

**The General Condition of the Mines.**

During the year 1883, several new collieries began to operate in this district, swelling the list to an appreciable degree, and increasing the inspection work in the same proportion. The Clear Spring colliery began to send coal through the breaker January 3; the Alden colliery began January 18; the Hanover March 10; the Fuller colliery the last week in August; the Schooley breaker started September 3, and the Hillman vein breaker September 28. Beside these, the new breaker at the Lance colliery started to ship coal June 30, and the new breaker at the Stanton mine September 1. Thus eight new breakers are added to the list of this district for 1883. These new collieries are all equipped with the latest improved colliery-plant, and each is starting the operation of mining in good condition.

The ventilation of the Lance, Stanton, and Fuller collieries is largely in excess of the need of the present workings, and evidently it will continue so for some time. The ventilating systems of the other new collieries have not been completely established yet, but I expect it will be efficient when the contemplated work is accomplished.

In the old collieries, the good condition reported last year is generally maintained. A few instances exist where there is sufficient ground to complain, but even in these a slow progress is being made, and I am promised that a more satisfactory condition will soon be effected.

With the large amount of coal mined at present, the workings underground spread out rapidly, requiring extraordinary care in the manipulation of the air-currents to supply an efficient quantity of ventilation at the face of the workings. This is done remarkably well, considering the difficulties of the work.

Some difficulty is experienced in maintaining an effective discipline, from which laxity accidents frequently arise, causing injuries to the workmen which might easily be avoided provided the discipline was more effective.

**Events Causing Fire-Damp to Accumulate in Collieries.**

Great danger exists when a large body of fire-damp accumulates in a coal-mine, and this danger had to be contended with at three of the collieries of this district for several months in 1883. During the first part of January the pillars of a large extent of workings in the Baltimore slope were crushing and showing the usual signs of an approaching cave, and about five o'clock, A. M., January 25, the expected cave transpired, breaking the strata clear through to the surface, and damaging a number of houses. While the pillars were being crushed, all the hitherto occluded gases were suddenly relieved and evolved into the cavities of the mine, causing the atmosphere of a large area of workings to become explosive. At the same time, from the same cause, the second opening of the Conyng-ham shaft was deranged and made for a while unavailable as an escape for the latter colliery's workmen in case of emergency. The ventilation of this mine was also affected, so that a large section of the workings became

and by the end of the year had mined fifty-nine thousand seven hundred and eighty-six tons. The Ross vein is worked by a slope, but this will only be used for a short time, the company having decided to sink a shaft to hoist the coal from that seam. A tunnel is driven into the Red Ash seam on a level with the breaker, the coal from which is brought out by mules. The ventilation is produced by a fifteen-foot fan, but the pitch of the seam being very steep some difficulty is experienced in conducting the air-currents to the face in desirable quantity. In a short time we expect that this difficulty will be subdued, when other openings can be gained for the admission of the air.

The breaker is a new structure, equipped with the latest improved machinery, and the requirements of the law have been complied with in all its arrangements.

**Fuller Coal Company.**

The Fuller shaft and breaker in Kingston township were completed and began to produce coal in the last week of August, 1883. The shaft was sunk through the six-foot seam down to the eleven-foot seam, but the latter is not mined for the present, the six-foot being more available. The colliery is equipped with excellent machinery and an efficient breaker. Over and underground, the effects of order and attentiveness to details are at every point apparent. The ventilation of the mine is good, and the openings are made with a view of maintaining good ventilation to the end.

A slope is being driven to work the coal lying below the shaft level. This is down a distance of five hundred feet at this writing, and is still being driven forward.

**Messrs. Cowan & Dinniny.**

The Scholey colliery of this company is situated about one mile east of Wyoming. The main shaft is 24'×10' in size, and is sunk at present to the Pittston vein, a depth of three hundred and forty-three feet. They have cut the six-foot seam also at a depth of one hundred and eighty-five feet, and the five-foot seam at a depth of about one hundred and fifty feet. Owing to the unusual depth of sand overlying this track, they intend to work the lowest vein first, thereby ensuring greater safety.

They have a large breaker which was completed and started to pass coal through on the 3d of September, 1883. The hoisting engines are geared-acting, the cylinders being eighteen by thirty-six inches.

They failed to sink the first air-shaft, owing to the trouble and difficulties encountered from quicksand. It was sunk to the depth of about one hundred feet, and was abandoned. The new air-shaft is 10'×18', and is going down successfully. At this writing the second opening was not effected, but they are driving openings ready to connect with the air-shaft when it will reach the vein.

**Hillman Vein Coal Company.**

This company sunk two shafts, one for hoisting coal, and the other for a second opening and ventilating purposes. They are located on the east

**Dinny & Co.**

The air-shaft at the **Schooley** colliery of this company was completed to the Pittston seam, at a depth of three hundred and twelve feet. Its sectional area is one hundred and forty square feet. It was connected to the workings by June 1, 1884, since which time the colliery has been working upon its full capacity. A fan was erected at the main shaft, the diameter of which is eighteen feet, and it produces a ventilation of about seventy-five thousand cubic feet per minute. They have had more than ordinary trouble in opening this colliery, but the work has been successfully accomplished, and the mine is now in a fair condition.

**The West End Coal Company.**

The East End colliery of this company began to produce coal for the market in the month of March, 1884, and has been in operation since that time. Their openings are all above water-level, having driven a tunnel to the seams. At the West End colliery an air-shaft was sunk to improve the ventilation. Its sectional area is one hundred square feet, and depth eighty feet. At the old tunnel a sixteen-foot fan was erected, which has improved the ventilation very materially.

**The Hanover Coal Company.**

This company sunk a shaft on their premises during the year 1884. Its size is  $11\frac{1}{2} \times 20$  feet, and its depth from surface to the Ross seam, which is mined at present, is one hundred and ninety-four feet. This, with other improvements effected at this colliery, has increased its capacity for producing coal and for giving employment to persons in and about the mine. Other improvements are in contemplation, which will be effected during the year 1885.

**The Alden Coal Company.**

The tunnel at the Alden colliery was extended to the Ross seam, having passed through three workable seams including the Ross. The latter is 6 ft. 2 in. thick, and it was reached at a distance of one thousand seven hundred and sixty-four feet from the entrance of the tunnel. The Bennett vein was cut at a distance of two hundred and sixty-three feet, the Twin vein at three hundred and fifty-eight feet, and the Ross at one thousand seven hundred and sixty-four as stated. The first is 4 ft. 6 in. thick, the second 5 ft. and the third 6 ft. 2 in. The tunnel is driven on the level of the breaker, and the coal is brought out by mules.

**The Hillman Vein Coal Company.**

A tunnel was driven at the Hillman Vein shaft from the Three-foot seam to the Hillman, cutting the latter at a much lower elevation than it was at the shaft. Its sectional area is  $8 \times 14$  feet, and its length is four hundred feet. This opens a fair lift of good coal at a point convenient to the shaft. They sunk a slope also to the South basin, from which they are now obtaining a large portion of their production of coal.

The Seneca shaft was extended to the Red Ash vein, a distance from the surface of 492'. The second opening has been completed in this vein with the Ravine shaft.

*Greenwood Coal Company (Limited).*

A new shaft 11'x26' was sunk by this company, from the surface to the "New County" and Dunmore No. 2 vein, a distance of 232'. The shaft is located convenient to the breaker, and opens a large field of coal which could not be got conveniently from the old shaft. A new 17-foot fan has been erected on this shaft to ventilate the workings of both seams. A slope was extended from the surface down to the seams for second opening. A new shaft was sunk by this company on the lands of the east-side "Bondholders" near the intersection of the C. R. R. of N. J. with the Delaware and Hudson Canal Company at Minooka, Lackawanna county. The breaker was completed in July, 1889, and has a capacity of 800 tons per day. It had not started to prepare coal for market at this writing.

*Butler Mine Company (Limited).*

At the **Schooley** colliery a new 18-foot Guibal fan was erected on a part of the second opening. This makes the second fan used in ventilating these shaft-workings, which gives very good results.

*Avoca Coal Company.*

The old Swoyer shaft located in Avoca borough, and which was abandoned for a number of years, has been re-opened by this company. The shaft is 11'x19', depth 70', sunk on the Stark vein. The workings are ventilated by the consolidated fan which is connected with the workings of this shaft. A new breaker has been built to prepare the coal for market, with a capacity of 400 tons per day. It is heated throughout by steam, and everything in and around the breaker is in as safe a condition as possible.

*Lancliffe Coal Company.*

The old No. 12 shaft which was sunk to the Red Ash seam located in the borough of Avoca, has been re-opened by this company after having been abandoned for a number of years. They are mining the bottom split of the vein which was left by the Pennsylvania Coal Company, who mined the upper seam. The rock between the seams is very thin, so that great care will have to be exercised with the roof so as to keep it up as they advance. A new 15-foot fan has been erected on the shaft to ventilate the workings. A new breaker, having a capacity of 600 tons per day, has also been built to prepare the coal for market. It is heated by steam and all the dangerous parts of the machinery boxed, or fenced off.

The supposed cause of the fire was a hot journal. The company proceeded without delay to clear up the debris and ordered the timber for rebuilding, as soon as the alterations in the plans could be made. As the breaker is on a different plan from the old one, it took considerable time to alter the plans to fit the old site with the new structure.

The new breaker is what is called a "wet and dry" breaker; that is, it has one dry side where all of the coal coarser than stove coal is prepared without using any water. To the wet side is carried all of the various sizes which are separated by screens and run into jigs for the purpose of picking out the slate. The wet side consists of six shaking screens, six by nine feet, and twelve jigs which are known as the Lehigh Valley pattern. Three of these jigs clean the stove coal, four the "chestnut," three for "pea," and two for "buckwheat," and they are doing the work in a very satisfactory manner. The coal that goes to the dry side is slated by the "Zigler Automatic Separators." Of this kind of slate picker there are 16 in the breaker, ranging from five feet to eight feet wide. The pickings from these pickers in the main dry screen room are taken up in an elevator and re-picked. In this way the slate in the coal is reduced to about four to five per cent. These pickers also separate the bone from the slate. This bone runs to an extra set of rolls which grinds it to a smaller size. These smaller sizes which are made from the bone, are elevated to the shakers on the wet side and sized, and then run to the jigs, which remove the slate. The largest size they make from these rolls is chestnut coal. All the doubtful pickings from the jigs run to a separate set of small rolls which grind to pea and buckwheat and it is re-elevated to the wet side and reslated. The jigs make a very perfect separation of the sizes of pea and buckwheat. In all its departments this is one of the most complete breakers for cleaning and preparing coal in this part of the Anthracite coal field. It was started on August 24, 1896, to prepare coal for shipment.

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## COLLIERY IMPROVEMENTS FOR 1896.

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### Improvements by Pennsylvania Coal Company.

On June 4, 1896, the **Schooley** Colliery passed out of the hands of the Butler Mine Company, Limited, and into the possession of the

Pennsylvania Coal Company, which company began immediately to make important repairs in and about the colliery. The old cribbing in the hoisting shaft was taken out and replaced by new. A general overhauling of the breaker and machinery was gone into and they were placed in first class condition. This company started the breaker to prepare coal on September 10, 1896. Four new Babcock and Wilcox water tube boilers of 150 H. P. each, in two nests or batteries, were installed and put in operation on August 28, and they supply steam to all the engines and pumps about the colliery, thus supplanting 21 cylindrical boilers formerly used at this colliery.

A new 20-foot exhaust fan was installed on the air shaft of the above colliery which gives very satisfactory results and supplies 72,000 cubic feet of air per minute under a speed of 37 revolutions.

Twenty-four new Babcock and Wilcox tubular boilers have been installed by the above company supplanting 71 old cylindrical boilers at their various collieries in this district during the past year.

#### Improvements by the Mount Lookout Coal Company.

During the time this company was rebuilding the new breaker they sunk No. 2 shaft from the "Pittston" through the "Marcy and Ross" to the "Red Ash" vein, a distance of 327 feet. They also sunk No. 1 shaft down through the Marcy and nearly to the Ross vein, a depth of 200 feet. There have been no developments made in these veins, but they expect to make some in the early part of the summer.

Before this can be done it will be necessary to place a pair of large hoisting engines on the head of No. 2 shaft and to have a new head-frame built, as the present tower for sinking is not strong enough to hoist coal. They expect to finish sinking No. 1 shaft as soon as the weather moderates, so that there will be no trouble with ice in the shaft. This work will have to be done at night as the colliery will be operated as usual during the day.

#### Improvements by the Lehigh Valley Coal Company.

A rock tunnel has been driven in the Prospect Colliery of this company from the "Bowkly" to the "Hillman vein," a distance of 150 feet, which is to be used for transporting coal. At the Maltby Colliery a new fan has been erected which is 25 feet in diameter; engine, 18x36 inch, directly connected.

The last fire seen was on January 27, 1899, at a point just east of the foot of the slope, but the workmen continued removing the heated and burned coal and rock until they had completely surrounded it and continued the streams from three lines of hose until February 18.

The method adopted for flooding the slope (see sketch) was undoubtedly the proper one for the place, and saved the expense and almost ruinous alternative of flooding the several mines mentioned above. The work accomplished in fighting the fire backward along the gangway for more than 250 feet by means of hose streams and the removal of the burned and fallen material, as the workmen advanced amid the dangers from foul air, bad roof and sides, was no easy task and at times was almost discouraging, but the workmen braved the danger, the foreman closely watching and doing everything to insure their safety, and it is greatly to the credit of all concerned that not a single accident occurred during the whole time, except some sickness due to foul air.

The locating of the gates and dams and the placing of same and the adjustment in their working was successfully placed and worked under the immediate charge of Mr. Alex. Bryden, superintendent of mining, he having been ably supported by the following officials: Messrs. Andrew Bryden, James Young, James Y. Bryden and John F. Reynolds and other employes whose most faithful and untiring efforts were crowned with final success in a comparatively short period of time.

#### Destructive Cave-in of the Schooley Shaft.

On Monday, May 8, 1899, at 8.30 P. M., an extensive cave-in took place in the Pittston seam of the Schooley shaft, operated by the Pennsylvania Coal Company and located on the property of the Schooley heirs on the west side of the Susquehanna river, in the borough of Exeter.

The shaft was sunk from the surface to the Pittston, or Fourteen Foot, vein in 1883, by Nelson, Cowan & Dininny, the size of the main shaft being 10x24 feet. A few years later it was sunk from the Pittston to the Red Ash vein. A large breaker was erected over the main hoisting shaft, which was started up on September 3, 1883.

The second opening or air shaft, 10x18 feet, was sunk 500 feet north of the main opening and all the underground workings connected throughout the four workable seams. The depth from the surface to these veins is as follows: The first, or Checker, 182 feet; Pittston, or Fourteen Foot, 312 feet; Marcy, 390 feet to Red Ash or bottom vein, 582 feet. The total thickness of these seams are about 39 feet.

The property extends from low water mark in the Susquehanna river northward a distance of one mile in length and 840 feet in width, with the Lehigh Coal Company's Exeter colliery on the east and the Pennsylvania Coal Company property on the south and west sides.

Previous to June 4, 1896, this colliery was operated by the Butler Mine Company, Limited, which company finished mining all the solid coal comparatively from the Pittston, Marcy and Red Ash veins, leaving only the pillars in the above seams as support to the roof.

On June 4, 1896, this colliery passed into the possession of the Pennsylvania Coal Company, which company immediately began to repair the shaft and inside workings in order to mine the coal which lay adjoining. The pillars around the shafts were strengthened by building cogs, standing props and filling all open spaces with rock and debris which took until September 10 following, when a general start to prepare coal in the breaker was made.

Richard Appleby, the mine foreman who had charge of all the underground work under the Butler Coal Company, was retained by the Pennsylvania Coal Company in the same capacity. Being a competent and careful official and having a thorough knowledge of all the old or abandoned workings in the shaft, he proceeded to place the new workings in as safe and secure condition as possible by leaving a 150-foot barrier pillar along the line of the Schooley property to protect the new workings from danger in case of a squeeze, if such should occur.

On the evening of May 8, 1899, while the night shift was at work, a cave took place in the old workings south of the hoisting shaft. The night fire boss immediately sent for the mine foreman and notified him of the fact. Arriving at the shaft, Mr. Appleby, in company with the fire boss, descended the shaft to the Pittston vein and investigated the cave. Returning, they ordered all the workmen out of the shaft until a more thorough and satisfactory examination could be made, and, after seeing their orders complied with, they returned and made a more complete and careful examination of the affected district and discovered that a general settling or squeeze of the overlying strata had taken place, causing the pillars to give way which were left for the support to the roof, to such an extent that the situation had become alarming. Returning to the foot of the shaft, the mules were ordered to be taken out for safety.

The next morning the officials of the company were notified of the situation and all meet for consultation at the shaft. In examining the surface for any indications, large cracks or crevices were discovered extending along Wyoming avenue about 800 yards south of the shaft and running down to the river.

On May 10, an examination was again made of the inside workings of the Checker and Pittston seams, as hopes were entertained that



the squeeze would stop when it came to the large fault which extended across the property between the squeeze and the shaft in the Pittston seam. In making their examination close to the air shaft in the Pittston vein, a large stream of water was discovered going down the air shaft to the Red Ash vein, which proved beyond doubt that the water from the river was coming into the workings through the crevices in the rock. In trying to get to the large Dunmore pump, situated some distance from the foot of the shaft, to start it, the explorers came in contact with a large body of explosive gas, which drove them back until the foreman and his assistant made a change in the air current and succeeded in clearing it off so that the pump was started in the afternoon, but the water was steadily increasing to such an extent that the pumps in the Red Ash seam stopped from being covered with water. The next day the cages were taken out of the shaft, and large iron tanks, having a capacity of 850 gallons each, were put in to hoist the water, and extra pumps put in at the foot of the air shaft in the Pittston vein to hold the water from coming to the Pittston seam. In my opinion this flow of water could have been controlled if the squeeze had stopped at the fault referred to. A careful watch was kept while the above work was being done, and the discouraging report came that the squeeze had crossed the fault and was fast approaching toward the shafts and so continued until May 29, when the Inspector of the District, considering the risk too great to the working men whose duty it was to attend the pumps, forbade all persons from descending the shaft when all had been done that could be done with safety, as large crevices were discovered close to the boiler room, which extended north of the shaft as far back as the Lehigh Valley Railroad branch, which had settled considerably. The fires were ordered to be drawn from under the boilers, and a locomotive was brought to furnish steam to keep the fans running, as the return air current was charged with explosive gas to such an extent that it would explode in the safety lamp in the fan room.

This condition of affairs continued until June 20, when the officials of the company, who were unceasing in their efforts to handle the large flow of water which was gradually increasing in the shafts, abandoned all work for the present, as all their efforts were of no avail, and allowed the water to rise to its level in the shafts, which, at this writing, has reached within eighty-five feet of the surface or top of the shaft.

How badly the inside workings are damaged cannot be ascertained at present, but from all surface indications a complete subsidence of the entire overlying strata of the old workings has taken place, rendering the air shaft in particular useless for the future. The breaker, which was located over the main hoisting shaft, has settled

considerably, causing some of the large timbers to be broken and others to be twisted out of place. The machinery likewise is thrown out of line, which in all probability will require the building of a new breaker when the mine is reopened.

#### Colliery Improvements for 1899.

##### Pennsylvania Coal Company.

At the No. 8 colliery a new washery was erected to wash the culm and prepare it for market. It is equipped with all the latest devices in machinery for cleaning and preparing a large tonnage of the smaller sizes of coal. A steam shovel is used to take the culm from the bank which deposits it into a chute, whence it is taken by a line of conveyors into the washery, where it is washed and prepared for market. A large tonnage of good coal is thus secured from the refuse of former years.

##### Florence Coal Company, Limited.

This company built an addition to their Elmwood breaker to clean and prepare culm which is taken from the bank. A large supply of good coal is secured, which adds to the tonnage of the company.

##### Walter B. Gunton, Operator.

A new colliery has been located by the above operator on the estate of the Jackson heirs, in Sullivan county, Pa., and is situated three-quarters of a mile west from the village of Bernice. The colliery consists of a new breaker, which was started to prepare coal in the month of April, 1899, is furnished with good machinery and has a capacity of 500 tons per day.

The opening consists of a drift driven from the surface to the vein, the crop of which is close to the surface and which tapped the old workings formerly operated by the State Line and Sullivan Railroad Company. The coal from the breaker is taken over a branch laid from Lehigh Valley Railroad at Bernice, to market.

##### North American Coal Company.

This company erected a large washery in the borough of Luzerne, in close proximity to the Raub Coal Company's colliery, to prepare coal from the culm bank of the Mill Hollow colliery. Work was commenced at the building in December, 1898, and finished in May, 1899, and coal was shipped on June 1. The capacity of the washery is 600 tons per day and it employs twenty-three men and boys and is equipped with the most improved machinery for cleaning and preparing coal. All dangerous parts of the machinery are covered or protected by fencing.