

Double Disaster: Lithgow Valley Colliery, New South Wales, 1886

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Ln February and April 1886 there were two separate accidents at the Lithgow Valley Colliery, New South Wales, resulting in the death of eight miners in total (constituting 11.3 per cent of the workforce) and representing 27.6 per cent of the total fatalities recorded in the whole New South Wales Coalfield during that year. The disasters were the most serious ever recorded in the Western Coalfield (based principally on Lithgow) 94 miles from Sydney.¹

This account traces the background to the disasters, including the provision of a brief history of the Lithgow Valley Colliery. It also considers the critical events that led directly to the disasters. There is special focus on the proceedings and conclusions of the Royal Commission of Inquiry and its censure of the mine's management for 'unsafe working conditions'.

Background to the Colliery and the Accidents

Irishman and railway construction contractor Patrick Higgins MLC founded the Lithgow Valley Colliery Company in 1870. Together with four partners, all Bathurst-based professionals, they acquired land known as Sheedy's Gully on the southern side of the valley facing north on Bent St and up to Hassan's Walls. Higgins the major shareholder had built some of Melbourne's suburban railway tracks – and also had won contracts for the Zig Zig to Bowenfels track and on to Wallerawang. The Lithgow Valley Shopping Plaza now occupies the site of the former colliery.²

Later in 1877, the partners incorporated themselves into a limited liability company. The partners were John Busby, solicitor and bank manager; Edward Combes, engineer, landowner, former MLA Bathurst, East Macquarie and Orange as well as renowned amateur water colour artist; Edward George Gell, Bathurst architect and one time mayor and Thomas Talbot Wilton journalist and part-owner of the *Bathurst Times*. He was the company's commercial director at the time of the disasters.³

The colliery was one of the oldest coal-producing mines in the Western Coalfield and operated until it ceased production in April 1979 ‘when it had worked-out its economically accessible coal resources’. Completion of the Great Western railway from Mount Victoria to Bowenfels in 1869, and on to Wallerawang, acted as a catalyst for the development of the Valley’s coal deposits. Other small coalmines operating in the valley during the ‘70s included Thomas Brown’s Eskbank, Vale of Clwydd and the Zig-Zag.⁴

Commencing operations in September 1872, the colliery traded from 1876 with 20 men and 2 horses, benefiting from government contracts to supply coal to the railways. It built a siding in 1873, connecting the colliery to the main Great Western line and in 1886 the company acquired the Hermitage mine. By 1886, 71 men and boys were employed in the mine (66 underground) and produced 52,654 tons⁵ with a value of £12,618.⁶ John Doig had been mine manager for 11 years (after serving previously as underground manager) and according to Wilton, three previous managers had proved ‘unsuitable’. Part-owner Wilton had delegated complete control of the mine to the manager, as the owners were not skilled in mining, and as he admitted to the Royal Commission, prior to the first accident, he had never been in the mine.⁷

In 1877 the enterprising company, taking advantage of the white clay that overlay the coal deposits, diversified into the manufacture of bricks, earthenware pipes and later domestic pottery. It imported expert staff and equipment from England.⁸

In common with some other coalmines in the valley, it was a drift or tunnel mine, working the 10-foot thick Lithgow coal seam where it outcropped. An inclined tunnel or adit was driven due east to a distance of 52 chains from the outlet, following the dip (1in 34) of the seam in which the coal was described as bituminous, lustreless and producing a high percentage of ash.⁹ The traditional bord and pillar method was used. The Annual Reports of the New South Wales Mines Department had indicated that no firedamp (methane) had been found in the Western Coalfield.¹⁰

Although the main inlet for fresh air was the tunnel, two furnaces artificially ventilated the colliery. The right-hand furnace, built in the centre of a bord close to the main tunnel maintained an adequate ventilating current, while a much smaller furnace was used to induce a draught in the flue from the underground boiler.

Three years prior to the first accident, a small boiler 15 feet in length was erected in an ordinary bord 38 chains from the tunnel’s mouth and situated only a few feet from the main tunnel roadway. It supplied steam to a Tangye pump that forced mine water

into a hollow on the north side of the tunnel and was supposed to direct water to the neighbouring Eskbank Estate.¹¹

First Accident 14/15 February 1886

At 6pm on Sunday 14 February, in response to a report that the mine was on fire and producing thick smoke, three men, manager John Doig, miner William Rowe, and banksman Charles Younger went to investigate. Joined by William Martin, they proceeded down the tunnel and were overpowered by smoke in the main heading and retreated some distance. Affected by the smoke, Martin left the mine at 12.30am Monday morning, leaving the three others. Returning home, he went to bed informing no one of the problem in the mine. At this time no apparent danger was anticipated. Martin was later to recall that when the group came to a new cross-cut, Doig informed them that he would enter it and open a heading opposite the boiler where it was supposed the fire was located.¹²

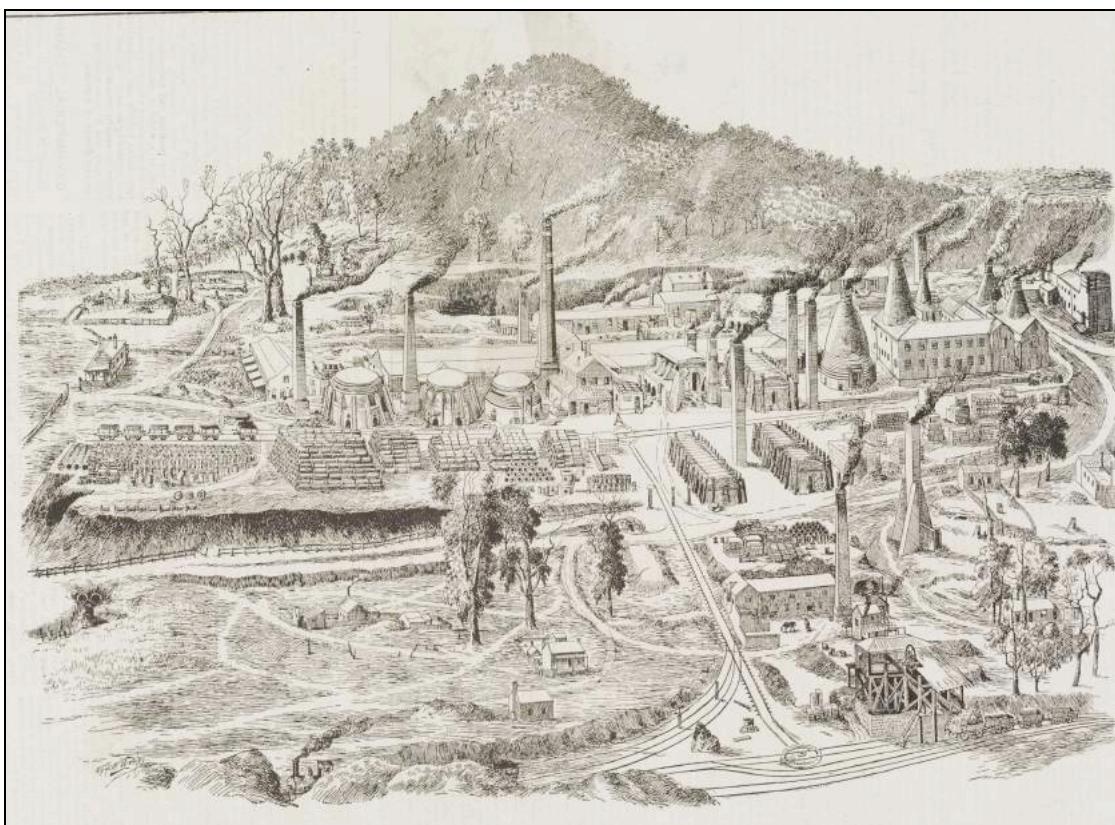
A small group of men on the first shift at 6am on Monday 15 February were confronted with a wall of smoke, and could not proceed very far down the tunnel. Realising that the three men were still in the mine, the alarm was raised and directors informed. Lacking a leader, John B. Turnbull, manager of the adjoining Vale of Clwydd colliery was sent for and put in charge by the owners. He organised volunteer rescue parties (which included George Rowe son of one of the missing miners). Principal searchers besides Turnbull were C.W. Cox manager of the Iron Works Tunnel mine, Robert Drury, President of the local union, William Martin and John Sheedy. The first rescuers were beaten back by foul air but eventually the bodies of Rowe and Younger were discovered ‘quite dead’ according to a press report. Manager Doig was found unconscious a few yards from the roadway, taken to the surface but passed away next day. The victims of the first accident were:

- John Doig, mine manager, age 33 married with 4 children, born Sydney but an old resident of the district.
- William Rowe, miner, age 56, with 3 sons (all miners) born Yorkshire, England.
- Charles Younger, banksman, age 42, married with 6 children, born Little Lambton, England.¹³

Turnbull was directed by the owners to ascertain the cause of the fire, ventilate the pit and eliminate the smoke. Department of Mines inspectors arrived and there was early speculation that the fire originated in the vicinity of the boiler. According to

evidence submitted later at the Commission hearings, an angry altercation occurred between Turnbull and R. Davies (innkeeper) former deputy manager with intimate knowledge of the mine. He accused Davies of interference. Examiner of Coalfields J. McKenzie advised that the mine be closed temporarily whereas Turnbull wanted to carry out tests and a survey, as he was convinced of the presence of firedamp. None was found and Turnbull, affected by choke-damp had to be carried out of the mine. Tests were carried out to determine the pressure on the stoppings before the mine was sealed for a month. Attempts were then made by the management to re-assign the miners to their other colliery, the Hermitage.¹⁴ In the meantime, following Sydney meetings of parliamentarians, civic leaders and clergy, a relief fund was established.¹⁵

Fig. 1: *Lithgow Valley Colliery Co's Brick and Pipe Works with Lithgow Valley Colliery in foreground.*



Source: *Sydney Illustrated News*, 7 March 1886, p. 17.

Coroner's Inquest on the First Accident-Tuesday 16 February

Local general practitioner Dr Asher, after examining the bodies of the dead miners, certified that the cause of death was asphyxia due to the inhalation of gases, probably carbonic acid gas (also known as choke damp). He found no marks of violence on the

bodies, only slight abrasions. The three bodies of the victims were identified by underground manger Samuel Passmore, who revealed that on several occasions prior to the accident, fires had occurred behind the boiler when small coal had ignited. Mines Inspector James Rowan reported that at his last inspection (15 December previous year), there was no sign of danger and he had found the ventilation good. He indicated that he had never heard of any fires in the mine. The jury verdict was: ‘Death occurred through inhalation of poisonous gases, but there was no evidence to show the origin of those gases’.

Many miners were anxious that the mine should re-open so that they could return to work. The owners, conscious of this, invited pit engine driver Joseph Campbell to take up the manager’s position. With expectations that the fire could be extinguished, and following consultation with the inspectors, the mine re-opened but some men who entered found the fire still burning and had to withdraw. Consequently, the mine closed again. Two weeks later, a group of the miners contacted the owners and indicated that they were prepared to volunteer on a week’s trial to try and put out the fire. With the permission of the Government officials, the volunteers assembled in the tunnel, arranged shifts, chose leaders and commenced work.¹⁶

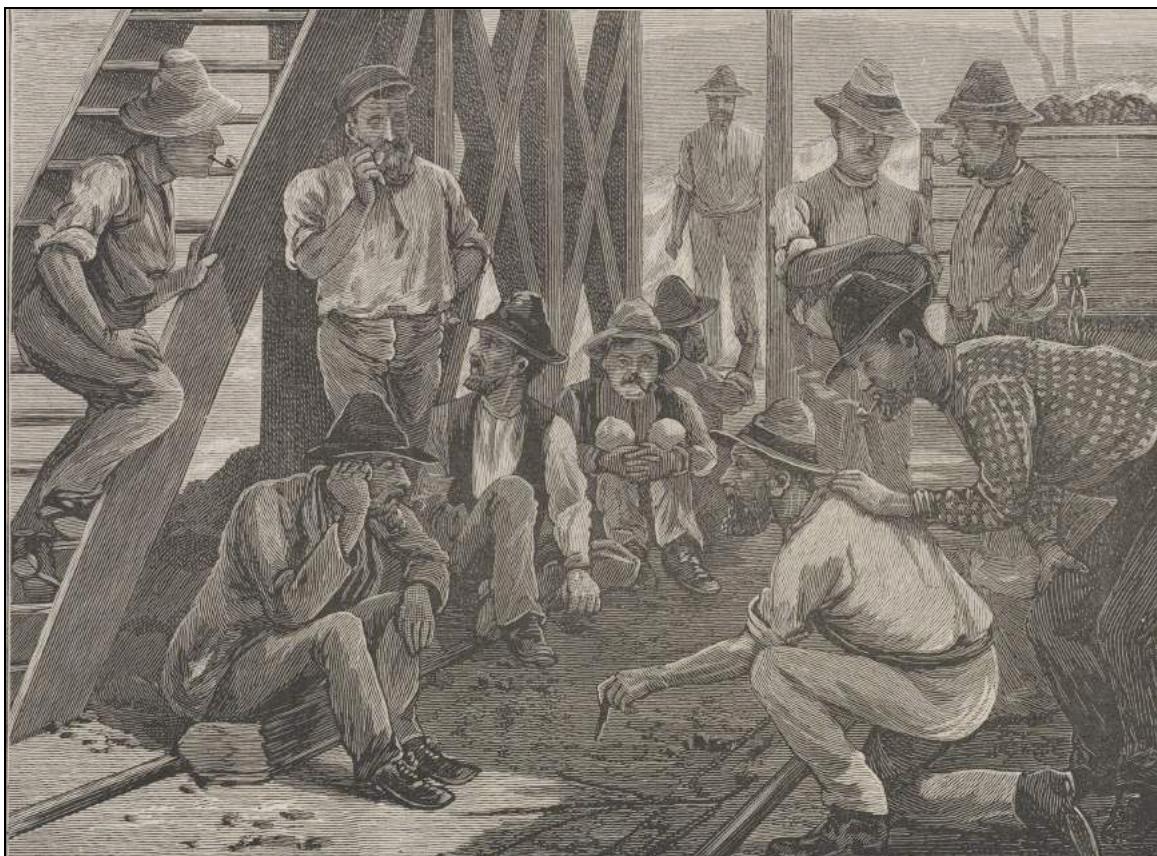
Second accident - Monday 19 April 1886

A detailed account of the second accident was given in evidence at the Coroner’s inquest by one of the survivors, Charles Norwood. He described how on Monday 19 April volunteers organised into four parties of ten men worked six hour shifts. Starting at noon, volunteers were engaged in attempting to subdue the fire by applying high pressure steam to it for 80 hours, erecting brattice, clearing debris and ‘using their coats to beat back the flames’. This failed and the fire increased in intensity as it was fed by the entry of oxygen into the tunnel. Then water was used, but only sparingly, as supplies were limited.¹⁷

Some of the men (including Thomas Mantle and Thomas Rowe), stopped work, retreated a short distance to a cool place and sat down to prepare for their ‘crib’. According to Norwood, they heard a thunder-like roar approaching them ‘appearing to crush down on them’.¹⁸ The men seized hold of each other and someone called out We’ll die together! The force of the wind knocked them off their feet, bursting the brick stoppings and brattice as well as extinguishing their lights. As there were five skips

nearby, someone cried out, ‘to the skips, boys’, with the intent of returning to the mouth of the tunnel. In the darkness the men made a rush for the skips and some clambered into them but then jumped out when some of the skips de-railed. Norwood related how he activated the rapper wire to signal the engine driver to haul the skips out. With the wire jammed under debris, and skips motionless, and fearing that the tunnel could become blocked, some attempted to crawl out. Some one called out ‘run for it boys!’ Others managed to grab hold of the hauling rope and were dragged out of the tunnel. Norwood claimed that there had been an explosion due to a heavy fall of rock in the left of the tunnel.¹⁹

Fig. 2: ‘The Lithgow Colliery Catastrophe – Discussing the Accident’.



Source: *Sydney Illustrated News*, 15 March 1886, p. 15.

The Attempted Rescue and Recovery

Manager Campbell assisted by J. Morris, manager of the company’s brickworks, organised the rescue and recovery effort. The skips were drawn out and search parties braved the impure air to look for the missing miners. The bodies of Allison, Buzzza, Hyde, Mantle and Thomas Rowe were recovered in close proximity about 20 chains

from the tunnel mouth. The victims were: Lancelot Allison miner, 36, born Durham, England; Joseph Buzzo, miner, 45, born Cornwall, England; Isaiah Hyde, miner, 29, born in Staffordshire, England; Thomas H. Mantle, miner, 29, born Bowenfels, Lithgow and Thomas Rowe, miner, 27, born Durham, England.

The five men who survived the accident were: John Duncan, Archibald Drury, Gilbert Kirkwood (shift leader) William Mantell and Charles Norwood. In order to suppress the fire and to prevent the escape of gases, the portion of the mine known as the ‘old workings’ was sealed and not re-opened until October 1897.²⁰

Inquest on the Second Accident

The inquest on the five dead miners opened on 22 April before the District Coroner and twelve jurymen. James Rowan Government Mines Inspector (Southern and Western districts), with colliery management experience in gassy mines in Scotland, gave technical evidence at the inquest which proved influential. In his opinion, the accident was caused by a heavy falling-in of the roof in the interior of the old workings, causing a concussion of air, which rushed out to the main heading at the weakest part of the stoppings. Having experienced firedamp explosions in Scottish mines, in particular the 1877 Blantyre disaster, where most of the victim’s bodies were unidentifiable, he concluded that a firedamp explosion was not the cause of the Lithgow accident. The Coroner returned the following verdict:

We are of the opinion that the deceased came to their deaths through the inhalation of impure gases, caused by an explosion of gas or a heavy fall of rock, forcing the impure air upon them.²¹

Community Impact and Funeral

The second accident, occurring only barely two months after the first, had a significant impact on the small cohesive mining community. The Sydney press called it a catastrophe and labelled the day of the accident as ‘Black Monday’. Many families were affected and fathers, sons and brothers were either victims, rescuers or survivors, while a number of miners were temporarily unemployed. Five women became widows and 15 children and young people lost their fathers. William Mantle, a survivor of the first accident, lost his father Thomas. Thomas Rowe who died in the second accident had recovered his father’s body in the first accident. Some of the survivors, swathed in bandages, gave evidence at both the inquest and the commission.²²

The funeral of the five dead miners evoked an outpouring of community grief and a collective sense of loss. The procession following the cortege was reported as a mile long. It was headed by a Salvation Army band, and comprised miners, politicians, government officials, civil dignitaries, scholars from the local Methodist Sunday School and members of local Friendly Societies.²³

The Royal Commission on the Accidents at the Lithgow Valley Colliery

The Commission that reported in July 1886 was originally appointed to inquire into the causes of accidents at the Ferndale Colliery, Newcastle and the condition of adjacent collieries. At the request of the Minister of Mines, the Commission's President agreed to extend the investigation to the Lithgow accidents and gave it priority.²⁴

The composition of the Commission reflected a balanced mix of practical miners and experienced mine managers. It included the Chairman (known as the President) mining engineer Dr James R.M Robertson. Other members were James Curley President of the Northern Miners Union; W. Davies; Archibald Drury (a survivor); John Jones; John Y. Neilson; James Swinburne; John Thomas; J.B. Turnbull; William Turnbull and James Usher.²⁵

The Inquiry sat for 13 days from 29 April until 13 May and examined 34 witnesses including the owners, Government inspectors, medical officers, survivors and former employees. The Commission also inspected the underground workings and those of the Eskbank mine. At this time in the colony's mining circles there was some concern over the question of the existence or non-existence of explosive gases namely firedamp (methane). Some believed that the Commission would settle this.²⁶

Before the opening of the formal proceedings, part owner Thomas Wilton asked the Commission's President if the Company's legal representative be permitted to attend the inquiry. He also requested that the public and press be allowed to attend as the inquiry was vitally important to the management of the collieries of New South Wales. Responding, the President ruled that the 'inquiry should be held without interference from outside sources and that neither the press or legal gentlemen will be admitted'. Wilton protested that the inquiry was unlike any other commission and 'tantamount to a secret enclave'. Ironically Wilton, a controversial figure in mining circles, during the coroner's inquest had raised objection to the presence of the union's legal representative who was eventually barred from participating. He made

uncomplimentary remarks about the miners' union describing it as an 'irresponsible body unknown in law and an insult to the court'.²⁷

The issue of the company's and the union's representation at the Commission became controversial and was raised in both the New South Wales Parliament and in Cabinet. Mines' Minister James Fletcher opposed the Commissioner's decision, declaring that the inquiry should be 'fair, full and impartial, open and above board'.²⁸ Editorialising, the *Newcastle Morning Herald* claimed that holding the investigation behind closed doors was bitterly distasteful to the British mind'. It appeared that George R. Dibbs, Colonial Secretary (and a mine owner) had instructed the Commission to conduct proceedings in private, over-riding the Mines Minister.²⁹

Wilton was examined at length, together with underground manager Samuel Passmore, engine driver William Martin, James Doig (brother of the deceased manager) and several others including part-owner Edward Gell and inspectors John Dixon and James Rowan. Responding to cross-examination, Thomas Wilton stated that as his co-owners were personally ignorant of mining matters, they had delegated full control and management of the colliery to the manager John Doig. He had been in the position for twelve years and he always enjoyed the confidence of the owners. From Wilton's evidence, it was clear that Doig had not been in the habit of reporting critical incidents to the proprietors. According to Wilton, the colliery did not give the owners much concern as they considered it a safe mine. The owners then as 'unskilled men' were happy enough not to be 'troubled with detail'.³⁰

Referring to the first accident, it emerged in the hearings, from the evidence of some employees that there had been a history of fires occurring behind and around the underground boiler and related pipes. One occurred soon after the boiler was installed, as a result of the accumulation of small coal (slack). Similar fires were recalled and there was one serious fire six weeks before the first accident. Former deputy manager, R. Davies, considered that the boiler was unsafe as 'slack was ignited by sparks from the flue'. It was revealed that the manager did not inform either the owners or the inspector of these incidents Wilton remarked that Doig was a man of 'much decision of character but remarkable for his reticence'.³¹

The Commission's report was critical of the manager, as he had disregarded the danger and took no steps to remove the cause of the fires (the inflammable material-ashes around the boiler) or prevent its reoccurrence. It stated that:

It was scarcely credible that a man with years of colliery management experience could have been guilty of such culpable indifference to the first signs of smoke near the boiler when it had been the source of previous fires.³²

It was also critical of the practice of allowing large amounts of ash to accumulate near the boiler and furnaces. The Commission labelled it as ‘unsafe, reprehensible reflecting a reckless regard for the general safety of property.³³

The Commission also observed that it was remarkable that the accumulation of small coal and ashes around the boiler had eluded the attention of the inspector, but he nevertheless absolved the inspectors of any blame as they were never informed of the previous fires.³⁴ The Commission’s conclusions relating to the first accident was summarised:

The three men met their death by their inhalation of carbonic acid gas while in the wastes of the mine on the right-hand side of the tunnel. In their opinion, it was probable that their oil failed. They lost their way in the darkness, wandered for hours in the waste workings, full of gas and laid down and died. Probable cause of the fire at the underground boiler was due to the indifferent disregard by the management for underground safety. Deaths were due to a grave error of judgement - with the men themselves responsible.³⁵

The Commission found it unusual and inexplicable that the three men attempted to penetrate the mine’s wastes when their lights had been extinguished. The Commission claimed that ‘there was a long chain of lax arrangements and indifference to mine safety’.³⁶

With regard to the second accident, during the inquiry, two possible theories were put forward to explain the cause: some survivors favoured the firedamp-explosion explanation, whilst others, especially the inspectors and Commission members, supported the ‘heavy fall and wind thesis’. As the Commission’s report noted, most witnesses including inspectors agreed that the ordinary signs of an explosion were absent from the victim’s bodies. The Commission then attempted to counter the firedamp theory with the following rationale:

No flame was observed, no superheated atmosphere existed, no steam was seen, no evidence of burning on the pillars and props; or on the bodies of the deceased. How was it possible for a mine in which no gas (methane) had ever been seen, to have an accumulation of this at the boundary with the Eskbank colliery? The evidence of an explosion...was not only weak but not supported by a single statement or reason.³⁷

The Commission agreed that there was a stronger case for the ‘fall-of-roof’ hypothesis. Evidence seemed to support this view as such falls appeared to have been a frequent occurrence on the north side of the tunnel. Some survivors referred to a fall behind the boiler one day before the accident. There appeared to be a consensus among the Commission (based on their mining experience) that in mining operations, falls do occur in old and abandoned mine workings. They agreed that in the Lithgow case, a fall suddenly displaced a quantity of air sufficient to partially blow out stoppings on the left hand (northern) side of the tunnel.³⁸

The Commission’s main conclusions were: that the second accident was caused by a ‘wind blast’, the result of a fall of top-coal, or of the overlying rock, of unknown extent, and in an unascertained locality of the old workings in the north of the tunnel, probably in the vicinity of the encroachment from Eskbank. It forced a mixture of foul and exhausted air, smoke and carbonic acid gas, to fill the wastes, continue through the stoppings and finally enter the tunnel.³⁹

That Isaiah Hyde, Thomas Rowe, Lancelot Allison, Thomas Mantle and Joseph Buzzo were killed by the inhalation of carbonic gas. This lamentable occurrence was a pure accident, could have not been foreseen and was unpreventable, for which no one, in the opinion of the Commission, is to blame or can be held responsible⁴⁰

The report also commented on the condition of the abandoned workings, with pillars removed, roof falls and decaying timber. It emphasised that because of the fire the old workings must have filled with steam, carbonic acid gas and other products of combustion. It claimed that a ‘heavy fall that occurred in the old workings suddenly displaced a quantity of air and sent gas rushing unrestrained across the open bords sweeping choke damp before it’. The Report concluded that if this situation continued there would be no limit to the damage the fire could cause. They recommended the flooding and sealing of the abandoned workings.⁴¹

The Commission praised the courage and ‘true heroism’ of all the rescuers who had risked their lives in attempting to recover the bodies of the eight deceased miners.⁴²

Postscript

The two accidents did not appear to affect the mine’s annual production, for the next year, 1887, it increased by 13 per cent to 58,532 tons.⁴³ In an account in the *Lithgow Mercury* of October 1897, the manager James Campbell related how when the

abandoned workings were-opened, eleven years after the second accident, personal articles belonging both to those who perished and some survivors were discovered. They included a billy can, clothing, match box, oil bottles, pit lamp, pocket knife, and a silver watch.⁴⁴

They were sad mementoes and reminders of the only multiple mining disaster ever to occur in the Western coalfield.

Endnotes

¹ *Annual Report of NSW Department of Mines, 1886*, pp. 112-14, 127.

² G. Armstrong, 'The Archaeology of Coal Mining: Site Formation, Processes Affecting Coal Mines in the Lithgow Valley - A Case Study', BA, Dept. of Archaeology and Palaeontology, University of New England, 1991, pp. 19, 58, 60.

³ I. Evans, *The Lithgow Valley Pottery*, Flannel Flower Press, Sydney, 1980, pp. 9-10; Charles W. Sloman, *The History of Bathurst 1815-1915*, Runciman Press, Sydney, 1994, pp. 35, 307, 309, 345.

⁴ *Lithgow Mercury*, 31 October 1978.

⁵ Units in this article; 1 (long) ton = 1.01605 tonnes; 1 foot = 0.3048 m; 1 chain (Gunter Survey measure) = 20.117 metres. Pre-decimal currency: £1 (pound) = 20s (shillings) and 1s = 12d (pence).

⁶ Armstrong, 'Archaeology of Coal Mining', p. 60; *Annual Report, NSW Department of Mines, 1886*, pp. 113-14.

⁷ *NSW, Report of Royal Commission - Accidents at Lithgow Valley Colliery, 1886*.

⁸ Evans, *Lithgow Pottery*, pp. 10-12.

⁹ Armstrong, 'Archaeology of Coal Mining', p. 60.

¹⁰ *Annual Reports of the NSW Department of Mines 1885-1886*.

¹¹ *NSW, Report of Royal Commission - Accidents at Lithgow Valley Colliery*, pp. 4-10.

¹² *Bathurst Times*, 15 February 1886; *The Sydney Morning Herald* [hereafter SMH], 16 February 1886.

¹³ *Bathurst Times*, 17 February 1886; SMH, 17 February 1886; *Sydney Illustrated News*, 15 March 1886.

¹⁴ *NSW, Report of Royal Commission - Accidents at Lithgow Valley Colliery*, p. 15. 'Choke Damp' is a suffocating gas (basically a mixture of carbon dioxide and nitrogen) often referred to as 'black damp' prevalent in abandoned mine workings. www.yourdictionary.com, accessed 2 December 2009.

¹⁵ SMH, 20 February 1886; *Town and Country Journal*, 27 February 1886.

¹⁶ SMH, 17 February 1886.

¹⁷ *Ibid.*, 22, 23 April 1886.

¹⁸ *Ibid.*

¹⁹ *Ibid.*

²⁰ *Ibid.*, 22 April 1886.

²¹ *Ibid.*, 23 April 1886; *Newcastle Morning Herald*, 6 May 1886. The Blantyre Colliery explosion in Lanarkshire on 22 October 1877 was the worst mining disaster in Scottish history. It resulted in the deaths of 207 miners (including a boy of 11 years), leaving 92 widows and 250 children fatherless. The disaster left an indelible legacy in Scottish capital-labour relations following the eviction of many families from their 'tied cottages' just two weeks after the massive explosion, www.blantyrepast.com/1877 - accessed 1 December 2009.

²² SMH, 21 April 1886.

²³ *Bathurst Times*, 21 April 1886.

²⁴ *NSW, Report of Royal Commission - Accidents at Lithgow Valley Colliery*, pp. 2-4.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ SMH, 24 April, 1 & 4 May 1886. Thomas Talbot Wilton was a controversial figure in mining circles. In 1887 he wrote a series of letters to the *Daily Telegraph* complaining about the composition of the Royal Commission into the Bulli Colliery explosion. Wilton was also highly critical of the evidence submitted by the Examiner of Coalfields, J. McKenzie. As he believed there were too many experts on the Commission 'all with their own pet theories', he recommended that in future commissions should be

headed by a judge with experts to act as witnesses. His letters were incorporated and published in a booklet and distributed to interested parties in the mining industry. T.T. Wilton, *The Royal Commission on the Bulli Disaster: Its Unsatisfactory Composition, Weak Theories and Vapid Reasoning Challenged in A Series of Letters*, Gibbs, Sydney, 1888, reprinted from the *Daily Telegraph*.

²⁸ *New South Wales Parliamentary Debates* [hereafter NSWPD], 21 April 1886, pp. 1488-89; *ibid.*, 6 May 1886, p. 1763.

²⁹ NSWPD, 11 May 1886; *Newcastle Morning Herald*, 6 May 1886.

³⁰ NSW, *Report of Royal Commission - Accidents at Lithgow Valley Colliery*, pp. 6, 23.

³¹ *Ibid.*, p. 23.

³² *Ibid.*, p. 25.

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ *Ibid.*, p. 24.

³⁶ *Ibid.*, p. 23.

³⁷ *Ibid.*, pp. 20-21.

³⁸ *Ibid.*, p. 21.

³⁹ *Ibid.*, pp. 21-22.

⁴⁰ *Ibid.*, p. 23.

⁴¹ *Ibid.*, p. 22.

⁴² *Ibid.*, p. 26.

⁴³ *Annual Report of the NSW Department of Mines, 1887*, p. 54.

⁴⁴ *Lithgow Mercury*, 18 October 1897.