

stoppings of concrete and brick, used for guiding the ventilation into the interior of the mine, all blown out with few exceptions, but otherwise the mine is not much injured.

We consider this a very gaseous mine and found explosive gas in large quantities in all of the interior workings, and even after the ventilation had been restored, as at present, we found the mine generating explosive gas very freely. We believe the mine to have been worked with open lights with but very few exceptions. We are of the opinion that the total volume of air in circulation in the interior workings at the time of the explosion was insufficient to keep the mine in a safe condition. Very few of the victims of the explosion were killed as the result of the force developed by the explosion, but by the after damp when trying to make their escape.

We are of the opinion that the disaster was the result of an explosion of fire damp intensified by the coal dust of the mine. This gas was fired either by one of the open lights used by the employes or by an electric spark or flash from an arc formed by the electric appliances in use in the mine.

There exists a difference of opinion among the inspectors only as to the real agency that fired the gas, and as to the real location at which the explosion originated. This difference of opinion is due to the peculiar conditions now existing. It is the opinion of the inspectors that if the gas was fired by an electric spark, the explosion occurred in the vicinity of No. 25 entry, and if an open light was the agency that fired the gas, it occurred at some other point in the mine."

The testimony given at the inquest by the engineer in the power house seems to support the opinion of the inspectors as to the cause of the explosion. He stated that at 7.26 o'clock, P. M., the circuit breaker blew out and the explosion followed almost instantly.

The verdict of the Jury is as follows:

"We find that Joe Hagerdish, Frank Risky and others, came to their death as the result of an explosion of gas and dust in the Naomi mine of the United Coal Company.

This gas seems to have accumulated from insufficient ventilation and was, we believe, ignited from the arching of the electric wires or an open light at some point not definitely located.

We condemn the use of electric wires on return air currents, and we further condemn the use of open lights in all gaseous mines.

We would recommend that hereafter an air shaft be opened up when the workings reach a point 4,000 feet from the mine opening. Further, that the Mining Commission appointed by the Governor recommend such amendments to the mining laws that human life will be protected and the present laws be more rigidly enforced.

(Signed)

Arthur S. Hagan, M. D., Coroner.  
Harry R. Boyd.  
Claude H. Truxal.  
N. Bert Lowman.  
Charles Cheeseman.  
Wooda H. Lange.  
Ambrose G. Bradley.

### **The Darr Mine Disaster**

One of the most prosperous years ever known in the bituminous region was, at its close, marred by several disasters of unusual magnitude. Of these, the explosion at the Darr mine of the Pittsburgh Coal Company, located near Jacobs Creek, Westmoreland County, by which 239 persons were killed, was the most serious one.

The accident occurred about 11.30 on the morning of the 19th of December. Persons in the vicinity of the mine describe the explosion as an awful rumbling followed by a loud report and a concussion that shook the nearby buildings and was felt within a radius of several miles. The Darr mine is a slope opening in the

Pittsburg coal seam and it was never deemed a very dangerous mine, inasmuch as it generated only a small percentage of explosive gas and was worked with open lights.

Daniel R. Blower, temporary inspector of the Nineteenth District, in which the mine is situated, reached the mine a short time after the explosion occurred. The inspector of the district, W. J. Neilson, and eighteen of the other inspectors, were notified by the Department of Mines to go at once to the assistance of Inspector Blower.

The explosion had been so terrific in its force that the inspectors were convinced upon a superficial investigation that it would be impossible for any of the entombed workmen to be rescued alive, as the after damp they found pouring out of the openings would have smothered any person that had escaped the force of the explosion. The Chief of the Department of Mines reached the scene of the accident the second day after the explosion and arranged with the General Manager of the company, Mr. George W. Schluederberg, for three inspectors to go into the mine with each shift of men, each shift to remain inside four hours. Inspector Neilson assisted in the work, both inside and outside of the mine, giving to the other inspectors the instructions issued by the Chief of the Department of Mines, who remained on the ground for several days until all the bodies were recovered. The progress made by the rescuers was very slow, owing to the fact that all the stoppings in the mine were blown out and had to be replaced as the men advanced, and great precautions had to be taken in conducting the ventilation for fear of fire smouldering in the coal or in old timber.

About 400 men were regularly employed at the mine, and the reason there was not a greater loss of life was owing to the fact that many of the foreign miners were absent observing a festival of the Greek Catholic Church. The mine had been closed down on Tuesday and Wednesday to celebrate St. Nicholas Day, and many of the miners had not returned to work. Of the 239 miners killed more than half the number were Americans or English-speaking miners.

Only one man, a pumpman, escaped from the mine. He had left the part of the mine where the men were working and was on his way to the engine room for oil. He describes the accident as follows: "I was near Entry No. 21 when I heard an awful rumbling. I started toward the entry, but the next instant I was blinded and for a little time I did not know anything. Then I got to the side entry and worked my way out."

After the bodies were taken out of the mine, the superintendent and foremen of the mine, with the mining experts and engineers for the company, made a thorough examination of the mine and were of the opinion that the explosion was caused by workmen crossing the danger mark and their open lights coming in contact with the gas. Their report is as follows:

"We, the undersigned mining and electrical engineers, miners and mine experts, do certify:

That we made a thorough examination of the Darr mine of the Pittsburg Coal Company since December 19, 1907, for the purpose of determining as to the character, equipment, and operation of the mine, and, as well, to ascertain the cause, if possible, of the explosion on the said December 19, 1907.

That we found the said mine of modern design and character, with evidences of safety appliances and ample equipment to furnish adequate ventilation for all parts of the mine.

That we traced the course of the explosion and examined the report of the fire bosses for the morning of said December 19, so as to obtain sufficient facts from which we might be able to form an opinion as to the explosion; well knowing that a theory or opinion not based on facts would be of no consequence, nor would it aid the jury in arriving at a correct conclusion. It appearing from the book of the fire bosses that right butt entries 3 and 4 off 28 entry were fenced off by the fire boss on the morning of the explosion and prior thereto as dangerous because he discovered danger from the roof falling, and the bodies of five miners being found in No. 3 butt and 200 feet or more beyond said fenced-off portion and in said dangerous and forbidden section, this is conclusive proof that miners were in dangerous and forbidden portions of the mine without the knowledge, consent, or approval of the owners of the mine; and with such facts established and together with evidence we discovered in the mine, that the course of the explosion was from said fenced-off section into other parts of the mine, we are unanimously of the opinion that said explosion resulted from the presence of said miners in said fenced-off section, at a time when there must have been considerable fall and the possible liberation of gas; and that, for the presence of said miners in said forbidden section and the explosion resulting therefrom the owners of the mine are in no way to blame nor are they in any manner responsible."

This statement was signed by J. P. K. Miller, Wm. G. Muse, George R. Wood, Benj. Pereday, W. W. Jamison, W. M. Kelvington, George W. Waring, E. J. Taylor, P. Y. Cox, J. N. Armstrong, H. F. Randolph, John Britt, H. B. N. Louttit, and J. D. Sharp, eight of the 14 being officials of the Pittsburg Coal Company.

The inspectors were also instructed to make a careful inspection of the mine to determine, if possible, the cause and to locate the initial point of the explosion. Having spent about a week in the work of restoring ventilation and locating bodies, they were very well acquainted with all parts of the mine, and in their final inspection they divided themselves into two groups, each group spending about nine hours in the mine. At Pittsburg they made their report to the Chief of the Department of Mines in which they attribute the cause of the explosion to an open light coming in contact with explosives, or an accidental explosion of dynamite, or a flame projected from a blast. The material part of the report, which was submitted to the Jury, reads as follows:

"We are of the opinion that the initial point of the explosion was near the face of No. 9 left butt entry off No. 27 face entries, marked B on map herewith) and that the general trend of the force from this point was as follows:

Down No. 9 and No. 10 left butt entries to No. 27 face entries. Here a division of the forces took place, one part going into the face of No. 27 face entries and then down through No. 9 right butt entry off No. 27 face entries to the Swamp face entries, reinforcing itself, then and on rib falls between No. 6 and No. 7 left butt entries to the Swamp section, with gas, and going out of the Swamp entries toward the entrance of the mine; and another division going out of No. 27 face entries and through No. 1 and No. 2 left butt entries to No. 29 face entries. The force which came out of No. 27 face entries seemed to sweep No. 28 face entry and join the force of No. 29 face entries and from thence it proceeded to No. 30 face entries and the main entries. From these points the general course was toward the entrance of the mine. The evidence of forces was so conflicting in many of the entries that we have made no attempt to describe any but the main ones, which were fully demonstrated in many ways; as for example, the sweeping of tools and the roads from the face of No. 9 left butt entry and parallel off No. 27 face entries, and the demolishing of a car near the last cross-cut and the condition of a loaded trip that stood near the foot of this entry, the abrasion of the sharp projections of coal pillars along the passageways, the unmistakable fine dust deposits, or dust eddies, at sharp pillar projections and on timbers; dust eddies formed, and the floor swept clean of dust along the path of the blast; the carrying of heavy materials in well-defined directions; the forcing of coke dust into the rugged ends of pillars, and the bending of T iron rails and switch levers.

The cause may have been the projection of flame into a gaseous and dusty atmosphere (the mine being very dry and dusty at this point) from a shot fired in the face of No. 9 butt entry or in a cross-cut nearby; or the ignition may have been caused by one of the open lights used by the workmen (when we consider the ease with which the ventilation could be disarranged in this

section of the mine, and also the fact that this entry was generating gas), or it may have been caused by an accidental explosion of dynamite. The explosion reached nearly all portions of the mine and was intensified by coal dust.

We deem it our duty to express our disapproval of the system of workings of the Darr mine in that it does not provide for efficient ventilation and we also deem it our duty to recommend the following:

That the main developments of the mine be conducted on the four-entry system and the ventilation be controlled by overcasts instead of numerous doors; that a different type of coal cutting machines be substituted for the chain machines; that the best flameless explosives be used for all blasting purposes; that competent shot firers be selected and employed to prepare, charge, and fire the shots after the workmen are out of the mine. These shot firers should have the authority to reject the charging and firing of holes which in their judgment would be unsafe to fire, and all stemming should be with clay or other incombustible material; that the mine be worked exclusively with locked safety lamps. That a water system be installed for the purpose of thoroughly wetting and laying the dust, and all accumulations of dust be loaded and sent out of the mine at least once a week, and said dust to be thoroughly watered before being loaded; a sufficient number of fire bosses should be employed to make careful examinations of the mine without undue haste; that the superintendent shall see that the mine foreman devotes the whole of his time to such duties in the mine as prescribed by the Act of May 15, 1893, relating to bituminous coal mines, and he shall maintain rigid discipline at all times.

We are of the opinion that had the well-known safeguards, such as ample and efficient ventilation, the use of safety explosives, the thorough wetting and laying of dust, the use of locked safety lamps, the employment of shot firers, and the maintenance of rigid discipline been employed in the Darr mine, this calamity would not have occurred.

These recommendations apply not alone to the Darr mine, but to all mines in the various bituminous districts which are gaseous and dusty.

Respectfully submitted,

C. B. Ross, Elias Phillips, I. G. Roby, John I. Pratt, Joseph Knapper, Thomas D. Williams, Joseph Williams, Alexander McCanch, Roger Hampson, John F. Bell, F. W. Cunningham, Alexander Monteith, David Young, Nicholas Evans, W. J. Neilson, and Thomas S. Lowther."

The reports are reproduced here for the information of the public, and the reader may draw his own conclusions. It seems to be very evident that if the fire bosses and mine foreman had performed their duty, the employes would not have been allowed to enter the mine when conditions were manifestly unsafe. The law is very plain as to the duties of the fire boss and the mine foreman, but it is not a new thing to have it violated. It is, moreover, hardly probable that the superintendent of this mine was ignorant of the fact that the employes were allowed to go to work before the mine was reported safe by the fire bosses. On account of change of inspectors it is probable that the new inspector of the district was not aware of the fact that employes were allowed to enter the mine before it was reported safe by the fire bosses. Whether the manager or assistant manager of the Darr mine knew of this violation, I cannot say, but they could not have known of it unless informed by the superintendent or foreman. No matter how we view this case, we fail utterly to agree with the jury in the part of their verdict that reads as follows: "We find the bituminous laws of Pennsylvania were fully obeyed by all those having charge of the Darr mine of the Pittsburg Coal Company." It would seem also that they were not quite satisfied with their own verdict, as they say in another place: "We would call attention to the necessity of, first, a rigid compliance with and enforcement of the bituminous mining law by inspectors, mine foremen, fire bosses, and all others," and they recommend, "greater penalties for violation of law, and more inspectors, as this mine was not inspected for over three months previous to June 15, 1907."

We cannot understand, even admitting that the inspector did not "inspect the Darr mine for over three months previous to

June 15, 1907," how his failure could in any way be connected with an explosion that occurred December 19. I deem it my duty to make an explanation here to relieve the inspector of any charge of neglect or failure to comply with the law.

The mine had been inspected February 20. On April 15 additional inspectors were added to the force and the Darr mine was allotted to one of the new inspectors. There was no record of previous inspections left by his predecessor for his information and guidance, as the district was newly formed and made up of mines from three or four other districts; but he made a tour of the district as soon as possible and on June 15 and 17 made an inspection of the Darr mine. This, of course, was 27 days more than three months after the inspection made by his predecessor, but the fact that he made an inspection of the mine in two months after he had assumed charge of the district shows the weakness of the position taken by the jury in ascribing the cause of the accident to a lack of inspection six months before the date of the accident and in recommending on that account an increase in the number of inspectors. He made additional inspections September 12 and 13 and December 9, and would have made an inspection of the Darr on the day of the accident had he not been requested to go to the Banning, an adjoining mine. To attribute accidents to a lack of inspection has been the practice of most juries, especially accidents in which many lives have been lost, but thus far they have failed to connect any of the accidents with the failure or neglect of duty on the part of inspectors. I therefore feel constrained to join the inspectors in the opinion that had the well known safeguards, such as ample ventilation, the use of safety explosives, the thorough wetting and laying of dust, the use of locked safety lamps, the employment of competent shot firers, and the maintenance of rigid discipline been employed in the Darr mine, this calamity would not have occurred.

There was no evidence of any violation of the mine law offered at the inquest, as all who were in the mine were dead, except that an effort was made to put the blame for the explosion on five persons, who, it is claimed, crossed the danger mark. This was only a theory suggested by the chief engineer of the company and possibly a few other persons.

At every important coroner's inquest held in Western Pennsylvania of late years to inquire into the causes of accidents that resulted in serious loss of life, an effort has been made by the Coroner to lay the blame upon the inspector by assuming that he did not do his full duty.

This was very evident at the Harwick inquest of 1903 and the more recent Darr inquest. The Coroner in the former case tried to convict the inspector of manslaughter, while in the Darr case an attempt was made to discredit the written report of the inspector because he had made a personal note on his record book: "Inspection to be continued," after he had sent his original report to Harrisburg. In reading his report at the inquest the inspector did not read this note, as it was not a part of his report to the Department. It was written with a different kind of pencil and the Coroner, observing this fact when the book was handed to him, at once began to berate the inspector for not reading it to the

jury. He tried to discredit the record book and handed it around to the Company's lawyers and to the jury. Again the fact was commented upon that more than 90 days had elapsed between the inspections of February 20 and June 15 of the year 1907. An effort was also made by questions addressed to the Chief of the Department to show that the force of inspectors was not sufficient to make the required and proper inspection of the mines. The Chief stated, however, that the number of mines in the bituminous districts ranged from 30 to 150 for each inspector and that the dangerous districts of the counties of Allegheny, Westmoreland, Fayette and Washington contained the smallest number. He also said the inspectors did their work well and fully complied with the law.

The verdict of the Coroner's jury (a very respectable body of men) was as follows:

"William S. Campbell, Joseph W. Murphy, Herman Tanzky, and 236 others came to their death on December 19, 1907, at the Darr mine in Rostraver Township, Westmoreland County, from an accidental explosion of gas ignited by an open lamp at a point which we are unable to locate owing to a difference of opinion between inspectors and experts. The explosion was augmented by coal dust that extended throughout the mine. Various centers of the explosion were developed from gas and coal dust or other explosives.

We find the bituminous laws of Pennsylvania were fully obeyed by all those having charge of the Darr mine, of the Pittsburgh Coal Company. We would call attention to the necessity of, first, a rigid compliance with, and enforcement of, the bituminous mining law by inspectors, mine foremen, fire bosses, and all others; second, the need of additional legislation for mines which generate explosive gas, providing for the exclusive use of flameless explosives, employment of competent shot firers, the use of incombustible material for stemming, some qualifications to mine coal on a probationary service with an experienced miner, for better care of coal dust, greater penalties for violation of law, and more inspectors, as this mine was not inspected for over three months previous to June 15, 1907.

The evidence of several inspectors at the inquest showed that recommendations had been made by them in a number of instances looking to bettering conditions in the mine and that these recommendations had been complied with by the company in the instances cited at the inquest.

There was no evidence to show that there was an electric coal cutter at work when the explosion occurred."

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## EXPLOSIONS OF GAS AND DUST AND HOW TO PREVENT THEM

The great mining industry of Pennsylvania, while attended with heavy loss of life, due to various causes, has been comparatively free from disastrous explosions of gas and dust until within recent years. The first very serious accident of this kind occurred January 27, 1891, at the Mammoth mine, Westmoreland county, by which 109 persons were killed. Other explosions occurred as follows: February 20, 1884, West Leisenring No. 2 mine, Fayette county, 19 killed; October 27, 1884, Youngstown mine, Fayette county, 14 killed; June 16, 1890, Hill Farm mine, Fayette county, 31 killed; March 23, 1896, Berwind Shaft, Clearfield county, 13 killed; December 23, 1899, Sumner mine, Fayette county, 19 killed; June 10, 1901, Port Royal mine, Westmoreland county, 19 killed; July 10, 1902, Rolling Mill mine, Cambria county, 112 killed; November 21, 1903, Ferguson mine, Fayette county, 17 killed; January 25, 1904, Harwick mine, Allegheny county, 179 killed; April 27, 1905, Eleanor Shaft, Jefferson county, 13 persons killed.