VERDICT RETURNED MARCH 15, 1928, BY CORONER'S JURY IN EXPLOSION AT KINLOCH MINE, JAMES M. HARKINS, CORONER

"We find that the following persons came to their death in the Kinloch Mine of the Valley Camp Coal Company, situated in Lower Burrell Township, Westmoreland County, Pennsylvania, February 20, 1928, namely: William Ivory, West Blackman, John Pool, Charles Wise, and Andrew Stroder, from an explosion of gas, and that the following persons, Thomas Burtoff, William Casey, Kinzy Nice, John Clark, and Parley Bell, from afterdamp.

We find that the explosion was caused by the failure of the proper mine officials to operate the mine as required by the Bituminous Mine Laws of the State of Pennsylvania.

We find also that Louis Venzel and G. Newton Beck came to their death in the H. W. Boyd Mine, Lower Burrell Township, Westmoreland County, Pennsylvania, February 21, 1928, from the effects of afterdamp caused by the explosion of gas in the Kinloch Mine adjoining and from the failure of the officials of the Kinloch Mine to notify the H. W. Boyd Coal Company of the explosion."

MATHER MINE EXPLOSION

On May 19, 1928, at 4:07 P. M., an explosion of gas and coal dust resulting in the loss of 194 lives occurred at the Mather Colliery, operated by the Pickands, Mather and Company, situated at Mather, Greene County, and located in the Twenty-first District, C. P. Byrne, Inspector.

The appalling magnitude of the disaster caused consternation to spread throughout the entire mining industry, for this operation was recognized as being under careful and intelligent management, and was conducted along modern lines with respect to safety practices.

On being notified of the intensity of the explosion, the Department of Mines directed all available inspectors, 22 in number, to report at Mather without delay.

A mine rescue car with a full corps of officials of the Federal Bureau of Mines, and trained rescue workers from all the bituminous mining sections of the State, responded quickly to the call for assistance. The rescue and recovery operations were so efficiently organized and carried on that all the uncovered bodies were removed from the mine by the morning of May 23, and the mine turned over to the owners for the purpose of restoring ventilation.

The Secretary of Mines appointed a Commission of seven Mine Inspectors and invited three officials of the Federal Bureau of Mines to accompany them in an investigation to determine the cause of the explosion.

The investigation began on May 28 and was concluded on May 31. The report of the Commission and the verdict of the Coroner's Jury of Greene County follow:

REPORT OF COMMISSION OF INSPECTORS

June 4, 1928.

Hon. Walter H. Glasgow,
Secretary, Department of Mines,
Harrisburg, Pa.

Subject: Report of Gas & Dust Explosion, Mather Colliery of Pickands —Mather & Company, Mather, Pa., May 19, 1928

Sir:

We regret to report officially the occurrence of one of the most appalling coal mine disasters in the annals of the Pennsylvania Bituminous Coal Mining Industry on May 19, 1928, at 4:07 p. m., in Mather Colliery of Pickands-Mather and Company, situated at Mather, Morgan Township, Greene County, in which 208 persons were involved in a coal dust explosion, confined to the north side of the mine, and initiated by the ignition of an accumulation of methane gas. Sixteen of the persons involved escaped to safety after the explosion by or through the prompt aid of rescue parties, two of which persons have since died from the effects of their exposure during the explosion. The remainder perished by inhaling the products of the explosion and by violence, those dying from inhaling the fumes of the explosion being approximately 33 per cent.

The mine as above stated is situated at Mather in the County of Greene, and is mining the Pittsburgh coal seam which is approached through two shaft openings, having depths of approximately 350 feet. One of these shafts is used for hoisting coal, and the other is divided into two compartments, one compartment being used for handling men, mine material, and mine refuse. The other compartment is connected to a 6 x 14 foot exhaust fan of the Jeffrey type, exhausting from the mine about 300,000 cubic feet of air per minute at a speed of 135 R. P. M., developing a water gauge of 2.6 inches. The air enters the mine through the two shafts here spoken of and an additional shaft located about 8,250 feet from the hoisting shaft, which shaft in addition to serving as an air inlet also affords a means of escape, being provided with a stairway through which six of those involved in the explosion escaped to safety.

The large volume of air shown in the former paragraph of this report is said by the mine management to have been ample for the needs of the mine, judiciously distributed, and so well controlled that interruption in air circulation was only feasible through the careless use of doors, except in rare instances wherein the development was not of sufficient extent to justify more permanent control. It is also stated by the mine management that line brattice was used in conveying the air to the face of all working places generating explosive gas, and that this means of conveying the air to the face of working places was timely installed. The character of material used in doors, stoppings, and overcasts is practically in common with that used in all mines of a gaseous character. The statements made in this paragraph are also confirmed by Mr. Byrne, District Inspector, and to some extent confirmed by the observations of the Commission members.

The mine is planned and arranged along conventional lines for large scale mining operations, the main unfolding entries being composed of five and in some instances six entries in parallel with main entries of less importance in sets of threes and fours. Butt entries

are turned off the face entries in pairs and rooms turned therefrom on one hundred foot centers. The method of extraction is by what is generally known as single panel full retreat. It will thus be observed that an ample number of passageways have been provided to accommodate ventilation, haulage and travel. It will further be observed that the method of extraction favors the keeping of a sound physical state in pillar areas and elsewhere and makes easy the keeping of the exhausted areas of the mine free of explosive gas as well as permitting maximum extraction of the seam. Collectively these advantages make for general safety. The mine normally employs inside 613 persons, 151 of these being employed at night, whose joint efforts resulted in a daily production of 3,800 tons.

Electricity at a potential of 250 volts is used very extensively in the operation of the mine, being used for lighting, haulage by main line trolley locomotives confined to main inlet airways, coal-cutting and pumping. Storage battery locomotives and draft animals are used for gathering coal from the faces of the working places to collecting points, from which points it is taken to the bottom of the hoisting shaft by main line trolley locomotives. Wiring and the manner of attaching it to supports is in conventional form with cut-out switches at intervals specified by the mine management and with switches at all branches where the development justifies such an installation.

Men specially trained in the art of blasting and in the use of safety lamps do all blasting after the coal has been properly prepared by Jeffrey top-cutting machines and after a painstaking examination has been made for explosive gas and other unfavorable conditions. Only permissible explosives are used and these are carried and kept in the possession of the miners, but detonators are carried and kept in the possession of shot-firers as well as the approved electric shot-firing devices which furnish the current for detonating all blasts. Only incombustible material is used for stemming.

Generalized rock-dusting of tracked roadways was an established practice, and 14 rock-dust barriers containing an average of 7,000 pounds of rock-dust were placed at strategic points in passageways for the purpose of retarding or totally arresting explosive violence. But as far as your Commission is advised no analyses were made to determine the relative proportion of combustible and incombustible dust on the surface of rock-dusted passageways, hence the mine management was without knowledge as to whether or not the proportion of incombustible dust was sufficient to serve as a useful agency in the event of an inflammation.

Facilities were provided for watering roadways, and a water line with a spraying effect was attached to the cutter-bar of each coal-cutting machine for the purpose of drenching the cuttings as they were made, but it is, indeed, very unfortunate that miners were not supplied with the wherewithal for watering the coal at the face of working places before being loaded into mine cars. Had this been done, much of the most inflammable coal dust would have reached the surface instead of having been thrown into suspension by the various operations of mining and borne by the air currents to practically all parts of the mine.

Your Commission is informed that frequent analyses were made of air currents passing through active workings for the purpose of

determining the methane content, and that these determinations always revealed the methane content within the limits of tolerance. The results of these analyses were not accompanied by the quantity of air passing at the point where samples were taken, and therefore fail to disclose to the Commission the amount of methane transpiring from the workings ventilated by any particular division of air. The mine was worked exclusively with approved electric cap lamps.

All of these precautions and many others included without special emphasis in other parts of this report were taken to avoid the initiation and possible propagation of an explosion.

As mentioned before, the explosion occurred on May 19, 1928, at 4:07 p. m., being only a short time after the night shift had entered the mine and before many of the day shift men had left the mine.

Following a hasty investigation and determination by the mine management as to what had occurred, a call was made on adjoining communities for aid and at the same time the State Mine Inspection force was given notice of the accident, as well as the United States Bureau of Mines. Help responded promptly, but in the meantime the mine management had entered the mine through the man and material shaft which was unimpaired, and also through the air shaft at the north end of the property which was only slightly impaired, and were doing as best they could to establish temporary ventilation and recover those entombed.

A few minutes after 8 p. m. the State Mine Inspectors began to arrive, followed an hour or so later by trained men and rescue apparatus from the United States Bureau of Mines at Pittsburgh, which trained men promptly joined the rescue and recovery forces. On the arrival of the State Mine Inspectors, a hasty examination was made of the plan of the mine workings and of the officials then present. This examination and investigation justified the advisability of pushing rescue and recovery operations from both the air shaft and the man and material shaft with the object of recovering the passageways linking together the two openings to the surface. In this venture it was distinctly understood by those entering the mine by the way of the air shaft that their activities were to be confined solely to the area north of the air shaft and that no attempt whatever was to be made to reconstruct the ventilation system. This venture and procedure was rewarded by the recovery of six men who were brought to the surface through the air shaft and who have now fully recovered. In the meantime, the forces entering the man and material shaft pressed forward rapidly as far as No. 14 entry on the east side of the north mains, making temporary repairs to a number of stoppings and one air overcast. Reaching No. 14 entry on the east side of the north mains, the air supply from the main hoisting shaft and the man and material shaft was practically all passing into the return airways at this point. This necessitated at this point the building of a number of stoppings to the end of advancing the air along the north mains. As this closure was being made, three men came out to No. 14 entry on the east side of the north mains, and reported that they had left one of their party at the point where No. 14 entry intercepted No. two right face. A crew wearing self-contained breathing apparatus immediately proceeded to the given location, but failed to find the victim. Another attempt was made to rescue the victim by advancing the ventilation towards

his location, but this was abandoned because of difficulties encountered in controlling the ventilation. However, the victim was reached later and in time to save his life, but not at the given location.

Closing off the entrance to No. 14 entry on the east side of the north mains, the original plan of advancing to the set objective was undertaken again and rapid progress was made in reaching No. 15 entry on the west side of the north mains. Reaching this entry a preliminary survey of a portion thereof showed the stoppings to be intact and justified the hope that life still existed in the area of workings approached through No. 15 entry in which area of workings the night shift force was employed. In view of the hope of finding men alive in the area occupied by the night shift force, effort was next directed to advancing into this entry, which was continued almost to the end of the entry. Finally increasing difficulties in controlling the ventilation and a growing conviction that life was extinct in the night shift area, suggested the wisdom of withdrawing from this location and proceeding with the original plan. In consequence of this, the advance was again taken up at the entrance to No. 15 entry on the west side of the north mains, and pressed to the air shaft and thence to the innermost end of the north mains. Having reached the innermost point on the north mains, the exploration force faced about, so to speak, and proceeded in orderly fashion through the workings and towards the main entrance of the mine. The last of the exposed bodies were located early on the morning of May 23, 1928, and recovery operations were halted, and the State Inspection force was withdrawn from the mine to permit of having the ventilation sufficiently established to clear the mine of explosive gas, so that their inquiry and investigation into the cause of the disaster might be carried into all the ramifications of the mine with safety, if this became necessary in determining the seat of the explosion and the source of ignition, as well as for the further purpose of ascertaining in detail the extent to which the north side of the mine was involved by the disaster.

On May 21st the exploring crews encountered eleven fires on butt entries on the west side of the north mains, eight of these fires being located in pillar areas. None of these were difficult to locate or extinguish, save one, this one being both difficult to find and extinguish. These fires caused considerable apprehension for a time, and naturally slowed up exploration work on the 21st.

Some wonder has been expressed at the inactivity of these fires because it was generally felt that the oxygen content in the air had been sufficient to support active combustion for many hours before the finding of the fires. Various reasons have been assigned for the inactivity of these fires, assuming the atmosphere was in condition to support active combustion, but the weight of opinion appears to support the theory that the inactivity of the fires was occasioned by the fuel bed itself and the surrounding fuel being sufficiently mixed with rock-dust to retard rapid combustion.

A searching investigation and thorough inquiry was commenced on May 28, 1928, into the cause of the disaster and of the conditions and particulars in connection therewith, and concluded on May 31, 1928. And now after a careful survey of the findings, viewed from every angle, your Commission is unanimously of the opinion that the disaster was the result of an explosion of coal dust, affecting in one way

or another the entire operating area, including its attending passageways, on the north side of the mine instituted by an accumulation of explosive gas, occasioned in all probability by an interruption in air circulation in No. 12 face north on No. 24 entry on the west side of the north mains. While the evidence as to the source of ignition is inconclusive, we are of the opinion that the proximate cause lies in the storage battery locomotive positioned at a point from which the lines of visible force appear to radiate.

A map is herewith subjoined for the purpose of illuminating this report.

Recommendations:

Despite the many precautionary measures taken in this mine to avoid explosion hazards, the Commission feels justified in offering the following recommendations:

First—That adequate and dependable ventilation be provided, and that the air be circulated throughout the mine in sufficient quantity to prevent the possibility of explosive gas accumulating, by guiding means that will avoid the interruption of the normal flow of air to the working faces.

Second—All electric machinery used in working places and return air should be exclusively of a permissible type and it should receive frequent inspections to insure its maintenance in a permissible condition at all times, and a record made of said inspections in a book kept at the mine for that purpose.

Third—The use of water on the cutter-bar of all coal-cutting machines to allay dust is commended. Water should also be used to wet down the coal before it is loaded and at frequent intervals during loading. Loaded cars should also be sprayed before leaving the working face.

Fourth—That supervision be increased in frequency and intensity during working hours, and especially during the period shifts are being changed.

Fifth—That legislation be enacted at the coming session of the Legislature providing for the compulsory rock-dusting of gaseous or dry bituminous coal mines within the Commonwealth. Said rock-dusting to be of such a standard that the flame from ignition of gas or other sources will be localized or confined to the immediate vicinity where ignition occurs.

Respectfully submitted,

ALEXANDER McCANCH,
Inspector First Bituminous District.
SILAS S. HALL,
Inspector Ninth Bituminous District.
ALEXANDER JACK,
Inspector Tenth Bituminous District.
C. P. BYRNE,
Inspector Twenty-first Bituminous District.
E. W. WILKINSON,
Inspector Twenty-third Bituminous District.
THOMAS S. LOWTHER,
Inspector Twenty-fifth Bituminous District.
CHARLES H. CROCKER,
Inspector Thirtieth Bituminous District.

VERDICT RETURNED JUNE 5, 1928, BY CORONER'S JURY IN EXPLOSION AT MATHER MINE, JOHN W. ROSS, CORONER

"We, the Coroner's Jury sitting on the investigation of the cause of an explosion which occurred at the Mine of Mather Collieries, Pickands, Mather and Company, Operators, located at Mather, Greene County, Pa., on Saturday May 19, 1928, on or about the hour of 4:07 P. M., hereby submit the following return: After hearing the testimony of the various witnesses, and a further study and consideration of the thorough report made on this disaster by the State Mine Inspection Commission, we find that this disaster was caused by an explosion of explosive gas and coal dust in the north side of the mine. The primary cause of which explosion is unknown."

HILLSIDE MINE EXPLOSION

On August 9, 1928, at 1:00 P. M., a gas explosion resulting in the loss of five lives occurred in the Hillside Mine operated by the Tunnel Smokeless Coal Company and situated near Johnstown, Cambria County, in the Twenty-fourth District, Nicholas Evans, Inspector.

The report of the Commission and the verdict of the Coroner's Jury of Cambria County follow:

REPORT OF COMMISSION OF INSPECTORS

Johnstown, Pa., August 14, 1928.

Hon. Walter H. Glasgow,
Secretary of Mines,
Harrisburg, Pa.

Dear Sir:

We, the undersigned Mine Inspectors, were directed by you to examine the Hillside mine of the Tunnel Smokeless Coal Company, to ascertain the cause, if possible, of the explosion in said mine on the afternoon of August 9, 1928, at 1 P. M., resulting in the death of five workmen.

This mine is situated in Stoneycreek Township, Cambria County, on the line of the Baltimore and Ohio Railroad, south of the tunnel near Kring Station.

The C-Prime seam of coal is being mined and the coal is delivered to the surface through a rock slope 330 feet long. This mine has been operating for about 10 years, the workings cover an area of about 3,000 by 2,500 feet and no pillars as yet have been extracted.

The ventilation is produced by a Robinson fan, 3 ft. in diameter by 4 ft. wide running 300 RPM with a water gauge of 7/10 inch, producing 31,500 cubic feet of air per minute. The fan is electrically driven, working on the exhaust principle. It was slightly damaged by the force of the explosion.

The mine is electrically equipped by A. C. current for coal-cutting and pumping; the voltage for mining machines and small pumps is 220. The coal is hauled to the bottom of the slope by storage battery motor. The coal-cutting machine is self-propelled, receiving its power from the connection to the power lines at junction boxes placed along the entries. This machine is of the explosion-proof type.