Audenreid shaft.—This shaft is located south-west of the city. It is just being sunk, is down at present over 700 feet, and will probably reach the Baltimore vein at about 800 feet from surface. There are all indications of this becoming a fiery mine when once opened; it will have its second opening ready by the time it is down. Rendrick Bros., contractors; John T. Griffith, mining superintendent.

Hollanback shaft.—This is a new shaft located near the S. R. R., and within the city limits. It is down at present about 350 feet, it is to go to the Baltimore vein. There are indications of large quantities of gas in this shaft also. The second opening to it will be made from the Hollanback, No. 8, in the Hillman vein, and from the Diamond shaft for the Baltimore vein. Murry & Son, contractors; John J. Griffith, mining superintendent.

South Wilkesbarre shaft.—This is a new shaft, located also within the city limits. It has not been worked of late; only preparing to start, having had its head house, engine house, &c., burnt down a short time ago. It is down now about 100 feet, and is intended to reach the Baltimore vein. Smyth & Son, contractors; John T. Griffith, mining boss.

Lance shaft.—This colliery is located near Plymouth borough. It was sunk last year from the Lance vein to the Bennet vein. Gangways, air-ways, &c., have been started in the Cooper bed or the top bed of the Baltimore vein. There is to be a second opening made between this and the Dodson shaft, by driving gangways from both sides to meet. The old 8 feet fan has been replaced by a 15 feet fan. They are changing some of the hoisting machinery and remodeling the breaker, and expect to be ready to ship coal in 1873.

The plan upon which the bottom and turnouts of this shaft is being opened out, promises to be an improvement upon the old style of opening out around the bottom and tunnels of mines in the past, if properly carried out, with some slight changes as suggested by the inspector, it will give a fair chance to ventilate the mine properly by having double doors, so that the air currents on either side need not be cut from one end of the week to the other, besides having hundreds of feet on either side of the shaft without a door, hence free to pass from the obstructions of so many doors close to foot of shaft. John T. Griffith, mining superintendent: Wm. Smyth, assistant; Geo. H. Parrish, general superintendent; F. Tiffeney, assistant.

Dodson shaft.—This shaft is located in Plymouth borough and is 280 feet deep. It is sunk into the Bennet vein, in which vein the work has been opened out.

There has been considerable trouble experienced in opening this mine. A heavy stream of water was cut in the west gangway, which compelled the abandonment of the same, having cut the same twice in this same vein, and a similar one in the overlying vein, from which cause it was found necessary to abandon the west gangways in each vein for the present. It was my opinion from the outside indication that it was doubtful as regards the safety of opening a gangway westward on the Cooper vein without first ascertaining how much rock covering it had, as it might be that the rock roof of the same could be replaced by a sand bed which, if struck, would let in the water from the river bed and drown out the mine in a short time, and in all probability sacrifice many lives. Accordingly, I called the attention of the company's officials to the matter and requested them to find out the thickness of rock overlying the vein at this point. When the time arrived for them to start the gangways westward, they did not pay any attention to the matter of how much rock roof they had, but pushed on their gangways. They did not go far, however, before they struck a water seam and which caused them to abandon the same. This shows how much unnecessary risk of loosing many lives and destroying much valuable property is often run for the sake of saving a few paltry dollars and this even after being cautioned of the danger, &c. Otherwise the mine is tolerably safe, considering that there is some explosive gas generated and that the Cooper vein has some very dangerous roof, but it being very well timbered.

Ventilation is produced by a fan 15 feet in diameter, and is tolerably good at present, having had several important improvements made this year in the way of making new air bridges of large size, and splitting the air into several currents; besides this they have the stone and mortar system of building their stoppings, instead of the wooden ones, as heretofore, and which, on the whole, makes it a well ventilated mine.

All the safety appliances are in good order, such as bridle-chains, safety-catches, speaking-tube, gates at head of shaft and an adequate brake on the hoisting drum; besides, there is a convenient way to travel up and down the second opening shaft by a first-class set of ladders. Amount of air at inlet,

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 Bowkley 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.

Mr. William M'Culloch, the contractor, having sunk the Wyoming shaft 216 feet in four months, also received the contract and sunk the second opening shaft to the same depth. The latter is a circular shaft, used for an upcast air-way, and also has a wire rope and bucket, with the necessary hoisting machinery to be used in case of need, as a means of escape, or second opening.

A short distance west of the air-shaft head, is erected a pair of ventilating fans, each 15 feet in diameter. These fans are similarly constructed to those at the Enterprise colliery, belonging to the same company, and described in my last report.

Lehigh and Wilkesbarre Coal Company's Audenried Shaft.—This shaft has been completed, so far as sinking, timbering and lining is concerned, and is now ready to be operated. The tunnels now being driven, and the machinery are not quite finished.

Delaware and Hudson Canal Company's No. 4 Shaft, Plymouth.—This shaft was being sunk deeper from the Bennett or lower bed of the Baltimore seam, down to the Red Ash or Buck Mountain seam, at the time of my last report, and has since been completed. Gangways are being opened out, preparatory to driving at the proper distance, to connect with a new shaft now being sunk, about 200 feet north of the former, to secure a lawful second opening.

SHAFTS NOT YET COMPLETED.

Lehigh and Wilkesbarre Coal Company's No. 14 Shaft.—This shaft is located adjacent to the Gaylord slope, Plymouth, Pa. It is progressing, having been sunk through the Cooper or upper bed of the Baltimore seam. It is intended to win the coals of the Red Ash seam in this locality.

South Wilkesbarre new Shaft, by the Lehigh and Wilkesbarre Coal Company.—This shaft has only been worked a part of the time since my last report, but has reached a depth of 418 feet. It is now thought that it will take 400 feet additional sinking to cut the Baltimore seam.

Hollenback Shaft, also owned by the Lehigh and Wilkesbarre Coal company. This shaft has penetrated the Baltimore seam at a depth of 500 feet from the surface, and was found in good condition. Although the sinking has been finished, the shaft is not quite completed for hoisting, its timbering, lining, &c., not having been finished yet. Neither has it the necessary second opening, but a shaft 12′ by 20′ is being sunk at a distance of 1,300 feet south-east of it, to which a communication will be made for a second opening; it will also be used as an upcast air-shaft.

The necessary fan or fans will be erected to ventilate the Hollenback and Diamond collieries; besides that, a hoist-way will be in one end of this shaft, through which the workmen will be let up and down for both the mines above mentioned. Also materials, such as timber, machinery, &c., may be handled in the same manner if need be.

Susquehanna Coal Company's Shafts, Nos. 1 and 2.—No. 1 shaft has already reached a depth of 540 feet, having passed through the upper and lower beds of the Baltimore seam. The lower of the two aforementioned beds is called, in that locality, the "forge" vein. The shaft is now being timbered, preparatory to its continuation at some future time, how soon I know not, to the lower or Red Ash seam.

The sinking has been done, for some time, by day's work, under the immediate direction and supervision of the company's mining foreman, Mr. Geo. T. Morgan.

No. 2 shaft has reached a depth of 445 feet. Having been commenced about 540 feet lower in the measures than No. 1 shaft, it has cut through

feet in length. A second opening is effected to another lift, and the coal is twenty feet thick, and of good quality.

At No. 9 shaft, Sugar Notch, two tunnels are now in progress of driving from the Ross to the Red Ash seam, having an area of twelve by seven feet.

The Lance shaft was extended from the Bennett down to the Baltimore seam. The depth of extension was two hundred and thirty-three feet, and the total depth of the shaft, at present, is five hundred and fifty-nine feet from the surface. An air shaft is in progress of sinking, which will constitute a second opening for the other. It was down, December 31, 1881, three hundred and thirty-five feet, and, when completed, will probably be five hundred and thirty feet. There was no coal shipped from this colliery during 1881, but it will be ready to ship coal in the course of a few months, when the second opening will be effected. They have been employing an average of sixty-three persons during the year, effecting the work described.

The Stanton air shaft was down December 31, a depth of six hundred and eight feet and is to be extended to the Baltimore seam; a probable depth of eight hundred and thirty feet. This shaft is intended to improve the ventilation of the Audenreid colliery, and a fan, thirty-five feet diameter, will be erected upon it for that purpose. The shaft is twelve by twenty-five feet; part of it will probably be used to work the Hillman seam, the condition of which appears favorable for that in the shaft. They are employing an average of twenty-five persons and had two fatal accidents during the year just past.

The south Wilkes-Barre shaft was down, December 31, a depth of five hundred and eighty-six feet, and when completed to the Baltimore seam will be about one thousand one hundred feet deep. Its size is twelve by twenty-four feet, and is employing an average of twenty-one persons.

Delaware and Hudson Canal Company.

At the Mill Creek slope a new tunnel was driven from the lower to the upper split of the Baltimore seam. It is two hundred and eighteen feet in length, and has an area of seven by twelve feet. The seam is eight feet thick, and the coal is of good quality.

A new pair of hoisting engines was erected at the top of the slope to supersede the old ones. The dimensions of the steam cylinders are twenty-six by forty-eight inches, and the drum is twelve feet diameter.

At Laurel run slope a new tunnel was driven from the bottom to top split of the Baltimore seam, a distance of sixty-feet; seven by ten feet area, and has opened a convenient territory of coal.

The new tunnel in the Baltimore Tunnel colliery, noted in my last report, is completed, and the second opening effected. It is one thousand four hundred and fifty feet in length, and seven by fifteen feet area. The Baltimore seam in this colliery is very nearly exhausted, and this tunnel was driven from that seam to the Red Ash, of which they have a very large territory intact. The coal is of good quality, and fourteen feet thick. A

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,	28	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	28	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		

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 5½ 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 17½ 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 escapage 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The Susquehanna Coal Company.

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

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

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

automatically as soon as the bucket ascends through the door-passage. The Delaware and Lackawanna plan has balance arrangement, so that the headman can easily close it when the bucket passes. Both are very good arrangements, and either one is worthy of adoption.

COLLIERY IMPROVEMENTS DURING 1884.

The Lehigh Valley Coal Company.

In February, 1884, a new shaft was commenced by this company on the tract of land now worked from the Exeter shaft. It is located a short distance west of the Exeter shaft, and will be sunk to mine the seams lying beneath those mined in the Exeter. The size of the new shaft is twelve and a half by forty-eight feet, and it will reach a depth of about six hundred feet before cutting the intended seam. A block of coal was left unmined in the Pittston seam, through which this shaft passes, without making connection with the workings of the Exeter colliery. It was sunk at the close of the year 1884 to a depth of three hundred and fifty-five feet.

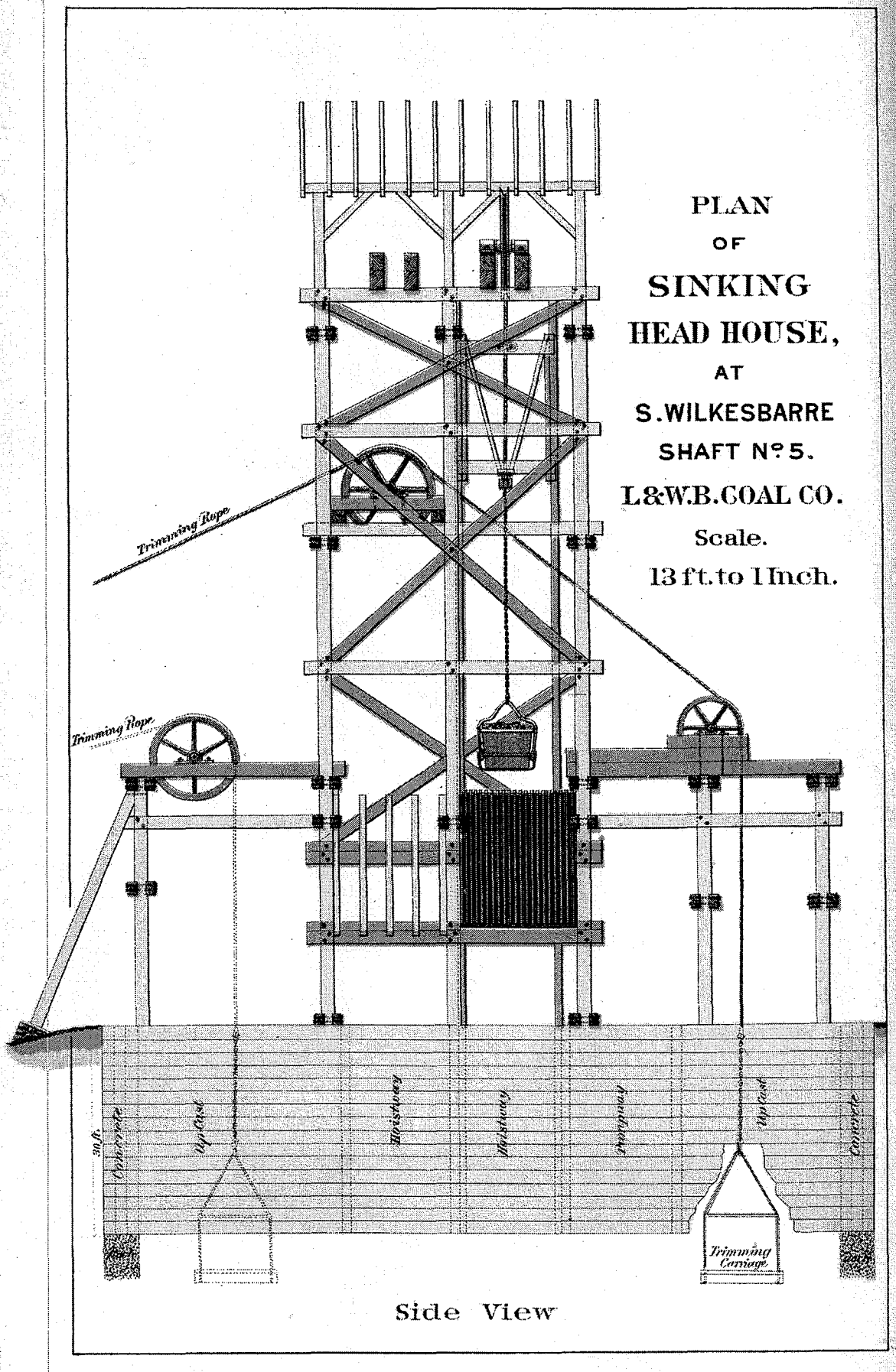
In the Prospect mine, a slope was sunk to the basin on north side of shaft to a depth of eight hundred feet, and an engine, worked by compressed air, is located at the top of the shaft to hoist the coal up. The engines which compress the air are located on the surface near the shaft, and the air is conveyed through pipes to the hoisting-engines in the mine.

At the Henry colliery, a new breaker was erected about three hundred feet north-east of the shaft. It was completed ready to connect with the shaft by the beginning of December, 1884, when work was suspended to tear the old structure away, and connect the new one. It was started about one week prior to the close of the year. This was a very important improvement at this colliery. It has decreased the risk of descending the mine, besides increasing the facilities for shipping coal.

The Dorrance colliery breaker was started June, 1884, and they are shipping a small quantity of coal every month since. The second opening to connect the two shafts was completed by the beginning of October; but, owing to faults and dislocations interrupting the gangways, they have not been able to mine much coal. The mine is ventilated by a thirty-five-foot fan, Guibal pattern, which was started April 24, and is ever since producing ventilation far in excess of their present need, although running but very slowly. Mr. Mercer, the general superintendent of this company, evidently is bent on securing the best kind of machinery, as well as insuring the highest known degree of safety for both men and property.

The Lehigh and Wilkes-Barre Coal Company.

On April 1, this company began sinking their new shaft at South Wilkes-Barre, and located it about three hundred feet south-west of the old shaft. Its size is twelve by fifty-two feet, and it is intended to work the Red Ash and over-lying seams. It is expected to reach the Red Ash seam at a depth of about one thousand three hundred feet, and had reached a depth of two hundred and thirty feet at the close of the year 1884. Its sinking



PA Mine Inspection 1884

Colliery Improvements During 1886.

The desire for improvement was not very active during the year 1886. The demand for coal and the price received for it were not such as would encourage expensive outlays to obtain it. The improvements, therefore, were confined chiefly to what was necessary to maintain the existing production.

Susquehanna Coal Company.

At the No. 1 deep shaft of this company a new fan was erected, twenty-five feet diameter, and of the Guibal pattern. This was found necessary to ventilate the workings of the red ash seam, which are becoming extensive and require a large volume of air.

In the George seam of the same shaft a slope is being sunk to reach the coal lying below the shaft gangway. The hoisting engine will be located on the surface and the rope passed down through a bore-hole already made for that purpose.

At the Newport shaft a second opening was effected for the upper seam, and another is being driven for the lower seam. The second openings for the tunnel seams and also for the slope were completed.

Lehigh and Wilkes-Barre Coal Company.

The new shaft which is being sunk by this company at South Wilkes-Barre, and which is named Tillinghast shaft, was at a depth of eight hundred feet at the close of the year, having passed the Hillman vein a short distance. It is a large shaft, fifty-two by twelve feet, and located a short distance south-west of the old South Wilkes-Barre shaft; was started in 1884, and operations have been going on continually since.

At the Nottingham colliery a new shaft was started for the purpose of improving the ventilation. It will be divided into two compartments, one an upcast and the other a downcast. It will be used chiefly to ventilate the workings of the Ross vein, which are now spreading extensively.

At the Hollenback colliery an underground slope was completed. The hoisting engine is located on the surface and the rope passed down through a bore-hole. It works admirably. Signals are given by electric bells, and conversation between the engineer and inside men effected by telephone.

Delaware and Hudson Canal Company.

Work is continued in the Baltimore shaft of this company, driving passages toward the No. 2 Baltimore shaft. The latter was standing idle until the close of the year, having been stopped upon sinking it to the rock. It was walled with a thick, cement-laid stone from the rock to the surface, and was left to stand idle for several months after, but preparations are being made now to complete its sinking.

At the No. 3 colliery, at Plymouth, a new fan, eighteen feet diam-

Examination of Applicants for Mine-Foreman's Certificate.

The annual examination of applicants for mine-forman's certificate in the Third district was held in the Central school building, Wilkes-Barre, Pa., June 21 and 22.

The examiners were G. M. Williams, inspector; Charles Conyngham, operator, both of Wilkes-Barre, Pa., and James Fisher, miner, of Nanticoke, Pa.

Forty-five applicants for certificates of qualification appeared for examination, and the following thirty-two were successful:

John W. Joseph, William T. Evans, Daniel P. James, A. J. Gallagher, Andrew H. Weir, John Heycock, Jonathan Weir, William P. Howells, Richard Martin, Jacob D. Jones and Samuel Griffith, of Wilkes-Barre, Pa.; R. M. Williams, Samuel R. Morgan, William E. Howells, T. M. Rees, Edward Roderick, Thomas Cross, John I. Williams, H. G. Willams, Benjamin Richards and John R. Williams, of Plymouth, Pa.; Mordecai Dando, John D. Williams and William A. Jones, of Edwardsdale, Pa.; Henry R. Jones, John Winters and John I. Absalom, of Nanticoke, Pa.; Rees Morgan and John R. Morris, of Sugar Notch; Richard Faull and Griffith G. Roberts, of Ashley; W. S. Williams, of Peeley, Pa.

A. Rees, Nanticoke, Pa., applied for certificate of service, and was recommended to receive one.

Mine Improvements During 1887.

Lehigh and Wilkes-Barre Coal Company.—At the Stanton mine air-shaft this company is erecting a new fan thirty-five feet diameter to duplicate the present one, so that one may be used while the other is undergoing repairs. They have found it dangerous to allow the ventilation to cease traversing, because in such a gaseous mine blowers of gas may be burning which cannot be detected by examination, and yet would ignite the gas when the mine would be filled to the point where the burning blower might be.

At the No. 9 colliery, Sugar Notch, a new fan twenty-four feet diameter is in course of erection to ventilate the upper seams. The workings have extended so that this was found necessary.

At the Nottingham colliery, Plymouth, a new air-shaft 12′x30′ was sunk from the surface to the Ross seam, where it will be connected to the Red Ash seam by a tunnel now being driven for the purpose of improving the ventilation. A fan twenty-four feet diameter is being erected in the shaft which is expected to effect material improvement.

The new shaft at South Wilkes-Barre is sunk to a point twenty-four feet below the Baltimore seam, a total depth from surface of 1,064 feet. The coal was found in its usual thickness of sixteen feet and of excellent quality. They are now at work putting up partitions and linings preparatory to opening the gangways, etc. The indications are favorable for an unusually productive colliery.

Mine Improvements during 1888.

During this year the spirit of improvement was active, and a number of important movements were made towards improving the condition and the producing capacity of the collieries. Among the number the following were perhaps the most important:

Lehigh and Wilkes-Barre Coal Company.

At the Hollenback colliery movements are in progress towards working the Red Ash seam. A new air shaft is being sunk from the surface and has, at this writing, passed below the Baltimore seam. Its size is 12x37 feet, and it is expected to cut the Red Ash seam at a depth of about 650 feet. Preparations are in progress also to have the main shaft extended from the Baltimore seam, where it now is, to the Red Ash.

At the Stanton colliery a new fan was erected on the air shaft to duplicate their other thirty-five foot fan. The mine gives off such an enormous quantity of fire-damp that it was very hazardous to suspend the course of the air currents for any length of time. To avoid this a new thirty-five foot fan was erected adjacent to the other, and doors were so adjusted that, in case one fan stops running, the other can be operated in a few minutes to ventilate the mine. This mine now has one pair of seventeen-foot double fans and two thirty-five feet fans for the purpose of producing ventilation.

At the South Wilkes-Barre shafts, Nos 3 and 5, extensive preparations are in progress for the completion of the colliery. The main shaft is 1,064 feet deep to the Baltimore seam, where the coal was found in its usual thickness of sixteen feet and of excellent quality. The shaft is divided into four hoisting compartments and an up-cast air shaft. This work is now completed, and a large force is at work erecting foundations for the massive hoisting engines which are to be placed thereon.

The other shaft (No. 3) was sunk to the Baltimore seam also, and cut the latter at a depth of 250 feet below the old terminal or Hillman seam. One of these shafts will constitute a second opening to the other, and coal will be mined from both. A new pair of first-motion hoisting engines were placed on this shaft, and a solid wall of mason work was erected to support the earth from the rock to a point several feet above the surface around the shaft, greatly enhancing its safety. It is expected that a considerable amount of coal will be mined during 1889 from this colliery, which will be shipped from the Diamond breaker.

At the Sugar Notch shaft, No. 9, a new twenty-four foot fan was erected chiefly to ventilate the workings of two seams opened at the bottom of the shaft; *i. e.*, splits of the Baltimore seam. This makes the third fan used in ventilating this colliery, which is quite effective.

At Wanamie the water was pumped out of the old No. 19 slope,

MINE IMPROVEMENTS DURING 1889.

No improvements were made during the year 1889, except those which were absolutely necessary to keep up the usual production of coal. The coal business was not active and the market did not demand nearly as much as it did in the previous year, and this, perhaps, was the cause of the inactivity in effecting improvements.

Lehigh and Wilkes-Barre Coal Company.

At the Hollenback colliery the main shaft was extended from the Baltimore to the Red Ash seam, an increased depth of 373′. Its total depth from surface to the Red Ash seam is 950′ and its sectional area is 12′x46′.

The new air-shaft mentioned in my last report was sunk to a depth of 743′, having a sectional area of 12′x37′. They have not yet struck the Red Ash seam and it is supposed to have pinched out at that point. This shaft is to constitute the required second opening for the Red Ash workings of the Hollenback colliery.

At the Stanton colliery a new rock tunnel was driven on the south-east side of the main shaft from the Baltimore seam workings to the Ross and Red Ash seams. It cut the Ross at a distance of 550′ and the inner or lower split of the Red Ash at a distance of 700′. Its sectional area is 7′x12′, and its grade is about 1′ in 100′.

At the No. 5 shaft, South Wilkes-Barre, the hoisting appliances were put in place on massive stone foundations. The engine cylinders are 32″x60″ connected directly to a cone drum having a diameter in center of 14′ and 8′ at the ends. The shaft is sunk to a depth of 1,068′, the depth to the bottom of the Baltimore seam being 1,045′.

At No. 3 shaft, South Wilkes-Barre, a pair of hoisting engines having cylinders 32″x60″ were also erected on solid foundations of massive stone work, and it is directly connected to a drum 14′ diameter at center and 8′ at ends. The shaft is sunk to the Baltimore seam which was penetrated at a depth of 950′. It is to constitute the required second opening for the No. 5 shaft. Both shafts are already connected by openings in the Hillman seam at a depth of 700′. A long gangway is also driven and connected with a rock plane that was driven from the Stanton mine several years ago.

Delaware and Hudson Canal Company.

The second opening to the Baltimore shafts Nos. 2 and 3 was effected during the latter months of this year. The workings of both are now connected and available for the workingmen of both mines, and each shaft is equipped with hoisting engines and cages. The main shaft, No. 2, is 660′ deep to the Red Ash seam and has a sectional area of

Hillman Vein Coal Company.

At the Hillman Vein colliery two tunnels were driven to the Abbott seam. One was an extension from the Kidney to the Abbott, 7′x12′ area and 325′ in length, driven for the purpose of hauling the coal through; the other was driven to effect a second opening from the Hillman to the Abbott seam and to constitute a return air-way. It is 7′x10′ area and 150′ long.

NEW VENTILATING MACHINES ERECTED DURING 1889.

At the No. 5 shaft, South Wilkes-Barre, of the Lehigh and Wilkes-Barre Coal Company, a new fan of the Capell double-power type was erected. The inventor G. M. Capell claims that this machine is superior to all well-known fans. This is the first to our knowledge that has been erected in this country and we are not prepared to state how it compares with the fans generally in use in this district, as we have not yet had an opportunity to make the necessary tests for that purpose. It is a peculiarly constructed machine, differing considerably from the pattern of the fans generally used. It is constructed very strongly, and adapted to run at a very high speed. It is 12′ wide and 12½′ diameter; has an inlet for the air on each side, but it is divided by a disc at the center of the blades, so as to form a partition from the fan shaft to the blade-tips. The air is delivered from the blades into a wide expanding chimney. The accompanying cut will show the construction lines of the machine, and may assist the reader to understand how it is made. If circumstances permit, we shall report its work in the future.

At the Dorrence colliery, Lehigh Valley Coal Company, a new Guibal fan, 30′ diameter, was erected in the air shaft. It is 10′ wide and has one inlet 15′ diameter. This makes a second 30′ fan at this colliery. The engine cylinder is 30″x60″, connected directly to the crank of the fan.

At the Warrior Run colliery a new fan was erected on the air-shaft. Its diameter is 15′, face 7′, and running eighty revolutions per minute exhausts 79,000 cubic feet of air. This has improved the ventilation of this mine considerably, and the location of the fan is favorable for circulating the air through the face of the workings.

At the No. 2 Baltimore shaft, Delaware and Hudson Canal Company, a 20′ fan was erected and enclosed with brick work. This is a new mine and the fan provides ample ventilation without running it at its maximum speed.

At the No. 2 shaft, Plymouth, of the Delaware and Hudson Canal Company, a new fan was erected in place of an old one. It is 17½′ feet in diameter, of modified Guibal type, and it is doing very satisfactory work.

NEW BREAKERS IN COURSE OF ERECTION.

At the No. 2 shaft, Wilkes-Barre, the Delaware and Hudson Canal Company is building a new breaker. It is expected to be completed by

followed. The concussion of this explosion killed and injured the workmen at the points mentioned, and did the other damage. The colliery had not been in operation since the other cave-in on January 2, and only repair-men were in the mine when the explosion occurred.

It has been well known here for several years that when a squeeze or a cave-in occurs fire-damp is also liable to appear in the air in sufficient quantities to make it explosive, and every man who assumes charge of a mine should know this, and exercise the necessary precaution when such trouble comes upon him, but in this instance every official, from the superintendent down, seemed to be ignorant of this fact, and acted in conformity with their experience in other very different regions.

DISASTER AT THE No. 3 SHAFT SOUTH WILKES-BARRE.

A map of the workings of this mine is here presented in this report which shows the workings and their connections with the Stanton mine. To enable the reader to understand the situation, the conditions just prior to the accident is explained. The No. 3 shaft was the hoisting way for both coal and men. This shaft was also the inlet for the ventilation. The air-current after descending this shaft, passed in through the tunnel and in the gangway to the point "P" where it was split, a part going up the outlets and down the rock plane to the Stanton fan, and the other split passing into the face of the gangway and returning through the air-way as indicated by the arrows, to the fan at the No. 5 shaft. This shaft also had a cage in to hoist the coal worked from the Baltimore seam 300 feet deeper than the Hillman, which was worked from the No. 3 shaft. Thus it may be seen that there were three available openings for No. 3 shaft working; one leading down the rock plane into the Stanton mine; one in the No. 3 shaft; and one in the No. 5 shaft. It was a gaseous mine and exceedingly so at some points. The rock plane was driven from the Baltimore seam in the Stanton mine on a rise of 18 degrees for the purpose of working the Hillman seam above the level of the point "B" on map, but it proved so gaseous that it was found impossible to conduct sufficient air up through one opening, and to avoid driving another passage through the rock from the Stanton, connection was made to No. 3 working of South Wilkes-Barre, undoubtly a costly error. On February 2, after making this connection, the inspectors had to notify the company to suspend operation in both the Stanton and South Wilkes-Barre mines, because in consequence of the opposite effects of the ventilating fans of South Wilkes-Barre and Stanton mines. The air-currents became unreliable and fluctuated so that they became explosive at frequent intervals making both mines dangerous. In a few days this was remedied so that a reliable system of ventilation was established in the manner indicated on the accompaning map.

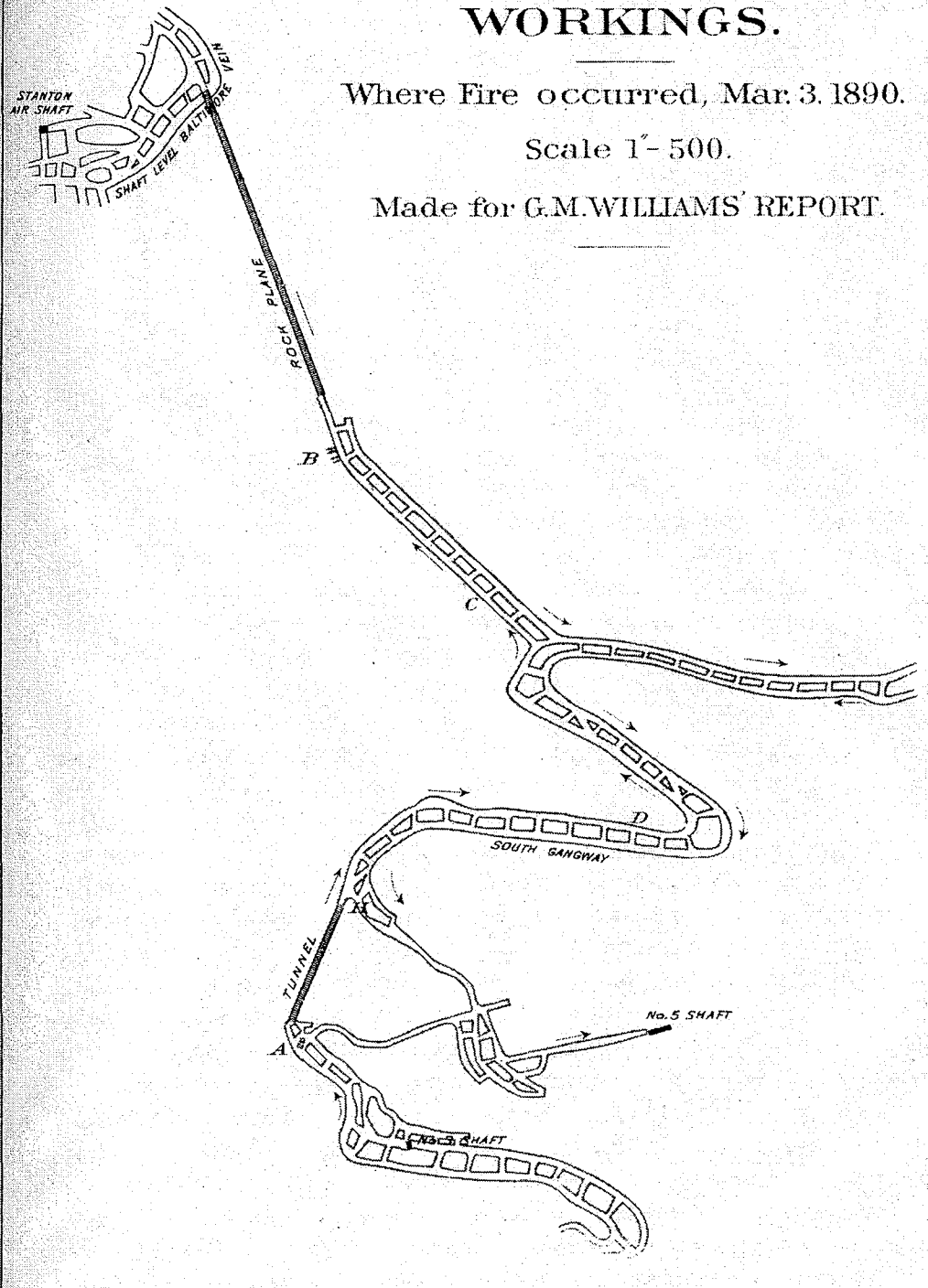
On the third day of March, a party of men consisting of Frank Cull, Hugh Dugan, Thomas Williamson, James O'Donnell, Michal Ferry and

MAP OF
SOUTH WILKES-BARRE
WORKINGS.

Where Fire occurred, Mar. 3. 1890.

Scale 1″ - 500.

Made for G.M. WILLIAMS' REPORT.



Patrick McNealus was started to work in driving a gangway and air-way at the point B near the head of the rock plane leading down to the Stanton mine. Shortly before 5 o'clock p. m., Frank Connell, William Evans and Brien Markey were repairing the track at C on the passage driven up to connect with the rock plane when the foreman, Richard Faull, passed them on his way out from Cull and his party.

At the same time Thomas Hall and James W. Jameson footman and driver, were going out towards the No. 3 shaft with a trip of cars, and when at the point A, a short distance outside of the tunnel, Jameson stumbled and fell with his head against the rib where a large gas blower was issuing from the coal, and this ignited from his lamp and caused several other blowers to ignite. Mr. Faull was coming outwards on the gangway and smelled something burning in the air-current. Hurrying out, he found the two boys about to try to extinguish the burning blower with a patent fire-estinguisher which they had procured from the bottom of the shaft. The place was thickly timbered and a current of 80,000 cubic feet of air per minute was passing inward and conveying the smoke into the workmen. The patent extinguisher proved usless, and under the circumstances it was only a waste of valuable time to try it. Mr. Faull sent young Jameson in to warn the men and tell them to come out, and immediately went to work to attach hose to the water pipe already convenient, so that a stream of water could be poured on the fire. The night men descended the shaft at this time and joined in to help, but despite their efforts the fire continually gained.

Young Jameson ran in and told George Ford and James Haslam, who were working in the airway, of the fire, and they went out through the No. 5 shaft. Then he ran by Frank Connell and his two companions at C telling them as he went by on his way up to tell Cull and his men.

Frank Connell started out at once to help put the fire out, leaving Evans and Markey to pick up the tools and put them away. The following statement of William Evans explains what occurred:

"My work is carpenter work. I was fixing the track at the time, was down on my knees when the boy James W. Jameson came in and told Frank Connell, who was with me, that he should hurry out to help put out a fire which was just the other side of the tunnel. Frank went out for all he was worth, and then the old man, Brian Markey, followed him, and then I put the tools to one side after they went. We had been taking out some broken wooden rails and replacing them with new ones. The boy, Jameson, went up to notify Cull and the others who were with him to come right out. I was at the bottom of the branch of the plane (at P) when the boy came back. Tom O'Donnell was with me all this time. O'Donnell was the runner. The boy, Jameson, asked O'Donnell whether they could ride out on the mules. O'Donnell said no, let us hurry up and get the mules. The mules were right on the right hand hole (there were two holes, one on the right and the other on the left)

about forty feet away from where we were. Then I told them to hurry up and get out for the smoke was coming pretty fast. So then I hurried out. I came all the way with my head nearly touching the rail, the smoke being heavier (denser) above than it was below. I caught up to Brian Markey before he reached the fire. He was nearly out of breath. Before he came to the fire he asked me whether he would make it (meaning whether we would get out alive) I said yes, that we would be all right soon. We went right through the fire. I put my coat right over my head. Brian was ahead of me. After I got through I helped the men fight the fire. There was plenty of chance for the men to get out, and I don't know why they didn't take the warning and hurry out. They had the same opportunity to get out that I had." "The above is a true account of the circumstances to the best of my knowledge and belief."

Evans was the last person that came out alive. Messengers were sent over to the Stanton mine to see whether or not the Cull party had escaped that way, but they had not, and the smoke was so dense in that direction that it would be impossible for any one to live in it but a very short time.

The efforts to extinguish the fire were continued until about half-past seven o'clock, when it became too dangerous by reason of the presence of a large accumulation of fire-damp in close proximity to the fire, where it might explode and kill them all. Before this Mr. Scott, the superintendent, Mr. Richards, the mining engineer, Mr. R. Morgans, district superintendent, William M. Thomas, mine foreman of the Stanton, John James, assistant foreman, and Charles Jasper, mine foreman of the Empire, had reached the mine, and for a short while assisted in the endeavor to extinguish the fire. At the time stated their efforts were abandoned, and all left the mine expecting an explosion to occur at any moment.

The writer learned of the accident at 7 o'clock p m., and arrived at the mine at a few moments after 8. On being informed of the situation, and after a careful consideration of the circumstances, it was suggested that an effort be made to enter the mine beyond the fire from the Stanton mine, hoping that thereby the bodies of the missing could be found. The writer realized that this undertaking would be a perilous one, attended with many difficulties, but he knew the district superintendent, the mine foreman and fire bosses of the Stanton mine as men of experience, who could be relied on to make no mistakes, and he, with the approval and co-operation of the managers, resolved to make the attempt.

In order to accomplish what was desired it was necessary to change and reverse the direction of the air current leading to the Stanton, so that the smoke would be driven back towards the South Wilkes-Barre fan, therefore the South Wilkes-Barre fan was run up to a speed of 200 revolutions per minute. District Superintendent Morgan R. Morgans,

Mine Foreman William M. Thomas, and his assistants, John W. Joseph, John R. James and William T. Evans, had descended the mine and were at the bottom of the rock plane ready to make required changes in the airway. The writer and Superintendent T. H. Phillips were in communication with them by telephone from the top of the air shaft, and also with South Wilkes-Barre. Men were stationed at the telephone, and men were employed watching and lubricating the South Wilkes-Barre fan, who were all instructed to be on the alert, ready to give alarm promptly in case the fan failed to keep up the high speed. The Stanton fan was stopped until the party in the mine had pulled down a stopping and put up another, when instantly the air current reversed its course and carried the smoke away towards South Wilkes-Barre. Immediately after receiving word that the changes were completed, the Stanton fan was set to running again at 25 revolutions, half its usual speed, so as to keep the Stanton workings clear of gas. In the meantime the inside party hurried out of the mine for fear that the reversed air-current should cause the fire to ignite the large body of fire-damp known to have accumulated on the South Wilkes-Barre side and produce an explosion.

A party of trusty men was now organized consisting of the following persons: G. M. Williams, mine inspector; M. R. Morgans, district superintendent; William M. Thomas, mine foreman of the Stanton Colliery. John W. Joseph, assistant mine foreman; John R. James and Willlam T. Evans, fire-bosses; Charles Jasper, mine foreman of the Empire Colliery. John Leyshore, Frank P. Thomas, James Berrigan, John J. Thomas, Sheridan Hilton, William Walker, John C. Thomas and William H. Phillips, employes of the Stanton Colliery. All descended the shaft and went to the foot of Rock plane. This plane is nine hundred feet long on a rise of twelve degrees, all driven through rock. Upon receiving assurance from Superintendent Phillips, who was still at the tele phone on the top of the Stanton air-shaft that all was right, a man was left at the telephone in the mine at T, and one within hailing distance on the way from there on and up the plane All had locked safety lamps. At the head of the plane, the intense heat of the air-currents had caused the roof to fall so as to close the passage. It took about an hour to open a small passage sufficient to enable one to crawl through. At this time Superintendent George Scott came in, having been attending to matters at South Wilkes-Barre. The writer suggested to him that it would be well to make preparations for flooding the mine as quickly as possible, so as to prevent the fire from passing over to the Stanton mine, and he went at once to inform Superintendent Phillips to that effect by telephone. Shortly after, a passage was made through the fall and the officials named passed through and down the South Wilkes-Barre gangway as far as P. Its parallel airway was also examined to the same point, but none of the missing men were found. It was too hot to at-

tempt further examination all retreated to the Stanton gangway, and after a brief consultation decided to rest a few hours, to give the heated passages time to cool, and that all should return with additional force at 9 o'clock. It was now 5.30 a. m. At the time agreed, the party returned with the following persons in addition: District Superintendent L. W. Sarge, Joseph Ford, mine foreman of Hollenback Colliery; Joseph Nesbit, R. J. Williams, Wat. Jones, Thomas D. Rowland, Thomas Malia, James W. Davies, Ed. Williams, J. S. Griffiths and David C. Morgan. This time the workings of South Wilkes-Barre were thoroughly examined from the face back to D, to which point the fire had traveled and was seen burning fiercely.

This satisfied us that the missing men had fallen suffocated by the smoke at some point between this and the tunnel, and that the fire had traveled inwards to a point 1,200 feet inside of where it started.

Superintendent Phillips did excellent work in procuring water, and had the mine flooded by March 12, so that water was running over to the Stanton, but it was boiling hot for several days.

On Monday, March 24, they began to hoist the water out again, and by April 1, it was low enough to enable District Superintendent M. R. Morgans and Mine Foreman Richard Faull to descend the No. 3 shaft for examination. They found the gangway completely closed to within 150 feet of the shaft. On the 4th of April again a party of officials examined all that could be examined, and came to the conclusion that the fire was extinguished. They went down the No. 5 shaft and in as far as H, on top of the falls, and found everything cool, but the roof had fallen to a height of about 24 feet and from there it was full of gas.

A gang of men was set to work that night to re-open the gangway from the No. 3 shaft, using locked safety lamps, but at 2 o'clock a. m. an explosion occurred somewhere inside, and blew them about quite roughly, but they came out safe, and without injury of any consequence.

On Monday morning April 7, when the officials were on their way into the Stanton mine for the purpose of making another examination, another powerful explosion occurred which determined that fire still existed and South Wilkes-Barre was filled with water the second time. This time it was allowed to remain filled with water until May 28, and after it was taken out, no attempt was made to ventilate farther than the point where the men were at work. The rock plane leading into the Stanton was hermetically sealed so that no air could pass.

They worked incessantly night and day without finding any trace of the missing men until the last night of the year, December 31, when the bones of two were found. The next day, January 1, 1891, the bones of the other six were found. All were near together at the point H. They had evidently attempted to go to the return airway at this point and were suffocated by the smoke when between the two doors. The roof had falled to a depth of twenty-two feet over them. The flesh had dis-

appeared leaving nothing but the bones. Frank Cull had lost one leg and this enabled them to identify his bones; but the others could not be identified and all were interred together.

The men who made the daring attempt to rescue the missing men are entitled to the highest commendation for their intrepid courage and humane efforts to save their fellow workmen. The officials of the Stanton mine and District Superintendent M. R. Morgans, without apparent hesitation, took the most perilous position. They knew that under ordinary circumstances this part of the mine would fill with gas in five minutes were the ventilation to cease, and that, if the South Wilkes-Barre fan, being a new one tried for the first time and at such high speed, would break or be retarded in motion, the smoke would be drawn upon them instantly by the Stanton fan. They also knew that if the double doors at H would burn down, the air fan No. 3 would take a short circuit that way to the No. 5 shaft; but, trusting that the tunnel would choke by falls so as to prevent this, all did their part bravely and well without betraying any hesitation.

THE DISASTER AT THE NEW JERSEY OR NO. 8 COLLIERY, ASHLEY.

At about 9 o'clock a. m. on the 15th day of May, 1890, an extensive part of the workings of this colliery unexpectedly caved in, closing the usual escape-way of twenty-eight persons and closing them in at the inner part of the first lift west, on the top split of the Baltimore seam, at B in the accompanying sketch.

It was reported to the workmen before they entered the mine that their working places had been examined and found safe. Shortly before 9 o'clock a. m., a message was sent in to tell the employes that the colliery would stop working at 9 o'clock, owing to the scarcity of railroad cars. At about this time also the cave-in took place, closing in not only all the men that happened to be working in the top split, but four others also who were working in the bottom split. The four persons from the bottom split were at their work shortly before the occurrence of the cave-in and the cause and manner of their going to the top split remains a profound mystery. The bottom split gangway did not cave and is still open. The rock passage leading from one split to the other at C was not closed and is still open. At first it was thought fortunate that John Allen, one of the fire bosses, was with the party, because he knew that an opening could be made from the surface at A and to one of the breasts inside of the cave in a short time, and that this would allay their fears and anxiety and guide them in their conduct; but he, through a thoughtless act, caused the death of all but two, twenty-five of his companions and himself.

The driver, Willie Matthews, and Thomas Lloyd, a door-boy, were the last that came out of the top split before the cave-in. They stated that a few minutes before they left, while they were at the back branch (B on

At the Empire colliery several short tunnels were driven from the top split of Red Ash to Ross seam and through a fault on the west side.

A new pair of hoisting engines 20″×36″ were put up at the No. 2 shaft to hoist from the underground slope.

At the South Wilkesbarre shafts, the damage that was done by the fire of 1890 was repaired, and a much more reliable system of ventilation was effected by driving new passages. A new fan 35′×12′, having an engine 20″×48″, is also in course of construction. The experiment of trying to ventilate this gaseous mine by a twelve-foot Cappell fan has not proven satisfactory, and the new fan is expected to effect a much desired improvement.

At the Stanton colliery the damaging effects of the cave of 1890 were repaired, and so was the effects of the South Wilkesbarre fire on the rock plane connecting the two collieries. This plane is now in working shape and openings are being driven to connect with the air-shaft, which when effected, will place the Hillman vein workings of this mine in good condition for work.

A tunnel was driven across the basin in the Baltimore seam, near the bottom of the underground slope, a distance of 456′, which has enabled them to ventilate a very gaseous portion of workings which has been idle for more than four years, owing to the prevalence of an unusual quantity of explosive gas.

A new air-shaft was also sunk for the Red Ash seam a depth of 318′ upon which a ventilating fan 24′ diameter, an engine 20″×36″, and two batteries of Babcock & Wilcox boilers were erected.

At the Jersey No. 8 colliery a new air shaft was sunk, having an area of 12′×12′ and a depth of 57′, upon which a new fan 24′ diameter, having direct acting engine 30″×36,″ were erected. Several other minor improvements were also made at this colliery.

At the No. 9 colliery, Sugar Notch, the underground slope was re graded and a new lift opened. The hoisting engines were taken out and new ones erected on the surface to do the work. These engines are 24″×48″ direct-acting on a parallel drum 9′ diameter. This has made a very agreeable change in the ventilation. Three tunnels were driven at different levels to work the Twin, Shaft and Top split seams.

At the Lance No. 11 colliery a new tunnel was driven from the Bennett to the Cooper seam, a distance of 222′. They have also improved the ventilation by enlarging the airways at contracted points through the mine. They also put in a system of water pipes in the gaseous gangways to be ready for extinguishing fires in case the gas-feeders should be ignited. A 100-horse power Dimmick & Smith high-pressure boiler was added to the plant on the surface.

At the Nottingham colliery the third and fourth east gangways closed by the cave of last year were reopened, and the standing gas removed by driving airways around the cave.

proved that a volume of 1,800 cubic feet of carbonic acid gas, per minute was generated, and that there must be a brisk fire existing somewhere in the mine to produce such a large quantity. Shortly after the temperature rose so as to verify our apprehensions. At the South Wilkes-Barre colliery, and also at the Nanticoke collieries, the instrument is used to ascertain the percentage of fire-damp in the air of each split, and it enables them to regulate the air so that the gas can be diluted evenly in the different air currents.

AN AUTOMATIC CAR TRANSFER SYSTEM.

A drawing is here presented showing an automatic system for transferring cars from the shaft-head to the breaker dump at the Baltimore No. 2 shaft of the Delaware and Hudson Canal Company. It has been in operation for about one year, and works satisfactorily. This was designed by Mr. C. H. Scharar, chief engineer of the coal department, who kindly consented to have it appear in this report. It explains itself, and can be easily understood from the drawing.

THREE NEW COAL BREAKERS.

Three new breakers were erected in this district during the year 1892. The first one completed was that of the Susquehanna Coal Company, a short distance north of their No. 1 shaft at Nanticoke. It is to prepare the coal previously shipped through the old No. 2 breaker, now abandoned, and is known as the No. 7 breaker.

The second was the No. 5 breaker at the South Wilkes-Barre colliery of the Lehigh and Wilkes-Barre Coal Company. This breaker was completed in the latter part of September, and has been operating successfully since.

The third is the No. 4 breaker of the Kingston Coal Company, erected to replace and do the work of the two breakers burned May 5, 1891. This new breaker started to prepare coal for the market in December, 1892.

The three breakers are large structures, equipped with the latest and most efficient machinery, and on the most approved plans for the purpose of cleaning and preparing a large production of coal. They are safe for the employes, and heated comfortably by steam. The stairs and machinery are well guarded, so that no one can be hurt inadvertantly.

RECORD OF COLLIERY IMPROVEMENTS DURING 1892.

The spirit of improvement was active during the year 1892 in this district, and a detailed account of its work is shown in the following:

Improvements by the Lehigh and Wilkes-Barre Coal Company.

At the Hollenback No. 2 colliery a new fan was erected to ventilate the new Red Ash seam workings. It is 35 feet diameter, and in run-

ning 45 revolutions per minute produces a ventilating pressure of 10.4 pounds per square foot, and is exhausting 250,000 cubic feet of air per minute. A self-recording pressure meter and automatic alarm is also attached to it. The fan engine is 16×48 inches direct acting. A tunnel was driven from the Hillman to the Kidney seam; also a second opening for the same. The main tunnel is 7×12 feet and 300 feet in length; and the second opening for the ventilation is 7×12 feet area and 90 feet in length. This is the first opening to the "Kidney seam," and it will enable them to work a large area of it.

Second openings were driven through the rock from the Red Ash, one to the top split and the other to the Ross seam. The first is 43 feet in length and the second 80 feet, and each has an area of 7×12 feet, which make roomy return airways. Another tunnel is being driven south from the West Red Ash gangway to cut the Diamond basin, which will open an extensive field of coal.

At the Empire colliery three new rock tunnels were driven, the first through a fault in the Red Ash seam a distance of 180 feet, the second from the top split of Red Ash to the Ross seam, a distance of 60 feet, and the third from the Red Ash to the top split, a distance of 130 feet. Each of these have an area of 7×12 feet.

At the South Wilkes-Barre colliery besides the new breaker already noticed, a new 35-foot Guibal fan has been erected which, running at a speed of 45 revolutions per minute, exhausts 240,000 cubic feet of air under a water gauge pressure of 1.9 inches. This fan was erected to supersede the old Capell fan, which was not of sufficient capacity for this gaseous mine. The new fan is supplied with a self recording pressure meter and automatic alarm.

Three new tunnels were driven through the rock, one from the Hillman to the Kidney seam in the No. 3 shaft, a length of 228 feet, and an area of 7×12 feet. This will enable them to work the Kidney seam, which is 4 feet 3 inches in thickness. The second was driven from the Baltimore to the next seam above, called there the "Stanton" seam. This tunnel is 300 feet long and 8×12 feet area. A second opening was driven for ventilation a distance of 84 feet, having an area of 9×12 feet.

An underground slope was sunk in the Hillman seam from the east gangway of the No. 3 shaft. It reached the basin at a length of 425 feet, which opens a productive lift of coal.

At the Stanton colliery a new fan has been erected to ventilate the old Hillman seam workings near the main shaft. Fire-damp would occasionally accumulate in these workings, making it dangerous to pass through the main shaft, and the erection of this fan has removed every vestige of the danger. It is a Sturdevant fan, 8 feet diameter, running 80 revolutions, and exhausting 3,000 cubic feet of air per minute—run by a horizontal direct-acting engine 10×14 inches.

A new gravity plane 1,000 feet long was made in the Hillman seam to work the coal to the rise. It has an average grade of 10 degrees.

Lehigh and Wilkes-Barre Coal Company.

Hollenback No. 2 Colliery—

Return airway in rock from the Diamond basin; 12x8x400 feet.

No. 2 Red Ash slope being sunk in coal in the bottom split vein.

Annex on east and west side of breaker for the preparation of stove and chestnut coal.

South Wilkes-Barre No. 5 Colliery—

No. 1 airshaft has reached the vein; 37x12x650 feet.

Tunnel has been driven from Stanton to Hillman vein.

Rock slope finished from Hillman to Baltimore veins and second openings in rock finished to same.

New fan, 35 feet diameter, has been erected at No. 5 shaft.

Erected 250 horse power Stirling boilers.

Erected 500 horse power National boilers.

Erected 470 feet of 8-inch steam line to fans.

Sugar Notch No. 9 Colliery—

Main airway enlarged to 90 square feet; 1,050 feet in length.

Ross slope extended in rock 120 yards.

Tunnel, Twin to Ross veins.

Lance No. 11 Colliery—

Rock slope to Ross veins finished; sunk a distance of 400 feet this year.

No. 2 airshaft completed to Ross vein, and second openings are now being driven to connect with the rock slope workings.

No. 12 plane partly in coal and partly in rock has been finished.

No. 2 slope in coal has been finished.

Erected 250 horse power National boilers.

Erected 430 feet extra steam line to fans.

Nottingham No. 15 Colliery—

The Ross slope is being extended in rock through the anticlinal.

The Red Ash No. 3 slope is being extended in coal.

Erected one 24 feet by 8 feet Guibal fan on No. 1 airshaft.

Erected 300 horse power Stirling boilers.

Erected 4,000 feet 8-inch steam lines to fans.

Wanamie No. 18 Colliery—

No. 5 slope is being sunk in coal in the Ross vein.

Two bore holes, 200 feet deep each, have been put down for hoisting and pumping purposes.

No. 19 slope has been sunk in coal almost to the basin.

Erected one pair geared engines, 18x30-inch, with 8x10-foot drums.

completely consumed, and the machinery was all irreparably damaged.

There were ten men working in the mine, but all escaped through the Boston shaft without injury. The workings of the two mines are connected.

The fan in the second opening was stopped and the hoisting shaft beneath the fire was converted to an up-cast. No smoke entered the mine workings.

The next morning the company made preparations to build a new breaker about 300 feet west of the location of the old one, which is, by this time, about half finished and will be completed in April or May, 1895. The new breaker is to be covered with sheet iron instead of boards. The engine house will be of brick, and only a simple frame will be erected over the shaft.

A Singular Accident and Happy Escape at the South Wilkes-Barre Colliery.

The New York Retail Coal Dealers' Association visited the Wyoming coal field, about 120 in number, and on Thursday, May 24, under the guidance of the officials of the Lehigh and Wilkes-Barre Coal Company, they started early in the morning to make an examination of the South Wilkes-Barre colliery. After making a cursory examination of the boiler plant, consisting of three batteries of high pressure water tube boilers of 750 horse power and twelve cylindrical boilers, they examined the 35-foot fan and the hoisting engines and outside arrangements. While some were going to see the breaker, the others desired to see the interior workings of the mines.

When ready, nine visitors, in charge of Superintendent Morgan, descended the shaft on the first cage. The second party of nine, in charge of John F. Jones, the mine foreman, was descending, when, to the consternation of all on surface, one of the cylindrical boilers exploded with a loud report. All the hoisting engines and fan at both shafts were instantly made powerless. The flying boiler and debris had broken all the steam pipe lines. Fortunately, Mr. Elmer H. Lowall, the general superintendent, and Mr. W. J. Richards, chief mining engineer, and other officials were at the head of the shaft. Every available man was set to work at once to repair. In fifteen minutes, by plugging a steam pipe, they were able to run the hoisting engines of No. 8, and all the men were hoisted out. The visitors and over 400 workingmen were in the No. 5 shaft, 1,068 feet deep, which is the gassiest mines in the country, and no hope for ventilation for an hour at least.

On losing steam the engineer applied the brake and stopped the descending cage within about 20 feet of the bottom, fortunately oppo-

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 workingmen 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

Rowland Thomas, Nanticoke.
Robert Smith, Nanticoke.
Edwin W. Davies, Nanticoke.
Thomas Bailey, Glen Lyon.
John Abrams, Glen Lyon.
John J. Griffiths, Luzerne.
Richard McDonald, Parsons.
Daniel C. Richards, Wilkes-Barre.
Andrew Cox, Wilkes-Barre.

Thirty of the applicants for assistant foreman certificates were recommended as having passed a satisfactory examination and received their certificates.

Colliery Improvements for 1895.

Notwithstanding the continued depression in the coal trade through the year, important improvements were made by several of the coal companies. A detailed account of which is given:

Lehigh and Wilkes-Barre Coal Company.

At several collieries of this company minor improvements were made which are not noted, but the important ones are described.

At the South Wilkes-Barre Colliery.

Second opening was driven and completed for the No. 2 tunnel. One new slope 500 feet long having an area 7x12 feet; grade, 12 degrees. One tunnel from Hillman to Hillman seam, 762 feet long, 7x12 feet area. One new gravity plane 200 feet long; grade, 20 degrees.

The Maxwell No. 20 Colliery.

This shaft was completed to the Red Ash seam, the lowest seam in the coal measures. Its size is 12x54 feet to the Baltimore seam, and from there to the Red Ash it is 12x37 feet. Its depth to the tracks at the Baltimore seam is 650 feet. The shaft is equipped with two cages to hoist coal from this part, and two more cages will shortly be put in to hoist from the Red Ash seam a depth of 1,048 feet. A full description of the plant and outside arrangement is found in the following furnished by Mr. Herring, outside superintendent:

Maxwell No. 20 colliery which has recently been put into operation, probably embodies more new features in the construction of its breaker and equipment and the development of its underground workings than any other colliery in the anthracite coal fields. A minimum cost of operating has been the chief aim in all the work

light is so feeble that danger from loose rock and coal could not be so easily discovered. However, if all the workmen would use the well known precautions we would have few casualties of this class to record.

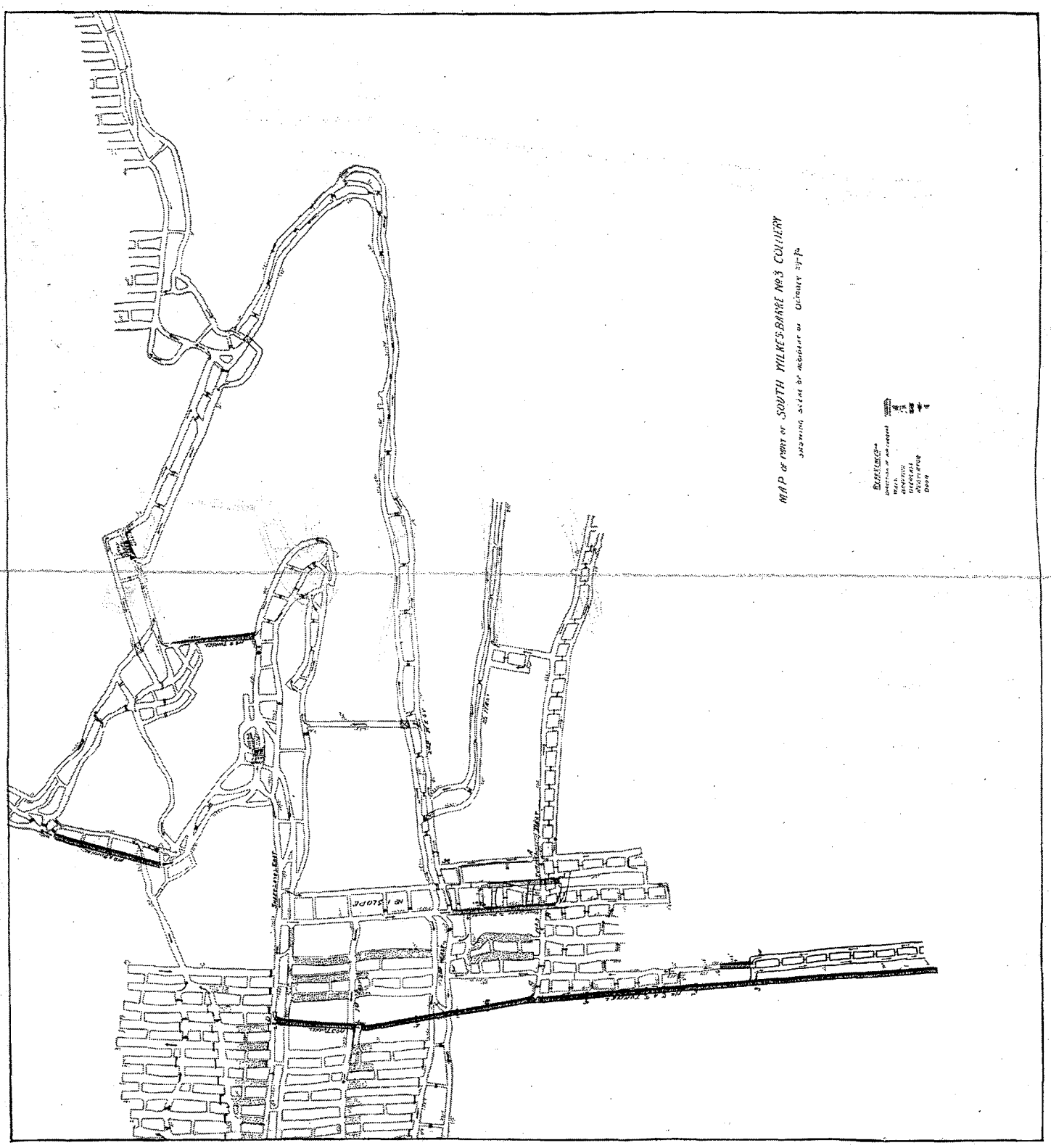
With the care taken by the officials in these days the accidents from falls of roof and coal can only be averted by the care of the workingmen themselves, more especially the miners. They and their laborers are most frequently the victims of this class of accidents, and only by vigilance and care on their part can they be reduced. The same remarks apply to the other classes of casualties, so that it is not necessary to repeat them here.

A Disastrous Explosion in the South Wilkes-Barre Mines.

A few minutes after one o'clock, Thursday afternoon, October 29, an explosion of fire damp occurred in the No. 3 shaft, South Wilkes-Barre Colliery, of the Lehigh and Wilkes-Barre Coal Company, which instantly killed four men, and shortly after, the assistant foreman and one of the fire bosses lost their lives by inhaling after-damp while endeavoring to go to the rescue of the others. A map of that section of the mine is presented in this report to assist the reader to understand the conditions which existed prior to the accident.

This colliery is opened by two shafts which are sunk to the "Baltimore" seam and are 650 feet apart. The main shaft is the No. 5, through which the coal of the Baltimore seam is hoisted. Part of this shaft is partitioned off for an upcast, over which two 35-foot fans are located, which are operated on alternate weeks. The hoisting compartments are also a downcast for the greater part of the air for ventilating the Baltimore seam. The No. 3 shaft is all a down-cast and is also used to hoist the coal of the Hillman seam. The accompanying map shows a section of the Hillman seam workings which was the scene of the accident. The No. 3 tunnel was driven across a basin through the top rock from the east level gangway at "D" cutting the same seam on the other side of the basin at "C." From this point the "No. 4" tunnel, a continuation of No. 3, was driven in the bottom rock, cutting the Stanton seam at "E," and is continued still further, intending to cut a still lower seam.

It is an exceedingly gaseous mine. The split of air passing in through these tunnels, when measured during the last week of October, was 27,160 cubic feet per minute. Gas feeders had been cut in the Stanton seam which charged the air current to a dangerous condition, and work in all this part of the mine was suspended for several weeks prior to the accident in hopes that the gas would become exhausted. Finally the officials decided to split this air current at "C" and send the part contaminated by gas,



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over a bridge to be made across the No. 3 tunnel west gangway at "A" and down to the return airways at the bottom of the basin. The passage leading up from "H" to "A" was driven and broken through to the tunnel west gangway on the day before the accident.

They had to blast top rock down to make room for the bridge, and four men worked all night enlarging the hole and blasting the top rock down and a fire boss was with them. On the day of the acdent the colliery was idle and only the men at this work and those loading and unloading the rock were working in that seam. They were using 50 per cent. dynamite to blast and were firing with an electric battery. Before blasting they were instructed to open the door at C so as to permit the air current to make a short circuit through the breasts and clear out the gas, so as to make sure that it was safe before blasting; all worked by the safety lamp.

Thomas Owens, William T. Lacey, James Herron and Robert Lloyd were working there, and Joseph Worth, fire boss, was sent to remain with them and to see that everything was safe in the vicinity before they should blast. There were two men at "H" loading the rock out. At about 10 A. M. the mine foreman, John F. Jones, visited them and found the work progressing all right.

Shortly before one o'clock they were getting ready to explode a blast and Robert Lloyd was sent around to call the two men at H back to a safe position. He did so, and the three were together at the foot of the slope when the blast was fired, and instantly they were blown about by the concussion of an explosion of gas. John F. Jones, the mine foreman, was on the surface when he saw a cloud of dust and debris blown up the two shafts. He at once ran over to the No. 3 shaft and accompanied by William R. Jones, the fire boss, who happened to be coming towards the shaft, and John D. Davies, a mason, descended the shaft. At the bottom, John D. Joseph, assistant foreman, joined them. All used safety lamps. The foreman and Davies went to examine if a wall near by had been blown away. While Joseph, followed by Jones, went in past the head of No. 1 slope to the entrance of No. 3 tunnel. Unexpectedly they encountered the after damp and Jones, feeling its effect, called for help. Just then the mine foreman and Davies were approaching and both assisted Jones back a short distance, when they also became weakened and both Jones and Davies fell. The foreman managed to reach the bottom of the shaft where the air was pure. Then the three men who were in the slope came out, and other help from surface came down and they carried Jones and Davies out; both were unconscious. Davies soon revived, but Jones died. Every effort was made by several physicians to resuscitate him, but they proved unsuccessful. The body of the assistant foreman, J. D. Joseph, was found lying in the gangway at "D."

The afterdamp filled the gangway back to the shaft and was followed by explosive gases. The explosion damaged about 400 feet of the brattice partition in the No. 5 shaft and all the ventilation found a short circuit to the fan, leaving no ventilation for the workings of either seam. Streams of water were poured down both shafts, which produced a current of air. There were about 30 men working in the Baltimore seam and they were hurried out through the No. 1 air shaft, a mile and a half southwest of the colliery. As soon as they reached the surface the top of No. 5 shaft was covered with boards and canvas and thus the air was compelled to enter shaft No. 3. The workings of both seams had by this time, filled with explosive gases. It was explosive back to "D" in the No. 3 tunnel. The air current was forced entirely into this tunnel and in a few minutes the gas was swept out from that passage, thus enabling the rescuers to follow into the tunnel. The body of William Lacey was found near the door at C and the door was blocked open, showing that they had complied with the instructions by opening this door before blasting. The bodies of the other three, viz: Thomas Owens, James Herron and Joseph Worth, were found lying on the gangway at B. Evidently, not one had moved from the position he was thrown into by the terrible explosion of the blast. They were not severely burned, but appeared to have been killed by the tremendous pressure of the explosion and its resulting afterdamp. They were all good, reliable and experienced workmen. No one can tell what the conditions were when they fired the blast nor how the gas was ignited. It was between six and seven o'clock P. M. when the bodies were recovered. It was an anxious time when such a large body of explosive gas was being forced out, while the adjacent workings of both seams were also full of gas, and no means of ascertaining whether the explosion had left anything on fire or not. Fortunately, nothing further happened.

The Serious Consequences of the Explosion at the No. 3 Shaft, South Wilkes-Barre Colliery.

The preceding article in this report describes the explosion and its fatal consequences. All felt relieved when the bodies were recovered on the night of the acident and in finding no evidence of fire. The first work required was to repair the brattice between the down-cast and up-cast in the No. 5 shaft, so that the ventilation could be restored. The effect of the explosion on the stoppings and doors of the mine could not be ascertained on account of the large volume of firedamp that had accumulated, and this could not be removed until the ventilation was re-established.

A gang of men commenced to repair the brattice in the shaft on Friday morning and the work was continued until 10 P. M. Satur-

day, October 31. Fortunately all the men were on top of the shaft preparing material for the work, when another explosion occurred, lifting the boards and canvas that covered the shaft. This was reported to the officials at once and the repair work was suspended. The fire bosses descended the No. 3 shaft and went in as far as the tunnel and found everything as it was left on Thursday night. The cages in No. 5 were damaged and could not be used. The situation was grave and exceedingly uncertain. The ventilation could not be restored without repairing the brattices in the shaft. The explosion was undisputed evidence of the existence of a fire somewhere in the mine, and the workings were known to be full of explosive gases, and if an explosion should occur when the men were working on the brattice in the shaft it would most certainly cause their death. It required more than ordinary courage to attempt to make an examination of the workings, but on November 2 the fire bosses went down the No. 3 to the bottom seam and made an examination in the vicinty of the two shafts but saw no evidence of an explosion having taken place in the Baltimore seam. From there they ascended into the Hillman seam and went into the return airway but failed to detect any evidence of fire in the air returning from the seat of the first explosion. It was too dangerous for them to stay long, so they returned to the surface and made their report. The officials and the Inspector were present, and it was decided to wait a few days for further developments. The fire boss descended No. 3 again on November 5 and found indisputable evidence that fire was burning in the Hillman seam. The return air currents coming from the region of the first explosion was highly charged with the smoke and gaseous products of the fire and it was decided to flood the No. 1 slope workings in the Hillman seam as soon as practicable, and streams of water were at once turned in.

On November 7 another explosion took place, lifting the covering on the No. 5 shaft and the smoke and dust came out through the fan. It was expected that in a few days the water would cover the region of the fire, and it was decided to wait until that was effected.

The water having filled the slope workings to the required height by November 21, the fire bosses descended to the Baltimore seam and finding that a small current of air was passing up the inclined planes, they went up and at the head of the planes they saw evidences of a terrific explosion having taken place there. The stoppings and doors were blown away and the cars were blown to pieces, and they believed that they smelled fire. It was an awful situation for men to be in and they were naturally timid. They returned to the surface and made their report. This had a depressing effect upon everybody connected with the mine. The workings of the Baltimore are very extensive and at this time they were nearly

all filled with fire damp. This could not be cleared without a strong air current and the ventilation could not be forced in unless the brattice in the shaft was repaired, and the very act of forcing air in would, most probably, carry the gas to the fire and cause such an explosion as would utterly ruin the mine and its ventilating appliances. Another examination was made on November 23. All the officials and the writer were at the colliery and indisputable evidence of the existence of fire was obtained. Seeing that it was useless to permit any more risks to be taken it was decided to flood the Baltimore seam workings with water to the necessary height for filling the whole workings and measures were at once taken to put this into effect, and no more men were allowed to enter the mine.

By December 10 the water had risen so as to seal the bottom of both shafts, so that it was safe to work at repairing the brattice. While connecting a broken pipe one of the workmen received an electric shock and noticed sparks. There being fire damp near, they ascended the shaft and reported it. Subsequently the electrician of the traction company was sent for and he found that a potential of 4 volts and a current of 12 ampieres was in the pipes leading down into the shafts. This electric current was leaking from the current of the Traction company, which was regarded very dangerous for a gaseous mine. An insulator was put in one of the joints of each pipe on the surface to prevent the electric current following into the mine and this proved effective.

At this writing the workings are filled to the required height of 205 feet and the water is being hoisted out. The water is all out of the Hillman slope and the location of the fire was found to have been on the second west gangway. Both the second west and two and one-half west gangway were damaged by the explosions and by falls brought down presumably by the effect of the water on the fireclay roof.

An Explosion of Gas and Fire at the Franklin Colliery.

At 12.30 P. M., Saturday, August 15, Fire Bosses John Flynn and William Tredinnick, accompanied by Joseph Hughes, James Monaghan and William N. Thomas, went into the old workings west of No. 1 slope in the Baltimore seam to make a change in the arrangement of the ventilation. They were told to use safety lamps, but ignoring the instructions, they all carried naked lights. Flynn, taking Hughes with him, went some distance away from the others and on breaking down an old brattice stopping, he ignited a body of gas which burned him and Hughes severely and set some old timber on fire. Flynn died on August 17. They had a large force of men for about two weeks endeavoring to extinguish the fire, when it became too dangerous and it was decided to isolate the old workings west of the slope and flush culm enough in to fill it. All the

Colliery Improvements During the Year 1896.

The coal trade was unusually lax, requiring work for less than two-thirds time; such improvements only as were urgently needed were made during 1896, and such as were made and had effect on the condition of the mines are recorded in the following:

Improvements by the Lehigh and Wilkes-Barre Coal Company.

In the Empire mine a rock plane on a rise of 25 degrees was driven from the Ross to Baltimore seam in the abandoned Diamond colliery. It is 10x10 feet area and 435 feet in length. It enables the ventilation to be improved and they can work the remainder of the coal in that part of the Diamond mine.

At the South Wilkes-Barre colliery the No. 4 tunnel was extended to a length of 1,200 feet. It is driven from the Hillman through an anticlinal to cut the same seam on the other pitch.

No. 2 slope was sunk and connected to the No. 1 air shaft, effecting a third opening by which the ventilation will be effectively improved.

At the Lance No. 11 colliery two short tunnels were driven from the Cooper to the Five Foot seam. Their lengths are 200 and 250 feet respectively, and they have sectional area of 7x12 feet.

Improvements by the Delaware and Hudson Canal Company.

At the No. 2 colliery the shaft was driven from the Bennett to the Red Ash seam on an extension of 273 feet, making the total depth of the shaft from the surface 859 feet.

Improvements by the Susquehanna Coal Company.

At the No. 1 shaft a rock tunnel was driven from the Lee to the Lee seam through an anticlinal. It is 600 feet in length and 8x16 feet area.

A rope haulage was installed in the Forge seam in place of a mine locomotive, which is a decided improvement to the quality of the air.

In the No. 4 slope and No. 2 shaft several minor improvements were made. A tunnel was driven from the Hillman to the Mills seam. It is 500 feet in length with 7x14 area. An extension was made to the No. 5 slope which added 600 feet to its length. Size, 7x14 feet, grade 11 degrees. An extension of 300 feet was also made to the No. 11 slope.

In the No. 6 colliery Glen Lyon, 5 new gravity planes were made, varying in length from 200 to 500 feet, and a tunnel was driven from the Twin to the Ross seam. It is 700 feet in length and 7x14 feet area.

shafts the men are not hoisted up as promptly as the law provides. These were investigated and the accusations were denied. Yet, it can be seen that where several hundreds of men are employed in a mine it is impossible to hoist the men and hoist coal in the last hour when all the men have finished their day's work and are going to the shaft. It requires about one hour in these mines to provide the required number of cars for the night shifts and these cannot be provided and have the men hoisted at the same time. I have no personal knowledge of any violation, but the conditions themselves indicate this difficulty and there is no way out of it. The law provides that whenever five men shall come to the bottom of the shaft they shall be hoisted. In one or two instances where men have complained, they have been compelled to stay in their working place until quitting time and this was a greater hardship to endure than to wait a short time at the bottom of the shaft.

There is practically no water in the mines of this district when they are over 500 feet in depth, unless it is that which follows the workings down from the outcrops. The mines are dry and most of them are exceedingly dusty. The gangways are occasionally sprinkled with water so that the dust is allayed, but the breasts are intensely dusty and the air currents, though large, are heavily charged with dust. It is with large volumes of air only that working is made tolerable. The presence of so much fine dust in the air may intensify the heat and cause greater expansion of the flame in explosions of gas, but I have had no cause to even suspect that the dust was itself explosive.

The ventilation is reported monthly as the law prescribes from all the mines except one. In this case the foreman has been provokingly careless. His reports are sent in only after repeated requests. He is an intelligent, capable foreman and is derelict only in this one particular.

The boiler inspection reports come in in lawful order. Some trouble was had in getting reports from inspectors of insurance companies, but they, on their attention having been called to the law sent the reports promptly and in satisfactory form.

The South Wilkes-Barre Colliery.

When the report from this district was made for the year 1896 the Baltimore seam workings of the South Wilkes-Barre mine were filled with water to a height of 205 feet in the shaft. On February 1, 1897, two large iron tanks were used to raise the water out both day and night, and by May 23, it was all out. The gangways, airways and all other passages were found practically closed by falls of roof and sides and the heaving of the fireclay bottom, and all were literally filled with explosive gases. In the first week of March a small cave came down in a breast of the Hillman seam and released enough

gas to make an air current of 75,000 cubic feet per minute explosive, and kept it so for several weeks, but it gradually lessened until it was exhausted. They have cleared out the gangways and airways of Hillman seam and have been working steadily day and night to open those of the Baltimore seam, but it will take two or three months more to complete it. Extraordinary care was exercised in working, and so far they have been successful, having had not one accident. The work has been extremely dangerous.

The Conyngham Mine, Delaware and Hudson Canal Company.

This mine has had a fire in it for several years and was filled with water the second time in an endeavor to extinguish it. On January 14, 1897, the water had filled to a height of 313 feet. The Inspector being apprehensive of danger to the employes of the Hollenback mine lest the pillar should give way, requested that all employes of the latter mine be prohibited from entering the mine until it was considered safe, and the following day work at the mine was suspended. The water was poured into the Conyngham until it attained a height of 394 feet. Two bore holes were drilled to let the pent up gases escape.

On March 2, they started to hoist and pump the water out and the Lehigh and Wilkes-Barre Coal Company was permitted to work in the Hollenback, and started on March 8. By Saturday, September 18, the water was all pumped out and early in November evidence of the existence of a fire became noticeable again. A wide extent of the workings are caved, breaking down all to the surface and the fire lurks somewhere in the heart of the cave. On November 13 a current of noxious gases and steam that came out from the cave had a temperature of 100 degrees F., which at this writing has risen to 150 degrees.

Having flooded the mine with water twice and failed, they are now flushing culm in to fill a circuit of old workings around it, so as to shut the air entirely off and have it so isolated that it cannot do any injury. At this writing they are flushing the culm in at three points, viz: At the Baltimore air shaft, at one of the bore holes and at the Conyngham shaft. It is hoped and believed that this plan will have the effect of extinguishing the fire.

The Hillman, Kidney and Bowkley seams of the Conyngham are worked from the No. 2 shaft. This was idle for the first eleven months of 1897 owing to a squeeze which had taken place in 1896. Work was resumed there at the beginning of December, 1897. The mine was inspected December 10 and found restored to a satisfactory condition. The ventilation was ample and the gangways and breasts were well secured with excellent timbering work.

still its possessors. The breaker was not rebuilt and the coal of the Baltimore tunnel is now hoisted up the new No. 4 shaft and hauled by a locomotive to the Baltimore No. 2 breaker where it is prepared and shipped to market. Therefore the name Baltimore tunnel will be superseded by the name Baltimore Shaft No. 4 in all the reports of the future.

The Burning of the West End Coal Company's Breaker.

At about ten o'clock Monday morning, March 29, the West End Coal Company's breaker at Mocanauqua was discovered to be on fire, and in a short time was completely burned. The colliery was idle and it is not known how the fire originated. On March 14, 1893, a breaker on the same site was burned and this one was erected in its place and commenced to prepare and ship coal on August 15, 1893. A new breaker was erected again on the same site and this was completed and commenced to prepare and ship coal September 2, 1897.

Record of Improvements for the Year 1897.

Improvements by the Lehigh and Wilkes-Barre Coal Company.

At South Wilkes-Barre colliery a rock tunnel has been driven from the Hillman to the Kidney seam for hauling purposes. It is 450 feet in length and 8x12 feet area.

At the Maxwell colliery a new fan has been erected thirty-five feet diameter, Guibal pattern, 12 feet wide. Area of upcast is 192 square feet. Horizontal engine working direct. Cylinder 20x48 inches diameter. Engine horse power, 150.

Improvements by the Delaware and Hudson Canal Company.

At Baltimore tunnel a shaft was sunk to save hauling the coal out from the old tunnel. The new shaft is designated as the Baltimore No. 4 shaft and the mine will be known hereafter by that name. The shaft is from the surface to the Baltimore seam. It is 97 feet in depth having an area of 12 by 30 feet. A new gravity plane is being made to take the place of three old planes. When finished it is to be 3,300 feet in length, having grades varying from 7 to 12 degrees. Its sectional area is 8x18 feet.

A rope haulage has been installed to haul the coal from the head of slope and foot of plane in the Red Ash seam to the bottom of the shaft. The engines are located on the surface.

At Baltimore No. 3 a new gravity plane has been made 800 feet long having a grade of 15 degrees and a sectional area of 8 by 16 feet.

At Baltimore No. 2 the trestle leading from the shaft to the breaker was torn down and a conveyor was constructed to convey

Fourth Anthracite District.

(LUZERNE COUNTY.)

Office of Inspector of Mines,
Wilkes-Barre, Pa., February 15, 1899.

Hon. James W. Latta, Secretary of Internal Affairs, Harrisburg, Pa.:

Sir: I have the honor of presenting herewith my report as Inspector of Mines for the Fourth anthracite district for the year 1898.

It contains tables prepared as required on the blanks formulated in the office of the Bureau of Mines, an article describing a mine fire in the Alden Coal Company's No. 2 shaft, and a brief record of lessons derived from mine fires in this district during the last eighteen years.

The mine fire in the Conyngham mine of the Delaware and Hudson Canal Company was isolated by flushing the surrounding workings with culm. This was completed by September 9, 1898, since which time no indication of the existence of fire has been discovered.

The effects of flooding the South Wilkes-Barre shafts to extinguish a fire have been repaired and all the explosive gases have been expelled from the workings.

A brief report of inspections of mines and of the condition of the mines when inspected, together with a record of work for every day, also a copy of the report and description of every accident that occurred during the year was sent to the Chief of the Bureau. My remarks on the condition of the mines and on mine accidents in the report for the year 1897 will be as appropriate for 1898, and it is not necessary to repeat them.

I deeply regret that the number of accidents has been increased in 1898. The fatal casualties were 75 against 60 in the year 1897, and the serious non-fatal accidents were 278 against 269 in 1897. The tons of coal produced per life lost was 104,883 against 124,290 in 1897. The only explanation for this is that men become less watchful during intermittent work than when working continuously, and a much poorer class of miners is now employed than ever before.

The average number of days worked was 143.27 against 133.92 days in 1897.

The total production was 7,866,277 tons against 7,457,418 in the year 1897.

Yours very respectfully,

G. M. WILLIAMS,
Inspector of Mines, Fourth Anthracite District.

The north outcrop of the seam at that point was covered by about sixty feet of sand. That part of the mine has not been worked since, and the gangways have not been cleared, and it is premised that no work will be done in that lift until some time in the future.

This occurred in a locality where there was no stream or body of water anywhere in sight on the surface, and where it was believed that no danger existed.

Annual Examination of Mine Foremen.

The annual examination of applicants for certificates of qualification for mine foreman and assistant mine foreman was held in the common council room, city hall, Wilkes-Barre, May 23, 24 and 25, 1899.

The board of examiners was G. M. Williams, Mine Inspector; H. H. Ashley, Edward Mackin and Andrew McGeehan.

The following named aplicants passed a satisfactory examination and were recommended to have certificates of qualification as mine foremen, viz: Maurice Williams, Robert Johnson, William N. Thomas and Evan Thomas, of Wilkes-Barre; Richard L. Evans, of Edwardsdale; Lewis Richards, John T. Cartwright and Richard R. Jones, of Nanticoke; David Edwards, of Ashley; William H. Harrison and Richard T. Morgan, of Plymouth.

The following named persons were recommended to have certificates of qualification for assistant mine foremen, viz: Alexander Lawrence, Timothy Cronan and Frank Mills, Alden; Thomas Saunders, Mark Lloyd, William E. Thomas, Robert Richards, John Griffiths, Robert M. Smith, Edward D. Williams and Evan R. Jones, Nanticoke; David B. Morgan, Charles Price, Isaac Greenaway, Reuben Hoffman, William Morgan, Lewis Keen and Lawrence Keen, Glen Lyon; William Dedalis, Ashley; William E. Jones, Sugar Notch; Lewis R. Thomas and Alfred Gibbs, Wilkes-Barre; William Duffy, Thomas Bellamy, Joseph Harrison, Morgan W. Griffith, Morgan Williams and E. P. Evans, Plymouth; William J. Evans, Parsons, and Charles Johnson, Christopher.

Improvements made at Lehigh and Wilkes-Barre Collieries During 1899.

Hollenback Colliery.—Tunnel from bottom to top split Red Ash, 40 yards; duplicate steam line from breaker boilers to fans at airshaft.

South Wilkes-Barre Colliery.—Tunnel from Hillman to Kidney, 110 yards. Rock airway, Stanton to Hillman vein, 55 yards. Rock airway, Hillman to Kidney vein, 30 yards. Five hundred horsepower Babcock & Wilcox boilers to replace cylinder boilers.

Stanton Colliery.—Tunnel from Baltimore to Five Foot, 55 yards.

S. Wilkes-Barre

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

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

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

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

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

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

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

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

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

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

S. Wilkes Barre

out one of the screens, and the assistant foreman saw him at his work at 3.30 P. M., but he fell into the elevator shaft, seventy-five feet away from his work.

James Dudson, a laborer in the Conyngham, had been notified on the morning of December 22 not to run any loaded cars out of the counter in which he was working, as there were runners employed for that purpose. After loading their last car, he and his partner ran it out to the gangway; the front end of the car struck the head block, throwing the hind end off the road, catching Dudson's head against a prop, killing him instantly.

Joseph Depedaro fell into the conveyors at the North American Washery, although he had been ordered not to go near them, as the culm he was wheeling was blocking up the conveyor line, and should have been dumped at the foot wheel. In spite of his orders he went twenty feet beyond the foot wheel, and when he fell he was dragged around the wheel and killed.

John Pelkis, a miner at No. 1 Shaft, Kingston Coal Company, was struck by a small piece of coal flying from a blast on December 30. The injury he received seemed very slight, as there was only one cut visible on his head, but he died December 31.

Improvements Made by the Lehigh and Wilkes-Barre Coal Company During the Year 1902.

Hollenbeck No. 2.—Erection of new boiler house at shaft and the installation of two batteries of water tubular boilers of 500 horse-power each, with a forced fan draft system, and under ash ducts.

A second opening from the top split to the bottom split in Red Ash seam, No. 2 Tunnel, east, to provide ventilation for these workings.

Extension of No. 2 Slope on a grade of seven degrees through rock, from the bottom split to the bottom split in the Red Ash seam, cutting top split of Red Ash seam. This extension was made for the purpose of opening up a larger area for No. 2 Slope.

South Wilkes-Barre No. 5.—Erection of a 35-foot Guibal fan at No. 1 air shaft for ventilating western portion of South Wilkes-Barre mine.

Stanton No. 7.—Erection of forced fan draft system at shaft boiler house.

Sugar Notch No. 9.—Erection of new boiler house and installation of two batteries of tubular boilers of 500 horse power each, with a forced fan draft system and under ash ducts.

Lance No. 11.—Erection of new boiler house at shaft and installation of one battery of 500 horse power water tubular boilers.

to bar it back to the loading chute. At the same time the car runner was running three more cars on the same track. The rails were wet and muddy and he could not bring the cars to a stop before they slightly bumped the half-loaded car, causing it to start and run over the victim. The car runner called loudly to the victim to look out but he evidently did not hear him.

By Machinery

Theodore Tucker, slatepicker, at the Red Ash No. 2, was sent by the screen boss to start the coal running in the chute leading from the elevator to the rolls. There is a hole in the side of the chute to allow a person to go into the chute to start the coal running when it blocks. The hole is 25 feet from the elevator. He was next seen on the floor of the screen room at the foot of the elevator, the supposition being that he had come through the elevator. He was injured about 4 P. M. and died at 11 P. M. at the Wilkes-Barre City Hospital.

Thomas McDonald, laborer, at the Hadleigh colliery, outside, was shoveling coal into the scrapper line along with six other men when a rush of the bank started. He became confused and instead of standing still, he ran into the conveyor line. The other men who were much nearer the line than he was, when the rush occurred, stood still and escaped injury.

IMPROVEMENTS DURING THE YEAR

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery

Outside.—Five hundred horse power battery B. & W. boilers completing plant of 2,000 horse power.

Inside.—No. 11 tunnel, bottom split Red Ash to top split Red Ash, 50 yards.

No. 12 tunnel, bottom split Red Ash to top split Red Ash, 50 yards.

Empire No. 4 Colliery

Outside.—Machine, smith and car shops to replace shops destroyed by fire April 18, 1903.

Inside.—No. 24 tunnel, extended from top split Red Ash to Ross, 70 yards. Hoisting shaft enlarged to standard size.

South Wilkes-Barre No. 5 Colliery

Outside.—Duplicate 35 foot Guibal fan, No. 1 air shaft. Barn and carriage house. Inside and outside foreman's office.

Inside.—No. 8 tunnel, Kidney to Abbot, 160 yards. No. 10 tunnel, top split Baltimore to top split Baltimore, 140 yards. No. 11 tunnel, Kidney to Abbot, 90 yards. Tunnel airway, across basin

for No. 10 tunnel return, 124 yards. Rock plane airway, Kidney to Abbot for No. 9 tunnel return, 70 yards. Rock plane airway, 3d West Hillman to No. 9 tunnel Abbot, 90 yards. Three inch drainage bore hole, No. 5 slope Hillman sump to Baltimore.

Stanton No. 7 Colliery

Outside.—Duplex air compressor, simple steam, compound air. Five hundred H. P. battery, B. & W. boilers. Colliery shop.

Inside.—Triple-expansion, condensing, duplex pump, brick arch pump room, and sump tunnel to shaft sump. No. 4 Rock slope, from surface to Abbot, 100 yards.

Jersey No. 8 Washery

Conveyor, railroad and steam shovel equipment to work Hartford No. 6 culm bank.

Sugar Notch No. 9 Colliery

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

Inside.—Compound duplex pump and brick and structural steel pump room, located on 3rd West Ross. Rock plane airway, Red Ash to Baltimore, 100 yards. No. 15 tunnel, Baltimore to Stanton vein, 195 yards.

Maxwell No. 20 Colliery

Outside.—Five hundred H. P. battery, B. & W. boilers. Duplex air compressor, simple steam, compound air. Brick engine house for compressor and electric lighting plant.

Inside.—No. 10 tunnel, extended from Ross to Baltimore, 312 yards. No. 16 tunnel, Hillman to Hillman across basin, 37 yards. Compound condensing duplex pump, pump rock in rock, and tunnel Baltimore to Twin for sump, Baltimore shaft to level. Sanitary barn to accommodate thirty (30) mules, Red Ash shaft level.

LEHIGH VALLEY COAL COMPANY.

Dorrance Colliery

Hillman vein slope extended 654 feet into the basin north of cemetery anticlinal. Tunnel finished from Abbot to Snake Island—Middle plane level. Tunnel commenced on Upper level to same vein. Tunnel is being driven from Hillman to Five Foot vein, 232 feet. New slope started from lower Bennett gangway to reach the basin below Slant slope. New inside slope started to work river warrant—Hillman vein. Preparations are being made and work started to sink main hoist shaft from Baltimore to Red Ash, also second opening rock slope for same. A new stable is being made, and improvement to pump houses. Fire emergency water lines extended during the year. A series of test holes were put down from surface

the fire entering the mine, to stop the fan so that the smoke would not be drawn into the mine and smother the workmen.

Second: That the company build two hanging doors, one at each landing in the shaft that could be closed in the event of fire in the breaker, and that the proper persons in charge, both on day and night shift, be fully instructed how and when to close them.

Third: That the manways leading to the two small shafts on second outlets be put and kept in good order at all times and fit for men to travel in, and that large painted signs be put up at different points along the manways for the purpose of showing the workmen the proper route to take to get out quickly.

Fourth: That the company build two iron doors at the mouth of the shaft that could be closed in the event of fire in the breaker. These doors to be so arranged as to prevent any material from falling down the shaft in the event of fire in the breaker.

I am pleased to state that the company has completely followed the recommendations made, and I believe the workmen at this mine are protected as fully against fire as is possible under the existing circumstances.

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery

Outside.—Supply store, barn and carriage house and railroad No. 3 slope to breaker.

Inside.—No. 9 tunnel extended to the Ross, 70 yards; No. 13 tunnel Hillman to Kidney, 82 yards; No. 14 tunnel Hillman to Kidney, 93 yards; No. 15 tunnel Hillman to Kidney, 97 yards; No. 16 tunnel Hillman to Stanton, 52 yards; No. 17 tunnel Red Ash to Top Red Ash 49 yards.

South Wilkes-Barre No. 5 Colliery

Outside.—1,000 H. P. water tube boiler; Duplex air compressor, simple steam, compound air.

Inside.—Compound condensing pump and pump room; No. 1 air shaft extended to Baltimore 107 yards; Rock plane airway Kidney to Abbott for No. 11 tunnel, return 44 yards; No. 12 tunnel Baltimore to Five Foot, 62 yards; three-inch drainage bore hole No. 8 slope to No. 9 slope.

Stanton No. 7 Colliery

Outside.—500 H. P. water tube boiler; colliery supply store; railroad No. 4 slope to breaker; 24x48 inch hoisting engine No. 4 slope.

Inside.—Air shaft surface to Abbott; No. 10 tunnel Skidmore to Ross, 80 yards; 3 inch drainage bore hole No. 4 slope to No. 8 plane.

South Wilkes-Barre No. 5 Colliery

Outside—Two pairs 24x48 hoisting engines Nos. 6 and 7 slope; brick oil house.

Inside—No. 13 Tunnel Baltimore to Five Foot; No. 14 Tunnel Baltimore to Five Foot; No. 15 Tunnel Five Foot to Stanton.

Stanton No. 7 Colliery

Inside.—Compound condensing duplex pump and reinforced concrete pump room.

Sugar Notch No. 9 Colliery

Outside.—Supply store; started erection new breaker.

Inside.—No. 19 Tunnel Twin to Twin; No. 15 Tunnel extended Stanton to Hillman.

Maxwell No. 20 Colliery

No. 19 Tunnel Hillman to Kidney; No. 20 Tunnel Red Ash to Twin; Rock plane airway Hillman to Kidney; Bore hole for culm slushing.

LEHIGH VALLEY COAL COMPANY

Dorrance Colliery

Baltimore shaft extended 170 feet and landings are being turned off from which tunnels will be driven to the Red Ash vein.

No. 13 Rock slope has been finished to the Red Ash vein. This to be used for a second outlet.

No. 6 Rock slope has been finished and a tunnel is being driven through Mill Creek Anticlinal to the main South dip.

No. 14 sub-slope in the Cooper and No. 15 sub-slope in the Bennett vein have been extended 800 feet.

Two tunnels are being driven in the Five Foot plane level to the Hillman vein.

No. 13 Tunnel from the Hillman to the Abbott finished.

No. 10 slope in the Bowkley has been finished to the basin.

Two tunnels, each 125 feet long, were driven from Bennett to Cooper vein in bottom lift of extension slope.

No. 1 Tunnel Hillman to Bowkley has been finished to the Abbott vein.

A new concrete wash-house equipped with 100 lockers has been erected.

One thousand five hundred H. P. Stirling water tube boilers has been installed, dispensing with 1,200 H. P. tubular.

The boiler house has been rebuilt with brick and corrugated iron roof.

The outside barn has been rebuilt, also mule hospital and concrete fire hose house.

Franklin Colliery

Three hundred H. P. Stirling water tube boilers are being erected.

The water has been pumped out of the fire water submerged district in long slope and the Sump vein No. 7 slope has been extended to the No. 2 old level.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2.—Outside: Brick locomotive house, new engines, Hillman slope.

Inside: Number 20 Tunnel Hillman to Stanton, No. 21 Tunnel Hillman to Stanton, No. 22 Tunnel Kidney to Stanton, No. 23 Tunnel Hillman to Stanton. Compressed air haulage plant.

South Wilkes-Barre No. 5.—Inside: No. 16 Tunnel Hillman to Kidney, No. 17 Tunnel Kidney to Hillman. Compressed air haulage plant.

Stanton No. 7.—Outside: 488 H. P. water tube boilers, steel head frame Empire No. 4 shaft, extension railroad to Empire shaft, brick engine house Empire shaft, brick locomotive house, brick oil house.

Inside: Compressed air locomotive. No. 11 Tunnel Red Ash to Ross.

Maxwell No. 20.—Outside: Supply house.

Inside: No. 7 Rock slope. Compressed air haulage plant.

No. 21 Tunnel Red Ash to Red Ash. Tunnel Hillman to Hillman.

LEHIGH VALLEY COAL COMPANY

Henry Colliery.—A series of safe cover test holes was drilled to determine the working limits in the 5 foot Hillman and Bowkley Veins.

A permanent concrete steel overcast was completed in Red Ash Vein.

New empty car plane and turnout were completed in Red Ash Shaft.

Numbers 21, 23, 27 and 28 sub-slopes have been started in Red Ash Shaft and are being extended.

A new 28x10x36 inch Goyne pump with 12 inch column and 8 inch exhaust pipe from the foot of shaft to the surface has been installed in the Red Ash Vein.

Numbers 51, 53, 54 and 56 tunnels have been finished through the Red Ash anticlinal.

A new permanent concrete steel overcast was completed in Wyoming Marcy Vein.

Preparations have been made and plans outlined and work commenced unwatering the Enterprise workings lying to the east of Henry.

Additional pumps have been placed in the 5 foot vein at the counter level of the Henry Shaft and a series of Diamond drill holes put through the pillar. These holes are being reamed out, so that it is expected by the close of the coming year the Enterprise workings will be unwatered and the coal in that property reclaimed.

Additional steam lines and column pipe lines and emergency pumps incidental to this work have been set in place. The new permanent plant to follow.

The Henry Washery has reclaimed all of the old Wyoming banks on the north side of the L. V. R. R. and the shovel and locomotive outfit has been transferred to the Enterprise banks to reclaim the coal through the Henry Washery.

A new bridge was constructed across the C. R. R. of N. J. and public road for the culm dump.

Outside barn remodeled to Lehigh Valley Standard; concrete floor and mangers. New 18x30 mule hospital.

Enterprise bank west of Plank road exhausted and Henry bank being reclaimed.

Preparations are under way to reclaim old Prospect bank. This is to be taken to Henry Washery by means of locomotive.

Prospect Colliery.—Stables for 75 mules in Red Ash completed. New electric hoist in operation on new slope west workings.

No. 10 Slope regraded through fault. A new concrete steel overcast has been put in this vein over No. 10 Slope. Second opening for Rock slope, Skidmore workings.

New mule stable in Midvale Hillman slope. New 500-ton washery completed and in operation.

Extensive repairs have been made to breaker and jig foundation.

Colliery office remodeled and new loaded scales installed.

Dorrance Colliery.—Red Ash tunnel and plane completed. Second opening to No. 6 Extension Tunnel completed. 5 concrete steel overcasts in Baltimore vein completed. 1 Undercast and direct return at head of Slant slope completed.

Vein connection made through Mill Creek anticlinal from No. 18 Tunnel Upper Baltimore to Plank road, Upper Baltimore workings.

2-10 ton electric locomotives installed in Hillman vein.

New slope is being driven in Hillman to connect with No. 15 and No. 17 tunnels from 5 Foot vein.

Extension was made to new Hillman vein stable.

Outside

New 350 K. W. 250 volt generator installed. Work is now being done on new 25x14 upcast shaft, from surface to Baltimore vein.

Franklin Colliery.—Central pumping plant in Red Ash vein completed. No. 8 Plane equipped with engine, steam from surface through bore hole. Nos. 23 and 24 tunnels Top Red Ash to Bottom Red Ash. No. 9 Slope district completed.

10 inch Water line from Column bore hole to reservoir completed. New steam line from boiler house to Red Ash Central pumping plant completed.

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery, Inside.—No. 18 Tunnel extended to Ross.

No. 19 Tunnel extended to Ross.

Rock Plane airway Stanton to Hillman.

No. 5 Slope graded through rock.

South Wilkes-Barre No. 5 Colliery, Inside.—No. 7 Slope extended from Abbott to Hillman. Pumping plant No. 2 Slope.

Stanton No. 7 Colliery, Outside.—Slush hole, Surface to Hillman. Slush hole, Surface to Stanton.

Inside.—Mule barn Red Ash Shaft Level. Pumping plant No. 4 Shaft Level.

Maxwell No. 20 Colliery, Outside.—Breaker remodeled. Timber saw mill. 500 H. P. water tube boilers. Engines and rope holes for Nos. 8 and 10 Slopes.

PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Ventilation good; roads and drainage fair; condition as to safety good.

WILKES-BARRE AND SCRANTON COAL AND IRON COMPANY

Hillman Vein Colliery.—Ventilation good; drainage good; condition as to safety good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery, Inside.—No. 26 Tunnel-Bottom Red Ash to Top Red Ash.
Rock plane airway Bottom Red Ash to Top Red Ash.
New pumping plant Baltimore Shaft level.
Outside.—New shaft hoisting engines for Baltimore level.
Remodeling breaker and annex.
Steel head frame.
South Wilkes-Barre No. 5 Colliery, Inside.—No. 19 Tunnel, Hillman to Kidney.
No. 21 Tunnel, Baltimore to Five Foot.
No. 22 Tunnel, Baltimore to Five Foot.
No. 20 Tunnel, Hillman to Kidney.
No. 23 Tunnel, Top Baltimore to Bottom Baltimore.
Rock plane airway, Bottom Baltimore to Top Baltimore.
Outside.—Paving retail wagon road, and new scales.
Stanton No. 7 Colliery, Inside.—No. 13 Tunnel, Hillman to Hillman.
No. 14 Tunnel, Baltimore to Five Foot.
Slush Hole, Surface to Baltimore.
No. 12 Tunnel, Skidmore to Hillman.
No. 29 Tunnel, Stanton to Hillman.
Sugar Notch No. 9 Colliery, Inside.—No. 21 Tunnel, Twin to Cooper.
No. 9 Tunnel, Extended to Five Foot.
No. 20 Tunnel, Ross to Baltimore.
No. 15 Tunnel, Extended to Hillman.
Maxwell No. 20 Colliery, Inside.—Tunnel, Top Red Ash to Bottom Red Ash.
Tunnel, Top Red Ash to Bottom Red Ash.
No. 22 Tunnel, Baltimore to Five Foot.
No. 24 Tunnel, Baltimore to Five Foot.
New pumping plant, 4th Lift.
Outside.—Dust system installed in breaker.

LEHIGH VALLEY COAL COMPANY

Prospect, Outside.—Repairs to breaker. New refuse conveyor line.
Inside.—Air shaft from Lower to Upper Baltimore in Klondyke Slope district. Motor haulage in Red Ash and Baltimore veins extended.

Outside: Hoisting engines, Baltimore shaft.
Remodeling breaker.
Steel head frame.
Dust system.

South Wilkes-Barre No. 5 Colliery

Inside: Extension No. 10 tunnel, Top to Bottom Baltimore.
No. 24 tunnel, Abbott to Hillman vein.

Stanton No. 7 Colliery

Inside: Rock plane airway, No. 12 tunnel west to No. 29 tunnel.
Extension of No. 13 tunnel to Hillman vein.
No. 15 tunnel, Hillman to Kidney, No. 6 plane counter.
Rock manway, No. 4 slope, Abbott vein.
No. 16 tunnel, Hillman to Kidney, No. 8 plane west.

Sugar Notch No. 9 Colliery

Inside: Extension No. 13 tunnel, Stanton to Hillman vein.
Extension No. 20 tunnel, Baltimore to Five Foot.
Tunnel, Twin to Cooper, No. 9 tunnel west.

Maxwell No. 20 Colliery

Inside: Tunnel, Ross to Twin, No. 18 tunnel west.
No. 23 tunnel, Baltimore to Five Foot.
Outside: Engines, etc., for No. 8 slope.

LEHIGH VALLEY COAL COMPANY

Prospect Colliery

Outside: Extensive repairs to breaker. Extension of the conveyor line to the washery. Changes to engine and drive for Prospect conveyor line and the construction of two overflow catch basins.

Inside: Midvale Hillman mule stable completed. The electric motor haulage, Red Ash vein, was extended to the extreme east. A concrete steel overcast constructed on the shaft level west district. Changes of head of No. 8 rock slope and installation of automatic head block.

Henry—Outside: A series of rock cover test holes for the Hillman vein were completed. An 8-inch Churn drill bore hole from the surface to the Red Ash vein for the changes in high pressure air line was completed. The Enterprise culm bank east of plank road is being hauled to the Henry Washery. A new Lehigh Valley Coal Company standard wooden head frame completed for No. 2 Red Ash shaft. The water course at Prospect was concrete lined with "I" beam reinforcement for the roof from the mouth to the rock. The coal road between the Henry and Prospect was renewed throughout and the old rails replaced with 56 pound rails. A concrete steel bridge was constructed for the Prospect Hillman slope, Plank road crossing.

Inside: An engine and pump were installed in No. 28 slope north of the fault for the extension of operation in No. 28 slope and airway. Preparations were made to construct an intermediate landing in the Red Ash shaft at the Marcy vein level for the haulage concentration

FATAL ACCIDENTS

Explosion of Gas at South Wilkes-Barre No. 5. Colliery

On March 12 an explosion of gas at the South Wilkes-Barre No. 5 Colliery of the Lehigh and Wilkes-Barre Coal Company caused the death of seven men.

The colliery had been idle for three days, but a number of men under the direction of the mine foreman and the fire boss had worked all day until shortly after 4:30 p. m. on plane and plane airway, where the explosion occurred. The fire boss was the last man to leave the place, and upon examination he found both places free of gas. His other duties were to see that no fire or feeders were left burning after the day shift; also to see that all doors affecting the ventilation in this part of the mine were closed. He walked behind the day shift men all the way out to foot of shaft where the fire boss's shanty is located. Here he gave the charge-man of the night shift a safety lamp and reported both places free of gas. The work they were engaged in was moving a compressed air hoisting engine from its old location to a point further up the plane, so as to make it available for hoisting from new levels located above those from which it had been drawing coal.

Parallel to the plane was the plane airway connected with the plane by a heading about ninety feet apart. All but the upper heading had stoppings in them. This upper heading was quite close to the face, and a board brattice extended from it to a point about eight feet from the face. The normal air current through this air course was 13,000 cubic feet per minute, amply sufficient to dilute and carry off all gas evolved there.

The night shift consisted of eight men, all of whom were English speaking men of more than average intelligence. When they reached the fire boss's shanty, the fire boss, although aware that the place made gas, told them that when he left it, the place was safe. But to make absolutely sure, he cautioned them to examine it with safety lamps before attempting to use their naked lights. When they reached the foot of the plane airway, one of the men was sent back for some tools that were required, and the other seven went up.

As the seven men who went up the plane airway, which was the intake from the foot of the shaft, were all killed, there is no evidence as to how the explosion occurred. However, when the bodies were recovered it was found that the safety lamps had not been used, but were in the coat pockets of the men, so that the accident was due to the failure to follow the fire boss's instructions. That it was not a particularly severe explosion was evidenced by the fact that the men were but slightly burned. An examination showed that they had all been killed by after-damp, resultant from the explosion. It is probable that the explosion, which blew out several of the plank stoppings on the headings, was heavy enough to knock them down and stun them, and that before they could regain their senses the deadly after-damp killed them.

As soon as knowledge of the accident reached the officials a rescue corps equipped with Draeger helmets attempted to reached the men, but the knocking out of the stoppings on the headings had short circuited the air current, and, as a result, the heated atmosphere in the upper section of the air course remained and rendered it so hot that the rescue party could not enter. After the air current had been restored to its usual course the hot air was driven off and the bodies recovered. Notwithstanding the fire due to the ignition of the gas and the heat engendered, it is more than probable that all of the men could have escaped if they had not been stunned, because an examination of the bodies showed but comparatively slight burns, and the brattice boards and stoppings showed no signs of scorching. The only way in which the gas could accumulate was by the temporary baffling of the air-current. It is the writer's theory that the few changes in doors and stoppings that were made shortly before the day shift left that day, allowing more leakage in the new stopping, caused diminution of the normal current in this particular split. The result was an accumulation of gas in an explosive condition, just as the men reached the point near where they were to commence work. This would have been detected and the accident prevented, had they heeded the instructions of the fire boss, and used their safety lamps.

CONDITION OF COLLIERIES

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2.—Ventilation, roads and drainage good; condition as to safety good.

South Wilkes-Barre No. 5.—Ventilation, roads and drainage good; condition as to safety, good.

Sugar Notch No. 9.—Ventilation, roads and drainage good; condition as to safety good.

Maxwell No. 20.—Ventilation, roads and drainage good; condition as to safety good.

Stanton No. 7.—Idle since October, 1909.

LEHIGH VALLEY COAL COMPANY

Prospect.—Ventilation and drainage good; roads fair; condition as to safety good.

Dorrance—Ventilation and drainage good; roads fair; condition as to safety good.

Franklin.—Ventilation and drainage good; roads fair; condition as to safety good.

Warrior Run.—Ventilation, roads and drainage fair. They are robbing pillars. Condition as to safety good.

DELAWARE AND HUDSON COMPANY

Baltimore No. 5.—Ventilation, roads and drainage good; condition as to safety good.

Baltimore Tunnel.—Ventilation, roads and drainage good; condition as to safety good.

Conyngham.—Ventilation, roads and drainage good; condition as to safety good.

RED ASH COAL COMPANY

Red Ash No. 2.—Ventilation, roads and drainage fair. They are robbing pillars. Condition as to safety good.

PITTSTON COAL MINING COMPANY

Hadleigh.—Ventilation, roads and drainage fair. They are robbing pillars. Condition as to safety good.

WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein.—Ventilation, roads and drainage good; condition as to safety good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery.—Inside: No. 28 tunnel—Red Ash to Ross.

South Wilkes-Barre No. 5 Colliery.—Outside: Remodeled forced draft system. Inside: Rock plane airway—Kidney to Abbott.

Stanton No. 7 Colliery.—Outside: Installed forced draft fan system at Empire shaft boiler house. Erected outside stable. Inside: Extended No. 3 air shaft—Abbott to Five Foot.

Sugar Notch No. 9 Colliery.—Inside: No. 9 tunnel extended to Hillman. No. 23 tunnel Twin to Cooper. No. 16 tunnel Cooper to Five Foot.

Maxwell No. 20 Colliery.—Inside: No. 25 tunnel—Baltimore to Five Foot.

LEHIGH VALLEY COAL COMPANY

Prospect Colliery.—Outside: A new machine shop for repairing cars from Dorrance, Prospect and Henry collieries and for general machine work in the division, was completed and the narrow gauge tracks to same installed. The handling of timber, which previously was done at the respective collieries and sawed by hand, is now done at the Prospect yard in connection with the new machine shop. The timber is taken from the railroad cars by an overhead traveling timber trolley, which carries it to the saw house where it is cut with a steam saw and loaded on mine cars for the various collieries. The washery has been abandoned and removed. During the erection of the new steel breaker, Mineral Spring coal was prepared at this place. Repairs to the breaker were made and a complete fire alarm system installed.

An extra pump was placed in the river pump house, which has been remodeled and enlarged. A series of test holes for proving the rock cover in the river district was drilled. Inside: The driving of No. 22 slope from the Midvale pump lift to the surface at the machine shop was started. In the Five Foot vein a new slope was also started and two new slopes in the Baltimore vein were driven. In the Red Ash vein a new electric hoist on No. 18 slope was installed, and also an electric haulage on the second lift east off No. 11 slope. In the lower Baltimore shaft level east, electric haulage was installed with one new motor. Extensive improvement of the Baltimore vein mule barn were carried on. The securing of the foot of the Oakwood shaft with reinforced concrete and "I" beams was started.

CONDITION OF COLLIERIES

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5, Stanton No. 7, Sugar Notch No. 9, and Maxwell No. 20.—Ventilation, roads, drainage and condition as to safety, good.

LEHIGH VALLEY COAL COMPANY

Prospect and Dorrance.—Ventilation, roads, drainage and condition as to safety, good.

Franklin.—Ventilation and condition as to safety, good; roads and drainage fair.

DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel.—Ventilation, roads, drainage and condition as to safety, good.

RED ASH COAL COMPANY

Red Ash No. 2.—Ventilation, roads and drainage fair; condition as to safety, good.

PITTSTON COAL MINING COMPANY

Hadleigh.—Ventilation, roads and drainage fair; condition as to safety, good.

WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein.—Ventilation, roads, drainage and condition as to safety, good.

MINERS MILLS COAL MINING COMPANY

Healey.—Ventilation, roads and drainage fair; condition as to safety, good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery:

Outside.—Red Ash shaft hoisting engines and house, electric light plant, feed water heater system.

Inside.—Extended No. 5 tunnel to Ross No. 30 tunnel, Hillman to Kidney.

South Wilkes-Barre No. 5 Colliery:

Outside.—Wash house.

Inside.—12x16-inch hoisting engines provided for Nos. 12 and 13 slopes. Installed two compressed air locomotives. Extended No. 23 tunnel to Five Foot; No. 27 tunnel, Kidney to Abbott; No. 26 tunnel, Stanton to Five Foot.

Stanton No. 7 Colliery:

Outside.—New breaker; steel head frame for breaker hoist. Concrete fuel bin for boiler house. Steam heat in breaker. Dust-collecting system in breaker. Hopper and pocket to receive coal from No. 21. 240 H. P. boilers at Empire Shaft. Fuel conveyor and slush trough. Feed water system. Tower hoisting engine and house. Power house. Yard grading, tracks and car hoist. New steam lines in colliery yards and to Stanton air shaft.

Outside.—Installed breaker fire lines and remodeled mule barn on No. 4 slope.

South Wilkes-Barre No. 5 Colliery.—Inside: Completed fireproof mule barns on Nos. 3 and 5 shaft levels; No. 8 tunnel extended to Baltimore, and drove tunnel from Abbott to Abbott, 1st east No. 7 slope.

Outside.—Completed addition to power plant.

Hollenback No. 2 Colliery.—Inside: Installed concrete and steel timbering on Baltimore and Red Ash landings to shaft, also in small engine and pump rooms. Completed fireproof mule barn; also No. 31 tunnel, Top Red Ash to Ross; No. 32 tunnel, Kidney to Abbott, and No. 17 tunnel extended to Ross.

Outside.—Completed saw mill and timber yard.

Sugar Notch No. 9 Colliery.—Inside: Completed fireproof mule barn; No. 9 plane Ross to Red Ash; also No. 25 tunnel Hillman to Kidney; No. 26 tunnel, Hillman to Kidney; tunnel, Twin to Ross, 3rd east, No. 5 plane; tunnel, Five Foot to Five Foot, No. 20 tunnel west.

Outside.—Completed fire pump and breaker fire lines, and made addition to mule barn.

LEHIGH VALLEY COAL COMPANY

Prospect Colliery.—Inside: The work of completing fireproof additions to the Red Ash and Baltimore barns was carried out. Man cars were placed on No. 8 rock slope to hoist men from the Red Ash vein to the Oakwood level. No. 57 rock tunnel, 500 feet long, from the Baltimore to the Skidmore vein, Prospect Shaft level, was driven and electric haulage installed therein. No. 58 rock tunnel was driven from the Abbott to the Bowkley vein a distance of 280 feet, for the purpose of mining a virgin area in the vicinity of Oakwood shaft.

Outside.—An addition was built to the breaker to house the box car loader. Three new sets of Compound rolls were placed in the breaker. A concrete engine house for No. 8 slope was completed, in which were installed a pair of second motion engines to replace the old hook engine operating the slope. A mess house, equipped with all improvements and conveniences for the outside employes was started. Work was started on the remodeling of the old car repair shop to accommodate the blacksmith and carpenter shops. A 10 inch rope hole was driven from the surface to the Red Ash vein, a distance of 760 feet, to avoid carrying the rope that operates No. 10 slope over the Laurel Line tracks. A 6 inch hole from the surface to the Abbott vein, for sewage from the mess house, was drilled a distance of 126 feet.

Henry.—Inside: The installation of pumps for water concentration to the Red Ash vein, mentioned in report of 1911, was completed. The fireproofing of the Red Ash, Baltimore and Henry Five Foot barns was also completed. Rope haulage was installed in No. 2 level from No. 11 slope to No. 6 plane and placed in operation. The second opening rock plane from Skidmore to Lower Baltimore vein for No. 36 rock slope was completed. No. 17 plane from Lower Baltimore vein to the Skidmore landing in Red Ash shaft was driven to serve as a manway. Test drilling to prove Hillman and Bowkley veins was also carried on.

CONDITION OF COLLIERIES

LEHIGH AND WILKES-BARRE COAL COMPANY

Stanton No. 7, Maxwell No. 20, South Wilkes-Barre No. 5, Hollenback No. 2 and Sugar Notch No. 9 Collieries.—Ventilation, roads, drainage and condition as to safety good.

LEHIGH VALLEY COAL COMPANY

Dorrance, Henry, Prospect, Franklin and Warrior Run Collieries.—Ventilation, roads, drainage and condition as to safety good.

DELAWARE AND HUDSON COMPANY

Baltimore Tunnel and Baltimore No. 5 Collieries. — Ventilation, roads, drainage and condition as to safety good.

WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety good.

RED ASH COAL COMPANY

Red Ash No. 2 Colliery.—Ventilation, roads and drainage fair; condition as to safety good.

RISSINGER BROTHERS AND COMPANY, INCORPORATED

Miners Mills Colliery.—Ventilation, roads and drainage fair; condition as to safety good.

PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Ventilation, roads and drainage fair; condition as to safety good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Stanton No. 7 Colliery.—Inside: Completed No. 31 tunnel, bottom to top, Red Ash; No. 18 tunnel, Hillman to Kidney; No. 19 tunnel, Baltimore to Five Foot. Rock plane airway, top Red Ash to Ross; No. 11 tunnel, West Empire; tunnel top to bottom Red Ash, No. 2 tunnel west.

Outside: Installed slush pump.

Maxwell No. 20 Colliery.—Completed No. 6 plane, bottom to top Red Ash; tunnel top to bottom Red Ash, No. 4 tunnel east; No. 29 tunnel Hillman to Kidney; two tunnels bottom to top Red Ash, No. 20 tunnel east. Installed 10 by 36-inch compound pump on 4th lift, No. 4 slope.

South Wilkes-Barre No. 5 Colliery.—Completed No. 29 tunnel, top to bottom Baltimore; Rock slope, Hillman to Hillman, No. 3 slope; tunnel, Stanton to Stanton, First East No. 12 plane.

Outside: Installed feed water heating system.

CONDITION OF COLLIERIES

LEHIGH AND WILKES-BARRE COAL COMPANY

Stanton No. 7, South Wilkes-Barre No. 5, Maxwell No 20, Hollenback No. 2, and Sugar Notch No. 9.—Ventilation, roads, drainage and condition as to safety, good.

LEHIGH VALLEY COAL COMPANY

Dorrance, Henry, Prospect, Franklin and Warrior Run.—Ventilation, roads, drainage and condition as to safety, good.

DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel.—Ventilation, roads, drainage and condition as to safety, good.

RED ASH COAL COMPANY

Red Ash No. 2.—Ventilation, roads, drainage and condition as to safety, good.

WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein.—Ventilation, drainage and condition as to safety, good.

PITTSTON COAL MINING COMPANY

Hadleigh.—Ventilation, roads, drainage and condition as to safety, good.

RISSINGER BROTHERS AND COMPANY, INCORPORATED

Miners Mills.—Ventilation, drainage and roads, fair. Condition as to safety, good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone No. 3.—New mine. Sinking shafts.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Stanton No. 7 Colliery.—Inside: Completed tunnel, Abbott to Abbott, 6th East, No. 4 slope; No. 17 tunnel, Abbott to Kidney; No. 32 tunnel, Skidmore to Hillman; and tunnel, Hillman to Top Stanton, No. 6 Plane West. Installed two 14-inch by 8-inch by 18-inch pumps in Nos. 2 and 3 slopes; also compressed air haulage on Empire No. 4 shaft level. Remodeled shaft level barn.

South Wilkes-Barre No. 5 Colliery.—Completed No. 30 tunnel, Baltimore to Baltimore; No. 31 tunnel, Kidney to Kidney; Rock Plane airway, Top Baltimore to Five Foot, 2nd West No. 2 slope. Installed 14 inch by 8 inch by 18 inch pump in No. 4. slope.

CONDITION OF COLLIERIES

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5, Stanton No. 7, Sugar Notch No. 9 and Maxwell No. 20 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

LEHIGH VALLEY COAL COMPANY

Franklin, Dorrance, Prospect, Henry and Warrior Run Collieries.—Ventilation, roads, drainage and condition as to safety, good.

DELAWARE AND HUDSON COMPANY

Baltimore No. 5 and Baltimore Tunnel Collieries.—Ventilation, roads, drainage and condition as to safety, good.

WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety, good.

RED ASH COAL COMPANY

Red Ash Nos. 1 and 2 Collieries.—Ventilation, roads and drainage, fair. Condition as to safety, good.

PITTSTON COAL MINING COMPANY

Hadleigh Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

CAMPBELL AND JOHNS

Miners Mills Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Pettebone Nos. 3 and 4 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery.—Inside: Completed No. 39 tunnel, Baltimore to five foot; tunnel. Ross to Red Ash, 5th East, No. 6 plane; No. 41 tunnel, Hillman to Kidney; and No. 42 tunnel, Stanton to Five Foot vein.

Outside: Installed a 24 by 48 inch hoisting engine for No. 3 plane.

South Wilkes-Barre No. 5 Colliery.—Completed No. 32 tunnel, Abbott to Hillman; rock plane, Hillman to Kidney; and No. 33 tunnel, Stanton to Baltimore vein.

Stanton No. 7 Colliery.—Completed No. 20 tunnel, Abbott to No. 1 vein; rock plane, Abbott to No. 1 vein; No. 21 tunnel, Top Red

S. Wilkes Barre

CONDITION OF COLLIERIES

LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2, South Wilkes-Barre No. 5 and Stanton No. 7 Collieries.—Ventilation, roads, drainage and condition as to safety, good.

LEHIGH VALLEY COAL COMPANY

Prospect and Dorrance Collieries.—Ventilation, roads, drainage and condition as to safety, good.

HUDSON COAL COMPANY

Baltimore No. 5 Colliery.—Ventilation, roads, drainage and condition as to safety, good.

RED ASH COAL COMPANY

Red Ash No. 2 Colliery.—Ventilation, roads and drainage, fair. Condition as to safety, good.

WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—Ventilation, roads, drainage and condition as to safety, good.

IMPROVEMENTS

LEHIGH AND WILKES-BARRE COAL COMPANY

Stanton No. 7 Colliery.—Completed extension of No. 3 tunnel from Ross to Red Ash vein; rock slope return from Top Red Ash to Ross vein; No. 18 rock plane from Abbott to Abbott vein; tunnel from Abbott to Abbott vein, through fault in No. 4 slope; rock plane airway from No. 15 plane to No. 28 tunnel; extension of No. 11 tunnel from Top Red Ash to Bottom Red Ash vein; No. 12 plane, Skidmore No. 16 tunnel to shaft level on No. 2 plane.

South Wilkes-Barre No. 5 Colliery.—Completed rock plane airway from Stanton to Hillman vein.

LEHIGH VALLEY COAL COMPANY

Prospect Colliery.—Installed a wooden box-car loader to replace old metallic loader. Installed a new 400-hp. Erie City boiler; also air hoist in Red Ash vein, and electric motors at foot of No. 13 slope, Red Ash vein, and on No. 5 slope, in Baltimore vein. Completed No. 60 tunnel, Midvale slope, from Hillman to Five Foot vein; No. 8 plane from Skidmore to old workings in Lower Baltimore vein, for the purpose of improving ventilation, and No. 10 slope manway, Red Ash vein.

Dorrance Colliery.—The Lance vein was opened from No. 28 tunnel. Completed No. 29 tunnel from Hillman to Bowkley vein; No. 30 tunnel from Five Foot to open up the Cooper, Bennett, Lance and