

One pump, ten inches, diameter of cylinder; twelve inch stroke; piston speed, forty feet per minute; discharging fifty gallons water; one hundred and five feet, vertical height.

One pump, ten inches, diameter of cylinder; twelve inch stroke; piston speed sixty-four feet per minute; discharging eighty gallons of water; eighty-one feet, vertical height.

We do our pumping at night, lifting about seven hundred tons of water to foot of shaft. The ventilation of our lower levels is greatly improved; the temperature normal; and the total quantity increased.

We hoist the coal from our lower (No. 2) slope, with air; it does the work nicely, far better than steam, owing to the great condensation of the latter; the pipes leading to engine being somewhere over a mile in length.

In summing up the advantages of compressed air over steam, I find that, when the pipes leading the steam are longest, there we have the best results with air. Take our lower pump as an illustration, we have somewhere about six thousand one hundred feet of pipe leading to it. With steam pressure of sixty pounds on boilers, we could get only twenty-eight feet per minute of piston speed. Now, with air pressure of forty-eight pounds, we can get a piston speed of sixty feet. The ratio of gain is less as we approach the boilers. The temperature of the air exhausting from the pump into the air currents is about thirty-five degrees Fahrenheit.

My impressions are that for deep workings compressed air is a grand success. There is necessarily a small loss by condensation in long pipes when steam is used, and, besides, the pressure with air is effective at all points.

I have written this for your information, at your request, and trust it may embody all you expected.

Yours respectfully,

WILLIAM E. LINES.

This company is sinking a new shaft called **Dorrance**, on the Bidlack farm, near Wilkes-Barre, the sectional area of which is fifty-two by twelve feet, and it is expected to cut the Baltimore seam at a depth of one thousand feet. When completed, it will have two distinct hoisting departments, one for the Hillman, and the other for the Baltimore seam. There are twenty-five men employed in it, and at the time of this writing, December 31, it is down two hundred and fifty feet. Several years will elapse before it will be completed ready to ship coal.

**Lehigh and Wilkes-Barre Coal Company.**

At the Empire shaft a tunnel was driven from the Baltimore vein to the Red Ash. It is one thousand and twenty feet in length, and has a sectional area of seven by fourteen feet. The coal is fourteen feet thick, and of good quality.

At the Hartford slope a new tunnel was driven from the Baltimore to the Ross seam, the area of which is seven by twelve feet, and is five hundred

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. <b>Dorrance</b> , . . . . .	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		

end of Wilkes-Barre, within the limits of the city. The size of the hoisting shaft is 16'×11', and the area of the air-shaft is ninety-one square feet. Both are sunk to the three-foot seam, a depth of two hundred and eighty-two feet. The breaker was completed and started to work on the 28th of September, 1883. Both shafts are connected to the workings, and the ventilation is produced by a Guibal fan, sixteen feet diameter. They are working both the three-foot and Hillman seams, and both are emitting carbureted hydrogen gas very freely, which caused considerable trouble while sinking the shafts.

**The Lehigh Valley Coal Company.**

The **Dorrance** shaft is completed to the Hillman seam, a depth of six hundred and two feet. Two cages are already in operation to hoist from this seam, and the second opening is now being driven to connect with the air-shaft. The air-shaft is sunk to the same seam, and reached it at a depth of three hundred and thirty-four feet. Its size is twenty-five by ten feet. A new thirty-five feet Guibal fan is being erected at the top of the hoisting-shaft, a part of which shaft is to be used as an upcast. The breaker is in course of construction, and will be ready to work in a few months. It is evident from the extensive preparations that this is intended to be a large producing colliery, and will be actively at work during the latter part of 1884.

The Maltby shaft was sunk to the eleven-foot seam, an extension of one hundred and twenty feet, and its depth at present is two hundred and eighty-seven feet. A second opening to this seam was made by driving a passage out to the outcrop of the vein. A slope is being driven down the dip of the vein, which had reached a distance of five hundred feet at the close of the year. They intend to drive a tunnel from the bottom of this slope to the six-foot vein, to work that seam under the flats, beyond the point where the old river-wash exists. The dams erected around the shaft in the six-foot seam, described in last year's report, hold the water perfectly well, and no trouble from that source is apprehended.

**The Lehigh and Wilkes-Barre Coal Company.**

The collieries of this company have been operated under contract by Charles Parrish and Company for a number of years, but they all passed into the management of the Lehigh and Wilkes-Barre Coal Company on the first day of August, 1883. This change was regretted by a large number of people who were employed at various branches of work in those mines, and the excellent condition in which the mines were left speaks well of Mr. Parrish's management.

At the Hollenback mine, a tunnel was driven through the anticlinal existing between this and the Diamond mines. This tunnel was made for the purpose of leaving the water run from the Diamond into the Hollenback mine. The lowest portion of the Diamond workings was filled with water to extinguish a fire, as reported in my last report, and it was tapped

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

a tunnel from the Hillman toward the Kidney vein, which at the close of the year was driven a distance of 250 feet. Its size is 12×7.

**The Hanover Coal Company.**

At the Maffit colliery of this company a tunnel was driven from the Ross to the bottom split of the Baltimore seam. Its sectional area is 7×12 feet and its length 200 feet. A second opening was effected, and the new seam is now being mined. A tunnel is in progress also from the Ross to the Red Ash seam, which will open a long lift of that vein.

**The Parrish Coal Company.**

A twenty-foot fan was erected at this colliery, which improved the ventilation to a great extent. Running 32 revolutions, it produces a ventilation of 75,000 cubic feet of air per minute. They are sinking a slope at this mine also to work the Baltimore seam.

**Fire in the Dorrance Colliery.**

This colliery belongs to the Lehigh Valley Coal Company and is located in the northern end of Wilkes-Barre. Late on Saturday evening, June 13, 1885, while the night shift were at work sinking the underground slope, the gas-blowers ignited from a miner's lamp. It very soon spread, and set the brattice and timber on fire, to such an extent that in spite of the most strenuous efforts they failed to extinguish it by the ordinary means and it was concluded to flood the mine with water. Water was pumped in from the river. While it was filling, a considerable quantity of smoke was ascending both shafts. By July 2, the mine had filled with water to a point sixty feet vertically higher than where the fire existed, and, believing it was extinguished, they began to hoist the water out. By July 12, the water was lowered to within two feet of the bottom of the gangway, when, to every one's surprise, four explosions took place, showing that fire still existed. The water was poured in again until the air-passages on the east side, where the fire existed, were closed. Then an examination revealed the fact that fire existed in the air-way at a point where it was much higher than the surrounding entrances, and they at once went to work to lay pipe from this high point out so that the air and gases could escape while the water was filling. This was a very dangerous work, because it had to be done in very noxious gases, consequently it was slow and tedious. By August 1, this was completed and water was poured in again. The air escaped all right for a day or two, but the heat caused steam to rise, saturating the air, and this again condensing in the pipe, soon filled the lowest point with water and made it useless. After leaving the water stand awhile, it was pumped out until it lowered so that the east air-way could be entered, and an examination proved that the fire was extinguished. After pumping the water all out, it was seen that the fire had spread over considerable ground and had done material damage, but this in time was re-

paired and the mine started to ship coal again in the fore part of November. At this fire it was demonstrated very clearly that a pipe is not of any use to permit air to escape from high points during a fire if water can stand in the pipe. It had a fair trial here and it failed.

**A Powerful Explosion of Gas at the Stanton Colliery, Lehigh and Wilkes-Barre Coal Company.**

The Stanton Shaft is located in Wilkes Barre, about a mile south of the center of the city. The air-shaft is on the side of Hazle street, about two thousand feet north-west of the main shaft. The old workings are ventilated by a fan, located at the mouth of a slope sunk from the outcrop of the Baltimore seam, and the workings now in progress are ventilated by a thirty-five-foot fan, located at the air-shaft, which is divided into two compartments, one a downcast, and the other an upcast. The boilers generating steam to run this fan were near the top of the shaft, and the stack, made of boiler-plate iron, was standing just one hundred feet off, southeast of the outcast of the fan, and it was thirty feet high. On Sunday afternoon, May 10, 1885, this fan was stopped to pack the engine and do some repairs. Prior to this the mine was examined twice, to ascertain that no gas-blowers were burning, and it was pronounced safe. In one hour after stopping the fan, the explosive gases were full in the mine, up to the top of the shaft. It exploded in the safety-lamp on the surface at the mouth of the shaft, and a fire-boss was stationed there to watch and keep persons away, lest it might be carelessly fired. The fan was standing for three hours, and it was started again at six o'clock, p. m. After running about five minutes, throwing out about one hundred and fifty thousand cubic feet of fire-damp every minute, a flame was seen in the air, between the fan and the boiler-stack, which instantly descended the shaft through the fan, causing a slight shock, and raising the roof of the fan-drift about a foot out of place. The wind was blowing directly from the outcast toward the boiler-stack, and it is supposed the gas ignited from flame ascending the stack. The damage was only slight on the surface. William M. Thomas, the mine-foreman, and William G. Thomas and John Joseph, fire-bosses, descended the main shaft, and went in as far as the bottom of the air-shaft to see the result in the mine. This was very dangerous work, as another explosion might follow, but it was thought safer to go immediately after the explosion than after a delay. They returned in a short time, saying that considerable damage had been done inside, but they saw no indication of fire existing, and to make sure of being safe, they concluded to wait till the following morning before entering again. The next day they began to repair the damage, and an examination showed that the explosion had been very extensive, and had developed tremendous force, but the peculiar shape of the passages of the bottom of the air-shaft diverted its course, and thus saved the fan and the structure on top from destruction. All the doors from the shaft to the face of the workings were torn to frag-

**Alden Coal Company.**

The shaft-tunnel of this company was extended to the Red Ash seam. A new fifteen foot Guibal fan was also erected on the mine, making the second fan in use for the purpose of producing ventilation. While running at lower speed than it is capable of it is exhausting 50,000 cubic feet of air per minute, which, at present, is found sufficient.

**Delaware, Lackawanna and Western Railroad Company.**

The Woodward colliery of this company was completed and began to prepare coal for shipment in July, 1888. The breaker is a large double structure, capable of preparing 2,000 tons of coal per day for the market. It is well lighted and is heated throughout by steam. Everything in the breaker and around the colliery is finished in an exceedingly satisfactory shape. No expense has been spared to make everything as safe as possible. The main shaft is a double one; *i. e.*, it has four cages for hoisting coal—two working for the Red Ash seam and two for the Bennett. The hoisting engines are powerful and are directly connected with the drums. From each of the seams conversation with the engineers can be had by telephones, and signals are given by pneumatic gongs.

The main shaft is 53x12 feet area, and is over 1,000 feet deep to the Red Ash seam.

The No. 2 shaft is 35x12 feet area, and is also sunk to the Red Ash seam, a depth of 1,013 feet, and both are connected by openings in the Bennett and Red Ash seams. This shaft is being fitted with cages and machinery to work the Cooper seam. Two fans were erected, one on each shaft, and one is twelve and the other sixteen feet diameter, exhausting respectively 55,000 and 59,700 cubic feet of air per minute.

**Lehigh Valley Coal Company.**

The **Dorrance** shaft having been extended to the Baltimore seam a second opening was effected by a slope sunk from the Hillman to the latter on a grade of 30 degrees. This was 7x12 feet area and 400 feet long, all in rock.

**Plymouth Coal Company.**

At the Dodson colliery a new Guibal fan, 15 feet diameter, was erected to replace the old one. By running 70 revolutions it produces a ventilating pressure of one and two-tenths inches of water gauge, and 108,000 cubic feet of air per minute. The driving engine is 16x13 inches, connected directly to the fan.

**Hanover Coal Company.**

The Maffet shaft of this company was sunk from the Ross to the Red Ash seam, and is now at a depth of 385 feet below surface. This opens a new lift of good coal extending up to the level of the old Ross tunnel.

*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



property, and it is owned entirely by the Lehigh Valley Railroad Company.

Of the twelve collieries owned and operated by this company in the Wyoming Coal Field, only two are located in the Fourth district, viz: **Dorrance** and Franklin; both these collieries are located in Wilkes-Barre, Pa.

The production in 1894 was 305,261 tons and the shipment was 280,683. Days worked 151.97, and the number of employes was 931. Three were fatally and 16 seriously injured.

In the **Dorrance** colliery the Baltimore, Hillman, Bowkley and Abbott seams are being worked. The workings are effectively ventilated by two thirty-foot fans located one on each shaft. The roof is generally good, needing but little work in timbering. The workings across under the Susquehanna river are exceedingly dry and dusty. The greatest need for care is to prevent accumulations of fire damp, for a large quantity is unceasingly evolved, but in this they have hitherto been successful.

The openings of the Franklin colliery are two main slopes, one on the Baltimore seam, from which, by a tunnel through the upper rocks three of the upper seams are also mined. The other slope is sunk from the surface across the strata to the Red Ash seam on a pitch of about 30 degrees. The Red Ash is in two parts, and both are separately mined. Each slope has a separate system of ventilation produced by a fan located on the upcast of each mine. Another fan is soon to be constructed to ventilate the upper seams of the No. 1 slope. The workings of both slopes are in fair condition, the roof is generally good, except in some localities in the Red Ash seam, where careful timbering is required.

The officers in charge of the mining department are:

W. A. Lathrop, general superintendent.

I. R. Moister, division superintendent.

E. S. Mercur, division engineer.

Robert Shoemaker, outside district superintendent, **Dorrance** colliery.

Joseph J. Jones, inside district superintendent, **Dorrance** colliery.

Thomas Samuel, mine foreman, **Dorrance** colliery.

Frank Eicke, outside foreman, **Dorrance** colliery.

Thomas R. Thomas, general mine foreman, Franklin colliery.

William N. Thomas, mine foreman, Franklin colliery.

Charles Lynn, outside foreman, Franklin colliery.

Principal officers of the company:

E. P. Wilbur, president, Bethlehem, Pa.

Henry S. Drinker, general solicitor and assistant to president.

Charles Hartshorne, first vice president, Philadelphia.

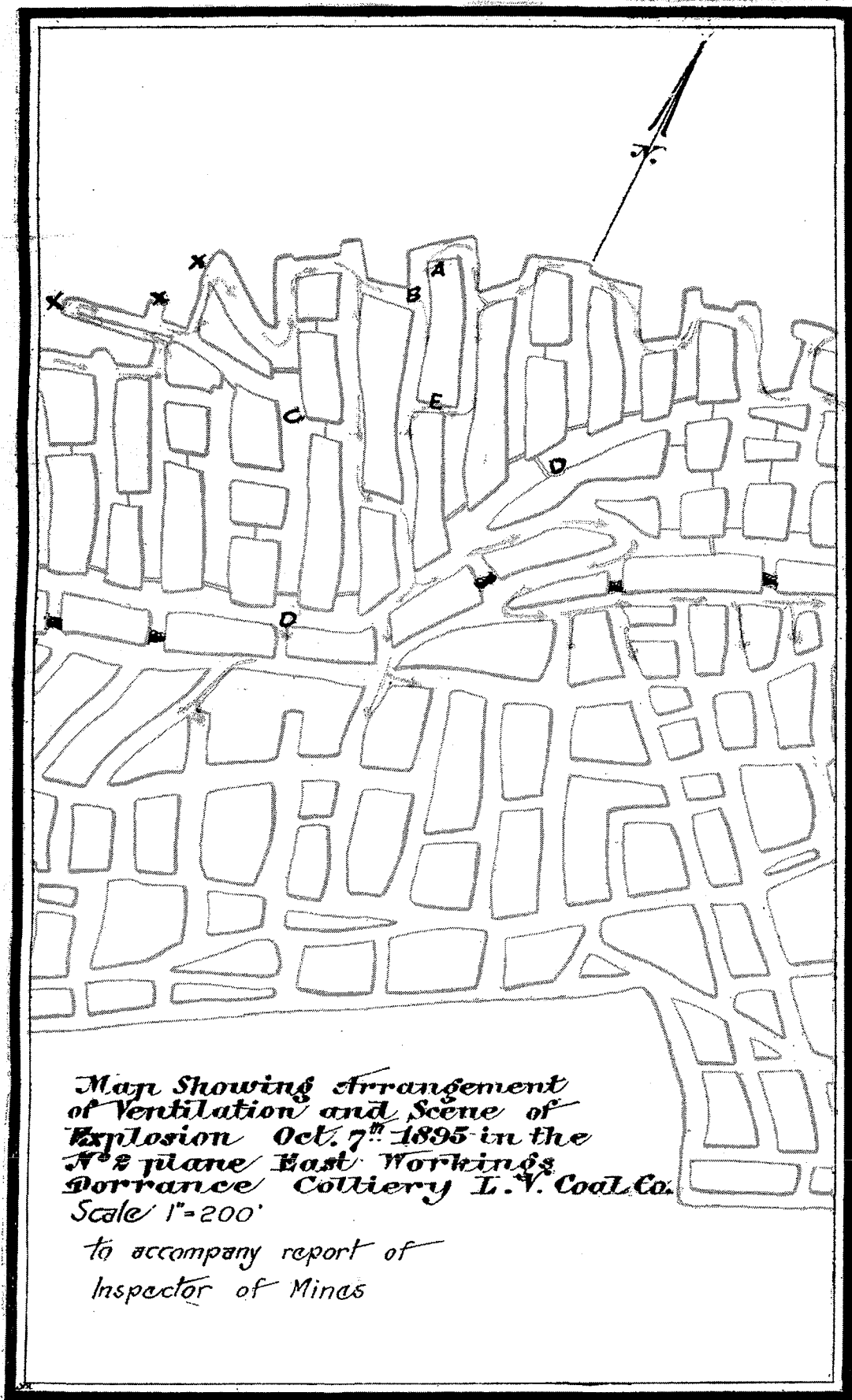
Of the accidents which occur on surface I am pleased to state that few only occur in the breakers. The machinery and stairs are at all places so well guarded by boxing and fencing that no person can be injured without climbing or crawling into places where no one is expected to go. Yet we find that some do it occasionally and one now and then is hurt in consequence. Where so many boys are employed they will play "tag" or "hide and seek" and will crawl into dangerous places and get hurt. This can be prevented only by effective discipline. A more rigid discipline would, I believe, prevent a number of the accidents of each year, but with the class of people who are now employed in and about the mines and who can neither speak nor understand the English language, it is almost impossible to enforce the rules and maintain obedience to them.

#### Disastrous Explosion at the **Dorrance** Colliery.

At about 4 o'clock Monday afternoon October 7, 1895, an explosion of fire-damp at the Dorrance colliery of the Lehigh Valley Coal Company, Wilkes-Barre, Pa., resulted in the death of seven young men, five of whom constituted a corps of mining engineers. One was a fire boss and the other was a miner. Reference to the accompanying map of that section of the mine will assist the reader to understand the conditions when the accident occurred. The names of the victims were Daniel J. Davies, fire boss; William Jones, mining engineer; William P. Cahill, Llewelyn Owens, Robert Miller and Robert Blanchard, assistant mining engineers and Michael Morris, miner. The engineers had been in another part of the mine making surveys. Daniel J. Davies an experienced fire boss was sent with them to see that all places were safe before they entered. During the afternoon they went into the section of the mine shown on the accompanying map. The two places turning to the left from breast C were working, all those to the right of this had been finished and abandoned, including breast marked C. They surveyed the three places marked x x x and started to go out, but stopped to examine their map at C and found that the cross cut A was not measured and put on the map. Miller and Blanchard were left at this point with the instruments while Jones, Cahill and Owens, led by Davies went across through headings at the faces, intending to measure the said cross cut A. All carried naked lights.

Davies safety lamp was found hanging on his belt when his body was found, which proves that it was not in use at the time.

Shortly after they left Miller and Blanchard a terrific explosion occurred which caused a perfect tornado that blew away all the air stoppings and doors through a wide extent of workings. All the workmen in that seam felt the concussion and it extinguished their



*Map Showing Arrangement  
of Ventilation and Scene of  
Explosion Oct. 7<sup>th</sup> 1895 in the  
No. 2 plane East Workings  
Dorrance Colliery L.V. Coal Co.  
Scale 1"=200'*

*to accompany report of  
Inspector of Mines*

lights. This naturally caused a panic and all made their way out in the dark through the hot dusty atmosphere as quickly as they could.

The men who were at the faces of the places marked x x x were not injured and one of them when groping his way out through breast C found both Miller and Blanchard severely burned, and led them out. Shortly after a rescuing party found the miner, Morris, at D with his clothing on fire and body severely burned. He died that night.

The afterdamp was so dense that the ventilation had to be partially restored, which took several hours before the bodies of the other four were found. They were finally discovered after some searching at the point marked B which evidently was the point where the gas was fired.

They were all within a few feet of each other and all had been instantly killed and as before stated, Davies safety lamp was hanging on his belt. The props were charred at D and at each breast to right for about two hundred feet. This shows that the flame had expanded to a length exceeding six hundred feet and through five or six breasts having a height of fourteen feet or more.

Miller lived until October 10 and Blanchard until October 19, and they were able to tell what they knew of the disaster, but they knew nothing as to the location of the gas nor as to how it was fired.

It is evident that it was fired at B by the fire boss and the three engineers, because it was at this point that their lifeless bodies were found, and the force of the explosion radiated from this place. This point was also the junction of two splits of air currents. They were traveling in the split coming with them from the west side, but the split from the east entered this breast B at two points through the heading A, which they wanted to measure and also through the heading E; both were open. The heading A was on the top bench of coal and the one at E was on the bottom bench. The air currents had been working in this way for several weeks and no one had known of any gas accumulating at A before, and the accumulation now was evidently an unexpected surprise to the fire boss or he would have examined the place with his safety lamp and discovered it. It is a very gaseous mine and is ventilated by two thirty-foot fans which produce strong currents of air. Gas could not have accumulated at this point unless the current of air had been deviated from its proper course or stopped entirely.

The fan which ventilates the workings of the Baltimore seam, where the explosion occurred was stopped for repairs on Sunday, the day previous for about four hours and it is supposed that the gas accumulated during that time at the cross cut A and at the face of the breasts at each side of it, in such a body that the air current on its

restoration failed to remove it and passed all through the cross-cut E, leaving the gas stand at the faces of the breasts. On Monday afternoon when the fire boss and his company reached the point B and started up towards A the gas fired from their naked lamps.

The explosive gas of mines being only one-half the weight of an equal volume of air is difficult to move when it accumulates in such situations as this, unless the ventilating pressure more than equals the difference of weight between the body of gas and an equal volume of air. To force a log of wood to sink into water a pressure must be applied equal to the difference in weight between the wood and its volume of water. It is precisely the same when it is necessary to force a body of light gas into air. A pressure equal to the difference of weight must be applied. In this case the situation was such that if the cross-cut A and the face of the two breasts were filled with gas it was as effective as if a stone wall was there in preventing the air current from passing through that heading, and the result was that all the air passed through the heading E, leaving the gas stand at the faces. The rise in the breasts was from six to eight degrees.

This was the theory presented to the writer by Mr. Lathrop, general superintendent and by Mr. Moister the superintendent, with which the writer fully agrees. After the explosion the door O was found to have been affected by a fall of roof but evidently the fall came after the explosion and could not have caused the accumulation of gas. The body of gas fired was greater than would have accumulated by leaving this door open from the time the fire boss passed in the morning.

#### Murder of a Man in the Franklin Colliery.

Andrew Yeisley, a Lithuanian miner, was found dead with the appearance of having been killed by a blast in the breast in which he worked on the Kidney seam, old slope Franklin Colliery, Lehigh Valley Coal Company at 6 p. m., Friday, June 14, 1895.

There were only three breasts working on the gangway and deceased was working the inner one. His boarder Anthony Zemitus was working the one next to him. Shortly before 6 o'clock the driver saw Yeisley on the gangway at his box preparing cartridge to blast. The driver went out leaving no one except the two men in that part of the mine.

Shortly after 6 o'clock Zemitus went back to the pumpmen and told them that a man was killed by a blast. The went back and into the breast and found Yeisley's body partially covered with coal with his clothing on fire.

The body was taken home and the undertaker found bullet holes and came to the conclusion that the man had been murdered. On

### Improvements by the Susquehanna Coal Company.

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

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

### The Kingston Coal Company.

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

### Lehigh Valley Coal Company.

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

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

### The Parrish Coal Company.

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

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

### New Breaker at Warrior Run Colliery.

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

effect on November 29, 1901, is provided with an emergency hospital in accordance with the law; the supplies and furnishings vary with the different companies, but the above list is a fair average of the materials provided. The majority of the companies have employed physicians to hold schools of instruction at which the foremen, fire-bosses and driver bosses have been taught how to stop the flow of blood, dress burns, set a broken bone, and give what aid they can before the arrival of a physician.

#### Improvements Made by the Lehigh Valley Coal Company During the Year 1901.

**Dorrance** Colliery.—A rock plane has been started, to be driven on an angle of eighteen degrees, from the Baltimore to the five foot seam; during the year this plane has been driven a distance of 357 feet. The plane is eight feet high and eighteen feet wide. A rock tunnel driven through the measures 372 feet long from the Hillman to the Abbott seam. The volume of gas given off in the West Hillman plane workings was so large, that during the first part of the year this portion of the mine was stopped, until the intake airway was enlarged. When this was completed, the quantity of air at the face, was increased from 55,000 cubic feet per minute to 75,000 cubic feet, which has enabled them to resume mining in that seam, although they use locked safety lamps exclusively as a precaution. Outside, two horizontal tubular boilers, six feet in diameter and eighteen feet long were put in, replacing six old cylinder boilers.

#### Improvements Made by the Alden Coal Company During the Year 1901.

Shaft No. 1.—Tunnel over synclinal from mill to mill seam, 300 feet long seven feet by fourteen feet. Airshaft as a second opening from Forge to Cooper seam 100 feet deep, size eight feet by ten feet. A slope driven on a pitch of twenty degrees from the surface in the Mill seam 297 feet deep, size eight feet by twelve feet.

Shaft No. 2.—Rock airshaft from the Rosy to the Red Ash seam, to be used as a second opening fifty feet deep, seven feet by eight feet. Outside, five Anthracite separators, or spiral slate pickers and a fifty light acetylene gas plant.

#### Annual Examination of Mine Foremen.

The examination of applicants for certificates of qualification for mine foremen and assistant mine foremen was held in this district on the 4th, 5th and 6th of June, 1901, at the City Hall, Wilkes-Barre.

The board of examiners were, G. M. Williams, Mine Inspector; Edward Mackin, superintendent; Frank Mills and Thomas D. Lloyd,

A second opening from the Five Foot to the Stanton seam, for the purpose of ventilation.

Wanamie No. 18.—Erection of ten double blocks of houses for the use of employes.

A return airway from the Red Ash to the Ross seam at No. 19 Slope, for the purpose of ventilation.

Maxwell No. 20.—Erection of a forced fan draft system in shaft boiler house.

Erection of new engine house, and installation of one pair of 24"x48" double drum friction engines for operating No. 6 Baltimore Slope and No. 7 Red Ash Slope.

#### Improvement by the Lehigh Valley Coal Company During 1902.

Dorrance Colliery.—An 18 degree rock plane, 375 feet in length, for haulage, has been driven from the Baltimore to the Five Foot seam. Also, a 30 degree rock plane, 225 feet long, for a second opening.

A slope has been extended in the Hillman 300 feet from the crown of the Cemetery anticlinal into the North basin.

A battery of six return tubular boilers of 150 horse power each. The boiler house has been equipped with duplicate feed pumps and forced draught fans.

The tower over the main hoisting shaft was rebuilt.

Franklin Colliery.—No. 8 Slope in top split of Red Ash seam was extended 310 feet, and a rope bore hole, 340 feet in length, completed from the surface to the head of the slope.

The bottom lift, Red Ash gangway, has been reopened for the extension of the unfinished tunnel to the Ross seam.

The head frame and fan at Red Ash second opening have been rebuilt.

A washery is under construction for the preparation of coal from the culm banks.

Conyngham.—No. 4 tunnel, 348 feet long, driven from Abbott to Snake Island seam.

No. 5 tunnel, 108 feet long, driven from Abbott to Snake Island seam.

Three-inch drainage bore hole, 314 feet deep, from Hillman sump to Baltimore seam, to drain water to shaft sump.

Baltimore No. 5.—An entirely new colliery plant, known as Baltimore No. 5, including a 2,000-ton breaker, was built during 1901, and began operations January 1, 1902. This plant prepares the coal from Baltimore tunnel and Baltimore No. 2 workings, which latter breaker was burned on January 26, 1901. The coal is transported overland to the breaker, on a surface railroad, also built



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

to determine safe working rock cover on the flats near the river. New concrete cribs have replaced the old wooden ones in both hoist and ventilating shafts. New and improved safety gates and stop blocks put on Baltimore shaft. New brick electric light house. New brick and concrete safety lamp house. New concrete pump house on river bank.

#### Franklin Colliery

No. 8 slope extended 320 feet to Brown pillar line. No. 8 tunnel extended 190 feet to Ross vein. No. 15 tunnel is being driven from Red Ash rock slope to Ross, 480 feet to date. Tunnel extended 150 feet in Baltimore slope district to Abbot vein. New tunnel from top to bottom split of Red Ash completed. A new slope started in Ross vein. A new inside slope begun in top split of Red Ash. The old Brown slope reopened. Work is progressing on installation of 300 additional H. P. return tubular boilers. New fan, blowing engine installed. New 14x20 engine set in place at Red Ash second outlet shaft. New corrugated iron powder house. New dam and corrugated iron pump house. Washery completed and working. Number of repairs and alterations made in breaker. Baltimore fan house rebuilt.

### SUSQUEHANNA COAL COMPANY

#### Colliery No. 5

Outside.—Jig house completed. New steel bridge over breaker tracks. New compressor house, and 2-20 $\frac{1}{2}$  and 36x20x36 Ingersoll-Sergeant duplex two stage compressors. One hundred new steel mine cars.

Inside.—Rock plane, Mills to George, unfinished.

#### Stearns

Inside.—No. 4 shaft tunnels and returns completed, rock turnout for empty cars unfinished. New plane in Ross unfinished.

#### Colliery No. 7

Outside.—New lamp house completed. New timber yard completed. Remodelling No. 7 breaker, unfinished.

Inside.—New plane in Cooper seam unfinished. Slope No. 14, Ross seam.

#### Colliery No. 6

Outside.—Two thousand five hundred H. P. B. & W. boiler plant completed, and old cylinder boilers at No. 6 shaft and No. 6 slope abandoned. New rolls and screens in breaker. New railroad from No. 7 shaft to breaker, about 1 $\frac{1}{2}$  miles, completed.

Inside.—New tunnel slope No. 6 to N. shaft No. 6, unfinished.

## LEHIGH VALLEY COAL COMPANY

**Dorrance** Colliery.—New inside stable for 54 mules completed in Baltimore vein. Stable is a model; every precaution taken against fire; lighted by electricity; Baltimore shaft extended 100 feet, will be continued to the Red Ash vein; No. 13 rock slope for second outlet Red Ash development, extended 460 feet; No. 6 rock slope driven 350 feet through Mill Creek anticlinal, will be continued to Bennett vein basin; No. 9 slope in Bennett vein sunk 1,080 feet; No. 10 slope in Bowkley vein sunk 210 feet; No. 12 slope in Hillman vein river warrant extended 900 feet; No. 7 tunnel, Bennett to Cooper vein, completed, 115 feet; No. 5 tunnel, Hillman to Snake Island, finished, 125 feet; No. 8 tunnel, Hillman to Five Foot, completed, 160 feet; No. 10 tunnel, second opening, completed 455 feet; No. 1 tunnel, Hillman to Bowkley, driven 165 feet and being continued to the Abbott vein; No. 13 tunnel, Hillman to Abbott, driving, 170 feet; new steam brake and steam reverse placed on Baltimore and Hillman shaft hoisting engines; a new Williams crusher installed and all refuse from breaker being ground up and silted in mines; brick house completed and 2 20-31x32-20x24 air compressors being installed; new electric light plant finished for light in breaker and other buildings, also inside stables, foot of shaft, pump houses, etc.; additional mechanical pickers in breaker, also 1 new slate conveyor; 75 additional mine cars.

Franklin Colliery.—No. 7 slope, Sump vein, extended 605 feet; No. 9 slope, Top split of Red Ash vein, sunk 615 feet; No. 10 slope, Ross vein, extended from counter to bottom lift, 1,100 feet; No. 11 slope, Sump vein into Franklin Overturn Basin, 300 feet; No. 15 tunnel from Abbott to Snake Island vein, finished, 120 feet; a new inside stable is being made for 36 mules in Sump vein; a new pump placed and water being pumped out of the old Baltimore fire district; a large sump made in Red Ash vein, two additional pumps placed with new column pipe to surface, preparations being made for central pump plant; work now being pushed developing the smaller and over-lying veins, also re-opening the caved Hillman vein district; the breaker has been over-hauled; new elevators; conveyor lines; mechanical pickers, etc., steam heat, fire protection lines; additional railroad trackage room provided; 100 new mine cars; both collieries have well equipped fire companies.

## DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Auchincloss Colliery—Inside.—Six rock tunnels have been driven connecting the different seams for the purpose of development and ventilation. No 2 slope, Ross vein has been graded for 335 feet on an average dip of 19 degrees. Ross vein has been graded for 335

## 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.

Prospect Colliery.—The electric transportation roads have been extended in the Red Ash Vein, and preparations are under way for the installation of further electrical equipment in haulage hoist and dumping in this colliery.

**Dorrance** Colliery.—Tunnels were started from the foot of the Baltimore shaft to tap the Red Ash Vein, also a tunnel at that point for the empty car and foot turnouts.

Tunnels Numbers 11 and 12 were completed from Hillman to the Bowkley.

Tunnels Numbers 15 and 17 completed from 5 foot vein to the Hillman Vein.

Tunnel Number 16 completed from Hillman to Abbott.

Tunnels Numbers 18 and 19 completed from Cooper to the Bennett through the Mill Creek anticlinal.

The tunnel from the foot of No. 6 Rock slope was finished to the Bennett Vein, and a second outlet tunnel through the Mill Creek anticlinal is being driven.

A new stable is being constructed in the Hillman Vein.

Silting has been extensively carried on at this colliery in the Hillman, Abbott and Bowkley Veins.

A new No. 20 sub-slope in the Baltimore has been started.

Numbers 14 and 16 sub-slopes have been continued in the Cooper Vein.

Number 15 sub-slope in the Bennett and No. 13 in the Red Ash have been continued.

Number 2 slope in the Baltimore Vein has been reopened and is being extended.

Number 12 slope in the Hillman River Warrant has been extended.

A new electrical hoist and transportation outfit is being installed.

A new brick concrete mine locomotive house built.

Dust house torn down and replaced with stack devices for killing dust.

A new frame carpenter and blacksmith shop completed.

New standard warehouse built.

Franklin Colliery.—Number 10 Rock slope surface to rope vein completed, giving an additional outlet for the Rock slope Red Ash-Ross district.

Number 21 Tunnel finished from sump vein to 5 foot vein.

Number 22 Tunnel finished from sump vein to Baltimore vein.

A new central pumping plant is under construction in the Red Ash vein, equipped with 28x12x36 compound duplex pump, with 14 inch column pipe bore hole, 12 inch steam hole and exhaust hole from the Red Ash to the surface.

A 14 inch drainage bore hole from the surface to the Ross vein has been made through which all the water from the upper lifts of the long slope district will be drained to the central pump plant in the Red Ash.

New steam lines are under construction for the above plant.

The following slopes were extended during the year:

Number 9 Slope Top Split of Red Ash.

Number 4 Bottom Split of Red Ash.

Number 11 Slope Sump Vein.

Number 7 Slope Sump Vein.

Number 8 Top Split of Red Ash.

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.

Henry, Outside.—Preparations to reclaim Enterprise culm bank on east of Plank Road. Series of surface test holes for Hillman vein rock cover.

Inside.—Second opening traveling way to surface for No. 8 Slope workings.

Rock return air course for Wyoming Lower Baltimore workings completed.

Tail rope engine plane No. 5 Slope, Wyoming Skidmore vein, started.

Concrete steel overcast, No. 15 plane, completed.

Considerable work done repairing and improving No. 2 Lift, No. 10 Slope.

**Dorrance**, Outside.—No. 4 air shaft 13 feet 10 inches x 25 feet 2 inches from surface to Baltimore completed. 28 x 7½ foot Dickson-Guibal fan, driven by 24 x 48 Allis-Chalmers, 4 valve Corliss engine, capacity 300,000 cubic feet per minute at 3 inches W. G. installed and operating.

35 x 12 foot Guibal fan house and drift completed; to ventilate the Hillman vein district when change from present location is completed.

No. 3 air shaft, wooden cribbing removed and lined with concrete to vein, and provided with iron ladders for second opening traveling way.

Inside.—New motor road in Hillman vein completed.

Rock plain gangways in Abbott vein reopened.

Silting operations in Hillman West Plain district.

Engines installed on No. 23 Red Ash Slope.

No. 6 Extension Slope reopened.

No. 21 Slope, Hillman vein, connected with No. 17 Tunnel.

Hillman vein new stable extended.

Concrete arch at Hillman vein landing started.

New brick hospital in Red Ash vein.

Franklin, Outside.—Extensive repairs to breaker and breaker machinery.

Washery dismantled.

Series of surface test holes for Snake Island rock cover.

Inside.—New plane in Abbott vein, No. 2 lift, completed.

New manway for No. 7 Slope, Sump vein, completed.

New manway for No. 2 Slope, Sump vein, completed from No. 2 lift to surface.

New manway to No. 9 Slope, Top Red Ash, completed.

Debris from Bowkley surface cave cleaned.

Water in Baltimore vein lowered to No. 2 level.

Baltimore No. 2 West lift reopened, and engine installed on No. 14 Slope. No. 2 Slope Sump vein extended from No. 1 to No. 2 level.

No. 15 Slope in Bowkley started.

Drift level Baltimore West reopened and gangways extended west.

Drift level Skidmore and Ross veins gangways cleaned and reopened.

No. 22 Tunnel Forty Fort vein gangways cleaned and reopened.

Hillman No. 2 west gangway cleaned and reopened. No. 10 Skidmore Slope extended below No. 8 Tunnel level.

Pump installed and water lowered in No. 9 Slope.

No. 8 Slope, Red Ash (Top) extended through rock to Bottom Red Ash on No. 3 Slope level.

plan. An 8-inch bore hole was completed from the lower Baltimore to the Red Ash vein. A concrete-steel air bridge was built in the Five Foot vein east of No. 14 slope.

### *Dorrance Colliery*

Outside: A new brick garage was completed. New foundations were constructed under the breaker plane and a B. G. Carpenter and Co. dust collector was installed on the east side of the breaker. The 35 x 12 foot Guibal fan was moved from No. 1 shaft to No. 2 shaft, for the purpose of ventilating the upper veins. No. 1 Shaft was concreted to the Rock on north side.

Inside: The concrete and steel roof supports at the Hillman landing were continued and considerable loose rock and old timber were removed. Silting operations were continued in the Hillman West Plane district and diamond drill bore holes to prove the Bennett vein north of the fault were completed. Electric motor haulage was installed in the Red Ash tunnel level district. No. 24 slope in the Red Ash vein was started and No. 13 slope extended. A mule stable was constructed in the Red Ash vein. New engine planes were started in the Hillman, Bowkley and Abbott veins on the east side. Preparations were made to resilt the Baltimore and overlying veins on the east side of the shaft.

Extensive developments were made in the No. 21 slope district in the Hillman vein.

### *Franklin Colliery*

Outside: Extensive repairs were made to the breaker. A series of test holes was made to prove upper veins in the Gin and Brown slope basins. The Bowkley vein upcast shaft was concrete lined.

Inside: A new rock manway was completed from the Bottom Red Ash to the Top Red Ash, near the foot of Rock slope, and No. 25 tunnel from the Top to the Bottom Red Ash vein was completed.

No. 16 Slope in drift, Skidmore vein, was started. The Bottom Five Foot gangways on No. 2 level were cleaned of mud and debris from the Bowkley cave. No. 1 tunnel was cleaned to the Hillman vein. A new hospital has been completed in the drift workings. Silting operations were continued in the Rock slope and Baltimore vein districts. A second opening is being driven for the Snake Island vein to the Hillman level, and a second opening to the drift Skidmore was completed. The pumping plant on the Hillman level was discontinued and the water is now handled directly from the No. 2 level. Preparations were made for reopening Brown slope, to extend No. 21 tunnel to the Hillman vein, and to drive No. 27 tunnel from the Bottom Five Foot to the Hillman vein, and the head of No. 6 Plane level, and also to drive No. 26 tunnel from the Top Red Ash to the Skidmore vein on No. 25 tunnel level.

### *Warrior Run Colliery*

A series of test holes to prove the overlying veins was completed.

A new slope from the surface to the Hillman vein was sunk. Work was started on dismantling the old breaker. Colliery buildings were repainted and the silting of the burning rock bank continued.



**Dorrance** Colliery.—Outside: The dust collector at the breaker was remodeled. A new addition to the compressor house for the dynamo was built and a new drum on the Red Ash shaft engine installed. A series of test holes for proving the rock cover in the river bed was drilled.

In the breaker a complete fire alarm system was installed.

Inside: Concrete steel roof supports were continued at the Hillman Foot of Shaft, and grading the head of No. 24 slope in the Red Ash vein was practically completed. A new electric hoist and "I" beam roof supports were installed. Electric haulage was installed in the Hillman vein No. 21 slope district, using one motor. In the Red Ash vein the electric haulage was extended and a new motor installed. Three new planes were graded in the Upper veins on the east side of the shaft and two electric hoists were installed.

Diamond drill proving of the fault in No. 6 Extension slope was continued. A new tunnel to shorten haulage in the Bennett and Cooper veins was started and Nos. 13 and 23 slopes in the Red Ash vein were extended.

Franklin Colliery.—Outside: Extensive improvement to the breaker were made, practically rebuilding same. A new engine house was built for No. 10 slope. Diamond drill provings for the Five Foot sump veins in the Gin and Brown Slope basins were carried on. A second opening shaft to the Snake Island vein was sunk and concreted.

Preparations were made to silt the Bowkley vein, and about 1,000 feet of wooden silt line laid. A complete fire alarm system was installed in breaker, and to the equipment was added 100 new standard steel under-frame cars.

Inside: In the Bottom Ash vein a new slant slope was started to develop the northern section of the property. A new slope in the Skidmore vein was also driven in No. 4 tunnel workings. Diamond drill provings for the Ross vein in No. 4 tunnel were carried on. Silting was continued in the rock slope district. A new manway for No. 9 slope in the Top Red Ash vein was completed. In these workings No. 26 tunnel with a length of 230 and 290 feet respectively was driven from the Bottom Five Foot to the Hillman and Bowkley veins in the Long Slope workings. Work on the new concrete barn in the Rock Slope was started. It is the intention to install on No. 25 tunnel level a new 12 by 32 by 36 Scranton pump.

Warrior Run Colliery.—Inside: A new second opening plane from "B" to "C" veins in the robbing section was started, and also the reopening of lifts off No. 1 slope. Good progress was made pumping water from No. 2 slope, which has been flooded on account of fire.

Outside: A new slope was sunk from the surface to the Hillman vein and 100 feet of concrete roof supports installed. A trestle, dump and siding from Lehigh Valley Railroad were constructed and an engine with 1400 feet of 6 foot steam line installed.

#### WILKES-BARRE ANTHRACITE COAL COMPANY

Hillman Vein Colliery.—The inside slope was extended 264 feet and a 325 horse power electrical hoist installed.

when finished bore holes will be drilled from the Henry Skidmore to the Maltby Six Foot. At the New Skidmore landing in the Red Ash shaft, which is the point at which the Henry and Wyoming coal is concentrated, side walls with roof of reinforced concrete and "I" beams were constructed.

Outside.—Two Welch overwinding devices were installed in the Red Ash engine house. Plans were completed for the installation of an electric plant to light the inside and outside buildings. New conical drums with clutch device were placed on the Red Ash engines, in connection with the new haulage concentration. The old slope in the Hillman vein in the yard near Wyoming shaft was reopened to serve as an airway to the proposed new 20-foot fan to be installed; this will replace the two Hillman fans now outside the colliery yard. Test holes were put down in the vicinity of Anthracite Park, **Dorrance-ton**, to prove the rock cover for the Hillman and Bowkley veins. Test holes were also put down to prove the rock cover over the Five Foot vein near No. 8 outside slope and Henry shaft. A new feed water heater was installed. The Wyoming shaft engines were removed to Mineral Spring and a small pair temporarily installed, which will be removed on the completion of the Henry Baltimore barn, and the Wyoming shaft will be entirely abandoned.

#### Warrior Run:

Inside.—A second opening was driven from the first lift west, Hillman slope, to the surface. Tunnel was started in the basin in the Hillman vein to the Mills vein. The second opening Rock plane, mentioned in last year's report, 130 feet in length, was driven from the B to C vein in the robbing territory. A slant slope 350 feet long was driven off No. 2 slope in the B vein to mine the coal south of the fault. Work was started on the reconstruction of the inside mule barns to make them fireproof.

Outside.—Two air shafts 10 by 10 by 35 feet deep, one on each side of the Hillman slope, were sunk from the surface to the Hillman vein and concreted. A concrete air duct was constructed over the slope connecting these two shafts, and a 14-foot Guibal fan installed, the entire construction being of concrete. A concrete powder house was built. A new road was graded along the Lehigh Valley Railroad for hauling timber by team from the colliery yard to the Hillman slope.

#### **Dorrance** Colliery:

Inside.—All wood was removed from the engine house on the head of No. 7 Cooper slope and concrete retaining walls put up with roof of reinforced concrete and "I" beams. Diamond drill holes, mentioned in last year's report, from the face of the Bennett workings No. 6 extension slope, through the fault to prove the Cooper and Bennett veins on the other side, were completed. No. 21 tunnel, to shorten haulage in the Bennett and Cooper veins, mentioned in last year's report, was completed, total length 816 feet in the solid and 238 feet of bottom rock grading. The construction of side walls and concrete roof was continued at the head of No. 24 slope, Red Ash vein. The mule barns in the Hillman vein shaft, Baltimore vein, and Rock slope, Baltimore vein, were dismantled and are being reconstructed to make them fireproof. A new barn of fireproof construction is being built in the Red Ash vein. Electric haulage was extended in the Hillman, **Baltimore** and Red Ash veins, and several new motors installed. A

new Goyne pump was installed on No. 12 slope, Hillman vein, to handle silt water. A tunnel was started from the Cooper to the Lance vein, the Lance vein coal to be transported by motor to the new No. 21 tunnel mentioned above.

Outside.—Both silt holes near the breaker were reamed and made larger and terra cotta pipe inserted and cemented. Two Welch overwinding devices were installed, one on the Red Ash and one on the Hillman hoisting engines. Extensive repairs were made in the breaker and the breaker plane renewed.

#### Franklin Colliery:

Inside.—No. 27 tunnel, 222 feet long, was driven from the Bottom Five Foot Northward, cutting the Top Five Foot and Hillman veins. No. 28 tunnel, 264 feet long, was driven from the Sump vein to the Bottom of Five Foot in the Gin slope basin. Rock plane, 107 feet long, was driven as a second opening to No. 28 tunnel. No. 29 tunnel, 165 feet long, was driven from the Top Red Ash to Ross vein on No. 29 tunnel level. The 12x32x36 inch Scranton pump mentioned in last year's report was installed on No. 25 tunnel level, and a concrete pump-house is about two-thirds completed. A 2-inch drainage hole was drilled from Bottom to Top Red Ash to tap water in No. 8 slope. A 3-inch horizontal bore hole was drilled from the Skidmore vein on No. 26 tunnel level to the Baltimore vein, a distance of 340 feet, to tap water in the Long slope. The Baltimore vein at the foot of the Brown slope was re-opened to No. 5 tunnel, the tunnel cleaned and the roads laid to the Red Ash Vein. A manway for No. 10 slope was completed from the Skidmore vein to the surface. Work on the new concrete barn in the Rock slope was carried on and is nearly completed.

Outside.—A new pair of engines were installed on the Brown slope and a brick engine house erected. Old feed water heaters were taken out and a 2,000 H. P. Cochrane heater installed. A new shifting shanty was built. The Sump vein fan was dismantled and installed at the Warrior Run slope. Repairs to the dry side of breaker were completed and the old rolls replaced with new compound rolls. A new 40-foot track scale with new scale house was built and considerable grading done for the proposed rearranging of loaded car tracks.

A 10-inch rope bore hole was drilled from the surface to the head of No. 9 slope. The 16x24-inch geared engines formerly at Coal Brook were installed on the surface and the 12x15-inch engines on the inside removed. Bore holes were put down from the surface to prove the Sump vein in the Brown slope district. The old boiler drain near the Long slope engine house was removed and a concrete arched culvert constructed and the yard considerably graded and improved in that vicinity. Concrete retaining wall at the foot of breaker plane was constructed. A new roof was placed over the breaker plane..

#### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held on April 4 and 5, in the Y. M. C. A. Building, Wilkes-Barre. The Board of Examiners was composed of Thomas H. Price, Mine Inspector; Morgan R. Morgans, Superintendent; and William Chappell and Patrick McGrane, Miners.

Outside.—A concrete fan house was built in which a 20-foot fan was installed to ventilate the Hillman and Five Foot veins, releasing two old 15 foot fans. A concrete crusher house and conduit to take ashes from the boiler house to two 10 inch bore holes from the surface to Lower Baltimore vein were constructed. An addition to the outside barn, to quarter an additional number of mules, was also completed.

Warrior Run.—Inside: No. 8 tunnel was driven from the C to the D vein a distance of 210 feet. No. 22 tunnel was driven from the Hillman to the Mills vein, a distance of 210 feet to develop a virgin area. No. 5 rock plane on 30 degrees was driven a distance of 105 feet from the Hillman to the Mills vein to serve as a second opening. Built pump house of fireproof material at the foot of the old slope in the B vein.

Outside.—A concrete fan-house was built, in which was installed a 16-foot fan to replace two fans that were in poor condition, one of which was destroyed by fire. A concrete powder house was also constructed.

**Dorrance** Colliery.—Inside: The Hillman, Baltimore, Red Ash and Rock slope fireproof barns were completed. Two electric motors were placed in the Cooper vein, No. 21 tunnel section, and 2 in the Red Ash vein, No. 24 slope section. A 4-inch hole was drilled from the Hillman to Cooper vein 384 feet deep, and a 4-inch hole was drilled from the Cooper to the Red Ash vein 265 feet deep, to carry electric cables. A 4-inch drainage hole, 62 feet deep, was drilled from the Bowkley to the Hillman vein, to release the pump in the Bowkley vein. A 10-inch hole was drilled from the surface to the Baltimore vein for silting purposes, depth 605 feet. No. 19 rock plane was driven at foot of No. 6 extension slope from Bennett to Bennett vein, through a fault a distance of 90 feet. New guides were placed in the Hillman shaft from the surface to the Hillman vein, and also in the Red Ash shaft from the surface to the Baltimore vein. The construction of a pump room in the Baltimore vein and also in the Hillman vein was started, for the installation of two 1,500-gallon capacity pumps to take care of the large silting operations being carried on.

Outside.—The breaker was practically rebuilt, concrete retaining walls being placed at the foot of the breaker plane to replace wooden posts.

Franklin Colliery.—Inside: No. 18 rock slope was driven from the Brown slope in the Baltimore vein to the Sump vein, a distance of 243 feet. The fireproofing of the rock slope barn was completed. A 4-inch drainage hole was drilled from the Skidmore to the Baltimore vein, a distance of 292 feet, to unwater a large territory.

Outside.—The concrete foundation for the new breaker was completed and a shaft 8 feet square was sunk a depth of 60 feet from the surface to the old workings in the Baltimore vein, with a view of silting the openings under the breaker foundations. Entrance of the rock slope was concreted. Built engine house for No. 9 slope and installed therein a pair of 20 by 30 engines.

#### DELAWARE AND HUDSON COMPANY

Baltimore No. 5 Colliery.—Rock plane air return, Red Ash to Red Ash Top Split in Conyngham shaft, 7 feet by 12 feet by 120 feet, 12 degree pitch.

Hollenback No. 2 Colliery.—Inside: Completed tunnel Stanton to Stanton; Rock plane airway Kidney to Abbott; Nos. 33 and 34 tunnels Stanton to Stanton; No. 35 tunnel top to bottom Red Ash; tunnel, bottom to top, Red Ash, 3rd east, No. 1 plane; No. 36 tunnel, bottom to top, Red Ash and No. 37 tunnel, bottom to top, Red Ash.

Outside: Completed wash house.

Sugar Notch No. 9 Colliery.—Completed No. 24 tunnel Baltimore to Five Foot; Rock plane airway Kidney to surface; No. 28 tunnel Hillman to Hillman; No. 29 tunnel Twin to Ross and installed 10 by 36-inch compound pump on shaft level.

Outside: Completed wash house.

#### LEHIGH VALLEY COAL COMPANY

Henry Colliery.—In the Wyoming Five Foot slope a tunnel 145 feet long was driven through a fault to the Five Foot vein. The manway in this vein was also extended to the bottom of the slope. A concrete barn to accommodate 30 mules was constructed in the Hillman vein. In the Henry Five Foot vein a new concrete hospital and a fire boss station were erected. A manway from the second life west to the head of No. 14 slope in the Five Foot vein was started. A concrete waiting room was built in the Skidmore Landing in the tender shaft to accommodate the men waiting for the cage. A tunnel 675 feet long was driven from the Baltimore vein from which one 3-inch and two 6-inch holes were drilled to tap the water at the Maltby colliery. A new manway parallel to No. 28 slope in the Red Ash vein was driven.

Outside: The old boiler house was converted into a locomotive house. A new engine house was built for the Wyoming Five Foot slope and the engines from the Prospect-Hillman slope were transferred to this house. A new outside hospital was also erected. A 20-inch terra cotta line was installed to take care of the discharge of the Henry pumps and also the surface water, conveying it to a ditch at the Port Bowkley station. A 28 by 17½ by 20 by 30-inch Norwalk compressor was added to the power plant. Drilling operations for determination of rock cover were carried on in the Susquehanna river. A manway was driven from the surface to the Five Foot vein, and the Henry Shaft was abandoned for hoisting. The head frame at the old Wyoming shaft was torn down and a concrete wall placed around the shaft. The landing at the Red Ash Tender shaft was raised and the yard in the vicinity was filled in and the tracks rearranged.

**Dorrance** Colliery.—Fireproof hospitals were built in the Hillman and Red Ash veins. A concrete fire boss station was also built in the Hillman vein. Three concrete overcasts were started in the Red Ash vein, two in No. 24 slope district and one in No. 23 slope district. Completed reinforced concrete pump rooms in the Hillman and Baltimore veins and installed two 1,500-gallon pumps. A 15-degree rock plane 45 feet long was driven through a fault from the Cooper to Cooper vein. Second opening on 30 degrees was also driven. A tunnel from the Cooper to the Bennett vein was started. A small pump was placed at the foot of No. 24 slope, Red Ash vein. Removed two 16 by 20-inch engines on No. 20 slope, Baltimore vein.

Outside: An extension to the River pump house was made and a larger pump installed. The loading of refuse into cars was discon-

Maxwell No. 20 Colliery.—Completed No. 29 tunnel, Hillman to Kidney; tunnel, Hillman to Hillman, 2nd South, No. 10 slope; tunnel Red Ash to Red Ash, No. 21 tunnel west; tunnel, Five Foot to Baltimore, No. 27 tunnel east; tunnel, Hillman to Hillman, 1st South, No. 10 slope; two tunnels, Bottom to Top Red Ash, No. 20 tunnel east. Remodeled the Red Ash shaft level barn and built a new barn in No. 5 slope.

Hollenback No. 2 Colliery.—Completed No. 38 tunnel, Top Red Ash to Ross. Installed 16 inch by 8 inch by 18 inch pump in No. 2 slope extension. Outside: Installed an air compressor.

Sugar Notch No. 9 Colliery.—Completed Nos. 27 and 30 tunnels, Bottom to Top Red Ash. Outside: Remodeled the breaker.

#### LEHIGH VALLEY COAL COMPANY

**Dorrance** Colliery.—No 23 tunnel, 200 feet long, was driven from the Cooper to the Bennet vein through the fault. No. 24 tunnel from the Cooper to the Lance vein was started and driven about 20 feet. Three concrete overcasts in No. 24 slope district, Red Ash vein, were completed. A new Jeanesville pump in the Baltimore vein was placed in operation. An engine was installed at head of No. 21 plane. The engine at the head of No. 21 slope, Hillman vein, was relocated and a fireproof room is being constructed. An engine was installed at the head of No. 25 slope, Red Ash vein, and a fireproof engine room was constructed. The Red Ash barn was extended by the addition of five concrete stalls. The motor from West plane was transferred to the head of the Five Foot plane.

Outside: A new steel fuel line is being constructed from the breaker to the boiler house. Work has been started on the installation of an additional 300 H. P. boiler plant. A concrete driveway was laid through the colliery yard. A powder house was constructed of metal lath and plastered on the inside as also on the outside. A concrete and terra cotta tile office was built. A new crusher, elevator and engine and fireproof engine house were installed on the ash line from the boiler house to the bore hole. Concrete retaining walls were built along the tail tracks. A fireproof engine house was erected over the conveyor engine under breaker. The shaft tower was braced and concrete pillars placed under the columns.

Henry Colliery.—Inside: No. 74 tunnel, from the Hillman to the Bowkley driven 370 feet. A new concrete hospital is in course of construction. A concrete roof was placed over pumpway in Red Ash vein. Completed manway to No. 28 slope. Started slope in Red Ash vein west to the shaft.

Outside: Mine tracks were regraded from hoisting shaft to colliery fence and a concrete retaining wall built alongside of the tracks. A new brick blacksmith shop was erected. The Henry Five Foot, Baltimore and Wyoming Baltimore fan houses were made fireproof. The reservoir was fenced in. A new road was laid through colliery yard. Feed water regulators and Watts pump governors were installed in the boiler house. A 10-inch bore hole was drilled from the surface to the Five Foot vein and the old culm bank is being flushed into the workings.

Prospect Colliery.—Inside: Installed a Scranton pump in Hillman vein. All refuse from the breaker and boilers is now silted into the mine workings. An 8-inch bore hole was drilled from the Abbott

Ash to Ross; rock plane, Hillman to No. 17 tunnel; tunnel, Abbott to Abbott, 1st East; No. 22 tunnel, Top to Bottom Red Ash; tunnel, Ross to Top Red Ash, and No. 23 tunnel, Abbott to Kidney vein. Extended No. 17 tunnel to Kidney. Drove 10-inch bore hole to the Baltimore vein.

Sugar Notch No. 9 Colliery.—Completed No. 31 tunnel. Twin to Hillman, and a tunnel from Station to Five Foot vein.

Maxwell No. 20 Colliery.—Completed a tunnel from Red Ash to Red Ash, and No. 31 tunnel, Red Ash to Ross vein.

Empire Washery.—Installed pea and chestnut spirals.

#### LEHIGH VALLEY COAL COMPANY

**Dorrance** Colliery.—Inside: Two electric motors were placed in service in the Lance, Cooper and Bennett veins. A 4-inch drainage bore-hole was drilled from the Baltimore to the Red Ash to drain silt water. No. 26 tunnel was driven from the Bowkley to Abbott vein, 210 feet long. No. 27 tunnel was driven from No. 21 tunnel into Lance vein. No. 24 slope, in the Red Ash vein, was graded and tunnel commenced through the anticlinal at the foot of the slope, in order to facilitate haulage. Completed No. 24 haulage, Cooper to Lance vein.

Outside: Installed an additional 300 horse power boiler in boiler plant. A spray system was placed in breaker, and a pump installed, and pump line laid from pump to breaker, and pump house erected near reservoir. The construction of a steel fuel conveyor was continued. A fence was built around tracks, and bridge constructed over tracks near head of shaft for traveling way and safety.

Prospect Colliery.—Electric cables in shaft were renewed. Considerable grading was done at the head of Nos. 26 and 29 slopes in the Skidmore vein. A 15-degree rock slope, 80 feet long, was sunk through fault from Lower Baltimore to Upper Baltimore vein, for a return airway. Two bore holes were drilled from the Five Foot vein to drain water from Prospect Hillman slope workings to the Oakwood pump. Edison electric safety lamps were purchased for use in the Red Ash vein. Concrete and steel timbering at foot of Red Ash shaft continued.

Outside: Steam lines were recovered. The fuel line from breaker to boiler house was rebuilt. A new roof was placed on the boiler house. The supply yard was rearranged. Steel bents were put under main conveyor from the Prospect shaft to the head of the breaker. A condenser was placed in the river pump-house. The old boiler house at Oakwood shaft was remodeled for a washhouse and lamphouse.

Henry Colliery.—No. 74 tunnel from the Hillman to the Bowkley vein was completed, and a 30-degree rock plane 152 feet long was driven for a second opening. A 45-degree rock plane was driven from the Five Foot to the Hillman vein, the Wyoming Five Foot slope, for a return airway, and to improve the ventilating conditions. The concrete hospital at the head of No. 11 slope was completed. A concrete roof was constructed over the barn in the Red Ash vein, west of the shaft. A 10-degree rock plane, from the Five Foot to the Hillman vein, was started. An air shaft was sunk and concreted to the Hillman vein, Prospect slope, for an intake. Considerable rock grading was done on No. 39 slope in the Skidmore vein, to improve haulage conditions. The Henry shaft was abandoned.

## 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

**Dorrance**, Prospect and Henry 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, drainage and roads, fair. Condition as to safety, good.

## IMPROVEMENTS

## LEHIGH VALLEY COAL COMPANY

**Dorrance** Colliery.—Completed tunnel No. 24 in the Red Ash vein and installed an electric motor for haulage on this level. No. 28 tunnel from Baltimore to Five Foot vein was started.

Outside: Completed a new steel conveyor carried on steel bents to the boiler house.

Prospect Colliery.—A 4-inch steam line was laid from the new steam bore hole to No. 5 slope engine in the Upper Baltimore, previously operated by air.

Telephone connections were extended to the head of No. 5 slope, to the foot and head of No. 4 Rock plane, and also to No. 26 slope in Skidmore vein.

A 4-inch drainage bore hole, on an 18 degree pitch, was drilled from the face of No. 9 tunnel to Midvale-Hillman vein, to assist in unwatering this mine, which was flooded by the cave under Mill Creek, December 19, 1915. Installed a Goyne pump, 12 by 18 by 18 inches, at the foot of Oakwood shaft, to pump this water to the surface, and a concrete pump-house was built for the same.

Outside: Steel bents were erected under conveyor lines. New cribbing was inserted in Prospect shaft from the surface to the rock. Renewed 700 feet of 8-inch pipe in the water lines.

An 18-inch bore hole was sunk from the surface to the Skidmore vein to handle water. A 12-inch bore hole was put down from the surface to the Upper Baltimore vein to carry steam to the engine at the head of No. 5 slope, and a 10-inch bore hole was started from the surface to this engine to be used for exhaust steam.



## CONDITION OF COLLIERIES

### LEHIGH AND WILKES-BARRE COAL COMPANY

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

### LEHIGH VALLEY COAL COMPANY

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

### RED ASH COAL COMPANY

Red Ash Colliery.—Ventilation, drainage and condition as to safety, good.

### WILKES-BARRE ANTHRACITE COAL COMPANY

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

## IMPROVEMENTS

### LEHIGH AND WILKES-BARRE COAL COMPANY

Hollenback No. 2 Colliery.—Completed rock plane airway from Hillman to Kidney veins.

Outside. Installed one 250 H.P. electric hoist at No. 5 slope; one 500 K. W. turbo generating plant. Completed electric transmission line, bore hole, etc., from Hollenback No. 2 colliery to Stanton No. 7 colliery.

Stanton No. 7 Colliery.—Completed No. 25 tunnel, Skidmore to Skidmore vein; No. 28 tunnel, Stanton to Stanton vein; No. 11 tunnel, extension to Bottom Red Ash; No. 34 tunnel, Bottom to Top Red Ash (Empire) and No. 35 tunnel, Top Red Ash to Ross, Empire section.

Outside. Installed a 500 K. W. turbo generating plant.

### LEHIGH VALLEY COAL COMPANY

**Dorrance** Colliery.—Completed No. 28 tunnel, Baltimore to Lance and Five Foot veins; No. 29 tunnel and second opening from Hillman to Bowkley vein; extension of West Hillman plane; 4 inch bore hole from Hillman to the Five Foot vein; 6 inch bore hole from No. 21 slope basin in the Hillman vein to the Five Foot vein, and a new foreman's office of concrete at foot of the Red Ash shaft. Started No. 28 slope for development purposes.

Installed an Exter engine on No. 27 slope and an 8 ton gathering motor was put into service at the foot of No. 24 slope in the Red Ash vein.

Outside. A fire proof engine house was constructed near the pump house for hoisting on the Hillman west plane. An 8 inch rope hole for this purpose was drilled from the surface to the Hillman vein.

Installed a 175 K. W. 250 volt engine and generator for emergency purposes and three additional fire hydrants in the vicinity of the breaker. Diamond drilling was conducted on the river flats for proving the rock cover over the upper veins.

## 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