

BELLEVUE SHAFT COLLIERY.

This colliery is located in Lackawanna township, and lying one-fourth of a mile north-west of the Lackawanna river; the shaft is 182 feet deep to the G vein. The opening is 10 feet by 18 feet; it is operated by the Delaware, Lackawanna and Western railroad company; John Hale is mining boss, and J. M. Acker is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they mine and prepare about 350 tons of coal per day; they employ 42 miners, 42 laborers, 22 drivers, 12 door-boys and 15 company men in the mine; 51 slate pickers, 7 head and plate men, 4 drivers, 17 company men, 5 mechanics and 2 bosses outside; in all 219 men and boys; they are working the G or Big vein, average thickness 12 feet; they work headings 12, air-ways 15 and chambers 30 feet wide; they leave pillars from 15 to 20 feet wide to sustain the roof; they leave cross entrances about 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation is produced by means of a furnace located 500 feet from main opening; the intake is located at mouth of shaft, area 180 feet; the upcast is located in furnace air shaft, area 38 feet; the amount of fresh air per minute is 18,060 cubic feet; there is poisonous, noxious and inflammable gas evolved in this mine; the mine is examined every morning before men go to work, and every evening to see that the main doors are all closed; the main doors are hung so as they will close of their own accord; they have attendants at main doors; they have double doors on traveled roads and an extra one in case that any of the others would get broken; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one pair of hoisting engines of 90-horse power, one pumping engine of 80-horse power, one breaker engine of 40-horse power, all in shaft engine rooms; one fire pump of 30-horse power in donkey house at river; they have a metal speaking tube in the shaft; they have two safety carriages with all the modern improvements; they have an adequate brake and flanges of sufficient strength and dimensions attached to their hoisting drums; they use standard wire ropes, with clevis and cone attachments; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they are connected with Dodge shaft workings, which can be used as a second opening; they have a house for men to wash and change their clothes in; there is some standing water in the mines; the mining boss is a practical and competent man; he has a fire boss to assist him; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft; they do not allow more than ten persons 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.

BELLEVUE SLOPE COLLIERY.

This colliery is located in Lackawanna township, and lying one-fourth of a mile north-west of the Lackawanna river; the slope is 300 feet long to the Diamond, and 710 feet long to the Rock vein; it is 7 feet high by 14 feet wide; it is driven on an angle of 11°; it is operated by the Delaware, Lackawanna and Western railroad company; John Hale is mining boss, J. M. Acker is outside foreman.

Description.—There is a breaker connected with this mine, located 600 feet away; they mine and prepare 350 tons of coal per day; they employ 36 miners, 36 laborers, 10 drivers, 10 door-boys and 9 company men in the mines; 51 slate pickers, 6 head and plate men, 5 drivers and 14 company men outside; they have the same mechanics and bosses that they have at the shaft workings—in all 177 men and boys; they are working the Diamond and Rock veins; average thickness, 7 feet each; they work headings 12, air-ways 15 and chambers 30 feet wide; they leave pillars from 15 to 20 feet wide to sustain the roof; they leave cross entrances about 60 feet apart for the purpose of ventilation; the roof is slate; the mines are in a good working condition.

Ventilation is produced by means of a furnace, located 400 feet from main opening; the intake is located at mouth of slope, area 93 feet; the upcast is located at furnace air shaft, area 25 feet; the amount of fresh air is 16,100 cubic feet per minute; there is noxious gas evolved in the F vein; the mines are examined every morning before men go to work, and every evening to see that the main doors are all closed; the main doors are hung so as 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 that an accident would happen to any of the others; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported; ventilation is good.

Machinery.—They use one pair of hoisting engines of 120-horse power, one breaker engine of 40-horse power, one pumping engine of 80-horse power, one steam pump in the slope of 20-horse power; they have a metal speaking tube in slope; they have an adequate brake and flanges of sufficient strength and dimensions attached to the sides of the hoisting drum; the boilers have been cleaned and examined and reported in good condition; they have a steam guage to indicate the pressure of steam; also a safety valve for safety.

Remarks.—They have furnished a map of the mines; they are connected with Dodge shaft and the old slope, which can be used as second opening; they have a house for men to wash and change in; there is some standing water in the mines; the mining boss is a practical and competent man; he has a fire boss to assist him; there are no boys working in the mines under twelve 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 slope; 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.

OXFORD SHAFT.

This shaft is located in Scranton city, about $\frac{1}{4}$ of a mile north-west of the Lackawanna river. It is 205 feet deep to the Diamond vein and 238 feet deep to the Rock vein; the opening is 22 feet by 10 feet. It is operated by the Delaware, Lackawanna and Western railroad company. John Lewis is mining boss and William H. Carling is outside foreman.

Description.—There is a double breaker attached to the shaft tower, which has 2 self-dumping hoisting carriages for the purpose of hoisting coal out of the mines; they mine and prepare about 550 tons of coal per day; they employ 57 miners, 40 laborers, 31 drivers, 11 door-boys and 19 company men in the mines; 56 slate pickers, 7 head and plate men, 5 drivers, 20 company men, 7 mechanics and 2 bosses outside; in all 255 men and boys; they have a second opening from the surface to both veins, where men and mules travel into and out of the mines; they are working the Diamond and Rock veins at this colliery, average thickness of Diamond vein is 6 feet and Rock vein 8 feet; they work their headings 12, airways 12 and chambers 30 feet wide; they leave pillars from 6 to 7 yards wide to sustain the roof; they leave cross-entrances from 20 to 30 yards apart for the purpose of ventilation; the roof is good slate; the mines are in a good working condition; the mouth of second opening is on the west bank of the Lackawanna river.

Ventilation.—Ventilation is produced by a large arched brick furnace; the intake is located at the mouth of second opening, the area is 60 square feet; the up-cast is located in air-shaft at the furnace, 900 feet from main shaft; it contains an area of 60 feet; the air is conducted to the face of the workings in both veins systematically by the aid of check-doors; the average supply of pure, fresh air at in-take is 18,000 cubic feet per minute; there is but very little noxious or inflammable gas evolved in this mine; it is never found in the mines except when a door or gate is broken and then not to any dangerous extent; the main doors are all hung so that they will close of their own accord, with an attendant at each; they have double doors on main traveled roads so as to keep up a steady current of air, and they have extra doors in case that any of the others get broken; they do not work over fifty men in any split of air; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—The engines in use at these mines are 1 pair of hoisting engines of 90-horse power, 1 breaker engine of 60-horse power, 1 pumping engine of 80-

angle of inclination is $9^{\circ} 35'$. The slope was driven part of the way through coal, at a cost of \$364, but there were $28\frac{3}{4}$ yards of rock to cut, from nought up to eight feet, which cost \$283 33, and 77 yards driven through sandstone, which cost \$3,080. The whole cost for sinking the slope was only \$3,952 33. They have a pair of engines, 13-inch cylinder and 18-inch stroke; estimated horse power, 50; the size of their drum is six feet diameter, which has an approved brake attached to it. There is no second opening to the slope, but they are driving for one toward No. 1 drift, and expect to make a connection soon.

OTHER NEW OPENINGS AND CONNECTIONS.

The Delaware, Lackawanna and Western railroad company have made connections between the Hampton shaft and the Oxford shaft, at Hyde Park, and between Tripp's slope and the Brisbin shaft, in the Third ward, Scranton. They have also sunk an air shaft, at Hyde Park, into the workings of the Oxford shaft, and connects also with the Hampton shaft workings. A fan is to be placed at this air shaft which will assist in ventilating both collieries named.

The Pennsylvania coal company have completed a new slope at No. 1 tunnel, in Pittston township, which is intended for hoisting coal. They have also made a second opening for No. 4 slope, in Jenkins township, which is to be used also for ventilation; and the workings of old No. 10 shaft in the 14-foot seam, have been connected with the new No. 10 shaft, in Pittston. No. 2 shaft, Dunmore, was sunk to the lower seam.

The Delaware and Hudson canal company have made a connection, in the 14-foot seam, between Marvine and Leggetts Creek shafts, Providence; and at No. 1 shaft, Carbondale, an air shaft has been sunk, and two more air shafts at No. 3 shaft, and still another at the Coal Brook colliery. These air shafts are only poor-make shifts, unless mechanical means are used to produce ventilation. There are too many of them in Carbondale. What is needed there is a system of air courses inside of the collieries.

At the Filer colliery, Winton, a drift has been driven from a ravine into the workings, for a traveling way for the men to go to and from their work. A new drift has been opened at the Greenwood colliery for mining coal, and the same company have made an additional opening for coal at the Sibly colliery, in Old Forge township. An opening has been made at the Green Ridge slope for ventilation. The above are all the openings and connections made in the district during the year, so far as I am informed.

IDLE AND ABANDONED COLLIERIES.

The Archbald shaft, Lackawanna township, and Oxford shaft, Hyde Park, owned by the Delaware, Lackawanna and Western railroad company, were idle all through the year; the last work done at the Hyde Park shaft was done in February, and the Scranton coal company's drifts at Bellevue were idle. Bellevue slope and shaft worked only $22\frac{1}{2}$ days.

No. 1 shaft, Pittston township, owned by Pennsylvania coal company, was idle; No. 2 and No. 3 shafts were abandoned as hoisting shafts, and are now used as pumping shafts.

The Marvine shaft, Providence; Powderly slope, Carbondale township, and Breaker, Forrest and Jefferson tunnels, Carbondale City, all owned by the Delaware and Hudson canal company, were idle.

The following collieries have also been idle: Rolling Mill colliery, Scranton, consisting of a slope, tunnel and drift; the Ontario colliery, Pleasant Valley, and the Heidelberg colliery, Pleasant Valley. Spring Brook No. 1

whole number at present in the district is forty-nine. One old fan was replaced with a new one, and two have been removed from one mine to another. Several air-shafts have been sunk, and a large amount of work has been done inside of the mines, for the purpose of utilizing a greater proportion of the air entering them.

The Delaware, Lackawanna and Western Railroad Company still carry the palm for having the best ventilated mines—all of their collieries having excellent ventilation, with the single exception of Tripp's slope. This slope needs attending to, and it is expected that long before the close of the current year, there will be no cause of complaint even here. A new fan, twelve feet in diameter, and three feet six inches face, was erected at the air-shaft connected with the Hampton shaft in place of a furnace, which has increased the ventilation from forty-four thousand six hundred to sixty-two thousand six hundred cubic feet per minute. This fan commenced running on the 27th of October.

The Dodge shaft is also ventilated at present by the fan at the Scranton Coal Company's slope adjoining, which has been lying idle for years. This also is a change from the furnace heretofore used, and has undoubtedly been affected, because it is so much cheaper to run a fan than to keep up a fire in a large furnace. The furnace in this instance produced more air for the Dodge shaft than the fan does, but the fan furnishes ventilation for the Scranton mines in addition to the Dodge. The furnace at the Dodge has produced as high as one hundred and forty-two thousand cubic feet per minute, exerting a horse power of 26.66 to move the air, and I doubt very much that another furnace is to be found in any colliery in the country, that will give so favorable a result. It is a double furnace, having an aggregate grate surface of one hundred and twelve square feet, the depth of the upcast being three hundred and thirty feet, and the sectional area, one hundred and thirty-two square feet. As an example of a first class furnace, I here insert a plan of it. There are two other furnaces—one at the Hyde Park shaft, and the other at the No. 2 Diamond slope—both of them sisters to the one at the Dodge, but neither of them has ever produced the quantity of air that this one has, and the difference is accounted for by the comparative shallowness of the upcasts which makes a great difference in the height of the motive column. A new fan has been put in to replace an old one at the Sloan shaft, the old one being so much worn as to require the change.

A number of the collieries of this company are quite fiery, especially the Taylor shaft, Bellevue shaft, Bellevue slope, Dodge Shaft, Sloan shaft, Central shaft, and Hampton shaft, while there is considerable gas generated in nearly all of the others. But the ventilation is so sweeping, that no explosion can occur unless it be through want of proper distribution, or through some inexcusable blunder. I find the general mine superintendents, Messrs. B. Hughes and T. D. Davies, always careful, and prompt to inaugurate improvements whenever such are needed, and they always manifest a cheer-

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.

other points of shipment are Jermyn No. 4, at Price, and the Lackawanna, at Olyphant, both mines having now been in operation a little more than one year.

JOHN JERMYN, *General Manager.*

SCRANTON, PA., *March 19, 1884.*

P. BLEWITT, Esq.,

DEAR SIR: Our improvements for 1883 are as follows: Cayuga plane from G to Diamond is finished, and working about twenty places in the Diamond vein. Brisbin has the third plane, that I alluded to last year, completed on the west mountain side. We are also sinking a new shaft, (near Tripp slope, called Tripp shaft,) 10'×35' proposed to reach the Clark vein. Hyde Park shaft in F vein have driven a dip heading about one thousand feet; intend to put an engine there to hoist the coal up, then let it down the gravity plane to foot of shaft G vein. Continental shaft—we have a gravity plane in progress a thousand feet long, which we intend to get in operation early this year. We have partly sunk a shaft in **Belle-vue**, under the tower of breaker, where the slope and shaft coal are hoisted to top of breaker, so as to hoist the coal direct from Clark vein to top of breaker at once, making the old shaft the pumping-way and place to put down all the supplies, &c.

• Respectfully yours,

B. HUGHES.

PATRICK BLEWITT, Esq.,

Mine Inspector, Scranton, Pa.:

DEAR SIR: Referring to our conversation in regard to Pancoast shaft, we commenced sinking shaft 10×34 feet in May last. At a depth of thirty feet we cut two feet five inches in coal. Below this, at a depth of ninety-nine feet, we cut the rock vein, nine feet and four inches thick. Coal good. Below this thirty feet, we cut two feet seven inches in coal—very good—and forty-three feet five inches more, the rock vein seven feet, very nice clean coal, making the shaft from top of brace two hundred and twenty-four feet deep. We have erected a tower-engine and fan-house, with machinery complete, all first class, furnished by the Dickson Manufacturing Company; also a new machine, carpenter, and blacksmith-shop, which is furnished with machinery and tools of the latest pattern. The second opening shaft, located two hundred and ten feet from main shaft, 10½×14 feet, was commenced the 14th day of January and is now down one hundred and twenty-three feet, and we expect to reach the Diamond vein next week. We are now building another wing to the breaker, which we expect to have finished by the 15th of April, which will give us a capacity of twenty thousand tons per month or more.

Very truly yours,

C. M. SANDERSON,
President.

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 $4\frac{1}{2}$ 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'x37 $\frac{1}{2}$ '; 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 $2\frac{1}{2}$ 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

The following were recommended to receive mine foreman's certificates:

David Jenkins, Scranton.
William W. Baird, Dunmore.
John M. Dobbie, Pittston.
Evan H. Evans, Scranton.
Thomas McWilliam, Moosic.
Thomas F. Cook, Pittston.
M. I. Garvey, Pittston.
John T. Brown, Avoca.
William Watkins, Scranton.
I. A. Garvey, Pittston.
Dd. F. Davies, Scranton.

The following were recommended to receive assistant foreman's certificates:

Thomas Parry, Scranton.
William McDowell, Scranton.
James Tibbs, Rendham.
Rd. R. Hughes, Scranton.
John R. James, Scranton.
Samuel C. Evans, Taylor.
Benjamin J. Rees, Rendham.
John W. Jenkins, Scranton.

Mine Improvements During 1896.

The improvements made in this district during the past year, such as new openings, shafts, planes, tunnels, slopes, boilers, etc., are the following:

The Delaware, Lackawanna and Western Railroad Company.

Bellevue Shaft. A tunnel 7 x 12 feet was driven from the Clark vein to the New County vein, a distance of 911 feet, on a grade of two and one-half inches on ten feet.

Continental Shaft. A plane was driven on a grade of 11 degrees. Sectional area, 9 x 16 feet; length, 328 feet.

Dodge Shaft. A tunnel was driven and completed; sectional area, 72 square feet; length, 300 feet.

Diamond Mine. A tunnel was driven from the "seven foot" seam to "Church vein," 300 feet long and 84 feet sectional area. A new drift was also driven on a level having 60 feet sectional area; length, 900 feet.

P. at 150 pounds pressure, divided into seven and one-half batteries Babcock & Wilcox vertical headed water tube boilers. They are fitted up with McClave & Brooks Automatic Stokers and self-feeding arrangement for fuel from storage pockets, and also have attached the Green Economizers, divided as follows: One for eight batteries and one for seven and one-half batteries, with induced fan draft in connection with forced fan draft. This plant is all under one roof. The steam pipe connections are as follows: To Sloan shaft 1,420 feet of 8 inch pipe. To Central shaft 1,400 feet of 8 inch pipe. To Hyde Part shaft, 3,140 feet of 8 inch pipe. To Hampton Shaft, 1,400 feet of 12 inch pipe. To Continental shaft 1,500 feet of 8 inch pipe. The above plant takes the place of ninety-five boilers, cylinders and locomotives. A new reservoir 100 feet in diameter has also been located near the plant which will hold 500,000 gallons of water.

At Pyne shaft a tail rope system of haulage is being installed. Length of main rope 4,000 feet; size of engines 15 feet x 30 feet geared.

Sloan Mine.—A new air shaft has been sunk to the surface vein and a connection driven from the bottom to the upcast compartment of main shaft. A new ventilating fan will soon be erected over this shaft. The fan which is now ventilating the mine and is located at the breaker over the main shaft will be removed, thus reducing the risk from fire, and at the same time doing away with the possibility of the air—which is being exhausted, entering the downcast again.

New Water Shaft.—A new shaft is being sunk at a point between the Central and Sloan shafts. This shaft is 8'x33' in the clear, and will be 500 feet deep. It is to be used to drain the mine workings of the company's Keyser Valley collieries. When the work is finished it is proposed to raise 7,000,000 gallons of water every twenty-four hours, by the use of buckets.

An electric motor system of haulage has been installed in the Dodge mine, and a new steam generating plant erected, at a point between the Dodge and Bellevue breakers. This plant will supply steam to the two mines and breakers.

A new ventilating shaft has been sunk at the Taylor mine from the surface to the Clark vein.

In the Manville shaft of the Delaware and Hudson Company and the Delaware, Lackawanna and Western Railroad Company, and the Delaware, Lackawanna and Western Company's Holden shaft, the old cribbing has been removed and replaced by expanding metal. The work was successfully accomplished in each case, and the result is highly satisfactory.

The improvements made in the several mines in the district are of the usual kind, and as important as the condition of the mine required and the increased output demanded.

Cayuga.—A new Duplex pump, 28x12x36, has been installed in the "Fourteen Foot" vein, and is now in operation.

Bellevue Shaft, etc.—The main shaft (12x18 feet) has been sunk from the Clark vein, a distance of one hundred and thirty-seven feet into the Dunmore No. 2 vein.

The Oxford inside slope has been driven a distance of eighty-eight feet, from the New County vein into the Clark vein. A tunnel has been driven from the Clark into the Big Vein, height sixty-five feet.

Electric Haulage.—An electric haulage system one thousand feet long has been installed in Dunmore No. 2 vein.

The following extensions were made to haulage systems in use before 1904, namely: G. gangway No. 3 tunnel, 900 feet; No. 2 slope, Dunmore No. 2, 1,100 feet; M. gangway and Sloan road, 4,350 feet; No. 1 County vein, 1,000 feet.

Shaft Concreted.—The cribbing in the supply shaft has been replaced by concrete.

New Electric Motors and Pumps.—Four new electric motors have been added during the year, making a total of eight in the mine. A new electric pump has also been installed at the foot of the supply shaft, and two other and similar pumps at other points in the same mine.

PENNSYLVANIA COAL COMPANY

No. 5 Shaft.—A rock plane was driven from No. 3 Dunmore to No. 1 Dunmore vein. Length 330 feet; section 7x14 feet. Also a new car and blacksmith shop was built outside; dimensions 30x60 feet.

A number of the other operators have made similar improvements during the year, but have not thought it proper to report the particulars to appear in this report.

Mine Foremen's Examinations

The annual examinations for candidates for certificates as mine foremen and assistant mine foremen were held June 10 and 11, in the City Hall, Scranton. The following persons were recommended for certificates:

Mine Foremen.—W. W. Inglis, Thomas Barber, Lucien F. Hiorns, Frank E. Shedd, William Campbell, Henry Davies, H. D. Powell, William P. Kelly, Henry J. Williams, William P. Jennings, Martin F. Sheridan, John Moore, George W. Oswald, Isaac Dawe, John H. Watkins, Henry H. Hitchings, Thos. J. Williams, Jos. Morris, James J. Cusick, Thos. W. Watkins, James Tibbs, Peter Comtesse, Jr., Thomas Malloy, Jos. R. Burns.

Assistant Mine Foremen.—Edward Dempsey, David James, James Cooney, Martin Quinn, James D. Robinson, John J. James, Martin Corcoran, John J. McDermott, Wm. Morgan, Anthony Gallagher, Jno. E. Phillips, Fred. E. Carpenter, Benjamin Evans.

Hampton Colliery.—Idle since October 20 for extensive repairs on breaker. When completed the breaker will be almost entirely equipped with new machinery which includes 12 of the latest improved 5 foot tandem slate pickers. The wood cribbing in the shaft was taken out and replaced with concrete and expanded metal. A new fire proof mine Hospital and Foreman's office were also completed inside.

Sloan Colliery.—One rock tunnel was driven from the New County vein to the Big vein for return air.

Central Mines.—A new 8x6x24 foot diameter fan with steel casing on concrete foundation has been installed at this mine to replace the old 14 foot diameter belt-driven ventilating fan. Also a fire proof brick building for engine room. Class and size of engine: Corless Tandem, high pressure cylinder 14x36 inches; low pressure cylinder 22x36 inches, 84 horse-power. The engine is connected direct to the fan. The fan was connected to the mine May 26.

Central Boiler Plant.—Installed a modern 6,000 horse-power open Cochrane water heater and a new fire proof brick building for water feed pumps, store room and Foreman's office.

Electrical Machinery Installed

Pyne Colliery.—One 10 ton electric motor on west gangway Clark vein. One 1,000 gallon electric centrifugal pump at foot of slope in Clark vein; induction motor, alternating current 400 volts. One 450 gallon electric centrifugal pump in west side dip; induction motor; alternating current 400 volts. Power is taken to these pumps from the surface through bore holes.

Archbald Colliery.—One 6½ ton electric motor in the Big vein.

Continental Colliery.—One 100 horse-power electric motor hoist on Dunmore slope; induction motor; alternating current 400 volts.

Hyde Park Colliery.—One 100 horse-power electric hoist on Dunmore slope; induction motor; alternating current 400 volts.

Sloan Colliery.—One 5½ ton electric motor in surface vein.

Central Water Shaft.—Installed during the year at the foot of the shaft in the Clark vein, an 800 horse-power six-stage electric centrifugal pump. Capacity 5,000 gallons per minute; alternating current; 3 phase; 2,100 volts. Column pipe 16 inch diameter. Lift 480 feet. This pump was put in operation the latter part of December, and to date is apparently working satisfactory. This pump is used in connection with the automatic bucket water hoist that was installed and commenced operation in August 1905.

Bellevue Colliery.—Grading and cutting rock at foot of Main shaft No. 2 Dunmore vein to improve the foot. Installed electric hoist in No. 2 Dunmore vein to operate No. 2 slope. Installed electric motor on V gangway Clark vein. Installed electric motor in New County vein. Rock cut in New County vein to take Big vein coal to New County vein. Tore down old boiler house. Installed new middle rolls in breaker. New water line reservoir to pump house. Erected new brick office for foremen, also new brick pump room. Erected a new brick oil house.

Dodge Colliery.—Installed 3 electric motors, one in Diamond vein, and two in New County vein. Tore down old boiler house.

Sloan.—One 100 H. P. electric hoist on Dunmore vein slope, induction motor. Three 6½ ton electric locomotives installed to operate in the Surface and New County veins.

One 200 K. W. rotary converter at water shaft to supply power to Sloan New County vein. One 4x14 feet dust fan, in progress of erection, to take the dust from the breaker.

Bellevue.—One 450 gallon capacity electric pump installed in Clark vein. Electric pumps installed in Nos. 1 and 2 slopes and No. 3 tunnel. Electric chain hoist installed at foot of main shaft. Four electric locomotives to operate in the Clark and Dunmore veins, and one rotary converter. A new concrete wash house with lockers erected. New fire pump and fire line.

Dodge.—One 30 H. P. motor for endless rope, three electric locomotives inside, one rotary converter sub-station installed.

Taylor.—Lighting breaker and buildings with electricity, one 300 K. W. rotary converter and sub-station building.

Holden.—Four electric locomotives installed in Clark vein and one electric pump in Clark vein.

National.—One electric hoist in Clark vein, three electric locomotives, and a new water reservoir outside.

DELAWARE AND HUDSON COMPANY

Greenwood.—Checker vein plane at No. 1 new shaft extended 600 feet. No. 1 slope in No. 2 shaft driven 125 feet and completed. No. 1 plane in No. 2 shaft driven 900 feet.

The general condition of almost all the collieries in the district, as to ventilation, drainage and general safety, is good.

One rock slope from the No. 2 to the No. 3 Dunmore vein, 7 x 12, to a depth of 193 feet.

One 4 x 4 x 14 ventilating fan on the surface vein, driven by a 10 H. P. electric motor, was installed; one 50 H. P. electric motor to drive the ventilating fan at the Central Air Shaft to replace the steam engine, and one 35 H. P. electric hoist to replace the steam hoist to operate the Central Air Shaft.

Hampton Colliery, Outside.—Installed one 750 gallon steam pump for fire protection.

Sloan Colliery.—Installed one 150 H. P. electric hoist on the rock slope sunk from the Clark vein to No. 2 Dunmore vein.

Continental Colliery.—One rock tunnel, 7 x 12, in length 218 feet, from the Clark to the New County vein on the pitch, for the purpose of shortening the haulage.

The main shaft and the air shaft were concreted, replacing the old wood cribbing.

Bellevue Colliery.—New concrete barn in slope. Rock tunnel from New County to Big vein, and a second opening to the same tunnel. Rock tunnel from No. 2 to No. 1 Dunmore vein, and a second opening to the same tunnel.

Built new concrete blacksmith and carpenter shop, outside.

Dodge Colliery.—Concrete partition in main shaft.

Holden Colliery.—Installed electric hoist on plane to Surface vein.

National Colliery.—Installed dust fan in breaker. New brick blacksmith and carpenter shop, concrete barn built, inside. New fire pump and fire line installed. Outside.

DELAWARE AND HUDSON COMPANY

Greenwood Colliery.—Drift opened from outside to Checker vein. Haulage road built from breaker to head of plane, outside, distance 1,000 feet. A plane 400 feet in length, equipped with 10 x 12 engines, was built to hoist coal from mouth of drift to the Surface railroad.

Sloan Colliery.—The new air-shaft was sunk a distance of 336 feet during the year.

Bellevue Colliery.—New annex to breaker under construction. Two Triplex Plunger pumps installed. Two low vein coal-cutting machines installed. New concrete mule barn inside.

Dodge Colliery.—New locomotive house. (Outside.) One additional electric locomotive installed. One new 750 gallon fire-pump installed. New concrete mule barn inside. New wash-house.

Holden Colliery.—One additional electric locomotive installed. One additional boiler installed. New wash-house. New concrete barn inside.

National Colliery.—Rock tunnel, No. 2 to No. 1 Dunmore vein. New wash-house. New concrete barn inside.

This Company is to be commended for its efforts in educating its non-English speaking employes. Colonel R. A. Phillips, the General Manager, conceived the idea of having pictures taken in the mines showing how accidents occur and how they are prevented. Two hundred of these pictures appear in book form with simple statements. The book was prepared under the direction of Colonel Phillips and Mr. C. E. Tobey, Superintendent of the Coal Mining Department, and ten thousand copies have been printed and will be distributed to groups known as extension schools in the various mining communities.

The company is promoting this educative work through the local branch of the Young Men's Christian Association.

SCRANTON COAL COMPANY

Capouse Colliery.—All inside buildings reconstructed of incombustible material.

PEOPLES COAL COMPANY

Oxford Colliery.—New mule barn inside constructed of incombustible material.

New breaker was erected south of the site of the old breaker with a capacity of 1,500 tons daily, equipped with the most modern machinery of every kind.

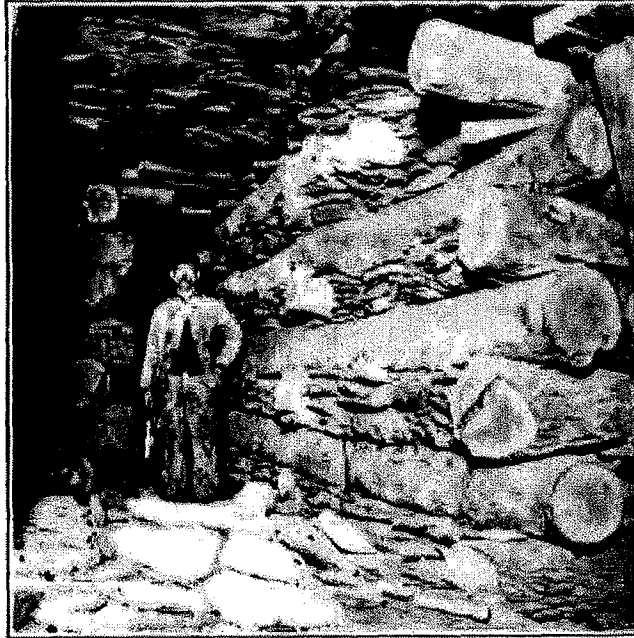
CARLETON COAL COMPANY

National Colliery.—New breaker erected, capacity 100 tons daily. Began operations December 12.

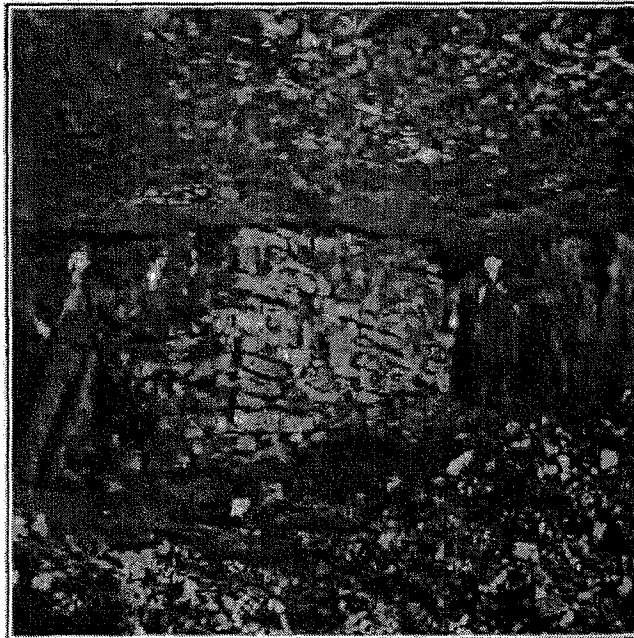
MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the City Hall, Scranton, April 15 and 16. The Board of Examiners was composed of the following persons: H. O. Prytherch, Mine Inspector, Scranton; John P. Corcoran, Superintendent, Rendham; William J. Jenkins, Miner, Scranton; James W. Reese, Miner, Scranton.

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



A. TIMBER AND ROCK COG, IN BELLEVUE MINE.



B. GOB PIER IN DUNMORE NO. 2 BED, NATIONAL MINE.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Sloan Colliery.—Ventilation in Sloan Surface vein good. A new air shaft has been sunk to improve the conditions.

Bellevue, Archbald, Hyde Park, National, Dodge, Holden and Continental Collieries.—Ventilation, drainage and condition as to safety good.

HUDSON COAL COMPANY

Greenwood Nos. 1 and 2 Collieries.—The ventilation where fans were in use was good. In the openings where natural causes were depended upon, the quantity was a variable one, but sufficient to maintain a healthy condition. Drainage fair. Condition as to safety, good.

SCRANTON COAL COMPANY

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

PEOPLE'S COAL COMPANY

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

CARLETON COAL COMPANY

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

MINOOKA COAL COMPANY

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

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—New annex to breaker under construction. Installed railing around all dangerous parts of machinery. Built a new annex to the breaker, which will clean all of the small sized coal, from pea coal down, and installed in this annex all modern machinery and proper safety appliances, which will greatly decrease accidents caused by coming in contact with exposed machinery. A Welch automatic overwind or engine stop was installed on supply shaft engine.

Archbald Colliery.—All the inside buildings reconstructed of incombustible material. A tunnel 134 feet long was driven to redeem pillars from Rock vein to Diamond vein. An automatic overwinding device was attached to hoisting engine.

Sloan Colliery.—The new air shaft was sunk a distance of 640 feet to No. 3 Dunmore. Installed a fan 24 by 8 by 6. An automatic overwinding device was attached to hoisting engines.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Archbald, Sloan, Hyde Park, Dodge, National, Continental and Holden Collieries.—Ventilation, drainage and condition as to safety good.

HUDSON COAL COMPANY

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

SCRANTON COAL COMPANY

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

PEOPLES COAL COMPANY

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

CARLETON COAL COMPANY

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

MINOOKA COAL COMPANY

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

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Installed one rock pulverizer to be used to crush the rock from the breaker and have it flushed into the mines, and one new Corliss breaker engine to replace old engine.

Completed one rock tunnel from No. 2 to No. 1 Dunmore to develop No. 1 Dunmore vein, and new air shaft and engine house. Are installing fan and engine to replace old fan and engine.

Installing a fire escape on breaker. There will be several exits in case of fire.

National Colliery.—Installed an endless rope haulage system at foot of shaft for the purpose of conveying the coal, and a fan at the old Stafford workings. Completed the track and electric equipment, and tunnel from No. 2 to No. 1 Dunmore vein near Meadow Brook shaft to develop No. 1 Dunmore vein. Made a tunnel from Clark to New County vein to develop a section of the New County vein.

Made second opening tunnel from No. 1 Dunmore vein to Clark vein and second opening from Clark vein to New County vein for ventilating purposes.

Dodge Colliery.—The main shaft has been made wider in order to use a larger car and an endless rope installed from the shaft to the breaker to handle the mine cars.

R. J. ...

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Sloan, Archbald, Hyde Park, National, Dodge, Holden and Continental.—Ventilation, drainage and condition as to safety, good.

HUDSON COAL COMPANY

Greenwood.—Ventilation, drainage and condition as to safety, good.

SCRANTON COAL COMPANY

Capouse.—Ventilation, drainage and condition as to safety, good.

PEOPLES COAL COMPANY

Oxford.—Ventilation, drainage and condition as to safety, good.

MINOOKA COAL COMPANY

Minooka.—Ventilation, drainage and condition as to safety, good.

CARLETON COAL COMPANY

Carleton.—Ventilation, drainage and condition as to safety, good.

EAST MOUNTAIN COAL COMPANY

East Mountain.—Ventilation, drainage and condition as to safety, good.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Installed an 8 foot by 20 foot Vulcan ventilating fan, capacity 400,000 cubic feet to replace two small fans of the Guibal type, having a capacity of 300,000 cubic feet.

Holden.—Installed a new Jeffrey fan, size 6 by 18 feet capacity 225,000 cubic feet, over a new shaft sunk to the Rock vein, for the purpose of ventilating the Rock Top and Bottom Diamonds and Surface veins.

SCRANTON COAL COMPANY

Capouse.—Installed tail rope from the Four Foot vein, new tail rope around shaft in Four Foot vein, and endless rope around shaft

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Holden, National, Archbald, Continental, Hyde Park and Sloan Collieries.—Ventilation, drainage and condition as to safety, good.

DELAWARE AND HUDSON COMPANY

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

PEOPLES COAL COMPANY

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

SCRANTON COAL COMPANY

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

MINOOKA COAL COMPANY

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

CARLETON COAL COMPANY

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

SCRANTON ANTHRACITE COAL COMPANY

Oak Hill Colliery.—Ventilation, drainage and condition as to safety, good.

SPRUKS COAL COMPANY

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

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Reopening water courses through silt, Clark vein, for drainage purposes.

Dodge Colliery.—Completed sump in No. 2 Dunmore vein, to take care of the surplus water. Also completed new foot and tunnel from Rock vein to bottom split, Diamond vein, for haulage purposes.

Outside:—Erected a brick and concrete blacksmith and carpenter shop. Built a new mule barn in order to avoid crossing railroad tracks with the mules, which had to be done in the case of the use of the old barn.

Holden Colliery.—Completed rock tunnel from New County vein to Big vein, for haulage purposes. Installed a new steam pump to take care of the surplus water.

Outside:—Renewed casing on ventilating fan.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Sloan, Archbald, Continental, Holden and National Collieries.—Ventilation, drainage and condition as to safety, good.

DELAWARE AND HUDSON COMPANY

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

SCRANTON ANTHRACITE COAL COMPANY

Oak Hill Colliery.—Ventilation, drainage and condition as to safety, good.

SPRUKS COAL COMPANY

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

JOHN GIBBONS AND COMPANY

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

MINOOKA COAL COMPANY

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

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Completed a rock tunnel, on a 45-degree pitch, connecting Nos. 1 and 2 Dunmore veins, length 75 feet, and one tunnel 7 by 12 feet from the New County vein to the Big vein, length 50 feet. Installed one 7-ton locomotive and reel, etc., in the Diamond vein "T" gangway.

Outside:—Installed a new Jeffrey ventilating fan, 6 feet wide, 16 feet in diameter, and built a new fan house for the same.

Dodge Colliery.—Completed a tunnel and bottom cut, 350 feet long from Rock to Bottom Diamond vein, and foot branch installed with connections with above landings. Tunnel, bottom and roof cut for a distance of 198 feet from Bottom Diamond to Rock vein. Roof cut from L and M gangway, Bottom Diamond vein, for a distance of 400 feet, and roof cut on No. 2 South gangway for a distance of 270 feet. Installed one 10-ton locomotive on main haulage-road. Made new shaft landing in Rock vein; also new sub-station and new mule barn.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Continental, Archbald, National and Sloan Collieries.—Ventilation, drainage and condition as to safety, good.

DELAWARE AND HUDSON COMPANY

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

SCRANTON ANTHRACITE COAL COMPANY

Oak Hill Colliery.—Ventilation, drainage and condition as to safety, good.

CARLETON COAL COMPANY

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

SPRUKS COAL COMPANY

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

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Installed 5 7-ton electric locomotives, wing reel device, etc.

Dodge Colliery.—Completed roof cut from New County to Big vein. Installed 3 7-ton electric locomotives, and 3 200 KW transformers, cable, bore hole, etc.

National Colliery.—Installed 2 7-ton electric locomotives.

Sloan Colliery.—Completed second opening from Diamond gangway, No. 2 Dunmore vein, into the No. 2 Dunmore vein, at Bellevue Colliery.

DELAWARE AND HUDSON COMPANY

Greenwood Colliery.—Completed a plane in Dunmore No. 3 bed, from old No. 1 shaft and New No. 1 shaft, to lower coal to New No. 1 shaft, thereby doing away with old No. 1 shaft.

Stripping of New County bed started.

Installed two 1200-gallon pumps at foot of New No. 1 shaft, one centrifugal and one plunger. Direct motion engines installed at No. 2 shaft, and 18 Lehigh Valley jigs in the breaker.

A great deal of interest is manifested in this district in the workings of the Greenwood Colliery Safety Institute which gives splendid promise of producing results.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Archbald, Continental, Sloan and National Collieries.—Ventilation, drainage and condition as to safety, good, except in a few places where conditions should be improved.

HUDSON COAL COMPANY

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

SCRANTON ANTHRACITE COAL COMPANY

Oak Hill Colliery.—Ventilation and drainage, good. Condition as to safety, fair.

CARLETON COAL COMPANY

Carleton Colliery.—Ventilation and drainage, good. Safety conditions, fair.

SPRUKS COAL COMPANY

Spruks Colliery.—Ventilation and drainage, good. Safety conditions, fair.

JOHN GIBBONS COAL COMPANY

Gibbons Colliery.—Ventilation and safety conditions, fair. Drainage, good.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Completed two rock tunnels from New County vein to Big vein, each 200 feet long, on a grade of 5 per cent. Erected a new engine and rotary house, of brick, with concrete roof.

Archbald Colliery.—Completed a rock plane from New County vein to Big vein.

Continental Colliery.—Completed a rock tunnel from Rock vein to Diamond vein.

Sloan Colliery.—Completed a rock tunnel from No. 2 Dunmore vein to No. 1 Dunmore vein, 500 feet in length.

Hampton Washery.—Installed two Simplex jigs.

HUDSON COAL COMPANY

Greenwood Colliery.—Installed a car pull at the coal tippie; a lump coal shaker in the breaker; also stationary hoist at No. 2 shaft to eliminate mule haul. A new addition was built to the office building. Completed a connection from No. 1 shaft to No. 2 shaft for water, which eliminates the danger of No. 2 shaft being flooded in case of high water.