

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.

GAYLORD COAL 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

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.

they have concluded to leave the shaft for the present at this depth, and proceed to work the Hillman seam as soon as a second opening can be effected to the Stanton air-shaft, where it is intended it shall be made.

The Delaware and Hudson Canal Company.

At the Laurel Run mine a short tunnel was driven from the lowest split of the Baltimore seam, a distance of 129 feet and 7×12 feet area, to the checkered vein $5\frac{1}{2}$ feet thick, from which that seam will be mined to a more or less extent, and there is a large area of it intact.

At the Conyngham shaft, a pair of new fans $17\frac{1}{2}$ feet diameter was erected to supersede the old one, which proved inadequate for the ventilation required in the mine. These fans are of Mr. Scharar's pattern, and are giving satisfaction.

At the No. 5 shaft, Plymouth, a second opening was effected to the workings of the Cooper seam by sinking a shaft thirty feet depth and sixteen feet area, which can be used as an escape for the men in case it be required.

The Susquehanna Coal Company.

This company has under way a number of improvements, some of which are the following: At the Grand Tunnel, the water was pumped out of the old slope workings, with a view of re-opening them and sink a slope to mine the coal lying below these workings, of which a large area lies intact.

A large air-shaft is in progress of sinking for the purpose of ventilating the No. 4 slope and other workings, which was, at the end of the year, 160 feet deep, having an area of 13×18 feet, upon which, when completed, a pair of double fans will be erected to create the ventilation.

At No. 2 shaft, a new slope was sunk from the level of the shaft to a length of 381 feet, and is still in progress of sinking at this writing. It passed through a series of rolls, but is now opening a track of good coal, in which two lifts have already begun to be mined. A new tunnel is also in progress, and has already reached a length of 672 feet, having an area of 7×15 feet, which is destined to open the Ross and Twin veins at that level.

The No. 4 slope is being extended also, and had reached a depth of 318 feet from the old foot at the close of the year.

The Wyoming Valley Coal Company.

This company bought the Albright Coal Company's colliery, formerly called the Ellenwold, and they have pumped the water out of the shaft and are mining the coal from there since. A new fan was also erected on the air-shaft, a description of which can be seen in the table of New Fans in this report.

The Kingston Coal Company.

Another new shaft is in progress of sinking for the Red Ash seam by this company, the size of which is 10×30 feet; and it was down over 200 feet at the close of the year 1882.

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-

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 $7\frac{1}{2} \times 12$ 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 $7\frac{1}{2} \times 11$ 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.

Tunnel No. 6, Worthy Carver, inside foreman; William Morgan, outside foreman.

Slope No. 6, Thomas R. Williams, inside foreman, William Morgan, outside foreman.

The chief officers of the Susquehanna Coal Company are as follows:

George B. Roberts, President.

Isaac J. Wistar, vice president.

George H. Ross, Secretary.

Thomas P. Haviland, Treasurer.

Directors, George B. Roberts, Isaac J. Wistar, John P. Green, A. J. Cassatt, N. P. Shortridge, Henry D. Welsh, William J. Howard, Amos R. Little, Samuel Rea.

Collieries of the **Kingston** Coal Company.

In the year 1863 the collieries now operated by the Kingston Coal Company at Edwardsdale, Pa., were leased and operated by the firm of Waterman and Beaver. They were then under the supervision of the late David Morgan, who, in the year 1868, left the company, and Mr. Daniel Edwards took charge of the operation. In the year 1877 the Kingston Coal Company, Limited, was organized and operated for six years. Then the Gaylord Coal Company was united, and on August 8th, 1883, the Kingston Coal Company was chartered, with a capital stock of one million dollars.

In 1894 they operated three breakers, five shafts and one slope. Four of the shafts are located in Edwardsdale, and one shaft and one slope in Plymouth.

They are working more or less coal from the Red Ash, Ross, Bennett, Cooper and the Lance seams. Each mine has an extensive area of coal land to work from, and an operation of such a length of time has a large area of old workings. Much of this is closed by caves, but there is no gas existing therein, and all is safe.

The production for 1894 was 683,813 tons in a work of 175.98 days, an average of 3,317 tons per day. The number of persons employed was 2,162. The number of accidents was higher than usual, owing to the disaster of February 13 in the Gaylord shaft, an account of which is given in another part of this report. The record of the Kingston Coal Company's accidents is higher than its neighbor's for the last two years, when compared with the quantity of coal mined. In Nos. 1 and 4 shafts, slopes are sunk to the dip, a distance of nearly a mile. The lower workings in these slopes, in the Red Ash seam, have dangerous top, but in the upper seams the roof is generally better. A serious mistake made when sinking these slopes was, that proper precautions were not taken to provide means for an efficient ventilation of the lower workings.

While the quantity of air circulating through these workings is

ample for the few men employed there, the volume is not sufficient for a larger number of workmen. The attention of the officials was called to this over a year ago, but hitherto only futile attempts have been made to improve it. In July, the writer found that the return air in the slopes of No. 4 shaft was charged with two per cent. of explosive gas, and all had to work by safety lamps until the ventilation was somewhat improved and the air made reliably safe.

The workings to the rise in all the seams are fairly ventilated, and their general condition is satisfactory. The officers of the Kingston Coal Company are as follows:

Daniel Edwards, president and superintendent.

William B. Chamberlain, treasurer.

E. R. Morgan, secretary.

Directors, Daniel Edwards, John C. Bullitt, E. W. Dwight, T. L. Newell and W. B. Chamberlin.

Mr. Daniel Edwards has acted as superintendent since the year 1868. He is assisted by Morgan D. Rosser, who is directly in charge of the Nos. 1 and 4 shafts, and by Gwilym Edwards, who has charge of the Nos. 2 and 3 shafts, and of the Gaylord mine. The names of the mines and of the foremen are as follows:

Shaft No. 1, David M. Jones, inside foreman; Thomas J. Morgan, outside foreman.

Shaft No. 2, Lance vein, Mordecai Dando, inside foreman; William Cook, outside foreman.

Shaft No. 2, Bennett vein, John D. Williams, inside foreman; Geo. W. Edwards, outside foreman.

Shaft No. 3, Richard B. Watkins, inside foreman; Geo. W. Edwards, outside foreman.

Shaft No. 4, John Armstrong, inside foreman; Thos. J. Morgan, outside foreman.

Gaylord, D. W. Morris, inside foreman; Frank Trimble, outside foreman.

Collieries of the Delaware, Lackawanna and Western Railroad Company.

Concerning the history of this company, the following is copied from the "Coal Trade Journal."

"This company, which has a charter antedating the present Constitution of the State of Pennsylvania, is one of the few privileged to carry on coal mining and selling, together with transportation.

This was originally the Ligett's Gap Railroad, incorporated by special act of Pennsylvania Legislature approved April 7, 1832, chartered March 19, 1849; name changed by special act of Pennsylvania Legislature, approved April 14, 1851, to Lackawanna and Western; consolidated April 30, 1853, with the Delaware and Cobbs Gap Rail-

Improvements by the Susquehanna Coal Company.

This company drove a tunnel from the George to the same seam which is 700 feet long.

Two tunnels were also driven which are not yet completed. One from the Mills to the Mills seam 8x14 feet area which is now 300 feet long. The other tunnel is from the Hillman to the Hillman, through an anticlinal, having an area of 8x14 feet and is also 300 feet long.

The **Kingston** Coal Company.

In the No. 1 colliery an air shaft has been sunk from the Cooper to what is thought to be the Bennett seam and a short tunnel has also been driven from the Checker to the Bennett seam. The size of the shaft is 8x10 feet; depth, 125 feet; size of tunnel, 7½x12 feet and 250 feet in length.

Lehigh Valley Coal Company.

At the Dorrance colliery a new slope has been driven from the Hillman seam through the rock on a grade of 7 degrees to the Baltimore seam and following that seam on the north rib of the anticlinal. Its length is 1,300 feet and size 8x12 feet.

At the Franklin colliery a slope has been sunk from the outcrop on the next small seam above the Baltimore. It is 1,000 feet long and will work the upper lifts of said seam. A new fan has been also erected at this colliery to ventilate the upper seams. It is fifteen feet in diameter and operated by a vertical engine. It is the first machine put up in this district to act as a forcing fan. The conditions here are favorable for that, but in gaseous mines where the haulage roads would be the return airways such a method is not practicable.

The Parrish Coal Company.

The inside slope in this mine has been extended to a length of 3,814 feet. It was 3,216 feet before.

At the Buttonwood colliery two tunnels have been driven, one for coal haulage from the Hillman to the Kidney 335 feet long, and one for ventilation and "second opening" from the old Bennett to the Hillman seam. This is 62 feet long and has an area of 70 feet.

New Breaker at Warrior Run Colliery.

The old breaker having worn beyond the power of repair has been replaced by a new one having a capacity of about 1,000 tons per day. The machinery and stairs are boxed and fenced in a satisfactory manner. The old one was abandoned at the beginning of

A compressed air locomotive was put in the No. 6 slope to haul the coal from the foot of the planes to the bottom of the slope. This is the second one put in at this colliery and they work very satisfactorily.

Improvements by the Kingston Coal Company.

In the No. 1 shaft a tunnel was driven from the Cooper to the Lance, having 8x12 feet area and 300 feet in length.

One gravity plane 600 feet long was finished and another is being made.

In the No. 3 shaft a tunnel was driven from the Ross to the Red Ash, 420 feet in length and 8x12 feet area.

Improvements by the Delaware, Lackawanna and Western Railroad Company.

In the Bliss colliery two new rock tunnels were driven; one 681 feet long, from the Ross to the Ross seam across a basin, and one from the Baltimore to the Baltimore seam 400 feet across the same basin. Both have a sectional area of 84 square feet.

The Auchincloss shafts were both sunk at the close of the year to a greater depth than any other shafts in this region. The No. 1 was at a depth of 1,719 feet and the No. 2 at a depth of 1,692 feet. Both will be completed during 1897.

Improvements by the Parrish Coal Company.

In the Buttonwood mine four new gravity planes varying in length from 300 to 800 feet were made. Three are in the Hillman and one in the Kidney seam. A slope is in progress of sinking on the Hillman to work the coal to the dip from the shaft. It was at a length of 240 feet at the close of the year.

Improvements by the Plymouth Coal Company.

The rock slope in the Dodson mine was extended from the Ross to the Red Ash seam, an extension of 298 feet. Size, 14x8 feet. Also, another rock slope for second opening 275 feet and 14x8 feet area. These slopes open the Red Ash seam for this colliery.

There were a number of short tunnels, gravity planes and other minor improvements made at a number of the mines, but they were of minor importance and so are not recorded.