizes down to No. 3 buck is prepared.

300 feet long, delivering coal from surface to breaker is under construction. A 10-foot Buffalo steel fan is under construction in No. 8 plane.

**White Oak** Colliery.—Grassy slope finished from surface to coal and concreted on four sides. Installed 26 by 48 engines for Gravity No. 3 slope. A 20 foot Guibal fan was erected and equipped with a double 14 by 24 engine, and a brick house, 33 feet by 32 feet, was built for same. A new breaker of 1,500 tons capacity is almost completed. A brick wash-house, 18 by 48 feet, was built. Completed new boiler plant, comprising four 300 H. P. Sterling boilers and brick building. A supply house, 20 by 40 feet, was completed.

#### ARCHBALD COAL COMPANY

Tappans Colliery.—Two wings were added to the breaker to give additional pocket room, and an addition was made to the boiler house and a shaker placed therein to distribute the fuel.

The loading pockets were housed in and a 100 horse power return tubular boiler was installed to furnish steam heat.

A new Vulcan hoisting engine, 10 by 14 inch cylinders with loose drum 4 feet in diameter, and 8,000 feet of rope haulage, were installed at the New County slope. A new 16 by 12 by 12 Scranton duplex piston pump, 8 inch discharge, 10 inch suction, was installed in the Dunmore shaft.



20 by 7 feet and built concrete fan drift connecting with upcast compartment of No. 4 shaft. The fan is driven by an 18 by 30 inch Hamilton Corliss engine, single. Completed reinforced concrete partition wall between the upcast and downcast compartments of No. 4 shaft, a distance of 680 feet. Commenced to build new wash house near No. 2 shaft to contain shower baths and 200 lockers.

Coal Brook Colliery.—Installed two 6.5-ton electric locomotives with drum attachment for hauling coal and a 10-foot steel Buffalo fan for ventilating No. 6 tunnel. Built an addition to the boiler house 51 by 56 feet. Installed a General Electric 1,000 K. W. generator, driven by a pair of engines, 24 by 44 by 22 inches. Installed a new engine house and a 20 by 24 inch engine for No. 1 haulage and a 21-ton locomotive for hauling coal from the mines to the breaker. No. 22 plane was driven 2,000 feet.

Powderly Colliery.—No. 1. Installed a 6½-ton electric locomotive with drum attachment for hauling coal inside. No. 9 plane was equipped with a 20 H. S. P. electric house. Powderly tunnel driven from the surface to the Clark vein, a distance of 600 feet.

Jermyn Colliery.—Installed a General Electric 25 K. W. generator, driven by a 22 by 22 inch engine, and built a brick addition to the power-house, 24 by 51 feet. Two 6.5-ton electric locomotives with drum attachment installed for mine work. Tunnel driven 200 feet from surface to Clark vein. Driving a tunnel from the surface to the Dunmore vein to be 300 feet in length when finished. It is about one-third completed.

Gravity Slope Colliery.—Completed a breaker, 92 by 114 feet with a capacity of 1,500 tons per day, to supersede the old **White Oak** breaker. A concreted washhouse, 16 by 50 feet, was built for Gravity slope. A wooden washhouse, 16 by 24 feet was built for No. 6 tunnel. Installed a 16-ton locomotive for hauling coal from the mines to the breaker. Completed a water tight pump room, 20 by 60 feet, and a chute 14 by 18 feet. Installed two centrifugal electrically driven pumps with a capacity of 2,500 gallons each. Completed an engine house, with 14 by 20 foot engines, for lowering coal on No. 8 plane. Installed four 300 H. P. Stirling boilers in brick house and one generator 250 K. W. at breaker, and furnished power for pumping plant and light for breaker. Completed one engine house, 20 by 24 feet, and installed a 14 by 20 foot Flory engine on No. 8 plane and No. 12 tunnel.

### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the Carbondale High School Building, June 23 and 24. The Board of Examiners was composed of P. J. Moore, Inspector; Richard Beers, Superintendent, Carbondale; John F. Boland, Miner, Carbondale, and David Evans, Miner, Olyphant.

The following persons passed a satisfactory examination and were granted certificates:

#### MINE FOREMEN

Thomas Davies, Charles F. Moore, Carbondale; Thomas J. Sullivan, Thomas H. Thomas, Patrick Cowley, Olyphant; Edison Thomas,



## IMPROVEMENTS

DELAWARE AND HUDSON COMPANY, INSIDE  
HUDSON COAL COMPANY, OUTSIDE

Powderly Colliery.—No. 9 tunnel, from Clark to Top Clark was extended 400 feet.

Coal Brook Colliery.—The breaker was remodeled to increase capacity. A rock plane 175 feet long was driven from 3rd vein to Bottom Clark; No. 21 plane was extended 1,600 feet and equipped with electric hoist; 8,700 feet pipe line laid from Wilson Creek to breaker, for water supply.

Four 7-ton electric locomotives were installed to improve transportation.

Jermyn Colliery.—No. 17 rock plane, 350 feet long, was driven from Grassy to Top Grassy. No. 11 tunnel, 150 feet long, from Grassy to Top Grassy. No. 12 tunnel, 260 feet long, extended from Clark to Top Clark, Airshaft, surface to Top Clark, 60 feet.

**Gravity Slope** Colliery.—A rock slope, 80 feet long, was driven through fault in Archbald bed. Tunnel from surface to Dunmore bed, 325 feet; rock plane through fault in Dunmore bed, 250 feet; airshaft from surface to Archbald bed, connected. An 800-gallon electric pump was installed in No. 3 slope, Archbald bed, and two 10-ton electric locomotives in Dunmore bed.

## MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Carbondale High School, Carbondale, Pa., June 6 and 7. The Board of Examiners was composed of the following persons: P. J. Moore, Mine Inspector, Carbondale; Richard Beer, Superintendent, Carbondale; John F. Boland, Miner, Carbondale; David Evans, Miner, Blakely.

The following persons passed a satisfactory examination and were granted certificates:

## MINE FOREMEN

Michael Munley, Jessup; Wade F. Rodham, Scranton; James T. Stephens, Peckville.

## ASSISTANT MINE FOREMEN

Lewis D. Jones, Olyphant; Frank Moon, Jermyn; Anthony J. Conaboy, Thomas G. Williams, John W. Williams, Leo Healey, Joseph Surdoval, Carbondale; Edward J. Magnar, Jessup; Isaac Benjamin, Scranton.

## CONDITION OF COLLIERIES

## DELAWARE AND HUDSON COMPANY

Coal Brook, Gravity, Jermyn and Powderly Collieries.—Ventilation, roads, drainage and condition as to safety, good.

## TEMPLE COAL COMPANY

Sterrick Creek Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## SCRANTON COAL COMPANY

Raymond and Riverside Collieries.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## ARCHBALD COAL COMPANY

Tappans Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## HILLSIDE COAL AND IRON COMPANY

Erie Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## HUMBERT COAL COMPANY

Sunnyside Colliery.—Ventilation, roads, drainage and condition as to safety, fair.

## WEST MOUNTAIN COAL COMPANY

West Mountain Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## FALL BROOK COAL COMPANY

Murrin's Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

## MAXEY COAL COMPANY

Tipperary Colliery.—Ventilation, roads, drainage and condition as to safety, good.

## IMPROVEMENTS

## DELAWARE AND HUDSON COMPANY

Coal Brook Colliery.—Rock plane was driven to Bottom Clark vein; distance 140 feet. Shaft was sunk from surface to Top Clark vein; distance 50 feet.

Gravity Slope Colliery.—Rock tunnel was driven from No. 3 Dunmore to No. 2 Dunmore vein; distance 117 feet. A tunnel has also been driven from and to the same vein; distance 150 feet. Installed an electric hoist in No. 6 Slope and No. 12 Plane.

Powderly Colliery.—Installed 10-foot electrically driven fan; also jigs and shakers in breaker.

Jermyn Colliery.—Installed two 2,500-gallon electric centrifugal pumps.

Gravity Slope Colliery.—Installed 112-hp. electric hoist on No. 12 plane; also 10-ton electric locomotive running from the tunnel to the breaker.

### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Stone's Hall, Carbondale, April 23 and 24. The Board of Examiners was composed of the following persons: P. J. Moore, Mine Inspector, Carbondale; Thomas J. Kennedy, Superintendent, Jermyn; Michael McCann, Miner, Carbondale; David Evans, Miner, Blakely.

The following persons passed a satisfactory examination and were granted certificates:

#### MINE FOREMEN

James J. Cleary, Forest City; Frank Moon, William J. Henry, Jermyn; Edwin B. Charlton, Archbald; Patrick J. White, Mildred.

#### ASSISTANT MINE FOREMEN

Frank J. Holmes, Michael J. Barrett, Michael F. Munley, James T. McAndrew, Archbald; James F. Malia, James Arrow Smith, Forest City; William Simpson, William Hill, Peckville; Hayden Bennett, Richard Seymour, Edwin N. Stuart, William H. Rowe, George Woodward, Jermyn; Frank Herst, Mildred; Frank J. Kutarnia, Simpson.