

gummy, and the rubber lining on the outside of the fabric had been almost completely dissolved. Tests also were conducted on a similar apparatus, a duplicate in every way of

the one Cunningham used, by subjecting it to gasoline in both vapor and liquid forms. The conclusion from the tests was as follows: "The experiments show that gasoline and also gasoline vapor in higher concentrations can penetrate the thin rubberized bags such as have been used on the ½ hour oxygen breathing apparatus"

This accident led to the development of heavy rubberized breathing bags for oxygen apparatus that are now used on some of the modern mine rescue equipment. Subsequent tests on heavy bags revealed that high concentrations of gasoline vapors will in time penetrate them. The Bureau, therefore, recommends that the heaviest type breathing bags should not be used in gasoline vapors longer than 2 hours, after which the bag should be discarded or thoroughly soaked and washed with water and aired out before reuse. It is recommended also that when necessary to enter a place containing gasoline vapors while wearing an oxygen breathing apparatus, a rope or safety belt should be provided and that the apparatus man or men should be watched closely so that they can be withdrawn immediately in case of distress. [Source document](#). (page 22-23)

Henry DeWinter, Hugh Hughes, and James Hudson

On July 10, 1920, Henry DeWinter, Hugh Hughes, and James Hudson lost their lives while wearing oxygen breathing apparatus in an **abandoned slope of the Black Diamond No. 2 mine of the Pacific Coast Coal Co., Black Diamond, Wash.** Hughes and DeWinter, wearing Draeger apparatus, were members of the Black Diamond mine rescue team which had gone down the slope to measure the height of the water in the slope as part of their mine rescue training practice. Hudson, wearing Gibbs apparatus, lost his life while assisting with the recovery of the bodies of Hughes and DeWinter.

The crew left the slope portal, which was the fresh air base, without a reserve crew present but with a man at the portal to pay out the lifeline. The dip of the first 500 feet of the slope was about 25° and the remainder was 35°. The crew descended about 200 feet when the flame of the safety lamp which they were carrying was almost extinguished by blackdamp. They retreated a short distance, hung the lamp on a timber, and descended to the water, which was about 1,400 feet from the portal. After reaching the water, the crew members took a short rest, read their gages, and then started to return. They had proceeded a short distance when DeWinter collapsed. The team captain opened the bypass of DeWinter's machine, but there was no flow of oxygen. The four remaining

members of the crew had carried him 30 feet, when Hughes collapsed. Realizing that it would be impossible to carry both men up the slope, the other three members of the crew decided to go to the surface for help. One of the men reached the surface in good condition, another collapsed when he reached the fresh air, and the third collapsed before he reached the portal and had to be assisted by the man that had been left at the fresh air base.

A call was sent out for assistance, which was received by a Bureau of Mines employee who had just finished training a team at Burnett, a town 18 miles away. Taking four members of the Burnett team with him, the Bureau man drove to the mine immediately and organized a crew to enter the slope and a crew to stay in reserve at the portal. The advance crew entered the slope and brought out the body of Hughes. Hudson and four other men, wearing apparatus, descended the slope to recover DeWinter's body. This crew had brought DeWinter's body a short distance when one of their members was found to be in distress, complaining of not getting enough oxygen, and later he went to the surface. It is generally supposed that in using the bypass valve he had turned off the main bottle valve (perhaps a condition similar to that described previously in the case of Lewis M. Jones). When this man found that his apparatus was again working properly, he started to rush up the slope, deserting the crew. On his trip out, he was met by another rescue crew coming down the slope. Two members of this crew assisted him until he was within 100 feet of the fresh air base, when he collapsed. Men at the fresh air base took him to the surface, where he was revived. He had worn a Bureau of Mines Fleuss apparatus, and it is believed that in his rush to get outside the oxygen supplied by the reducing valve was insufficient, causing him to gasp and inhale some of the mine atmosphere.

Soon after this man left the crew, Hudson became distressed. He was assisted a short distance by four other crew members but finding it impossible to carry him they left one man with him and went for assistance. Soon thereafter the relief crew arrived and tied a rope around his body, the crew at the fresh air base pulled him to the surface while the rescue crew guided his body. No reason is given for Hudson's collapse other than excitement or fright. It is known that when he collapsed his apparatus was apparently working perfectly and was adjusted properly. His apparatus became somewhat deranged while he was being dragged out of the mine, and he probably breathed some of the mine air. He was given artificial respiration for 1 hour and 27 minutes without results. Hudson had been wearing a Gibbs apparatus, which was tested later and found to be in perfect working condition; moreover, the same apparatus was worn again that same day, and no trouble was experienced with it.

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When Hudson was brought out of the mine, it was believed that DeWinter was dead, and since the rescue crews were exhausted a second call was sent out for additional help. Rescue teams from Carbonado, Hyde, Bayne, and New Castle, Wash., responded. These apparatus men, in groups of three, were stationed at 200-foot intervals on the slope. DeWinter's body was lashed to a sled, which was pulled with a rope by men at the fresh air base. The crew that lashed DeWinter's body to the sled guided it the first 200 feet, and then the next crew took over for the next 200 feet, and so on until the body reached the surface. Approximately 12 hours had elapsed between the time DeWinter entered the slope and the time his body reached the surface. [Source document](#). (page 23-24)

Philip White

On July 29, 1920, Philip White, district superintendent, age 41, lost his life while attempting to explore a part of No. 18 mine, By-Products Coal Corporation, West Frankfort, Ill., which had been sealed because of fire.

According to the information in our files, Mr. White was not satisfied with the progress being made, and, after a hearty Sunday dinner, he entered the mine, borrowed the helmet of one of the men, took the lifeline, and ran ahead alone over several falls and collapsed. Reportedly, he became sick and vomited into his mouthpiece, thus rendering his apparatus inoperative. [Source document](#). (page 24-25)

Thomas Ritson

On the morning of September 2, 1921, a party composed of three men appointed by the Illinois State director of the Department of Mines and Minerals, the superintendent of the State rescue station at Harrisburg, Ill officials of the mine investigated an explosion that had occurred in the Harco mine, Harrisburg Collieries Company, on August 31, 1921. During this investigation, a crew composed of Frank Patterson, superintendent of the Harrisburg rescue station, William Lacy, safety inspector for the coal company, and three other men, Davis, Kilgore, and Ritson, all wearing Fleuss apparatus, explored the 9th and 10th and the 11th and 12th north entries for possible fires. During the exploration in the 11th north entry, Davis complained of distress. The team was immediately halted, and Davis 1 apparatus was examined and appeared to be functioning properly, but as he still complained of distress the team was ordered to retreat to the fresh air base. At this time Ritson complained of being in distress, and Mr. Lacy examined Ritson's apparatus but could find nothing wrong with it. The gage showed 45 atmospheres of oxygen. Lacy then