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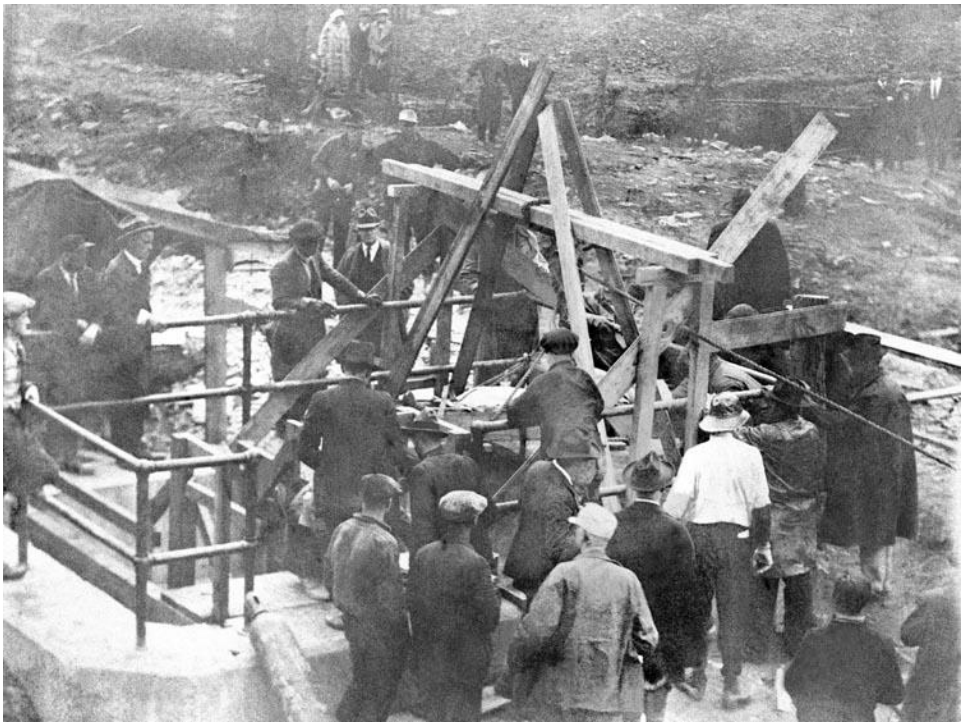
ON THIS DAY IN WEST VIRGINIA HISTORY
APRIL 28



Body of victim being removed from air shaft, Benwood Mine Disaster

On April 28, 1924, 119 miners were killed in an explosion at the Benwood mine of the Wheeling Steel Corporation.

CSO: SS.8.9, SS.8.24, ELA.8.1

Investigate the Document: (Report, Benwood Explosion, Ar1533)

1. According to the report, what was the likely culprit of the explosion in the Benwood mine?

2. The explosion caused what kind of collateral damage made rescue and exploration difficult?

3. According to the report, the first two men that rescuers discovered would have likely survived had they had what life-saving apparatus on their person?

Think Critically: How does the Benwood mine explosion compare to others you have read about in West Virginia's history? How would you improve mine safety if you were given unlimited control to coal mining legislation?

REPORT ON BENWOOD EXPLOSION

The necessity for a change in our state mine laws is forcefully brought to our attention by the recent occurrence of several serious explosions. The Castlegate explosion has attracted the most consideration because a larger number of men lost their lives in it than in others, and chiefly because its occurrence awakened Utah to the need of drastic revisions and annexations to her mine laws.

All attention is now focused on the situation created by the Benwood mine explosion in West Virginia. The industry wants to know the facts, and rightly, relating to the most fatal explosion that has taken place in many years in this state. Let us hope that we of the eastern coal producing states will profit as much by the explosion in the Benwood mine as did the western states by that in the Castlegate mine.

Several lessons were brought home to us while exploring the Benwood mine and searching for the causes of the explosion. Until such time as our knowledge of right and wrong practices is made the backbone of our mine laws, I am disposed to maintain that the frequency and violence of mine explosions will continue as in the past. No better way is at my command to present my case to you than by reporting on the Benwood explosion, at the same time making certain recommendations based upon my findings.

DATE OF EXPLOSION

On Monday, April 28, at 7:08 A. M. an explosion occurred in the Benwood mine of the Wheeling Steel Corporation near Wheeling, West Va., taking the lives of 118 men. Not a man in the mine when the explosion took place was able to save himself. Until such time as the examining commission makes its investigation and the inquest is held, no statement can be made fixing the agent of ignition which set off the explosive mediums. However, it is safe to say that a pocket of gas was ignited and the resulting local explosion propagated by coal dust, sweeping all the inner workings and galleries of the mine. The explosion is believed to have originated in the 8-North section.

At irregular intervals this mine working the Pittsburgh No. 8 seam, liberates gas at the faces of advancing headings. Consequently, it was always safe to operate with open lights after having been inspected for gas by fire bosses. Safety lamps were used by all assistant foremen and fire bosses. Air analyses taken at this mine from time to time showed less than one-half of one per cent of gas on any return section. This is one reason why open lights were used, but it proves conclusively that it is dangerous to depend on percentages of methane in any air split. Of course analyses should be taken at all times so that the officials will have a complete knowledge of the amount of gas liberated, but it does show that regardless of how low the percentage shown in the analysis, a

dangerous condition can be created in a very short time by a fall of slate, or the disarranging of a brattice or stopping. Dry and dusty sections of the mine were sprinkled by a water car. Both permissible and black powder were used in shooting.

OPENED 60 YEARS AGO

The Benwood mine was opened up about sixty years ago. Its early development was on a two-entry system for a distance of 7,500 feet from the pit mouth, and is now developing all its new workings on the three-entry system. Cross entries at right angles to the mains, and butt entries at right angles to the cross entries, develop panels in which rooms are driven in two directions on both sides of the butts, which is usually the practice where no pillars are recovered as in this mine.

Up until February 24, 1924, only one intake and one return were provided for ventilation. Realization of the need for better ventilation, as a result of a local explosion last fall of a pocket of gas in which a fire boss and two other men were killed, led to the sinking of a 9 x 13 foot concrete shaft to a depth of 315 feet. The latter is provided with an open stairway but has no hoisting equipment. The newly sunk airshaft serves as an intake for the 5-north section.

Two fire bosses were constantly employed in the Benwood mine, examinations starting at 3 A. M. making their inspections in time to return with the miners to their working places. On the morning of the explosion, the fire bosses had made their runs and reported no gas in any section of the mine. A night crew had distributed supplies, including explosives, to all working places in each of the live sections. As was the general custom, the distribution of supplies was supervised by one of the fire bosses.

TIME OF ENTRY

At 6:30 A. M. two men trips entered the mine. One traveled to the 5-North section and the other to the Main East and 8-North section. Both trips had reached their destination before the explosion occurred. The men in the 5-North section were found a short distance from the trip and apparently were headed for their respective working places, as were also the majority of the men on the 8-North section. Eight men were found on 5-East haulageway in a small trip of mine cars. They had been to their working places, and they endeavored to save themselves and had gotten as far back as the trip. The men on the Main East section had left the man trip and were located some distance away from the trip landing. One of these men was Fire Boss Rawlings who had examined this section of the mine for gas a few hours before the explosion.

The force of the explosion extended to nearly every section of the mine, with the exception of an area within a radius of about 1,000 feet of the airshaft which is remotely located with respect to the probable seat of the explosion. Its violence was checked also at a point on the main entry about 500 feet from the pit mouth because of the presence of wet spawlings of roof material on the bottom of the entries. As the explosion spent itself before reaching the outside, no damage was done to the ventilating fan. If the airshaft had not been sunk, or had the violence of the explosion continued unabated to and up the airshaft, it is quite likely that attempts to enter the mine would have been futile, and in that event the Benwood mine with its victims would have had to have been sealed.

All stoppings on the main entry and many on secondary entries were demolished, and overcasts were partially or totally destroyed. That brick stoppings are stronger than those of tile was conclusively proved in this explosion, for the former resisted concussion while the latter collapsed under similar conditions.

FALLS OF ROOF

Heavy falls of roof in almost every section of the mine were started by the explosion, hampering the exploration work. Practically all timbers were dislodged, releasing heavy loads of roof material on the entries. So weak and treacherous is the roof in this mine that timber sets, placed on two foot centers, were required on every principal entry. A six inch layer of roof coal is left in mining, above which is an easily weathered soapstone attaining a thickness of from four to ten feet.

Many difficulties were encountered which retarded the rescue and exploration work in the recovery of the bodies. A rescue team, on advancing 4,500 feet from the pit mouth by crawling over the falls, was forced to give up the attempt. In the evening of the first day, activities at the pit mouth of the mine were transferred to the Brown's Run airshaft.

In order to maintain a larger volume of fresh air in the workings being explored, a change was made in the system of ventilation. The intake of the split ventilating that area nearest to the pit mouth of the mine was stopped, after two of the temporary stoppings erected in the early exploration were removed, and the main entrance sealed off. This made a double return airway in conducting air to the exhaust fan. The change increased the flow of fresh air down the airshaft from 17,000 to 27,800 cubic feet per minute and served to draw all gases, wherever the ventilation was effective, in a direction away from the shaft. The volume of fresh air entering the shaft was increased hourly as temporary stoppings were erected to control the ventilation. Incidentally, the water gauge reading of 7 inches is a measure of the damage done by the explosion in destroying ventilation and obstructing airways by bringing down roof, etc.

3 MILE ROAD

Brown's Run airshaft is reached by traveling over a dirt road for a distance of about three miles from a hard state road. A heavy rain throughout the first day made the road impassable for trucks. Wagons, sleds and tractors were used in transporting supplies to the shaft. As no hoisting equipment had been installed in the shaft, supplies had to be lowered by a rope attached to an improvised cage platform, passing over a pulley block fastened to a quickly erected wooded headframe, and drawn by horses. Later a tractor was utilized for raising and lowering the cage. Rescue men were compelled to use the stairs in entering and leaving the mine.

As an aftermath of the explosion, a fire broke out between rooms No. 3 and 5 off 19-East heading. The roof in the vicinity of the fire fell heavily, due to the high temperature developed. The first was discovered following an investigation brought about by the night shifts' complaints of headaches and the observing of those manifestations of underground fires such as "breathing" action.

Little time was required to extinguish the fire by sealing off the fire zone. An air lock was erected to allow the passage of men into the fire zone after the fire was believed to have been extinguished. Subsequent to the exploration of this zone for the discovery of bodies, it was sealed for the second time. The situation was precarious by reason of the finding of gas about 1,000 feet from the fire. Ventilation was turned on this section and the gases were diluted and carried off after seals had been completed. A fire boss patrol at all times was necessary to protect the men exploring the mine.

The cause of the fire is not known, though the theory is advanced that a heavy squeeze on a room pillar caused spontaneous combustion.

The Benwood explosion, like several others of less serious consequences, should emphasize the necessity for classifying all mines as gaseous which liberate any quantity of gas. To avoid similar disasters, those mines which should be rightly termed gaseous must use approved electric cap lamps, explosion proof motors and also permissable explosives.

RESCUE AND EXPLORATION

The practicability and advantages over self-contained oxygen breathing apparatus of the Burrell All Service gas mask in rescue and exploration work following an explosion was conclusively proved at the Benwood mine. At least fifty Burrell masks were in use at all times, and about 90 per cent of the work was done by men wearing them. However, the self-contained oxygen breathing apparatus was used to explore places where it was thought the percentage of oxygen in the air was not sufficient to support life. The latter equipment was also worn by men who accompanied the gas mask crews,

to act in cases of emergency. In only rare instances was the heavy and cumbersome outfit really required. Men wearing the gas mask penetrated distances as great as 125 feet beyond points at which the carbon monoxide content of the air killed canaries.

How much greater are the freedom of movement and efficiency in work of the wearers of gas masks was demonstrated to Director H. Foster Bain, of the U. S. Bureau of Mines, who spent a long time in this mine watching the rapid erecting of stoppings, the recovery of bodies and other work by men equipped with the mask. In many cases, with cars jammed across the tracks and with timbers knocked crosswise and interlocked, it would have been exceedingly difficult to work with self-contained oxygen breathing apparatus. Mine rescue stations, in my judgment, are not complete unless they be equipped with at least ten gas masks.

Of the men who lost their lives in the Benwood explosion, I am certain that the two men who were first found and whose bodies were warm when discovered, would have saved themselves had they carried a self-rescuer (diminutive gas mask). Evidence surroundings of at least 35 bodies proved that this number of men were not killed by the violence of the explosion. As it was, many of these men tied handkerchiefs around their noses and mouths in an attempt to ward off death by the breathing of afterdamp. Had they likewise been equipped with self-rescuers and were they not prevented from reaching the outside by falls, they, too, would have been saved.

ROCK DUSTING

There remains one more point about which I desire to speak, and that is the necessity for rock dusting to prevent the propogation of explosions. It is my intention to use every resource at my command to urge the operators of West Virginia to take this important step in the direction of safety.

The criticisms which appear in this report are not directed in particular toward any company, field, district or state. Accidents of small or large magnitude cannot be attributed directly to carelessness or neglect on the part of a mine or company manager. Before state mining departments can effectively pin down responsibility for accidents and fatalities, they must build a structure of mine laws that provides no loopholes for evasion. The present laws must be brought up to date in order to meet the requirements of our fast growing industry, and guard lives and property under conditions brought about by advanced methods of engineering and operation. To that end coal-producing states should combine in an effort to make uniformity of mine laws the major consideration.

It is high time that an interstate code of safe-practice regulations be formulated, to which individual states so far as

possible should adhere, to revise and extend the scope of mine laws. There are many ramifications to the achievement of the purpose for which we should strive, but in sum and substance our biggest task is the attainment of uniformity in the mine laws of all coal-producing states. When this is accomplished, all operators in each of the states will be placed on a plane of equality as regards the monetary cost of obeying the mine laws.

There is yet another phase of our prospective program which must not be overlooked. That is, the education of the consumer of coal in the importance of safety in mining. He must be made to realize that the cost item resulting from the employment of safety precautions must be absorbed in the price of a ton of coal.

R. M. Lambie
Chief of Department of Mines.