1927.

NEW ZEALAND.

DOBSON COLLIERY DISASTER

(REPORT OF ROYAL COMMISSION ON).

Laid on the Table of the House of Representatives by Leave.

COMMISSION.

COMMISSION TO INQUIRE INTO AND REPORT UPON COLLIERY DISASTER AT DOBSON.

CHARLES FERGUSSON, Governor-General.

To all to whom these presents shall come, and to EDWARD PAGE, Esquire, of Wellington, Stipendiary Magistrate; JOHN WATSON, Esquire, of Huntly, Mine-manager; and WILLIAM BALDERSTONE, Esquire, of Blackball, Miner: Greeting.

WHEREAS an explosion occurred on the third day of December, one thousand nine hundred and twenty-six, at the coal-mine at Dobson known as the Dobson Mine, the property of the Grey Valley Colleries, Limited, which caused the death of nine persons working therein: And whereas it is expedient that a Commission should be issued for the purpose of inquiring into the cause of the said explosion, and into the working of the existing law in respect to the prevention of such explosions, and for the other purposes hereinafter mentioned:

Now, therefore, know ye that I, General Sir Charles Fergusson, Baronet, Governor-General of the Dominion of New Zealand, reposing trust and confidence in your knowledge, integrity, and ability, and acting by and with the advice and consent of the Executive Council of the said Dominion, do hereby, in exercise of the powers conferred on me by the Commissions of Inquiry Act, 1908, and of all other powers and authorities enabling me in this behalf, constitute and appoint you, the said

EDWARD PAGE,
JOHN WATSON, and
WILLIAM BALDERSTONE

to be a Commission for the purpose of making inquiry into the matters hereinbefore referred to, and into the several other matters mentioned in these presents, that is to say,—

(1) To inquire in what part or parts of the mine the explosion first started, and the nature of the same.

(2) To inquire how the explosion was initiated.

(3) To inquire to what extent the provisions of the Coal-mines Act, 1925, were complied with in the mine, and more especially as regards (*a*) The examination of the mine; (*b*) ventilation; (*c*) lighting; (*d*) the character of explosives used, the preparation of shots, and the method of firing shots; (*e*) prevention and treatment of inflammable dust; (*f*) use of electricity underground.

(4) To inquire into the nature and character of the working and general management of the mine, and whether the mine was well and safely managed.

(5) To inquire into the efficiency of the inspection of the mine by (*a*) The Inspector of Mines for the district, (*b*) the workmen's Inspectors.

(6) To inquire whether or not the loss of life would have been averted or reduced had the services of a rescue brigade been available immediately after the explosion occurred.

(7) To make suggestions for the prevention as far as possible of similar accidents, and for the safe working of this and other mines in the future.

(8) And generally to make inquiry into any matter or thing arising out of or connected with the several subjects of inquiry hereinbefore mentioned, or which in your opinion may be of assistance in fully ascertaining, explaining, and arriving at a fair and just conclusion in respect to the subjects of inquiry, and into the working of the existing law in respect to the prevention of similar accidents; and to report whether any additional legislation is necessary, and the scope of same, and whether an amendment of the regulations included in the existing law can be made sufficient to provide reasonable and proper safeguards against such accidents.

And with the like advice and consent I do further appoint you, the said

EDWARD PAGE,

to be the Chairman of the said Commission.

And you are hereby authorized to conduct any inquiry under these presents at such time and places as you deem expedient, with power to adjourn from time to time and place to place as you think fit, and to call before you and to examine on oath or otherwise such persons as you think capable of affording you information as to the matters aforesaid, and to call for and examine all such books, papers, writing, documents, and records as you deem likely to afford you the fullest information on any such matters, and also to use the evidence taken in the course of any inquest or other previous inquiry having reference to the said explosion and the deaths thereby caused.

And, using all due diligence, you are required to report to me under your hands and seals, not later than the twentieth day of June, one thousand nine hundred and twenty-seven your opinion on the aforesaid matters.

And you are hereby strictly charged and directed that you shall not at any time publish or otherwise disclose, save to me in pursuance of these presents or by my direction, the contents or purport of any report so made or to be made by you.

And it is hereby declared that this Commission shall continue in full force and virtue although the inquiry be not regularly continued from time to time or from place to place by adjournment.

And, lastly, it is hereby further declared that these presents are issued under and subject to the provisions of the Commissions of Inquiry Act, 1908.

Given under the hand of His Excellency the Governor-General of the Dominion of New Zealand, and issued under the Seal of that Dominion, this second day of June, one thousand nine hundred and twenty-seven.

[L.S.]

G. JAS. ANDERSON,
Minister of Mines.

Approved in Council.

F. D. THOMSON,
Clerk of the Executive Council.

REPORT.

In the matter of the Commissions of Inquiry Act, 1908; and in the matter of a Commission to inquire into the mining disaster which occurred at the Dobson Colliery on the 3rd December, 1926.

To His Excellency the Governor-General of New Zealand, Wellington.

MAY IT PLEASE YOUR EXCELLENCY,—

Pursuant to the Commission, dated the 3rd day of June, 1927, entrusted to us by Your Excellency, we have the honour to report as follows:—

1. We duly assembled and commenced the inquiry at the Courthouse, Greymouth, on the 10th day of June, 1927.

2. *Parties.*—The following parties appeared:—

(*a*) The Grey Valley Miners' Union (represented by its president, Mr. J. Smeaton).

(*b*) The West Coast District Council of Miners' Unions (represented by Mr. R. J. Wearne).

(*c*) The Deputies and Underviewers' Industrial Union (represented by Mr. W. J. Joyce, of Greymouth, barrister).

(*d*) The Grey Valley Collieries, Ltd. (owners of the mine), (represented by Mr. J. W. Hannan, of Greymouth, barrister).

(*e*) Mr. W. A. Leitch (general manager of the mine at the time of the disaster).

(*f*) Mr. Charles Hunter (formerly the mine-manager).

(*g*) The Department of Mines (represented by Mr. A. H. Kimbell, Under-Secretary for Mines).

(*h*) Mr. J. A. C. Bayne, Chief Inspector of Mines for New Zealand.

(*i*) Mr. O. J. Davis, Inspector of Mines for the District.

(*j*) Mr. C. J. Strongman, formerly Inspector of Mines for the district.

3. *Proceedings.*—After the inquiry had been formally opened and the question of procedure settled, the proceedings were adjourned until the afternoon, and the Commissioners visited and made a thorough inspection of the mine. The sittings were resumed on the afternoon of the 10th, and were continued on the 11th, 13th, 14th, 15th, and 16th June. The Commissioners, on the 17th June, made a further lengthy inspection of the mine.

During the course of its investigations the Commission examined thirty witnesses. The proceedings throughout were open to the public, and full reports were published in the newspapers.

4. *Description of Mine.*—The Dobson Mine, in which the accident the subject of this inquiry occurred, is situate in the Township of Dobson, on the left bank of the Grey River, some six miles inland from Greymouth.

5. *Tenure.*—The company holds under lease from the Crown an area of 950 acres. The lease was granted on the 6th December, 1920, to the predecessors in title of the present company, and was assigned to the present company on the 24th September, 1924. At that date development work only had been carried out. The present company has continued development work, and has for the past two years been winning coal.

6. The seam is a bituminous coal of good quality. It averages from 10 ft. to 21 ft. in thickness, and dips generally from north-east to south-east at a gradient of 1 in 3·5.

7. *Firedamp.*—The Dobson seam, like many seams in this district gives off a substantial quantity of firedamp.

8. *Dryness.*—Though damp in parts, the mine may be described as of average dryness compared with mines in the district. It makes an average amount of dry coal-dust.

9. *Method of Working.*—The coal is reached by a main tunnel 1,200 ft. long, cut in sandstone, descending at a gradient of 1 in 2·75 from the surface to the seam. The mine was worked on the panel system. Being a new mine, its chief operations consisted in development by way of driving main headings and dips. The headings, levels, and dips made in the seam at the time of the disaster extended in all to some two miles and a quarter. A plan of the workings is forwarded herewith.

10. *Power.*—The power used throughout is electrical. The main plant above ground consists of the haulage and the main ventilating-fan. Underground are a winch, a ventilating-fan, and two pumps, all electrically driven.

11. *Story of Explosion.*—The explosion occurred during the night shift in the early hours of Friday, the 3rd December, 1926. There were during that shift twelve men at work in the mine, one of them being a deputy in charge of the operations. Three of these men were engaged in taking sleepers and other equipment from the surface into the mine. Shortly before 3 a.m. these three men, being then at the surface, entered a small shed near the entrance to the mine to have their crib there. While there they heard a deep rumble, lasting several seconds, culminating in a violent explosion. This was followed at a few seconds' interval by a smaller explosion. A tongue of flame flashed from the mouth of the mine. To reach this point the flame had travelled 1,200 ft. up a clean sandstone dip from the workings to the surface against a strong air-current. A subsequent examination showed that a similar flame had travelled the length of the return airway and issued from the mine there.

Shortly after the explosion a party consisting of the mine-manager and some miners courageously, and, as we think, at the risk to their lives, entered the mine in an endeavour to rescue their comrades. In the winch-house they found four of the men, three of them dying and one dead, and brought them to the surface. They were unable to reach the others. Some time later another party, consisting of the Mining Inspector for the district, the various mine superintendents and managers in the district, and some selected miners, again at the like risk entered the mine. They found the mine on fire in several places. It was clear to them that the remaining men who had been in the mine at the time of the explosion must have perished and that there was no possibility at that time of recovering the bodies. As the fan had gone out of action the party withdrew, and after a general conference steps were taken to endeavour to choke the fires by stopping up the mine.

At about 3 in the afternoon—just twelve hours after the first explosion—a further explosion occurred, blowing the stoppings out. Six hours later, while efforts were still being made to seal up the mine, a third explosion, more violent than the last, occurred. Steps were then taken to flood the mine.

The bodies of the remaining men were recovered some five months later when the mine was dewatered. The positions where the various men and bodies were found are shown on the plan.

12. *Origin of Explosion.*—The closest investigation by us has failed to disclose with certainty the origin of the explosion. All of the three injured men who were brought to the surface died without recovering consciousness, so that no information was given by them to their rescuers.

Two theories were advanced by witnesses at the hearing. There was in this mine considerable laxity (hereinafter more fully referred to) in the issue and use of oil safety-lamps. It was suggested that a lighted oil safety-lamp may on this occasion have been left behind in the rise workings, and that an accumulation of gas may have reached it and have gradually caused the flame to increase until the lamp became heated and the gas thus became ignited.

The alternative theory was that the explosion originated in the dip workings, at one of the faces where men were working, either by a blown-out shot or a defective lamp, or a naked light igniting a body of gas.

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.

Dealing now seriatim with the various matters detailed in the Commission and not covered by the above comments, we have the honour to reply as follows :—

16. *Examination of the Mine.*—The regular examination of the mine by the company's officials appears to have been properly carried out.

17. The ventilation is effected by a main ventilating-fan in the return airway outlet, the necessary directing and splitting of the air-currents being effected by brattice, pipes, and stoppings. An auxiliary fan feeding air through pipes to some of the working-faces assists the main ventilating scheme. Ample air to effect thorough ventilation enters the mine.

The carrying of the air-currents through to the various working-faces improved considerably during the last few months, but notwithstanding this the ventilation in some of the places was capable of improvement. The remedy for this consists in a more careful construction of the stoppings, and in a regular and methodical fitting and continuing of the various brattices.

We suggest that the Department consider the question of increasing in gassy mines the minimum of 150 cubic feet of air per person per minute, and also that it make provision that in all mines not less than the minimum amount be conducted into each working-place for each person working in such place.

18. *Lighting.*—It may be mentioned here that, so far as is known, this is the first explosion of magnitude that has occurred in New Zealand in a mine where safety-lamps are used. It was the custom of the company to issue one electric safety-lamp to each miner, and one oil safety-lamp to each pair of miners. There was considerable laxity in the daily issue of these oil safety-lamps. Miners just helped themselves and returned the lamps as they chose, no note or check (as required by section 97 of the Act) being taken of such issue or return. The idea of thus issuing three lamps to each pair of men was that the men would use the electric lamp to illuminate their work and the oil lamps to test, if necessary, for gas. This issue of lamps (though of advantage in enabling each miner to test for gas) carries with it an element of danger. In practice the men would hang up the oil-lamp on some adjacent prop and leave it there unattended. The laxity of the management in the manner of issuing lamps was reflected in the actions of the men. It was proved that on at least one occasion a man had gone away off shift from his working-face and left his lighted oil-lamp behind. Sometimes lighted lamps would be left by the men on trucks on the main level or at the foot of the stone dip and be brought in by the deputy.

In this connection we think that a regulation should be framed requiring the management of a mine, before first issuing to a miner a safety-lamp, to ascertain that he is fully conversant with its properties, and if necessary to give full instruction to him thereon.

19. *Explosives and Shot-firing.*—The type of explosive used is monobel A 2, which is a " permitted " explosive within the meaning of the Coal-mines Act. Some laxity existed in this mine in the method of preparing coal for the firing of shots. Regulation 242 (*b*) provides that no shot shall be fired unless the coal has been holed or side-cut to a depth greater than the depth of the shot-hole. We are satisfied that this regulation has at times been ignored and that the dangerous practice of " grunching " has been followed (*i.e.*, holes have been drilled in the solid face of coal, and fired). The great risk of such a shot is that, instead of breaking the coal down, the charge may blow out of the hole in which it was put. Should gas or dry coal-dust be present and the shot be overcharged, this may cause an explosion.

We think that the regulation should be amended so as to specify the length and depth of the holing or cutting required, the distance within which the hole must be placed in relation to the cut, and the direction the hole must take, reserving power, however, to the Inspector to modify or waive such provisions in any seam which should necessitate it. One witness of experience described the life of a shot-firer as " one constant fight " to resist the urgings of miners that he should fire shots that in his opinion are improperly prepared. A concise regulation on this question will strengthen the hands of the shot-firers.

20. *Electricity underground.*—Details of the electrical plant in this mine are set out above. We think that electricity played no part in the origin of this explosion. In our opinion the use of electricity underground in mines should not be forbidden. The strictest care should, however, be exercised by the Inspector of Mines in regard to the nature and type of plant, and the places where it is to be used, before permission to install it is given.

21. *General Management of Mine.*—The staff consisted of a general manager, a certificated mine-manager, an underviewer, two deputies, and an electrician. There were about one hundred and forty men employed in and about the mine, one hundred underground and forty on the surface.

At the date of the disaster the general manager was away from the district, having been off on sick-leave for about three weeks.

On account of the rapid increase in the number of the working-faces the number of miners employed had been steadily increasing, and the number of staff had not kept pace with the increase in the number of miners. We think that on the 3rd December the mine was somewhat understaffed.

We have referred above to the failure to keep a check on lamps daily issued, and the failure to ensure that coal was properly holed or cut before being fired. There was also a failure to make a search for matches and tobacco, as required by Regulation 189.

Subject to these comments, the mine appears to have been satisfactorily managed.

22. *Inspection by Inspector of Mines.*—In April, 1925, the Minister of Mines, by memorandum to the Under-Secretary, intimated that he had reasons for believing that gas would be met in considerable quantity in Dobson Mine, and directed that a close watch should be kept on the operations, and that every precaution should be taken in the interests of the safety of the men. Pursuant to this direction, and in consequence of his own observations, the Inspector of Mines for the district has throughout given special attention to Dobson Mine. In our view the inspection by the Inspector has been thorough and efficient throughout.

This combined district is a large one, and contains a substantial number of collieries. We suggest that the Department look into this question with a view to considering whether an additional Inspector should be appointed here.

With regard to inspection of mines generally in New Zealand, we are of opinion that every requisition made by a District Inspector of Mines to a mine-manager relating to any matter in a mine, whether made at the time of any visit or otherwise, should be forthwith put into writing and handed or forwarded to such manager.

23. *Inspection by Workmen's Inspectors.*—This inspection was regularly done, and we consider that it has been carried out conscientiously and with moderation. A fuller account by workmen's inspectors in their reports to the management of their respective examinations of the mine would, we think, be an advantage. The Inspector for the district stated in evidence that he had received very great assistance from the workmen's inspectors.

24. *Rescue Brigades.*—We are of opinion that in the set of circumstances existing here loss of life would not have been averted or reduced had the services of a rescue brigade been available. On the contrary, we think that the miners, in their endeavour to succour their comrades, might have taken unjustifiable risks, and that the death-roll might have been increased.

Cases may, however, arise where the services of a rescue brigade would be of value. The important thing is to have a group of men properly trained and efficiently controlled. In a colliery district like the one now under consideration a central depot available for all collieries in the locality, where teams of men would be trained and gas-helmets and other accessories would be kept, might prove of value. The matter is one which the Department might profitably discuss with mine-owners with a view to devising a practicable scheme.

25. *Existing Legislation.*—Subject to occasional minor amendments of the regulations that may from time to time be found desirable, we consider that the existing legislation, if carried out, is ample to ensure safety in coal-mines. Constant vigilance and firmness on the part of the Inspectors is, however, necessary. Some tightening up in this regard may prove beneficial.

26. *General.*—We desire to express our appreciation of the assistance rendered to us during the inquiry by the counsel, advocates, and parties engaged. The secretary, Mr. J. T. Watkins, merits our sincere thanks for the able manner in which he has discharged his duties.

We return herewith Your Excellency's Commission, and also enclose—(1) Minutes of the proceedings and verbatim report of the evidence given; (2) plan of the mine, and documents produced at the inquiry.

And this our report we have the honour respectfully to submit for the consideration of Your Excellency, in obedience to the Commission addressed to us.

Given under our hands and seals, at Greymouth, this 20th day of June, 1927.

E. PAGE. [L.S.]
JOHN WATSON. [L.S.]
WM. BALDERSTONE. [L.S.]

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