case that persons, holding responsible positions under our large companies and small operators, are selected, less from the practical knowledge possessed by them, or the duties pertaining to the place, than from the fact of relationship to high officers, or other equally unworthy and improper motives. No other condition, save that of fitness for the place should govern the selection of men upon whose skill, coolness and judgment the lives and safety of others depend. More than one fearful accident during the past year, entailing great loss of life and property, have borne witness to the truth of this proposition.

Some expression of opinion has been made upon the subject of increasing the number of inspectors. In my judgment no increase is necessary at present. With a proper appreciation of individual responsibility upon the part of owners and superintendents all the legitimate benefits that can result from the inspection of mines may be attained under the present system. It was not the purpose of the law, as I view it, to create a mine superintendent in the office of inspector, but rather to cloth with official authority one whose watchfulness and care should constantly prompt others to obey the requirements of the law, and in case of flagrant neglect to require its enforcement. It is a mistake, not seldom made, to suppose that the dictum of an inspector can take the place of positive enactment. The responsibility of wrong construction should be upon the violator, even though backed by the erroneous opinion of an inspector.

PROSECUTIONS.

I have caused legal proceedings to be taken to punish infringements of the law, viz: Against five persons for riding upon loaded cars up a slope called the Gaylord slope, near Plymouth.

Also, against three persons for the same offence at the Mineral Spring slope, near Wilkesbarre.

No penalty was insisted upon by me save a payment of costs, these being the first cases prosecuted and the defendants pleading ignorance of the law. The effect upon the whole district has been salutary. Action was taken against the agent of the Consumers' coal company for not reporting accidents, also against Broderick, Conyngham & Co., for a similar offence, which resulted in obtaining judgments for $25 in each case—the minimum penalty. These also being the first cases of this class.

I caused bills in equity to be filed in the common pleas of Luzerne county against Samuel Bonnell and others, the Consumers' coal company and the Wilkesbarre and Seneca Lake coal company, charging them with a violation of the ventilation law in working their several collieries without having provided the second opening required, and praying for injunctions to restrain them.

In the two former cases injunctions were promptly granted by the court. The latter case being of a somewhat different kind, and late in the year when brought up, was discussed; but no opinion given before the court in this case; it was a slope extended downwards, called a new lift.

Also, against the Northern coal and iron company, charged them with a violation of the ventilation law in not providing a sufficient quantity of pure air in their colliery. The court granting an injunction in this case also promptly.

Also, against Broderick, Conyngham & Co., charging them with a violation of the law in not providing a sufficient quantity of pure air in the mine known as the Washington mine. This case was not disposed of for some time, had several hearings; in the meantime the condition of the mine was somewhat improved.

J. Smith, general superintendent; Jas. Waddle, mining superintendent; J. C. Edwards, mining boss.

No. 2 slope.—This mine is located at the eastern end of the village of Wanamie, and near the No. 2 breaker. It is opened into a vein supposed by some to be the same vein as that in drift No. 1; others differ and claim it to be an overlying vein.

Condition and ventilation.—This slope has been worked but a short time this year. Early in the spring a fan 15 feet in diameter was put up there, which exhausted a considerable amount of air; but having been put up in haste, and not having the proper arrangements, such as large air-ways and cross-cuts, it could not be expected to give the desired relief to the persons employed, or satisfaction to the bosses, that it would if it was well put up, and otherwise well provided for. The interior part of the mine was in very great need of better ventilation. The cross-cuts were too small, not as many doors as there should be to force the air to the face of the mine, and the old ones badly constructed; the stoppings were very badly made up, where they were made, and the whole mine was in a very unsatisfactory condition. The most of the above deficiencies having been pointed out, and ordered to be remedied on several occasions; but it seemed as if there was great indifference or inability on the part of the officers in charge.

J. B. Smith, general superintendent; James Waddle, mining superintendent; George Sager, mining boss.

Slope No. 4.—This is a new slope, located north of Wanamie a short distance. It has not been worked since the first part of the year.

Smith and Waddle, general superintendents.

Nottingham Shaft.—This shaft is located within the borough of Plymouth. It is sunk into the Red Ash vein, and is about 400 feet deep.

Ventilation and condition.—The ventilation of this mine has been improved within the past year, by having a 15 feet fan, instead of a 10 feet fan, which exhausts more air from the mine. The same was put at so great a distance from the workings, which were very badly opened, that the amount of air put into circulation, about 25,000 cubic feet per minute, is very much reduced before it reaches the face of the mine, as a great deal of the same leaks out before it can be used, nevertheless there are some hopes of having things better in the future, as the superintendent, H. C. Brodhead, and the mine boss, J. Johns, are endeavoring to have those complaints remedied. There has been a great many of the old wooden stoppings re-built with stone and mortar, and all the new ones are being built of this material. Many new doors have been put up, some as double doors, and others as check doors; in this way they are improving things gradually, and will be much better after the 24 feet fan is erected and connected to this mine, which will be done early next spring. Number of persons employed 103.

John Johns, mining boss.

Washington Colliery.

This colliery is located a short distance north-west of Plymouth, and consists of a slope and a tunnel. The tunnel workings are above water level, and are adjoining the old workings that have been worked out in all directions to the crop of the vein. The vein pitches about 35 or 40°.

Ventilation in this mine has not been satisfactory to the Inspector up to this time.

There is a small furnace built under the supervision of Mr. Charles Smith, in the employ of Broderick & Co., which is located close to the gangway side, to create circulation. It is difficult to decide which is the worse, the construction or location of the same.

The whole of the mine shows evidence that it has been badly managed up to the present time. Whatever may be done under the administration of the present firm and its officers remains to be seen.

Slope No. 1.—The slope is located near the entrance of the tunnel. It is sunk upon the same vein that is being worked in the tunnel and shaft—Red Ash. There are two lifts being worked in the slope. On the first lift eastward a large fault was met, through which a tunnel has been driven into the vein north of the fault.

That part of the mine opened north of said fault is being ventilated by a current of air that passes through it from the Nottingham shaft workings, towards

a fan 15 feet in diameter, which is placed on an old lift 300 feet above this level. Said air is not healthy for persons to breathe after having traveled said (Nottingham) mine. The whole amount of air circulated is about 25,000 cubic feet per minute, and it has to ventilate the shaft workings and those north of the fault, whereby it has to do for about 140 persons between both places.

The two lifts working on the west side of the slope have been ventilated by a small iron-cased exhaustion fan 4½ feet in diameter, and running at a very high speed, which has been removed preparatory to having the 24 feet fan put up in its place.

The air has not been quite so bad in this part as in the tunnel workings, although it was poor enough. There have been some improvements made in the slope workings on both sides, since the present firm has had possession of the place; such as the building of good stone and mortar stoppings in many places and putting up main doors anew with heavy frames and built around with stone and mortar. All the stoppings between the main gangways and air-ways are now being built in this substantial manner.

There will be plenty of pure air in this mine after the new fan above mentioned is erected. It is to ventilate the Nottingham shaft workings and the workings of this slope.

H. C. Brodhead, general superintendent; A. Reese, mining boss.

Slope No. 2.—This is a new slope located a short distance west of the breaker of the Washington mines and near the foot of the Jersey mines' plane. This slope is being sunk through rock and is down at present about 350 feet. It may reach the Red Ash vein in about 200 feet more. It is being done under the supervision of H. C. Brodhead, general superintendent over all the Lackawanna Coal and Navigation Company's mines on the Plymouth side of the Susquehanna river.

Hutchison & Co.'s Shaft.

This colliery is located about a mile and a quarter north-east of Kingston. It is sunk about 170 feet on to the same vein that is being worked in the next shaft west of them, and is called by some the Cooper vein. This mine is considered tolerably safe; roof being good and no fire-damp discovered as yet.

Ventilation.—This is produced by a fan 15 feet diameter. The mine has been opened in such a manner that it will always be difficult to properly ventilate it, and up to this time, although comparatively a new mine, no satisfaction has been given to the inspector in the matter of ventilation. The fan is large enough to exhaust at least 60,000 cubic feet of air per minute, while being driven at about 100 revolutions, while at present there is only 22,000 cubic feet per minute passing into the return near foot of shaft; how much is being lost in the shaft I know not; and about 8,000 cubic feet per minute traversing the face of the mine. The vein is about 6 or 7 feet in thickness, works rather hard, and requires much powder to loosen the same, and must necessarily make a large amount of powder smoke. Number of persons employed, 60. Charles Hutchison, general superintendent; James Hutchison, mining boss, successor to Mr. William M'Culloch, who had charge of opening the mine.

Hillside Coal and Iron Company.

Enterprise mines.—This colliery is located on the Plank road, Plainsville township, and consists of one slope on the Hillman vein, and a shaft about 150 deep to the Five Feet vein.

Slope workings, their condition and ventilation.—These workings are not as safe as many of our other mines. In the first place there is very bad roof, requiring a great deal of care on the part of the miner and his boss; however the mine is well timbered, and all precautions are being taken to secure the safety of the men. Very few accidents occur, which must be attributed mostly to the great care and vigilance of the parties above mentioned. There is a small quantity of gas generated in this mine, but it has not given much trouble so far. The venti-

The New Jersey Coal Company has had a small fan 10′ 0″ dia built to ventilate the workings on the Red Ash seam. It has greatly improved the ventilation of said mine.

The Lehigh Coal and Navigation Company has had a large fan 24′ 0″ dia erected at the Washington colliery, near Plymouth. This fan ventilates the workings on the west side of the slope, two lifts, and the whole of the workings in the Nottingham shaft. I have not yet learned what amount of work this fan is able to do, as it has not yet been fully tested. There are about 85,000 or 40,000 cubic feet of air circulated through the shaft workings, and about 18,000 or 20,000 cubic feet for the slope west side.

The workings in the slope tunnel are being well ventilated by another fan 15′ 0″ dia.

The Susquehanna Coal Company has had the following fans erected: At No. 3 slope, old Harvey mine, West Nanticoke, one fan 17′ 0″ dia, which exhausts about 45,000 cubic feet of air per minute, and is capable of much more when required.

At No. 3 or Grand Tunnel one fan was taken from the old M'Farlane shaft, and placed upon the side of the mountain near the outcrop of the seam, to ventilate the workings of the back basin. This fan is 15′ 0″ dia, and does very well when being run to an ordinary speed, say 75 revolutions; but there has been some difficulty in getting a sufficient quantity of water to make steam at times, hence the fan has not had a fair trial, although very much needed at times.

The Riverside Coal Company has had a double fan built at the Enterprise shaft. This fan is built different to any other in this district, being two distinct fans, each 15′ 0″ dia, with the usual proportions, their shafts being so arranged as to allow of their being coupled or uncoupled at pleasure. Hence these fans can be run together, or either may be run independent of the other, allowing, if need, ample time to repair the one while the other keeps the mine clear of gas. When they were run together at 111 revolutions per minute, they discharged 69,600 cubic feet per minute, with a water gauge of 1.8 of an inch; a very heavy drag area, 48.×velocity 1,450=69,600, no allowance for friction of the instrument.

New Shafts Completed since my Last Report.

Waterman & Beaver's No. 2 shaft, located north-east of their old shaft, near Kingston, Pa. Coals have been hoisted from this shaft for several months past, which were sent through their new breaker.

Luzerne Coal and Iron Company's new shaft, near West Pittston.—This shaft has been completed, and coals are being hoisted from the opening. They are now driving so as to connect the new and the old shaft. The water having been taken out of the said old shaft, an opening between the two will be completed early in the next year, the driving being done at present from both sides.

Northern Coal and Iron Company's No. 3 shaft, near Plymouth.—It has been completed, but no coals have as yet been shipped therefrom. A new shaft is being sank to form a second opening for the former at present.

D. and H. Cannal Company's Cunyngham shaft.—It has been completed to the Hillman seam, from which coals are now being hoisted from their gangway driven eastward. It is intended to drive for a second opening from the said gangway at some favorable point, yet to be decided upon, either to the surface or otherwise into Young's slope. One of the five seperate compartments of this shaft is being occupied at present by a drilling aparatus for the purpose of testing the coal bearing strata below the present bottom of the shaft.

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section of Pine Ridge colliery. Wyoming colliery has two fans, one fifteen feet diameter and one twenty-five feet diameter; the former is, ordinarily, being used in exhausting dust from the coal-breaker, but may, at any time, be used in an emergency to substitute the other fan. There are two fans at No. 5, Delaware and Hudson Canal Company, Plymouth, one sixteen feet diameter and one twenty feet diameter. Nottingham and Washington collieries have three fans between them, one fifteen feet diameter and two twenty-four feet diameter each. At Avondale colliery there are two fans, each twelve feet diameter. Also, there are two fans at No. 2 slope, Nanticoke, each twenty feet diameter; and at the Kingston Coal Company's Nos. 1 and 2, they have three fans, one twelve feet, one twenty-one feet, and one twenty-five feet diameter. There is but one colliery in the district not having one or more fans, which is the Waddell or Ellenwold drifts, operated at present by Honorable Thomas Waddell and F. T. Walters & Co., except the Chauncey old mine, which is about being abandoned.

In view of the great change suggested in the above as having taken place in our mining operations, it is highly necessary that our mine officers, from the lowest to the highest, improve in their administrative, as well as executive, abilities. To cope successfully with the difficulties and dangers of our present mining, it requires considerable more skill, tact, and general knowledge than it formerly did, and this cannot be had without some practice and theory blended together. No one person is supposed to know everything about mining more than it would be in any other branch of business. Hence, we should study out what others have done, and how it was done. This may be learned in various ways, which I need not here refer to. I will here insert an abstract of the mining law adopted, in England, in 1872, relating to management of mines.

I am fully convinced that such an enactment by legislation is much needed here, and, further, am just as confident that it must be had in this or some other form, within a short period, and I should say the sooner the better for all parties interested. The law is titled "the coal mines regulation act, 1872," being the act regulating mines of coal, stratified iron-stone, shale, and fireclay.

Certificated Managers.

"SECTION 26. Every mine to which this act applies shall be under the control and daily supervision of a manager, and the owner and agent of every such mine shall nominate himself or some other person (not being a contractor for getting the mineral in such mine, or a person in the employ of such contractor) to be the manager of such mine, and shall send written notice to the inspector of the district of the name and address of such manager.

"A person shall not be qualified to be a manager of a mine to which this act applies, unless he is, for the time being, registered as the holder of a certificate under this act.

600 feet in length. This opens to a large tract of coal, which will be extensively mined as soon as a second opening can be effected. The old No. 2 shaft, whose workings were connected with the upper Red Ash tunnel in this mine, was arranged as an escape for the men, in case of emergency, by having good accessible ladders erected up through it.

At the Stanton shaft, a force of men were kept at work through the year re-opening the mine and restoring the ventilation of the old workings. A gangway has been driven a long distance, from which a series of chambers will be opened as soon as connection can be made with the new air-shaft. The latter is now sunk to the Baltimore seam, a depth of 840 feet, and they expect to have it connected with the Stanton workings by the middle of April, 1883. A 35-foot fan was erected on top of this shaft, ready to set to work when the connection is made, which will produce splendid ventilation upon the starting of the operation. The new breaker is completed, ready for operation, as soon as the connection with the air-shaft is made.

At the No. 9 shaft Sugar Notch, the two tunnels reported in last year's report were completed—one from the Ross to the Red Ash seam was 7x12 feet area and 705 feet long, the other, not on the same level, but from the Ross to the Red Ash vein, also was 7x12 feet area and 560 feet long. A new fan was also erected on this colliery, which has improved the ventilation and made the colliery much more comfortable to work in.

At the Lance colliery a new air-shaft was sunk, which is 10x18 feet area and a depth of 520 feet, and its connection with the main shaft effected. A new 35-foot fan was erected, on top of the air-shaft, to ventilate the colliery, when ready for operation. The old breaker was pulled down, and a new one is in progress of construction, which they expect to have completed by the beginning of next May, when the mine will begin to ship coal again.

At the Nottingham shaft a new tunnel was driven from the Red Ash seam to work the Ross, none of which has yet been mined. The tunnel was 7x12 feet area, and 1,075 feet in length, and they are, at this writing, working to effect a second opening to it.

At the Reynolds slope a tunnel is in progress from the Red Ash to work the Ross seam, 7x14 area, and had been driven, at the close of the year, a distance of 300 feet. Another tunnel was driven through a large fault, which opens a large tract of coal hitherto untouched; it was 360 feet long, and has an area of 96 square feet.

At the Wanamie colliery a new tunnel was driven from the Ross to work the Red Ash seam, which has an area of 72 square feet, and is 390 feet long. A new fan, 15 feet diameter, was also erected at this colliery, which has been the means of producing much improvement in the ventilation.

The South Wilkes-Barre shaft is completed to the Hillman seam, a depth of 700 feet, and have found the vein proving better than their expectation. This has opened a large tract of hitherto solid territory of coal, and

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from the said tunnel by a drill-hole two and a fourth inches in diameter and eighteen feet long, about five o'clock, A. M., September 14, 1883. The water has been running continually since, but it is not all out yet.

A tunnel was driven in this mine from the Baltimore to the Hillman seam. It is seven hundred feet in length, and one hundred and twelve feet area, on a grade of eighteen degrees. The second opening was made by driving a passage to the shaft.

The new breaker erected at the Stanton mine started to put coal through September 1st, 1883. This colliery had been idle since the fire which caused the flooding of the mine in 1879. The new air-shaft was connected to the working on April 18, 1883, and they immediately went to work casing the air-shaft preparatory to setting the new thirty-five-foot fan to work.

The mine is now in excellent condition, having a very large quantity of air circulating, and plenty of margin to meet any extra requirements.

At No. 11, the Lance colliery, the old breaker was torn down and a new structure erected in its place. This started to work June 30, 1883. The colliery was equipped with a complete set of new machinery, consisting of a set of direct-acting hoisting-engines and conic drum, a breaker-engine, a pair of hoisting-engines for underground slope, but located on surface, and a thirty-five-foot fan, all of the best kind of machinery.

At the Reynolds colliery, the tunnel reported last year was completed to the Ross vein. Its total length is six hundred and forty feet. They are now working to effect a second opening to it.

At the South Wilkes-Barre shaft, a fan was erected fifteen feet diameter, dimensions of which can be seen in table of new fans.

The Susquehanna Coal Company.

This company is making rapid and sure progress in all their collieries. A pair of massive engines was erected to sink the No. 1 shaft extension from the forge seam to the red ash, and the three compartments at the southern end of the shaft were extended to a depth of two hundred and sixty-six feet below the forge vein, and they expect to cut the red ash seam in the first part of 1884. Two new shafts were opened for ventilating purposes from the surface to the Mills seam. Both are eighteen by thirteen feet area, and one is one hundred and eighty feet, and the other sixty-three feet deep. The ventilation of this company's collieries has been much improved during last year, and the spirit of the management from the highest officer to the lowest seems to be alert watching improved methods and adapting them to their mines.

A new double fan was erected on one of the above shafts, designed by Mr. J. H. Bowden, chief engineer of this company, and it produces excellent results, improving the ventilation greatly in two or three of the mines.

The underground slope in No. 2 shaft was extended during this year to a length of one thousand five hundred feet, on an average grade of eleven degrees. The tunnel reported last year in this shaft was completed to the

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seventy-five. This is low enough to ensure a healthy condition of the air which the said number would have to respire, and at the same time the volume required by law would have sufficient speed or velocity to sweep the smoke away in a short time after it is produced.

The volume of air in the Boston mine became insufficient, and the company erected a new fan at the No. 3 shaft to remedy this. This change was effective and produced satisfactory results.

In the Nos. 2 and 3 shafts of the Delaware and Hudson Canal Company, at Plymouth, the air currents were divided into a larger number of splits, and the change has proved very beneficial. Both mines are now in conformity with the requirements of the law, having limited the number of persons employed in each split below seventy-five.

At the Nottingham mine of the Lehigh and Wilkes-Barre Coal Company, at Plymouth, the quantity of air was approaching the minimum allowed by law, and too many persons were placed to work in some of the splits. On December 13, the inspector requested the foreman to make preparations to increase the quantity of air and reduce the number of persons employed in each split to the lawful number. The company at once concluded to sink a new air-shaft, to provide an additional intake and upcast, upon which a fan will be placed as soon as the shaft can be completed.

The foremen of the Lance and Reynolds collieries were also notified that too many persons were employed in some of the air-currents, and they were distributed properly in a few days thereafter.

In the No. 1 shaft, Nanticoke, there were more than the lawful number of persons employed in the "main west gangway split," and after receiving a letter from the inspector, requesting compliance with the law, it was immediately complied with by adding another split of air.

In many instances, the provisions of the law are overlooked, until the inspector requests compliance. In underground slopes, and particularly where the pitch is small, the second openings are frequently not effected or driven until the inspector pushes the matter. There were several instances during the year under consideration where the inspector had to request such work to be done; but generally, upon requesting, the work is promptly started and pushed to completion.

I find that the operators are generally disposed to have their collieries worked in such a manner that the inspector will have nothing to say, but the foremen have a tendency to delay costly preparations in cases where no imminent danger is threatened, and where the law is not strictly complied with I find that the fault generally lies with the foreman. Naturally, he desires to make the business of his employer as profitable as he can, and sometimes he is tempted to economize unwisely by aiming to do that.

Automatic speed recorders have been attached to a number of the fans on the gaseous mines, and they are working very satisfactorily.

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At the Reynold's colliery a new slope was driven through the rock from the Ross seam to the surface. It is 240 feet in length and 84 square feet area, on a grade of 20 degrees. This is to take the place of the old slope and leads to a new breaker now in course of erection.

Delaware and Hudson Canal Company.

The new breaker at the Baltimore No. 2 shaft of this company was completed and began to prepare coal for the market in the month of November, 1890. This is a new colliery. The shaft is sunk from the surface to the Red Ash seam, a depth of 650 feet, and having a sectional area of 11 by 45½ feet. A compartment having an area of 11 by 12 feet is bratticed off for upcast, upon which a fan 20 feet diameter is erected. There are three cages, two for hoisting coal and one to hoist the workingmen. The coal is hoisted by a pair of engines 26″ by 48″ cylinders directly connected to a conic drum 6 and 10 feet diameters. The men will be hoisted by a pair of engines 18 by 36 inches, geared 4 to 1 to a parallel drum 9 feet diameter. The fan is operated by a pair of engines 14 by 24 inches.

At the No. 2 colliery, Plymouth, a new pair of hoisting engines were erected having cylinders 24 by 48 inches, directly connected to a parallel drum 8 feet diameter. A new fan was also erected to take the place of the old one. It is 17½ feet diameter, operated by an engine 14 by 36 inches. They also added ten feet to the length of the breaker-wings in order to enable them to lengthen the screens used to separate the different sizes of coal.

Susquehanna Coal Company.

At the No. 1 shaft an underground shaft was sunk from the Ross to the Red Ash seam, a depth of 180 feet. It is to be used to hoist the coal from the Red Ash to the Ross level. Its size is 12 by 21 feet. A space of this area was driven up a distance of 35 feet to give height to land the cages. The hoisting engines are located on the surface, from which the ropes pass down through bore-holes 950 feet deep and eight inches diameter. Another hole of the same diameter was sunk for the signal wires. The three holes are incased by a pipe 5⅝ inches diameter. This shaft will enable this company to work all the lower parts of the Red Ash seam in their property which could not be reached without incurring greater expense from their other openings.

In the Forge seam of the same shaft, the underground slope was extended to a depth of 1,150 feet. This slope has an area of 14 by 7 feet, and an average grade of 8½ degrees.

At the No. 2 shaft the underground slope was extended a distance of 600 feet, and the hoisting engine was placed on the surface. The bore-hole for the rope is 500 feet deep.

At the No. 2 slope the timber was removed from the underground engine house and replaced by walls of masonry. Now everything is in-

PA Mine Inspection 1890

The Red Ash slope was extended, and a new lift was opened. A line of water pipes was laid into the lower gangways ready in case of fires from ignition of gas. The weak and affected pillars were strengthened by having the exhausted breasts filled up with refuse. A new underground slope was sunk on the Ross seam a distance of 660′ and the rope for hoisting, passes down a hole 206′ deep from surface. The hoisting engines on surface are 22″×48″ direct-acting to a parallel drum 9′×14′.

Two batteries of Babcock & Wilcox high pressure boilers, 212 horse power, were added to the surface plant and three elevators and three setts of conveyors were added to the breaker.

At the Reynolds No. 16 colliery the new breaker in course of erection in 1890 was completed and the old one was removed. The new breaker was started to prepare coal for the market in April, and so was the new slope described in my last report. An underground slope was sunk in the Ross seam with hoisting engines located on the surface, size of cylinders 14″×24″. The bore-hole through which the rope passes is 125′ deep. A tunnel 300′ feet long was driven through rock fault in the third west gangway, and a new plane was made in the Red Ash seam.

At the No. 18 colliery, Wanamie, a tunnel was driven from the Baltimore to the Ross seam a distance of 630 feet, and at the No. 19 colliery a tunnel was driven from the Ross to work the overlying seams. The main slope is also being extended to work another lift in the Ross seam. The breaker was remodeled, and one sett of elevators and two large conveyors were added to its machinery.

Improvements by the Delaware and Hudson Canal Company.

At the No. 2 shaft, Plymouth, an underground slope is in progress of sinking in the Bennett seam. This will enable them to mine the coal lying to the dip from the shaft level. A second opening was made for the Bennett seam by driving to connect with the workings of the No. 5 shaft, making a very convenient place of exit in case the shaft became unavailable. At the No. 3 shaft, Plymouth, a plane 1,000′ long, on a grade of 9°, was made in the Five Foot seam.

Improvements by the Susquehanna Coal Company.

At the No. 1 shaft the second opening for the underground shaft was completed by driving to connect with the slope level workings. Second opening for the tunnel to the Ross was also effected by driving a rock plane from the Red Ash level gangway. This will be useful also to work a large area of the Ross seam to the rise from that point.

A sixteen-foot Guibal fan is in course of construction to ventilate the workings of the George seam.

An underground slope is being sunk in the Forge seam east of the shaft. The hoisting engines for which are located on surface near the No. 2 shaft and the rope passes into the mine through a bore hole drilled for that purpose.

PA Mine Inspection 1891

The board of examiners was G. M. Williams, Mine Inspector; Edward Mackin, superintendent, and Frank Mills and David L. John, miners. Seventeen applicants for mine foreman certificates were examined, and the following named were recommended to have certificates: William T. Davies, Charles A. Brown, Harry Gaughan and Thomas E. Edwards, of Wilkes-Barre; William S. Davies and Oliver Rhydderch, of Edwardsdale; James Wilson and Gomer Evans, of Plymouth; John Rousing and James Stirling, of Westmore.

The following named persons received certificates of qualification for assistant mine foreman: James Coughline, Luzerne; Peter Tully, John Dietz, John C. Parry, Lewis Lewis, William E. Thomas, Edward H. Williams, Thomas W. Jones and Ivor Davies, of Wilkes-Barre; Michael Nork and Thomas Morgans, Glen Lyon; David Morris and James H. Davy, Wanamie; William Newland, Alden Station; John P. Evans, Illtyd Evans, William H. Faust, Benjamin A. Waters, Arthur D. Evans, Lewis B. Lewis, William E. Bowen, Llewelyn Williams and Ivor T. Phillips, of Nanticoke; John Whittington and David Roberts, Sugar Notch; John Abrahamson, William A. Roberts and John Boyer, of Parsons.

Improvements by the Lehigh and Wilkes-Barre Coal Company in the Year 1900.

Hollenbach Colliery.—Tunnel from bottom to top split Red Ash, 49 yards. Return airway in rock, 19 yards.

South Wilkes-Barre Colliery—Bore hole to drain water from Kidney to Hillman Vein. Tunnel Hillman to Stanton, 159 yards. No. 4 tunnel extended 50 yards. Tunnel Baltimore to Five-Foot, 63 yards. Fuel conveyor breaker to boiler house.

Stanton Colliery—Rock plane Hillman to Kidney vein, 60 yards. One pear 24x48-inch first motion engines erected at Stanton air shaft for operation of No. 4 rock plane. One thousand horse power. Babcock & Wilcox boilers to replace cylinder boilers at breaker plant. Additional 6-inch steam line from breaker plant to air shaft.

Sugar Notch—Tunnel from bottom to top split, Baltimore vein. Tunnel from Ross to Red Ash vein, 70 yards.

Lance Colliery—Tunnel Five-Foot to Hillman, 189 yards, partly finished. Tunnel bottom split to top split, Baltimore, 57 yards. Annex to breaker to prepare buckwheat coal.

Nottingham Colliery—One pair 24x48-inch first motion engines for operation of new slope in Ross vein. An 8-inch bore hole, 280 feet long, to conduct rope from surface to head of slope.

Reynolds Colliery.—Rock plane Red Ash to Ross, 50 yards. Partly finished.

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance Colliery

Outside.—Duplex air compressor, simple steam, compound air; forced fan draft system for boilers, and addition to new boiler house.

Inside.—No. 18 tunnel, Red Ash to top Red Ash, 15 yards. No. 19 tunnel, Red Ash to top Red Ash, 15 yards. No. 20 tunnel, Red Ash to top Red Ash, 15 yards. No. 21 tunnel, Cooper to Five Foot, 50 yards.

Nottingham Colliery

Outside.—Started erection of new breaker; shaft hoisting engines; No. 1 slope engines and No. 2 slope engines placed on new foundations, and new houses erected for the same; colliery supply store; colliery shop; extended brick compressor house, for accommodation of three stage air compressors.

Inside.—Eighteen inch by 30 inch hoisting engines and engine room in rock, on No. 2 slope anticlinal. Pumping plants on 5th, 7th and 9th, Red Ash levels, remodeled with the addition of two simple duplex pumps and two bore holes for water from Ross to Red Ash, thereby concentrating all pumping in Red Ash vein.

Reynolds Colliery

Outside.—Five hundred H. P. battery B. & W. boilers.

Inside.—No. 8 Rock plane, through Red Ash fault, 125 yards.

Wanamie

Outside.—Five hundred H. P. battery B. & W. boilers.

Inside.—Pumping plant No. 6 Red Ash slope; extending No. 6 slope through rock, 100 yards; No. 11 tunnel, Baltimore to Red Ash across basin No. 2 drift, 190 yards.

PARRISH COAL COMPANY

Parrish Colliery

One 8 inch bore hole for flushing; one crusher for crushing slate and bone, for flushing; one pair breaker engines; No. 6 slope extended 300 feet; intake air shaft, concreted from surface to rock; one 30,000 gallon water tank; one 20,000 gallon water tank.

Buttonwood

Tunnel driven from Kidney to Abbot vein about 560 feet; one 35 foot fan, also fan engine 22x36; one saw engine, etc., for cutting prop timber, etc.; outside railroad, plane and engine, for handling timber, etc., from railroad to head of shaft; concrete wall erected around coal shaft head, also around boiler house; one 30,000 gallon water tank.

PA Mine Inspection 1903

high water in the Susquehanna river, which has resulted so disastrously to this colliery heretofore.

Woodward Colliery

New steel tower over No. 1 shaft, installation of endless rope haulage on breaker trestle and to convey empty cars to No. 2 shaft, new brick and concrete pump room, lamp room and fire-boss shanty near the entrance of No. 1 shaft.

Breaker repairs consist of the installation of mechanical pickers, elevators, rollers, etc., together with a new 12 foot dust fan, which has been quite an improvement in this breaker.

Haulage roads and return airways were enlarged and widened, increasing the area of some of these openings from 48 square feet to 90 square feet.

No. 2 shaft was retimbered during the year to within 250 feet of the surface. A brick partition has also been erected between the air shaft and hoistways in this shaft for a distance of 212 feet from the bottom. This work will be completed as weather conditions will permit.

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance No. 11 Colliery

Outside.—Colliery shop.

Inside.—Rock plane airway Cooper to Five Foot for No. 21 tunnel return, 20 yards; 10 inch bore hole Stanton to Red Ash for pumping plant; No. 22 tunnel Cooper to Cooper, 26 yards; rock plane airway Stanton to Hillman for No. 14 tunnel return, 40 yards; No. 11 tunnel extended to Cooper, 95 yards.

Nottingham No. 15 Colliery

Outside.—Oil house; three stage air compressor; 2,000 H. P. water tube boilers; fuel conveyor.

Inside.—Compressed air haulage motor for shaft level haulage.

Reynolds No. 16 Colliery

Inside.—Tunnel turnout on No. 8 plane, 36 yards.

Wanamie No. 18 Colliery

Outside.—Supply store; 24 foot ventilating fan No. 2; locomotive house; 24x48 inch hoisting engines, No. 6 slope; 10 double dwellings.

Inside.—Rock plane airway Red Ash to surface, 175 yards; No. 12 tunnel Ross to Baltimore, 105 yards; No. 13 tunnel Ross to Ross.

PA Mine Inspection 1904

"An era in the history of mining anthracite in the Wyoming coal field has been inaugurated by the success of the Dundee Coal Company in reaching a superior vein of eleven feet in thickness at a depth of nearly 800 feet below the surface.

From a distance we have watched the progress of this shaft with anxious eyes, and we are sure that the pleasure to us of their success can very little be less than to the members of the company. Much credit has been thrown on our coal field by the partial and unsuccessful exploration for coal in Hanover and Newport. Borings have been abandoned at a depth of three or four hundred feet, leaving doubt about the existence of coal, in the minds of strangers, and, indeed, in the minds of some of the less sanguine of our own citizens.

The Dundee Coal Company, composed principally of our own citizens, resolved to sink its shaft to a depth of 1,000 feet if coal could not sooner be obtained. The largest vein cut had been but four feet, with many smaller ones. Still, without hesitation, yard after yard was cut. Mr. F. Koerner, an intelligent and energetic man, had charge of the work, which progressed as rapidly as the hard rock would permit, until 780 feet had been passed. Then indications of coal appeared and an auger was put down three feet to a small eight-inch seam of slate below which was a vein of fully eight feet of beautiful coal. To the bottom of the vein is 792 feet, and to provide for the dropping of the water from above the shaft was sunk a few feet deeper, probably 800 feet in all."

The story is continued with a narrative of the personal experiences of the editor in a descent of the shaft. A large stream of water entered at a depth of 250 feet, but was cared for by pumps. The editor mined a few specimens of coal at the bottom with illumination furnished by a few gas jets pouring forth from the vein itself. He says, in his story, that the vein was supposed to be the Mills vein, found at Nanticoke, and that other veins of greater thickness were believed to be underlying it. This belief was well founded, for the territory in which this vein was located is now considered the richest in the Wyoming coal field, and the lower veins are found at a depth of from 1,800 to 2,000 feet. The ancient chronicler also tells of the gas found in the vein, for it was the presence of this gas in large quantities and the lack of knowledge of proper ventilating methods in those days that caused the subsequent abandonment of the mine.

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance No. 11 Colliery, Inside.—Tunnel, Cooper to Five Foot, No. 1 Slope, 5th West.

Nottingham No. 15 Colliery, Outside.—Corliss breaker engine.

Reynolds No. 16 Colliery, Inside.—Rock plane, Ross to Ross, No. 4 tunnel East.

DELAWARE AND HUDSON COMPANY

Plymouth Nos. 1 and 2 Colliery.—A return airway was driven from No. 14 plane, Abbott vein to No. 1 shaft.

An air shaft was sunk 55 feet from surface to Lance vein workings and 300 feet of return airway was driven in vein.

A 50,000 gallon water tank was erected and pipe connections made for boiler supply.

Plymouth No. 3 Colliery.—Extensive repairs were made to breaker and the timbering in main shaft was replaced by concrete from top to bottom. A new 8-inch rope hole was drilled 425 feet from surface for No. 6 plane, Red Ash vein.

Plymouth No. 5 Colliery.—No. 7 plane, Bennett vein, was driven 1,200 feet and an inch rope bore hole was sunk 290 feet from surface.

No. 3 plane, Bennett vein, was driven 250 feet.

Boston.—No. 14 plane was driven from the Boston Split Red Ash 250 feet through rock to the Top Red Ash and 600 feet in the latter vein.

No. 15 plane, Bottom Red Ash vein, was driven 1,100 feet.

The Boston breaker was torn down and the coal is now being prepared at No. 5 breaker.

PA Mine Inspection 1909