

slip was discovered about 5½ feet above the roof of the entry. All the holes for this blast appeared to stop at this smooth slip and were drilled at such angles as to make their depths about seven feet. One hole was found that had failed to explode, leaving thirteen that had exploded at one time, causing the loss of life as above stated.

We found that considerable force had been developed in the immediate vicinity of the blast, and also along the entries leading therefrom. Considerable fine dust was found in this part of the mine, and we have every reason to believe that a portion of the very fine dust was consumed by the flame from the blast, but we failed to find sufficient evidence to warrant us in giving an opinion that coal dust played a prominent part in this explosion. However, after a careful examination of the place where it occurred, and from all the facts learned in connection therewith, we are agreed in the opinion that the said Michael Gibson, Arthur Custer, William Gibson, Steve Nemis, Joseph Kowatz, Metro Katopitz and Paul Myernak came to their death by an overcharged blast of dynamite, charged and fired by or in the presence of Michael Gibson, the Rock Foreman in Eureka No. 37 Upper Mine.

And further, that in our opinion the said Michael Gibson failed to use good judgment in the amount of explosive used and also in the number of holes included in the one blast, fourteen being the number, thirteen of which exploded. Either of these numbers of holes was entirely too many to be fired at the same time and place in this or any other mine.

C. B. ROSS,  
Inspector of Second Bituminous District,  
D. R. BLOWER,  
Inspector of Sixth Bituminous District,  
JOSEPH WILLIAMS,  
Inspector of Tenth Bituminous District."

#### Verdict of Coroner's Jury

"Michael Gibson, Arthur Custer, William Gibson, Steve Nemis, Joseph Kowatz, Metro Katopitz and Paul Myernak came to their death from an explosion in No. 37 mine of the Berwind-White Coal Mining Company, on the 9th of April, 1909, said explosion being caused by an overcharge or blast of dynamite while blowing rock at fourth right off No. 4 right heading, the work being under the supervision of Michael Gibson.

Signed:

Selah Linton, Ralph Caldwell, Rev. D. S. Hafer, James Murphy,  
Michael Conroy, and S. C. Prosser."

#### **THE EXPLOSION AT LACKAWANNA NO. 4 MINE**

On the 23rd of June 21 persons lost their lives in a terrific explosion that occurred at the **Lackawanna No. 4 mine of the Lackawanna Coal and Coke Company, at Wehrum**. The accident was totally unexpected, as the Department had never been apprised of the existence

of explosive gas in this mine. The Inspector of the district could not at the time give any definite statement as to the number of persons killed or entombed. The Inspectors of the Second, Fourth, Fifth, Sixth, Ninth, Eleventh, Fifteenth, Twentieth and Twenty-first Districts were at once instructed to accompany him to the scene of the disaster to assist in the work of rescuing the living and recovering the bodies of the dead. They were also directed to make a thorough inspection of the mine to locate, if possible, the initial point of the explosion and ascertain its cause, and to place the responsibility on the person or persons who had been guilty of neglect or carelessness. They were also notified to attend in a body the inquest held at Wehrum, July 15 and 16.

The report of the Inspectors in relation to this explosion is a very convincing argument in support of the theory that hardly a coal mine in this State is safe to work in when black powder or dynamite is used, especially when used by ignorant men who know nothing of the dangers lurking in the coal dust of the mine and care nothing about their own safety or the safety of the other employes.

To meet the conditions, as they are found in mines like the Lackawanna No. 4, the mine law should be amended so as to give the Inspectors and the Department full authority to demand that the people in charge of dusty mines shall use all the known precautions and observe strictly the same rules required to be followed in gaseous and dusty mines.

In the proposed law that failed to pass the last Legislature, the term "ordinary" safety lamp was changed to read "improved" safety lamp, which lamp might possibly have shown one or two per cent. of explosive gas in the air of the No. 4 mine, while the ordinary safety lamp could not have detected this amount. It may be stated here that the wet condition of parts of the mine referred to prevented the explosion from communicating to all the parts of the mine and thus the lives of other employes were saved. This accident tends to show that the dust in all coal mines should be watered and taken out. To secure safety for the future mining of coal a stringent law must be passed giving the Inspectors the power to demand that necessary precautions be taken, even at the expense of closing down the mines when, in their opinion, continued operation would be a menace to life. The report of the Inspectors and the verdict of the jury follow herewith; also a map of the mine:

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#### REPORT OF INSPECTORS

"Altoona, Pa., July 14, 1909.

Hon. James E. Roderick,  
Chief of Department of Mines,  
Harrisburg, Pa.

Dear Sir:

At your request, the undersigned mine inspectors, on the 24th, 25th and 26th days of June, 1909, made an inspection of the Lackawanna No. 4 mine, of the Lackawanna Coal and Coke Company, situated at



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Wehrum, Indiana county, to ascertain, if possible, the cause, and to locate the initial point of the explosion that occurred in said mine on the morning of June 23, 1909, about 7.40 o'clock, which resulted in the loss of 21 lives and the serious injury of 11 persons.

The B or Miller seam is being mined at the Lackawanna No. 4 mine at a depth of about 180 feet beneath the surface. The coal is hoisted out of a rock slope at a pitch of about 35 per cent. A second opening, a hoisting shaft, is located a short distance north of the slope. The shaft had been equipped for lowering and hoisting persons and was also used in connection with the slope as an inlet for ventilation. A third opening is a shaft located 250 feet west of the foot of the slope and used as an outlet for ventilation. The fan producing the ventilation was placed at the top of this shaft and was operated on the exhaust principle. It is of modern type and construction, 16 feet in diameter and 8 feet wide, and is driven by steam power. It usually produced 131,000 cubic feet of air per minute at a speed of 100 revolutions against a water gauge of 2.75 inches.

Fortunately the ventilating machinery was not seriously damaged by the explosion and continued in operation, except that it stopped possibly for a few seconds, as shown by the pressure gauge chart, but the slope or main entrance, being an inlet and but slightly damaged, allowed the escape of several persons who otherwise would no doubt have perished. It also gave the rescuers an opportunity to enter the mine immediately after the explosion, which we have every reason to believe enabled them to save several lives that otherwise would have been lost.

The main developments in the mine are conducted on the two, three and four entry systems. Haulage is done by rope on the main slope. Electric motors are used for delivering the coal from the different parts of the mine to the main landing at the foot of the slope. Coal cutting machines are of the puncher type and operated by compressed air.

The main entry running north and south and passing the foot of the slope at right angles thereto was used as a haulage way, as was also the west side parallel to this entry. Both of these entries were used as inlets for air from the hoisting shaft and slope to the mine workings, the second parallel entry on the west side being used as a return to the fan shaft, while the east side parallel entry, which passes under the slope and is the fourth entry in this group, was being used as a return north of the slope and an inlet south of the slope. This group of four entries was extended a distance of about six hundred feet north and south of the slope. From these points the developments were continued on the two and three entry systems. The mine is ventilated by five air splits or divisions of the main air current.

We entered the mine by way of the slope or main entrance and made a careful examination of the bottom of the slope and hoisting shaft and for some distance around them. Evidence of considerable force was present at all points, also of flame in many places. Continuing our examination we found that in no direction from the bottom of the slope had the force extended beyond a distance of one thousand feet, except in No. 1 south entries, where it reached the face of each. In this area we found overcasts of concrete strengthened

with steel rails, stoppings of brick and wood, doors and timbers blown in different directions and in many places pieces of them had been carried many feet from their proper location, mine cars derailed, electric wires blown down, motors disabled, very heavy timbers displaced and general debris scattered practically in all directions.

All indications about the bottom of the shaft and slope appeared to point to the fact that the main force had come from the north. Continuing along the main north and on reaching a point beyond the No. 1 chute, which connects this entry with the west side parallel or back haulage, we found that a division of force had taken place at this point, the evidence of which was very plain, very heavy timbers having been displaced and moved in opposite directions, the one division going in the direction of the shaft and slope while the other went in the opposite direction toward the face of the main north entry. Following the latter to a point where an overcast of masonry had been built over this entry we found that the top of the overcast had been blown off, and that the force had spent itself at this point and a short distance beyond, the entry on each side of the overcast for some distance being very wet. Returning from this point to a chute, which we passed through to the west side parallel or 'back haulage,' we found a division of force had taken place on this entry and about opposite to where the same had taken place on the main north entry. From this point we proceeded to the first north entry left and discovered that quite a force had entered the entry. Passing along it a short distance we found evidence of force coming in an opposite direction from the face of the entry. Evidence of considerable heat was also found and on examining the face of the entry and also that of the parallel we found that a blast had been fired in each, and that each blast had done the work intended. No evidence of an excessive amount of flame produced by either was found. However, the blast that had been fired in the entry had been placed in the coal underneath the fire clay bottom. No evidence of any explosives having been exploded was found, except that used in blasts mentioned above; but instead we found three and one-half sticks of dynamite undisturbed in a box a short distance back from the face of the entry. No explosive gas was found in any part of the mine.

After a careful tracing of the forces in the entry we were of the opinion that the initial point of the explosion was at or near its face and that considerable flame had been produced, but from what cause we were unable to determine. We then proceeded to the No. 1 south entry where we found evidence of a force having entered, wood stoppings having been blown out to the right and left of the entry. A door used for directing the air current near a point where the entry turns to the right was blown to pieces and carried toward the face. The force continued to the face of the entry and passed through the last chute to the parallel. A short distance back from the face of the parallel, evidence of considerable heat and flame was found. The main force after entering the parallel passed down the parallel entry some distance below a chute near Nos. 2 and 3 left butt entries, derailing cars and bending and displacing air lines and timbers along its route. We then proceeded to No. 2 entry south and found that the force had entered there, but had spent itself before

going any considerable distance, evidently owing to the excessive amount of moisture along the entry. Continuing on to a point on the south main entry where an overcast of concrete had been erected, we found that the top of the overcast had been blown off, and that the force had spent itself at this point and a short distance beyond, the entry for some distance on each side of the overcast being very damp. We next proceeded to the west main entry where evidence of force having entered was present, but owing to the water having raised to a considerable depth, caused by the pumps being disabled, we were unable to explore to any great extent. However, this force weakened and gradually spent itself before traveling any great distance, and was no doubt checked by the amount of moisture along this entry.

We returned from this point to the first north entry left, which about completed a circuit of that part or parts of the mine affected by the explosion. We retraced our steps through the entry, but failed to find any evidence that would in any way change our opinion, formed on our first examination of this entry, viz., that the initial point of the explosion was in this entry. We then left the mine.

On the morning of the 26th we entered the mine and made another close examination of the first north entry left, and on examining the blast we found that the fire clay had been completely loosened up, especially in and about the center. A piece of burned fuse was found, but the depth of the water at this point prevented us from making an examination of the bottom of this blast, as before stated.

From this point we proceeded again to the No. 1 south entry and entered the first butt entry. Continuing along the entry until we reached the first opening to the left, we entered and discovered evidence of force having traveled up this entry or aircourse. We continued to the second cut-through north of the slope, which had been driven through the pillar between the main north and east side parallel entries. A brick stopping that had been placed in this cut-through had been blown out and in the direction of No. 1 south entry, this being near where the division of force took place on the main north entry. We returned by way of this aircourse, tracing the force, which gradually weakened until it joined the force coming up No. 1 south entry at the No. 1 left butt entry. We continued from this point on up the No. 1 south entry and through the last chute leading into the parallel and to where the powder had exploded, as before mentioned. We then returned to the outside.

On June 27th, Alexander Monteith, one of the inspectors who assisted in making the investigation, visited the hospital and received the following statement of Thomas Bestesta, an Italian miner, who worked in the first left north entry: 'On the evening of June 22nd, on quitting work, we fired a shot in the bottom. The hole was drilled in the coal. This shot displaced the fire clay in a large piece, too large to be loaded in the car. We returned on the morning of the 23rd and decided to break it. We placed two and one-half sticks of dynamite (40 per cent.) on or under the fire clay (attached to it was 6 feet of fuse) and returned to a cross-cut 15 to 20 yards back. The shot went off, filling the place with flame.'

When asked if he felt any shock previous to the blast he said that he did not.

The coal underneath the fire clay had evidently been crushed to a greater or less extent by the blast the evening before, and this

amount of dynamite, having been exploded in the coal and not being confined, evidently produced much heat and flame. The concussion produced by the exploding dynamite sent the flame at a rapid rate out of this entry, thereby setting up a destructive distillation of gases from the dust thrown in suspension along its route until it reached the main north and west side parallel entries at the point where the division of force took place on these entries, as before mentioned. The entries at these points had the appearance of having been dry, and the dust that had been deposited on the roads, especially on the roof and sides, (for we believe that the most dangerous dust is to be found on the roof and sides), became suspended in the air, and this coming in contact with the flame produced quite an explosion at this point and was transmitted to all parts of the mine, with the effect herein described.

From our observations and the statement of Bestesta, we are firmly of the opinion that the initial point of the explosion was at or near the face of No. 1 north entry left. The general trend of force from that point, as herein described, was, we think, sufficient evidence to establish that fact. The statement of Thomas Bestesta not only confirms this opinion, but establishes the fact beyond any doubt both as to the initial point and the primary cause of the disaster, this cause being the firing of what might be termed an open or unconfined blast of dynamite which spent its force on the atmosphere of the mine, thereby producing the same dangerous effect as that of a blown-out shot.

We are further of the opinion that the disaster was the result of carelessness or lack of knowledge of the proper use of explosives, and while we greatly deplore the disaster and the way in which Bestesta prepared the blast that was the primary cause, we think it only just to commend Bestesta for his truth and veracity which he so manfully maintained after the disaster occurred relative to its cause. His statement is, in our opinion, sufficient evidence that he was ignorant of the dangers likely to follow his act. Otherwise he would probably not have confessed, and if he had not confessed, the primary cause would no doubt have been recorded as one of the unsolved mysteries connected with mine disasters.

Three things presented themselves very plainly to us in our examination of this mine, and we deem it advisable to call attention to them in this report. They are as follows:

1st. That the greatest force was developed in the main inlet road or airways, and at points that were dry.

2nd. That the forces weakened on entering the return airways.

3rd. That the forces were completely spent when they came in contact with plenty of moisture for a considerable distance along the entries.

We deem it our duty to offer the following recommendations in order to better secure the lives, health, safety and welfare of persons employed in Lackawanna No. 4 mine, Lackawanna Coal and Coke Company:

1st. That none but permissible explosives be used for the purpose of blasting coal or other material in the mine, such as have passed the government test and are noted on the permissible list.

2nd. That the mine be kept as free as practicable from dust, and if necessary to prevent any dangerous accumulations of dust from



floating in the atmosphere, the same be thoroughly watered and kept wet.

3rd. The exclusive use of non-combustible material for stemming all shot holes.

4th. That extreme caution be exercised in blasting and handling explosives.

5th. That no shot shall be laid deeper than the under-cutting.

6th. That safety lamps be used when and where directed by the law.

7th. That rigid discipline be enforced and maintained at all times.

8th. The employment of a sufficient number of fire bosses to examine every working place without exception and all roadways immediately before each shift.

9th. That these recommendations apply not only to Lackawanna No. 4 mine of the Lackawanna Coal and Coke Company, but to all other mines of similar conditions.

Respectfully submitted,

JOSEPH WILLIAMS,

10th Bituminous District,

C. B. ROSS,

2nd Bituminous District,

ELIAS PHILLIPS,

4th Bituminous District,

ISAAC G. ROBY,

5th Bituminous District,

T. D. WILLIAMS,

6th Bituminous District,

P. J. WALSH,

9th Bituminous District,

D. R. BLOWER,

11th Bituminous District,

ALEXANDER MONTEITH,

15th Bituminous District,

NICHOLAS EVANS,

20th Bituminous District,

F. W. CUNNINGHAM,

21st Bituminous District."

#### Verdict of Coroner's Jury

"We, the Jury impaneled to determine the cause of the death of the seventeen miners or employes of the Lackawanna Coal and Coke Company, find that their death was caused by an explosion, presumably dust, in Mine No. 4, owned and operated by the said company, located at Wehrum, Indiana county, Pennsylvania, on June twenty-third, one thousand nine hundred and nine. Said explosion was caused by the carelessness of Thomas Bestesta, a miner, firing a dynamite shot, not tamped, at the face of first left heading off north main heading.

Signed:

Franklin Sansom, Harry P. Dowler, Edward A. McConville,  
Harry Kallaway, Thomas M. Doherty and J. Dalton Johnston."