It is difficult to say how many cubic feet of coal should be allowed for a ton, as we had no means to ascertain at the time, but will assume it at 40 cubic feet, hence the following:

422÷(40×6)=1.7583 tons per day of 24 hours. Therefore, $\frac{2{,}240\times1.7533}{1.516\times24}=109.7$ lbs. per horse power per hour.

This does not take into account the difference between the temperature of the mine and that of the outside which was 3°.

In connection with the above figures it may not be out of place here to state that the above results are nearly similar to what was found in England.

It will be seen by referring to the "Transactions of the North of England Institute of Mining Engineers," for April 10th, 1868, page 102, that a Mr. Morrison gave a table of experiments that had been conducted to compare the work of a Guibal fan and a furnace, when it was claimed that the annual expense was reduced in favor of the former £100. Also, the following table exhibiting the effective power:

EFFECTIVE POWER.

	Coal consumed per fortnight	Coal consumed per 24 hours	Coal consumed per hour, average.....	Coal consumed per horse power per hour.....	Horse power in air at bottom of upcast.....	Cubic ft. of air per minute,	Water gauge at bottom of shaft.....
	Tons.	*T. cwt. qr. lbs*	*Lbs.*	*Lbs.*	*H. P.*	*Cubic feet.*	*Inches.*
Furnace....	96	6 17 0 16	640	101.75	6.29	36,350	1.1
Fan	62	4 8 2 8	413	19.82	20.83	64,700	2.05

B. Hughes, general mining superintendent; Thomas D. Davis, assistant; James George, mining boss.

Jersey mine.—This mine is located a short distance north-west of Plymouth, and has a tunnel opening into the Red Ash vein. All the coals are hoisted by a slope to the water level, and are brought to the surface through the aforesaid tunnel.

Condition.—The condition of this mine has not been flattering to any person interested in it, although somewhat better perhaps now than it has been hitherto. A new air shaft 230 feet deep has been sunk; and a fan similar to that at Avondale is in contemplation, which will give better ventilation than this mine has had in the past. A new travelling road has been made there; also a good wash house, furnished with hot and cold water, and a stove, all of which are kept in good order. B. Hughes, general superintendent of mines; F. J. Phillips, mine boss.

Avondale shaft. This colliery is located about two and a-half miles west of Plymouth. It is 237 feet deep, and sunk into the Red Ash vein.

Condition.—This mine has been kept in a very good condition ever since it was re-built after the calamity of 1869, and is better arranged than most of the mines; yet there is one important part that has been overlooked in this, as in the majority of other mines, to wit: No preparation for the protection of the air currents, by having double doors so as to keep the currents steady; this is very difficult to do unless provided for in the opening out of the mine. The hoisting carriages were provided with bridle chains and safety catches. The gates were put on at the head of the shaft, and a brake on the hoisting drum prior to my first visit, in 1870, all of which were of the best kind in use, except the brake, which has since been replaced by a better one. It has 400 pounds dead weight upon a compound lever, and is conveniently placed; it will bring the pair of engines, 14 inch cylinders, to a dead stand with a full head of steam, (80 pounds pressure,) and the load in a revolution and a half of the drum. I would here state that there is one more change desirable to this brake, so as to have it arranged in a manner that it can be used independent of the dead weight, as a brake is seldom used when there is dead weight attached to it, unless in a case of emergency, when the engineer is very liable—not being accustomed to the use of his brake—to forget that he has one, hence I prefer an efficient lever brake, that may be used

in letting down persons or material, whereby the engineer becomes accustomed to the use of his brake. However, Mr. Preedhoe, the master machinist under the Deleware, Lackawanna and Western Company, on this line, is entitled to credit for the manner in which he built his brakes, as they were about the third good brakes built in the district, and the first of this kind.

Ventilation.—The power used to cause a circulation in this mine, since the wood work was rebuilt, is a fan 12 feet in diameter, sheet iron casings, revolving disc and open periphery which exhausts from the mine about 38,000 or 40,000 cubic feet of air per minute. This air is conducted around the mine, in two different splits or currents, one east and one west; number of persons employed inside 138. There has not been much improvement made during last year, except in the building of all the stoppings, between the main air-ways and gangways with stone and mortar, which assists very much in keeping the air to the face of the mine, besides being much cheaper than the old wooden ones.

Elliot & Co's Colliery.

Hollenback Colliery.—This is a slope located on the plank road, Plainville township, and is sunk on the Hillman vein. It is a small colliery working around and stripping a fault to the dip of the old Hillman mines, besides mining a small tract of coal lying between them, and the mines of the Seneca Lake coal company, south of them.

Condition.—Nothing very important can be pointed out in the shape of improvements since my first visit.

There are but few persons employed inside. Ventilation at inlet, 14,500 cubic feet; at face of mine, 7,000; number of persons employed, 20 inside. No mechanical or artificial means used to assist ventilation.

Robert Pool, general superintendent; Thos. E. Morpeth, mining boss.

Franklin Coal Company's Mines.

Brown's slope.—This slope is located a short distance south of Wilkesbarre, and is opened on the Baltimore vein.

Condition, &c.—The coal is hoisted to an old water level gangway. It is then brought to the surface through a tunnel. This mine has been idle a long time this year. The men are not allowed to travel the slope, there being a traveling road for that purpose. The mine is tolerably safe. They have some very poor roof, but it is generally well timbered. Otherwise it is about the same as when the last report was made.

Ventilation.—It is produced by having a small furnace, which moves about 13,620 cubic feet of air per minute at outlet; at face of mine, 12,350 cubic feet; number of persons employed inside, 75.

A new tunnel has been driven from the water level gangway into the Red Ash vein, from which they may be able to mine some coal in 1873.

R. R. Morgan, general superintendent; Wm. Thomas, assistant superintendent; Samuel Thomas, mining boss.

Old slope.—This slope is located a short distance east of the Brown's slope, on the same vein and nearly adjoining. There is also an underground slope to this mine. This mine is tolerably safe, there being but a small amount of gas generated, and there is a reasonably good current of fresh air circulated through the whole mine. Power used to create circulation is a fan 12 feet in diameter, which discharges about 30,000 cubic feet of air per minute. Number of persons employed inside, 93.

R. R. Morgan, general superintendent; Wm. Thomas, assistant superintendent; John D. Hughes, mining boss.

CONSUMER'S COAL COMPANY'S SHAFT, KINGSTON, PA.

East Boston Shaft.—No. 1 carriage dropped, first trial, 13¾ inches; second trial, 6 inches; third trial, 9½ inches. No. 2 carriage not used for hoisting or lowering persons.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY'S SHAFTS.

Avondale Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 1¾ inches; third trial, 1¾ inches. No. 2 carriage dropped, first trial, 1½ inches; second trial, 1½ inches; third trial, 1½ inches.

Boston Shaft.—No. 1 carriage dropped, first trial, 1½ inches; second trial, 1¼ inches; third trial, 1½ inches. No. 2 carriage dropped, first trial, 1½ inches; second trial, 1½ inches.

RIVERSIDE COAL COMPANY'S SHAFT, PLAINSVILLE, PA.

Enterprise Shaft.—No. 1 carriage dropped, first trial, 4 inches; second trial, ¾ inch. No. 2 carriage not used for hoisting or lowering persons.

LUZERNE COAL AND IRON COMPANY'S SHAFTS, PLAINSVILLE, PA.

Henry Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches. No. 2 carriage not used for hoisting or lowering persons.

Prospect Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches; third trial, 2 inches. No. 2 carriage not used for hoisting or lowering persons.

DELAWARE AND HUDSON CANAL COMPANY'S SHAFTS.

Pine Ridge Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches; third trial, 2 inches. No. 2 carriage dropped, first trial, 2 inches; second trial, 2 inches; third trial; 2 inches.

Conyngham Shaft.—No. 1 carriage dropped, first trial, 12 inches; second trial, 14 inches; third trial, 8 inches. No. 2 carriage not used for lowering or hoisting persons.

NORTHERN COAL AND IRON COMPANY'S SHAFTS, PLYMOUTH, PA.

No. 1 Shaft.—No. 1 carriage dropped, first trial, 2 inches; second trial, 2 inches. No. 2 carriage dropped, first trial, 2 inches; second trial, 2 inches.

No. 2 Shaft.—No. 1 carriage dropped, first trial, 3 inches; second trial, 2 inches. No. 2 carriage dropped, first trial, 3 inches; second trial, 2 inches.

No. 3 Shaft.—No. 1 carriage dropped, first trial, 3 inches; second trial, 2 inches. No. 2 carriage not used for hoisting or lowering persons.

No. 4 Shaft.—No. 1 carriage dropped, first trial, 6 inches; second trial, 2½ inches. No. 2 carriage dropped, first trial, 6 inches; second trial, 2½ inches.

WILKES BARRE COAL AND IRON COMPANY'S SHAFTS.

Dodson Shaft.—No. 1 carriage dropped, first trial, 6 inches; second trial, 6 inches; third trial, 6 inches. No. 2 carriage dropped, first trial, 6 inches; second trial, 6 inches; third trial, 6 inches.

Lance Shaft.—No. 1 carriage dropped, first trial, 5 inches; second trial, 4 inches; third trial, 6 inches. No. 2 carriage dropped, first trial, 6 inches; second trial, 6 inches; third trial, 6 inches.

PA Mine Inspection 1873

Avondale Colliery.

A new slope was sunk there this summer, and on my last visit there, on the 20th of December, I found them operating some eight or nine places in a new lift that they had just opened from said new slope, and not having completed their second opening, which they were driving, I requested them to suspend all mining of coal there until said outlet be through, which they promised to comply with, at once.

Gaylord Slope.

A new tunnel was driven in this mine from the Cooper to the next workable underlying seam called the Ross, and on my visit there, in December, I found several parties working there, besides those driving an outlet, which I ordered to be stopped, this being the second time I did so, Mr. Daniel Edwards, the managing partner and superintendent, promising to comply immediately that I called his attention to it. A second opening is to be made to said Ross seam by sinking a shaft to it from the next overlying seam.

Steam Boilers.

There were no explosions of steam boilers in this district during the year, hence no lives were lost. Notwithstanding all this, I am as fully convinced as ever that our present system of steam boiler inspector is anything but a proper and safe one, and I once more point out the threatening danger.

Legal Proceedings.

The cases of the Commonwealth *vs.* Daniel R. Davis, miner boss at Kingston No. 1 shaft, relating to the death of Richard Coon, who was fatally injured by fall of coal and slate, on the 14th day of November, 1877, as also that of Patrick Langan, the miner and partner of said laborer, came up before the court of Luzerne county, January 28, 1878. In the case of Langan, the jury brought in a verdict of not guilty, and directed that the county pay the costs. In the case of Davis, the jury brought in a verdict against the defendant, and recommended him to the mercy of the court. On the following day or so, his honor Judge Harding, after the intercession of the prosecutors' counsel, sentenced Davis to pay a fine of one dollar and cost of prosecution.

I would here state that the verdicts of these two juries took most people, watching the cases, by surprise, as every person could see at a glance that the miner was certainly fully as much, and more, to blame than the boss; yet he was exonerated of all blame, and the person who had called the miner's attention and instructed him to timber the place, was put in for costs and fine, and had it not been for the mercy of the court might have had to fare worse.

Coal Production for 1878.

The following are the items of coal production of the district for the year: Sent to market, 3,860,413 tons; coal sold as local sales and con-

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.

PA Mine Inspection 1879

which has improved the ventilation of that colliery greatly. For full description of the fan, see Table No. 1.

At the Baltimore tunnel, a new tunnel is now in progress, from the Baltimore to the Red-Ash seam. It is at present about twelve hundred feet in length, and is expected to go about three hundred feet further before striking the coal. It is intended for a mine locomotive to haul the coal out from this tunnel when completed, and is driven large enough for that purpose.

At the Conyngham shaft, the second opening is through, and a breaker is now in course of construction at the top of the shaft. By the time they will be ready to ship coal through the breaker, the gangways will be driven a goodly distance, and will have room to open a number of chambers, and give a good quantity of coal when they start.

Susquehanna Coal Company.

The No. 5 breaker, a large structure capable of shipping over one thousand five hundred tons per day, erected by this company at Nanticoke, was completed ready to ship coal on the first day of April, 1880.

A new fan was erected at No. 1 slope, a description of which is given in table No. 1. The ventilation of this mine was much improved by the erection of this fan, and is now in pretty good order.

At the grand tunnel, West Nanticoke, a new underground slope was driven down to a basin, which was a considerable distance below their workings. The slope is one thousand four hundred feet in length, and has an average grade of seven and a half degrees. It opened a convenient territory of excellent coal.

Delaware, Lackawanna and Western Company.

At the Avondale colliery a new underground slope was opened a distance of one thousand eight hundred and forty-five feet, on an average grade of twelve degrees. A large territory of excellent coal can be worked from this slope, and is convenient to the shaft.

They also drove a new plane, extending above their present workings a distance of one thousand four hundred feet, from which a large amount of coal is expected to be mined. This makes the fourth plane, one extending above the other, on the same pitch.

The Kingston Coal Company.

This company is sinking a new shaft near their present No. 2 shaft. The sectional area of it is twelve by thirty-three feet, and it is down at the time of this writing four hundred and seventy-five feet. They contemplate sinking it through the Ross and into the Red Ash veins, both of which are to be worked from it.

In the No. 2 shaft an underground slope was driven down to a length of one thousand three hundred and fifty feet, on a grade of one in twelve. They also drove a tunnel from the Cooper to work the Bennett vein.

PA Mine Inspection 1880

Ross and Twin veins, its total length being one thousand two hundred and seventy feet. This opens a large territory of coal.

The No. 4 slope was extended, reaching a point two hundred and eighteen feet below the old level, and opens a new lift of excellent coal.

A new colliery is to be opened at Morgantown, four miles west of Nanticoke. The shaft is 33′×12½′ area, and will have a probable depth of eight hundred feet to the Ross seam. A horizontal tunnel is being driven also to cut the same seam, which is seven feet high by sixteen feet wide, and is expected to cut the coal at a length of about one thousand two hundred feet. The shaft was down at the end of the year to a depth of fifty-six feet, and the tunnel was in from the opening a distance of seventy-five feet.

At the Grand Tunnel the water was pumped from the old No. 3 slope, and a new slope is being driven down from a point near the bottom of the old McFarlane shaft, which was, at the end of the year, down a distance of eight hundred and twelve feet below the line of the old workings. This will open an extensive area of coal of the Red Ash seam and of good quality.

The Wyoming Valley Coal Company.

At the Forty-Fort shaft an underground slope is in progress of being driven to work the coal lying below the shaft level. It was down, at the close of the year, a distance of nine hundred feet, on an average grade of seven degrees, and is still continued.

At the Harry E. colliery a new tunnel was driven from the surface to the Bennett vein, a distance of two hundred and twenty-five feet. Its size is 9′×7′, and it has cut the vein nine feet thick of excellent coal.

The Delaware, Lackawanna and Western Railroad Company.

At the Avondale colliery this company is sinking a new air-shaft, with a view of putting a fan on it to increase the ventilation of the underground slope. The shaft is 16′×12′ area, and was sunk to a depth of one hundred sixty-five feet at the close of the year. The underground slope has opened a large extent of workings, and the new fan will prove an effective addition to the ventilating power.

The Woodward shafts have not yet been completed, and it may take another year to complete their sinking. No. 1 was at a depth of five hundred and thirteen feet and No. 2 four hundred and eleven feet at the close of the year 1883. They are beginning to prepare for the erection of a breaker, and have partly graded the railroad beds leading to that structure.

The Pettibone shaft was started to sink on April 18, 1883, and after encountering great difficulties in passing through clay and sand, they have successfully reached the rock at a depth of eighty feet. The progress of this enterprise has been watched with unusual interest, because it was generally supposed that a shaft could not be sunk on the sandy flats, owing to its great depth of sand. This company contemplate sinking another shaft to constitute the second opening required by law, and it will be started in the course of a few months.

PA Mine Inspection 1883

At the Pine Ridge colliery a new double fan was erected to ventilate the workings of the Hillman and the Baltimore seams. The old fan was removed and the new one was placed at a distance from the shaft, so as to insure its safety in case the breaker takes fire. A passage is made, underneath the surface of the ground, leading from the shaft to the fan, through which the return air passes. This is arched by mason work, and is of sufficient area to pass a large quantity of air.

The Susquehanna Coal Company.

This company is making preparations to mine a large quantity of coal at the Newport colliery. A brief note was made of it in my previous report. The shaft is now at a depth of four hundred and ninety-five feet, having passed through four seams of workable coal, aggregating a thickness of twenty-six feet. A tunnel is also being driven which has reached a length of nine hundred and forty-two feet, having cut through three seams of coal in the first five hundred and eight feet; at which length it also cuts a fourth seam on the anticlinal axis, the thickness of which is not yet determined. The tunnel is continued across a small basin where more seams of coal are expected to be found.

Prepartions are in progress also to sink a slope to work the upper seams. The open cut and a short tunnel to an eight-foot seam is driven, and the slope will now be sunk in that seam, which promises to produce good coal. The coal from all these openings will be shipped from one breaker, which is now being erected, and bids fair to be the largest structure for the purpose ever erected in the anthracite coal region.

The No. 1 shaft, at Nanticoke, was extended from the Hillman to the Red Ash seam, and they are now driving a second opening, which is to be effected by holing into the workings of the No. 2 shaft.

A new fan was erected to ventilate a part of the workings of Nos. 1 and 2 shafts; the details relative to this may be seen in the table of new fans presented in this report.

The Delaware, Lackawanna and Western Railroad Company.

A new air shaft was sunk at the Avondale colliery of this company with the view of placing a new fan upon it to improve the ventilation. Its size is 12′×26″ and its depth to the workings of the Red Ash seam is two hundred and forty-one feet.

The No. 1 Woodward shaft is now at a depth of eight hundred and fifty-one feet, and is still being sunk. The No. 2 was sunk to a depth of one thousand and three feet, where it cut the lowest seam of coal supposed to be in the property. These shafts pass through several excellent seams of coal, and the capacity of these openings, when ready for mining coal, promises to be very large.

The Pettibone shaft is still in progress of sinking and has reached a depth of three hundred feet.

PA Mine Inspection 1884

Delaware and Hudson Canal Company.—A new opening was effected for the Conyngham colliery, connecting with the workings of the Baltimore slope, in October, 1887. It provides a convenient escape way for the workmen of both collieries, and makes everybody connected with those mines feel safer in case anything should happen to prevent exit through the main openings.

The No. 2 Baltimore shaft is now at a depth of over 500 feet, and is expected to cut the Red Ash seam at a depth of 670 feet. At No. 3, which is to constitute the second opening, gangways are being driven to open work, and to be ready to ship coal when the main shaft shall be completed

At the Boston mines the fan at No. 3 was applied to ventilate its workings, and it gives fair results. Still the ventilation of this mine is not satisfactory, but when the air-ways are fully prepared, an improvement is confidently expected.

Susquehanna Coal Company.—At the No. 1 shaft of this company two new underground slopes were sunk, one in the Forge seam and the other in the Buck Mountain. To avoid the trouble arising from the heat radiating from the steam pipes, the hoisting engines are located on the surface, and the ropes pass through bore-holes made for the purpose. Telephones and electric bells are used to converse and give signals.

At the No. 6 colliery, Glen Lyon, a new fan twenty-five feet diameter was erected. The engine is 24"x36", connected directly to the shaft of the fan. It is used to ventilate the workings of the shaft. The second openings for the workings of this shaft are now completed to each of the seams.

Kingston Coal Company—The new breaker erected at the No. 4 shaft of this company was started to prepare and ship coal in October, 1887, and has been running since. It is one of the largest structures in the district. It is heated throughout by steam, and is equipped with the most efficient machinery.

Delaware, Lackawanna and Western Railroad Company.—At the Avondale colliery a new fan was erected on the new air-shaft. It is an open fan sixteen feet diameter, connected with a horizontal engine by belt gearing. Under a ventilating pressure equal eight-tenth inch of water-gauge it is exhausting 137,600 cubic feet of air per minute. A new opening was made from the lower lift of the Red Ash seam to the Ross. It is a rock tunnel 226 feet long on a grade of 18½ degrees and 7x18 feet area. It opens an extensive field of this coal seam.

The new breaker at the Woodward shafts is nearly completed. Four cages are in operation in the main shaft, and workings are being opened in both the Bennett and Red Ash seams. Second openings are being driven in both seams to connect with the air-shaft.

West End Coal Company.—A new fan was erected on this colliery sixteen feet in diameter and connected directly with the engine. It is

PA Mine Inspection 1887

eter, was erected to ventilate the Boston mine, and it proved a very satisfactory appliance by increasing the ventilation to the desired extent.

Kingston Coal Company.

At the No. 1 shaft the endless-rope system of haulage was introduced, and it works well. I am informed also that the same system is contemplated to supersede a locomotive at the Gaylord mine, and that it will be adopted at each of this company's collieries at Edwardsville.

The new breaker at the No. 4 shaft laid idle throughout the year, but the main openings of the mine were driven and have opened a large territory ready for breast-work.

Delaware, Lackawanna and Western Company.

The Woodward shaft of this company is in progress of preparation for mining coal. Pumps are being put in place, and also the shaft cages. The breaker is also in course of erection, and it promises to be one of the largest producers in this region. At the Avondale mine a new fan, sixteen feet diameter, was placed on the new air-shaft. It works well, and is reported to exhaust 105,000 cubic feet of air per minute, under a ventilating pressure of eight tenths of an inch water gauge. To produce this pressure, it is running at a speed of eighty-five revolutions per minute.

Accidents in 1886.

The number of accidents causing injuries to workmen are still very frequent, but the number was less in 1886 than it was in each of the past five years, and we have good reasons to hope that the number will still be reduced in the future.

If the workmen, and especially the boys who are employed to drive and run cars, could be induced to exercise more care, the number of accidents could be greatly reduced. The rigid requirements of the new mine law were, no doubt, instrumental in bringing the number of accidents for 1886 down below its usual figure, and a more stringent enforcement of the rules laid down in that law would perhaps result in a further improvement.

There are serious disadvantages to a reduction in the list of accidents. The number of persons employed and the amount of coal produced increase every year, and if the number of accidents does not increase in the same proportion, a decided improvement is effected. And when we consider that the dangers of coal mining increase daily with the extension of the workings and the increase of depth in each mine, a non-increase in the list of accidents would be very gratifying, as well as an indication of improvement in the system of mining. The total number of serious accidents during the year 1886 was three hun-

Delaware, Lackawanna and Western Railroad Company.

At the Woodward colliery in the Bennet seam an underground slope was driven to a distance of 1,228′, and its sinking is still continued. Its grade is about 10°, and its sectional area 7′x16′. It was started east of the shaft from the level gangway in a southeasterly direction and it opens a wide extent of excellent coal.

At the Avondale colliery a new underground slope was completed and a new pair of hoisting engines were erected on the surface to hoist the mine cars from the slope. The cylinders are 30″x60″, connected directly to the crank of a parallel drum 9′ diameter by 14′ in length. The foundation of the engines and drum is built of concrete, consisting of broken stone one part, sand three parts and cement two parts. The rope passes down into the mine through a bore-hole 12″ in diameter and 238′ deep. Communication between the engineer and slope men is maintained by electric signals and conversation may be held by telephone. Everything is finished in good order and equipped for convenience and dispatch in doing the work.

Lehigh Valley Coal Company.

The Franklin colliery was leased by this company in March, 1889. Since then they have made many improvements which tend to make the mine safer and more productive. New pumps were put in the Old slope, and new steam pipes were put in from the surface leading through a bore-hole which effected a great improvement.

An air-shaft is being sunk from the surface to the workings of the Red Ash seam in the Rock slope. This shaft has a sectional area of 11′x15′ feet and is at a depth of 230′. In the meantime the necessary openings for connecting with the air-shaft are being driven, and will be ready when the shaft is finished.

Alden Coal Company.

In the Alden colliery a rock tunnel was driven from the Ross to the Red Ash seam from the shaft level. This tunnel is 1,035′ long and has a sectional area of 84 square feet. The Red Ash seam was found to be 7′ in thickness. The water level tunnel was also extended from the Ross to the Red Ash, and penetrated the latter at a distance of 195′. This tunnel also has 84 square feet of sectional area and found the seam 6′ in thickness. The workings of these tunnels are connected by a passage driven up from the lower tunnel.

An underground slope was made in the Ross seam 700′ long, on a grade of 20°. With the aid of this most of the coal between the lower and upper tunnels can be mined from the Ross seam.

PA Mine Inspection 1889

At the No. 6 shaft, Glen Lyon, another opening was effected by driving to connect with the No. 6 tunnel, and a part of this is utilized as a gravity plane, which has a grade of 30°. This was driven through disturbed faulty strata from the Ross seam and connects to the side of No. 6 tunnel.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

At the Avondale colliery the new underground slope on the Red Ash seam is being sunk. It extended below the lower level gangway a distance of 750′ on an average grade of 12°.

At the Woodward colliery a new slope was sunk on the Red Ash seam, from the east level gangway, a distance of 700′ on a grade of about 5°. A tunnel was driven from the same seam, west of the shaft, to the Ross seam a distance of 500′ and having an area of 7′×14′. Important improvements were also made in the ventilation of this colliery by erecting new air bridges of substantial brick work. This colliery is opened in excellent shape, and the officials spare no pains in having everything arranged in the best order.

Improvements by the Lehigh Valley Coal Company.

At the Franklin colliery a new air shaft, 8′×10′, was sunk near the outcrop of the Abbott seam and connecting with the workings of that seam. This effected a very desirable improvement in the ventilation of the thin upper seams of this mine.

Improvements by the Alden Coal Company.

The main shaft of this company was extended from the Twin to the Red Ash seam and has now a total depth of 586′. An underground slope has also been sunk in the Red Ash seam to a length of 1,741′ on a grade of 14°, the average dip of the seam. This work is chiefly in the Ross and Red Ash seams.

Improvements by the Plymouth Coal Company.

At the Dodson colliery a new slope was sunk through the rock across the strata from the Bennett to the Ross seam. Its area is 7′×15′ and its length 382′ on a grade of 21°. A second opening is now being driven and will be completed in a few weeks. The hoisting engine is located underground near the head of the slope and the engines are worked by compressed air taken down from compressors on surface.

Improvements by the Parrish Coal Company.

The Baltimore seam slope of this company was extended a distance of 700′ and opened a productive extent of excellent coal. They leased also the old Buttonwood shaft property and are at work enlarging the old shaft and making preparations to reopen the mine on a large scale.

PA Mine Inspection 1891

Improvements by the Susquehanna Coal Company.

At the No. 1 shaft a tunnel was driven from the "Forge" to the Hillman seam. It is 650 feet in length and 7×14 feet area. It is intended to work the coal of No. 2 slope through this tunnel and abandon the slope.

The workings of the Forge Vein No. 1 shaft were connected by a tunnel from the No. 2 shaft and it is intended to convey the coal from a part of the Forge Vein workings by that way, to the No. 2 shaft when necessary.

In the No. 4 slope a tunnel was driven from the Mills to the George seam on a grade of twenty degrees, to make a gravity plane. It is 300 feet in length and 7½×12 feet area. A second opening was driven to connect with the workings of the George seam in the No. 1 shaft, and from there an airway was driven out to the surface. Upon this airway to ventilate the George seam workings, a new fan was erected, 18 feet in diameter, which is exhausting about 50,000 cubic feet of air per minute. At the No. 6 shaft a rock gravity plane has been completed, extending up to the No. 6 tunnel. It is 700 feet in length on an average grade of 14 degrees.

A great deal of work has been done in enlarging the return airways in several of the mines of this company, which has effected a marked improvement in the ventilation in each case.

Improvements by the Kingston Coal Company.

At the No. 1 shaft a tunnel was driven 1,200 feet from the Bennett seam to what is supposed to be again the Bennett. Its size is 7½×11 feet. In the No. 2 shaft an outlet has been driven to the outcrop to be used as an intake and travelling way.

At the No. 4 shaft two underground slopes were completed in the Red Ash seam.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

At the Avondale mine each of the two underground slopes were extended, and they have commenced to drive a tunnel from the Red Ash to the Ross. Its size is 7×12 feet. At the Woodward colliery, a rock tunnel was driven from the Red Ash seam to the Ross, and continued to be driven to the Baltimore seam. Its length now is 1,200 feet, having an area of 7×14 feet. The two slopes, one in the Red Ash seam, and the other in the Baltimore, were extended to a length of 1,713 and 3,700 feet respectively, the Baltimore slope being the longest. This is now an extensive mine, well ventilated and kept in good order.

9-12-92

PA Mine Inspection 1892

the year. The hoisting engines for both these slopes are located on the surface, the ropes passing down through bore holes.

At the Boston colliery, several hundred feet east of the old shaft, a new shaft has been started. It is intended to sink it from the surface to the red ash seam. Its size is 12x33½ feet and it was sunk to a depth of 110 feet by the end of the year 1893.

The sinking of another shaft is in progress by this company about a quarter of a mile east of the No. 5 shaft. It was sunk at the close of the year to a depth of 115 feet. Its size is 10½x33½ feet.

Improvements by the Susquehanna Coal Company.

At the No. 1 shaft a slope was made through old workings a length of 1,400 feet on a dip of 8½ degrees; size 8x16 feet.

Another slope is being sunk in the George seam. Its size is 8x16 feet and it was at a length of 1,000 on an average dip of 8½ degrees at the end of the year.

A new tunnel was driven from the Forge to the Mills seam a length of 800 feet, and a size of 8x14 feet.

At the No. 4 slope, a tunnel 300 feet long was driven from the Mills seam and a rock plane was driven from the Mills to the George seam. Its length is 300 feet; grade, 20 degrees, and size, 8x14 feet.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

At the Avondale colliery a horizontal tunnel was driven through the rock from the red ash to the Ross seam. Its size is 7x10 feet and its length 300 feet. This opens a large area of the Ross seam.

At the Woodward colliery both underground slopes were extended, the one in the red ash seam a length of 306 feet to a total length of 2,019 feet and the slope on the Baltimore seam was extended a length of 372 feet, thus opening in each a new lift. The tunnel mentioned in last year's report, which is being driven from the red ash to cut the Baltimore seam was driven a distance of 486 feet. Its total length now is 1,686 feet. When this tunnel is completed it is intended to haul the coal of the Baltimore seam below a certain line in the slope out through it to the foot of the red ash shaft, where it will be hoisted to the surface.

The three new shafts in progress of sinking by this company in Hanover township are not yet completed. The Bliss shaft was at a depth of 669 feet. The Auchincloss No. 1 at a depth of 661 feet, and the Auchincloss No. 2 at a depth of 659 feet. The size of each shaft is 12x43 feet 3 inches.

Improvements by the Parrish Coal Company.

At the Parrish colliery a new air shaft was sunk to a depth of 60 feet, having a sectional area of 216 square feet. For the purpose of

PA Mine Inspection 1893

July and the new one worked ten days in November, 1895. A new twenty foot fan has been also erected instead of the old one at the air shaft. It is operated by a vertical engine. Running 62 revolutions per minute it exhausts 88,000 cubic feet of air with a water gauge of 1.8 inches.

The Lee Coal Company.

The Lee colliery passed out of the hands of the Newport Coal Company and into the hands of the Lee Coal Company. They sunk a shaft a depth of 200 feet and erected a fan seventeen feet in diameter, operated by a vertical engine. It was ready at the close of the year but had not been started. The colliery worked only twelve days in 1895.

Improvement by the Delaware, Lackawanna and Western Railroad Company.

Avondale.

A new air shaft 12x21 feet has been sunk, striking the Red Ash vein near the head of No. 2 slope workings to give it more effective ventilation and a sixteen foot fan was erected which, running 65 revolutions is exhausting 67,350 cubic feet of air per minute.

A compressed air pumping plant is being installed, consisting of a 14 and 23½x24 cross compound condensing Corliss engine with 17 and 28x24 Riedler air cylinders which is to furnish air at 150 pounds pressure to operate a cross compound Riedler pump, having plungers 5½ and 7¾x18.

This pump is to operate on a lift of 780 feet, taking the place of three steam pumps. It is expected also to reduce the temperature of the air and improve the effects of the ventilation.

Woodward.

A tunnel from the Red Ash shaft level to the foot of the Baltimore slope a distance of 2,700 feet has been completed.

A 35 foot fan of the same construction as described has been erected at Bliss mines, also a 16 foot diameter Guibal fan has been erected, the former taking the place of a 20 foot direct connected, and the latter a 16 foot open fan.

Both show much greater efficiencies, which together with their ability to run at higher speeds, have resulted in a marked increase in the ventilation. The 16 foot Guibal fan is driven from the engine by manilla ropes instead of a belt.

Bliss.

On September 17, 1895, this new colliery was started to prepare and ship coal for the market. It had been in course of construction

PA Mine Inspection 1895

The Baltimore No. 2, Delaware and Hudson Canal Company.

On Monday, December 21, 1896, a fire ignited by a blast in this mine required the flooding of the Red Ash slope workings. The fire being in a high part of the workings, a bore hole was drilled to let the gases escape so as to permit the water to fill to the highest points. On March 24, 1897, at 1 P. M., the bore hole broke into the mine and the confined gases instantly rushed up and were ignited by the boiler fire of the boring machine. The flame consumed the shanty and boring machine and threatened to destroy several houses in the vicinity. It made a flame eighty feet high, a mighty torch swayed by the wind. The fire department was called out and they had to work incessantly for a day and a half to save the houses. At 4 P. M., March 25, the flame was extinguished but the gas continued to escape for several weeks. Finally it ceased and the water in the mine filled to the hole.

By October, 1897, all the water was pumped out and the workings were found to have been entirely closed in by falls of roof caused by the action of the water. The slope is being remodelled and arranged so that the gangways will be above the old workings and in new ground. When this is completed this part of the mine will be much better arranged than the old one was.

A Squeeze and Serious Inflow of Water at the Avondale Mine.

Towards the middle of March, 1897, a squeeze began in the Red Ash seam workings west of the No. 1 inside slope in the Avondale Mine of the Delaware, Lackawanna and Western Railroad Company.

The seam was 22 feet in thickness and the workings in this part were old and had for years been abandoned but now they had just resumed working a block of coal formerly left as being too poor in quality to mine. The pillars were irregular and at some places the breasts were unusually wide and as usual in this seam the gobs were high.

By March 24th the squeeze affected the workings in the Ross seam directly over the seat of the trouble in the Red Ash seam. The rocks overlying the Ross workings cracked, and crevices were opened through which a stream of water flowed into the mine, which was estimated to be about 14,000 gallons per minute. It ran down into the workings of No. 3 slope which is a slope sunk from the lower lift of the No. 1 slope. It was evident at once that the pumps could not pump the water and they were taken up.

Dams had been already partially constructed across the gangway and airway leading into the workings connected with the Nottingham and these were hastily completed. By March 29th the No. 3 slope and its workings were submerged and it began to fill upon the dams. The next day the dams began to leak and the quantity leaking through

PA Mine Inspection 1897

increased as the water raised. By April 20 the water in Avondale had reached a height of 150 feet vertical above the dams and the leakage into the Nottingham had filled their entire workings below the seventh lift.

At this time it was apparent that the inflow of water had been materially reduced and the D., L. & W. Company decided to instal the pumps and make energetic efforts to control the water. It continued to rise in the Nottingham until May 8. The Lehigh and Wilkes-Barre by this time had installed more pumps than were needed at the fifth lift to hold it. The number of pumps necessary to hold it were started and it was kept at this height until September 13. The workings of six lifts were submerged. On this date they started to reduce the water and have unceasingly pumped day and night in both mines ever since. At this time it has been pumped down to the eighth lift in the Nottingham and to the level of the dams at bottom of No. 1 slope in the Avondale mine. The quantity of inflow has very materially decreased, being not more than one-half as much as it was when it broke into the mine, and it is confidently expected to decrease as much again as the crevices in the top works become filled with clay, etc.

The production of coal had to be suspended in both mines. One of the hoisting compartments in the Nottingham shaft had to be utilized for additional steam and column pipes required for the extra pumps, but after an idleness of two and a half months that part of the mine which was not occupied by the water was put in operation and the coal was hoisted by one cage. They have been hoisting about 400 mine cars per day. On October 7 work was resumed at the Avondale mines and they are working in the No. 2 slope and that part of the Ross seam workings lying to the rise from the shaft level. It is a question of only a few months before both mines will be producing their usual quantity of coal.

In the breaking in of the water at Avondale there is an ominous warning to all who mine under the flats of the Susquehanna river, of the possibility of enough water breaking into one of the mines to flood and ruin all the mines that are connected together. All the mines are connected from West Nanticoke to Edwardsville except the Woodward, and it behooves all to exercise extraordinary care in mining. The outcrops of all the seams are buried under the sandy flats between Nanticoke gap and the upper end of Plymouth, and to mine the coal in the approaches to these outcrops needs more than the ordinary care and even with the exercise of all possible care, a pot hole or deep crevice in the rock may be struck at any time to the ruin of all these mines.

PA Mine Inspection 1897

Avondale.—One 300-horse power McEven engine to one C. W. 200 K. W. Multipolar electric generator.

Bliss.—One 200-horse power McEven engine, directly connected with one Bullock 150 K. W. Multipolar electric generator.

One rock tunnel, 7x16 feet, from Forge to the Red Ash seam, 650 feet long.

Improvements by the Kingston Coal Company.

At the Nos. 1 and 4 shafts electric haulage was installed during the year 1900. The length of haul in each shaft is 3,500 feet. The motors are ten tons each in weight, 25 horse power, constructed by the General Electric Company. Each does the work of 12 mules and hauls 20 car trips on level road. The generator is located on surface. A McEven engine 22x24½ inches, 350 horse power. Multipolar generator operated by belt gearing. Voltage, 250. Full load, 275 volts. Speed, 450. Amperes, 727.

PA Mine Inspection 1900

Inside: New openings in Cooper seam, Shaft No. 1, in two places in No. 13 tunnel.

Enlarged main gangway from foot of No. 1 North Shaft to head of No. 9 Slope, and to No. 13 tunnel.

New bore hole, 960 feet deep, from surface to Lee seam, for No. 10 Slope hoisting rope.

Improvements at the Delaware and Hudson Collieries During 1902.

Plymouth No. 2.—Tunnel in G vein through fault 200 feet long, 7′x12′. Tunnel from Red Ash to top split, 275′ long, 7′x16′.

Outside: A Norwalk compressor, 24″x14½″x22″x24″, was installed for furnishing air for pumping.

Shaft No. 1.—A Dickson compound triple expansion pump, with a capacity of 3,000 gallons per minute, size of pump 15″x26″x16″x48″.

Shaft No. 3.—Tunnel from Red Ash seam to top split, 275′ long, 7′x16′. A 10″x48″x24″ Jeanesville pump was installed at the foot of shaft.

Outside: A new breaker engine, 16″x30″, was attached to the old one, changing it into a double engine.

Boston: Reopened tunnel and sank slope in the Bennett seam, and put in a pair of 24″x48″ haulage engines to take coal from the slope to the breaker.

Outside: Installed nine new cylinder boilers, 34″x36′ in length.

Placed one pair of engines, 26″x48″, at the bore hole to hoist out of plane from top split of Red Ash.

Improvements at the Alden.

A slope in the Cooper seam 550′ long to reach the basin.

Tunnel 100′ long from the Cooper to Hillman seams, 14′x7′ through the rock.

There has also been provided for cases of emergency two "Vajen's" improved head protectors.

Improvements at the Delaware, Lackawanna and Western Collieries During 1902.

Woodward.—A new steel trestle connecting the breaker with the shaft, and four batteries of Sterling boilers have been installed. One electric hoist and one electric motor have also been installed at this colliery.

Avondale.—One electric motor has been placed inside.

Auchincloss.—An electric breaker of 500 tons daily capacity has been placed in operation and is giving perfect satisfaction.

PA Mine Inspection 1902

Lance colliery.—Condition good as to safety, drainage and ventilation.

Reynolds colliery.—Condition good as to safety, drainage and ventilation.

Wanamie 18.—In safe condition; drainage and ventilation fair.

Wanamie 19.—Condition good as to safety, drainage and ventilation.

Plymouth No. 2.—Condition good as to safety, drainage and ventilation.

Plymouth No. 3.—Condition good as to safety, drainage and ventilation.

Plymouth No. 4.—Condition good as to safety, drainage and ventilation.

Plymouth No. 5.—Condition good as to safety, drainage and ventilation.

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

West End.—In safe condition; drainage and ventilation fair.

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

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

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

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

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

Kingston No. 2.—In safe condition; drainage and ventilation fair.

Kingston No. 3.—In safe condition; drainage and ventilation fair.

Gaylord.—In safe condition; drainage and ventilation fair.

Chauncey.—In safe condition; drainage good, ventilation fair.

IMPROVEMENTS DURING THE YEAR

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Avondale Colliery

This mine was flooded during the year 1902. This great accumulation of water has now been pumped out and the pumps lost during the flood have been recovered.

Jersey Mine Fire

This most disastrous and serious underground conflagration is known to the people of this region from one end to the other, on which volumes could be written, giving the experiences that we have met with and the difficulties we have had to contend with in fighting

PA Mine Inspection 1903

GEORGE F. LEE COAL COMPANY

Chauncey, in safe condition, drainage good, ventilation fair.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Avondale Mines

The following covers the work done at the Jersey fire during the year 1904, which consists in cleaning out an old breast driven from the water level gangway to what was presumed at one time to be the outcrop, but which proved later to be an air shaft or some similar opening, 79 feet deep from the surface. This shaft and breast was re-opened and cleaned and a concrete battery built upon the gangway road and the work of slushing in material was proceeded with, with the result that at this time but very little heat is escaping from any of the openings and crevices on this hillside from which formerly volumes of heat poured forth. On the evening of January 27, 1904, the heavy rains washed out the material that had been formerly slushed into the old Jersey slope for a distance of 75 feet. An investigation was made by Mr. Lewis and myself to ascertain the condition existing, with the gratifying results that where the heat at the top of the slope on the turn-table gangway had been so intense that it was almost impossible for a human being to live therein, icicles were now formed.

A very serious fire was discovered at 7 A. M. September 1, on the head of No. 1 slope Red Ash vein, which taxed the ability and ingenuity of all the officials of the D., L. & W. Coal Mining Department and the Mine Inspector of the District, with the result that on September 20, the last shovelful of burning material was loaded out, without any serious injury to any of the employes employed at this hazardous work, which was very gratifying to me indeed, as a fire could not have occurred in any worse place in any of the collieries of this district. A description as to how it was fought and finally vanquished would fill a good sized volume. I shall therefore not attempt to describe the methods adopted nor the conditions existing.

The installation of mechanical pickers, conveyor lines, new rollers for the preparation and cleaning of coal for the market, comprised part of the improvements. Concrete walls around main air shaft and around the Ross shaft or second opening were erected, and will prevent the water from flowing into these mines during periods of

PA Mine Inspection 1904

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

Inside.—Two bore holes from surface for steam pipes, two car hoists at foot of shaft, two compressed air motors for haulage.

Wanimie No. 18 Colliery

Inside.—No. 7 rock slope Baltimore to Ross, No. 12 tunnel extended, Baltimore to Cooper.

DELAWARE AND HUDSON COMPANY

Plymouth No. 2

No. 10 plane, Top split Red Ash, extended 800 feet.
No. 6 slope, Stanton, extended 300 feet.
No. 8 slope, Hillman vein, extended 150 feet.
No. 12 Rock plane, Stanton to Kidney vein, driven 330 feet.
Eight inch rope hole for No. 7 Stanton vein plane, 246 feet deep, and 12¼ inch x 15 inch engines installed.
Eight inch culm hole and crusher plant for flushing refuse into the mines.

Plymouth No. 3

Crusher plant installed, to break up refuse from breaker to be flushed into the mines.

Plymouth No. 4

No. 10 plane, Ross vein, extended 150 feet, and 10 inch x 12 inch engines installed for operation of same.
No. 9 plane, Bennett vein, driven through old workings 600 feet, and pair of 10 inch x 13 inch engines installed for operation of same.
Crusher plant installed for flushing purposes.

Boston

No. 12 Rock plane, from Upper to Lower Ross, 250 feet.
No. 9 plane, Top split extended 315 feet.
No. 10 plane, Top split extended 100 feet.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Avondale

Extensive breaker improvements made at this colliery. When repair work was begun on this structure it almost became necessary to rebuild the entire building, costing a large amount of money, with the result that the company has what might be considered a modern breaker on a small scale.

The work of changing the location of steam boilers from the Ross shaft to the main shaft will be completed early during the year 1906.

Connection is being made with the colliery to the Nanticoke Power Station, which will generate electric current for operating locomotives and hoists in this mine.

A 7x12 rock tunnel connecting Red Ash and Ross vein, 743 feet long on a 5 per cent. grade has been completed.

PA Mine Inspection 1905

Boston

No. 9 Plane, Top Split, Red Ash vein, extended 600 feet.

No. 13 Plane, Bottom Split, Red Ash vein, graded and driven 1000 feet, 600 feet of which was driven through fault cutting the Top and Bottom Splits of the Red Ash vein.

8 inch rope hole for No. 13 Plane drilled 225 feet and pair of 14x20 engines installed.

Air return in rock driven from Ross vein to Top Split of Red Ash.

Steel tower erected to take the place of frame structure over main shaft.

Condition of colliery is good.

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance No. 11

Outside.—Fuel conveyor.

Inside.—Compound condensing pump and rooms.

Condition of colliery is good.

Nottingham No. 15

Outside.—Colliery office.

Inside.—Duplex pump, 9th East.

Condition of colliery is good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Avondale

The appearance outside at this colliery has been considerably improved by the erection of a concrete retaining wall extending along the hillside from the breaker to the fan house.

The installation of feed water regulators, etc., in boiler room is a decided improvement over the old method of feeding the boilers.

Inside.—Two 7x12 short rock tunnels were driven on No. 4 East Gangway Ross vein, through fault.

The installation of a double motor electric hoist on No. 7 Slope, Ross vein, is a decided improvement over the old steam engine.

The erection of concrete piers, or props, in several places in this colliery might be worthy of mention.

Condition of colliery is good.

Woodward

Outside.—New steam lines from the boiler plant to ventilating fan, hoisting engines and power station have made a decided improvement in the outside appearance and efficiency of this colliery.

The breaker has been improved by the installation of mechanical pickers, rock crushers, etc., together with two Phillips steam dumps.

The brick partition separating hoist way and air way No. 2 Shaft was partly completed during the year; it is now completed. It has been a source of improvement to the ventilation of this colliery.

The erection of a steel bridge under this breaker over railroad tracks adds strength to the building and will prevent the building from getting on fire from sparks from locomotives passing under it.

Inside.—Two rock tunnels were driven connecting Cooper vein with 5 Foot vein and Red Ash with Ross vein.

A rock slope is being sunk from the surface to the Abbott vein. This work will be completed in 1907.

The erection of a concrete and iron air bridge, No. 2 Slope, Red Ash vein, has made a decided improvement in the ventilation of this section.

PA Mine Inspection 1906

DELAWARE AND HUDSON COMPANY

Boston Colliery.—General condition as to safety good.
Plymouth No. 2 Colliery.—General condition as to safety good.
Plymouth No. 3 Colliery.—General condition as to safety good.
Plymouth No. 4 Colliery.—General condition as to safety good.
Plymouth No. 5. Colliery.—General condition as to safety good.

PARRISH COAL COMPANY

Parrish Colliery.—General condition as to safety good.
Buttonwood Colliery.—General condition as to safety good.

PLYMOUTH COAL COMPANY

Dodson Colliery.—General condition as to safety good.

KINGSTON COAL COMPANY

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

GEORGE F. LEE COAL COMPANY

Chauncey Colliery.—No. 3 Slope, Ventilation and drainage good. Condition as to safety good.
Breaker Level Drift.—Ventilation fair, drainage poor. Condition as to safety good.

CHRISTIAN AND DAINTY COAL COMPANY

Hillside Colliery.—Ventilation poor, drainage good. Condition as to safety good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance No. 11 Colliery.—Inside: No. 24 Tunnel, Red Ash to Top Red Ash.
No. 23 Tunnel, Baltimore to Cooper.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Avondale Colliery.—The ventilating fan at the main air shaft was rebuilt during the year. Work of connecting Nos. 5 and 7 slopes, Ross vein, by a rock slope on a 20 degree pitch, is under way.
Two electric reel device locomotives were installed for transportation purposes.
The work of installing an inside electric sub-station No. 2 Slope, Red Ash vein, to be connected by the Nanticoke power plant by high tension lines through a 14 inch bore hole from the surface, is under way and will be completed early in 1908.
The work of installing a 500 gallon electrically driven centrifugal pump, Ross vein is under way.
The old steam engine at foot of No. 9 plane has been disposed of and a 160 H. P. electric hoist has been installed to take its place.

PA Mine Inspection 1907

Improvements were made to the boiler plant and were completed by the installation of a 1250 feed water heater and 2 feed water Duplex pumps, 18x16x8, making this steam plant equal to any other in the district.

A steel bridge crossing the railroad tracks near the breaker was built during the year and is a great improvement over the old wood trestle formerly in use.

Concrete retaining walls have been erected around the colliery, which greatly improve its appearance.

Woodward Colliery.—The work of sinking slope from Surface to Abbott vein has been completed. The work of development for second opening is now going on in this slope.

A rock tunnel was driven from Cooper vein to Five Foot vein and connection made with No. 1 shaft for second opening.

A rock slope was sunk through fault from Hillman vein to Hillman vein a distance of 600 feet on a 15 degree dip, and it is also connected with No. 1 shaft for second opening.

Five new air bridges were erected which have greatly improved ventilation.

The work of installing an electric sub-station near the head of No. 2 slope, Cooper vein, is now under way. The high tension lines will be carried from the Nanticoke power plant to this station through a 10 inch bore hole, sunk from the surface to the Red Ash vein, about 1000 feet west of No. 1 shaft. The current will be transformed at this point and used by the electric locomotives, slope hoists, etc.

The work of sinking what is known as Woodward No. 3 shaft was begun September 13. This is a four compartment shaft, containing one airway, one pump way and two hoist ways. It will be used to mine the coal in the upper seams and to lower the coal to No. 1 Tunnel level. From No. 1 Tunnel level the coal will be hauled to the foot of No. 1 shaft by electric locomotives and then hoisted to the surface. This opening will be very beneficial to the colliery, as it will result in releasing a large quantity of explosive gases that are now pent up under a very high pressure.

The work of sinking the caisson is being done by the Foundation Company of New York City, under the supervision of Mr. R. V. Norris, Consulting Engineer for the D. L. and W. R. R. Company. This, I presume, is the first time that work of this kind has been attempted in connection with the sinking of a coal mine shaft.

The work of sinking the caisson almost to the rock was very successfully carried on with but little trouble. However, a sudden rise in the river of about 10 feet in about ten hours, resulted in forcing considerable water through the clay and down along the caisson into the bottom of the shaft. The Foundation Company people did not think the matter a very serious one, but very little progress has been made within the last two or three weeks, as a large amount of water and sand is being pumped daily from this opening.

DELAWARE AND HUDSON COMPANY

Plymouth No. 2. Colliery.—Outside.—Pumping plant, 62′x26′, completed for entire division with tunnel to river 186 feet long, 8 feet wide and 7 feet high, to furnish water for boilers. Boiler house enlarged 36′x54′ and two new 78″ boilers, locomotive type, installed.

PA Mine Inspection, 1930

New brick blacksmith and carpenter shop completed; new brick oil house and hospital and new brick warehouse completed.

Fifty foot addition to stable.

Addition of 300 H. P ; B. and W. boilers completed for washery.

Electric haulage is now in service between the Red Ash vein and foot of slope.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Woodward Colliery.—The work of sinking Woodward No. 3 Shaft on the Kingston flats has progressed to a depth of 450 feet. The shaft will be completed during this year to the Baltimore vein.

The rock tunnels have been driven from the Cooper to Five Foot vein for development.

The work of installing the sub-station mentioned in last year's report has been completed, but it is not yet in operation.

The No. 2 Shaft hoisting engines have been equipped with new drums and clutch arrangement; also steam brake and reverse.

The three slide valve breaker engines have been replaced with three compound Corliss valve engines, in order to economize in the consumption of steam with very good results.

Four new concrete and steel air bridges have been built during the year.

Avondale.—The work of installing an inside sub-station mentioned in last year's report is now completed and is in operation and running order.

The Ross shaft has been abandoned as a hoistway and will be used hereafter as an air shaft only.

One concrete and steel air bridge has been erected on 4½ East lift, No. 2 Slope, Red Ash vein.

A rock tunnel was driven from Ross vein to surface for second opening to Ross and Red Ash veins.

DELAWARE AND HUDSON COMPANY

Plymouth No. 2 Colliery.—Rope hole, 93 feet deep, drilled for No. 7 plane.

Air shaft to Lance vein sunk 40 feet.

No. 9 slope, Top Ash vein, driven 340 feet.

Plymouth No. 3 Colliery.—Air shaft to Lance vein sunk 40 feet deep.

No. 9 plane, Station vein, extended 450 feet.

Plymouth No. 5 Colliery.—Slush hole for ashes drilled 448 feet deep.

No. 2 slope Cooper vein, rope hole drilled 177 feet deep.

Rock slope from Bennett to Cooper vein completed 350 feet long.

Four Emery slate pickers installed in breaker.

Boston Colliery.—New plane No. 6 driven from Boston to Plymouth No. 5 in Bottom Red Ash 4,200 feet long, to take Boston coal to Plymouth No. 5 breaker. Rope hole 446 feet deep drilled, and pair of 22 x 48 inch Dickson engines installed. Boston breaker has been abandoned.

PA Mine Inspection 1908

(c) Rock tunnel, Cooper to Lance, on shaft level gangway, connecting old workings of Lance vein, was completed.

(d) The work of grading over and through anticlinal at foot of No. 1 slope, Red Ash vein, is now under way and will soon be completed.

(e) Short rock tunnel on No. 3 West lift, No. 2 Slope, Cooper vein to Cooper vein through fault, completed.

(f) Also rock tunnel from Cooper to Lance vein, No. 3 East lift, No. 1 slope, completed.

The electric sub-station at head of No. 2 slope, Cooper vein, is now in operation. The high tension lines are being carried from the Nanticoke power plant through a 6-inch bore hole to this room, where the current is transformed and distributed to the various points along the haulage roads.

In addition to this, 20 concrete arches have been erected in No. 1 tunnel, Red Ash vein, to replace timbering on main haulage road.

A triplex expansion pump at foot of No. 1 Shaft, to pump the water to the surface, is now under way and will soon be completed and installed in a concrete and steel pump room of large dimensions.

Avondale Colliery, Outside.—A concrete storeroom has been erected of sufficient capacity to handle all the supplies at the colliery.

The work of installing a 25-foot ventilating fan for auxiliary purposes to main shaft is progressing very well and ought to be in operation during the early part of 1910.

A new concrete and brick mule barn is also under way, and, when completed, the present dilapidated buildings, located but a short distance from the barn now being constructed, will be torn down.

Inside.—The new sub-station in No. 2 slope has been placed in operation, the high tension line being carried from the Nanticoke power plant through a bore hole to the sub-station.

An additional 14-inch bore hole has been connected to the No. 2 slope electric pump 800 feet deep, through which the water is now being pumped to the surface.

Two concrete and steel air bridges have been erected in No. 8 slope, which has improved the ventilation.

The work of extending rock tunnel from Ross to Mills vein is under way.

A small shaft to connect Nos. 5 and 7 slopes is being sunk for the purpose of ventilating the old workings in these slopes by return air currents.

The mule barn near foot of shaft has been practically rebuilt with concrete walls and floor, and conditions have been improved very materially.

Dundee Colliery.—Operations were started at this point August 16 for the sinking of two shafts, 50 feet 2 inches x 12 feet in the clear, to a depth of about 920 feet, to what is known as the "Hillman vein." Both shafts have been sunk to a depth of 48 and 58 feet, respectively.

In connection with the sinking of these shafts and the development of this important property, there appeared in the Wilkes-Barre Record of December 13, 1909, some very interesting reminiscences regarding the sinking of the old Dundee Shaft located about 1,250 feet southwest of this locality. The following is quoted from the Wilkes-Barre Record of the Times of December 7, 1859, fifty years ago, when the old Dundee Shaft pierced the Mills seam at a depth of 810 feet:

PA Mine Inspection 1909

electric lamps, pulmotor, etc. They also have a trained corps of employes who are able to equip themselves with this apparatus at any time in case of mine fire.

The working of installing two 20-foot Jeffrey ventilating fans on Woodward No. 3 shaft has been commenced and will be completed in the early part of 1911.

A massive steel frame has been erected over No. 3 shaft.

Avondale Colliery.—Outside: Erected new locomotive house for mine locomotive.

Breaker improvements consisting of additional rolls, elevators, etc.

Inside: The work of extending rock tunnel from Ross vein to Surface vein was progressing very well until interrupted by the general "squeeze" referred to above.

The work of installing a 25-foot ventilating fan is now being held up on account of inside conditions.

Loomis.—The work of sinking these two shafts is being proceeded with and they have now reached a depth of 465 feet in No. 1 shaft and 375 feet in No. 2 shaft.

A 20-foot Jeffrey ventilating fan is being installed on the air drift, equal distance from each shaft, which will provide sufficient ventilation when the desired seams have been reached and connections made.

The shafts are 54 feet 2 inches in length by 12 feet in the clear, and are being timbered with wall plates and studdles from the concrete foundation wall to the bottom.

The outside improvements at these openings are of a temporary nature.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held at Plymouth, Willow Street School, April 19 and 20. The Board of Examiners was composed of the following members: D. T. Davis, Mine Inspector; Thomas R. Evans, Superintendent, Plymouth; William Toner, Miner, East Plymouth, and James Addis, Miner, Edwardsville.

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

Mine Foremen

John Cassidy, Plymouth; Daniel D. Davis, Kingston; James B. Lewis, Plymouth; Richard Lewis, Plymouth; Samuel Pritchard, Edwardsville; George A. Spare, Larksville; William Walters, Plymouth.

Assistant Mine Foremen

Edward P. Davis, Edwardsville; Thomas Dougherty, Plymouth; William Edwards, Plymouth; James Wolf, Plymouth; David J. Thomas, Edwardsville; Handel J. Jones, Wilkes-Barre; Thomas E. Jones, Plymouth; Addison Keating, Edwardsville; William King, Lee Park; Andrew Mahler, Plymouth; Thomas Morcom, Plymouth; John Mitchell, Plymouth; George McKechnie, Edwardsville; Joseph G. Morris, Edwardsville; William J. Morgan, Plymouth; John Nichols, Plymouth; John L. Picton, Plymouth; Timothy Price, Edwardsville; Charles Roberts, Plymouth; Thomas Rowlands, Edwardsville; William Russell, Courtdale; Thomas H. Rowlands, Plymouth,

PA Mine Inspection 1910

Avondale Colliery.—A new ventilating fan 25 by 8 by 8 feet, was placed in operation during the year.

The colliery resumed operations on a small scale during the month of November, after being idle the entire year, due to the subsidence that took place at this plant, by which a large quantity of water was permitted to flow into the workings from the bed of the Susquehanna River. The work of re-opening is being proceeded with as fast as conditions permit.

Installed in No. 1 slope, Red-ash vein, a 3,500 gallon centrifugal, electrically operated pump.

The colliery has also been equipped during the year with four Draeger helmets, and men have been trained in their use. This apparatus is kept in a small brick building, and is examined frequently by a man detailed for that work to see that it is kept in good condition.

Loomis Colliery.—The two shafts 50 feet 4 inches by 12 feet, sunk on this property have now reached the Hillman vein, 930 feet below the surface. Connections have been made between the shafts and preparations are being made for the erection of a 12-inch concrete partition separating hoistway and airway. When this work is completed and towers are erected, coal will be mined and shipped to Bliss colliery, Hanover township, for preparation.

The slope on 15 degree dip, which is being sunk from the Surface to the George vein, has passed through the upper seams and reached a depth of 645 feet.

A 20-foot Jeffrey ventilating fan is in running condition. Plans for the erection of breaker are under way, and work on the breaker will be started during the year 1912.

BRIGHT COAL COMPANY

During the year the Bright Coal Company put down a well on the property of John Barry. It is 327 feet deep and has a diameter of 6 inches and a capacity of 72 gallons per minute. It supplies the Company with sufficient water for all purposes.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the Willow Street School, Plymouth, April 4 and 5. The Board of Examiners was composed of D. T. Davis, Mine Inspector, Wilkes-Barre; H. G. Davis, Superintendent, Kingston; William Toner, Miner, Larksville; James Addis, Miner, Edwardsville.

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

Mine Foremen

Joseph Dzialdowski, Glen Lyon; Milton R. Edwards, David G. Jones, Charles E. Rowe, S. Fuller Reynolds, David J. James, David R. Humphreys, Plymouth; William W. Jones, John E. Morris, Edwardsville; William L. Richards, Courtdale; Edward W. Taylor, Charles T. Gallagher, Larksville.

PA Mine Inspection 1911

LEHIGH AND WILKES-BARRE COAL COMPANY

Nottingham No. 15 Colliery.—Inside: Built fireproof mule barn. Remodeling pumping plants, No. 1 slope. Completed rock manway from surface to Ross vein at Reynolds.

Outside: Completed mule barn at Reynolds, steam line to River pump and bore hole.

Lance No. 11 Colliery.—Inside: Completed fireproof mule barn. Installing concrete and steel timbering in No. 4 tunnel and shaft landing and also in small engine and pump rooms. 12-inch bore hole for steam line to shaft level pump; Tunnel for air return, Stanton to No. 2 air shaft.

Inman No. 21 Colliery.—Finished development in Baltimore vein.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Woodward Colliery.—Completed the installation of, and put in operation the 20-foot ventilating fan on No. 2 shaft to take the place of two 16-foot ventilating fans. The new fan is giving much better results than the old ones gave. The work of sinking a slope on the Five Foot seam is under way, and a rock tunnel has been driven for a second opening from No. 3 East lift, No. 1 slope, Lance vein to Cooper vein.

Avondale Colliery.—The work of reopening this colliery after the squeeze of 1910 in the Red Ash vein is about completed. The Ross vein, however, is still under water. Completed the work of installing large capacity centrifugal pumps, electrically operated, in Red Ash vein. Preparations are now being made for the installation of larger capacity pumps in the Ross vein, by which this seam will soon be unwatered.

Loomis Colliery.—The work of development is going on as fast as circumstances permit. Gangways are being driven east and west of Nos. 1 and 2 shafts in the Mills and Hillman veins. The work of installing and electrically operated plunger pump at the foot of No. 2 shaft is under way. The buildings for the housing of the shaft hoisting engines, mule barns, store room, boiler house, etc., are under way and will be of fireproof construction.

Along the old river road they are erecting large and commodious houses as residences for the foreman and their assistants.

This Company made special effort during the year to reduce the number of accidents in and about the mines. Notices have been posted at the mines calling attention to the fact that "safety is the first consideration," and the pay envelopes have also been printed with the inscription "Safety First Consideration."

PARRISH COAL COMPANY

Buttonwood Colliery.—Inside: Completed 3 concrete engine houses. Built new pump room at foot of shaft, also repaired and concreted the other two pump rooms. Built concrete barn in Abbott vein and one in Stanton vein. Drove 2 rock tunnels through a fault in Stanton vein, each 100 feet long, for production. Extensive work on No. 11 slope in Stanton vein to shorten haulage and place engine. Silting in Abbott vein to strengthen pillars near shaft.

Outside: Washery was completed.

PA Mine Inspection 1912

Avondale Colliery.—The work of reopening this colliery after the squeeze of 1910 is not yet completed. The major portion of the workings in which there is virgin coal is in fairly good condition. The Ross vein section, No. 5 slope, is still under water. A large centrifugal electrically operated pump will be installed to remove the water and the mining of coal will be continued.

Loomis Colliery.—The work of development at this colliery is under way; the coal is being shipped for preparation to the Bliss colliery. Installed shaft hoisting engine and steel shaft head frame. The foot of the shaft openings in the Hillman vein is being equipped with concrete side walls and I beams, and single passageways for persons to travel from waiting rooms to foot of shafts when about to be hoisted to the surface. All the work is of a very substantial and permanent character.

The buildings on the surface are of concrete and brick construction.

A 20-foot multi-blade fan is being installed.

The work of widening out the old Dundee shaft to the Mills vein will soon be started. It is also proposed to sink a four compartment shaft from the surface to the Hillman vein, a short distance south of Butzbach's landing, the coal from which will be prepared at the Loomis breaker now under construction. This breaker will have many unique features. It will be constructed of reinforced concrete from the surface to the pocket lines; the rest of the building will be of steel and wired glass. It is intended to make it as nearly fireproof as possible. It is also to be a very large producer. 6,000 tons of coal per 9 hour day will be shipped to market. The company has a large undeveloped territory of coal surrounding these openings. The boiler plant and other equipment will all be of the latest design.

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—Completed a 12-inch concrete, reinforced steel partition from the Ross vein to the Orchard vein close to the surface and the old wooden brattice was removed from No. 3 shaft.

Installed an 8 by 25 foot double intake fan at the Old slope, driven by 18 by 30 inch direct connected Corliss engine, all encased in concrete, reinforced steel building and connected by concrete upcast to the fanway at the outcrop of the Eleven Foot vein.

Built an addition 22 by 68 feet to the miners' wash house at No. 2 shaft. The wash house is now equipped with six showers, a battery of twelve wash stands, twenty-eight tubs and two hundred and eighty-eight lockers.

Completed a pump discharge bore hole, 315 feet deep, from the surface to the Checker vein No. 3 shaft, dispensing with the cast iron culm line in the shaft.

Completed the addition to the boiler plant at No. 2 and installed 300 H. P. B. and W. boilers; also transferred from the washery and installed at No. 2 300 H. P. B. and W. boilers.

The boiler house is covered by steel truss galvanized iron roof and Pond steel continuous sash ventilator frames.

Gaylord Colliery.—The pump and boiler at the river for supplying wash water were replaced by an Aldrich vertical triplex pump 11 by 12 inches, with a 50 H. P. A. C. electric motor.

PA Mine Inspection 1913

Lance No. 11 Colliery.—Inside: Completed No. 8 slope, Top Baltimore to Bottom Baltimore; No. 28 slope, Bottom to Top Red Ash; and No. 29 tunnel, Top Baltimore to Five Foot. Installed a 10 inch by 36 inch compound pump in Hillman vein.

Parrish No. 23 Colliery.—Inside: Completed No. 1 slope, Baltimore to Baltimore; and built a new barn. Installed electric haulage on 2nd West Baltimore and a centrifugal pump and gravity water pipe to No. 14 tunnel.

Buttonwood No. 22 Colliery.—Inside: Completed No. 10 tunnel, Kidney to Abbott; No. 11 tunnel, Stanton to Stanton; and No. 12 tunnel, Surface to No. 6 vein. Installed electric haulage on shaft level and 2nd East, No. 2 plane; also new pumping plant on shaft level.

Outside: Erected colliery shop, breaker engine-house hoisting house, timber yard and saw mill. Reconstructed the power plant and boiler plant. Installed electric haulage, Buttonwood to Inman No. 21, and breaker wash pump and reservoir.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Woodward Colliery.—Steam generators have been replaced by electric motor generators. Electric power is being generated at the Nanticoke power plant and transmitted by high tension lines, transformed and stepped down as necessity demands at the colliery.

Concrete walls and I beams have been placed around the shafts, thus reducing the fire risk considerably. Completed several rock tunnels for development and ventilation purposes.

Installed two 20-foot fans outside.

Loomis Colliery.—Completed a new shaft known as Loomis No. 3, near Butzbach's Landing, from surface to Hillman. Preparations are being made for the widening out of the Old Dundee shaft.

Avondale Colliery.—Completed reopening of the Red Ash vein; also second opening for No. 9 tunnel, Ross to Hillman, to be connected at the Five Foot vein. The Ross vein section, No. 5 slope, is still under water. Installed pumping equipment to remove the water from this colliery, the flooding of which was caused by the inflow of a large quantity of water from the Susquehanna River bed after the squeeze of November, 1910.

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—Inside: Completed two tunnels, one from Cooper to Bennett vein, and the other from Cooper to Lance vein, for haulage and second opening, also a tunnel in No. 3 shaft through roll in the Eleven Foot vein. Installed an electric hoist in No. 1 plane, Ross vein; and a new system of culm and surface clay and rock flushing. An emergency hospital was built near the main turnout of the Eleven Foot vein in the slope. The sides around the foot of No. 2 shaft were reinforced with concrete-steel.

Outside: Installed a new 6-inch bell mouth water line, 2,400 feet in length from fresh water tanks for fire emergency, and a new 8 inch by 6 inch by 10 inch Scranton Duplex pump. Fitted up brick

PA Mine Inspection 1914

tunnel airway, Abbott to Abbott; No. 15 tunnel, Baltimore to Five-Foot; No. 9 rock plane, Stanton to Hillman, and rock slope on shaft level.

Outside: Completed an oil and lamphouse, washhouse, lumber shed and motor house. Installed a 27 by 40 by 22½ by 30 inch air compressor and fuel conveyor.

At the Parrish, changes were made to breaker so as to connect with washery operations. Completed lamphouse and inside foreman's office, oilhouse and blacksmith shop.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Avondale Colliery.—Completed rock tunnel from Ross vein across measures to Hillman vein, a distance of 1650 feet, and made a second opening for same; also rock tunnel through fault in No. 10 slope and rock return airway, parallel with No. 2 slope, to assist in ventilating the live workings. Built a blacksmith and carpenter shop of concrete and brick. Installed pumps for unwatering the mine workings flooded in November, 1910, and pumping equipment in No. 5 slope section of Ross vein. The installation of this pumping equipment has been very costly and the expense of reopening the colliery shows that to mine anthracite coal in the Wyoming Valley requires capital, as the dangers from flooding are quite imminent.

Loomis Colliery.—This colliery is, perhaps, the most wonderful operation of its kind in style and construction, that has ever been erected in the anthracite region. The breaker building and annex or washery is practically fireproof, and is constructed of concrete, steel and wire glass, and all the other buildings are most modern in their equipment. The breaker will be completed during the year 1916. It is electrically operated, with separate units, and is expected to have a large capacity. There are already miles of gangway developed, so that a large tonnage might be expected as soon as the breaker is placed in operation. The work of sinking No. 3 shaft, near the Susquehanna River, is underway. The shaft will be sunk to a depth of about 660 feet to the Hillman vein. The old Dundee shaft is also to be widened and sunk to the Ross vein bed.

Woodward Colliery.—Preparations are now being made to reconstruct the breaker of concrete, steel and wire glass; this building was placed in operation during the year 1888. It has been a large producer for the past ten years. It was the first breaker that prepared 1,000,000 tons of coal in a year, which was accomplished in 1905. Side walls are being built and "I" beams placed for roof support, instead of ordinary mine timber along the haulage roads. This is in line with the progressive movement established some years ago by this company. Completed the driving of rock tunnels for the necessary development and transportation of the coal.

DELAWARE AND HUDSON COMPANY

Plymouth No. 2 Colliery.—In November the breaker was abandoned and the coal is now being prepared at Plymouth No. 5 breaker. Completed a tunnel, 290 feet, from the Stanton vein to the Hillman vein.

PA Mine Inspection 1915

Installed machines, tools, etc., in machine shop. Built bridge to No. 3 shaft. Installed one 500 rotary converter, transformers, etc., loaded and retail scales, main conveyor line from Nos. 1 and 2 shafts to breaker. Placed a concrete floor in compressor and fan house.

Avondale Colliery.—Built a blacksmith, carpenter and machine shop.

Truesdale Colliery.—Completed rock tunnel, 453 feet, in Bottom Red Ash vein; rock tunnel, Mills to Hillman vein, 222 feet in length; rock skip No. 4 west airway, No. 1 slope, Mills vein; surface rock slope, No. 20 tunnel, length 780 feet; rock plane from George to Mills vein, length 249 feet; Rock tunnel, Red Ash to Ross vein, No. 2 slope, length 72 feet; rock tunnel, No. 3 slope, for passing branch, length 87 feet; extension of No. 9 slope in rock, length 363 feet; extension of No. 8 tunnel, Cooper to Hillman vein, length 370 feet; second opening rock plane from Top Red Ash to Ross vein, length 61 feet; second opening to No. 2 west lift, No. 6 slope, Hillman to Mills vein, length 87 feet.

Installed one 500 steam hammer for blacksmith shop; motors in three small air hoists; 7-ton locomotive with reel, etc., in No. 2 East lift, No. 6 slope; 7-ton locomotive with reel, etc., in No. 1 slope, Mills vein; 7-ton locomotive with reel, etc., in No. 3 east lift, No. 7 slope; and steam hoist for Forge vein plane, No. 1 tunnel.

LEHIGH AND WILKES-BARRE COAL COMPANY

Sugar Notch No. 9 Colliery.—Completed No. 31 tunnel, Twin to Hillman; No. 33 tunnel, Five Foot to Hillman; No. 34 tunnel, Red Ash to Twin; and No. 32 tunnel, Twin to Hillman.

Maxwell No. 20 Colliery.—Completed No. 31 tunnel, Red Ash to Ross; and No. 30 tunnel, Hillman to Kidney.

Buttonwood Colliery.—Completed No. 10 tunnel and tunnel airway extension to Abbott; tunnel No. 4 to No. 4 vein, and No. 16 tunnel, Abbott to Abbott.

At Inman No. 21 shaft, completed concrete and steel timbering, Hillman shaft level.

Outside: Installed one 32 by 48 inch duplex Corliss valve shaft engine for Hillman shaft, and also one for Baltimore shaft at Inman No. 21. Also built a brick engine house. Two steel head-frames, one for Baltimore shaft and one for Red Ash shaft, were built.

At Parrish washery, a 600 H. P. boiler plant was installed for Parrish slope.

LEHIGH VALLEY COAL COMPANY

Warrior Run Colliery.—Built a new concrete hospital in No. 4 tunnel level.

Outside: Constructed 2,000 feet of new 4 by 8 foot flume to carry creek and surface waters. The old flume was destroyed and washed out by cloudburst of June 27, 1916.

Franklin Colliery.—Completed No. 33 tunnel, from Baltimore to Sump vein; extension of No. 34 tunnel from Ross to Skidmore vein. Started driving No. 35 tunnel from Skidmore to Skidmore; No. 36 tunnel, from Skidmore to Skidmore through an anticlinal; No. 37 tunnel, Sump to Sump vein through fault; and No. 11 tunnel, on No. 4 tunnel level to the breaker.

PA Mine Inspection 1916