

### ON THIS DAY IN WEST VIRGINIA HISTORY MARCH 17



Barrackville, Marion County

**On the night of March 17, 1925, an explosion in the Bethlehem Mine No. 41 at Barrackville killed 33 coal miners.**

**CSO: SS.8.9, SS.8.24, ELA.8.1, ELA.8.32**

**Investigate the Document: (*Mine Inspection Report, Ar1519*)**

1. Describe the tone of the mine inspector as he recalls the explosion rescue.
2. According to the mine inspector, what were the odds that the mine would explode again while the rescue squad was underground?
3. What hazards existed, in addition to the fire, in the first hours of the rescue attempt? What personal protective equipment was required to survive this hazard?
4. Although the mine inspector could not verify the origin of the explosion, what two theories does he have about its cause?

**Think Critically:** Did the mine inspector's report paint a vivid picture of the explosion's aftermath? What is your biggest takeaway from the reading?

of these men being alive. However, as we proceeded with improvised stoppings we were horrified to discover an immense volume of smoke, which we decided was from a mine fire, undoubtedly at some point on main north face.

Those who have fought mine fires will understand the thoughts that flashed through the brain of each man present. To be in a mine liberating explosive gas freely, the ventilating system entirely disrupted, with a mine fire at some unknown point, and not knowing what minute the mine was likely to blow up again, was indeed discomforting. The fact that in the 1916 explosion rescue squads had just reached the outside when the mine again exploded was enough to upset the routine of things for a few minutes. The general plan of work had to be changed, and it was necessary to make all possible haste to the point of fire, hoping that we could reach it before the mine atmosphere reached the explosive point. Times such as these, when men face danger together, bind them more closely to each other, for these men knew the hazard and they realized that it was a fifty-fifty proposition whether the mine atmosphere would reach the explosive point at the fire or whether it could be reached with a fresh volume of air and the explosive hazard eliminated. However, there was no time under conditions of this kind to figure on the possibility of failure, as all thought and energy had to be concentrated and directed toward success.

No man in such a crisis was blessed with more courageous and able men than I had at my command in this emergency, and, as the map was carefully charted with a stopping here and a stopping there, the men worked as they had never worked before. About midnight the day following the explosion we reached the fire, which was a raging furnace. This fire

was in by the mouth of fifth left butt off main north face and extended a distance of 175 feet. A hasty examination of the mine atmosphere just in by the fire, made possible by using Burrell Gas Masks, revealed the fact that an explosive mixture of gas was less than 75 feet away. The next few hours were the most trying imaginable as we did not have the ventilation in sufficient volume to remove this immense body of gas, there being over one million two hundred thousand feet of gas at that point, most of which was on top of gobs where the pillars had been extracted. However, we soon had a sufficient volume of air to deflect over and around the fire which carried off and diluted the heavy volume of gas, thus removing the gas hazard from the fire zone for all time. This heavy volume of air acted on the fire the same as a force draft at a furnace, but the removal of the gas from the fire zone was of the greatest importance. As soon as it was deemed safe to change the ventilation around the fire zone, this was done and carried out by using canvas stoppings and checks for deflecting the air current. Then the fight to subdue the flames commenced, and with two lines of hose with a two hundred pound pressure a straight attack was made; and as the flames were lowered those brave men would follow, crawling on hands and knees over the red hot coals. There was great danger of falling roof owing to its being exposed to such high temperature and the sudden change brought about by forcing heavy volumes of water <sup>of</sup> low temperature on the fire, roof and ribs, but this danger was minimized by setting short safety posts to protect the men as they advanced. This fight was maintained until all flames were extinguished, then dams were hastily built around the fire zone to submerge the burning coal. This worked very successfully, and the task of building

the seals was made comparatively easy. After the completion of the seals the temperature in the fire zone fell rapidly. However, as an added safety measure, a patrol of two men on each shift was detailed to the fire zone and instructed to keep the seals in proper condition to prevent leaks. After this was done, the men felt somewhat relieved, notwithstanding the fact that they realized they had yet many difficult and dangerous tasks to perform before they could reach the entombed men.

In the actual recovery of the bodies, after the fire hazard had been eliminated, it was just a case of maintaining sufficient ventilation to carry off and dilute the dangerous gases that filled every portion of the mine. The advance guard, which was composed of men wearing Burrell Gas Masks, performed ninety-five per cent of the exploration work, five per cent being accomplished by men wearing Gibbs Self Contained Breathing Apparatus. Following these men were the brattice crews, who were equipped with gas masks and often compelled to wear them, and then the transport men.

Telephone communications were established just as fast as the gases cleared out. There were eight telephone stations in all. These points served also as supply bases. The entombed men were in practically every section of the mine, which made the recovery work slow. However, the entire mine was explored and all bodies brought to the surface in less than six days' time.

While this great fight was going on, our Governor was on the job day and night, seeing that everything was done to take care of the dependents and to hurry supplies into the mine as requests were made. When the first bodies were brought to the surface he was there lending his aid, and he remained on

the scene until the last bodies were removed from the mine.

The State Constabulary was also on the job just a few minutes after the explosion, and the men in their quiet, courteous and efficient way took charge of the situation, and in a very short time everything was being conducted in an orderly manner. In fact, there was no confusion at or near the mine as is generally the case at explosions.

It has already been stated that this mine liberates explosive gas in dangerous quantities and that coal dust is a source of great danger, but, inasmuch as the inquest has not yet been completed, it is impossible for me to express my opinion as to the cause or the point of origin. However either of these could have been the cause.

If this explosion was started by the ignition of a pocket of explosive gas, it is possible that the shock and pressure waves threw sufficient particles of fine dust in suspension to propagate the flame throughout the mine. Supposing it was started by the ignition of coal dust alone, it could have been propagated throughout the mine, for it has been demonstrated that fine, dry bituminous coal dust, when in suspension in the air, can be ignited by an open torch. However, before this can be done, the atmosphere must have a relatively high density such as one sometimes sees at mine tipples. Fine bituminous coal dust having ten per cent or more of volatile can be ignited when in suspension in the air, and the greater the percentage of volatile matter, the easier the ignition. The coal at Barrackville is high in volatile having a per cent of 35.7.

The damage done at the hoist shaft was terrific as undoubtedly this shaft was in the direct line of the explosion.

The man-shaft was also badly damaged. It is safe to state that only about fifty percent of the force that was exerted at the hoist shaft was exerted at man-shaft and possibly ten per cent at air shaft. The greatest destruction at any point was that at the hoist shaft, but this is no indication that the explosion happened at that point, for, generally speaking, the point of origin shows the least physical destruction. This, of course, would be determined by the source and cause of ignition. If high explosives, such as caused the explosion at the Summerless mine, were responsible, then there would be a great shattering force, the effects of which would be easily noticed. An explosion does not attain high velocity nor build up high pressure until it has traveled nearly two hundred feet. This, however, is determined by the amount of dust it has to feed upon, also the fineness of the dust, etc.

— In demonstration work, velocities of three thousand feet per second have been recorded and, judging from the destruction of this mine and the extent of development, it is safe to assume that the velocity of the flame of this explosion traveled not less than <sup>Three</sup> ~~two~~ thousand feet per <sup>Second</sup> ~~minute~~, and possibly developed a pressure of not less than one hundred and forty pounds to the square inch; but this depends upon the rapidity of the combustion of the dust and the percentage that is finer than twenty mesh, as dust coarser than twenty mesh will not ignite. The finer the dust, the easier it is to ignite and the more violent the explosion.

The explosion wave travels in conic shape, the apex being at or near the center of the opening through which the flame is traveling, and it is the movement of the flame and hot gases that constitutes the chemical reaction. Preceding