

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.

25,500 cubic feet; amount at face of mine, 23,300 cubic feet per minute. Number of persons employed inside, 80.

Daniel Reese, mining boss; Jno. T. Griffith, mining superintendent; Wm. Smyth, assistant; Geo. H. Parrish, general superintendent; F. Tiffeney, assistant.

Gaylord slope.—This slope is located in Plymouth borough. It is sunk across the measures and has its bottom opened out on the Cooper bed and has a tunnel into the Bennet vein. The body of its present workings are in the Bennet seam, the Cooper not proving as good as it does in other localities. On the western end of the mine the two seams, Bennet and Cooper, are united into one large vein, not having more than six inches of slate between the two beds.

Condition.—This mine is a very safe one, has good roof and does not generate any fire-damp. Many important improvements have been made in this mine during the time that this company has had possession of it, such as the putting up of a fan 15 feet in diameter; the laying of new roads; building of stone and mortar stoppings instead of wooden ones, as heretofore; new air-ways, cut through the solid rock, and a new set of steps put in alongside the slope for a traveling road, with a row of ten-inch timber thickly set between the traveling and the hoisting road, and planked on the side nearest the car with two-inch plank; this makes a tolerably good traveling road, about as good as can be made when placed in the slope as this is—a very unfit place to have a traveling road if it can be avoided; but when a slope is sunk through rock it is difficult to overcome this matter.

Ventilation is tolerably good. Amount of air at inlet, 35,200 cubic feet per minute; amount at face of mine, 32,600 cubic feet per minute; number of persons employed inside, 115. George Pickton, mining boss; John T. Griffith, mining superintendent; William Smyth, assistant; George H. Parrish, general superintendent; F. Tiffeney, assistant.

New shaft.—This is a new shaft just being sunk. It is down about 50 feet, and ready to put in the permanent timber. Dimensions, 46×13 feet. It is intended to reach the Red-Ash vein with this shaft at a depth of 50 feet. Officers in charge, Smyth, Griffith, Tiffeney and George Parrish.

The following new breakers are being built by the Wilkesbarre coal and iron company: One at Sugar Notch, which is almost ready for operation at present; one at the Diamond shaft, which will be ready early next spring. Besides the above, the Lance breaker, now being remodelled, will be ready for operation next spring.

LOCAL OPERATIONS.

There are some nine of these that I have a record of; most of them, however, work only during the winter months.

MESSERS. DAVIS & Co.'s COLLIERY.

This mine is located a short distance north of the West Pittston old shaft. It is a small opening just being opened on the water level to supply a local trade. Employs 14 persons inside and 9 outside. Mr. Joseph Davis, mine boss.

PAYNE PETYBONE'S DRIFT.

This is a small drift located on the back north of the town of Wyoming. It is worked only during winter to supply a local trade. Wm. Jones, mining boss.

MOSS & POLLOCK'S DRIFT AND SLOPE.

These mines are located a short distance west of the Petybone drift, on the back road, and work only during the winter months to supply a local trade.

NEW SHAFTS NOT YET COMPLETED.

Wilkes Barre Coal and Iron Company's, No. 14, shaft near Gaylord slope, Plymouth, Pa. This is a large shaft and is intended to work the Red Ash seam, and to be connected to the Nottingham shaft where the seam is being worked.

Hollenback Shaft is located within Wilkes Barre city limits, a short distance east of Market street, near the P. R. R. This shaft will penetrate the Baltimore seam, in the early part of 1874.

South Wilkes Barre Shaft.—This shaft is intended to win the coal of the Baltimore seam, which is thought to lie at a depth of about 500 or 600 feet. It is also intended to commence a second shaft at a distance of 150 or 200 feet west of the present shaft for a second opening to the former.

Audenried Shaft.—This shaft, although the sinking has been completed, will not be ready to hoist coals for some time to come, as it needs timbering and lining beside, that there is no coal breaker yet ready. This shaft is the deepest in the Wyoming valley—the Dundee not excepted—the latter being 810 feet and the former being 892 feet. The plan of the proposed breaker indicates that the coal will be hoisted over one hundred feet above the pit mouth, making a total hoist of over 1,000 feet; the hoisting to be done with first motion engines.

Riverside Coal Company's New Shaft, near Port Bookley slope, Plainsville.—This shaft was commenced in 1872, but operations since suspended have just been again resumed. It is now in contemplation to continue sinking until it reaches the Baltimore seam, which lies at a depth of several hundred feet below the surface at this point.

Susquehanna Coal Company's Shaft, at East Nanticoke.—Shaft No. 1 is located a short distance south of the village of Nanticoke, and alongside that branch of the Susquehanna railroad connecting Nanticoke, New Port and Wilkes Barre. The said shaft is 42 feet 4 inches by 13 feet 4 inches, to be divided into suitable compartments. It is calculated that this shaft will cut the Baltimore seam at the depth of about 700 feet, and then to continue one part of said shaft still downward until the Red Ash is reached, getting a second opening for the Baltimore seam by connecting with No. 2 slope, and for the lower seam by driving up to No. 1 tunnel workings.

No. 2 Shaft.—This shaft is located a few hundred yards north of the old mill, and close to the pond connecting with the water of the Nanticoke dam. Some dredging has been done, no doubt preparatory to bringing in their canal boats to this point. It is intended that this shaft also be sunk to the Red Ash seam, but it will not require so deep a shaft at the point where No. 2 is located as it will where No. 1 is located, as some of the overlying strata at the latter place is missing at the location of the former.

Luzerne Coal and Iron Company's Oakwood Shaft.—This shaft is intended to be a second opening for the Prospect shaft, and is down at present about 300 feet; will probably reach the Baltimore seam in 400 feet more, or a total depth of 700 feet.

Northern Coal and Iron Company's New Shaft, near No. 3 Shaft.—This shaft is intended to serve for a second opening for No. 3 shaft, and may be completed during 1874.

OLD SHAFTS BEING SUNK DEEPER.

Northern Coal Company's No. 4 Shaft, Swetland.—The company is having things prepared for the purpose of sinking this shaft from their Bennet or Baltimore lower bed to the Red Ash seam, a distance probably of about 300 feet or over.

Avondale Collery.

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-

GAYLORD CO. & COMPANY.—This company has begun the sinking of the new shaft located near the slope, and which had been commenced by the Lehigh and Wilkes-Barre Coal Company several years ago, and operations suspended during the panic. The said new shaft is to be continued to the red ash seam, which will be reached about the same vertical depth as that of the Nottingham shaft, where the same seam is being worked, and it is probable that the second opening, required by law, may be secured by driving to and connecting with the said Nottingham workings, which have already been driven a long distance eastward from the Nottingham shaft. The same company is erecting a large and convenient coal breaker at the said colliery, on the site of the old one which was destroyed by fire. The new breaker is intended to clean and prepare the coal from the slope and the shaft, and will be a great assistance to the already large and thriving business of the town of Plymouth.

KINGSTON COAL COMPANY.—The most interesting part of their improvements, has been the sinking of a new shaft, located near No. 2 shaft, which is to penetrate the red ash seam, and is to be used as hoisting and ventilating shaft. This shaft is down at present below the Baltimore seam, both splits, and from present indications will be completed early next year. A large fan, twenty-five feet in diameter, has been partially erected at the head of said new shaft. The writer endeavored to have the superintendent, Mr. Daniel Edwards, to erect a larger fan—not less than thirty feet diameter—but for reasons best known to himself, decided upon the size above mentioned, which no doubt will answer all purposes for a few years at least, unless a very large quantity of explosive gas should be met with there. The same company contemplates the sinking of another shaft soon, near the No. 1 shaft, also to the red ash, when a connection will be made between the same and the one at No. 2 shaft.

WADDELL, OR RAUBVILLE COLLIERY.—What was formerly known as the Ellenwold colliery, has been divided into two parts, and is being operated by two separate parties. The western part, better known as the drifts, has been leased by Messrs. Waddell & Walters. At the said drifts a small breaker has been erected to prepare the coals from the same. There being four of them, two on the red ash and two on the Ross seams.

The new company commenced to ship coal in June, and shipped about thirty thousand tons.

I did expect to have been able to report the erection of one or two fans at this colliery, as the officers and operators had promised to do so faithfully; but I am sorry to say, that they did not live up to their promise, although the condition of the workings required it, and only through the tolerance of their workmen, could they expect to work, together with the promise of improvements to the inspector, which he, like the workmen, depended upon, to be once more disappointed. It would appear that fair promises, to be disregarded at these drifts, are contagious. I hope we may soon have a change, and that by the time another report is due a better state of

The Gaylord Coal Company.

This company is sinking a very large shaft near their present colliery in Plymouth. It is twelve by forty-eight feet, and is to cut all the veins from the surface to the Red-Ash. They are down now a depth of four hundred and twelve feet, and have gone through the Cooper, Bennett, and Ross veins

J. H. Swoyer.

At the Forty Fort colliery the shaft was extended down from the Bennett to the Ross vein, a distance of two hundred feet, and is now beginning to open on that vein. At the Wyoming colliery an underground slope was driven down one lift.

W. G. Payne.

At the East Boston colliery a new tunnel was driven a distance of one hundred and fifty feet, from the Bennett, to work the Cooper vein.

Plymouth Coal Company.

The Dodson shaft, of this company, was extended down a depth of one hundred and eighty feet and struck an excellent vein of coal, which is believed to be the Baltimore. This mine is about finishing to work in the Bennett vein, which was thought to be a split of the Baltimore, and the discovery of the vein just struck was a very agreeable surprise. It is sixteen feet thick, and the coal is of excellent quality. The second opening, at this writing, is down ninety feet, and will soon be sunk into the new vein, when communication will immediately be made with the workings from the shaft.

NEW FANS ERECTED DURING 1880.

The importance of furnishing the means for supplying good ventilation is more fully realized every year, and it is very gratifying to see the increased efforts made towards improvements in the construction of the ventilators.

Ten new fans have been erected in this district during the last year, and they are all giving excellent results, which amply compensate the expenditure made in their construction. Two of them are thirty-five feet in diameter, viz: The one erected at the Hollenback shaft by the Lehigh and Wilkes-Barre Coal Company, and the other at Mill Creek slope by the Delaware and Hudson Canal Company.

A plan of the Hollenback fan is kindly furnished for this report by Mr. Thomas R. Griffith, one of the company's mining engineers, and it gives a very full description of it, to which the reader is referred. It is erected upon a massive foundation of mason-work, and has a brick-house covered with sheet iron roof. It is running at a speed of twenty-five revolutions per minute, and is exhausting one hundred and twenty-five thousand cubic feet of air per minute with a half inch of water-gauge. Another fan of the same dimensions was previously erected upon this colliery, but was not built on so substantial a foundation. Both are kept running at low speed,

new double fan was erected to supersede their old furnace. The fans are seventeen and a half feet in diameter, and fastened on the same axis, about eight feet apart; a plan of which is kindly furnished for this report, which can be seen in connection with the report of tests of the fan.

The breaker formerly at Young's slope was removed and erected at the Conyngham shaft. It was completed by August 13, when they began shipping coal. When the colliery is fully opened they will be able to put out about seven hundred tons of coal per day. About twelve years have elapsed since ground was first broken to sink this shaft.

Susquehanna Coal Company.

A tunnel was driven in No. 1 slope, from the Red Ash seam to the Ross. Its length is four hundred and eighty-seven feet, and size seven by ten feet. The coal is thin, but of good quality. Another tunnel is in progress lower down on the dip, in No. 2 shaft, to cut the same vein. A slope is also in progress of sinking in this shaft, towards the basin. It is down, at this writing, four hundred and eighty feet from the gangway level, near the bottom of the shaft, on a varying grade of from seven to twelve degrees.

Kingston Coal Company.

This company's new shaft, at Kingston, is down to the Red Ash vein, and has cut, in all, five seams of good workable coal. The Red Ash, at the point cut, is six feet thick. A tunnel was driven in No. 1 shaft, from the Cooper to the Bennett seam, which is ten feet thick, and has opened a convenient section of coal of good quality. The tunnel is two hundred feet in length.

Gaylord Coal Company.

The Gaylord shaft is completed to the Red Ash vein, and has cut three veins hitherto not worked in this track, viz: Bennett, Ross, and Red Ash seams. They are now working to effect second openings, which will be accomplished in about three months. The shaft is forty-seven by twelve feet area, and five hundred and seventy-five feet in depth. There are two pairs of hoisting engines and four cages—all of the latest and most approved plans. The coal will be shipped through the old Gaylord breaker, and will eventually be able to ship about twelve hundred tons per day.

Franklin Coal Company.

In the Brown slope a new tunnel was driven from the Baltimore to the Red Ash vein, and a new plane was made in the former to let the coal down from the upper lifts.

W. G. Payne & Co.

In the East Boston mine a new tunnel was driven from the Bennett to the Cooper vein, which is one hundred and fifty feet in length, and fourteen by six feet area. The seam is six feet thick, and the coal of excellent quality.

TABLE No. 1.--Giving details relative to the progress of new shafts in the Wilkes-Barre District, and their depth, December 31, 1881.

NAMES OF THE SHAFTS.	Names of Operators.	Purposes.	SIZE.		Depth on December 31, 1881.	Number of men employed.	Deepest coal seam to be cut at present.	Probable depth in feet.	Capacity of production per day in tons.	Fatal accidents to employees.	Non-fatal accidents to employees.
			Length in ft.	Breadth in ft.							
1. Dorrance,	Lehigh Valley Coal Company,	Hoisting coal,	52	13	250 ft.	25	Baltimore, .	1 000	1,000		
2. South Wilkes-Barre	Lehigh and Wilkes-Barre Coal Company, .	Hoisting coal,	24	12	586	21	Baltimore, .	1,100			
3. Stanton Air Shaft,	Lehigh and Wilkes-Barre Coal Company,	Hoisting and ventilating,	26	12	630	25	Baltimore, .	830	2	1
4. Lance Air Shaft,	Lehigh and Wilkes-Barre Coal Company, .	Ventilation,	18	10	385	} 63	Baltimore, .	530			
5. Extension of Lance Shaft,	Lehigh and Wilkes-Barre Coal Company,	Hoisting coal,	23	12	559		Baltimore, .	559	800		
6. Woodward,	Del're, Lackawanna, and Western Coal Co.,	Hoisting coal,	53	10	30	30	Red Ash, . .	800	1,000		1
7. Alden,	Alden Coal Company,	Hoisting coal,	26	12	23	18	Baltimore, .	270	1,000		
8. Bennett Shaft,	Thomas Waddell & Co.,	Hoisting coal,	20	10	290	37	Baltimore, .	310	1,000	2	
9. No. 3 Shaft, Kingston, . .	Kingston Coal Company,	Hoisting coal,	33	12	544	22	Red Ash, . .	544	800		
10. Gaylord Shaft,	Gaylord Coal Company,	Hoisting coal,	47	12	575	20	Red Ash, . .	575	1,000		
11. Raubville Shaft,	Waddell & Walters,	Hoisting coal,	22	12	192	21	Bennett, . .	192	600		

The Gaylord Coal Company.

A new air-shaft constituting a second opening to the Red Ash vein was sunk from the Ross seam, a depth of 120 feet, having an area of 10×12 feet. They also made two new planes, one in the Ross and the other in the Red Ash seam. Their lengths are 500 and 400 feet, respectively, on a grade varying from 13 to 18 degrees.

A. J. Davis.

At the Warrior Run colliery a new tunnel was driven from the D to E vein, a distance of 120 feet, and another is in progress from the D to B or Red Ash vein.

W. G. Payne & Co.

At the East Boston mine of this company, a new air-shaft was sunk convenient to the main workings, a depth of 150 feet, having an area of 10×15 feet, from the surface to the Cooper and Bennett veins, and the fan was removed from the old shaft and placed upon this. The ventilation of the mine has been greatly improved by this change, and is produced at less cost.

Haddock & Steele.

This company bought the Black Diamond colliery from J. C. Hutchison, and took possession March 1, 1882. Since then they have graded the underground slope, and made considerable improvements in the work.

The Red Ash Coal Company.

This company completed their second colliery ready to begin shipping coal on the 1st of March, and mined 69,204 tons of coal by the end of the year. All the coal, yet mined, is above the level of the breaker, and the Ross and Red Ash seams have been cut by a tunnel, through which the coal is brought out. A new slope was sunk, reaching a lift of coal below the level of their No. 1 colliery, from which a considerable quantity of coal can be very conveniently obtained.

Waddell & Walter.

This company completed their shaft at the Raubville colliery, and effected their second opening by connecting with the workings of the Black Diamond mine. The shaft was 170 feet to the Bennett vein. A new fan was erected to ventilate the workings, a description of which can be seen elsewhere in this report.

Waddell & Company.

The Bennett shaft, 10×20 feet, was completed, and cut the Bennett vein at a depth of 320 feet; also an air-shaft for the same mine. The breaker was set in operation in May, 1882, and during the remainder of the year they mined 26,226 tons of coal. This colliery is situated in Plains township, east of Mill Creek. A new fan was erected to ventilate the colliery, having a diameter of 22 feet, which is producing a ventilation of about 80,000 cubic feet per minute.

The Kingston Coal Company.

The No. 4 shaft of this company was completed upon reaching the Red Ash seam at a depth of six hundred and sixteen feet. Its size is 30'×12'. This opens a very large tract of convenient coal.

The Gaylord Coal Company.

At the Gaylord colliery a tunnel is in progress from the Ross to the Red Ash seam. Its sectional area is 7'×10', and its length, at present, is six hundred and fifty feet. This is intended to work the coal above the level of the bottom of the Gaylord slope.

A. J. Davis.

At the Warrior Run colliery a tunnel was driven from the C to the D vein. Its sectional area is eighty-five square feet, and its length one hundred and ten feet. The seam of coal was found eleven feet thick, and of good quality.

The Franklin Coal Company.

This company has started to sink a new slope, from the surface diagonally through the measures, to cut and work the Red Ash seam. Its sectional area is one hundred and sixty feet square, grade thirty degrees, and it was driven to a depth of one hundred feet at the end of the year.

W. G. Payne & Co.

At the East Boston mines of this company the shafts are being sunk or extended from the Bennett to the Ross vein. They had not struck the expected point at the close of the year, but they were approaching it closely. The blasting-hole in the air-shaft was thought to have penetrated the coal seam.

The Red Ash Coal Company.

A new tunnel is being driven from surface at the outcrop of the Baltimore seam, and is intended to drain and mine the coal lying above that level, and between that and the Red Ash slope, of both the Ross and Red Ash veins. It was driven a distance of three hundred and seven feet at the end of the year, and is expected to be finished sometime in 1884. This will open a wide extent of very convenient territory and desirable coal.

The West End Coal Company.

This company is opening a new mine and building a new breaker about three miles east of their West End colliery, in Conyngham township. It is to be named East End colliery. The breaker is expected to be ready in March, 1884. The vein is opened by two tunnels—one on each side of the basin—and they will mine and ship coal as soon as the breaker is completed.

The Delaware and Hudson Canal Company.

This company is sinking two new shafts in Plains township, near the Baltimore mines, for the purpose of mining the Red Ash seam. The main

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-

All were within a short distance of each other in a distance of 200 feet, and all except one, who was under rock, covered by loose coal crushed from the pillars. The mine foreman, Thomas H. Picton, and Daniel W. Morgan had gone only a few feet from the place where they were working, and it is evident from the position that they were found in, that they were in the act of running down the plane when caught.

The Red Ash seam in this section of the mine was twenty feet thick, and although the pillars were large, it is most probable that, during the seven years idleness, enough had scaled off in some of the old breasts to make the pillars too weak to sustain the pressure. It is also probable that the squeeze had been progressing for some time before it was discovered.

An inquest was held on the death of the victims of this disaster by the deputy coroner and a jury of experienced men, and they rendered the following verdict:

"We, the jury, do say that Thos. H. Picton (and the others) came to their death through an error of judgment on their part, or on the part of the person or persons in charge of the party who lost their lives, thereby remaining too long in a place that, as appears to the jury, must have been plainly dangerous for some hours prior to the cave. The cause of the cave is, in our judgment, due to the inefficient size of the pillars left in the Red Ash seam, which were further reduced in size by the chipping of the pillars due to atmospheric causes and to the shocks caused by shots or blasts in the overlying vein. The jury recommend that the next Legislature so amend the present mine laws, if that be possible, so as to prevent miners and laborers from going or being sent into such places as make possible such catastrophies as that under consideration."

JOHN E. PERKINS,
Deputy Coroner.

A. REES,
D. S. DAVIS,
AUSTIN GINLEY,
JOHN E. MALONEY,
REES JONES,
P. B. NEALON,

Jury.

the plane. It was over 1,600 feet in length, and the thirteen missing men had been working at about the middle of it.

The plane had been operated after Leyshon descended, for the cars of timber attached to the rope at the bottom and the planks he took down had been hoisted up to the point where the men were at work.

George Brace was in the mine with the men till near 1.15 A. M., and he says that all appeared safe when he left. He was at the top of the plane at midnight, and saw no sign of a fall. When coming out he noticed the roof cracking about 100 feet below the men, and he called to Picton and told him. Picton replied, "It is all right; hurry and send us cap-pieces." He and Leyshon went outside and asked the engineer what time it was, and the engineer said it was 1.30 A. M. The planks were taken down and placed on the car and hoisted up to the middle of the plane, and the cave took place at 2.15 A. M. Evidently the plane was clear of all obstruction when it was operated, and this shows that the final crush was sudden and without the usual warning.

The dotted line on map shows the outlines of the caved workings. The men were working at A, and all the bodies were found in the space between A and B. The farthest had not gone more than 240 feet in his flight for life. All were covered by the coal crushed in from the pillars. About 600 feet of the plane had to be reopened to find all the bodies, and then the workings of this seam were abandoned. Work was continued incessantly day and night until all the bodies were found, and each was found as follows:

Peter McLaughlin, on face, head down the plane, March 13, at 1.30 A. M.

Michael Welsh, stooping in a running position, March 14, 4 A. M.

Thomas J. Jones, crushed down on face by a fall of rock, March 15, P. M.

Richard Davies, stooping, in running position, March 16, 10.30 A. M.

James Kingdom, lying on face, head down plane, March 23, 5 A. M.

Thomas Cole, lying on face, head down plane, March 24, 6.30 P. M.

Thomas Leyshon, lying on face, head down plane, March 28, 3.45 P. M.

Thomas Merriman, lying on face, head down plane, March 30, 2.45 P. M.

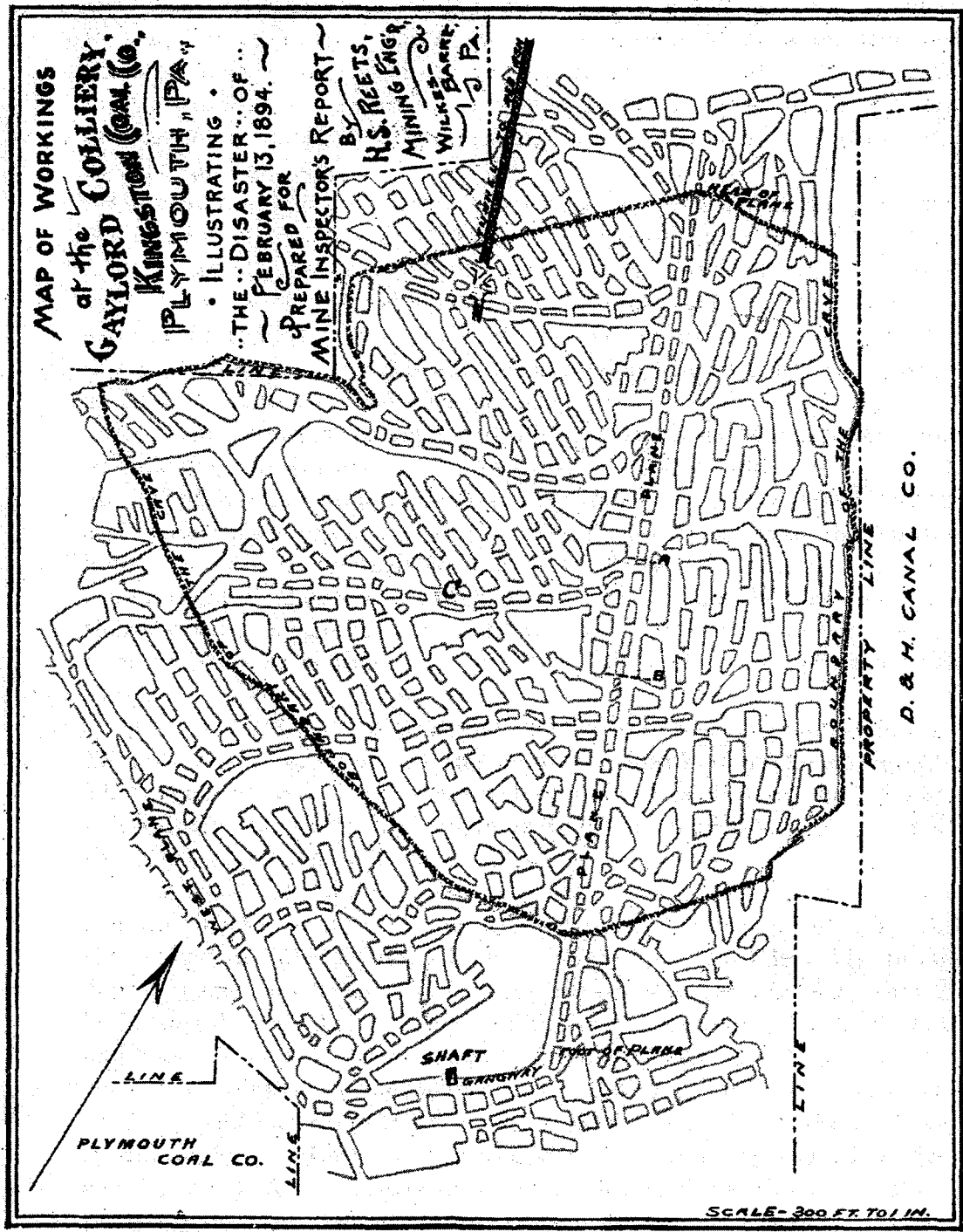
Joseph Olds, lying on face, head down plane, April 1, 7.45 A. M.

John D. Morris, lying with head down the plane, April 2, 4.30 A. M.

John Hamer, lying with head down the plane, April 2, 10.45 A. M.

Daniel W. Morgan, lying head up the plane, April 5, 10.30 P. M.

Thomas H. Picton, lying across the plane, April 6, 10 A. M.



MAP OF WORKINGS
 at the COLLIERY
 GAYLOR (COAL CO.)
 KINGSTON (PA.)
 PLYMOUTH, PA.

ILLUSTRATING
 THE DISASTER OF
 FEBRUARY 13, 1894.
 PREPARED FOR
 MINE INSPECTOR'S REPORT
 BY
 H. S. REETS,
 MINING ENGINEER
 WILKES BARRE,
 PA.

PLYMOUTH
 COAL CO.

D. & H. CANAL CO.

SCALE - 300 FT. TO 1 IN.

already or came earlier than the others, viz: Henry Williams, Robert Williams, Eli Culver and John Soley. The mine foreman, Thomas Picton, was in charge. He showed these four men the place and told them to clean along the rib to make room for the props. After working there awhile and hearing ominous cracking in the pillars and coal falling in the breasts west of them, they became afraid and decided to leave and go home.

On reaching the foot of the shaft, they met the other party of men coming in with props and tools in charge of Thomas Picton. The latter asked, where they were going, and they answered that they were afraid, and would go home. All right, answered Picton, if you are afraid, you better go. This was shortly after six o'clock P. M. Three men had been left outside to cut props and ten went to work setting the props up.

At 10.30 they were using the timber up, six more of the party went outside to help in getting more props. It was a cold, stormy night, but by fifteen minutes of twelve they had cut the necessary supply and sent them down the shaft. Then they went into the engine house to warm themselves. John D. Jones, the night engineer, asked them if there was much danger there and they replied that there was no danger at all; that the four laborers who went home were unnecessarily alarmed. At about 12.10 they all descended the shaft.

At 1.30 A. M. George Brace, the stable boss, accompanied by Thomas Leyshon, came up the shaft for plank to make cap-pieces. They sent six oak planks eight feet long, one and one-half inches thick down the shaft, and Thomas Leyshon descended the shaft on the same cage, and Brice went home.

At 2.15 A. M., about three-quarters of an hour after Leyshon descended the shaft, the engineer felt a concussion of air, and the speaking tube whistle blew a long, loud whistle. He immediately gave alarm by blowing the steam whistle. George Picton, William Edwards and a number of miners responded in a short time, and went down the shaft and attempted to go up the plane, and succeeded in going up a distance of about 400 feet, where the place was crushing and threatening to close in upon them. They shouted, but heard no reply. Lest the missing men had gone up the plane and were groping in the darkness of the open workings above the plane, parties were sent to enter above from the manway at the outcrop. They, after a search for several hours, came out satisfied that the men were not there. Every open space above and below and around the caved workings was searched without avail. Shouting and tapping brought no response. By noon all hopes of saving the men had vanished and work was promptly commenced to reopen

Seven were fatally injured and thirty-three seriously by explosions of gas. This class of accidents are less excusable than a large number caused by falls. The safeguards against explosions are so well known that if they were strictly executed no explosion would take place. Nearly every accident of this class is the direct result of some one's carelessness in disobeying well known regulations. In this class of accidents the innocent frequently suffer through the carelessness of others.

The mine cars are prolific sources of accidents, the most of which might be averted if the boys could be persuaded to exercise more care, but it seems to be an innate desire in a boy to be daring and venturesome, and in his recklessness he is often caught and injured.

The accidents of all classes could be reduced by a more effective discipline, by an effective enforcement of well known rules, and by a stricter regard for the proper qualifications of the persons employed to do the various kinds of work. All this depends on the foremen, and all the foremen have not had the power and natural executive ability to compel obedience to the rules.

Disaster at the Gaylord Colliery.

At about 2.15 A. M., Tuesday, February 13, 1894, an extensive area of the workings of the Gaylord colliery of the Kingston Coal Company at Plymouth, Pa., collapsed, closing the workings in each seam from the Red Ash to the surface, and thirteen workmen were buried nearly under the centre of the mass. No one escaped, and no one can explain how these thirteen experienced men were so suddenly entrapped.

On Monday morning, February 12th, George Picton discovered a squeeze in the workings of the Ross seam. On examination he suspected that the base and origin of the squeeze was beneath, in the Red Ash seam, and sent his son, Thomas Picton, and another person to make an examination in the old workings of said seam. They went down and found the breasts on the third lift west of Plane cracking and showing a decided indication of a troublesome squeeze. (This point is indicated by the letter C on the accompanying map.) This part of the Red Ash seam workings had been finished and abandoned for seven years and only about eighty car loads of coal remained to be mined in the seam altogether at this time, and that from a place above the head of the plane.

After a consultation, Messrs. Gwilym Edwards, superintendent, and George Picton, general foreman, decided to have a row of props set to support the pillar on the west side of the plane just above the third lift, (At A; see map), and a party of sixteen men were selected and sent for to execute the work. The mine was idle and the men had to be summoned from their homes. Four laborers were there

CLASSIFICATION OF FATAL AND NON-FATAL ACCIDENTS.

Causes of Accidents.	Killed or fatally injured.	Severely injured.
By explosions of fire-damp,	7	33
By falls of roof and coal,	44	68
By falling down shafts,	2	. . .
Crushed and run over by mine-cars,	7	59
By explosions of powder and blasts,	4	23
By miscellaneous causes underground,	6	27
By miscellaneous causes on surface,	7	23
Totals,	77	233

Number of widows, 46; orphans, 182.

The Collieries of the Fourth District.

During the year 1894 there were forty-three breakers and sixty-six openings at work more or less time, mining and preparing coal for market in the Fourth Anthracite district. An average of 46,789 tons per day worked was produced, making a total production of 7,162,961 tons in an average work of 153.1 days.

The collieries in operation less than 153.1 days were those of the Lehigh and Wilkes-Barre Coal Company. The No. 3 colliery of the Delaware and Hudson Canal Company, which, after working 153 days, was destroyed by fire on the evening of November 15, and remained idle the remainder of the year. The No. 3 colliery of the Susquehanna Coal Company, where the production is not sufficient to keep the breaker working all day owing to the partial exhaustion of the mine. The Gaylord colliery of the Kingston Coal Company, several weeks' idleness caused by the disastrous cave of February 13th. The collieries of the Lehigh Valley Coal Company, the Red Ash Coal Company, the Parrish Coal Company, the Maffet colliery of the Hanover Coal Company, and the Warrior Run colliery of Mr. A. J. Davis.

The Lee colliery of the Newport Coal Company did not work more than 100 days. It was suspended on August 25th, and since then has passed into the possession of another company. The Buttonwood colliery of the Parrish Coal Company is an old mine enlarged and reopened. It was lying idle since 1866. The shaft was enlarged and sunk to a deeper seam and a new breaker was erected. It began shipping coal in September, 1894, and worked 50 days until the end of the year.

This Company is making an effort to prevent mine fires by erecting concrete and brick walls with iron I-Beams, thus eliminating the use of timber.

Condition of colliery is good.

PARRISH COAL COMPANY

Parrish

No. 6 Slope extended 400 feet. Baltimore vein graded this slope to top of an anticlinal, 426 feet, deepest cut 10 feet.

No. 7 Slope extended 252 feet, to synclinal Baltimore vein.

No. 8 Slope extended 1300 feet to Boundary Five Foot vein.

Pair of engines for above 12x14 inches.

A tunnel from No. 2 West Baltimore vein to Cooper vein 99 feet.

A tunnel from No. 6 Slope, 3 West Baltimore to Cooper vein 80 feet.

A rope haulage from No. 3 Slope, Baltimore vein, to Five Foot vein, a distance of 5754 feet.

Pair of engines for above 16x24 inches.

No. 9 Slope sunk along Southern Boundary in Five foot vein for a distance of 450 feet.

Pair of engines for above 10x14 inches.

Condition of colliery is good.

No. 2 Colliery, Buttonwood

No. 1 Plane, Abbott vein, extended 249 feet.

Installed a Knowles duplex pump, 18½x18 inches, in Abbott vein.

No. 3 Slope, Kidney vein, sunk a distance of 99 feet in rock and 129 feet in coal.

No. 5 Slope, Hillman vein, sunk 480 feet.

Pair of engines for same 12x14 inches.

No. 4 Slope Stanton vein sunk 700 feet.

Rock Plane for return from the Stanton to Hillman vein, 7 feet by 12 feet on 30 degree pitch, a distance of 117 feet.

No. 1 Tunnel, East Level, Stanton vein, reopened for a distance of 1800 feet.

Installed a rope haulage at foot of shaft to the foot of No. 4 Plane, Hillman vein, 600 feet, to foot of No. 2 Plane, Stanton vein, 1002 feet.

Pair of engines 14 inches by 20 inches for above.

Condition of colliery is good.

KINGSTON COAL COMPANY

Gaylord

Driving a traveling way for men and mules from surface to Cooper vein. When this is completed the shaft will be abandoned and all mule stables inside.

A tunnel has been driven from the Bennett to the Checker vein about 3 feet 8 inches in thickness.

Installed a conveyor line and Williams crusher for the purpose of breaking down all refuse from breaker and washing it into the mines.

Installed a pump for the purpose of pumping water to the top of culm plane, where bore holes have been put down, through which to wash culm into the mines.

Condition of colliery is fair.

No. 2 shaft.—Concrete for 79 feet from surface to rock, also re-timbered from concrete to bottom, and head frame replaced.

New brick oil house erected 18'x28'.

No. 6 slope in Stanton vein extended 90 feet and stopped in fault.

No. 14 rock plane driven from Stanton vein 550 feet, cutting Hillman, Lance and Abbott veins, and intersecting a 8 by 6" bore hole from surface to rock a distance of 203 feet, for use of rope to operate place.

Plymouth No. 3 Colliery.—Red Ash sump lengthened 450 feet.

No. 6 slope in Red Ash vein opened and driven 260 feet.

No. 15 rock tunnel driven 460 feet from bottom to top Red Ash vein.

Rock tunnel driven 100 feet from Stanton vein to tap shaft for ventilation.

Plymouth No. 4 Colliery.—No. 11 plane, Top Red Ash vein, extended 170 feet.

Plymouth No. 5. Colliery.—Boiler house erected 50'x60' and two Sterling 300 H. P. water type boilers installed.

Boston Colliery.—No. 13 plane, in Bottom Red Ash vein, extended 300 feet.

PARRISH COAL COMPANY

Parrish Colliery.—A rock plane driven from Baltimore vein to the Five Foot vein for ventilation, a distance of 279 feet, size 7' by 18' on a grade of fifteen degrees.

Sank No. 6 slope Baltimore vein a distance of 200 feet.

Buttonwood Colliery.—Sunk No. 4 slope, Stanton vein, a distance of 300 feet, to the boundary line.

Installed a new engine on top of Stanton plane, for plane and slope, geared 18" by 30" (double engine) 460 H. P.

Sank a slant slope from top of No. 2 slope Hillman vein 600 feet, to mine coal in a synclinal between two rolls.

A new plane driven on the Abbott vein 900 feet long, and a pair of geared engines 12" by 16", 124 H. P., installed.

A tunnel driven from the Kidney vein to the Abbott vein, to strike the vein at the southern boundary line, a distance of 470 feet size 7' by 12.

KINGSTON COAL COMPANY

Gaylord Colliery.—The old cylinder boiler plant has been dispensed with and 900 H. P. B. and W. boilers have been erected and installed in brick house. Said plant has been completed with duplicate feed pumps, Cochran water heater, etc.

A new brick house has been erected for electric generator and air compressor.

Two new 7½ ton electric locomotives have been purchased and electric haulage is in course of construction between the foot of the Bennett slope and the Red Ash.

A new washery or wet side addition to the breaker is in course of construction and almost completed, with three banks of shakers, duplicate rolls, duplicate elevator.

A Compound Duplex 28"x36" pump is being installed.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance No. 11 Colliery, Inside.—No. 25 Tunnel, Cooper to Baltimore.
Nottingham No. 15 Colliery, Outside.—New wash house.
Inman No. 21.—Sinking shaft. Continued sinking Baltimore and Red Ash shafts.

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—A new washery, capacity 1,000 tons per day, has been completed midway between No. 2 breaker and No. 4 breaker, said washery complete with duplicate shakers, rolls, elevators and conveyors and Jeffrey crushers.

Three bore holes driven so that all waste from the breaker is flushed into the mines.

Shipment began from the washery in the month of May.

A new brick boiler house equipped with 600 H. P. water tube boilers, feed pumps and water heaters.

A wet addition was completed to the breaker equipped with duplicate shakers, elevators, rolls and Jeffrey crushers.

The dry part of the breaker is being entirely remodeled, work on which will be completed in the fore part of 1909.

All circular screens are being substituted with shakers.

The old plane has been abandoned and a new location made away from the breaker and at a much easier grade, which removes the unsafe condition.

A new brick office and retail scales complete.

The tracks on the loaded and empty sides of the breaker have been changed and new railroad scales set in place.

A new steel concrete bridge has been completed over Jackson avenue dispensing with the old wooden structure.

Special attention has been given the remodeling of the emergency hospital in the Nos. 2 and 3 Shaft districts; also a brick combination hospital and foreman's office built at the old slope.

The equipment has been increased with two new locomotives and cars for the Mountain tunnel development.

Gaylord Colliery.—A new washery, with a capacity of 1,000 tons per day, was completed and operation begun in March; the washery is completed with duplicate shakers, rolls, elevators and conveyors and Williams crushers, and also acts as a wet side or mud screen adjunct to the breaker.

Two new Goyne pumps 28 x 10 x 33 pump silt through 8 and 10 inch culm lines 3,000 feet to bore holes, so that all the refuse from the washery and breaker is flushed into the mines.

Series of six holes have been completed for flushing purposes.

Two bore holes for steam exhaust and culm pipe and a new pump outfit completed in Bennett vein.

During the months of July and August the breaker was remodeled and all circular screens dispensed with, shakers being substituted, also modern rolls, crushers, etc.

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.

A rope hole has been completed from the surface to the Ross vein and a set of hoisting engines installed on the surface, thus removing the inside slope rope from No. 3 shaft and the inside gangways.

A tunnel has been completed on the first lift from Bennett to Red Ash vein, and another tunnel has been started on the lower lift from Ross to Bennett vein.

A series of tunnels and rock holes has been completed from the Ross vein to the overlying split, and mining has now been started in the small vein 2 feet 6 inches thick.

Gaylord Colliery.—The wooden housing and building of the 25-foot ventilating fan has been replaced with reinforced concrete and brick. The fan is reversible and fire-proof.

A new brick-concrete wash-house has been erected for the use of the employes, and equipped with 100 steel lockers, ten bath tubs, shower baths, hot and cold water and steam. The conveniences and sanitary arrangements are worthy of mention.

A brick-concrete mule hospital has been constructed.

Powder house has been changed to a more isolated place.

A new 8-inch bore hole driven for pump discharge from Bennett vein to the surface for a new pump in the Bennett vein.

Progress has been made in the reopening of the old caved district in the Red Ash vein. To this end a slope 1,500 feet long has been sunk through the old workings in the Red Ash vein and a tunnel 650 feet long driven from the Bennett vein to the Ross vein.

Additional bore holes have been completed for culm flushing, which has been extensively carried on during the last year, into the old workings.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Woodward Colliery, Outside.—The work of replacing old trestling work connecting No. 1 shaft landing with surface with re-inforced concrete, is now under way and will soon be completed.

The breaker building has been re-piped and is now heated with exhaust steam in a very satisfactory manner.

Considerable repairs and improvements, including the installation of mechanical pickers, etc., have been made at the breaker with very good results.

Inside.—The work of sinking No. 3 shaft, located on the Kingston Flats, from the surface to the Cooper vein to a depth of 783 feet, was completed by Messrs. John Pugh and Sons on September 12. This work was started September 13, 1907, thus making the time occupied in doing the work about two years. The erection of a steel tower over this shaft is now under way and will soon be completed.

The underground workings have been connected to the main shafts at Woodward, and the work of grading roads for the mining of coal in this neighborhood is now being done.

The No. 17 slope, or surface slope, was sunk from the Snake Island to the Abbott vein. A 16-foot ventilating fan was installed upon this slope, and is now in operation.

The following rock tunnels were driven:

- (a) Rock slope through fault, Hillman to Kidney vein, on 8 per cent. dip, was completed.
- (b) Second opening for this slope in 2 per cent. grade was completed.

BRIGHT COAL COMPANY

Hillside.—Safety, ventilation and drainage good.

DUNN COAL COMPANY

Dunn.—Safety, ventilation and drainage good.

IMPROVEMENTS

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—A new manway has been completed in the Mountain Tunnel district from the foot of Rock slope to the surface.

A tunnel has been driven from the Ross vein through the Lift vein to the Bennett vein, making a second opening for No. 2 shaft.

The inside hoisting engine in Red Ash vein has been removed to the surface, rope being conveyed through bore hole to inside slope instead of through shaft-way.

Two new manways have been completed along the plane in the Cooper vein for the safe travel of men. Also reopened main gangways for width in Lance and Bennett veins.

New barn completed at foot of No. 2 shaft, with sheet iron, cement and concrete stalls, equipped with electric light. A similar outfit has been provided at foot No. 3 shaft.

A new brick-concrete locomotive house completed.

A new brick carpenter-blacksmith shop under construction to take the place of the old buildings around the head of Nos. 2 and 3 shafts.

Gaylord Colliery.—Completed brick and expanded metal concrete housing over 25 foot ventilating fan.

Complete brick pump house for silting pumps.

Installed two 12 by 8 by 12 boiler duplex feed pumps.

Installed new jigs in washery.

Tunnel 650 feet long completed from Checker vein to the Ross vein.

Old air shaft opened from Ross vein to Red Ash vein in squeezed territory, and steps placed in air shaft for a traveling way.

Red Ash slope has been extended through the squeezed territory to a total distance of 1,800 feet.

Two silt holes and one new rope hole were drilled. Silting operations have been carried on extensively during the year.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Woodward Colliery.—In the Cooper vein several air bridges have been rebuilt with concrete and steel.

The main haulage road has been timbered with creosote timber and the old timber taken out.

In No. 1 shaft concrete fire bosses' stations have been erected on the inside. The fire bosses are now located at the foot of these openings where they can better protect the entrance to the mine.

A tail rope has been installed on "G" gangway, Red Ash vein.

Twenty concrete arches have been erected in No. 1 tunnel. Several sets of treated timber upon which a comparison is to be made for future reference.

An old passenger coach has been equipped with the "Draeger Rescue Apparatus," consisting of four helmets, oxygen storage tanks,

Nos. 2 and 3 shaft hoisting engines were equipped with Welch Improved Overwinding Prevention Device, steam reverse and brake.

Brick-concrete-steel mule bath, shoeing and wagon shed completed.

Twenty-five thousand gallon circular wooden water tank set in place.

Nos. 2 and 3 shaft towers have been stripped of wooden sheathing and head frame removed and strengthened.

No. 2 Shaft.—Inside: In accordance with the Act of June 15, 1911, all buildings inside of the mines have been constructed of incombustible material.

A concrete emergency hospital was built at the bottom of No. 2 shaft.

A concrete fire boss station was built in the Lance vein at the foot of shaft.

Two openings were driven from the Cooper to the Lance vein for second outlet.

A rock tunnel was driven from the Cooper to the Lance vein, a distance of 180 feet for traveling way and mule way.

The Bennett vein barn was extended, with steel and concrete stalls.

No. 3 Shaft.—Inside: Concrete-steel barn was built in Red Ash vein.

Concrete motor pit was built.

Concrete emergency hospital was built at the foot of the shaft.

A concrete fire boss station was built.

A balance plane was made in Red Ash vein.

Kingston Nos. 2 and 4 Washeries.—No. 2 culm bank was exhausted on October 23, and they are now preparing No. 4 bank through No. 2 washery structure.

Three new conveyor lines were built, running by subway under the railroad tracks, Main Street and No. 4 yard, to transport No. 4 bank to the washery.

Four new jigs were installed.

A 25,000 gallon fresh water circular wooden tank is in course of construction at boiler house.

Roadway for retail wagon trade under washery.

Silting from the washery was carried into No. 3 Ross and Red Ash workings.

Gaylord.—Outside: A brick ambulance wagon shed was erected.

The culm plane bridge over wagon road was rebuilt.

A 50,000 gallon cedar water storage tank was placed on steel and concrete foundations.

A playground was established along Cherry Street, complete with swings, wading basin, horizontal bars, turnstiles, etc., and opened to the children of employes on July 4.

Foundations have been completed for a new Ingersoll-Rand air compressor.

Inside: A concrete engine house was built for the Red Ash slope engines.

A bore hole 450 feet was sunk from the head of culm plane to the Red Ash vein for silting purposes.

Red Ash slope was extended and steel timbers are being tried.

Silting operations have been carried on extensively during the year.

PARRISH COAL COMPANY

Buttonwood and Parrish Collieries.—Safety conditions, ventilation and drainage, good.

PLYMOUTH COAL COMPANY

Dodson Colliery.—Safety conditions, ventilation and drainage, good.

GEORGE F. LEE COAL COMPANY

Chauncey Colliery.—Safety conditions and drainage good. Ventilation fair.

WEST NANTICOKE COAL COMPANY

West Nanticoke Colliery.—New opening, just opening up from surface.

BRIGHT COAL COMPANY

Hillside Colliery.—Safety conditions and ventilation good. Drainage fair.

IMPROVEMENTS

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—Inside: A tunnel was driven from Cooper vein to Lance vein for haulage and second opening. Two 2-inch drainage holes were bored from Cooper vein to Bennett vein. Two electric hoists were installed in Bennett vein. A new 6-inch hole was completed from the surface to Red Ash vein, a distance of 550 feet, through which electric wires are conducted, the old ones having been removed from the shaft.

At No. 3 shaft a 15-degree rock plane was completed from Ross vein through the Eleven Foot vein to Bennett vein, making a second opening between Nos. 1 and 3 shafts.

In the slope and tunnel a new manway and muleway completed from Eleven Foot vein to the surface, and a new second opening completed from Eleven Foot vein to Bennett vein on the west side.

Outside: Rebuilt empty car trestle at head of No. 3 shaft extended No. 2 shaft boiler room to install 600 horse power additional B. and W. boilers. New blast fan has been purchased. New 10-inch steam line constructed from boiler house to No. 3 shaft and fan engines.

Gaylord Colliery.—An 18 by 30 by 27½ by 24 inch Ingersoll-Rand Corliss, valve two-stage air compressor was installed.

DELAWARE AND HUDSON COMPANY

Plymouth No. 5 Colliery.—At Boston Red Ash, No. 17 plane air return from No. 13 plane 7 by 12 by 132 feet, 18 degree pitch, and work on concrete stables completed.

Plymouth No. 2 Colliery.—Two 24-inch bore holes drilled from surface to Bennett vein, 640 feet deep. Concrete reinforcements to pumping rooms Nos. 1 and 2 in Bennett vein. Tunnel, 7 by 12 feet, 422 feet long, driven from No. 7 plane in "G" vein to top of Plymouth No. 5 Shaft. Established Mine Rescue Station for Plymouth Division, equipped with Draeger Apparatus and other appliances.

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 fire-proof 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.

building for a wash house and installed bath equipments to meet the requirements of the number of men using it. Remodeled brick building for use as an outside hospital.

Completed a new playground in Edwardsville and opened it on May 30. As in former years, night school has been held during the winter in the Company's free library.

Gaylord Colliery.—Completed a 15 degree slope from Ross to Red Ash, for ventilation and second opening. Silting operations were carried on extensively during the year.

Outside: Completed hospital.

The entire mine has been equipped with the Koehler type safety lamp replacing the Davey and Clanny safety lamps.

Installed an overwinding device on No. 3 shaft hoisting engine.

Completed a 7 foot by 12 foot rock tunnel, 700 feet long, from the Lance to the Five Foot vein, No. 1 shaft.

LEHIGH AND WILKES-BARRE COAL COMPANY

Lance No. 11 Colliery.—Completed No. 32 tunnel, Cooper to Five Foot vein and No. 33 tunnel and plane, Stanton to Hillman vein.

Nottingham No. 15 Colliery.—Completed extension of 14 inch compressed air line to 11th east and installed a 75 H. P. electric hoist on Nos. 1 and 6 slopes.

Outside: Installed a 100 H. P. electric hoist on No. 4 slope.

KINGSTON COAL COMPANY

Kingston No. 2 Colliery.—The cribbing between the surface and the solid rock in No. 2 shaft has been removed and replaced with reinforced concrete. Installed two storage battery locomotives in the Lance and Cooper veins and an electric hoist on the new plane in the Bennett vein.

At No. 3 shaft, the cribbing between the surface and the solid rock in the shaft has been removed and replaced with reinforced concrete. Fifty short shafts or rock holes were driven to the Ross split vein from the Ross vein. Installed two storage battery locomotives complete with charging station for each locomotive.

Installed three storage battery locomotives complete with charging panels, and two electric hoists, one in the Ross vein and one in the Red Ash vein.

Outside: One corrugated iron waiting station for miners was constructed at the head of No. 2 shaft and one near the head of No. 3 shaft.

Four Dutch ovens were added to the grate space of four boilers at No. 2 boiler plant.

Installed a cross compound Corliss engine 16 inches and 30 inches by 42 inch stroke, direct connected to a 300 K. W. Westinghouse generator as an auxiliary for generating power required for the new additional storage battery locomotives at No. 2 colliery.

Gaylord Colliery.—Completed boiler plant pump house and 17 K. W. lighting set. This machine furnishes power to all of the arc lights on the property and for the lighting of buildings; the hospital, ambulance room and electric shop; a brick and concrete mule bath, and a brick colliery office building, 27 feet by 50 feet.

Installed several chemical engines and fire extinguishers and a 44 foot, 150 ton track scale and also a 22 foot Barker 25 ton truck scale for retail coal. A new motor driven ambulance was purchased, as required by law.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in Plymouth, May 7 and 8. The Board of Examiners was composed of David T. Davis, Inspector, Wilkes-Barre; Henry G. Davis, Superintendent,