

MINUTES OF EVIDENCE.

HUNTLY, THURSDAY, 1ST OCTOBER, 1914.

The Commission met at 10 a.m.

Mr. C. J. Tunks appeared for the Taupiri Coal-mines (Limited); Mr. W. J. Napier for the trustees of Ralph's Estate, the owners of the mine; Mr. P. S. K. Macassey for the Mines Department; Mr. G. M. Newton for the Taupiri Coal-miners' Union; Mr. T. M. Wilford for the New Zealand coal-miners affiliated with the Federation of Labour and the United Labour Party, and certain of the relatives of the deceased miners; Mr. Gould for other relatives of the deceased miners.

HUNTLY, FRIDAY, 2ND OCTOBER, 1914.

HAROLD BAILY DIXON, Professor of Chemistry in the University of Manchester, sworn and examined. (No. 1.)

1. *The Chairman.*] What is your full name and qualifications?—Harold Baily Dixon. I am Professor of Chemistry in the University of Manchester. I am and have been working on the nature of explosions for the last twenty-eight years, and for the last twenty-five years I have been interested in explosions in mines. I was a member of the Royal Commission on the Explosion of Coal-dust in Mines that was sitting between 1891 and 1894. I have also been a member of the Royal Commission on Coal-supplies; and, lastly, I have been a member of the Executive Committee of the British Home Office to investigate explosions in coal-mines and to carry out experiments on a large scale, with a view to finding the nature of such explosions, and, if possible, to find a remedy for them.

2. You have inspected Ralph's Mine and come to certain conclusions with regard to what you saw there?—Yes, I have made two inspections of the mine since the accident—the first on the Monday following the explosion, the 14th September, and again last Tuesday, the 29th September. After making my first inspection I wrote a report on the subject, dated the 15th September, to the Minister of Mines, which is as follows:—

“Sir,—

“Wellington, N.Z., 15th September, 1914.

“I am glad to comply with your request conveyed in your letter of to-day's date that I should give you my opinion on the question of the future working of coal in Ralph's Mine at Huntly, and of coal in similar seams.

“Though it is not possible at present to locate the origin of the explosion in Ralph's Mine, the main loss of life was due to the inflammation of coaldust lying on the roads. The flame traversed the main intake airway, which is also a haulage-road to the downcast shaft. No other inflammable agent but coaldust could have been present in this intake airway in sufficient quantities to propagate an explosion. Parts of this road are wet, but the dust-cloud raised by the blast was carried over the wet places and the flame of the burning dust-cloud ignited the dust beyond until it reached the shaft. The flame also penetrated many of the other roads, blowing stoppings here and there into the returns.

“I am of opinion that it would be advisable in future to work this and similar coal-seams with safety-lamps, and I believe that modern electric lamps (which give far better illumination than oil-lamps) would be the best. There are several types of electric lamps which have passed the British Home Office tests. Until such lamps are procurable I am of opinion that it would be safe to work with naked lights, provided (1) that strict tests were made for firedamp before the miners entered, and (2) that the dust in the main roads was rendered unflammable either by systematic watering or by systematic admixture with finely divided inert dust, such as powdered shale, limestone, or fullers' earth.

“In the Home Office experiments carried out at Eskmeals, Cumberland, it has been found that it becomes more and more difficult to propagate an explosion through a gallery containing finely divided and easily inflammable coaldust when the latter is mixed with more and more inert dust in a fine state of division. When the inert material is equal in weight to the fine coaldust it is practically impossible to start an explosion by such means as the discharge of 24 oz. of blasting-powder from a cannon placed in the gallery. The inert dust must be so finely divided that any disturbance of the air that raises the coaldust into a cloud will also raise the inert material.

“The damping of coaldust by finely divided water-sprays (an atomizer is most effective) is also a sure means of preventing the coaldust being raised. A combination of inert dusting and spraying may be used, the inert dust being thrown into the roof, where it is sometimes impossible to water. Safety depends on either preventing a dust-cloud being raised or on rendering such dust-clouds as are raised unflammable by diluting the combustible with incom-bustible particles.

“The quantity of inert dust to be added depends, of course, on the amount of coaldust made in the mine. It is the fine dust blown off and shaken out of the tubs in haulage that is the most dangerous, and to this must be added in many cases dust carried from the screens on the surface down the downcast shafts and deposited on the haulage-road. In the case of Ralph's Mine, where the roofs are good throughout most of the mine, efficient watering would be very easy to carry out. In a few places inert dust might be used where watering might be difficult.

“It may not be possible to prevent some minor ignitions of fire-damp occurring, but I believe it is possible and practicable to prevent such small inflammations developing into a destructive explosion such as caused the disastrous loss of life at Huntly.

“I have, &c.,

“The Hon. the Minister of Mines, Wellington.”

“HAROLD B. DIXON.