Remarks.—They have furnished a map of mines; they have a second opening; they have no house for men to wash or change in; there are no boys working in the mines under 12 years of age; the parties having charge know their duty in case of death or serious accident.

GRASSY ISLAND COLLIERY.

This colliery is located in Blakeley township, and situated about one-half of a mile south-east of the Lackawanna river; the shaft is —— feet deep to the Fourteen Feet vein; it is operated by the Delaware and Hudson canal company. David M'Donald is mining boss, and J. G. Bell is outside foreman.

Description.—There is a breaker connected with this mine, about 3,700 feet away from main opening: they mine and prepare about 575 tons of coal per day; they employ 140 miners, 50 laborers, 34 drivers, 13 door-boys and 21 company men in the mines; 40 slate pickers, 9 head and plate men, 4 drivers, 9 company men, 12 mechanics and 2 bosses outside; in all 334 men and boys; they are working the Fourteen Feet vein of coal, average thickness 10 feet; they work headings 10, air-ways 14 and chambers 30 feet wide; they leave pillars 15 feet wide to sustain the roof; they leave cross-entrances about 50 feet apart for the purpose of ventilation; the roof is rock; the mine is in a good working condition.

Ventilation is produced by means of a furnace; the in-take is located at mouth of shaft, area 144 feet; the up cast is located in furnace air-shaft, area 49 feet; the amount of pure fresh air is 40,200 cubic feet per minute; the main doors are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main traveled roads, and an extra one in case of accident to any of the others; the air is circulated to the face of the workings in 2 splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use 1 breaker engine. 61 3-5-horse power; 1 hoisting engine, 72-horse power; 1 hoisting engine, 77-horse power, and 1 steam pump, 97½-horse power; they have a metal speaking tube in the shaft; they have a safety carriage, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions attached to their hoisting drums; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; also a safety valve for safety.

Remarks.—They have furnished a map of mine; they have a second opening, located about 1,100 feet away from main opening; they have no house for men to wash or change in; they have standing water in the mine; the mining boss seems to be a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded cars in the mine; they do not allow more than ten men to ride on the safety carriage at one time; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates; the breaker machinery is fenced and boxed off so that operatives are safe; they have 1 locomotive, 20-horse power, to transport coal from the mine to the breaker.

EATON & COMPANY'S COLLIERY.

This colliery is located at Archbald, in Blakeley township, and situated on the east bank of the Lackawanna river. It is operated by Eaton & Co. Alva Eaton is general superintendent, James Eaton is mining boss and George W. Eaton is outside foreman.

Description.—The opening to the coal consists of four tunnels; there is a breaker connected with these mines; they mine and prepare about 500 tons of coal per day; they employ 104 miners, 100 laborers, 42 drivers, 8 door-boys and 4 company men in the mines; 60 slate pickers, 15 head and plate men, 2 drivers, 7 mechanics and 2 bosses outside; in all 344 men and boys; they are working the Lackawanna vein; average thickness 10 feet; they work headings 10, air-ways 16 and chambers 26 feet wide; they leave pillars about 14 feet wide to sustain the

prevent explosions in the mines will be conceded throughout the world, and when this is universally admitted these terrible explosions will cease.

PRESENT CONDITION OF THE COLLIERIES.

I am happy to be able to report that the condition of the collieries in the district, so far as ventilation is concerned, is on the whole satisfactory. There are but few poorly ventilated mines, and the number is being reduced each year.

The Delaware, Lackawanna and Western Railroad Company's mines are kept well in hand, there being only one or two that cannot be rated as first class. There is never any trouble with the mines of this company, for the gentlemen in charge of them have always shown a cheerful readiness to comply with the requirements of the ventilation act. They have one colliery at present, the Central shaft, where the volume of gas evolved is increasing to such an extent as to require an early addition to the quantity of air now provided for the workings. Gas stands in small quantity in several of the working places, and the workmen are in continual danger from explosions on a small scale. But they are driving to make a connection with the Oxford air-shaft, where, I am informed, they intend to erect a fan as soon as possible. This will provide all the ventilation they will need. The other collieries of this company are well provided with a liberal quantity of air, with the exception of Tripp's slope; and there is no cause for complaint, only occasionally, when the mine bosses neglect to conduct the air to the face of the workings.

The Delaware and Hudson Canal Company's mines have been greatly improved. They have only two collieries now in my district which are not well provided with ventilation, and neither of these is very bad, and I have been assured by A. H. Vandling, Esquire, that one of the collieries referred to will be provided with two fans as soon as they can be put in place this coming spring. These fans are intended for the Grassy Island shaft, Olyphant borough, and when they are erected, they cannot fail to produce ample ventilation for the colliery, if it will be properly utilized by the inside bosses. The other colliery referred to is the White Oak colliery, Archbald borough. This is an old colliery and nearly exhausted; and as the ventilation is not very bad, it would be unjust, perhaps, to require costly improvements to be made in it. The air now provided can be better utilized by attending to the inside air-courses. A shaft will soon be sunk, to take the place of this colliery, which, I am assured, will be provided with a fan from the start.

A. H. Vandling, Esquire, is entitled to great credit for doing so much to improve the ventilation of the collieries under his charge during the last four years, and it gives me great pleasure to award him the credit due him. I am free to admit, that I was impatient to have improvements inaugurated, especially in the collieries at Carbondale, for I found them in very bad condition; and, perhaps, I was too impatient under all the circumstances. I am aware that a great part of the expense incurred should have been

gressing slowly. It is not developed enough at present to give it an extended notice here. It will be fully reported next year.

DELAWARE AND HUDSON CANAL COMPANY.

No. 3 Jermyn's Shaft, Green Ridge.

This colliery is operated by the Delaware and Hudson Canal Company and the Delaware, Lackawanna and Western Railroad Company, in partnership. They are now grading a slope in coal inside, which will be eight hundred feet long, when completed, on the northwest side of the shaft, also a new gravitation plane, four hundred feet long, on the east side of the shaft.

Von Storch Slope.

They are erecting another ventilating fan at this colliery in addition to the fan which they have there at present. The new fan is seventeen feet diameter by four feet face. This is to ventilate the fourteen feet and Diamond seams of coal. The old fan, which is twenty feet diameter by five feet face, will be used exclusively for the Clark seam of coal. They have just finished a slope, six hundred feet long, in coal in the Clark seam, on the southeast side of shaft.

Legitt's Creek Shaft.

They have re-opened the Diamond seam of coal, which has been idle for four years. They are now ready for operation.

Marvine Shaft.

They are now building a gravitation plane, six hundred feet long, in the fourteen feet seam of coal, on southeast side of shaft. Also sinking a slope in coal on northwest side of shaft, which will be about twelve hundred feet long when finished. They are also driving for second opening in Diamond seam, by connecting with Diamond seam in Legitt's Creek shaft. The connection is now made.

Olyphant, No. 2.

They have built a new breaker over second opening shaft of this colliery, and call it Eddy Creek breaker. They have cut and graded a new gravitation plane to bring coal to foot of shaft from the northwest side of the property.

Grassy Island Shaft.

They are sinking a new air shaft at this colliery. It is timbered down to the rock, a distance of twenty feet from the surface. The size of shaft opening is eleven by fourteen feet. They are now drilling a bore-hole in the air shaft to let the water down through to the mine workings. They expect to finish bore-hole in a few days. The contract for sinking shaft is already let. The intention is to put up two fans on the same shaft, seventeen feet diameter by four feet face, each. They are to be run by two

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-

Belmont Mines.

There has been a new fan erected here during the year, which gives general satisfaction.

Delaware, Lackawanna and Western Railroad Company's Oxford Shaft.

Sunk main shaft from Rock vein to Clark, a distance of about 165 feet, and sunk a new air-shaft from surface to Clark vein, 354 feet; 10×26 feet for ventilation, and to hoist men and let down material. We will set a fan over this one, and a fan at the old, or main shaft, to ventilate part of it and all of Bellevue slope, so as to leave Bellevue fan for Bellevue shaft alone. The slope at Diamond shaft E vein is completed, and working all right. At the Brisbin shaft we have two of the gravity planes we alluded to last year, all ready and working. The third one is very near ready. At Cayuga shaft we are driving a tunnel, or plane, from G to Diamond vein, to let down the coal to G vein. Expect to be ready in 1883. At Sloan shaft we are resinking from G vein to Clark; are also sinking a second opening from G to Clark—size, 8×10 feet in the clear. We intend to make this to that men can go up or down. Storrs shaft being sunk 416 feet, we are now opening gangways in G or big vein 285 feet down. Not developed yet.

Yours, respectfully,

B. HUGHES.

SCRANTON, *March 6, 1883.*

PROVIDENCE, *February 23, 1883.*

PATRICK BLEWITT, Esq.,

Inspector of Coal Mines:

DEAR SIR:—The following are the improvements made in and around the D. & H. C. Co.'s mines for the year ending December 31st, 1882:

Coal Brook Mines.

Have graded a new gravity plane to let coal down on north-east side. Have driven seventy feet of rock tunnel, 7×9 feet, to open No. 3, or four-foot vein from Lackawanna tunnel, in bottom coal on a level with breaker. Have about 600 feet of heading cut in coal.

No 1 Shaft.

Have graded a new gravity plane to let coal down on north-west side.

Powderly Slope.

Commenced pumping out water October 20th; are also building schutes and outside plane.

Jermyn No. 1.

Have finished sinking inside slope to basin. Put up a new 17-foot fan, by four-foot face, on air-shaft that was being sunk last year.

Grassy Island Shaft.

Have sunk fan-shaft, 11×14 feet, 252 feet deep to the Grassy Island vein.

Have put up a 20-foot fan, by 5-foot face, run direct by two engines, one on each end of fan-shaft.

Eddy Creek Shaft.

New breaker all ready. Expect to start on February 15th. Have sunk a new slope in south dip 600 feet long to first basin.

Marvine Shaft.

Finished sinking slope on north dip. Finished second opening to Leggett's Creek in Diamond vein. Put three drill-holes down from Diamond vein to 14-foot to take water from small basin—saves one steam-pump.

Leggett's Creek Shaft.

Put new buntings and guides in hoisting shaft. Are now taking 100 cars per day of coal from the Diamond vein. Put three drill-holes down from Diamond to 14-foot vein, to take water from basin—saves two steam-pumps.

Von Storch Mines.

Have driven under the river from foot of slope in 14-foot vein, to open coal on south-east side of river. Are cutting up the north-west rise in Diamond vein to outcrop to get air-shaft for intake air; also put in new 17-foot fan.

Yours, etc.,

ANDREW NICOL,

General Superintendent of Mines.

Per A. B. NICOL.

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.

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 hoistingand 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 $3\frac{1}{2}$°.

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′

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.

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.

Table F.—Nationality of Persons Killed and Injured.

Nationality.	Polish.	American.	Irish.	English.	Welsh.	Hungarian.	Italian.	German.	Russian.	Austrian.	French.	Grecian.	Bohemian.	Total.
Killed or fatally injured,	8	8	14	7	4	4	3	...	2	1	...	...	...	51
Injured,	31	26	19	24	11	10	2	5	2	1	1	1	1	134
Total,	39	34	33	31	15	14	5	5	4	2	1	1	1	185

Table G.—Showing the Quantity of Coal Mined and Shipped, the Number of Days Worked, the Number of Persons Employed, the Number of Persons Killed and Injured in and About the Mines of this District During the Five Years Ending December 31, 1896.

Years.	Total production in tons of coal.	Total shipment in tons of coal.	Number of days worked.	Number of persons employed.	Number of persons killed.	Number of persons injured.
1892,	5,854,638	5,546,890	209.94	14,121	55	115
1893,	6,202,131	5,914,673	195.35	15,634	51	96
1894,	5,907,251	5,602,644	171.90	16,014	47	93
1895,	6,510,817	6,216,137	182.31	16,272	39	121
1896,	6,217,447	5,996,599	179.40	17,604	51	134
Totals,	30,692,284	29,367,733	938.9	79,645	243	564

Improvements.

A new fan has been erected by the Delaware and Hudson Canal Company at the Marvine shaft to ventilate the fourteen foot workings. The old one will hereafter be used to ventilate the Clark vein.

At Eddy Creek two new planes were driven from the Rock vein to the "14 foot." One is two hundred feet long, the other five hundred feet. A new slope seven hundred feet long was also sunk.

At Grassy Island a new slope has been driven from No. 2 vein to the Diamond, a distance of six hundred feet. Two new shafts have been sunk and a new fan erected to improve the ventilation in the workings of the Wilson creek tunnel.

second opening, which had been but recently completed. As the only other way of escape was cut off by the fire at the head of the main shaft.

The Riverside Coal Company's breaker of 1,000 tons a day capacity was destroyed by fire on May 11, since which time a new one has been erected on the site of the old one.

The Delaware and Hudson Canal Company has built a new breaker of 2,000 tons a day capacity at Olyphant. A new coal washery has also been erected by the same company, and a new air shaft has been sunk for the Morvine and Dickown shafts, and a 20-ton air locomotive has been installed at Leggett's creek.

Compressed air coal drills have been introduced by the Elk Hill Coal and Iron Company at Richmond No. 3.

The tail rope system of haulage has been adopted by the Delaware, Lackawanna and Western Railroad Company at Storrs No. 1 with good results.

Many other improvements have been made by other companies for facilitating and increasing the output of coal.

The ventilating facilities are ample throughout the district, and on the whole the air currents are well conducted to the faces of all working places.

Culm is being successfully flushed into the old workings of Grassy Island and Eddy Creek by the Delaware and Hudson Canal Company. Also by the Mt. Jessup Coal Company into their slope workings.

Considerable "pillar robbing" has been done during the year by several companies, but the number of accidents attending this critical work has been remarkably few.

The Russel B., formerly the Old Buffalo mine, was abandoned in August.

The general condition of the collieries is good, and I am pleased to say that the provisions of the mine law are being very generally observed by those in charge of the mines.

The report contains the usual statistical tables, together with a brief description of each accident, but in view of the fact that a monthly narrative report of the daily performance of my duties has been made to the Chief of the Bureau of Mines, containing suggestions and recommendations from time to time as the circumstances required, the report is not as lengthy as heretofore.

Respectfully submitted,

EDWARD RODERICK,

Inspector First Anthracite District.

The annual examination of applicants for mine foreman and assistant mine foreman certificates of qualification, was held at Carbondale on July 12 and 13 by the Board of Examiners, consisting of

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.

TABLE F—Nationalities of Persons Killed or Injured.

Nationalities.	Killed.	Injured.	Totals.
Pole,	6	24	30
American,	6	22	28
Irish,	5	17	22
English,	6	14	20
Welsh,	2	13	15
Slavs,	2	9	11
Italian,	3	6	9
Austrian,	2	4	6
Hungarian,	2	4	6
Russian,	4	1	5
German,	2	2	4
Scotch,	.....	2	2
Totals,	40	118	158

Improvements at Collieries.

Delaware and Hudson Company's Improvements.

At Clinton a new air shaft 10x12 feet and 240 feet deep was sunk for ventilating purposes, and a new fan was installed to ventilate the East Side tunnel.

At Coal Brook a rock plane 300 feet long was driven from bottom to top vein, and an air shaft sunk. A new air compressor was installed and three new air motors added for haulage. A new drift was opened on East Mountain; and an air shaft sunk.

At Jermyn No. 1 a new 22-foot fan was installed, to replace the old one. A rock plane 600 feet long, driven to shorten transportation, and improve ventilation, was made.

Grassy Island.—The rock vein was opened and air connections made.

At Eddy Creek a slope was sunk from surface to rock vein to improve ventilation on Mills tract workings.

Hillside Coal and Iron Company.

A new breaker was built at Forest City to replace the old one, which was destroyed by fire in early part of the year.

The Price Pancoast Coal Company has sunk the main shaft to Dunmore veins; also, installed a new fan 35 feet in diameter.

The Johnson Coal Company has driven a 1,000-foot tunnel from prove ventilation on mills tract workings.

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.

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.

MOOSIC MOUNTAIN COAL COMPANY

Marshwood Drift.—Condition as to safety good, drainage poor, but it is being improved. Ventilation fair.

BLAKELY COAL COMPANY

Blakely.—Condition as to safety, drainage and ventilation good.

MOTT HAVEN COAL COMPANY

Mott Haven.—Condition as to safety, drainage and ventilation good.

IMPROVEMENTS

SCRANTON COAL COMPANY

Johnson.—Man shaft tower rebuilt.

Ontario.—Three new locomotive type boilers installed. New washery built.

Bryden Shaft.—Fourteen foot fan constructed in brick and concrete.

DELAWARE AND HUDSON COMPANY

Olyphant.—No. 16 Rock Plane driven from Diamond to Four Foot, a distance of 103 feet.

No. 18 Rock Plane driven 475 feet through fault in Diamond vein.

No. 10 Rock Slope (Miles) driven 842 feet from Rock to No. 4 Dunmore vein.

Grading 400 feet of No. 3 Tunnel from Rock to Fourteen Foot vein.

No. 9 Rock Plane driven 108 feet from Fourteen Foot toward Rock vein.

Grassy Island.—At Grassy No. 1 Rock Tunnel from New County to Fourteen Foot vein, driven 210 feet for second opening.

Rock Plane from Four Foot to No. 2 vein driven 200 feet.

Shaft from surface to No. 2 vein sunk 36 feet for second opening.

No. 4 Dunmore vein opened in Grassy No. 2 Shaft, 250 feet on east side and 100 feet on west side, and Clark vein opened 75 feet on east side.

Grassy Island No. 4 shaft sinking down a distance of 611 feet, not completed.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs No. 3.—A new ventilating fan has been placed and is in operation at Storrs No. 3 steel casting and brick building.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery Outside.—A brick building 18 feet x 18 feet to be used as an electric light plant, containing one 8 x 10, 40 H. P. engine, 100 ampere, continuous current 250 volts. Also one brick building 24 feet x 38 feet, with an annex 9 feet x 23 feet. This building contains one pair 12 x 24 hoisting engines to operate two inside slopes in No. 1 Shaft, one in the third Dunmore vein and one in the second Dunmore vein, which is being driven.

STERRICK CREEK COAL COMPANY

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

LACKAWANNA COAL COMPANY

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

DOLPH COAL COMPANY

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

MOUNT JESSUP COAL COMPANY

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

MOOSIC MOUNTAIN COAL COMPANY

Marshwood.—Condition as to safety good; ventilation and drainage good.

BLAKELY COAL COMPANY

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

IMPROVEMENTS

SCRANTON COAL COMPANY

Johnson Colliery: Johnson No. 1.—An air compressor 24 x 24½ x 30 feet installed.

Johnson No. 2.—Installed a 10-foot fan at Mountain shaft; rebuilt plane trestle and constructed a 2,500-ton breaker.

Ontario Colliery: Sturgess Shaft.—Rebuilt tower and trestle and installed two boilers, 66 inches x 16 feet.

Blue Ridge Shaft.—Installed a return boiler, 66 inches x 16 feet.

Ontario Washery.—Installed one 54 inch fire-box boiler.

DELAWARE AND HUDSON COMPANY

Olyphant Colliery: Olyphant No. 2.—Installed an additional electric generator to furnish power for operating hoists, fans and pumps at Birds Eye No. 10 slope; lights and signals at Grassy Island No. 2, consisting of an 18 inch x 18 foot McEwen engine and a 150 K. W. generator.

Grass Island No. 2, Rock Vein.—Graded 1,400 feet of main gangway to shaft landing; graded 120 feet for chain hoist of light cars, and 150 feet for light car road.

Grassy Island No. 4 Shaft.—Completed sinking shaft to No. 4 Dunmore vein to a depth of 740 feet, connecting with workings from Grassy Island No. 2 shaft for a second opening. Shaft was concreted from surface 56 feet down the shaft, including concrete buntons.

No. 10 Slope.—Placed an electric pump at foot of slope; installed an electric hoist to hoist coal up inside slope and lower down plane. Installed a 24 inch x 48 foot engine for hoisting on main slope, 2,600 feet long.

Eddy Creek Colliery: Eddy Creek.—Sunk shaft from Fourteen Foot vein to Dunmore No. 4, a depth of 414 feet; gangways opened on North side 120 feet and on South side 70 feet in No. 4 Dunmore.

Birds Eye.—Drilled a 6½ inch electric cable hole 120 feet from surface to Clark vein, and a 12 inch water hole the same depth a few feet from it.

No. 11 Slope.—Was driven to No. 2 vein a distance of 120 feet on grade of 20 per cent. An engine house was erected containing 3 engines; one 10 x 12 inches to operate No. 11 slope; one 10 x 12 inches to operate plane to rock dump, and one 12¼ x 15 inches to operate No. 18 plane in Diamond vein.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery.—Outside. Built a 45 x 29 foot concrete building with steel truss roof, containing one pair of 15 x 36 inch engines which will operate two slopes, one to the Clark vein and the other to the New County vein.

No. 2 Shaft.—Outside. Built a concrete building 42 x 15 feet to be used as an emergency hospital, tool room and blacksmith shop.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in City Hall, Scranton, June 15 and 16. The Board of Examiners was composed of L. M. Evans, Inspector, Scranton; F. G. Wolfe, Engineer, Scranton; W. F. Malloy, Carbondale, and David Evans, Olyphant, Miners.

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

Mine Foremen

John Conway, Old Forge; Harry E. Heckman, Jessup; Leo P. Gibbons, Carbondale; William Love, Scranton; Thomas J. Gillen, Carbondale; James F. Feeney, Olyphant; Charles O'Boyle, Olyphant; Howell R. Morgan, Throop; John J. Haggerty, Scranton; Sylvester J. Kane, Forest City; George Watson, Scranton; Thomas W. Lewis, Olyphant; Benjamin Anthony, Carbondale; Edward Newton, Scranton; James Elias, Scranton; John T. Loftus, Jessup; Charles E.

Grassy Island No. 2 Shaft.—Completed grading motor road about 3,000 feet toward No. 1 shaft in Dunmore vein.

Installed 4 air motors, 2 in Clark vein and 2 in Dunmore vein, for haulage.

Completed 12 inch reinforced concrete partition wall between intake and return compartments of No. 4 shaft, about 760 feet.

Bored 8 inch hole to flush ashes from boiler house directly into Rock and 14 Foot veins.

Installed new 22-36 by 25-16.5 by 12.5-7.5 by 42 inch stroke Laidlaw-Dunn-Gordon four-stage air compressor for use in motor haulage.

Miles Slope.—Replaced 150 feet of timbering with concrete and I beams, at mouth of main slope, under O. and W. Railroad.

Eddy Creek Colliery.—Placed 12 inch reinforced concrete partition wall between intake and return compartments of shaft, about 690 feet.

Completed rock plane for return of Clark vein.

Olyphant Shaft.—Completed rock plane 200 feet. Four Foot to No. 2 vein east of plane to fault.

Completed No. 12 rock slope, Rock vein to Clark vein 800 feet, cutting New County vein and 14 Foot vein.

Installed 16-25 by 25-16 by 24 inch two-stage Laidlaw-Dunn-Gordon air compressor for general use, pumping, haulage and rock-cutting.

Installed 24 by 24 first motion winding engine on surface in Smoketown to operate No. 12 rock slope.

Birdeye.—Completed No. 7 rock tunnel, 200 feet from surface to botton split 14 Foot vein.

Installed 5 by 4 Buffalo fan, and fan house, to ventilate bottom split of 14 Foot workings.

Drove rock tunnel 225 feet from Clark vein to New County vein off No. 3 slope and also rock return from same 75 feet.

Legitts Creek Colliery.—Rock plane, 12,300 feet long from Dunmore No. 3 to Dunmore No. 2 vein, for the purpose of opening Dunmore No. 2 vein.

Headings Nos. 42 and 39 to Rock vein graded to foot of No. 13 plane, for transportation.

Gangway from landing in Clark vein to pumping plant was bricked and I beams set. The same improvement was also begun in pipe-way from No. 2 pump.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery.—Installed fan engine; hoist, motor, etc., at Storrs No. 3 shaft, Clark vein.

Remodeling Jeffrey locomotives. New waterway, West slope, No. 1 shaft. New plane in Fourteen Foot vein, No. 2 shaft.

Throughout the district there has been a decided improvement in the equipment. Fireproof barns have been erected at the various collieries.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in City Hall, Scranton, June 5 and 6. The Board of Examiners was composed