Journal of Australasian Mining History, Vol. 6, September 2008

Dudley Colliery Disaster, Newcastle, New South Wales, 1898

By CLIVE BEAUCHAMP
Charles Sturt University, Bathurst, NSW

On Monday 21 March 1898, at 7.00am, Thomas Young, the examining deputy, went down the Dudley mine to inspect where the men were to work. Later, at 7.30am, 14 men also descended to prepare for the resumption of full-time work. Due to 'slackness of trade' the men had only worked four days in the previous two weeks. At 9.10am there was a massive explosion and the impact was heard in the neighbouring districts. No one survived.[1] The disaster was the largest collective loss of life for any colliery in the Newcastle coal measures.[2]

This paper traces the brief history of the mine and details its operations. It describes the damage incurred, the unsuccessful rescue attempts, the resultant fires and the temporary sealing of the mine. Evidence presented and conclusions made at both the Coroner's Inquest and Court of Investigation are outlined. The general impact of the disaster is considered, including the adoption of the practice of continuous artificial ventilation together with the industrial action taken in response to management's attempts to introduce safety lamps.

Background to the mine and the explosion

Dudley Colliery was located in the Northern District coalfield at Little Redhead, Dudley, near Newcastle. The coalfield was the most productive in New South Wales, with 62 coal and shale mines producing 71 percent of the colony's output. When the colliery was established in 1885, it was known as the South Burwood mine and was operated by the South Burwood Coal Co. Ltd. The company, formed with capital of £100,000 in 100,000 shares of £1 each was renamed in 1891 as the Dudley mine under the Dudley Coal Co. Ltd. Sinking of a shaft commenced on 20 November 1889: the Borehole seam 6 feet 2 inches thick[3] was struck at a depth of 624 feet. Under the management of Mr A. Gardiner, a permanent colliery plant was installed between 1889-1890, while the first marketable coal was produced in July 1891. The mine was serviced by a mile-long private branch line constructed by the Redhead Coal Co., that connected with the Government line at Adamstown. When established, the Dudley mine was bounded on three sides by colliery land, including that of the Scottish-Australian

Mining Company's Durham Estate, the Burwood Colliery and by the land of the Waratah Company. As a result, three coalmines were in close proximity of Dudley: they were Burwood; Burwood Extended at Redhead, Durham (later Lambton Colliery B Pit); and South Waratah at Charlestown.[4]

The Dudley colliery had a chequered history. On 21 November 1889, four sinkers were killed in an over-winding accident, having fallen down the shaft from the poppet heads. There had been a miscalculation by the engine driver.[5] In 1891, Mr Hugh Humphreys was appointed mine manager and he still occupied that position at the time of the explosion. Another fatality occurred in May 1893 when a miner was killed by a roof fall.[6]

Due to bank closures and a poor trading position experienced in the Depression of the '90s, operations were suspended in November 1893. Ownership of the mine was transferred to the debenture holders who became mortgagees in possession. The mine re-opened under new owners in 1895. Alexander Brown MLC, barrister, acted as 'manager in a commercial sense' on behalf of the proprietors. Brown was the managing director of the Newcastle branch of Dalgety and Co. that had been asked to look after the company for the mortgagees. Dalgety and Co. handled both the sale and shipping of Dudley coal.[7]

Dudley was a small mining community, similar in many respects to others in the Newcastle district. It boasted an estimated population of 1,000, 160 houses (many miner's cottages), two hotels, a post office, shops and a public school.[8] In 1898 a total of 292 men and boys were employed, with 250 of them underground. From 1896, in addition to the miners who worked on contract, 16 shift men were employed on day-wages in getting coal at night. In 1897 the mine produced 77,175 tons of coal valued at £22,221.[9]

The mine was worked with natural ventilation until a fan was erected in July 1892. The fan was located at the mouth of the up-cast shaft, and when in operation, ran at a speed of from 40 to 45 revolutions per minute. It was regarded as one of the best-ventilated mines in the Newcastle area. There were two shafts, the down-cast, to a depth of 624 feet and the up-cast or fan-shaft, 553 feet deep. The coal was bituminous and the mine was considered both dry and dusty, particularly in the part known as 'Nigger's heading' where work had been suspended since the previous October. The bord and pillar mining method was used. Naked tallow oil lamps were used throughout the mine, except during the deputy's inspection, when safety lamps were carried.[10]

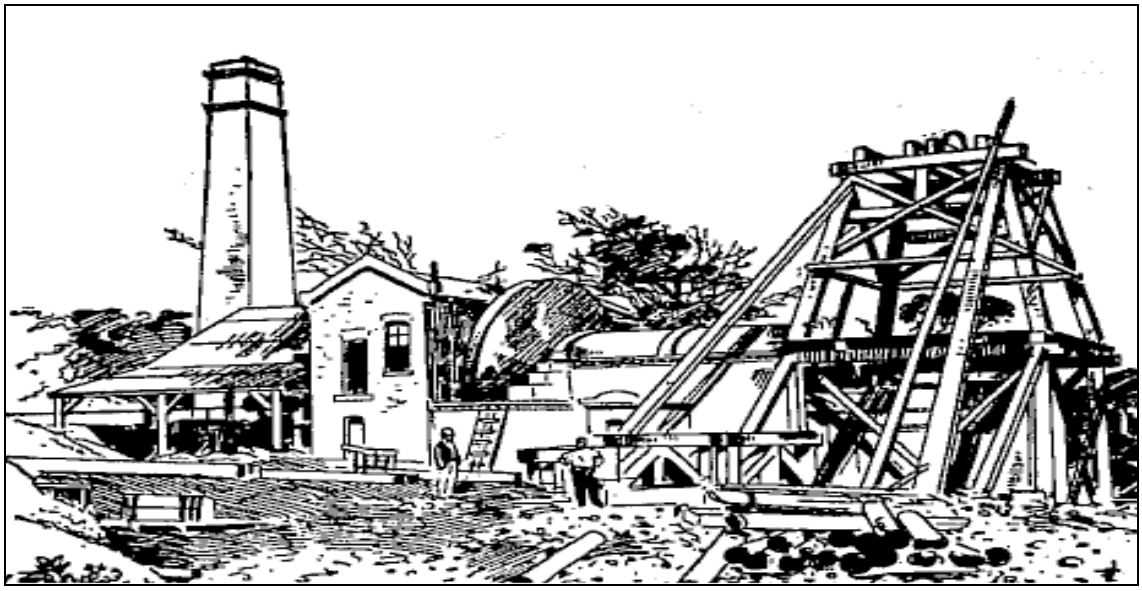
The explosion: Impact and damage

The local newspaper, the *Newcastle Morning Herald and Miners' Advocate* of *22* March bore the following bold headline:

> **AWFUL CALAMITY**
> **FEARFUL EXPLOSION**
> **FIFTEEN MEN ENTOMBED**
> **NO HOPE OF SAVING LIFE.**

In its initial report of the disaster, the newspaper editorialised that there was some small comfort in the fact that only 15 miners were in the pit at the time of the explosion, when normally there would have been about 250 men and boys. The explosion was heard at Belmont, some six miles distant. The first reports indicated that at the up-cast entrance, the force of the explosion had blown away the covering of the shaft, propelling timber from the pit roof into the winding wheels (Figure 1). Brickwork surrounding the fan had been damaged and ropes twisted and knotted. At the down-cast shaft, the cage weighing 23 hundredweight which was at the pit mouth at the time, was thrown upwards some 23 feet and the chain of the cage was broken. Thick clouds of coal dust enveloped the surface of the mine. Later, rescuers found that the cage at the shaft bottom was wrecked and the guide ropes broken.[11]

Fig. 1: Sketch - *The Colliery Disaster, Newcastle – Views of the Locality – Dudley Colliery. Fan and Air Shaft.*



Source: *Newcastle Morning Herald and Miners' Advocate*, 2 April 1898, Courtesy Newcastle Regional Library

There was early speculation that the explosion was caused by ignition of a mixture of methane gas and air with a force of such great intensity that it affected many parts of the mine.[12] Explosions occur if the methane content of air is between 5 per cent and 15 per cent. Methane, a naturally occurring gas, and commonly called firedamp by miners**,** had been the cause of many explosions in European coal mines, especially in England, France and in South Wales.[13] Significantly, colliery inspectors had reported that 'accumulations of firedamp were comparatively unknown in our northern district mines'. An 1896 inspector's report had indicated that, although the Dudley mine emitted moderate amounts of firedamp 'the emissions did not render the use of naked lights dangerous'.[14]

Table 1: *The Victims - Age, Marital Status, Occupation and Residence*

The Victims	Age	Marital Status	Occupation	Residence
John Benson	41	single	pumpman	Dudley
George Cook	45	married with 9 children	onsetter	Dudley
Thomas Dorrity	21	single	wheeler's deputy	Charlestown
Arthur Dunn (aka Durham)	20	single	onsetter	Charlestown
Thomas Green	27	single	wheeler	Lambton
Thomas Haddon	44	married with 3 children	deputy	Dudley
Thomas Hetherington	64	widower	deputy under-ground manager	Adamstown
George Hindmarsh	49	married with 4 children	underground manager	Dudley
William Humphreys	70	married - grown up family	deputy, father of the mine manager	Wallsend
Thomas Jones	20	single	water baler	Dudley
William MacDougall	16	single	flatter	Burwood
Archibald Mowbray	20	single	flatter	Dudley
Sidney (Cyrus) Price	30	married with 2 children	onsetter	Dudley
William Rudge	19	single	water baler	Dudley
Thomas Young	56	married with 6 children	deputy	Dudley

Sources: *Annual Report of the Department of Mines, NSW, 1898; Newcastle Morning Herald and Miners' Advocate*, 22 March 1898, p. 5.

The ages of the victims ranged from 16 to 70 years. There were eight single men, six married and one widower. Some of the older men who perished were migrants with mining experience in England.[15]

Rescue Attempts

Within hours of the explosion, district colliery managers, colliery inspectors together with volunteers and some politicians congregated at the pithead. Prominent among them were T.L. Bates, colliery inspector; Frank Croudace, manager, Lambton and Burwood

collieries; Thomas Croudace, general manager, Scottish-Australian Mining Co.; John Dixon, colliery inspector; and Hugh Humphreys, manager of the Dudley mine. Also present were Alexander Brown MLC, acting for the mine's proprietors, together with local parliamentarians and former miners, Alfred Edden (member for Kahibah) and David Watkins (member for Wallsend). Chief Colliery Inspector Alfred A. Atkinson arrived from Sydney late in the evening. Relatives of the entombed miners waited anxiously at the pithead for news of their family members.[16]

Following repairs to the cage and guide rope, at 12.00-noon, a mere three hours after the explosion, a rescue party was formed to ascertain the fate of the 15 miners and assess the extent of the damage. T. Croudace, Inspector Dixon and D. McGeachie (West Wallsend manager) descended to 200 feet where they encountered 'a composition of gases' and returned to the surface. Consequently the fan was operated at full speed to produce purer air. At 2.00pm the same party made a second descent, reached within 20 feet of the bottom and then lowered themselves by ropes. Examining the workings, they found that access along the main tunnel was blocked with timber, knitted ropes and over-turned skips making it impossible to penetrate. Remaining below for an hour they were unsuccessful in locating any of the missing men.[17]

Volunteer working parties, operating in six-hour shifts, cleared away debris at the bottom of the shaft and bratticing was erected to improve ventilation. At 3.30pm another rescue party descended and went 900 yards along the main heading but retreated on encountering gas. At the surface they indicated that, after a diligent search, there was no trace of the men. They expressed the opinion that there was little hope of finding any of them alive, although they intended to resume their search in the evening. At 10.00pm on the 21st, the day of the explosion, a party found the first body, charred and mutilated, only a few yards from the main road. At the surface it was identified as Thomas Dorrity, a wheeler's deputy. Alfred Edden, commenting on the condition of the body, claimed that '... it was if he had been fired out of cannon'. At 8.00am, next morning, Tuesday 22nd, the body of John Benson, pumpman was found beside the pump. Later the same day the remains of William Humphreys, a deputy and the mine manager's father, were discovered in Nigger's heading. In two weeks Humphreys was to celebrate his golden wedding anniversary. Their bodies were transferred to the surface where a tent served as a temporary morgue.[18]

Sydney Smith, Minister of Mines, and accompanied by Alfred Edden and mines

inspectors, went underground and stayed for three hours. He also visited families affected by the disaster. Smith pledged to introduce legislation establishing a permanent miners' accident relief fund. The special fund had been mooted following the 1896 Stockton (Newcastle) colliery disaster, but no agreement had been reached between representatives of the employers and the union. The Dudley disaster appeared to give momentum to the initiative and eventually led to the passage of the 1900 *Miners' Accident Relief Act.* Smith returned to the mine next day. The Premier George H. Reid sent a message offering Government assistance. Later, Alfred Edden and James Blanksby MLC, on the Government's behalf, distributed £100 between the distressed families.[19]

On the same day, there was a new development when rescuers located the seat of a fire '... at a considerable distance along the workings in a north-westerly direction of the main shaft'. Inspector Dixon reported that attempts were made to extinguish the fire and enable recovery efforts to continue. He added that there had been extensive falls of coal, and that impure air interfered with the party's operations. It was decided to erect more bratticing and that only safety lamps would be carried.[20] Next day (23 March), the bodies of Thomas Green and Thomas Hetherington were recovered. At 6.00am rescue parties were beaten back by a combination of fire, smoke and carbon monoxide. During the night, a volunteer, Jeremiah Jennings, a former mayor of Adamstown, was overcome by noxious gas and taken to the surface unconscious.[21]

On Thursday 24th, five bodies were found in close proximity (Haddon, Jones, MacDougall, Mowbray, and Rudge). Earlier, Jones's father Nathaniel, the oldest miner in the district, had pleaded unsuccessfully to search for his son. No trace was found of the three pit ponies that were stabled underground.[22]

Volunteers abandoned their efforts when a second fire was discovered, and it was thought that the potent mix of gas and coal dust could result in another explosion far greater than the first. The fear of a second explosion led to the police establishing a perimeter to exclude the general public from the vicinity of the mine. According to the *Sydney Morning Herald*, the disaster had attracted an estimated 200-300 on-lookers. As Thursday was a shop workers' half-holiday, many people came to Dudley by bicycle and horse. The Probert Bus Company advertised a trip to the mine, departing from Newcastle Post Office.[23]

On 24 March, the proprietors appointed an advisory board to take sole control of the mine. Meeting next day, the board decided to abandon further attempts at rescue and

recovery because of the fear that gas, fire and potential falls would endanger the lives of the various volunteers. It issued the following statement:

> It would be folly to risk the living to save the dead, and that anyone now going down the mine does so in imminent risk of his life and the board recommend that the mine be flooded-out, as the only means of ensuring finality in dealing with the fires; whilst pumping operations are to be arranged the shafts are to be sealed down as far as possible.[24]

It was likely that the Board was influenced by the 1896 tragedy at the Stockton colliery. Following a fire, two miners were found dead at the bottom of the upcast shaft. Two separate rescue parties lost nine men. A total of eleven miners perished.[25]

At Dudley, on Friday 25th, work commenced sealing the shafts with timber and clay and with pumping water from a nearby lagoon. A dispute arose between board members over the cost of acquiring expensive pumping equipment.[26] It was agreed that sealing would be as effective as flooding to extinguish the fires. By the 4th April, the *Sydney Morning Herald* was reporting that the sealing had been successful and that there was no need to flood the mine. Sealing the mine meant that five bodies had still not been recovered.[27]

As it became common knowledge that the mine would not reopen for possibly six months, concern was raised over the plight of the out-of-work miners. Appeals for employment were made to local politicians and district mine mangers. Some were promised positions in local collieries and others were given free train tickets by the Government to seek employment in the Cobar Copper mines. Throughout New South Wales mining communities and in major towns, relief funds for the dependents of the victims were established. The *Newcastle Herald and Miners' Advocate* set up a subscription list and regularly published details of donations.[28]

The Coronial Inquest

City Coroner George C. Martin conducted an inquest into the deaths of Thomas Dorrity and John Benson before a jury (Figure 2) at the Royal Hotel, Dudley, over 13 days between 22 March and 27 May. Fifty-one witnesses were examined. E.W. Wiltshire appeared for the Department of Mines, Alexander Brown MLC, a barrister**,** for the mine proprietors and James Curley, Secretary of the Northern Coal Employees Federation (CEF) on behalf of the relatives of the deceased. The initial proceedings on the 22nd March were devoted to the identification of the two bodies. Following a *post mortem*,

two examining doctors reported that both men had sustained superficial burns, scalp wounds and their skin exhibited a 'cherry red' colour. They concluded that in both cases death was due to carbon monoxide poisoning as a result of the explosion. At this time, it was normal practice to hold inquests only on a token number of identified victims, and then apply the findings to all. After a week's adjournment the inquest resumed when colliery inspectors, district managers and Dudley mine employees were cross-examined. The inquiry focused on the location of the explosion; the history of gas in the mine; the mine's ventilation and the use of naked lights.[29]

Fig: 2: *Jurymen, Dudley Colliery Disaster, 29 March 1898.*

Source: With kind permission of Newcastle Regional Library, NSW.

Most district mine managers were non-committal on the cause of the explosion. Until the mine was unsealed and re-examined they were reluctant to theorise. The mine's fan had been idle for 47 hours from 7.00am on the Saturday (19th) before the explosion until either 6.00am or 6.15am (depending on the witness) prior to the 15 men descending the mine. Most of the managers indicated that any gas that accumulated would have 'cleared-out' after between one and two hours operation of the fan. They

also pointed out that it was not the practice in the district to keep the fan operating when no one was working in the mines, especially at weekends. In their estimation, 'constant working of the fan', as prescribed by the 1896 *Coal Mines Regulation Act* did not mean that it should be operating for long periods when no one was working underground. They concurred that when the mine was idle and where furnaces were used, the fires were usually extinguished. District mine managers J. Barr (Co-operative), A. Ross (Wallsend) and W. Turnbull (Australian Agricultural Collieries) testified that an adequate amount of ventilation could be provided by natural means when men were not in the pit. Some managers were aware that General Rule 1 (ventilation) of the *Coal Mines Regulation Act* had a slightly different interpretation in the colony to its English counterpart.[30]

Dudley manager Hugh Humphreys appeared before the coronial inquiry on three separate occasions. He outlined the history of the mine and admitted that he was responsible for safety under the provisions of the Act. Humphreys agreed that small amounts of gas had been reported to him but he had not considered such emissions as dangerous. In response to questions from James Curley, Richard Dryden (miner's lodge secretary) testified that Humphreys was a 'competent and fair manager'.[31]

Dudley miners and former employees gave evidence that small amounts of gas had been experienced over time, together with small 'flare-ups' (ignitions) of gas. These had occurred mainly in Bob's Heading (known as Bord 9), when holes were drilled. Some testified that such incidents were reported to deputies, though it was apparent that the men did not formally report all incidences of gas. When reports of gas had been officially reported, bratticing up to the face had been erected. One witness, J.B. Reynolds, who had worked at Dudley in the week before the explosion, gave evidence that was considered sensational by the *Newcastle Morning Herald and Miners' Advocate*. He recalled that on one occasion he had experienced a 'flare-up' of gas that extended to 15 yards. He had reported the incident to deputy Hetherington, who had promised to erect brattice, but had failed to do so. Edward Weir, Reynolds's mate, when asked about the gas reported by Reynolds, responded that '... it was only 18 inches not 15 yards long; the size of a bible'. When the Coroner inquired how he extinguished it he replied, 'with my hat'![32]

When asked what had caused the explosion, Chief Inspector of Collieries, Alfred A. Atkinson, responded that, as there had been no shot-firing, it was 'the ignition of gas

by a naked light … It occurred on the left-hand side of the narrow bords in the left-hand side headings and coal dust aggravated the explosion'. He had concluded that the mine should be worked with safety lamps. In cross-examination, he claimed that his inspectors had not reported to him that the Dudley fan was not constantly working. Atkinson revealed that he had never told his inspectors his opinions about the ventilation section, because he had no knowledge that there was any difference in their views. Alexander Brown MLC, engaged in a robust exchange with Atkinson. Treating him as a 'new chum', he asserted that '... you have been here six months and have not talked over questions of ventilation. Did you not come here as an expert on ventilation'?[33]

E.H. Wiltshire, for the Crown, stated that the inquiry had opened up the whole question of the interpretation of the 1896 *Coal Mines Regulation Act.* He added that Dudley was a gassy mine and yet the fan had been stopped for 47 hours because of the expense. Wiltshire stressed that the Act prescribed that 'adequate ventilation must be constantly produced'. 'Does this give the manager power to stop artificial ventilation when there are no men in the pit '? Wiltshire claimed that if the stopping of the fan was the primary cause of the explosion, then the manager would be guilty of negligence and the jury could only find him guilty of manslaughter. He argued that it was the jury's duty to declare, in the interest of the coal trade, whether even only technically, a breach of the ventilation section of the Act had been committed.[34] Alexander Brown MLC resented the claim, made by Wiltshire, that the company's failure to adopt safety lamps was the result of economic considerations. He maintained that the introduction of such lamps meant there could be no blasting and therefore all coal would have to be cut.[35]

James Curley, Secretary of the Northern Coal Employees Federation, maintained in a statement that the deputy Thomas Young had not devoted sufficient time to inspect all the places where the men were to work. It was estimated that it would have taken at least three hours to conduct the statutory inspection yet the men were at their work stations only an hour after the deputy descended the mine. He also criticised the *Coal Mines Regulation Act, as* it did not provide for the inspection of abandoned underground workings.[36] After seven hours deliberation, the jury returned an open verdict:

> We consider that the deaths of the two men were due to carbon monoxide poisoning; and we are of the opinion that there is insufficient evidence before us to determine the cause of the explosion.[37]

In response to questions posed by the coroner for their consideration, the jury made the following observations:

> We consider that the artificial ventilation of the Dudley Colliery is quite sufficient. Referring to deputies' inspections; we consider that a greater margin should be allowed for a more thorough inspection of the whole mine at all times, and with stations further back from the working faces. Regarding introduction of safety lamps, we decide it a matter between the manager and the inspectors.
>
> We are of the opinion, according to evidence, that all precautions necessary for the safety and comfort of the workmen were attended to by the management with the exception of rule 1 of clause 47, part 2 of the 1896 *Coal Mines Regulation Act* with reference to ventilation being constantly produced, of which we consider ourselves unable to interpret. We consider the Dudley disaster was quite unexpected, as not sufficient reports were made to the management prior to the explosion.[38]

Immediately after the coronial inquiry, Chief Inspector Atkinson issued three circulars to all colliery owners and managers in the colony. The first reminded them of the need to comply with the 'continuous ventilation section' of the *Coal Mines Regulation Act* (even when the mine was not being worked). Manager H. Humphreys agreed to comply immediately.

Another circular drew their attention to the danger of coal dust and its part in pit explosions. Chief Inspector Atkinson also reminded managers of the provisions of Rule 8 relating to the use of locked safety lamps whenever there was the risk of the ignition of firedamp.[39]

James Curley, CEF secretary, wrote to Minister Sydney Smith demanding a formal inquiry into the disaster due to the 'unsatisfactory jury verdict'.[40] According to ministerial minutes and memoranda, both the Mines Minister and Chief Inspector Atkinson of the Coalfield Branch, were intent on prosecuting manager H. Humphreys for breaches of Rule 1 (ventilation) and General Rule 4 (deputy's inspection and report on gas). Atkinson requesting approval to prosecute, wrote:

> I believe that this would have a much more beneficial effect on the future discipline of mining ... than anything which may be brought out by an investigation under Section 23.[41]

Following the Chief Inspector's interview with E.H. Wiltshire of the Crown Solicitor's Office, he was advised against prosecuting Humphreys in view of the probability of an inquiry being held under section 23. He also suggested that if it was

decided to take proceedings under General Rule 1 (ventilation) as a test case, he recommended that some other colliery be selected. Another legal opinion claimed that a prosecution of Humphries would be unsafe as the requirements of the *Coal Mines Regulation Act* were not clear. A ministerial minute, dated 30 June 1898, referred to the need for an inquiry but that it should be held over until the unsealing and re-entry of the mine was complete.[42]

Following the temporary sealing of the mine on 24 March, it was eventually unsealed on 17 June after relatives of those whose remains had not been recovered had pressured the Minister of Mines. Recovery parties re-entered the mine and the five remaining bodies, of George Cook - on 10 July; Arthur Dunn - 23 July; Cyrus Price - 23 July; Thomas Young - 29 July; and George Hindmarsh - 4 August**,** were brought to the surface.[43]

The Court of Investigation

On 18 July, the Sydney barrister, Charles G. Wade was appointed by the Minister of Mines as sole Commissioner under section 23 of the Coal Mines Regulation Act, to conduct an inquiry into the Dudley disaster. The investigation was postponed until the mine was unsealed and re-opened for exploration. Departmental officers believed that as the clearing of the debris was imminent, they thought it imperative that Commissioner Wade should visit the underground workings before any material evidence was destroyed. Wade, accompanied by Chief Inspector Atkinson and district mine managers, spent one day at the pit, visiting the chief points of interest in connection with the explosion. [44]

Opening on Monday 15 August, the Court sat for 13 days examining 45 witnesses. Wade preferred to take oral evidence but also consulted the written depositions given at the inquest. Most of the evidence presented was a repetition of that given at the inquest although there were some new witnesses. Appearing before the Court and representing various interests were: Mr W.H. Baker, solicitor for the manager Hugh Humphreys; the Hon. Alexander Brown MLC, for the proprietors of the Dudley Colliery; Mr James Curley, Secretary of the Northern Coal Employees Federation (CEF) for some of the relatives of the deceased, and Mr Alfred A. Atkinson, Chief Inspector of Collieries who was watching over the interests of the Department of Mines.[45]

The Commissioner, in his opening remarks, said that the *Coal Mines Regulation Act* gave him wide powers and he proposed to use them. They would be used, not just in ascertaining the cause of the disaster, but also to elicit information that could guide future operations and lead to the adoption of safety measures. Alexander Brown MLC, on the defensive from the outset, inquired whether the Commissioner proposed to make any recommendations which would serve to bind the proprietors in their future management of the colliery, for example, in making safety lamps compulsory? Commissioner Wade's response was '... if the evidence warrants him making recommendations, he would do so'. Brown stressed that the mine owners would not consider themselves bound to follow any recommendations of the Court. Wade indicated that it was up to the Department of Mines to consider his recommendations and if they clashed with the provisions of the *Coal Mines Regulation Act* they could not be enforced.[46]

A great deal of the proceedings was devoted to evidence (some of it conflicting) attempting to ascertain the seat of the initial explosion. Both district managers and inspectors appeared to have different views. Some favoured the left side of the workings while others claimed that the force came from the right side and then affected the left. On that issue, Chief Inspector Atkinson, who had made 14 descents after the re-opening, actually reversed his opinion given at the inquest.[47]

There was also considerable time spent on trying to apportion blame for the explosion. Alexander Brown for the proprietors, defended manager Humphreys against accusations that he had been negligent in not being aware of the numerous incidences of firedamp ignitions and in committing a breach of the Act through not maintaining continuous artificial ventilation. Brown argued that if the manager was culpable (based on a breach of the ventilation section), so were the colliery inspectors, as there had been no complaint from them on ventilation since 1896. Colliery Inspector William Humble had often been in the pit, according to Brown, yet had never complained about the fan not operating when the pit was idle. Brown also claimed that, if 'continuous ventilation' was so vital, why did Chief Inspector Atkinson not discuss it with his fellow inspectors, or make himself aware of local practices?[48]

The report of the Court of Investigation was tabled on 29 September 1898. Its principal conclusion was that the explosion was caused by the ignition of firedamp at a naked light and was intensified by the agency of coal dust. Wade maintained that, on the

balance of probabilities, the explosion originated on the left side, at Deputy Hindmarsh's naked light, with the force directed across the second and left hand headings, through the pump drift and up the down-cast shaft.[49]

Another conclusion was that ventilation was not constantly produced in accordance with the terms of section 47, rule 1 of the *Coal Mines Regulation Act*. Wade also concluded that inspections were not conducted in compliance with General Rule 1 of the Act. Additionally he concluded that locked safety lamps should have been used, as there was a quantity of firedamp in the mine.

Commissioner Wade referred to the English Court's decision in Knowles v Dickinson 1862:

> That it is the duty of the Management to keep the fan constantly at work each day of the week, whether the men are actually in the mine or not, so long as it is being worked as a going concern.[50]

In the report, the Commissioner stated that a prosecution for a breach of the Act in this respect was barred by statute, as the permitted period of three months since the alleged breach had expired. The report also gave the following comments and observations.[51]

Evidence proved that stopping the fan from Saturday to Monday was not the cause of the gas being in an explosive state. Assuming that the brattice was in order, the volume of air was sufficient to dilute the noxious gas. The practice of stopping the fan at weekends had been common for years in Dudley and district mines without any objections from colliery inspectors. He noted that following the Inquest, the Chief Inspector of Mines had issued a circular emphasising the need for constant ventilation and that Manager Humphreys now complied with that rule.[52]

The history of Dudley mine demonstrated that it had always given off firedamp. In the 11 months before the explosion, gas had been reported by deputies on 16 different occasions. Twenty witnesses gave evidence of the ignitions of firedamp they had experienced. They had occurred in Bob's heading and in the bord next to where Hindmarsh's body was found, during the week before the explosion. After the pit was unsealed, gas was still being emitted from faces in the right-hand headings as well as in the bords in Bob's heading.[53]

Wade's report also referred to the fact that most of the mine was dry and dusty. He emphasised the danger posed by coal dust when it came into contact with a small portion of firedamp by quoting an 1894 English Royal Commission report: ‘What might

be a local explosion of a simple character is transformed through the medium of coal dust into a widespread disaster'.[54] The important part played by coal dust accumulation in colliery explosions, together with its impact on methane gas, was only just being understood in the colony at this time.

Manager Humphreys swore that only once had he known of gas igniting at a naked light. Wade found that many of the men, who gave evidence of 'flare-ups' admitted that they failed to report them and, when reported to a deputy, they were never recorded. Nevertheless, given the number of incidents disclosed, safety lamps should have been used in compliance with Rule 8. He stressed that prosecution of the manager was out of the question as it was statute-barred after three months (Section 62), and that he was not justified in recommending prosecution for manslaughter. He considered that the adoption of safety lamps was a matter at the discretion of the management.[55]

Given the time needed to recover and identify bodies, clear debris and establish the essential facts, the period of three-months appeared inadequate. It could be viewed as an attempt to protect both mine managers and owners from possible prosecution. This section of the 1896 Act was amended in 1900 and extended the period of notification of any breach to six-months.

Aftermath: Safety lamps and industrial disputation

When in early September 1898, the management was ready to resume coal mining, it arranged for the introduction of safety lamps. Local union officials met with manager Humphreys demanding an extra three-pence a ton in the district's hewing rate of two shillings and eleven pence (2s.11d) per ton to compensate for the disadvantage of using safety lamps. It was argued that the dim light of the safety lamps would slow-down the extraction, loading and cleaning processes. The hewing rate was paid for each ton of clean coal extracted and delivered at the pithead. Therefore the men believed that the introduction of safety lamps would impact negatively on their piecework wages. Some miners also stressed that the lamp's inferior light made loading skips dangerous, as there was the risk of coal falling on their legs and feet. The management's introduction of locked safety lamps, from a miner's viewpoint, could have been perceived as a serious threat to their autonomy at the work place. Northern District miners proved to be extremely resistant to their introduction at this time.[56]

The colliery manager informed the men that the lamps and the oil would be

provided free. He claimed that at the Helensburgh colliery, in the Southern district, where such lamps were compulsory, there had not been any increase in the hewing rate. Although a small number of men returned to work under the new conditions, the majority, supported by the Northern CEF took strike action. The union feared that the initiative, if adopted at Dudley, could create a precedent and spread to other pits in the district. Dudley's management engaged 30 non-union miners, but union pickets induced most of them to leave.[57]

On 28 September 1898, Alexander Brown, acting for the proprietors, announced that due to the dispute, the mine would be closed indefinitely. He stated that the closure was due to the attitude of the men in demanding three-pence extra per ton for using safety lamps. Brown added that most of the Dudley men refused to give safety lamps a trial. He alluded to the weak economic position of the mine and informed the local press that his application to the Mines Minister to reduce the royalties paid to the Crown, from six-pence a ton to four-pence a ton, had been rejected. He claimed that the proprietors, as mortgagees in possession, had lent £30,000 on the property without receiving one penny on the capital invested. Additionally, according to Brown, the mortgagees had spent £5,000 in re-opening the mine following the disaster.[58]

The *Newcastle Morning Herald and Miners' Advocate* commented that '… it was a sad commentary on Wade's report (with its recommendations for safety lamps) that its impact was to close the Dudley mine'. Its editorial given below encapsulated the position of the miners caught between their instinct to satisfy their material (economic) needs and their basic need for safety:

> Verily the lot of the miner who is forced to choose between taking his chance of being hurled to eternity at a moment's notice, or of starving above ground is a most undesirable one.[59]

Chief Inspector of Collieries, Alfred A. Atkinson referred to the stalemate at Dudley in his 1898 Annual Departmental Report.

> It is unfortunate that the question of the price to be paid for getting the coal should stand in the way of the adoption of the precautionary measures of using safety lamps, and it would be well if some satisfactory arrangement between management and miners could be arrived at on this matter.[60]

When work was resumed on 4 April 1899, only a small number of men returned. By the end of the month, although the strike continued, an estimated 100 men had returned. The strike eventually terminated on 19 August 1899, with the men returning on the

same terms as originally offered in September 1898. In the 1899 Annual Report of the Mines Department, it confirmed that 'safety lamps were being used in the underground workings of the Dudley Colliery'. Some miners were paid by yardage instead of by the ton. Ironically, Humphreys was prosecuted in December 1899 for a breach of Part 1 (38) of the *Coal Mines Regulation Act* which stipulated that miners be recompensed on the basis of the weight (by the ton) they produced. The mine continued to operate, reaching its peak in terms of production in 1901. It closed in 1939 and was demolished in 1940. To mark the 100th anniversary of the disaster, a commemorative plaque was erected at Frank Watkins Memorial Park (Dudley Oval) off Ocean Street, Dudley.[61]

Conclusion

Historically, in comparison with those in the Southern coalfield, Newcastle collieries had never experienced great accumulations of firedamp or explosions. From evidence revealed at both the Inquest and the Inquiry, district managers recognised that the existence of firedamp in such proportions was a relatively 'new development in the northern coalfield'.[62]

It could be argued that against this background, a 'culture of complacency' over safety existed at Dudley. It was clearly demonstrated that three inter-acting risk factors (dust, gas and naked lights) contributed to the explosion. Given the number of firedamp ignitions revealed at the Inquiry, the carrying of naked lights constituted a definite risk. The manager appeared to be unaware of most of these ignitions yet he acknowledged that he was individually responsible for mine safety under the 1896 Act. Reporting practices appeared casual, perfunctory and in some cases non-existent. Dust, for some years had been recognised as a potent agent in gas explosions, especially in British coal mines. Although a water cart operated at Dudley, ‘watering-down’ of roadways did not appear to be a priority. Some testimony revealed that dust always accumulated on the roofs and sides of the main roadways. [63]

At the inquest and the Court of Investigation, there was considerable focus on the alleged breach of the ventilation section of the Act. Would continuous artificial ventilation have reduced the risk of explosion? Several colliery explosions had occurred in spite of continuous ventilation. Nevertheless, the fan's operation for the 47 hours when the mine was idle could possibly have reduced the risk of an explosion. There was obvious ambiguity over the meaning of the ventilation section, with Chief Inspector

Atkinson having a different interpretation to that of the local managers and his own inspectors.

The delay in prosecuting Humphreys (to allow for the formal inquiry) led to any such action being statute-barred. If Humphreys was culpable, were the colliery inspectors who reported regularly on the satisfactory ventilation of the mine also culpable? In effect, by their silence, they condoned the practice of not operating the fan when the mine was idle.[64]

Local resistance to safety lamps has to be seen against the wider context of acrimonious relations between capital and labour in the Northern Coalfield. Besides disputes over the hewing rate (that had been reduced significantly during the Depression of the early 1890s), there were other long-running conflicts. They included disagreement over the methods used to weigh the coal and also the problem of 'excessive small coal (slack) in the skips'. The discord at Dudley over safety lamps was less an issue of the miners not wanting to use them, but more a question of whether the management was prepared to compensate them for the inconvenience.[65]

There were some positive outcomes of the disaster. Indirectly it gave momentum to the eventual passage of the Miners' Accident Relief Fund Bill enacted in 1900.[66] Continuous artificial ventilation in coalmines was adopted as normal practice throughout the colony. At Dudley, safety lamps were introduced following the termination of the strike in August 1899. Other miners in the northern coalfield remained resistant to their introduction and later disasters at Bellbird (1923) and Redhead (1926) were attributed to naked lights.[67]

The aftermath of the explosion highlighted the critical issue in industrial capitalism of trying to achieve a balance between productivity (maintaining output and at the same time keeping costs low) with safety concerns. Finally, reflecting on the disaster, one is reminded of the old adage, 'It's all very well to be wise after the event'. Did safety take a back seat?

Acknowledgement:
The author wishes to express his thanks to Ed.Tonks, local historian, Charlestown, Newcastle, NSW, for suggesting additions and rectifying errors in a draft copy of this paper. His valuable assistance is appreciated.

Endnotes

[1] *Newcastle Morning Herald and Miners' Advocate* (*NMHMA),* 22 March 1898, p. 5.
[2] Ed. Tonks quoted in *Newcastle Morning Herald*, 23 July 1998, p. 10.
[3] The following are conversions for measurements used in this article: 1 pound = 0.454kg; 1 hundredweight (cwt) = 50.8kg; 1 (long) ton = 1.01605 tonnes; 1 inch = 25.4mm; 1 foot = 0.3048m; 1 yard = 0.914m; 1 mile = 1.609km.
[4] George H. Kingswell, *The Coal Mines of Newcastle, NSW*, Newcastle Herald, Newcastle, 1890, pp. 59-60; *NMHMA*, 2 April 1898, p. 5; *Annual Report of Department of Mines, NSW*, *1897*, p. 107.
[5] The four sinkers killed were Edward King, Patrick Ryan, Augustus White and John Whitehead, *NMHMA,* 22 November 1889, p. 4.
[6] Miner killed was Giovanni Missi, *Annual Report of Department of Mines, NSW, 1893*, p. 195.
[7] *NMHMA*, 22 March 1898, p. 5
[8] Ed. Tonks quoted in *Newcastle Morning Herald*, 23 July 1998, p. 10.
[9] *Annual Report of Department of Mines, NSW*, 1897, p. 117.
[10] 'Dudley Colliery Explosion Report'*, NSW Votes & Proceedings (V & P) 1898,* series 3, pp. 2-3; Information provided by Ed. Tonks, Newcastle, 10 October 2007.
[11] *NMHMA*, 22 March 1898, p. 7.
[12] *Ibid*.
[13] Many coalmine disasters have been attributed to explosions caused by the inter-action of methane gas (firedamp), air, coal dust and naked lights. Major Australian coal mine disasters include Bulli, NSW, (1887) 81 dead; Mount Kembla, NSW, (1903) 75 fatalities; and Mount Mulligan, Queensland, (1921) when 75 perished. Europe's worst colliery disaster was in 1906, at Courrieres, Northern France resulting in 1,009 deaths (including children). The British mining disaster with the highest fatalities was at the Universal Colliery, Senghenydd, South Wales (1913) when 439 miners were killed. Sources: Peter Bell, *If Anything, Too Safe: The Mount Mulligan Disaster of 1921*, James Cook University, Townsville, 1996; 'Courrieres Mining Disaster', http: en.wikipedia.org/wiki/courri/, accessed 12 July 2007; Donald P. Dingsdag*, The Bulli Mining Disaster 1887: Lessons from the Past*, St. Louis Press, Darling Heights, 1993; D. Owen, *South Wales Collieries. vol. 6*, *Mining Disasters*, Tempus Publishing, Stroud, UK, 2005; Stuart Piggin and Henry Lee, *The Mount Kembla Disaster*, Oxford University Press, South Melbourne, 1992.
[14] *Annual Reports of the Department of Mines, NSW, 1890*, p. 195; *ibid.,* 1896, p. 87.
[15] *NMHMA*, 22 March 1898, p. 5.
[16] *Ibid*.
[17] *Ibid*.
[18] *Ibid*., 23 March 1898, p. 5.
[19] *The Sydney Morning Herald (SMH),* 23 March 1898, p. 6; *NMHMA*, 2 April 1898, p. 6.
[20] *Ibid.*, 24 March 1898, p. 5.
[21] *Ibid*.
[22] *Ibid*., 25 March 1898, p. 5.
[23] *SMH*, 26 March 1898, p. 6.
[24] *Ibid*.
[25] *NMHMA*, 4 December 1896, p. 4.
[26] *SMH*, 26 March 1898, p. 6.
[27] *Ibid*., 4 April 1898, p. 6.
[28] *NMHMA*, 26 March 1898, p. 5.
[29] The *NMHMA* provided detailed coverage of the Coroner's Inquest between 23 March and 28 May 1898.
[30] *NMHMA*, 29 March 1898, p. 5; 30 March 1898, p. 6; 1 April 1898, p. 5; 14 April 1898, p. 5; 16 April 1898, p. 7; 20 April, p. 5; 27 April, p. 5, 1898.
[31] *Ibid*., 15 April 1898, p. 5; 16 April 1898, p. 5; 27 April 1898, p. 5.
[32] *Ibid*., 1 April 1898, p. 5; 2 April 1898, p. 6.
[33] *Ibid*., 23 April 1898, p. 5.
[34] *Ibid*., 28 April 1898, p. 5.
[35] *Ibid*.
[36] *Ibid*.
[37] *Dudley Colliery Explosion Report*, p. 1.
[38] *Ibid*.
[39] *Annual Report of Department of Mines, NSW*, 1898, pp. 131-132.

[40] Letter 2 May 1898, James Curley to Minister of Mines, Mines, CGS 10012, State Records NSW (SRNSW),
[41] *Ibid.,* ministerial memoranda dated 9 May 1898, between Chief Mines Inspector Alfred A. Atkinson and Mines Minister, Sydney Smith.
[42] *Ibid.,* memoranda dated 12 and 15 May 1898, between Crown Solicitors Office and Alfred A. Atkinson, Chief Inspector of Mines.
[43] *Ibid*., pp. 1-7.
[44] *Dudley Colliery Explosion Report*, pp. 1-2; Charles Gregory Wade served as Premier of New South Wales 1907-1910, *Australian Dictionary of Biography, vol. 12, 1891-1939*, Melbourne University Press, Melbourne, 1984, pp. 340-342.
[45] *Dudley Colliery Explosion Report, 1898*, pp. 1-3; Alexander Brown MLC, barrister, pastoralist and colliery owner was a 'conservative stalwart' who led the opposition to the Coal Mines Regulation Bill 1895 in the NSW Legislative Council, *NSWPD*, 2, 30 May 1895, pp. 6572-6573.
[46] *SMH*, 16 August 1898, p. 5.
[47] *Ibid*., 30 August 1898, p. 5.
[48] *NMHMA*, 30 August 1898, p. 7.
[49] *Dudley Colliery Explosion Report*, p. 7.
[50] *Ibid*., p. 8.
[51] *Ibid*.
[52] *Ibid*., p. 9.
[53] *Ibid*.
[54] *Ibid*.
[55] *Ibid*., p. 11.
[56] *NMHMA*, 12 September 1898, p. 5.
[57] *SMH*, 29 September 1898, p. 7.
[58] *Ibid*.
[59] *NMHMA*, 3 October 1898, p. 6.
[60] *Annual Report of Department of Mines, NSW*, 1898, p. 118.
[61] *NMHMA*, 20 August 1898, p. 5; 26 June 1899, p. 4; 30 December 1899, p.6; 23 July 1998, p.10; *Annual Report of Department of Mines, NSW*, 1899, p. 122.
[62] *NMHMA*, 4 July 1898, p. 5.
[63] *Report of the Royal Commission on Bulli Colliery Accident, NSWLA V & P, 1887*, p. 26; *Dudley Colliery Explosion Report*, p. 7.
[64] *Coal Mines Regulation Act (Amendment) Act 1900*.
[65] Piggin and Lee, *Mount Kembla Disaster*, p. 40.
[66] *Miners' Accident Relief Act 1900*.
[67] *Annual Report of the Department of Mines, NSW, 1899*, p. 112.