

vein. Headings and air-ways have also been driven, but the greatest progress has been made in the top or first Dunmore seam. A new breaker has been built 1,160 feet east of Shaft No. 1, but there has been no coal run through it yet, owing to the dullness of the coal trade.

Shaft No. 4, "Gypsy Grove."—We are grading a new plane to cut off Hale's upper gangway. It is located about seven hundred feet from the D. & H. C. Co. line on the Horsefield tract, in bottom seam of coal.

Shaft No 5.—We have about completed a plane on the northeast side of shaft in No. 3 seam. It will be about 800 feet long and driven on a course of S. 50° E. We have also commenced grading another plane in No. 2 seam driven on the same course as the plane in No. 3 seam. It is located on the southwest side of shaft. An incline was driven through the anticlinal that exists between shafts Nos. 2 and 5 for the purpose of a second opening and drainage. This passage connects the bottom seam of No. 2 Shaft with the first Dunmore seam in Shaft No. 5. This does away with all pumps and other machinery at Shaft No. 2, which was abandoned September 1, 1888.

Hillside Coal and Iron Company.

Clifford Colliery, with a capacity of 1,000 tons of coal per day, was completed. This plant is made up of a breaker with the latest improvements, simplified as much as possible, keeping in view three essentials, sufficient height to pick out slate and rock before the product reaches the rolls, and to avoid putting through the rolls anything that had been broken in the process of mining; a shaft 12'x30' opening and 300 feet deep has been finished. It is operated by a pair of 22"x36" direct acting engines equipped with two Dickson safety carriages; a slope for second opening 360 feet long to hoist rock, of which, owing to the thinness of the seam, there is a great quantity, and for a manway. The breaker is located 700 feet from the shaft. The coal is hauled from the shaft to the breaker, and the empty cars hauled back by a wire rope haulage.

Erie Shaft.—A slope 250 feet long for a second opening and for a manway has been finished on the west side of the Lackawanna river.

Glenwood Shaft No. 2, to the Archbold vein was completed; the total depth from the head to the foot is 350 feet. A pair of direct acting engines, 22x48, with two Dickson safety carriages, is the motive power. A fan 18 feet in diameter by six feet face has been erected to ventilate Glenwood No. 1 Shaft, and it is run by an engine 16x36. Rope haulage is used at this colliery. At all the collieries of this company electric lights are in use in and around the breakers. They were first put in as an experiment at the Erie breaker and they were so complete a success that their general introduction soon followed. The arc light is used, and coal can be cleaned by its light even better than by daylight.

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 $1\frac{7}{8}$ 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'

Clifford Colliery.—Finished one plane in mines.

Erie Colliery.—Graded planes on west side of shaft from Bengough's heading through old chambers to Gilhool's heading.

Shaft No. 2, Forest City.—Finished plane in mines.

Glenwood No. 1 Shaft.—This shaft has been sunk through the "Grassy Island" to what is known as the Carbondale top vein, 60' below the Grassy Island Vein. Permanent mining has not yet commenced.

Keystone Tunnel.—We are improving the breaker by enlarging it, also by putting in place one pair of rolls 26" x 22" and one pair 26" x 12", for the purpose of breaking coal down to small sizes. They will be in place January, 1891.

Elk Creek Mines.—Have sunk a shaft to third vein of coal.

Marshwood Mines.—Finished one inside plane

Ontario Mines.—Finished one inside plane 300' long.

Pancoast Mines.—Finished rock tunnel and proved good coal.

Richmond No. 3.—Shaft down to the "G" vein of coal, they have not commenced opening out the mines yet. A breaker is in course of construction. They have not commenced to open up any of the veins of coal yet.

MT. JESSUP COAL COMPANY, LIMITED,
WINTON, PA., *January 8, 1891.*

Mr. PATRICK BLEWITT, *Inspector of Mines, Scranton, Pa.:*

DEAR SIR: Herewith I hand you our yearly report for 1890.

Regarding explosion of boiler at our fan shaft on night of January 21, 1890, by which Michael J. Murley lost his life, I would respectfully refer you to the evidence at coroner's inquest, of which you doubtless have a copy, and also to the verdict of coroner's jury.

As to our improvements for the year, we have concentrated all of our boilers at the breaker and abandoned the old plant at fan shaft, having put in three (3) new steel boilers 30" diameter by 36' long, and two iron boilers 40" diameter by 35' long, all in first class condition. Steam is conducted through a new line of 5" gas pipe to our big pump, a distance of 2,000', and from thence through four and three inch branch lines to our hoisting engines and pumps and up the fan shaft to fan engine.

The total distance from boiler house to our lowest pump on underground slope is 3,900'. We made connection with the Olyphant Water Company's main by laying 2,500' of 2" gas pipe and have now a good supply of pure water.

We put in a line of perpendicular elevators in our breaker for hoisting screenings and pickings, also put in a set of small "pony" rolls for reducing pickings. Besides which, we have made other minor improvements on breaker.

Yours truly,

ELI T. CONNER, *Superintendent.*

Table Showing the Occupation and Percentage of Persons Killed and Injured while Following these Occupations During the Year 1893.

Occupation.	Killed or fatally injured.	Per cent.	Injured.	Per cent.	Total.	Per cent.
Miners,	18	35.3	35	36.45	53	36.0
Miners' laborers,	20	39.2	28	29.16	48	32.7
Runners,	2	3.9	3	3.12	5	3.4
Drivers,	3	5.9	18	18.80	21	14.3
Door boys,	2	3.9	3	3.12	5	3.4
Company laborers,	4	7.9	1	1.04	5	3.4
Foot men and head men,			5	5.20	5	3.4
Shaft sinkers,			1	1.04	1	0.7
Slate pickers,	2	3.9	2	2.07	4	2.7
Total,	51	100.0	96	100.0	147	100.0

IMPROVEMENTS MADE IN 1893.

Delaware and Hudson Canal Company.

At the Marvine shaft a new plane was made, 1,430 feet long, area 98 square feet, grade 8 degrees.

At No. 1 shaft, Carbondale, two new air shafts were sunk a distance of 20 feet, which greatly improved the air at the extreme end of the workings.

At Grassy Island a second opening was driven at the extreme end of the plane working from the "Grassy" vein to the surface; length, 275 feet; area, 84 square feet.

Hillside Coal and Iron Company.

At Glenwood three new planes were made, the length of which are 400, 600 and 600 feet, respectively; sectional area of each 84 square feet, on angles of 12, 18 and 19 degrees.

At Erie two new planes were completed, one 150 feet long, with an area of 112 square feet; the other has 98 feet area, and is 175 feet long, on a pitch of 14 degrees.

At Forest City, No. 2 shaft, a new plane, 600 feet long, 6 feet high and 14 feet wide was put in operation.

A new plane, 275 feet long, 14 feet wide and 6 feet high was also put in operation at the Clifford shaft.

of new hoisting engines, 22x30, have been erected, and 1½-inch ropes, with heavy shieves, placed in shaft. Two new carriages with pneumatic fans have also been placed in the shaft. A road has been graded and built from No. 1 shaft, in Grassy Island vein, a distance of 5,500 feet, to reach certain numbers of pillars from this vein.

At Edgerton, a road 5,250 feet long has been graded and built from what is known as the Edgerton drift to the coal upon the Pierce Coal Co. property. A tunnel is now being driven to reach coal in what is known as the Russell tract, and two planes are now being built to reach this coal.

At Lackawanna colliery eight jigs of the Reading pattern have been placed in the breaker.

Hillside Coal and Iron Company's Improvements.

A washery at Clifford breaker has been erected to wash fresh-mined culm, all sizes above birdseye having been taken out. It was started about May 1. The capacity is 300 tons a day.

Forced draft plant with Sturtevant blower, 7x4 feet, to increase the capacity of the Clifford boilers. The blower is capable of furnishing blast for 900 horse-power.

Savory's plane, on the Ontario tract, Clifford mine, 1,500 feet long, 7x14 feet in area, has been finished.

No. 6 plane, on the Ontario tract, Clifford mine, 600 feet long, 7x14 feet, in area.

One hundred horse-power electric hoist, west plane, No. 2 shaft, Forest City. This plane is 1,800 feet long. The hoist has a capacity of 500 loaded cars per day. There are four headings and two lifts. The hoist pulls the loaded cars out of the headings and draws up the empty cars.

A tunnel in No. 2 shaft, Forest City, from the upper split of the shaft vein to the lower split, 750 feet long, 7x10 feet in area. This tunnel is two-thirds completed.

A curved self-acting plane at Glenwood breaker. The plane is 990 feet long, 780 feet of which is in the Archbald seam, and 120 feet on the curve carrying the plane into the rock in an easterly direction toward the small seam above the Archbald, which was reached at a distance of 90 feet after the curve was made. The plane was projected in this way because of the pitch of the two seams. The curve has a radius of 50 feet, and the cars pass around it without difficulty, and I see no reason why it cannot be operated as easily as the ordinary straight line self-acting plane. It is 7x16 feet.

Remarks on Accidents.

A few brief notes on fatal accidents, made from actual observations by visiting, for the purpose of investigation, the scene of each one,

North End Coal Company

North End, ventilation fair, drainage fair.

Improvements

The Hillside Coal and Iron Company made the following improvements at their various collieries during the year.

Clifford Shaft.—One balance plane driven 6x14 feet, 498 feet long.

Extension of No. 8 plane on east side, 6x14 feet, 198 feet long.

Engine plane on west side, partly driven, 6x10 feet, 300 feet long.

Forest City Slope.—Have sunk an air shaft at the extreme south workings, 12x25 feet in depth; also a new slope to the New County vein (opened from surface) 8 feetx16feet, 250 feet long.

Forest City No. 2 shaft.—The present air shaft was continued from the Clark to the Bottom or Dunmore vein, a distance of 245 feet; size of shaft, 12 x 12 feet. The cribbing at the head was replaced at the same time with concrete.

They have also installed at their Forest City No. 2 shaft (one in the Clark Vein and one in the Bottom or Dunmore vein) two 6½ ton mine locomotives with cable reels attached. These motors are used in place of mules to bring the coal from the face to the passing branches, where the larger motors get the coal.

It has been the practice for years at this colliery, to use a small size locomotive, but being equipped with a trolley, they had found considerable difficulty with having to extend the trolley wires in the chambers as the places advanced, and also found it quite expensive. The later type of motors, with the reel attachments avoid the necessity of trolley wires being put up in the chambers, and are working very successfully. They are so well satisfied with it, and especially in laying out new workings, that they will endeavor to do without mule haulage altogether, as besides the other conveniences, the motors do not take up as much height as mules, and consequently they find they do not have to cut as much rock in a low vein as would otherwise be necessary.

They have also installed at No. 2 shaft one Jeansville Woodlined Compound Duplex Plunger Pump, size 18 and 28x10x18 inches, and at Clifford shaft a Scranton Steam Pump Company's Compound Duplex Plunger Pump, 18 and 28x10x18 inches; both of these throwing to the surface; and at Clifford shaft they have constructed a mule barn (inside) to accommodate about 50 mules.

Scranton Coal Company

At their Johnsons No. 1 shaft, Priceburg, a pair of Vulcan Hoisting engines 28x48 inches has been installed.

When these mines were opened, the robbing of pillars was one of the important considerations, and with this in view a system of mining was adopted which has been strictly adhered to. An engineer was kept at the mines, to put up all chamber lines, and see to it that they were driven accordingly.

All chamber roads, gobs and props, conform strictly with the engineer's lines, the road being on one side, and the general success attending the mining at this colliery, is the best evidence of the successful methods there in vogue.

While the robbing of pillars is such an important part of the work at these mines, it can be said that not a single accident can be attributed to it.

Clifford Colliery.—The ventilation is, and has been, undergoing a thorough overhauling, and will soon be in a satisfactory condition.

Glenwood.—The ventilation is in fair condition; they are robbing pillars in a thick vein, and on this account it is very difficult to maintain systematic ventilation, but the employes do not suffer in any way for the want of air.

TEMPLE IRON COMPANY

Lackawanna.—The chambers of this mine are well ventilated, and have been very much improved lately. A new shaft is being sunk, which will improve their haulage and do away with using the main haulages as return, which, under present conditions, would be impossible.

Northwest.—The ventilation is fair; they are robbing pillars in a thick vein, but the men appear to have a full and adequate supply of air.

NORTH END COAL COMPANY

North End.—This mine has been under development, and is not sufficiently far advanced to be considered.

Improvements

SCRANTON COAL COMPANY

At the Johnson colliery a 30 foot Guibal fan has been installed as an alternate to the present fan now in use, which fully meets the requirements of this gaseous colliery.

The engine room and fan drift are built of substantial masonry, and the arrangement of operating the doors that turn the air currents to either fan, is very effective and complete.

At Raymond Shaft a 250 horse power locomotive boiler has been set up in addition to the present equipment. This will do away

The improved haulage and equipment at this colliery, is in a condition second to none in the region.

HILLSIDE COAL AND IRON COMPANY

At Forest City colliery a 7x12 inch Quintuplex Electric plunger pump, equipped with a C. C. 90 H. P. motor, the pump having a capacity of 600 gallons per minute against a head of 450 feet, has been installed in the Red Ash vein at No. 2 shaft.

An additional 7½ ton electric motor, with cable reel attachment, has been added to the Red Ash vein; also a 7½ ton with cable and reel attachments, added to the equipment of the Clark vein.

Also at Forest City (outside) a very modern supply house, 35x50x18, has been constructed, with a fire-proof addition 18x21x18, used for an oil house.

The interior arrangement—equipment for handling oil by the use of pumps, manner of storing supplies, and method of keeping a record of the same—is indeed of great value to the colliery, and reflects credit on its designers.

At Clifford colliery a steam plane, 900 feet in length, area 7x12, has been driven up the west rise.

At Glenwood colliery a new cold air blast for the boiler plant, with fan and engine, has been installed, and a new 6" steam line from Glenwood boiler room to the pump shaft, a distance of 3,000 feet, has been erected, which will allow the shutting down of the boiler plant at the pump shaft the greater part of the year, when the pumping is not excessively heavy.

TEMPLE IRON COMPANY

At Northwest colliery a plane 417 feet long has been driven from the Clark to the New County vein.

Remarks

A review of the operations in this district for the year 1904, shows an unsatisfactory condition regarding accidents.

The high percentage of accidents caused by falls of roof, is no exception to records of former years. The attention of those interested, has been repeatedly called to the irregularities that cause this class of accidents, but a reduction can never be looked for until the employes see that it is better to observe and obey the law concerning the examination and securing of the roof of their working places than it is to disregard it.

There were 36 fatal accidents, 17 of the victims were English speaking persons, and 19 foreign speaking. From this it will be seen that the increase in the number of accidents in the mines is not wholly due to the "foreigner," as is very often asserted.

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.