

Each of the two theories presents its difficulties, and such local indications as might have been disclosed had a full inspection of the mine been possible after the first explosion were destroyed by the second and third explosions. We think, however, that the explosion originated in one or other of the above ways.

13. *Part played by Coal-dust.*—Whatever may have been the origin of the explosion, it is in our opinion clearly established that its propulsion from end to end of the mine and its great violence was due to the presence of coal-dust. Had coal-dust not been present, or had such coal-dust as was present been rendered innocuous by treatment, we think that any explosion of firedamp that may have taken place would have been local and not general throughout the mine, and would have been of relatively small violence. The loss of life, if any, would have been considerably less.

14. *Danger of Coal-dust.*—Coal-dust has been the effective agent in most of the great mine disasters in different parts of the world. In the New Zealand explosions at Brunner in 1896, and at Huntly in 1914, coal-dust played the major part in the havoc wrought. Coal-dust in varying quantities and in varying conditions as to fineness and as to dryness is present throughout every coal-mine. Many precautions are taken for protection against an explosion of firedamp. Less has been done to minimize the danger due to coal-dust. We emphasize this matter as we consider that the potential danger of coal-dust has not in the past received attention commensurate with its importance. The Coal-mines Act and the regulations thereunder contain provisions for coping with the danger due to coal-dust.

15. *Steps taken in relation to Coal-dust.*—Early in 1926 the Chief Inspector of Mines, with a view to focussing the attention of mine-owners on this question, issued to them throughout New Zealand a circular setting out the methods he recommended for the sampling, analysing, and recording of coal-dust. A copy of this circular was on the 14th May, 1926, forwarded by the District Inspector to the general manager of the Dobson Mine, under cover of a letter which stated that the Department intended to insist on the observance of the regulations relating thereto.

On the 6th September, 1926, the District Inspector again wrote to the general manager requiring samples to be taken, and threatening a prosecution unless they were duly taken. The general manager thereupon took samples and forwarded them for analysis.

On the 3rd November, 1926, the District Inspector notified the general manager that the samples did not comply with Regulation 246 (2) and advised him that all roads must be stone-dusted. Stone-dusting involves the sprinkling of quantities of fine non-inflammable dust (such as crushed limestone) over the coal-dust deposited on the roof, walls, and floors of the mine. The efficacy of stone-dust in this connection is in its nature a matter that scientific research and thorough testing must decide; but so far as we can learn from the evidence given at the inquiry and from the books and treatises on the matter that we have been able to peruse we think that stone-dusting, if done in proper quantity and in a proper manner, renders the coal-dust inert and harmless.

No adequate steps were taken by the Dobson manager to comply with the Inspector's requisition, but about the middle of November, 1926, the mine-manager, with a view to meeting the further pressure put on the company by the Inspector, laid a surface of clay along one of the driest roadways in the mine. As has been shown, this precaution proved inadequate to prevent a coal-dust explosion.

The amount of time allowed to this company to comply with this regulation was in our opinion somewhat long.

It should be mentioned here that the value of stone-dust in the prevention of a coal-dust explosion was not fully appreciated by miners generally in New Zealand, and that until 1926, when the Chief Inspector of Mines insisted on compliance with the regulations in this regard, it was the exception rather than the rule for a mine in New Zealand to be stone-dusted.

We think that Inspectors of Mines should be instructed to insist on immediate and rigid compliance with the regulations regarding stone-dusting in all the mines to which they apply.