

GLEBE. Washington, Durham. 20th. February, 1908.

Washington 'Glebe' Colliery was also known as Glebe Pit and had been established about four years before the accident when the shafts had been sunk through the surface deposits by the freezing method and was one of two collieries, the other much older was known as the F Pit. Both Pits were owned by the Washington Coal Company Limited with Mr. F Stobart, a mining engineer and a certificated colliery manager, who had taken part in the management of the F Pit as managing Director and Agent. Mr. Mark Ford was the manager for both collieries with Mr. John Cockburn the undermanager for the Glebe Pit.

There were two shafts at the colliery, both sunk to the Low Main Seam at 114 fathoms passing through the Maudlin Seam at 104 fathoms. The downcast was the main shaft for drawing coal from the Maudlin Seam in two cages and was 14 feet in diameter. From the Maudlin Seam to the Low Main Seam, 10 fathoms below, the shaft was fitted with ladders. At the top of the upcast shaft there was a fan, 12 feet in diameter and had a single cage with wire rope guides. A single cage ran between the surface and the Low Main Seam and it was by this that coal was raised from that seam and the workmen passed to and from their work. The top of the upcast shaft, above the level of the fan drift was enclosed by a square wooden structure carried up nearly to the pulley and closed at the top except for hole through which the winding rope passed. A door in this structure at ground level gave access to the cage. Added to this there was wooden porch, entered by an outer door in which the banksman worked and where men stood before they descended the shaft.

Four or five days before the explosion, a stone drift driven up from the Low Main Seam to the Maudlin formed a third connection between the seams. The explosion originated and was confined to the Low Main Seam. There were extensive workings in both seams and a road from the Maudlin Seam connected the Glebe Pit underground with the F Pit.

The Hutton Seam lay 10 fathoms below the Low Main and had been worked many years ago from an abandoned colliery at Oxclose and these workings extended under the Glebe shafts. Two vertical boreholes from the bottom of the upcast shaft had been bored into them.

The workings on the bord and pillar system in the Low Main Seam commenced in October, 1906. The operations were more for development than for obtaining a large output and the raising of the coal in a single cage in the upcast shaft was a temporary measure and was later to be replaced by a permanent engine haulage which would bring the coal up a stone drift to the Maudlin Seam and from there to the surface by the cages in the downcast shaft.

The Low Main Seam at the colliery produced good quality gas and bunker coal. The floor was an inferior sagre clay followed by laminated sandstone and the roof was a good average roof, a layer of shale rested directly on the coal and above it was a laminated sandstone. There was an area to the south west of the shafts that had been subjected to considerable heat and this had taken out most of the volatile matter from the coal. This area had been proved from the adjoining collieries, of Hylton to the east, Unsworth to the north east, North Biddick to the south and Harraton to the west as well as the upper seams in the Glebe Pit where it was exposed in the Maudlin Seam. The coal in the Low Main Seam as it approached this area became softer and easier to work. The dip in the seam was about 1 in 12 to the east.

The leading of the coal was performed by five ponies, all of which were killed in the explosion, pulling wooden tubs which carried 10 cwt. The ventilation of the colliery depended on a exhausting Waddle fan, 25 feet in diameter and running at 40 r.p.m., near the surface of the upcast shaft. It had been running at its usual speed up to and for some time before the explosion. Before the completion of the stone drift, the ventilation

of the Low Main Seam depended on the air directly descending the downcast shaft and entering the seam. The main split at the time of the disaster was through a hole about a foot square in the brick framework of a door placed in the roadway extending eastwards from the downcast shaft and then passed inbye by the left hand of three winning places extending to the south east, returning to the upcast shaft by the right main winning except in regard to scales and leakage past canvas doors, returned to the centre road which was also the road along which the coal was transported. On the opposite side of the downcast shaft to the door already mentioned there was a brick stopping and from it six 12 inch diameter air pipes were carried across the main road passing through another stopping on the opposite side which allowed an air current to pass to ventilate some temporarily abandoned workings and the stone drift to the west and north of the shafts. Only three of the 12 inch air pipes were used.

This current passed to the north west along the back main wining and split, one part to the left ventilated the workings from the point where it split and a fault and was regulated as it returned to the upcast shaft. The remainder of the current split again, one portion ventilated a few excavations in the coal in one of which some firedamp had been met and the air from which it was not thought wise to take up the stone drift and the current was therefore brought across the road near the bottom of the stone drift by an air crossing, formed of a single 12 inch tube and then passed direct to the upcast shaft. The other portion was carried up the stone drift by means of brick bratticing and joined the air from the single tube air crossing and passed with it to the upcast shaft.

When the third connection to the Low Main was made by the completion of the stone drift, the ventilation was rearranged. The main current remained as before but the split passing through the pipes was replaced by air descending through the drift from the Maudlin Seam and two wooden doors of the main road between the foot of the stone drift and the shafts supplemented by other doors and stoppings carried this current round the temporarily abandoned places to the north and west of the shafts.

It did not appear that the change had any effect of the origin of the explosion. The overman stated at the inquest, that the change was effected, he examined the working places on the morning of 20th. February and found them well ventilated and subsequent reports from the deputies showed no change but no air measurements were made but on the day of the disaster the fan was working normally and the total quantity of air measured in the fan drift was 74,580 cubic feet per minute.

There were no difficulties in ventilating the Low Main Seam and the quantity of air could have been easily increased. The main split of air was carried along the left of the three winning places to the south east by brick stoppings and when it arrived at the working face, it was carried round by canvas sheets and doors into the cul-de-sacs where necessary by canvas bratticing, returning along the right and centre main winnings to the upcast shaft. The air descending the stone drift followed the same course but did not ventilate any working places. In ventilating the places to the east and dip of the shafts, no difficulties were found.

The Low Main Seam was known to give off firedamp but no gas had been reported only once in the preceding month, on 28th. January. The gas was found in the place where the explosion originated. The gas was reported to the undermanager who instructed the surveyor to make an examination of the evening of the 12th. February. this he did and found the place clear.

The seam did not make much water and was, on the whole, dry, but the old workings in the Hutton Seam under the explosion area were drowned. The boreholes to the Hutton Seam were arranged to deliver water into the sump of the upcast shaft and from there it was pumped to the Main Coal Seam by two hydraulic pumps placed near the shaft and driven by columns of water taken from the delivery pipe of a steam pump in the Main Coal Seam which forced the water to the surface. pipes fitted with cocks were wedged into the top of each borehole so that the water coming up from the Hutton

Seam could be cut off at any time. At the time of the explosion, only one hole was delivering water.

The pressure of the Hutton Seam water at the Low Main Seam was 52lbs. per square inch at the time of the explosion but it had been much higher. The water from the Hutton Seam had a smell of carburetted hydrogen but no firedamp had been seen with it. Three weeks after the disaster, the valve was opened after being closed for a considerable period and a little gas of some kind came up from one of the boreholes. The flow lasted for about half a minute and then was followed by water.

The seam was moderately dusty on the floor and there were probably deposits on the roof, sides and timbers of the intakes due to dust from passing tubs and from the screen at the surface. the manager did not consider the seam dusty.

The coal was moderately hard and was blasted by the permitted explosive, Bellite No.3 fired by an electric battery. the company provided the explosive but the stonemen who were on bargain work paid for it. No naked lights were allowed in the seam and the lamps used by the workmen were bonneted Clanny lamps with one gauze and cap, locked by lead rivets. Some of the officials used bonneted Davy lamps locked in a similar fashion..

From 4 a.m. to 4 p.m. the seam was occupied by the for and back shift hewers, about 12 altogether and these two shifts were overlapped by an ordinary haulage shift of three from 6 a.m to 4 p.m. Two hewers worked from 4 p.m. to 10 p.m. followed by another two from 10 p.m. to 4 a.m., usually in the winning places.

As there was not much work for the deputies in the seam, their shifts were arranged by one descending at 6 a.m. and remaining until 4.30 p.m., who met the back shift hewers and the hewers in the fore shift of the night shift at the station which was at the bottom of the upcast shaft. The other deputy went down at 8 p.m. and remained until 4 a.m. He examined for and met the backshift hewers in the night shift and the fore shift hewers in the day shift. The stonemen's places were examined by the deputy leaving the pit at 4.30 p.m. but he had usually got round all the places before 4 p.m. and they did not come down until 6 p.m.. The report commented-

“While this is specified in the Special Rules as regards hewers in compliance with the term of General Rule IV., it is no specified for other workmen. Attention has already been called to this defect in the Special Rules in connection with the explosion at Woodhorn and North Seaton Collieries in Northumberland.”

The workmen at the colliery regularly inspected the under General Rule 38 and Robert Glendenning and Thomas Lavery found the Low Main Seam in a satisfactory condition of the 18th. December, 1907.

On the day of the explosion the Low Main Seam had been occupied by two day shifts of hewers and the haulage shift. Two night shift hewers had gone down at 4 p.m. and Wood and Dixon, two stonemen, had descended at 6 p.m., Ashman, the night deputy at 8 p.m. and all went well until the moment of the blast. There were 108 men and boys underground in the Glebe Pit, 51 in the Main Coal, 42 in the Maudlin and 15 in the Low Main. No one in the upper seams was injured in the explosion.

In the porch at the top of the upcast shaft, two hewers on the 10 p.m. shift were about to descend to the Low Main and the waiter-on, who had just opened the door next to the shaft to allow two shafts men up from the Low Main, to get off. One of the shafts men was in the act of stepping out of the cage and his mate was in the cage behind him when the explosion occurred. The men heard a report but felt no heat and saw no flame. They saw no dust and their lamps were not extinguished. the outer door of the enclosure was blow open and they all ran out. Looking back they saw what appeared to be smoke ascending the shaft.

The upper part of the enclosure was slightly damaged. a skylight near the fan was broken and the doors leading to the fan drift were slightly damaged but the fan itself was unscathed. Immediately, the cage in the upcast shaft was run down in response to

a signal which was probably caused by some material moved by the explosion striking the signal wire but it was not able to reach the seam as the framework had been disturbed near the bottom of the shaft.

The downcast shaft was not damaged and the first explorers went down to the Maudlin and climbed the ladders to the Low Main Seam. They found the ventilation disarranged and the air short circuited and evident signs of an explosion. One of the victims, Oswald, was found alive near the upcast shaft but he died soon after. A man named Yardsley was found near him and he survived.

It was decided to take the fresh air along the centre winning or haulage road. The speed of the fan was increased to 180 r.p.m. and considerable progress was made despite the falls of stone and blown out stoppings, when word came that there was a fire at the foot of the stone drift. All the men were withdrawn until the manager and others, returning to the Maudlin by the ladders, had descended the drift and loose prop and a standing prop smouldering. The fire was extinguished without difficulty and the party the passed along the main road in the Low Main Seam to the shafts and then started to explore further in.

In the meantime, a canary had been brought in and used to test the air. The face had almost been reached and some bodies passed on the main road when some more smouldering timber was seen and extinguished and ore fires were seen smouldering. Latter, it was found that the brattice had been on fire. As they party approached the face, some of the party, including the manager, found themselves affected by afterdamp and they had to retreat to the shafts.

Before returning to the district where the men had been working, the abandoned workings to the north and west of the shafts were examined and found to be clear of afterdamp but some firedamp was encountered.

Messrs. Philip Kirkup and W.C. Blackett, mining engineers, joined the explorers and the whole party returned to the face and all the bodies were located and arrangements made to remove them, to the surface. This work was completed by 8 a.m on the 21st. February

Those who lost their lives were-

Edward Ashman aged 41 years, deputy,
Robert Cowan aged 44 years, stoneman,
Thomas McNally aged 48 years, stoneman,
Alfred Wood aged 50 years, stoneman,
William Edward Glendenning aged 32 years, stoneman,
James William Swan Wake aged 42 years, stoneman,
Charles Thomas Applegarth aged 33 years, stoneman,
John Dixon aged 42 years, stoneman,
William Henry Rollin aged 30 years, stoneman,
James Ambrose Madden aged 49 years, hewer,
ohn Thomas Clarke aged 29 years, hewer,
Charles Chivers aged 25 years, shifter,
Henry Oswald aged 35 years, waiter-on,
Thomas Agar Errington aged 18 years, putter and
James Yardsley aged 29 years, pumpman was injured.

Mr. Atkinson arrived at the colliery of the 21st. February and made a detailed inspection of the Low Main seam with mining engineers and representatives of the management of the colliery and the Durham Miners' Association. They established the course of the explosion and noted that coked coal dust was deposited on the props and was present in all the area covered by the explosion.

Oswald and Yeardsley had been found alive but burnt at their usual posts. Rollin had been coming outbye with a tram laden with drilling gear on his way to drill a hole in a place on the 1st. South district when the explosion overtook him. He was burned and his skull was injured. His lamp was not found and was probably under a fall of stone.

Wood and Dixon were working a few feet apart, drilling holes in stone which was to be shot down on the right side of the main road where an engine landing was to be situated. The heaps of drillings lay below the holes and were blackened by coal dust. They had finished drilling and were working 16 yards from the holes. Beyond them, through a canvas door, Chivers and Errington had been driving two ponies outbye with loaded tubs of coal. They were found a few yards inbye of the ponies, burned. Their lamps were found close by and at the moment of the blast they had probably they had been sitting on the limbers and carried them out in their hands. A few yards further in, Madden had been taking off coal on the right hand side where he was found with his lamp close by.

Clark was hewing at the face of a stenton going from the centre to the right winning. He had run 50 yards on to the main road where his body was found. Wake and McNally had been riddling a shot at the face of the right hand winning. they had run into the last holed stenton, A distance of about 40 yards. One of the lamps was found where they had been working and one had been brought out. Applegarth and Glendenning had been riddling a shot at the face of the place at an angle to the right of the main winning. They died from carbon monoxide poisoning and their lamps were found at their working places..

Three ponies in the intake airway near the shafts were killed by after damp. Ashman, the only authorised shotfirer in the seam, was found with his lamp overturned near a shot firing battery. the outer end of the cable was not connected to the battery and lay about 7 feet inbye of it and the cable, 30 yards long went inwards past a loaded tub to within a few feet of the bottom of the caunch and then turned away to the left. The inner end of the cable was wrapped round a pick shaft.

A shot had been fired in the pavement of the seam and the stone lifted had not been disturbed and there were no tools nearby. Ashman and Cowen were burned and attached to Ashman's belt was a leather case containing 20 detonators fitted with wires. He usually brought from 26 to 30 with him. Cowen's jacket was hanging on a prop at the entrance to the place and his pocket contained two 8 oz. cartridges of Bellite No.1. A shot box containing three cartridges was found damaged near Rollin's body and this led to the conclusion that there had been a contravention of general Rule 12 (b).

In the headways at the bottom of the caunch, about 16 inches thick, had been shot up on the right side and the stone stowed on the left side. In this board the caunch had been continued in the centre of the place for three yards, to within five yards of the face, the stone being stowed on each side and the shot was fired to extend this bottom caunch. The shothole was drilled by machine in the centre of the caunch and seemed to have been following a parting for about three feet ten inches. The thickness of the stone was about 17 inches. the shot had done its work well but no stemming remained in the hole. The face was blackened by raised coal dust and coked coal dust was seen on the props and sides.

The inquest was opened in the Wesleyan Hall near Washington Station by Mr. A.T. Shepherd, Deputy Coroner for the Chester Ward when all interested parties were represented. After hearing the evidence, the jury returned the following verdict_

“That on the 20th. day of February within the Low Main seam, Glebe Pit, Washington Colliery the men died from such as a result of an explosion of gas and dust and was accidentally caused by the firing of an overloaded shot in the Low Main seam.”

HAMSTEAD. Great Barr, Staffordshire. 4th.March, 1908.

The colliery was besides the Birmingham and Walsall Branch of the London and North-Western Railway about five miles from Birmingham and had two shafts from which The Thick of ten yard coal, which was the main seam in the Staffordshire coalfield was worked. When this seam was won, the shafts were sunk a little below it and the downcast shaft was 15 feet in diameter and the upcast 12 feet in diameter. Later, both shafts were filled for a distance until they were just below the 'Brooch Coal' level. This seam was only 2 feet 6 inches thick and occupied an horizon about 40 yards above the Thick Coal so that the depth of both the shafts was practically the same at 580 yards. The main road were driven for some distance from the shaft, in the Brooch Coal, so that a great part of the road was in rock as the seam was thin.

The Thick Coal was approached by two sets of roads driven a short distance to the north and south from the downcast shaft and then turned to the east. These served as intakes and haulage roads and the main return airways of the so-called north and south side workings respectively. After going for about 600 yards, the intake and return roads of the north side started to dip at 1 in 5 for distance of about 200 yards when they entered the Thick Coal. In the communication road between the two shafts were four doors, three of wood and one constructed of iron, which separated the intake from the main return.

The coal was worked on the 'wide' or 'square work' which was the common manner in Staffordshire. The main stables in the mine were known as the 'Rock' stables in which there were stalls for about 22 horses and ponies. These stables were about 400 yards from the bottom of the downcast shaft. The north side stables, were known as the 'Jubilee' stables, had accommodation for six to eight animals, and were about 1200 yards inbye from the bottom of the downcast shaft. There were other stables for the south workings. The Rock stables were the nearest to the shaft and the Jubilee were furthest inbye.

The Inspector. Mr. R.A.S. Redmayne, found the ventilation of the mine was satisfactory with between 70,000 to 72,000 cubic feet per minute passing down the downcast shaft under normal conditions. The air current was produced by a Guibal fan which had been bought second-hand in 1886 and placed at the top of the upcast shaft. The fan was 36 feet in diameter, had eight blades, 11 feet 6 inches wide and under normal conditions produced a water gauge of 1.75 inches. At the bottom of the upcast there was a furnace which assisted the fan to produce the necessary ventilation and in each of the two main return airways there was a fire grate. The one on No.4 East was 620 yards inbye and the other one was 430 yards inbye. These grates had been in use for two or three years and Mr. Grazebrook, the Director of the colliery, stated that they were installed to dry the air. He said-

"The air coming through these 'brooch' roads saturated with moisture started the rocks to give way, and it is a very difficult job to maintain these roads as we would wish then to be maintained we put these grates in."

The inquiry pointed out that these grates would no assist the ventilation of the colliery and whatever was intended by the management, the fact remained that to get efficient ventilation it was necessary to have one ventilating furnace underground at the bottom of the upcast shaft, the two small furnaces inbye and a ventilating fan at the top of the upcast shaft. The fire grates were not used at the time of the accident. a week before, a timber fire had been broken out in the South side, No.4 East return about 150 yards to the outbye of the 'grate'. In endeavouring to put out this fire the undermanager, Mr. Hughes had lost his life. The return had been damped off to stop the re-ignition of the fire and, as a result the ventilation to the South side had been considerably curtailed.

The fire that caused the loss of life, originate on 4th. March. The cages were treble-decked and, to allow all three docks to be filled with coal tubs, a kind of simultaneous loading was in operation. to carry this out steel girders had been constructed, the

stages connected by drop cages. The coal from the South level came in on the level of the middle deck so only that and the bottom deck of the cage could be loaded on that side, but on the north side it came on to the top deck level, so all three decks could be loaded. The staging on the North side was therefore of a greater length than on the South side.

Firedamp was rarely found in the Thick Coal collieries in Staffordshire and candles were used by the men throughout the mine. on the top level on the South side staging, was wooden candle box, 4 feet 6 inches long and 2 feet 6 inches deep and 3 feet wide which held a day's supply of candles. With the exception of the stallmen, all the workmen received their day's supply of candles from this box which were known as 'Company's candles' and were provided to all who were on contractors. The stallmen, who were contractors for getting the coal, had different coloured candles and obtained them at the surface, paying for them themselves.

A short distance from the box there was an electric light with a reflecting shade which was placed so the candle box and its interior could be plainly seen. On the South side of the staging on the evening of the fire, a few tubs containing dirt were standing but according to Dolan, the timekeeper, there were between 30 to 40 tubs containing coal on the north side.

Electrical signal and telephone wires were carried down the downcast No.1 shaft and the telephone was just outside the door of an underground cabin or office on the South side which communicated with the surface and the haulage road. the electric light wires for lighting were also carried down the shaft. No signal or electric wires were brought down the upcast shaft since it was a furnace shaft and the only way of signalling directly up this shaft, supposing the cage was working correctly, was to bang on the guide ropes. The ordinary and proper means of signalling were to signal electrically through the road with the separation doors and up the No.1 shaft. The signals up this shaft were transmitted at the surface of No.1 shaft to the engine House of No.2 shaft.

On Monday, March 2nd., the telephone system was out of order and there was no evidence to show that it had been repaired by the afternoon. Frank Dolan, the timekeeper at the pit bottom said that they had no occasion to use it in the afternoon but stated that he used it on Wednesday evening.

A water pipe was carried down the No.1 shaft and was attached to a short piece of hose, the end of which was not to be reached except with the help of a ladder. The pipe was fitted with a cock which was also out of reach. The pipe was there to fill water tubs which were then taken inbye for the horses. There was a ladder at the bottom of the shaft to get to the haulage rope sheaves and examine and oil them and to examine and repair the electric lights and signals.

At the time of the accident the mine was being worked by one shaft, the upcast and there was a repairing shift underground. the day or head cager, Joseph Dunkley, who had been stationed at the bottom of the shaft, came to the surface about 5.15 p.m. when he was relieved by William Carter, the night cager. Dunkley had last been to the bottom of the No.1 shaft at 4 p.m. and he found everything all right. from 4 p.m. to 5.15 p.m. He had been working at the shaft bottom of No.2 shaft, sending men up and receiving the downcoming men.

William Carter came down in the last cage load and with him in the cage were three others, Walter and John Summerfield and a man named Titley. Carter had heard the signals at the surface and on arriving at the pit bottom said to Dunkley, "What is the matter with the signals that have been ringing?"

Dunkley stated, he replied, "There has no one interfered with them down here as I know to."

Referring to these signals, Carter said-

"They rung twice, the banksman told me, and the engineman stopped the cage and then they rung twice for him to lower the cage back, and the engineman did. If

they (the men) had travelled as they ought to have done and went straight on forward, these men would have been down before I went down - Summerfield and the others would - they were on the afternoon shift.”

All the men except these had gone down and the banksman went to see who was tampering with the signals. He said he got an answer telling him that no one was doing so and Dunkley did not send the signals.

These mysterious signals might have indicated that there was something wrong as the wires went down the downcast shaft, at the bottom of which, the fire took place so a fire could have caused some short circuiting. It was also conceivable that the defective signalling wires could have caused the blaze. The apparatus had been in use before the signals when Carter was lowered down the shaft and Carter, when he got to the bottom signalled Dunkley and others up and seeing that Donlan had answered the banksman's queries on the telephone which was in sight of and near the No.1 shaft bottom, no importance was attached to the signals. They could have been given by someone, unobserved by Dunkley interfering with the bell push near No.2 shaft.

When Carter last saw the two Summerfields and Titley, they were going through the separation doors in the road between the two shafts. One of the men with Walter Summerfield, at least, had a safety lamp and none of them had candles and they were going to work on the . This was about five minutes past five. John Summerfield and Titley were working on the north side.

Carter went back to the signal cabin near the bottom of the No.2 shaft and close to the first separation doors. He stayed there for about 25 minutes and there was three cage loads of men to send up before he went to the bottom of the No.1 shaft. he sent up two loads and had only six men left when he saw smoke coming through the connecting roads. The man with him asked where the smoke was coming from and he said that he did not know and asked for men o go with him to see if they could find the cause of the smoke.

Harry Leach went with him and they went through the doors where they found the smoke got worse as they went along. When they got to the last door, which was made of iron, it was thick and strong and they could see very little by the light of the electric light as the smoke rolled along the road. Three men reported that the smell was like wood, grease and oil and the rubber that was the insulation round electric wires. At that time, they could not see if the tubs of coal were burning.

As soon as they got through the door they heard Donlan, Oakley and Webb calling out for the ladder to get at the water tap and turn it on. When the ladder was found Donlan tried to teach the scene of the fire but were prevented from doing so for just at that moment, the electric lights went out and this left them in total darkness.

Carter could see flames at the bottom of the pit but he could get no further than the cages at the far end of the staging on the north side when he was driven back by heat and smoke. as soon as he got to the No.2 cage, the men made a rush for the cage and after remonstrating with them, he sent up eight or nine in the first cage (six was the authorised number) and the remainder, and himself went up in the second. Before he left he went to the cabin and shouted along the roadway but received no answer.

At the time of the accident, Henry Oakley, a day deputy, employed on the North side workings, was at work on the South side. On the evening of the accident he was coming out of these workings with George Webb, haulage man, as they made their way to the No.2 shaft to go to the surface at the end of their day's work. This would be about 5.30 when they met William Summerfield who was on his way inbye. Oakley did not notice whether he had safety lamp with him. Summerfield was about ten minutes walk from the bottom of the No.1 shaft. Webb thought Summerfield was carrying a lamp but he was certain that he was carrying a candle. When Oakley and Webb came out towards the No.1 shaft bottom they did not observe any smell of burning or anything that was unusual.

Frank Donlan, the underground timekeeper, was in the underground office on the south side when the fire broke out. At ten minutes to five he was at the telephone just outside the office door when Oakley and Webb came in. there was short conversation when the telephone rang. Donlan did not answer it at once. He opened the door and there was rush of smoke. the ringing was also heard at the surface in the undermanagers house. This was between 5.15 p.m. and 5.30 p.m. which was the time of the ignition.

Donlan saw a lot of flames at and under the candle box and Carter Jones, the furnaceman, arrived at the fire about the same time Donlan said-

“We were all thunder-struck. I came to the bottom up the steps by the side of No.1 and shouted to the others to keep close to the wall and come as quickly as they could. I went to the ladder where the water pipe is and it was not there. I saw a light and shouted, ‘Where is the ladder?’. Carter’s light went out and the electric light was flickering. He gave me the ladder and I went back, but I could not get to where the tap was, and then the light went out.”

They all went through the separation doors and up the No.2 shaft but no one sent a message inbye except Carter’s shout. Carter found that the men at the bottom of the No.2 shaft were panic-stricken.

The first indication at the surface that there was anything wrong was brought by these men. When Oakley got to the surface he went to John Wright’s house. He was the acting undermanager’s house and told him there was fire at the pit bottom. This was about 6 p.m. Wright changed his clothes and ran across the yard where he saw that volumes of smoke were coming from the upcast shaft and found that he could not stay in the fan-drift because of it.

Donlan had gone to the engine-wright, Ourbridge, who was at the pit bank and asked him if the No.1 shaft engine could be run so that a descent might be made but the engine was dead centre and could not be run. Ourbridge thought it was too dangerous to go down the No.2 shaft and no effort was made to get into the pit until the manager Mr. Waterhouse, who had been telegraphed, arrived at the pit about 7.30 p.m.

On his arrival Waterhouse saw dense volumes of smoke coming from the No.2 shaft and though descent impossible. He called H.M. Inspectors of Mines and at 8.45 p.m. a partially successful was made to descend the No.1 shaft by the manger, undermanager, the engine-wright and some others, six in all. When they got down to within 25 yards of the bottom, they could get no further because of the smoke. They heard falls taking place and when these occurred, hot air was driven up the shaft. Mr. Waterhouse thought that all the woodwork and supports at the inset were burned out and this was the cause of the falls. There could be no doubt that the tubs of coal that were standing at the pit bottom would have been ignited and the heat intense. Unless the men in the working had found some means of short circuiting the air as feared that they would now be dead. Mr. Waterhouse believed that the men were dead within an hour of the outbreak of the fire. After the fire, it was found that the men had made no attempt to do this.

When he heard of the accident, Ourbridge stopped the fan to slow the force of the air that was going to the fire but when Mr. Waterhouse came up the shaft, he decided that the fire was to some extent smothered by the falls and decided to start the fan at 10 r.p.m. and try another descent down the downcast shaft. They got a little nearer the bottom this time, probably to with 10 yards, but no further. The fan then was run at 22 r.p.m. and a third descent tried but they got no further. Yet another descent was made and this time they heard heavy falls which seemed to be very near the shaft and Mr. Waterhouse feared that the backing of the shaft had gone. Latter this was discovered to be correct.

The atmosphere was improving and a descent of the upcast shaft was attempted. Live rats and birds had been lowered down the shaft to test the atmospheric conditions.

the manager, Jones and Westwood made a successful descent and got as far as the communication road in which the four separation doors were fixed. they decided that it would have been impossible for anyone to have come up the return airway in the smoke.

On coming to the surface they had a consultation with Mr. Grazebrook and the manager as to the possibility of sending for men trained in the use of rescue apparatus and at about 11 p.m., when Mr. Johnstone, H.M. Inspector of Mines for the Stafford District had arrived, they telegraphed for the Yorkshire rescue parties.

Mr. Waterhouse thought that conditions had improved and he, Mr. Johnstone, Ourbridge, Jones and Wright descended the upcast pit, taking with them a linnets in a cage. They found an improvement to the atmosphere and went 80 to 100 yards along the No.2 return where they found the air breathable. They returned because of danger behind them when a large volume of pungent smoke was leaking through the doors, a sign that the doors were burnt through the smoke would make their return to the shaft impossible.

The first time they went into the communication road, the bird showed signs of distress so they retreated into the return airway where the smoke was more diluted. After a rest Mr. Johnstone and another man, Wright went in again to examine the first separation door. they found it standing almost open and closed it. they tried to stop the leakage with the idea that the atmosphere would be improved and a stopping could be constructed there.

On the surface. The second party, led by the Assistant Inspector of Mines, Mr. Makepeace was able to reach the shaft bottom only. Shortly after, Mr. Johnstone examined the fan drift, he made another descent but he got only two thirds off he way down. Johnstone said-

“Under these conditions I considered it would be folly to attempt to go further. At the same time I do not wish it to be understood from this that the air through the whole of the workings was in a poisonous condition. I think what we suffered from was the leakage from the door. The air in the return was more respirable than in the shaft.”

The two rescue parties from Yorkshire arrived at the Hamstead colliery the following day about 2.30 p.m. and were made up of James Whittingham, John Welsby, James Cranswick and James Hopwood from the Altofts station who used Weg apparatus, and John Henry Throne, Walter Clifford, John Taylor, Joseph Otram and Arthur James Winborne from the Tankersley station who used Draeger apparatus. Both parties were under the charge of Mr. W.E. Garforth, the Chairman of Messrs. Pope Peason's Collieries, Yorkshire. Mr. Redmayne in his report commented-

“This gentleman, on receipt of the intimation of the accident, used the utmost expedition in reaching the scene of the operations and when there displayed the greatest zeal and energy in organising operations, as well as very materially assisting the management with his valuable advice.”

Mr. Garforth explained what he knew of the position underground and showed the brigade the plans of the colliery. The first descent was made at 3.20p.m. by Whittingham, Hopwood and Cranswick, using Weg apparatus. At 4.24 p.m., they returned to the surface and while underground they had got to the separation doors but when they got to the fourth one, they could go no further on account of the falls which were taking place. Although they could see no flames, they could hear the crackling of a fire. if they had had a water supply, Whittingham thought they might have been able to extinguish the fire. Mr. Redmayne said-

“There would have been two difficulties in the way of effecting this:

- 1) the steam produced by the operation might have killed them and
- 2) the effect of squirting water on the fire might, and in all probability, would, have brought about a great fall of roof, if not on top of them, in their near vicinity.”

On their way back through the communication road they entered the No.2 east return airway, and went along as far as the rock stables without finding anyone, though they found a cat alive in the return.

They had been a short time in the mine when another party went down the upcast shaft when word was sent that the signal bells were ringing at the downcast shaft so Whittingham, Hopwood and Welsby went down to see what the ringing meant. 50 yards from the bottom they encountered a great deal of smoke and flame and they had to retreat.

The second party to descend the upcast shaft was made up of the manager and two Tankersley men, Thorne and Clifford all wearing Draeger apparatus. It was suggested that they made for the steep bank for Mr. Johnstone said-

"I formed an opinion that as the men entombed - the miners - were practically all men experienced in dealing more or less with gob fires, at least some of them would be able to recognise the difference between the smell of smoke and the smell of the atmosphere when it was an ordinary gob fire, and they would see that it was not an ordinary gob fire, but that the smoke was coming from burning timber. That being so, instead of making for the intake airway, as I understand is the usual custom in South Staffordshire under these conditions, they would try to escape by the return airway. I got the velocity of the air from Mr. Grazebrook, and I thought it possible that those men had made a run for it towards the return airway, and had been overtaken by the smoke they might have 'pulled down' when climbing the steep bank. The exertion of climbing that bank would intensify the effects of carbon monoxide."

The party was down for one and three quarter hours, the time allowed for the being one hour twenty minutes. They went through the 'bolt hole' and into the Rock stables where they found two horses alive. The manger, Mr. Waterhouse, who was not trained to use the Dreager apparatus, had also been recently suffering from influenza and was exhausted so they could not proceed down the incline. They arrived at the surface at nine minutes past six.

The third party went down at 7.30 p.m. consisting of Welsby and Whittingham who were wearing Weg apparatus and Thorne and Outram with Dreager outfits. When they were about 20 yards from the pit bottom, Outram complained that there was something wrong with his apparatus. After they had gone about 10 yards he complained again so Thorne took him to the surface. As they were leaving, Whittingham remarked to Thorne that he and Welsby would go on and the unexpected him to catch them up. This he said he would do.

Welsby and Whittingham went along the return, resting now and then and looking behind them for Thorne. They had a plan of the mine with them and a bag containing brandy, milk and chocolate in case they found anyone alive. They came to the hill, 600 yards from the return and they found it very hot and smoke filled and the further they went, the smoke became thicker and it became hotter. The perspiration was streaming off them. Whittingham hammered on the water pipes that were about 800 yards from the shaft but got no response.

Welsby was quite well and wanted to go further but Whittingham would not agree to this. Welsby's gauge showed that he had 35 atmospheres in each of his oxygen cylinders and Whittingham had 60 in his. Welsby had had a cold for a week and this could have accounted for the greater consumption of oxygen. Whittingham went a further 40 or 50 yards on the return journey when Welsby said, "Jim, I am tired."

The following conversation then took place-
Whittingham said, "What's up? You know it's a hill, this."
"Yes. Sit down a bit."

Welsby sat down and started to use his bye-pass. Whittingham said, "What do you want to use the bye-pass for Jack? Don't do that."

"I feel funny."

"What do you feel like?"

"I seem like tired."

"Come on, we have really gone to the very utmost of the oxygen. You having 70 and me only 120. You know we was relying on going straight back."

"Aye. Come on then."

After going only a short distance Welsby wanted to sit down again and remarked that he had no use in his legs. Whittingham took hold of his left hand and helped him along while Welsby used his right hand to pull him self along the floor. They were crawling as there was not enough height to walk and the men were encumbered with the breathing apparatus which weighted about 35lbs. and it was very hot. They struggled up the hill together. By now, Welsby was exhausted and his comrade got hold of him and pulled him for about 50 yards. Welsby had kept using his bye-pass and his oxygen was now exhausted. Whittingham said, "Well Jack what have we to do. have I to stop with you or go for help?"

"Go on Jim".

"Nay, I don't like going."

"Go on," and his eyes rolled up and down.

"Well, you have no oxygen now. My best plan is to loose your mouthpiece."

Welsby did not reply and Whittingham left him in a kneeling position and left his light on so that he could be found when others came in. Going outbye, Whittingham began to feel ill, even though he had plenty of oxygen and at what he thought was about 20 yards from the pit bottom, but probably was about 80 yards, he met Thorne in an utterly exhausted condition and guided and helped him to the cage. Both men arrived at the surface in a semi-conscious state.

Something had gone wrong with the purifying part of Outram's apparatus and Thorne had a fresh flask of oxygen fitted to his apparatus. The Weg apparatus was charge with oxygen to 120 atmospheres and the Altofts party brought their force pump with them. The Taknersley men, leaving in a hurry, forgot their pump and had to send to Birmingham to have their cylinders recharged at the British Oxygen Company and the fitting there were not exactly suitable for the purpose as the Dreager apparatus was of foreign manufacture, and they found it impossible to charge the cylinders beyond 90 atmospheres so the time spent in a noxious atmosphere by a man wearing the Draeger apparatus was limited.

Arrangements were made for two men with Weg apparatus to go down and try to reach Welsby. They descended at 9.40 p.m. and returned at 10.50 p.m. They went only 4 or 500 yards when they were compelled to return because of a deteriorating atmosphere. They informed Mr. Johnstone that the smoke was so dense that they could not go even a yard even with an electric light. Their progress was very slow and they feared that their oxygen supply would run out.

A consultation was held and it was decided that it was futile to make further explorations of the workings and it was decided to reverse the air. Welsby was after fund to have died from heat stroke and his death was in no way due to his breathing apparatus.

When Mr. Johnstone arrived at the colliery late on the night of the disaster and heard from Messrs. Grazebrook, Waterhouse, Hughes and Charlton of the condition of the mine at the seat of the fire he had asked what steps had been taken to reverse the air and was told hat it had been considered but had been rejected for several reasons. There had been some difficulty with the fan and Johnstone suggested that water could be made to flow into the upcast shaft by damming the overflow from the pump and putting the whole of the water down the shaft. He was told that this idea had been considered and abandoned since just before the accident the engine-wright had

reported that two portions of the shaft lining were in need of repair and a sudden cooling of the shaft wall could bring down the walling and close the bottom of the shaft.

There was a doubt in the minds of those controlling the operations about the efficiency of the fan. Mr. Holland, the late manager, had approached the Board of Directors of the colliery with a view of putting in another fan three years before the disaster. The Directors did not agree and told him that they thought it was better to put a new shaft into the old fan. A fan that required two shafts in three years seemed to point to the fact that there was something wrong with it, either the fan or the bearings of the shafts themselves.

The air was eventually reversed by commenting the fan drift with the top of the downcast shaft by means of a trench and a brick arch-way about 60 yards long, covering the top of the shaft so that the fan could exhaust, and uncovering the of the No.2 upcast shaft and converting it to a down cast. The work could have been done in 12 to 18 hours but the brick walling of the No.1 shaft had to be blasted.

The management feared that the fan would not be able to reverse the air and Mr. Garforth sent a sirocco fan fro Altofts Colliery which had been used i the experimental gallery there but the old Guibal fan was started on Monday 9th. March and run at 15 then 30 r.p.m. It was then speeded up to 45 r.p.m. and after running for some time smoke began to come up the shaft.

The men who died were:-4 mar. hamstead			staffordshire	persons
Joseph Howell	Deputy	35		
John Guest	Deputy	27		
Charles Summerfield	Stallman	34		
William Underhill	Stallman	48		
Samuel Mitchell	Stallman	44		
Enoch Burton	Loader	39		
Jospeh Titley	Loader	25		
Ernest Jones	Loader	31		
Samuel Turner	Loader	40		
Edwin Johnson	Loader	30		
Henry Watts	Loader	47		
Thomas Cole	Loader	34		
Alfred Thomas Curtis	Loader	34		
A. Williamson	Pikeman	44		
John Hodgkiss	Time Keeper	17		
John Hodson	Dam Minder	29		
William Lawley	Dam Minder	27		
John Summerfield	Driver	26		
Henry Underhill	Driver	17		
Jame Hancox	Driver	23		
Arthur Merrick	Driver	23		
James Bradley	Haulageman	45		
Thomas Hollyoak	Haulageman	39		
Richard Ashton	Haulageman	33		
Walter Summerfield	Haulageman	21		

There was a possibility that the 11 men from the north side workings could not get out because the road led through the Jubilee stables and there was evidence that the horses were very frightened and the men could not get passed. Mr.. Hughes, the general manager of the Sandwell Park Colliery stated-

“I do not think it is a good policy to make the stables on at ravelling road. But I go further than this it seems to me a mistaken policy to have the stables far away

from the downcast and upcast shaft bottoms in any case, but especially in a colliery liable to underground fire due to spontaneous combustion. The custom of having stables far removed from the shaft is more prevalent in Staffordshire than elsewhere.”

In the report Mr. Redmayne commented -

“In view of a previous ignition of the candle box, it is greatly to be regretted that the water pipe was not easily accessible. On this account, if for no other reason, one would have thought that ready means of extinguishing a fire would have been provided at this spot. Had there been, I am of the opinion, that in all probability, the fire would have been extinguished before assuming very large proportions, and this lamentable disaster would have been prevented.

The desirability or otherwise of collieries being fitted with means for readily reversing the ventilating current and the nature of those means, is a question which is well worthy of the most serious consideration of mining engineers and feeling strongly that much is to be said in favour of the establishment of such means, I cannot in the present state of our knowledge of the subject make a definite recommendation in respect of the same.”

As a result of the disaster the management of the colliery constructed the staging at the bottom of the No.1 shaft from materials that would not burn.

NORTON HILL. Midsomer Norton, Somerset. 9th. April, 1908.

The colliery was in the Parish of Midsomer Norton near to and on the Radstock side of the Somerset and Dorset Railway Station. About 40 to 50 years before, it had been worked by a pair of small shafts, 4 feet in diameter which was the practice in Somersetshire at that time. Work appeared to have stopped and until 1897 it remained water logged. In that year, Messrs F.B. and J.B. Beauchamp, trading as the Norton Hill Colliery Company, gained possession of the mine and surrounding mineral rights, started to pump out the pit through the existing shafts and in June, 1899 had succeeded up to the 385 yards landing which corresponded to the 391 yard level or landing in the new shaft, the sinking of which was commenced in 1902 close to and on the south side of the Railway, about 368 yards from the old shafts.

The new shaft was 13 feet in diameter and sunk to a depth of 500 yards. The upper landing at which the explosion occurred, was at 391 yards and the bottom landing at 490 yards from the surface, allowing for the 10 yards depth of the sump. It was sunk through 74 yards of New Red Sandstone to the coal measures where the Frittington or 2nd., or Middle Series of the Somersetshire coalfield was struck.

The shaft and stone drifts from it struck, The Great Vein, 17 inches of stony coal about 334 yards from the surface, The Top vein, 12 inches of clean coal at 350 yards, The Middle Vein, 26 inches of clean coal at 385 yards, The Slyving Vein at 405 yards. This Vein consisted of 6 inches of top coal 3 to 6 inches of Benching and 27 to 30 inches of clean coal. Below this there was The Bottom Little Vein with 14 inches of clean coal with a bad roof at 141 yards and The New Vein at 430 yards. This was made up of 6 inches of top coal, 9 to 12 inches of Benching and 18 to 10 inches of bottom coal. Below The New Vein there are five seams or beds of unworkable coal which are the seams of the Upper or Radstock Series. It was thought that these were the seams that were worked at the original colliery.

The 391 and 490 yard levels were connected only through the New Shafts, and a road in the new Vein district. At the time of the accident the seams had not been extensively opened out.

The ventilation of the colliery was provided by a furnace at the bottom of the old shaft and was carried in two splits with a total of about 15,000 cubic feet per minute of air in total. About 7,000 cubic feet went to the bottom and 8,000 cubic feet to the to landing.

Mr. Martin the Inspector, commented-

“In view of the increasing area of the workings it may, however, be well to provide in good time for a large number of splits, in order to avoid causing the air currents to have too heavy a drag or friction, and being unable to give the working fresh air towards the ends of the splits. this is a fault which exists in several non-fieri collieries at the present time and had not been unknown in Somersetshire collieries, where, although the current may appear to be satisfactory the quality is not so, as the air is used up in the great length of the workings and roadways it has to pass through.”

There were about 380 men and boys employed at the colliery of whom 30 were underground at the time of the explosion, working on the night shift in different parts of the colliery. The manager of the Colliery was also the manager of the Farrington Colliery which belonged to the same owners and was about two and a half miles away. There was also an undermanager and six examiners, three on the day shift and three on the night shift. Those were authorised to fire shots, whether examiners or not, were appointed and authorised in writing. Mr. F.B. Beauchamp as the managing owner took an active part in the working of the colliery and was well acquainted with all that went on. Some of the main haulage roads were dry and dusty with a considerable amount of dust on the floor. The incline in the Middle Vein, at the north side of the shaft, which was the intake to the Middle Vein and the Slyving Vein workings, was, in parts, deep with dust. The Slyving Vein Incline, in which the shot was fired was the return for the air from the workings and had a lot of dust on the floor, especially near where the fatal shot was fired. The incline in the New Incline was also dry and dusty and attention had been called to both at different periods. It was not the practice at the colliery to water shots before they were fired on roadways. Mr. Martin went on to say-

“It is a fact that a number of managers of the Somersetshire collieries, if not all, have considered the dust of these mines inexplorable, and have taken as their basis, Mr. Hall's Report of the 20th. August, 1893. p.15, to the Royal Commission on coal-dust in mines, that he failed to get an explosion with the samples which he had received from Somerset, and they consequently considered the necessity for watering outside the considerations of practical mining in the Somersetshire coalfield.

It seems strange that they should never have accepted the Camerton and Timsbury explosions as clear and definite proof on the subject, and it indicates how tenacious the human mind is of early imbued principles, especially where trouble and expense attend the acceptance and carrying out of so called 'new fangled ideas'.

Naked lights were used in the colliery since the start of its development. Even the examiners used them when making examinations before the commencement of the shifts. This was allowed by the 4th. General Rule and no accumulations of firedamp had ever been found in the air before or after the explosion and the manager and officials never suspected that there was gas present. It was stated at the inquest that one of the dead men, Burge, had found gas which caused his candle flame to flare up at the bottom of the workings where they were sinking down after encountering a fault when he put his candle down near bubbles that were coming from water. He did not the others because he thought that they would laugh at him and the management never heard of the incident. One of the men appointed in Burge's place stated in evidence that he once heard the noise of a shot in the Slyving Vein which he believed was the result of a small explosion of gas.

Explosives were used at the colliery with Compressed powder for the coal and soft ground and gelignite for harder ground and a permitted explosion, 'Dragonite', for the roadways. The explosives were stored in a magazine about 100 yards from the new shaft but, for the convenience of the shotlighters, about 15 to 20 bs. of compressed

powder, 15lbs of gelignite and 10lbs . of permitted explosives were kept in the candlehouse at the top of the pit from which the shotlighters took as much as they wanted for work underground, in wooden boxes. There was no record kept of what each shotlighter had taken down the pit and it was not known whether Burge had Dragonite with him or not. He fired the fatal shot and at the inquiry, it was thought that he had used gelignite.

On the night of 9th. April, there was a shot hole drilled in the roof of the Slyving Vein, about 140 yards from the bottom of the 391 yard level, at a point where the loaded trams rubbed against the roof. The men who were engaged boring this hole stated that it was about 13 inches deep, rising into the roof. Charles Burge, who was killed in the blast, was the examiner and approved shotfirer. He went down the shaft at 7 a.m. to examine the working and fire the shots. He fired the shots in the Slyving Vein near the faces and came down the incline past this shot on his way to the surface to meet the night shift men before they descended. He did not fire this shot and there was not indication why he did not do so.

He saw the undermanager, Attwood, on the pit bank and had a conversation with him about the shothole, the depth of which he did not know. Attwood asked William Gould, the day examiner, who was at the pit bank at the time but he also did not know. Attwood stated in evidence, that he thought Burge did not think that the hole was deep enough and so did not fire it. Evidence was also brought forward which alleged that he had told a witness on Sunday night after the explosion, that he had told Burge to fire the shot. Attwood strenuously denied this.

It was admitted that as was the custom at the colliery, Burge would have been justified in firing the shot, if he thought it was safe to do so. Mr. Martin commented-

“Whatever did actually pass, Burge left Attwood and went down the pit straight to the hole and fired it, and thus brought about the explosion and the men’s deaths.”

Those who died were-

Charles Burge aged 32 years, examiner and shot-firer.

John James Ashman aged 34 years, collier.

Andrew Brooks aged 27 years, collier.

William Doughty aged 20 years, collier.

Ernest Jones aged 23 years, carting boy.

Frank Jones aged 41 years, collier.

Stanley Jones aged 16 years, carting boy.

George Maggs aged 20 years, incline man.

Henry Sage aged 14 years, examiner and shotfirer’s boy.

Gilbert Winsley aged 25 years, incline man.

Some of the bodies which were brought out of the mine before 3 p.m. and on the following day, 10th. April, showed the effects of severe burning, others badly bruised by the force of the blast and others as if death had been due to carbon monoxide poisoning by the fumes contained in the afterdamp. There were also five horses killed in or near the stables within about 30 to 40 yards from the bottom of the Slyving Vein Incline.

The inquest into the deaths was opened by Dr. Craddock, Coroner for the northern division of Somerset on Thursday 10th. April when evidence of identification was taken. The inquest reopened at the Town Hall, Midsomer Norton on the 24th. April and was continued on the 30th. April and the 8th, and 21st., 23rd., 26th., and 30th. May and the 3rd. and 4th. June. All interested parties were represented and Mr. R.A.S. Redmayne Chief Inspector of Mines attended along with Messrs. Martin, Robinson and Geenland-Davies, Inspectors of Mines.

The inquiry was protracted as to the cause of the explosion as the explosion was attributed to gas and not to dust by the representatives of the owners.

The jury returned the verdict-

“That Winsley Burge and others, ten in all, met their deaths in an explosion of coal dust caused by a shot fired by C. Burge in the Slyving Vein Incline, Norton Hill, Colliery, but whether Burge did it on his own initiative or by the orders of Mr. Attwood (undermanager), we are unable to decide on account of conflicting evidence.”

The Report on the disaster by Joseph Martin was presented to the Right Honourable The Secretary of State for the Home Department in September, 1908. Dr. Cook tested the dust from the mine and expressed the opinion that it was non-explosive which meant that the explosion was one of gas. Gas had been known to come from the watering the mine. Mr. Martin thought that it was an explosion of dust and concluded his report-

“The effect of this experience will, I believe, be, not only to satisfy managers and others connected with the Somersetshire collieries that they are not immune from the dangers of coal dust, but also further impress the necessity of watering upon those who, having previously realised the danger, have shirked the trouble and expense of carrying it out. I have no doubt that had here been a small percentage of gas in the air the damage and force of the explosion would have been greater and probably extended further into the new vein.”

THE MAYPOLE. Abram, Lancashire. 18th. August, 1908.

The colliery was at Abram about four miles from Wigan and was worked by the Moss Hall Coal Company, Limited who were also proprietors of several other collieries in the district. There were two shafts at the colliery, Nos. 1 and 2 and the fan was fixed at the No.2. The downcast was 16 feet in diameter and the upcast 18 feet in diameter. The downcast was 600 yards deep and the upcast 630 yards. The shafts were connected to several seams, the Pemberton Five Feet at 410 yards, the Bickershaw Seven Feet at 425 yards, the Wigan Five Feet at 544 yards, the Wigan Four Feet or Cannel Mine at 571 yards and the Wigan Six Feet at 585 yards.

Two shafts were sunk below the Wigan Six Feet seam and tunnels driven to the Wigan seams. The sinking of these shafts commenced on May 30th. 1895 and finished in December 1899. For 180 yards the shafts were sunk through New Red Sandstone which was heavily watered and the lower part was cased with iron tubing. The Pemberton Five Feet and the Bickershaw Seven Feet were not involved in the disaster but the Wigan Five and Four and Six Feet were won by tunnels driven from the shafts and were worked in conjunction with each other. They were mined on the longwall method, the roof being carried on pack walls and the roads thus passing through the goaf except where shaft pillars were necessary.

The Five Feet seam had just touched a fault and had not been opened to any great extent. The Four Feet was considered the most important seam and in places it was eight or nine feet thick, mostly composed of the famous Wigan Cannel Coal. The workings in this seam had extended north for about 700 yards and about 1,000 yards to the south. The overlying rock made a strong roof for these workings. The Six Feet seam was mined by tunnels driven about four feet and was about 5 feet thick. The seam was notorious in the early seventies for disastrous firedamp explosions which occurred in the nearly every neighbouring colliery in the Wigan area where it had been worked.

The ventilation of the colliery was held up by pack walls, stoppings and doors. Each district of the workings was ventilated through separate ‘splits’ of air but in some cases the ventilation of a section passed through a number of working places in one seam and then on to other working places in another. The fact that the air was divided into many splits and although seemed to be sufficient, in the view of Mr. W. Brace and R. Smillie,

the representatives of the Miner's Federation of Great Britain at the inquest, "In our judgement, the way it was dealt with left much to be desired."

The rock at the face of each working was supported by a double or triple row of props and chocks and the waste material that was got through working the seams was thrown back into the goaf and also supplied the material from which the packs were built. There was, at times, difficulty in finding enough rubbish to fill all the open spaces. The rise side workings in the Wigan Four Feet seam were connected by a roadway about 1,000 yards long to the workings of the neighbouring Wigan Junction Colliery which had been recently acquired by the Moss Hall Coal Company. At the time of the disaster this colliery gave a third means of egress from the Maypole workings. The connection had been made about a year before and the fresh air going down the Wigan Junction shaft regularly found its way into the Maypole and aided with the later ventilation of the colliery.

At the Maypole Colliery there was an exhausting Walkers fan, 30 feet in diameter, double inlet, placed at the surface and connected by a 16 feet diameter shaft, 60 yards deep from the bottom of which a tunnel was arched 12 feet by 10 feet for 30 yards and connected to the upcast shaft. The fan was capable of producing 600,000 cubic feet of air per minute at 6 inches water gauge. On the day of the disaster the fan was turning at its usual speed of 78 revolutions per minute and was registering 2.5 inches water gauge. The last measurements of the quantity of ventilation passing through the mine was made on 7th. August, eleven days before the explosion and there was no cause for worry. The fan was placed in such a position that it would be protected from damage in the event of an explosion.

The officials of the Wigan Mines at the Maypole Colliery consisted of a certificated manger who was in charge of all seams, one undermanager and one assistant undermanager in the day and one assistant undermanager at night, six day fireman and five night fireman. The manager was Arthur Rushton and the undermanager, William Picton. The assistant undermanager on the day shift was Robert Picton and on the night shift Isaac James. The day fireman were James Dawson, James Hodson, Herbert Nelson, W.H. Monks, Thomas Gaskell and Peter Simm. The night fireman were James Holcroft, George Turley, Edward Aspinall, W.H. Brown and Enock Atherton. The general manger of the colliery was Arthur Rushton who had returned from holiday on the day of the explosion. During the managers absence the pit had been managed by Robert Picton, the undermanager and Mr. Edwin Nelson the manager of a neighbouring colliery. There were 705 men employed underground in the different shifts. The colliery was classed as a fiery mine and was worked throughout with safety lamps provided by the Company. The lamp that was used was the Naylor's 'bifold burner' with a single gauze efficiently shielded, locked by a rivet and burned refined petroleum. The re-lighting stations were situated in fresh air in every case and the electric battery that was used for re-lighting was in the charge of an authorised fireman. The firemen in their respective districts examined the lamps to see that they were secure before the workmen were allowed to go to their working places.

Explosives were used in the mine and they were Geloxite, Ammonite, Westphalite and Faversham powder. Geloxite was used for ripping the roof and other stone work while the last three were used in the coal. At the time all the explosives were on the permitted list but since the explosion, Geloxite had been removed from the List. Shots were only permitted to be fired by the firemen, authorised in writing by the manager, whose wages did not depend on the amount of coal that was got. Blasting was not allowed on the day shift when the mine was full of workmen but was confined to the evening and night shifts when only repairers and certain officials were below ground. The amount of charge varied considerably from 4 ounces or less to as much as 20 ounces. These heavy shots were used in ripping or 'brushing' the roof immediately behind the working places.

Electric power was not used in the mine except for underground signalling at very low voltage. The men had been inspected from time to time by H.M. Inspectors but no inspections had been made by the miners under No.39 General Rule. No complaints of want of care or dangerous conditions had reached either H.M. Inspectors or the Miner's Representatives previous to the explosion.

The coal that was worked was dusty and dry and the roadways were generally dusty. Near the faces the dust was mainly coal but along the main haulage roads there was a considerable amount of stone dust and foreign matter mixed with it. Watering or any other method of damping the dust was not practised nor was any attempt made to clear the dust except where it interfered with traffic and that work seemed to consist of collecting large lumps of coal and sending it to the surface.

The explosion occurred on Tuesday 18th. August 1908 at 5.10 p.m. on a sultry August afternoon. Up to 4 p.m. on that day there were 580 men below ground but fortunately nearly all had finished work and had been raised to the surface before the accident. A night shift of repairers and shotlighters, about 60 in number had descended between 4 and 5 p.m., making the total number that were below ground 84. Six were in the upper seam, the Bickershaw Seen Feet which was not affected by the explosion and of the remaining 78 men and boys, only three escaped.

Mr. Arthur Rushton, the manager of the colliery in Abram returned home for ten days holiday. As he put the key into the lock at his home a dull rumble caused him to look over his shoulder. What he saw was the start of a nightmare that stayed with him for the rest of his life. A dense cloud of black smoke was pouring with great force out of the shaft of the pit. At the inquest he gave the following account of the disaster-

"When near the colliery I heard a low rumbling noise and saw a cloud of dust. I got out of the conveyance and walked straight to the colliery. When going between the lamp room and the fan house, I saw a portion of the masonry of the fan house had been blown down. It was then I realised what had occurred. I walked to the General Office, wrote a telegram to Mr. Hall, H.M. Inspector of Mines and afterwards went to the pit. I saw that the headgear of No.1 was dismantled and the rope was hanging in the headgear. The cage itself had gone below. Knowing that the afterdamp was coming up the No.1 pit I went to No.2 pit. The undermanager of No.1 came along and I instructed him to get a rescue party together and go to the Wigan Junction Colliery, descend the shaft and get into the seven Feet. I took it that there was nothing wrong with the Seven Feet. I told Mr. Nelson who had been in my place while I had been away and the undermanager to get the cage from the Seven Feet, then go down to the Seven Feet and if all was right there, to lengthen the rope and go down into the Wigan Mine. I went to Wigan Junction and found that the rescue party had got to the East Brow. A little further in they came across a fall which blocked the entire road. I gave orders that the fall be cleared, and in the meantime went back to the Maypole where I found Mr. Hall in the office. We went down No.2 pit about 9 o'clock and were able to join Mr. Picton and his party who had made their way from Wigan Junction."

During these operations three men were rescued alive and sent to the surface by way of the Wigan Junction shaft. The rescue parties were for some time able to explore some of the roads but no one was found alive except these three and all those who had been seen were dead. Advancing further they met afterdamp and exploration became very difficult. The roadways were filled with a mixture of smoke and afterdamp and although strenuous efforts were made to clear it, it resisted all their skill and bravery and stood like a wall preventing further advance, In spite of the appalling conditions seven bodies were located and fourteen others seen, but in positions that made their removal impossible. The seven were taken along the tunnel to Wigan Junction and to the surface 800 yards above. These men had survived the force of the explosion but

has died from the effects of the afterdamp. From this point it was clear that all the men below ground were lost.

Soot and debris were scattered over a wide area. Buildings over a mile away had been shaken by the blast and a dense cloud of smoke and poisonous vapours rose from the shaft for many hours.

It was soon discovered that the mine was on fire and smoke and afterdamp began to fill the roads which made access to the inner working impossible. Even so the rescuers persevered and again and again small parties were driven back by the poisonous atmosphere. It was clear to the rescuers that the explosion had blocked the bottom of the upcast shaft and that somewhere deep in the workings a fire had broken out and the mixture of smoke and afterdamp was rushing into the maze of tunnels and workings deep in the southern area of the pit. Unceasing efforts were made to penetrate the workings the men defying small explosions intense heat and suffocating smoke coming from the workings.

The struggle went on from Tuesday until Thursday midnight and fruitless attempts were made to reach the fire which continued to develop and filled the mine with smoke. At this time the only parts of the mine that could be reached were on the north side and the Spion Kop workings and it was from here that the dead were sent to the surface and those found on the north side near No.5 level were being carried out when something happened in the inner workings, probably a local explosion, which had the effect of driving the smoke and afterdamp towards the downcast shaft and thus cutting off their exit from the mine. The explorers had just enough warning to enable them to get to the shaft. There were 42 of them and they had to struggle through fumes and smoke which made some of them unconscious.

The No.2 shaft that had been the downcast had now become an upcast and was filled with poisonous atmosphere. The No.1 shaft had been wrecked and access underground was completely cut off. This put an end to rescue attempts and a roll call showed that sixty eight men remained below half a mile down the pit and without question they were all dead.

A team of five from the Howe Bridge Rescue Station, a few hours after the explosion and their services were utilised to take out stoppings so as to facilitate the explorations. On the following day a team arrived from Altofts Station, Yorkshire under Mr. Garforth. The report commented-

“We regret to have to report that no reasonable opportunity presented itself, where the services of these men might have been effective to save life, and as all hope had been given up of rescuing anyone alive, it was inadvisable to allow them to venture into the poisonous atmosphere.”

On Friday a conference was held to discuss what could be done. The Miners's Representatives were asked to attend and Mr. Walsh M.P. also attended. After a careful review of the circumstances it soon became apparent that the only solution was to flood the pit and put the fire out. The plan was submitted to the owners and their consulting engineers and they reluctantly approved them. Arrangements were at once made to obtain a supply of water from a neighbouring canal and flooding proceeded from day to day until the middle of October but as the water was being put down the pit, the fire continued to advance and eventually reached the top of the No.2 shaft, setting fire to the wood work on the surface near the lip of the pit.

On Sunday 14th, September a series of violent explosions occurred in rapid succession, four of which appeared to be as violent as the original explosion and it was not until the whole of the workings in the owner seam and the Bickershaw Seven Feet were under water that the fire was eventually extinguished. It was estimated that one hundred million gallons of water had been used. At the time of the report it was noted that the recovery of the mine started on 5th. November 1908 and had not been completed at the time of the report going to press.

At the time of their report there were 68 bodies that were not recovered and only seven had been recovered.

Those who had been recovered-

James Dawson aged 51 years, fireman,
Albert Draper aged 24 years, haulage hand,
Edward France aged 26 years, haulage hand,
James Holcroft aged 55 years, fireman,
George A. Holcroft aged 29 years, assistant hooker-on,
Thomas Lloyd aged 29 years, contractors man and
Thomas Henry Pimblett aged 26 years.

Those who had not been recovered-

George Allen aged 28 years, pusher-on.
Meynick Banks aged 28 years dataller.
John Bennett aged 41 years contractors man.
James Bryne aged 36 years, contractors man.
Michael Bozle aged 25 years, contractors man.
Patrick Carroll aged 33 years, contractors man.
Peter Caulfield aged 25 years, contractors man.
Thomas Cross aged 45 years, contractors man.
James Conway aged 17 years, haulage hand.
John Cassidy aged 19 years, contractors man.
Peter Charnock aged 34 years, contractors man.
Michael Cafferty aged 33 years, contractors man.
James Cullen aged 26 years, contractors man.
James Crehen aged 26 years, contractors man.
John Donlan aged 31 years, contractors man.
Thomas Donlan aged 28 years, contractors man.
Austin Deanne aged 28 years, contractors man.
Joseph Doyle aged 28 years, contractors man.
John W. Davies aged 24 years, contractors man.
Patrick Duffey aged 27 years, contractors man.
Samuel Evans aged 56 years, contractors man.
Jethro Frances aged 30 years, ropeman.
Charles Ford aged 30 years, contractors man.
John Flannery aged 34 years, contractors man.
Peter Fishwick aged 50 years, contractor.
Thomas Gaskell aged 45 years, fireman.
Martin Gallagher aged 28 years, contractors man.
Thomas Groark aged 36 years, contractors man.
Michael Thomas Guchion aged 20 years, contractors man.
James Gloghegan aged 26 years, contractors man.
Latrick Howze aged 22 years, contractors man.
Anthony Hughes aged 42 years, contractors man.
J.W. Hannon aged 33 years.
James Hodson aged 48 years, fireman.
Thomas Harrison aged 24 years, dataller.
Andrew Henderson aged 50 years, contractors man.
Thomas Jennings aged 42 years, contractors man.
Thomas Hearn aged 25 years, contractors man.
John Kirby aged 21 years, contractors man.
Hugh Killoran aged 29 years, contractor.

Anthony McDonough aged 29 years, contractors man.
James McDonald aged 38 years, contractors man.
Thomas McEllen aged 40 years, contractors man.
William McCabe aged 43 years, contractors man.
Patrick McGowen aged 26 years, contractors man.
John McGrath aged 37 years, contractors man.
Mick McGrail aged 33 years, contractors man.
William Henry Monks aged 40 years, contractors man.
Alfred Monks aged 32 years, dataller.
Thomas Murphy aged 25 years, contractors man.
John Moran aged 25 years, contractors man.
Michael Molloy aged 43 years, contractor.
Patrick Mulligan aged 43 years, contractors man.
Herbert Nelson aged 33 years, fireman.
John Pennington aged 42 years, contractors man.
Robert Pimblett aged 53 years, contractors man.
Ozias Robinson aged 40 years, contractors man.
John James Robinson aged 50 years, contractors man.
Levi Rushton aged 52 years, pusher-on.
Peter Simm aged 42 years, fireman.
Patrick Sloyan aged 29 years, contractors man.
Henry Taylor aged 33 years, contractors man.
John Edward Taylor aged 41 years, ropeman.
Joseph Walsh aged 32 years, hooker-on.
Robert Wilding aged 37 years, contractors man.
James Walkden aged 33 years, contractors man.

The inquest was opened on Thursday evening 20th. August 1908 by Mr. Samuel Brighthouse, Coroner for South West Lancashire who said that this was the saddest disaster the ad had to investigate and that the jury and himself would have an honest inquiry into the circumstances attending the explosion, to find out how it took place and if possible devise some means to prevent it happening again so that life might be protected in the future. He was very much in command in the court and showed concern for the relatives. He said-

“As the bodies were recovered, I shall convene the court and summon the jury at once, so that burial orders can be made without delay of any sort. All the officials and gentlemen of the jury must put themselves at the service of the relatives and not study their own personal convenience.”

He added that the would allow the witnesses to be examined by the miners' representatives both legal and lay and that "there would be no red-tapism at this inquiry." On this first meeting of the jury evidence of identification was given on the seven bodies that had been recovered and the proceedings adjourned when formal evidence was given of those who were still in the mine. The underground fire had not been extinguished and water was still pouring into the mine and it was decided to adjourn the proceedings again until 17th. November. Harry Twist, the Miners' Agent spoke for the mining community. He had been an eye witness of the rescue attempts, himself being a member of one of the teams which had penetrated the workings. "Company Officials miners and all concerned had not spared heart or brain in their rescue attempts." said Mr. Twist.

When the inquest commenced again Mr. Hall and Mr. Twist, who represented the miners were agreed that there should be a further adjournment. Mr. Twist, supporting this said that he had consulted Mr. R. Smillie. Mr. Brace M.P., Mr. Ashton, Secretary of the Miners' Federation and Mr. S. Walsh, M.P. and all were of the opinion that the

inquiry ought to be adjourned until the exploration of the mine could be carried out. Proceedings were adjourned until the 22nd, March 1909. There was still no prospect of examining the mine at this time and it was thought that the best interest of all parties would be served in completing the formal inquest.

All interested parties were represented and there were twenty three sittings from March until July 1909. The Coroner summed up on the 8th. July 1909 and gave the jury nine questions to answer. They left to consider their verdict at 11.15 a.m. and returned after five and a half hours of deliberation.

The verdict of the jury was given by answers to questions posed by the coroner.

“First question: How did the deceased come to their deaths?

Answer: The seventy five men met their deaths by the explosion.

Second Question: If the deaths came about through an explosion, in what district of the mine did the explosion originate?

Answer: The South Slant District.

Third Question: If the district of the mine in which the explosion originated can be ascertained, in what place in that district did it originate, and was there any lack of due care and caution in firing of shots in such place or otherwise?

Answer: In the balances. There was lack of supervision in the balances.

Fourth Question: Was the explosion caused by ignition of gas, or coal dust, or by gas or coal dust combined?

Answer: Gas and coal dust combined.

Fifth Question: Was the explosion caused by shot firing with a permitted explosive or by the use of a defective safety lamp or how otherwise?

Answer: The explosion was caused by shot-firing with a permitted explosive, and we believe there has been too much trust placed in the permitted explosive.

Sixth Question: Was due care and were all reasonable precautions taken in the following districts, namely, South Slant, South East, South 6-ft and North 6-ft, in respect to all and each of the following matters a) the examination for and the removal of gas in and near any place at which shots were to be fired b) the withdrawal of all workmen other than those actually engaged in the work of shot-firing, and other than those whose presence was absolutely necessary in the mine at the time when shots were to be fired c) in prohibiting the firing of shots in or near places where gas had been discovered d) for preventing workmen from working in places where gas was present e) in maintaining the airways (intakes and returns) in safe and proper condition f) in keeping all working places supplied in the quantity of air adequate to render them safe and proper to work in, and render harmless all noxious gases g) and in the exercise of all due care and caution by the manager, undermanager, firemen and other officials in their respective capacities of supervision and control, and specially to the use of explosives?

Answer: South Slant District, yes, with the exception of the balances south-east District, yes, with the exception of Hull's place, Mann's place and Conway's place South 6-ft and North 6-ft, yes a) yes, with the exception of the above named places b) same answer c) same answer d) same answer e) due care and reasonable precautions have been taken f) same answer, with the exception of the above named places g) in the absence of the manager we believe there was slack of supervision, especially in the use of explosives.

Seventh Question: was the explosion attributable to the non-observance of any statutory obligation?

Answer: Seeing that the person who could give us definite information on this have been killed by the explosion, and in the absence of any other evidence, we are not able to form a conclusive opinion.

Eighth Question: Does blame rest with anyone in connection with the explosion, and if so who and in what respect of what acts of commission or omission?

Answer: Same answer as to question seven.

Ninth Question: Do you, with a view to preserve life in the future, make an recommendation, more particularly with respect to 1) shot-firing, 2) dealing with coal dust in a dry and dusty mine. 3) Government inspection of mines, 4) generally?

Answer: We strongly recommend during shot-firing in the mines no men shall be below ground, only the firemen and shot-lighters, so as not to endanger the lives of others. We suggest the sweeping and watering of all dusty mines in the colliery to prevent dust explosion. We strongly recommend the appointment by the Government of more inspectors of mines. We recommend that firmers should carry out the duties of shot-lighting, and that shot-lighters should not carry out shot-firing without being called, on to act as firemen and in both cases practical men should be appointed. We recommend wherever long-wall work is in operation six-yard packs on either side of the drawing road would greatly add to the safety of those working in the mine and that all packing shall be kept within a distance of not more than six yards from the face and that all drawing roads shall not be more than thirty yards apart. This is the verdict of the Jury."

A Relief Fund was opened and there was immediate donation of £100 from His Majesty the King. Contributions came from near and far, the coppers of the unemployed and the gifts from the wealthier and the industrial concerns all over the country.

The inquiry was very exhaustive and lasted over 23 days with 56 witnesses being called. His Majesty's Inspector of Mines, Mr. Hall, outlined the likeliest causes of the explosion the gas having been ignited from several possible causes the most obvious being a blown out shot or a defective lamp. None could tell until a search had been made. The shafts at the colliery had been sealed and there was evidence that the fire was less intense than at first nevertheless millions of gallons of water remained in the mine, He had accompanied rescuers within four hours of the explosion but no sound had been heard from the men below. He assured the relatives that no person was living when the mine was flooded.

All the witnesses agreed that the explosion was from the ignition of gas but how it was ignited had to be the subject of speculation. It was suggested that the explosion was aggravated by coal dust in dirty roads and that pockets of gas in the cavities of old and abandoned workings were ignited by a shot penetrating these cavities. The shot firer would have been unaware of their existence. Letters were received from miners and engineers in other parts of the country. Some letters condemned the owners for making men work in dangerous areas other letters condemned the Miners Lodges for ignoring complaints allegedly made by men at the Maypole colliery. Several letters blamed the safety lamps that were used the Marsault type. 'After some years', said one of the letters, 'the threads of the base filament wear out allowing gas to travel along the threads,' Another pointed out from his own experience that the corrosion of the pillars supporting the glass and yet another correspondent wrote : *'If only one corrodes, the glass is no longer an air tight fit.'*

Witness agreed that the so called 'permitted' explosives were only safe if it was used under specified conditions. There was disagreement amongst the witnesses about the value of damping with water to keep down coal dust. about the heat in certain working places and about the correctness of and notice taken of the fireman's report. Even the location of these reports were in despite, one man leaving it on the surface and another leaving it below. It was clear from the evidence that the reports were rarely compared. The surviving firemen were questioned very closely by the legal representatives and by one of the jurors who was a collier of many years experience. The firemen held different views on the quantity of gas found especially in a large cavity in the roof caused by a fall

some time earlier. Mr. Monks, the fireman lost in the explosion, was said to be a very competent workman who had been in the industry all his life. At one hearing his widow was asked to address the court. She complained about the way in which some people attacked her husband in court, as he was unable to reply she had come to 'stick up' for him. She had a six week old child and had great difficulty in making ends meet and accused Lodge Officers of making things hard for her. The coroner said that he could make difficulties for any one who pre-judged the issue and the Miner's Agent promised to help and offered to look into her complaints.

The movements of people and tubs could often clear small accumulations of gas away and these were not always reported since the gas cleared so quickly. Some men assured the court that the gas was so strong near the working face that their lamps had to be 'put back' into a clearer area. Some men had their drawers or helpers. 'Fanning' them with a shirt. Others claimed that frequently they had to go away to clear their heads into cleaner air. A contrary opinion was put by others who had never seen or heard of anyone 'Fanning', putting lamps behind, removing fenced areas, bringing down brattice cloth or 'working low' that is in the clearer air at the bottom of the place near the floor. There is no record of complaints being made at the Lodge meetings and in fact the men did not wish to make use of rule 38 by which two men could be appointed to examine working conditions on the miners' behalf. The court had to decide, were some men working in bad areas because the money was good, and ignoring safety rules, or were the firemen helping them by making light of the hazards? Did the management know this and choose to ignore the case? Some places were so easy to work that as one man put it 'I could kick the coal out with my clogs.' The main complaint was that there were not enough empty tubs, and since a man made his money on the amount he cut, waiting for boxes (or tubs) meant a loss of income. One witness said he made an average of £2-5s a week which was enough to keep a man and his family in reasonable comfort.

There were frequent brushes between the coroner and Mr. Walsh who represented the Miners' Lodge. He was rebuked many times for repeating questions which the coroner felt had been satisfactorily answered already and for wasting the court time. Mr. Walsh accused the coroner of deliberately silencing him. At the end of the inquest they made their peace each man admitting that they had misunderstood the other. The checkweighman at the Maypole, Mr. Seth Blackledge, was threatened with removal from the court for communicating with a juror.

The Mines Inspector, Mr. Hall, gave the mine and the manager a good report. The reports he had seen from the firemen were adequate and neither worse nor better than those he had seen elsewhere. He agreed that much was discussed man to man that did not appear in the reports. He classed it as a clean, well run pit, a bit fiery but easy to work. He would not give an opinion as to the cause of the explosion no one could do that until the pit had been inspected and the job would be difficult because of the flooding.

The jury at the inquiry came to the following conclusions. That:-

"The explosion originated in the balances and was an explosion of firedamp and coal dust combined, ignited by a permitted explosive.

We attach importance to the fact that there had been two previous explosions in the colliery, each of them caused by blasting. Fortunately in neither of these accidents was there loss of life, but in one case a serious disaster was narrowly escaped. We also attach great importance to the evidence that on the day previous to the disaster there was a considerable body of gas accumulated in the balances which it would be very difficult to completely clear out or adequately test, because of the large open spaces in the roof caused by previous falls.

The fact that this unusual condition of things existed at the balances on Monday, and that the explosion occurred on Tuesday just at the time when, in the usual

course of his round, the shotlighter would be engaged in firing shots which had been prepared there that day, makes it difficult to dissociate the one circumstance from the other.”

The jury made several recommendations. On shotfiring they said-

“We strongly recommend during shotfiring in mines no men shall be below ground only the shotfirers and the fireman, so as not to endanger the lives of others.

We suggest the sweeping and watering of all dusty roads in this colliery to prevent dust explosions.”

The jury was also critical that too much trust had been put in the ‘permitted’ explosive and that very large charges had been used but the most important evidence that Mr. Hall called attention to was “the apparent lack of action to be followed by the fireman and shotlighters when they found parts of the mine dangerously affected by the emissions of firedamp.”

Mr. Hall concluded the report by saying that he was satisfied that nothing further could be done to throw any light on the disaster and did not recommend prosecution of any one connected with the mine.

The Miners’ Federation Representatives commented-

“Taking the case as presented by the evidence we can come to no conclusion other than in our serious judgement the conditions at the Maypole Colliery at the time of the accident and for a considerable period previous, were not what the workmen had a right to expect, and what the Mines Act and Special Rules demanded, we are further of the opinion that with a larger staff of Mines Inspectors which would naturally lead to a more efficient inspection of mines, we could with greater confidence look for a diminution of our truly appalling death and accident rate.

The men died from an explosion caused by a mixture of coal dust and gas, fired by shot using permitted explosive and into which too much trust had been placed. The supervision during the manager’s absence was slack.

Since all that could answer were dead we cannot express an opinion on whether rules were being broken at the time of the explosion however it appears that due precaution had not previously been taken by some of the men whose lives had been lost.

The men concerned are dead and therefore we cannot answer the charge that men worked in conditions which were dangerous and they knew to be dangerous or could be expected to know were dangerous in order to make easy money.

Firemen should not be expected to fire shots as well but there should always be a man doing the job exclusively.

There should be more Mines Inspectors.

There should be a rule limiting the number of people down the pit when shots are fired.

Floors should be swept as well as watered to keep down the dust.”

The report was presented to The Right Honourable Herbert J. Gladstone, M.P., H.M. Principle Secretary of State for the Home Office.

There were 17 jurymen one having died during the proceedings. the coroner dismissing the jury for ‘it’s usual citizenship’ and recalled the tragic stories brought out by witnesses. Boys found clinging to fathers’ legs, men with cloth on their faces and open tea cans as they vainly tried to combat the sulphurous fumes. Families in which all the men folk had been wiped out. The fearlessness of men who spoke out even though they feared being blacklisted by either collier or Company. Above all the shadow lasting longer than any fumes below that lay over the whole community from the day of the explosion eleven months earlier when the Maypole ‘went up’.

WEST STANLEY. West Stanley, Durham. 16th. February, 1909.

The colliery was about four miles to the west of Chester-le-Street, Durham and was worked by 'The Owners of the West Stanley Colliery. The manager was Mr. J.P. Hall, the undermanager, Mr. R. Heslop and there were two fore-overmen, one back overman, two master shifters and twenty two deputies. The colliery employed 527 men and boys underground and 118 at the surface a total of 645 people.

It was worked by two shafts known as the Busty Pit which was twelve feet in diameter and was the downcast and the Lamp Pit, upcast, which was nine and three quarters feet in diameter. Both the shafts were sunk to the Brockwell Seam at 163 fathoms. The shafts passed through the Shield Row, Five Quarter, Brass Thill, Low Main, Hutton, Towneley, Tilley, Busty and Brockwell seams but only the Towneley, Tilley, Busty and Brockwell seams were worked. the Towneley had an average thickness of two feet two inches, the Tilley, two feet three inches, the Busty three feet and the Brockwell two feet five inches. The coal from the Towneley Seam was lowered down a staple to the hanging-on of the downcast shaft at the Busty Level and that from the Tilley seam was run down a stone drift to the same level opposite the shaft, so coal was drawn up the downcast shaft from the Busty Level came for the Towneley, Tilley and Busty seams and the coal from the Brockwell seam was drawn up the upcast shaft from the Brockwell level.

The ventilation was provided by a Guibal fan 35 feet in diameter and ten feet wide which ran at 35 revolutions at a water gauge of 1.5 inches. The air measured going into the mine on the 12th. February was 76,808 cubic feet per minute. 21,756 cubic feet went to the Towneley Seam, 15,545 cubic feet to the Tilley Seam, 10,210 feet to the Busty Seam and 17,297 to the Brockwell Seam. The remaining 12,000 cubic feet went into some old workings higher up in the shaft in one of which a pump was positioned.

The Towneley, Tilley and the Brockwell seam on the south side of the shafts were worked by longwall methods while on the north side of the shafts in the Brockwell seam, pillars were being removed. In the Busty seam the workings consisted entirely of pillar removing. In the Towneley, Brockwell and Tilley seams here were for electrically driven Hurd Bar-type cutting machines. Two of these were in the Towneley and one each in the Tilley and Brockwell where there was also a spare machine in a stenton next the bottom of the upcast shaft.

There was other electrically driven machinery underground. In the Brass Thill seam there was a 25 h.p. motor for driving a pump and a 100 h.p. haulage motor in the Towneley seam hauling from the straight West District and a 5 h.p. motor driving a 3-throw pump which was in the straight West Way. In the Tilley seam an 25 h.p. motor drove an air compressor. In the Busty seam there was 100 h.p. motor driving a 3-throw pump close to the downcast shaft and two 5 h.p. motors which each drove a small pump in the West Way. There was 5 h.p. motor driving a creeper on the south side of the downcast shaft. There was 1 48 h.p. motor in the Brockwell seam there was a 48 h.p. motor to drive an air compressor but this had never been used.

The electric current was generated at the surface as three phase current at 550 volts and led to a switchboard in the generator house and from there down the shaft by three copper cables which were not armoured. The three mains down the shaft were controlled by an oil immersed switch and three fuses of 150 amps which were on the main switch board at the generating station. The shaft sidings at the Busty seam and the haulage engine house and staple top in the Towneley seam were lit by incandescent lights, twenty lamps in the Busty and fifteen in the Towneley.

All the other lights in use in the mine were safety lamps of which there were 637. 526 of these were Marsaut and 11 were of the Donald type. All were lit and riveted by lead rivets in the lamps room at the surface and no re-lighting was done underground. Only those men on the haulage roads, putters, drivers and others had Donald lamps. The coal hewers and stonemen were provided with Marsaut lamps with double gauzes.

There was a proper system recording the number of lamps given out and those returned and of the lamps that were recovered none were without tops or unlocked.

The workings of the four seam were dusty and the lower workings of the Busty seam were wet and there was wet area in the Tilley seam. The upper section of the Busty seam consisted of old crushed pillars and produced large quantities of dust. In the past, considerable quantities of dust were carried in the air down the downcast shaft from the screens that were near the shaft on the surface. It came from a shoot which delivered coal to the boilers. In order to lessen this, the boilers had been boxed in.

The roads of the mine were watered by a small tank in which was fixed a hand pump and spray. The water was supplied from pipes laid along the main roads with taps at intervals. The roads were watered but they soon dried out and it was possible that there was not enough watering done to keep the roads damp. The last watering had been done the night before the explosion, particularly in the Busty Seam.

In the Towneley seam, explosives were taken in by the stone men and no others. They obtained the explosives at the magazine at the surface in a locked box. Only the deputies had a key and they fired the shots during the night shift. The stonemen in the Straight South District in this seam went down the pit at 3 p.m. and shots would start to be fired when the men and boys were on their way outbye. The explosives used in the mine were 'Saxonite' in the stone and 'Monabell' in the coal. Shots were fired in the day time in the coal but between shifts only in the stone. All the shots were fired electrically using No.6 detonators. No shot had been fired on the day of the explosion except one in the coal in the South West District of the Towneley Seam and this was fired at 10 a.m. by a deputy as the deputies were the only people permitted to fire shots.

The return airways were travelled in the Towneley seam the week prior to the disaster and those in the Tilley and Brockwell seams during the week ending 22nd. January 1909 and it was presumed that no heavy falls obstructed the air passing through the mine. The presence of gas had been reported only once in the previous twelve months and the seam did not give off much gas. On Thursday 24th. September 1908 the workings of the Busty seam were examined as had the workings in the other seams some little time before and the result of the examination was as follows-

"Ventilation good working places satisfactory returns all right.

General Report:- we the undersigned travelled the Busty Seam, Straight West Way and Bugle South flats ponies scrubbing in South flat all things very satisfactory."

The explosion occurred about 3.45 p.m. and about five minutes before the explosion, Mr. Stephenson, the electrical engineer said the pumpman in the Busty Seam telephoned the generating station to switch on the current as he wanted to start the pump and at the time of the explosion the pump was working. There were two indications that an explosion had occurred with an interval of about 50 seconds between them and observed at the surface. Ralph Stevenson said-

"I stood at the lip of the edge of the downcast pit and looked at the ropes, then fairly steady, and then down the shaft. I heard a roar and saw a red flame right down the shaft. As the roar increased I stepped quickly back and called the other men to keep clear. I then stumbled about four yards from the shaft and fell sideways and just at that moment I saw a large ball of fire issue from the mouth of the pit, followed by a thick black cloud. The cloud spread around me whilst I was still on the ground. I was in darkness, still prostrate. When I was in the act of rising again the air in the shaft reversed and carried the remainder of the black cloud with it and I was then in clear air."

He went to the shaft and found that the doors on the bottom deck were splintered and broken open. Shortly afterwards, about five minutes, two of the three fuses on the switch board in the generator house which carried the current down the mine, blew. First there was a loud burring noise which indicated that there was an overload and then

the fuses blew. Simultaneously smoke came from the downcast shaft and the doors at the 'horse-hole' at the upcast shaft were blown open but swung to on their own. Fifteen seconds afterwards, a ball of flame issued from the downcast shaft followed by a dense cloud of black smoke.

Albert Todd, the engine winder, was bringing up a set of tubs from the south side near the Busty Seam. There was curve on the brow with an iron guard rail which directed the tubs. When the set was about half way round the curve he stopped the engine because the rope was tight and he thought the tubs were off the road. He reversed the engine and immediately the explosion occurred.

The cages were stuck in the shaft and a considerable time elapsed before the shaft was free and the rescuers could get down. There were three survivors from the Towneley Seam, twenty six from the Tilley Seam and one from the Busty Seam but all those who were in the Brockwell lost their lives. The sole survivor from the Busty Seam, Matthew Elliott was recovered unconscious and remained so for about a month after the accident.

On their arrival at the colliery the Inspectors found that both the downcast and the upcast shafts were damaged and the shaftsmen were engaged in clearing a way for the cages which fortunately were not damaged very much. While this work was going on, work went under way to make a temporary hospital in the joiner's shop. Medical stores, oxygen and other materials that were likely to be needed were brought to the hospital including Draegar, and other rescue apparatus under the control of Mr. Simonds of Messrs. Sir W.G. Armstrong Whitworth and Company, Elleswick works who arrive by car within two and half hours of the disaster and bringing men who were trained to use the apparatus. Unfortunately no opportunity presented itself to use the apparatus. The arrangements in the joiners shop were required for only three men, one from the Busty seam and two from the Towneley seam who were brought up the downcast shaft after the necessary repairs had been made.

By 2 a.m. the downcast shaft was repaired and rescue parties went down into the Towneley and Busty seams. They found twenty six men in the Towneley seam that had escaped the effects of the explosion, probably due to the absence of dust in the drift leading from the Busty to the Towneley seam. The landing was wet, which suppressed the dust and the men did not try to get to the shafts. The men from the Towneley seam were Patrick Joyce, John Smith, Patrick Cogan and Robert Leadbetter. Leadbetter struggled for life for thirty hours when he was given attention of the doctors and nurses in the temporary hospital but died from the effects of the fumes that he had inhaled. Along with Matthew Elliott from the Busty seam, these were the only men who were taken from the pit alive.

News of the disaster reached the London evening papers on 16th. February and the Committed of the Miners' Federation passed a motion that-

"our secretary write [to] Mr. John Wilson M.P. that this Committee deeply sympathise and console the bereaved families who have lost their breadwinners and beloved ones in the dreadful explosion at the West Stanley Colliery Durham."

The damage to the downcast shaft extended to the surface and the casing erected from ground level to the underside of the hempstead was blown down on three sides and the roof of the hempstead damaged. At the upcast shaft there was little damage at the surface and the fan was not damaged and continued to run but the water gauge fell from 1.5 inches to 1.3 inches.

The work of exploration went on round the clock and by 22nd. February, 165 bodies had been recovered and brought to the surface. Two men were still missing and the search for them was carried on until 5th. March when all hope of finding them was abandoned. It was known where they were likely to be but they could not be found and owing to the increasing danger to the exploring parties the attempts were abandoned.

The men who died were-
Those found in the Towneley Seam-
Thomas Coulson.
Thomas Smith.
William Clark.
Mark Cowan.
William Samuel.
James Murphy.
James Croney.
John Benfold.
Kames McGreavy.
Allan Miller.
Joseph Hodgson.
James Uncles.
William Morris.
Walter Scott.
Thomas Coyne.
Thomas Whitehead.
Matthew Robson Coxon.
John William Johnson.
Francis Gallagher.
Henry Croney.
William Wallis.
John Lackenby.
William Smith.
John Clary.
Thomas Robson.
Ernest Smith.
John Selkirk.
John Alfred Peart.
Patrick Hennessey.
George Stroyey.
John William Whitefield.
James Bell.
Robert Stoves.
Frank Donnelly jnr.
Thomas Worby.
Patrick Doran.
Matthew Coulson.
Joseph Glennon.
Patrick Glennon.
Thomas Nelson Charlton.
Thomas Skackleton.
Cornelius McAlison.
Michael McGuirk.
Peter Gibbons.
William Crosier.
Thomas Carr.
William Murphy.
Luke Reay.
Richard Burns.
Thomas Thompson.
James Brennan.

John Joseph Walker.
Stephen Wood.
Joseph Cummings.
William Ranson.
John Pearson.
James Clarke.
Thomas Watson.
Peter McGreavey.
William Nicholson.
Ralph Wood.
John William Graham.
Robert Leadbetter who lived for 33 hours after the disaster.

Those from the Tilley Seam-

Thomas Riley.
George Booth jnr.
Henry Manistre.
James William Dean.
Peter Allen.
Thomas Short.
John Glendenin.
Henry Gill.
William Batty.
Thomas Killingback.
Ralph Laverick.
Robert Johnson.
Albert Dunn.
Robert Brown.
George Bell Halliday.
William Doyle.
James Gardener.
George Lawson.

Those in the Busty Seam-

John Forster.
Joseph Agar.
John Mackay.
Edward William Manistre.
John Simm.
Anthony Reedman.
Thomas Crozire.
Anthony Hodgson.
Henry Wright.
William Quinn.
William Brophy.
John Glendenning.
John Henry Ivy.
John Finningham.
Thomas Herron.
John Joseph Smithson.
George Watson.
John Richard Johnson.
John Isaac Statt.

Thomas Anderson.
John Johnson.
Robert Forster.
Richard Broadmore.
James Jamison.
John Robinson.
William Crozier.
William McShane.
James Donkin.
Joseph William Dover.
Matthew Agar.
William Rowell.
John Pilkington snr.
William Palmer.
James Pilkington.
Jospeh Willis.
John Henry Manistre.

Those from the Brockwell Seam-

William Jefferson.
John William Smith.
Richard Proud.
Thomas Booth.
Joseph Johnson.
Henry Dunn.
James Charlton.
John Carter.
William McGough.
Partick McKenna.
Joseph Carter jnr.
John Thomas Nixon.
George Carr.
John Wood.
William Charlton.
William Green.
Henry Miller.
Thomas Whelan.
Edward Davidson.
George Bowes.
James Harsion.
Stephen Riley.
James Foster.
George Lawson.
George Fewster.
Robaert Johnson.
Stephen Riley
Jospeh Nixon.
Joseph Burn.
Thomas Bottoms.
William Scott.
John Counsell.
Matthew Pattinson.
Stephen Gourley.

George Gill.
John Donnelly.
Archibald Coils.
Thomas Lawson.
John McNestry.
George Gettens.
James Payne.
Sidney Hodgson.
Allan Counsell.
Edward Lodge.
Alexander Wilkinson.
Joseph Welsh.
Isaac Walton.
Thomas Shepherd.
James Lambert.

Two of the bodies were left in the mine as unrecoverable.

The inquiry opened on the 29th. March in St. Andrew's Institute, Stanley before the Coroner, Mr. Graham and all interested parties were represented. Messrs. W.E. Harvey, M.P., and H. Twist reported in the inquiry into the disaster to the Miners' Federation Committee at a meeting held on the 6th. May 1909 at the Westminster Palace Hotel, London.

There was conflicting evidence as to the original point of the explosion. Matthew Elliott was the only survivor who witnessed the explosion who was the sole survivor from the Busty Seam. He was too ill to attend the inquiry but his evidence was taken at home. He said-

"On the afternoon of the explosions I was on the flat sheets near the shaft on the South side when I heard a loud noise coming from the South Side which seemed to shake the whole of the shaft sidings. It was so violent that the tubs rattled as if they had been upset, and it was followed by a big cloud of dust, and the lights went out. I had a small safety lamp burning in the cabin which showed the dust."

The witness said that electric lights on the South side went out before the explosion and he heard a boy, Charles Redman crying, 'Help me,' three times. He tried to get into the cabin to get the lad a drink of water and he remembered no more. Elliott was found by a rescue party exactly where he fell. His body was severely burned.

Mr. W.C. Blackett, a mining engineer speaking on behalf of the owners had formed three theories as to the approximate locality of the first ignition. he thought that it was possible that it originated in the Towneley seam, or in the Brockwell seam although he thought Elliott's evidence did not support this theory and the third theory was that it originated in the Brockwell seam. Mr. Blackett continued-

"If then the Towneley and the Brockwell seams are absolved from blame, it is necessary to revert to the contemplation of Elliott's impression being correct and in that case the only possible point of the initiation to be suspected is somewhere in the immediate vicinity of a big fall just round the Busty West way, and the only cause I can conceive is a very thick and heavy cloud of dust being raised by a fall of stone, which may have brought about by an accident to the set which was being hauled outbye and was the cause of it having been rapped hold. What has ignited such a cloud of dust I can not say. I am very disappointed that I can unable to give any more definite conclusions and I regret the somewhat uncertain state in which I must leave the matter. I could not believe that such an explosion could not have occurred and be developed in all seams without leaving clearer evidence of its cause."

Mr. Tate, another mining engineer stated that on his first visit to the Busty seam and was more definite in his evidence. He said-

“I was stuck with certain indications which pointed to the force and trend of the explosion having come along the Busty shaft siding towards the downcast shaft. I afterwards had a string impression that it had occurred at the Towneley haulage motor, but this latter idea I found untenable and after hearing the evidence of Elliott, I had to reconsider my first impression and after careful and exhaustive examinations, I have satisfied myself that the explosion originated on the South side of the pit in the main intake of the Busty seam at a point beyond the curve at the entrance to the Bust west way.

I have ascertained that at the moment of the commencement of the explosion the engine set of laden tubs was just coming out of the Busty way end and would cause a cloud of coal dust. Just beyond the point where the end of the set had reached and near to the shaft siding there is a fall of stone and several balks and props under this fall appear to have been driven outbye towards the way end, whereas at a short distance further inbye the indications are all inbye over. I also noticed that the explosive force shown in this neighbourhood and from thence out over towards the shaft, and was not of a very violent character and there is an absence of serious damage.

All the persons employed in the shaft siding and at the bottom of the pit appeared from the position in which they were found to have had some intimation of the explosion and most of them had made an attempt to obtain shelter from the blast which was approaching them thus proving that it was at that moment a comparatively slow travelling force which had just commenced moreover the bodies did not appear to have been subject to much violence as some of the other bodies which were further away from this initial point. We also have it from Elliott that he heard one of the victims crying out for help.

All these incidents point to the possibility of this point being the neighbourhood of the first ignition consequently it must be coal-dust explosion, as gas could not possibly have been present there. From this point of ignition the force travelled in ever direction inbye to the face of the Busty way, inbye to the Bugle way and up the Tilley staple and up the Tilley drift and outbye to the downcast shaft, and up this shaft to the Busty seam and down the shaft into the Brockwell seam. It afterwards came down the Towneley staple into the Busty seam at the other side of the shaft.

In my opinion it was an explosion of coal-dust which was ignited at a point on the Busty waggonway on the inbye side of the curve.”

Other sources of ignition were examined, open lights, whether by defective lamps or matches, shot firing, sparking from mechanical friction and electrical sources. All the lamps in the mine were locked and none of the recovered lamps showed signs of damage that could have caused the explosion and sparking from mechanical sources were dismissed as a source of ignition. The fact that the fuses at the surface had blown led Dr. W.M. Thornton, professor of Electrical Engineering at the Armstrong College Newcastle-on-Tyne who was called by the Durham Miners' Association thought that the explosion was caused by an electrical spark. Three facts led him to this conclusion. First a lamp which was hung in front of a large pumping tank in the Busty seam was found smashed, second the breaking fuse in the pump house in the Busty seam and third, a short circuit set up by train of coal dust between the terminals in any of the junction boxes or gateway end switches. He thought the last to be the most likely.

At the end of the inquest the coroner summed up and left nineteen questions for the jury to answer. They retired and after three hours returned with the following answers-

“Question

1 What was the cause of death in each separate case?

Answer. As stated by the medical witness.

Question

2 Was the Towneley Seam in a safe working condition (including cables and their insulation, electric and all other plant, whether worked by electricity or otherwise) when the deceased men and boys were working therein on the 16th. February 1909, and up to the moment of the explosion, and had all proper precautions been taken by watering and sweeping to prevent dust explosion?

Answer. All in good working order and all proper precautions taken.

Question

3. Tilley Seam. Was the Tilley Seam in a safe working condition (including cables and their insulation, electric and all other plant, whether worked by electricity or otherwise) when the deceased men and boys were working therein on the 16th. February 1909, and up to the moment of the explosion, and had all proper precautions been taken by watering and sweeping to prevent dust explosion?

Answer. All in good working order and all proper precautions taken.

Question

4. Was the Busty Seam in a safe working condition (including cables and their insulation, electric and all other plant, whether worked by electricity or otherwise) when the deceased men and boys were working therein on the 16th. February 1909, and up to the moment of the explosion, and had all proper precautions been taken by watering and sweeping to prevent dust explosion?

Answer. All in good working order and all proper precautions taken.

Question

5. Was the Brockwell Seam in a safe working condition (including cables and their insulation, electric and all other plant, whether worked by electricity or otherwise) when the deceased men and boys were working therein on the 16th. February 1909, and up to the moment of the explosion, and had all proper precautions been taken by watering and sweeping to prevent dust explosion?

Answer. All in good working order and all proper precautions taken.

Question

6. Was the downcast shaft in a safe working condition (including cables and their insulation, electric and all other plant, whether worked by electricity or otherwise) when the deceased men and boys were working therein on the 16th. February 1909, and up to the moment of the explosion, and had all proper precautions been taken by watering and sweeping to prevent dust explosion?

Answer. All in good working order and all proper precautions taken.

Question

7. Was the upcast shaft in a safe working condition (including cables and their insulation, electric and all other plant, whether worked by electricity or otherwise) when the deceased men and boys were working therein on the 16th. February 1909, and up to the moment of the explosion, and had all proper precautions been taken by watering and sweeping to prevent dust explosion?

Answer. All in good working order and all proper precautions taken.

Question

8. Was the fan of sufficient capacity and was a sufficient current of air passed along in-takes and returns during the back shift?

Answer. Yes, in both cases.

Question

9. Were the lamps issued to the men and boys in good condition and safe as against gas, and were they properly locked?

Answer. They were issued in proper condition and properly locked.

Question

10. Was the West Stanley Colliery in all respects properly provided with all the necessary mechanical power and materials necessary for the safety of the men and boys employed on the 16th. February?

Answer. In all respects the jury consider this had been done.

Question

11. Were the manager, undermanager, overmen, deputy overmen, master shifter, engineers, enginemen (both steam and electrical) and all officials of sufficient experience and ability and did they discharge their respective duties in a satisfactory manner and were the general and special rules in force at the colliery strictly complied with?

Answer. We are of the opinion that all the officials enumerated were competent men and that all rules had been complied with.

Question

12. In which seam did the explosion originate?

Answer. In the Busty Seam.

Question

13. Was there one explosion or more than one?

Answer. One explosion not able to say if there was more than one.

Question

14. In what part of the seam (or elsewhere) did the explosion originate, and in what other parts where there other explosion (if any)?

Answer. On west way, Busty Seam, between curve and air crossing.

Question

15. Was the explosion of gas or dust or partly gas and partly dust?

Answer. A dust explosion.

Question

16. How was the dust ignited so as to cause the explosion?

Answer. What was the cause of the explosion the jury were unable to find.

Question

17. Who, if any, one or more, is (or are) and in what respect culpable?

Answer. No one.

Question

18. Was the explosion result of a cause or causes, which has or have not been and cannot be ascertained?

Answer. A dust explosion. What was the cause of the ignition the jury were unable to find.

Question

19. Does jury desire to make any recommendations or suggestions for the further guidance of the present or future owners of the West Stanley Colliery, or other similar collieries?

Answer. None."

With the presentation of the verdict the proceedings were terminated.

BERSHAM. Wrexham, Denbighshire. 3rd. August, 1909.

The colliery was the property of the Bersham Coal Company and had recently been sunk to the main coal seam and the opening of the seam was not very extensive but the coal was known to give off a great deal of firedamp. The Main Coal was reached by a shaft 418 yards deep. The diameter of the downcast pit was 10 feet 6 inches and the upcast 13 feet. The ventilation was by Guibal fan, 30 feet in diameter and the total amount of air passing through the mine on the day of the explosion was 43,110 cubic feet per minute and of this 5,980 cubic feet would pass into the West Side and 11,040 cubic feet on the East Side.

The coal was worked by gunpowder and on the evening of the explosions a shot had been fired at the far end of the No.2 West Level which had ignited a blower of firedamp. Attempts were made by the workmen to smother the flame but without success and eventually they left the mine and went to seek the help of the manager.

On the arrival of the manager with some firemen and others, nine in all, they went down the pit and tried to cut off the ventilation by means of stoppings. By this time the smoke had become very dense and they could not get close to the face or the in take end of the West Level. They appeared to have partly opened an air door to try to drive away some of the smoke. The opening of the door reduced the ventilation in the North level and neighbouring places. Gas appears to have accumulated very rapidly and eventually it came into contact with the flames of the fire in the West Level and exploded at a point about 335 yards from the pit eye. The manger was killed as well as seven other people and a workman named Valentine was seriously injured but he died a few days later.

Those who lost their lives were-
William Pattison aged 57 years, the manager,
Joseph Mathias, aged 34 years, fireman,
Edward Owen aged 49 years, fireman,
John Johns aged 42 years, fireman,
James Roberts aged 36 years, fireman,
Henry Valentine aged 44 years, pitman,
Thomas Evans aged 32 years, collier,
Edward Parry aged 36 years, collier and
Robert Lloyd aged 39 years, hooker-on.

The inquest into the disaster was held at the County Buildings before Mr. B.H. Thelwell, Coroner and the following jury, Messrs. Robert Roberts, John Salisbury, William Robert Griffiths, Edward Tunnah, David Yates, William Edwards, William Henry Simpson, Stephen Jones, R. Jones, John Prince, Benjamin Lloyd, Richard Pennah, Daniel W. Robinson, John Jones, John Owens and Robert Green. Also present were H.M. Inspector of Mines, Mr. Henry Hall and his assistant Mr. Hedley, Mr. J.H. Walker a mining engineer of Wigan and a number of colliery managers from surrounding collieries. Mr. Ellis, solicitor of Wigan, appeared for the Colliery Company.

Mr. Walker, of Wigan, was the first witness to be called. He had acted as consulting engineer to the Company from the preceding March and produced a plan of the mine as it was before the explosion. Mr. Walker thought that the explosion had taken place in the No.2 heading, west of the No.1 Pit. He had examined all the workings on the 27th. and 28th. July with Mr. Edward Lloyd Jones, the mineral agent, and had found the ventilation in good order and the only gas to be found was on the No.3 level on the east side. The fireman's book which was kept in an office close to the downcast shaft, was mostly destroyed in the explosion.

A collier, John Williams, who had worked off an on in the Bersham Colliery for about four years and knew all the men that had been killed went into the workings at 2 p.m. on the day of the explosion with his brother. He had seen shots fired as he went down the pit by Edward Owens who also fired shot at about 8 p.m. The shots were fired in William's working place and the one next to it. He did not know if the place had been examined by the fireman. They worked up till 8 p.m. and did not see any gas in their place but there was gas in the next place, about five yards away. They were in the pit when the gas fired. Edward Owens, one of the deceased, called to him that the gas had fired and added, "Let's go lads and put it out." John Williams went into the place with another collier, John Hughes, and they tried to brush the gas out with a piece of brattice

cloth but he did not succeed in doing so and they gave up and went to the surface. Williams believed that the gas had been ignited at a moderate blower.

Joseph Jones, another collier said Edward Owens was always close by when he fired the shots and a shot was never fired without the fireman's orders. When they could not put out the blower, they all got frightened and ran away but Edward Owens sent Johns for some water from the pit eye. When he returned, he could not get to Owens because of smoke. He tried to go another way but by that time the alarm had been given and everyone was running the other way. He went with them and did not see Owens on the pit bank.

James Owen, collier, went down the pit at 2 p.m. and knew all the men who had been killed. He was working on the North Seam Level and at about 9 p.m. was called by others to come and try to put out fire. He had gone on Owens' orders with Jones to get water from the pit eye and could not get through the smoke but on his return, he met the manager and Joseph Mathias but no words were exchanged between them. He had been a collier for forty years and when ever blowers were seen he had always wedged the coal down.

Henry Mathias, collier, thought that it was dangerous colliery to work in but that it was carefully managed. Thomas Steen, also a collier was working on the East Side of the North Level and at about 8 p.m. John Hughes came and asked him and his partner, Evan Parry, who was killed in the disaster, to come and help him put out a fire. He went back and he and his partner found smoke and ran for their lives. He saw the face of the coal on fire and he heard a man named Anthony calling out. He went back to help him as he was smothering on the road. The wind rushed through the workings and doors clapped violently and he felt sure that there would be an explosion as he knew that there was gas close by. Three days before Joseph Mathias had told him to put up rails to prevent people going into a place twenty yards off where Mathias had told him there was gas present.

Mr. N.R. Griffiths, mining engineer of Wrexham, heard the explosion at about midnight and immediately drove to the colliery. He was told of the position by John Pattison and Mr. Hough and they went to look at the air that was coming from the mine through the fan drift and there was a strong smell of burning coal coming from the mine. Griffiths and Hough descended the downcast shaft in the bottom deck of the cage since the cover had been blown off the top deck. They found some damage to the shaft. The water rings were broken which made the shaft very wet and the the down signal strand was broken about half way down but about four yards from the bottom they found that the the rods on the north side of the shaft had been blown into the shaft and the cage jammed against them. They returned to the surface where they met Mr. Dodd and got a ladder. With the help of the ladder Dodd and Griffiths got into the north inset, told the other two to wait in the cage for them and they set off along the North Level. A few yards from the shaft they found a fall of roof and just beyond this they could see the first body which they later found was William Pattison. He was lying on his face and knees facing the shaft and appeared to have been blown towards the shaft by the blast. They satisfied themselves that he was dead and went along the Level. They found that both stoppings were down as was the air crossing and the air supply decreased the further they went.

At the old longwall working they could smell burning and a little further on they found Valentine alive. The door to the First West Heading was blown out and the air was stagnant. They went on along the North Level and there was thin white smoke hanging along the roof. The afterdamp was very strong and affected Griffiths and found that they could go no further. They shouted once or twice but got no reply and as they got no reply, Griffiths came to the conclusion that there was no one left alive in that part of the pit. He became worried for the safety of the mine other parts of the pit and thought it was likely that the injured Valentine would have some information. He returned to the pit

eye and made arrangements to take Pattison's body to the surface where he spoke to Valentine.

Valentine told him that when he had left the pit eye the hooker-on was there and as he had gone towards the north Level, he had met Pattison going towards the pit eye. Pattison had told him to hurry and Valentine was certain that the men must be further along the North Level. Valentine also confirmed that the blast came from the Level towards the pit eye.

Griffiths went back down the pit with Mr. Hedley, the Inspector and some men who they sent to the South Side of the shaft to try to find the body of the hooker-on. The body was found under the guide rods that had been blown into the South inset. They found that the afterdamp was not as strong in the North Level and as they made their way up they found the bodies of John Jones and Edward Owen. These bodies were taken to the pit eye and further progress along the level was prevented by the afterdamp and they found that they could not return as gas had filled the road behind them up to the point where they found Valentine.

Griffiths and Hedley decided that the safest way to get the bodies out was to erect brattice along the North level from this point, taking the air one side of the brattice and returning it down the other. They went to the pit eye and sent up the bodies of John Jones, Edward Owen and Robert Lloyd and went to the surface where they met Mr. Walker, Barnes and Hall. the work on the bratticing started on the morning of Saturday 7th. and the second West heading was reached. The door was found shut and not damaged by the explosion but aboard was broken. This had been done intentionally, apparently to let some air to pass through the door. The stopping in the Main Return was knocked out to let air circulation. The bodies of James Roberts and Thomas Evans were found on the inbye side of the stopping.

Griffiths did not go down the pit again until the following Monday when the bodies of Evan Parry and Joseph Mathias were found. On the 18th. August the ventilation was restored throughout the pit and a full examination of the mine was made by the inspectors and others who were interested parties. From the evidence that was available it was seen that the explosion came out along the North Level and in the workings on the South Side there were indications of a violent concussion which had blown tubs for some distance.

The last witness to give evidence at the inquiry was John Laidley Hedley, Assistant Inspector of Mines. He was critical of the use of gunpowder in mines and said-

"Firedamp was freely given off in all parts of the seam and at the time of my inspection showed at the flame of the lamp in all the south headings, in addition to which there were blowers in several places. The danger of using gunpowder in such places was pointed out to Mr. Pattison, who presumably acquiesced in our views, as the work in this part of the mine was discontinued. The question then naturally arises whether in a seam of this character is it safe to fire shots at all. I am strongly of the opinion that shots should not be fired at any time when blowers are perceptible and that under any circumstances gunpowder should only be used when the men ordinarily employed in the mine are out of the mine. If it is held that the mine can not be worked under these circumstances, I may say that the principle is now being carried out in a number of fiery mines in Lancashire."

NAVAL COLLIERY, Ely Pit. Penycraig, Glamorganshire. 27th. August 1909.

The colliery belonged to the Cambrian Coal Trust and the disaster occurred on the morning of the 27th. August. The cage was descending with 26 men in and, owing to the breaking of the reversing gear, the engineman was unable to control the descent. The cage crashed into the sump while the ascending cage went into the headgear. The rope broke and fell down the shaft falling 525 yards on to the top of the bottom cage.

On the previous Tuesday night David Davis the engineman went to work at 10 p.m. and he noticed an electric lamp on a cord against the reversing spanner. He asked T. Evans, whom he was relieving what it was doing there. Evans told him that the spanner had cracked and Mr. Dolman, the mechanic had repaired it by shrinking a hot iron clamp around the crack. Davis hoped it was safe yet he felt afraid. he did not complain to any of the officials since the mechanic knew about it and had reported the fault. There were no safety catches or detaching hooks in use at the pit.

Those who died were-
Thomas Brown,
Alfred Watkins,
Morgan Evans,
Gideon Chapman were all killed in the initial impact.
Marshall, T.J. Morgan and
R.R. Jenkins died from their injuries.

The inquest into the disaster was held on Friday 3rd. September in the Vestry of the Nazareth Chapel, Williamstown. There were two coroners, Mr. R.J. Rhys of Aberdare and Mr. D. Rees of Pontypridd. The Home Office was represented by Mr. Atkinson, Superintendent Inspector of Mines, Mr. F.A. Gray Chief Inspector of Mines and Mr. F.J. Trump, Assistant Inspector. Mr. Hill-Kelly appeared on behalf of the Federation and Mr. W. Thomas, solicitor, for the Winding Engineman's Association and Mr. Charles Kensole for the Colliery owners.

David Davis, the winding engineman was the principle witness. He had been driving the engine for 25 years and on the morning of the accident he started to wind men down the shaft at 5.25 a.m. When the fourteenth of fifteenth cage was being sent down and was about thirty yards from the bottom the reversing spanner broke. At this distance it was usual to put the steam against the engine but on this occasion, when he did so the lever which lifts the links of the reversing gear broke. He was also using the foot brake and when he heard the snap he put this down to the last notch but it did not stop the engine. He had misgivings about the foot brake would not hold the load if anything happened to the engine. He had complained about the inefficiency of the brake a number of times over the previous six or seven years but in particularly when double deck cages were installed. There was a 'vice' brake but it had never been fixed to the engine and at the time of the disaster was still in the colliery yard.

John Dolman, the mechanic who had repaired the spanner considered it quite safe and he did not think that the crack had anything to with the fracture which caused the disaster. The double deck cage weighted 3 tons 5 cwt. and carried 26 men. The single deck cage weighed 1 ton 15 cwt. and carried only ten men. Dolman denied that he had ever heard Davis complain about the foot brake and he did not think it was inefficient. After the accident the brake was tested with the cage full of bricks equal to 26 men and the brake held the load. In his opinion the engine had been over run.

John Fry, one of the men who was in the cage, said he was in the bottom deck and when they were about twenty yards from the bottom he thought the rope had broken as the cage descended at a rapid rate. In his opinion the engine had been over run.

Obidiah Jenkins said that he had to examine the machinery and enter a report book kept for the purpose. He said that he had been a time keeper and had never served his apprenticeship as a mechanic and he did not know enough to make reports. His examinations consisted of inquiries from the enginemen and he had held the position for seven years.

Mr. F.A. Gray, Inspector of Mines was of the opinion that the final fracture was a continuation of the crack that was repaired on Tuesday. It should not have been repaired as it was involved in winding men and a new one should have been provided

within twenty four hours. He was in favour of steam brakes and detaching hooks but at the time these were not compulsory. He did not think that the examination of the machinery was efficiently done and should have been carried out by a competent man.

The company brought several witnesses to show that the brake was efficient. The manager and agent denied that the engineman had claimed about the brake. The 'vice' brake in the yard had come from the previous owners of the colliery and they did not think that it was necessary to fit it.

With all the evidence heard Mr. Rees addressed the jury and put to them the following suggestions-

- “1). Did the deceased person lose their lives in consequence of the breaking spanner forming part of the winding engine?
- 2). Was the flaw detected on the previous Tuesday repaired in a reasonably adequate manner?
- 3). Was it reasonable to continue the winding engine for the purpose of raising and lowering men in the condition it was run in?
- 4). Should the management have replaced the broken spanner with a new one?
- 5). Was the method of supervising the machinery at the pit a satisfactory one?
- 6). Was the brake power of the engine adequate?
- 7). If not, was the attention of the management drawn to it by the winding engineman or others before the date of the accident?”

The jury was out for two hours and when they returned they answered 'Yes' to questions 1, 2, 4, and 7., and 'No' to questions 3, 5 and 6. The foreman of the jury added that they exonerated David Davis, the engineman from all blame in the matter.

BIRCHROCK. Pontardulais, Glamorganshire. 1st. October, 1909.

The mine was owned by Graigola Merthyr and Company of Swansea. The explosion took place at the colliery on the 1st October. The pit was worked with naked lights except certain headings where safety lamps were used but the lamps were not locked. The pit was worked by a double shift and it was on the night shift that the explosion occurred. The velocity of the air at the bottom of the return air shaft was 31,600 cubic feet per minute and in the No.4 heading on No.6 level, where the disaster occurred, was 22,000 cubic feet per minute. The men thought that there was adequate ventilation and this was the first accident at the pit from gas since 1869 but there had been slight outbursts over the last eleven years. The men thought that naked lights were all right in the banks but that safety lamps should be used in the headings.

The men who died were-

Arthur Schroder,

Edward Mainwaring

John Whelan,

David Rees and

Samuel Jones, all of whom were married men.

Dr. R.J. Isaacs gave evidence that all the men had died from injuries and shock.

The inquest took place at the Institute, Pontardulais, before Mr. Glyn Price, Coroner. Mr. Atkinson and Dyer Lewis, H.M. Inspectors of Mines were present as were Mr. David Randall, solicitor who represented the Federation, Mr. W.E. Morgan and W. Jenkins for the Welsh Miners and Mr. Gregor, Agent and Mr. W. Kenshole, solicitor represented the Colliery Company.

The manager, fireman and a haulier all of whom were injured in the explosion gave evidence. They told the court that the explosion occurred at the No.4 heading, near a

gate, the No.10, which turned out of the heading. It was caused by knocking down some brattice that was used for the ventilation of the bottom, No.9, gate.

The haulier said that he had complained to the fireman about an hour before about tubs that were rubbing against a pair of timbers which were close to this sheet. The timbers were eventually knocked down and the sheet displaced. The haulier retorted this at once to the fireman who came and called out the five men who were working in the No. 4 heading at the No.10 stall. He told them to repair the sheet and reset the timber at the bottom of the No.9 gate.

It took about an hour to restore the ventilation and the fireman went into the heading to see if all was right. He had to pass two loaded tubs and he then found a naked light had been left in the No. 4 heading. This ignited the accumulated gas. The fireman said that if safety lamps had been used the explosion would not have occurred.

The jury returned the verdict -

“Accidental death, due to an explosion of gas caused by an open lamp and we exonerate the fireman from all blame.”

DARRAN. Deri, Glamorganshire. 29th. October, 1909.

The colliery was situated at Deri in the Bargoed-Rhymney valley and was the property of the Rhymney Iron Company Limited. It employed 272 people at the Darran Colliery which produced about 400 tons per day.

There were two shafts about 17 yards apart and each 111 yards deep to the Brithdir of No.2 Rhondda Seam. One shaft was used for winding and downcast which had a oval section, 17 feet 6 inches by 10 feet 6 inches. This was fitted with a pair of cages which ran in wire rope guides and carried one tram each. The other shaft was a circular pumping shaft 10 feet 6 inches in diameter. This shaft was fitted with ladders for travelling and both shafts were very wet.

In addition to the two shafts there was a connection with two others belonging to the Company. One of these was the Grosfaen shaft about 850 yards to the south of Darran. This had been recently sunk to the steam coals and passed through the Brithdir seam but was not used for winding or ventilating the Darran workings. The other shaft was at the Gilfach Colliery, 4,120 yards to the south of Darran. There was also the Penyarreg shaft which passed through the Brithdir seam but had no connection with the Darran workings.

Twenty four men working at Darran at the time of the explosion escaped through the Gilfach shaft and unsuccessful efforts were made from this shaft to rescue the men which resulted in the deaths of three of the explorers.

Mr. T.W. Bowen was the manager who was also the agent and manager of the other mines of the Company. The undermanager was Mr. John Evans, the day fireman, Edmund Davies who had an assistant and John John was the night fireman.

The Brithdir seam was about 3 feet 6 inches thick with a good roof of strong shale or sandstone. The workings in use at the time were all to the dip and at a considerable distance from the shaft. They were reached by an engine plane, called the drift, driven for 1,940 yards from the pit level. The seam was worked by a modified system of pillar and stall. Levels were driven to the east and west from the engine plane at intervals of 220 and 300 yards and headings driven off them to the rise about 100 yards apart. To the east and west of these rise headings, stalls were driven with pillars about 10 yards wide between each, the pillars being worked later.

The colliery was ventilated by a Schiele fan, 6 feet in diameter, fixed near the top of the upcast shaft and driven by a steam engine which ran at 300 revolutions per minute and produced 20,000 cubic feet of air per minute with a water gauge of 1.5 inches. The air was conducted through the pit in one current, going in by the main drift, through the

workings, and returning by a circuitous route to the upcast shaft. The ventilation of the Darran and the Gilfach collieries was entirely separate, and there was a sneaked door on the connecting road. There was little ventilating pressure on this door, and the direction of the pressure was said to vary.

The main haulage was carried out by a steam engine on the surface working and main and tail rope. The tail rope was only used for hauling the journeys of trams between the shaft and the top of the main drift, a distance of about 300 yards. From that point the empty journeys ran by gravity to 'double partings' or landings on the different levels, drawing the main rope behind them. From the double partings the trams were hauled by horses. The trams were of wood, with closed ends, one end acting as a door. They carried about 28cwts. each, with the coal stacked up above the tops of the trams.

The mine produced a considerable quantity of water and from 25,000 to 30,000 gallons an hour were pumped at Darran and some went to Gilfach. The water was drained to three pumps worked by compressed air and forced by them to the shaft where it was raised by a pumping engine at the surface.

Naked lights were, and always had been used throughout the mine. It was said that during the whole life of the colliery, firedamp had never been detected and none was observed after the explosion. Blackdamp was found in old workings and unventilated places.

The major portion of the roads and workings were wet or damp but portions of the man intake and haulage road were dry and dusty and it was on this road that the explosion occurred. In the vicinity of the downcast road the road was wet and from the shaft to the top of the drift the floor was partly wet and partly dry and dusty. The main drift was dry and moderately dusty for about 300 yards from the top where a spring of water rose out of the floor and ran inward, and from that point the floor was wet for a considerable distance and the roof and sides became damp. Further down the drift, below Shenkins level, there was another dusty section to which the explosion did not extend. The return airways and workings were damp and free from coal dust.

The coal dust in the dry portions of the haulage road was produced from dust and coal which was blown and fell off trams. The ordinary South Wales trams drop much coal dust all the way from the face to the shaft. There was probably no great amount of fine dust on any part of the road and there was little timber on which dust could lodge on the part traversed by the explosion.

Explosives were used for getting coal and stone work as required. For coal work compressed gunpowder and Bobbinite were used. The colliers supplied these explosives and fired their own shots by fuses ignited at their naked lights. For stone work, Rippite and Carbonite were used. The Company supplied these for use by the repairers. The only persons authorised to take the latter explosives into the mine were two firemen and a shotfirer who were appointed in writing to do so. They fired the shots by fuse and detonators, also supplied by the Company. There was no magazine or store for the explosives at the colliery but they were brought in small quantities as required from the magazine at another of the Company's pits and kept in a locked box in the carpenter's shop in the charge of the head carpenter.

There was considerable laxity shown by the Company with regard to explosives. A book was kept for the recording the particulars of shots fired but the last entry in it was on 16th. October although several shots were fired after that date. No account of the explosives received at the colliery not to who they were given, was kept. The head carpenter said it was his practice to put 5lbs. of explosives and a box of detonators in the night fireman's shot box and leave it in the office for him and that he gave out 5lbs. of Rippite and half a dozen caps on the 23rd. October. The Report commented:-

"The enclosure of detonators and explosives in the same box was a contravention of the Explosives Order."

The assistant carpenter said that on the 27th. October he put 5lbs. of explosives and a coils of fuse but no detonators into the night fireman's shot box and left it in the office for him. When the night fireman's shot box was found after the explosion it contained seven cartridges of Carbonite and one of Rippite, some fuse and 33 detonators in two in locked tins. The Report again:-

"Detonator boxes with locks are required by the Explosives Order were supplied by the Company and it could not be explained why the night fireman did not use one."

There were indications of the explosion at the surface at 4.30 a.m. when a loud report and a violent blast accompanied by dust came up the downcast shaft but there was no flame seen. The gates and fencing at the top of the pit were damaged and part of the roof over the shaft landing was blown off. The platform and handrail at the pulleys were also blown away. heavy iron landing plates which abutted against the cages were displaced and two of them fell down the shaft. One of the cages was damaged at the pit top. In the main upcast shaft no damage was done save that the ladder was displaced and the main part of the scaffold above the fan drift was blown up. The fan was not damaged.

At the moment of the explosion, Thomas Williams, stoker who also acted as night banksman, was at the pit top to send down Thomas Skryme, an ostler who was already in the cage. Williams was thrown violently against a wall and knocked unconscious. He could remember nothing. Neither of these men were seriously injured but both suffered severely from shock.

There were only four people at the surface at the time of the blast and two were disabled by the blast but the noise of the explosion waken people living near and some of these hurried to the pit and messages were sent to the officials and for medical aid.

As the cages could not be used for several hours, the only means of access at Darran was by the ladders in the upcast shaft. Cries for help were heard from below and William Evans, the pit carpenter, who was quickly on the scene, went down the ladders and he was followed by others. They found Eli Tovey and Evan Jones alive at the bottom of the downcast shaft, the latter was pinned fast under the cage. These men were attended to but could not be taken to the surface until the cages were in use some hours later. William Cleavy was also found a short distance from the shaft. He was badly shaken, but not seriously injured and was able to walk.

At this time, the ventilation was short circuited by the destruction of the doors between the shafts and in three connections between the intake and return airways, all within 300 yards of the shafts. The destruction of the air bridge, 380 yards from the shaft, also caused a direct opening between the intake and the return airways. The consequence of this was that the afterdamp in the immediate vicinity of the shafts was swept away. This accounted for the survival of the three men there. A small amount of air might also have circulated through the opened connections further away but there would have been afterdamp in the air which increased with the distance as the distance from the shaft.

Immediately after the explosion the road was traversed by the flame and would have been filled with a hot and deadly mixture of afterdamp, smoke and dust. Directly afterwards this atmosphere would cool rapidly and contract in volume and there would be an inrush of fresh air through all available openings, which would further cool the atmosphere but would not be sufficient to be capable of supporting life. The dust and smoke would gradually subside but the air would remain poisonous even when diluted with fresh air to support combustion and all the more dangerous because of its most deadly component, carbon monoxide, would have little or no effect o the flame of lamps.

Amongst the early rescuers was David Lewis, the undermanager of the Gilfach pit. He went down the ladders and proceeded along the main road with Edward Davies and T. Matthews, taking William Cleavy with them with the object of getting him through to

Gilfach. They went below the air bridge, when Cleavy was so affected by the afterdamp, that they had to return. They met Evan Owen, the undermanager of Darran, who had come down about 7 a.m., and Ned Jones. Edward Davies, who had been down since 5 a.m., was also overcome and he was sent back to the shaft with Cleavy. Lewis, Owen and Jones then proceeded down the shaft and saw the bodies of David Edwards, D. McCarthy, E. Roberts, L. Morgan, Ambrose Jones, M. Coombes and Henry Barker. They could hear someone breathing and eventually found S. Anthony in a manhole. His breathing was so noisy that they heard him 20 yards away. They tried artificial respiration but had to stop when they found the skin was coming off his arms. He was quite unconscious. Ned Jones was sent back to fetch Dr. Turner, who was then in the pit. This was at about 8 a.m.

David Lewis and Evan Owen then went on by themselves as far as Shenkin's level. The air here was very thick and Owen was unable to go any further. He described his sensations as follows:-

"Pains in the head, weakness of the limbs, legs felt heavy and I was stumbling about."

They returned and met Dr. Turner, Ned Jones, Edward Richards and William Edwards. Dr. Turner sent Owen back to the pit with Richards and gave orders that Anthony was also to be taken out. This was done by Edward Davies who had returned a second time with help. On his return to the shaft Owen received and was able to superintend repairs to the doors.

Dr. Turner, David Lewis, William Edwards and Ned Jones then went down the drift. Jones, who had been in the pit for some hours, was obliged to return but he was able to go out himself. The others continued down the drift as far as Shenkin's level, when Dr. Turner, who was leading, noticed that there was no reply from Lewis, and on returning back he saw Lewis slowly slide into a sitting position. He shouted and tried to rouse him but got no reply. Edwards gradually subsided but remained conscious. Dr. Turner asked him for the beef tea that he was carrying. Edwards did not speak but let the jack fall. They both became unconscious and Dr. Turner himself had no symptoms until he exerted himself trying to revive the other two. He then felt tired and wanted to lie down, but struggled out as far as he could, falling several times and finally losing consciousness.

Ned Jones then, for the third time, with William Thomas, underground manager of the Grosfaen, Meredith and C. Edwards came down the drift at about 9 a.m. They found Dr. Thomas unconscious but breathing. C. Edwards was told to carry him out and Thomas proceeded a short way down the drift. He found no one, and catching up with the others he found the C. Edwards could not carry Turner. Thomas took hold of Turner on his back and carried him for about 30 yards. He was then obliged to drop him and struggle on himself. Ned Jones elated how he saw Thomas drop to his knees, crawl forward and finally stop. He was just able to crawl beyond Thomas.

By this time Evan Owen had returned with Edward Davies and others to the air bridge. He saw alight below and shouted but received no reply and went down the drift where he found all four men unconscious. Ned Jones was in front with his lamp in his teeth and his chin resting on it so the lamp was vertical and alight. The four unconscious men were brought to the pit side of the air bridge, when Owen collapsed again and all except Edward Davies were overcome but a fresh party of rescuers were able to bring all the men out. Later operations were directed to recover Dr. Turner. He was treated on the pit side of the air bridge with oxygen and artificial respiration and was taken to the bank, still unconscious, about 2.30 p.m. David Lewis and William Edwards were both dead when they were found.

During these events, the ventilation had been partly restored by brattice stoppings fixed in the openings between the intake and return air ways as far as the top of the

drift. An attempt had also been made to repair the air bridge but the leakage here was so great that the air in the drift beyond remained charged with firedamp.

About 9 a.m a message was received at the recently established Rescue Station at Aberaman asking for assistance. Mr. Morris, the Inspector, immediately set about getting the men and conveyances the 20 miles from Aberaman to the colliery by road. The teams arrived at Darran with their apparatus in a car, about 1 p.m. and two squads of men who were following got there about 2 p.m.

Messrs. Gray and Trump, H.M. Inspectors, arrived at the colliery about 1 p.m. and went down accompanied by several mining engineers and managers. They found 12 to 15 of the rescuers in a very exhausted condition between the air bridge and Shenkin's level. At this time it was known that five of the rescuers had been lost and it appeared highly improbable that any further attempt to save life, with or without rescue apparatus, could be of no avail. It was therefore considered by the Inspectors and engineers present that it would be unwise to risk further life and nothing more should be done until the air bridge had been restored and there was sufficient ventilation to clear the afterdamp. This was effected in a few hours and the bodies were recovered that night. Further examinations were made by the Inspectors of 30th. October and 1st., 2nd. and 8th. November.

Rescue attempts were also made from the Gilfach Colliery. Mr. W.T. Bowen, the manager of both collieries, Gomer Griffiths, overman, D. Morgan, fireman, D. Jones and J. McCarthy went down about 4.45 p.m. McCarthy told the what happened:-

"We walked very quickly to Darran, so quickly that Mr. Bowen felt tired when he arrived there. The door between the two pits was shut. We passed a horse feeding on the first double parting (Week's). Proceeding carefully we noticed a distinct smell of powder. Bowen sat down and asked us how we felt. Morgan said he was a little dazed. Mr. Bowen asked for a drink of tea and then said, '*What about going a little further, boys?*' We started, and had gone about only 10 yards when D. Morgan, who was second, fell. Mr. Bowen went on a yard or so. We shouted and he dropped his stock and came back. Bowen, Jones and I carried Morgan back as quickly as possible, Gower Griffiths leading with his light. We had gone only 40 yards when Bowen said, '*Put him down.*' Bowen and Griffiths then dropped almost together. McCarthy and Jones ran back for help and were found by the second party almost exhausted. Bowen's stick was found 40 yards from the bodies."

The second rescue party said they heard Jones and McCarthy shouting for help and they rushed forward and saw them fall about Boot's level. they carried them back.

The last rescue party was led by Mr. Lewis Watkins, manager of Bargoed Colliery, who went down about 8 a.m. He turned all the man out of the Gilfach Pit and opening all the main doors, took the air straight to the separation doors between the Gilfach and Darran. He was not at first allowed to enter the Darran workings but soon Dr. Dan Thomas and others, the third rescue party, came through and told him that Ned Rees had been left behind. About 8.45 Watkins blocked up Gilfach return and went forward taking the air with him. They soon found Ned Rees breathing very noisily with his tongue out and quite unconscious. He was taken back to the Gilfach workings and sent out. On returning, they found a horse in Week's parting, unconscious and breathing very heavily. Mr. Watkins would not allow anyone to go into the double partings but himself and each time he went in he felt a little dazed, but soon recovered in the fresh air behind.

Watkins then worked his way gradually up to Boot's parting, taking most of the air with him, but allowing some to go into the returns. They passed a dead horse. there were no indications of cap on the lamp. A resinous smell was noticed like that of burning timber. The men were continually questioned as to their well being and on one case after a satisfactory reply, a man fell 10 yards further on. Watkins said:-

“One man fell and then I fell myself. A few yards before this I had taken a rest and felt quite well. My legs became weak and the men noticed that I was walking unsteadily.”

The party then retreated with Watkins on a stretcher. He soon recovered and returned, sending a party of seven men, followed shortly afterwards by another party of seven. The first party recovered the bodies of Bowen, Griffiths and Morgan and brought them out. Then Phil Williams and Parry went of further and had to be brought back by the second party. They were able to walk with assistance. On their return they found a horse standing in Week’s level. It had been revived by the fresh air. When this party returned, all rescue operations from Gilfach were suspended.

The Report comments:-

“These rescue operations add another to the many previous examples of the great danger of advancing in air contaminated with afterdamp. Such hasty procedure endanger not only of the lives of the explorers but may delay and derange the course of properly conducted rescue operations and it is generally more likely to result in the loss of the rescuers than of saving life.”

The men who died were-

William Brown aged 44 years.

James Weeks aged 23 years.

John Evans jnr. 18 years.

John Tovey aged 16 years.

Joseph Vincent aged 17 years.

Henry Edwards aged 17 years.

all colliers and known to be in the top of the Main drift at the time of the explosion and:-

David Edwards aged 45 years.

J. Morgan, haulier.

David Jenkins, repairer, in the Main Drift below Shenkin’s Level.

D. McCarthy aged 34 years, collier.

E. Roberts aged 35 years, repairer.

L. Morgan aged 25 years, repairer.

Ambrose Jones aged 55 years, repairer.

M. Coombes aged 46 years, repairer.

Henry Barker aged 37 years, labourer.

S. Anthony aged 18 years, labourer.

John John aged 43 years, fireman.

Evan Prosser aged 65 years, repairer in the Main Drift.

Charles Vaughan aged 36 years, labourer.

Edward Cleavey aged 33 years, collier.

William Davis aged 25 years, haulier.

J. Barawenith aged 27 years, haulier were seen in the Main Drift after the explosion.

The rescuers from Darren:-

David Lewis aged 57 years, undermanager and William Edwards aged 48 years, contractor.

The resuers from Gilfrach:-

Gomar Griffiths aged 52 years and W.T. Bowen aged 39 years, manager.

Those who escaped up the Gilfrach shaft were:-

Harry Anthony.

William Ball.

Dai Carter.

Wat Chapman.

Fred Clarke.
William Cutcliffe.
Sid Edwards.
David John Evans.
William Dardy.
George James.
David Jones, a boy.
David Jones.
George Mathews.
Dan McCarthy.
Bythan Thomas.
Sam Weeks.
William Weeks.
Sid Williams.
Nat Yeoman.

The Inspector commented:-

“In this explosion, when it was seen that the men at the top of the drift were killed and the air bridge destroyed no further advance should have been made until the ventilation was restored. The danger from the Gilfach side was increased by the restoration of the ventilation at Darran carrying the afterdamp in that direction.

It is probable that if trained rescue men with rescue apparatus had been in early attendance, the loss of the five rescuers would have been prevented and it is possible that a few more of the victims might have been brought out alive, although it is doubtful whether they would have survived.”

The inquest was held on Tuesday 9th. November at the Plas Newydd Hotel, Bargoed and lasted for two days. Several witnesses, including the general manager, could give no evidence or had formed any opinion as to the cause of the explosion.

John Evans was called and gave evidence that astonished the court. He stated that he and several others were coming up the drift from the lower workings when they were met by the pumpman who told them to hurry up as there had been fall in the upper portion of the drift that had to be cleared. They went on and when they got to a point known as Shenkin's level they were blown down and their lights extinguished by a blast. They got up as soon as they could and relit their lamps and went up the drift where they met the night fireman, Johns Evans and asked him what he had done and Johns replied that he had put four balls of powder on the stone and it had fired the dust. The fireman was badly burnt about the hands and face and had a cut over one eye. Evans, and the men with him, tried to get up the drift but they were driven back by heat and visibility was bad because of dust. They returned and made their way to another pit called Gilfach. Evans lost a son in the disaster.

Several other witnesses followed, including some of those who were in the drift with Evans but none of them reported the conversation with Johns until it was confirmed by William Bull who said he was behind Evans and heard him speak to Johnny Johns who said he had placed four balls of powder but the witness did not hear where he had placed them. Another witness, George James, was with Evans and heard a short conversation between Evans and Johns in Welsh and one sentence translated as, '*I have caused an explosion*', or words to that effect. The witness was placed under very close cross examination but he remained unshaken.

After this came the evidence from the experts with the object of refuting that any shot had been fired but on this point, their evidence completely broke down. Four of H.M. Inspectors were called and they had all made a searching examination of the explosion area after the event. They were all convinced that a charge of explosive had been placed upon the stone and it was the firing of this that caused the disaster.

No hole had been drilled in the stone and this was a clear breach of the Explosives Act, Rule 2 Sub-section B but the person who actually fired the charge was dead. The Inspectors found an unlocked powder can and seven pellets of Carbonite, one of Rippite and thirty three detonators a small distance from the stone. All the Inspectors thought that a serious breach of the Act had been committed.

In summing up, the Coroner praised the bravery of the Rescue teams and said he was pleased to hear the at Company were to establish a Rescue Brigade station at Darran. The jury heard the summing up and retired to consider their verdict. In a little over half an hour they returned the following verdict-

“That the deceased lost their lives through an explosion of coal dust caused by shot firing and that William Bowen, David Lewis, William Edwards and David Morgan lost their lives through afterdamp in an attempt at rescue.”

The representatives of the Miners' Federation commented-

“The Coroner, while welcoming the idea that a rescue station was likely to be erected in the district, went no further than saying that there must be some through test and before anything definite could be said as to their value. We agree as to the value of a test or test, but beg to submit that if there had been trained men with appliances on the spot at the colliery, the loss of life would not have been so great as it was. The explosion occurred at 4.30. the day foreman and a few others got down the pit at about 7.30.and about that time, Mr. Lewis Watkins was asked if he would send over to Aberaman, a distance of a few miles, for the necessary rescue corps. The rescue brigade eventually arrived but for some reason or other, went away without doing anything. It was 1.30 when the experts got down the Darran Pit, this was owing to the necessary repairs and at that time those who had got out earlier were found endeavouring to restore consciousness to one of the victims their efforts were not successful but, if an man is found with life in him nine hours after the explosion, it strongly presumptive evidence that this life and others also would have been saved if rescue apparatus under the control of properly trained men had been available in the first instance.

It appears very desirable to us in cases such as these, that there should be some Court apart from that of the Coroner's, whose duties should include-

- 1). The pointing out of nay breach or breaches of the Law.
- 2). Absence of such apparatus as could have usefully been employed in the rescue work.
- 3). The calling together of workmen and others who possess good local and general knowledge, and conferring with them in order that the best possible recommendations may be made with a view to the prevention of similar disasters in future.”

TARNEI. Pontardawe, Glamorganshire. 1st. November, 1909.

The Tarnei Colliery was thought to be a small drift mine about half way between Pontaedawe and Ystalyfera. At about 2 p.m. a torrent of water came rushing down the main drift which overwhelmed everything in its path. The officials tried to reach the men but could make no progress against a shoulder high surge. There were about 100 men at work in the pit at the time but only five lost their lives.

They were:-

Benjamin Griffiths aged 18 years. David Edward Rees aged 18 years, Issac Rees aged 38 years, Evan Thomas aged 19 years and Evan Harris, a boy who was missing two days after the accident and was presumed dead.

Those who were injured by the flood were:-

David T. Davies, Evan Evans, Jenkin Jenkins and Evan Roderick.

It was assumed that the water came from long abandoned workings, of which there were no records and into which the men holed.

CAPRINGTON No.4. Ayr, Scotland. 10th. December, 1909.

Collier was the property of the Caprington and Auchlochan Collieries
.10 persons

David McCabe, miner, aged 33
John Balfour, miner, aged 25
John Stewart, drawer, aged 17
Peter Dorans, waterman, aged 36
Chas. McSherry, drawer, aged 15
Jas. Menzies, drawer, aged 15
Jas. Lennon, driver, aged 17
Henry Graham, miner, aged 22
Hugh Ramsay, waterman, aged 19
Alexander Clark, drawer, aged 16

It was caused by an inrush of water in to the workings near the surface during the night

WATER HAIGH. Leeds, Yorkshire. 7th. May, 1910.

The Water Haigh Mine consisted of four pits which were in the course of being sunk to develop a new mining area. They were at Oulton about five miles south east of Leeds and were owned by Messrs. Briggs, son and Company, Limited. There were two accidents which occurred in the No.1 shaft which was 20 feet in diameter. The first ten yards were sunk through very treacherous ground where every possible precaution had to be taken with the work and the sides were secured with brickwork and concrete as the work progressed. The strata sunk through consisted of sandstones, shales and fireclays. These were dry during the sinking but later, water ran down the sides of the shaft which introduced a distinct danger as the fireclays absorb water and become much heavier.

At a depth of 69 yards, a cast iron water ring, 2 feet 6 inches wide had been embedded in hard rock in the shaft and from this to the surface, the shaft was lined with cemented brickwork. In addition, a concrete block, 40 feet square and 31 feet from the surface was formed round the shaft and supported by an iron skeleton rings and hangers backed with timber. At this point it was thought that the difficult part of the shaft had been passed.

At 109 yards sinking operations were stopped and a bricking crib was fixed two yards from the bottom and the permanent brickwork was built on this ring. When the work of lining the shaft started, the length of the shaft supported on the rings was 39 yards. The brickwork was carried on to a height of 13 yards and at the time of the first accident, 26 yards was dependent on the iron skeleton rings. It was necessary to remove the rings as the brick work progressed and this was being done at the time of the first accident. A heavy scaffold, secured by bolts into the side of the shaft, was fixed below the top of the brickwork. The men stood on this and the building materials were placed on this.

The first accident occurred at 7 a.m. on the 7th. May, 1901 when seven men, including a chargeman, W. Hellewell, went down the pit to the scaffold which had been fixed to the top of the brickwork on the previous shift. The scaffold was 19 feet 6 inches in diameter which left three inches between the edge and the side of the shaft. It was secured by eight wrought-iron bolts thrust into the brickwork. Each bolt had a breaking

strain of 20 tons. the scaffold was constructed of pitch pine balks, 8 inches square, and planks 3 inches thick and was firmly bolted and iron bond. It was calculated that it could hold 40 tons with safety.

The men who were standing on the scaffold, started to remove a skeleton iron ring and the backing timber so that the brickwork could continue. The rings were about 4 feet 6 inches apart and were 22 feet 6 inches in diameter, 3 inches wide and seven eighths of an inch thick. They were supported by iron hooks or 'hangers', the last ring was suspended from the water ring 68 yards from the surface.

By 8 a.m. the ring had been removed and the last segment was in the sinkers bucket, ready to be sent to the surface when the chargemen noticed something that made him uneasy and he told W. Macnamara to get the bucket to the surface to bring down the master sinker. When Macnamara was a few yards up the shaft he heard a loud noise followed by the shrieks from the men.

He looked down the shaft and saw that the scaffold was displace but could not see what had happened. as soon as he reached the surface, he and two other men, went down the pit and stopped just above the place where the scaffold had been fixed. The scaffold had disappeared and there was a large cavity in the side of the shaft which had caused a large fall of fireclay and brick. The men realised that something very serious had happened and immediately went to the surface.

George Silkstone, enginewright, and four other men then went right to the bottom of the pit. They thought the scaffold was there though it was buried with rock and wreckage. They saw Patrick McCarthy, one of the sinkers, jammed against the side of the shaft but could not see any of the other men. McCarthy told them that his leg was trapped and they tried to pull him out but failed. They returned to the surface for tools and Silkstone and others again went down to McCarthy but as stones and bricks were falling down the shaft, it was considered that the first priority was to take steps to protect the rescuers and McCarthy.

By this time. Mr. Hodges, the agent, had reached the colliery and took charge of the operations. He inspected the pit and decided to build a temporary scaffold. Mr. Pickering, the Inspector, arrived at the colliery was this was being completed. a descent was made and McCarthy was found to be still alive and every effort was made to release him but were had risen to his shoulders and this and the falling material made the rescue attempts to failed. He died from exhaustion in the presence of the rescue parties.

Further risk was the considered unnecessary and it was decided to make the shaft secure to recover the bodies of the other victims. This work was completed on the 15th.May, eight days after the accident. It became evident that no human effort could have saved McCarthy's life. Both his legs were jammed between the scaffold and the sides of the shaft. It took nearly seven hours of skilled work to recover the body. The scaffold weighed about three tons and there was 100 tons of debris on it.

Those who lost their lives were-
John McCafferty aged 30 years, sinker,
Patrick Gill aged 32 years, sinker,
W.G. Lancaster aged 26 years, sinker,
W. Hellewell aged 24 years, sinker,
F. Cooper aged 23 years, sinker and
Patrick McCarthy aged 27 years sinker.

All the men were buried by the debris with the exception of Cooper's who was in a cavity under the scaffold. there was no evidence as to exactly what had happened but it was thought that, when the skeleton ring was removed, the chargeman saw some weakens in the shaft and so sent Macnamara to go and get the master sinker. Just as

he was raised, a large quantity of fireclay and shale fell from the sides onto the scaffold with the result that the bolts were ripped out. The bolts at the sides held for a moment as the scaffold pivoted on them. Cooper was thrown down the shaft and the other men clung on but were knocked off by further falls.

The cause of the first slip was a smooth joint in the stratum of fireclay which had not been seen before the accident. The inspector commented on the courage and resource displayed by the colliery officials and workmen in a very trying emergency.

Work continued after the accident until on the 17th. November, 1901 there was another accident in which one man, James Plean, died from his injuries. As a result of the conduct of the rescuers in these two accidents His Majesty was pleased to award a number of Edward Medals.

WELLINGTON PIT. Whitehaven, Cumberland. 11th. May, 1911. The Wellington Pit was owned by the Whitehaven Colliery Company and was close to the sea shore in the town. There were three shafts, a coal drawing shaft 298 yards deep and 12 feet in diameter, an upcast shaft 12 feet in diameter and 204 yards deep and a water or pumping shaft 8 feet in diameter and 298 yards deep. The coal that was worked was the Main Band and was about 10 feet thick and worked by pillar and stall. A main haulage road extended from the shaft for about 4 miles due west under the sea and had a dip of about 1 inch to the yard. There were no horses in the colliery and the tubs were trailed by the workmen to the brakes or headings and from there by mechanical means to the shaft.

The ventilation was by Walkers Indestructible Fan, 24 feet in diameter which was placed near the top of the upcast shaft and usually ran at 126 revolutions per minute. The air was last measured on the 4th, May, which was seven days before the explosion on the main intake at a point near the down cast shaft and totalled 49,680 cubic feet per minute, while at the friction gear still on the main intake it was 28,000 cubic feet per minute. This was the whole of the ventilation available for three large working districts with about 200 workmen on each shift of three shifts a day. The average output of the mine was 850 tons per day.

Paraffin lamps were used at the bottom of the shaft and the lamp station for examining the safety lamps which were used exclusively in the mine, was at the bottom of the main haulage road between two and three miles from the shaft bottom. The lamps that were used were Ackroyd's and Best's Clanny Lamps with a single gauze. They were electrically locked and lighted. No shots were fired in the coal or in any of the working places but shots were fired in a stone drift in the third north district and occasionally in the main haulage road and intake. The holes were charged and fired by an overman and a permitted explosive was used and fired by an electric battery.

Under the Coal Mines Regulation Act, miners were appointed to make inspections under General Rule 38. Inspections were made on the 21st, 22nd, 23rd. and Wednesday 30th. March 1910 and reported-

"We, the undersigned, hereby certify that we examined all working places, shafts, levels, planes, return airways, bearmouth exit, and all machinery, and found all in safe working order.

John Mulholland.

John Thomas Mathers."

The workmen were transported in coal tubs by the haulage arrangement from the friction gear to the bottom of the shafts.

On the day of the explosion the night shift had gone in to change with the back shift in their working places. At about 6.30 p.m. the first set of workmen from the back shift had been raised and gone home. The second set, about 60 men, had arrived at the bottom of the shaft when they felt the air reverse and saw large clouds of dust behind

them. They went to the shaft and some of them went to inform the manager at the pit top that something serious had taken place in the workings. This was at 7.40 p.m.

The undermanager went down the pit and found that the hitchers and on-setters were not sending tubs of coal up the pit. He boisterously inquired why this was not being done. The men answered that they were uncertain what had happened when the air reversed and they had failed to get any replies from telephone calls. The phone lines extended to the friction gear from the pit bottom.

The undermanager got a workman, Daniel Benn and they went down the incline. The rest of the men left the bottom of the shaft and resumed their normal employment, sending full tubs up the shaft as if nothing had happened.

How the undermanager, Mr. Henry, and Benn spent the time from 7.45 p.m. when they left the bottom of the shaft until 10 p.m., two hours and fifteen minutes, when they were overtaken by Dr. Harris and others on the incline near the fan house is only known to themselves. They stated that they were engaged with two workmen who they discovered unconscious on the incline and had performed artificial respiration on them for more than an hour and that they had gone to examine the return at two points. It was known that the two men left the pit bottom at 7.45 p.m. and from conflicting statements it was thought that they discovered the two unconscious workmen at Benk's Turn at about 8.30 p.m. At 10 p.m. they met two workmen from the No.5 District, Weir and Kenmore, between the Benk's Turn and the fan house and they arrived at the fan house between 10 and 10.30 p.m.

It was significant that a workman they met some distance down the incline had gone up the pit, sent a message to Dr. Harris at his home and that the Doctor arrived at the fan house at the same time as Henry and Benn. Immediately below the fan house they found large volumes of smoke coming up the incline and they were prevented from making any further progress. Weir and Kenmore accompanied them and they stated that they were at work in the No.5 District at about 7.45 p.m. Weir was told by his son who was trailing, that when he was going down with a tub an unusual amount of dust was coming up the brake. Shortly afterwards, William Robertson came and told them to come out as something was wrong. All the workmen in the district, 33 in number, assembled on the level and Hugh McAllister, the deputy, went through the ventilation doors out to the incline. When he returned, he informed the men that he had found it impossible to get out that was as there was smoke coming down the incline.

He then started to lead them out through the return and after walking a considerable distance the atmosphere became so hot that they were compelled to turn back. They reached their starting point in the No. 5 level and McAllister again tried to go through the doors to the incline and failed. Two workmen wrote the following message in chalk on the ventilation door-

"Can not go any further. William O'Pray, J. Lucas."

At about 9.35 p.m. Weir suggested, that if someone would come with him, he would try to get through the smoke up the incline. Kenmore volunteered and they both started through the smoke to find that they were impeded by debris that had been blown about on the roadway. They reached the friction gear and found a smouldering fire of the right hand side and flames on the left hand side. They went further up the incline and came into fresh air. They rested for a few seconds before attempting to return. They found that this was not possible and they decided to continue up the incline where they met Benn and Henry at about 10 p.m.

It was clear that the workmen at the bottom of the No.5 and presumably the No.6 District were all right at at 9.35 p.m. when Weir and Kenmore left. There were 87 of these men. These two men passed the fire near the friction gear at about 10 p.m. and at that time, with a fresh rescue team, the fire could have been put out with little difficulty.

Henry and Benn had left the bottom of the shaft at 7.45 p.m. and it would not have taken them long to be at the scene of the fire at 8.30 p.m. but they stated that they arrived at a point three to four hundred yards from the fire at nearly 10.30 p.m.

From this time a large number of workmen and officials arrived on the scene. Mr. Steel, the manager, Mr. Blair the assistant general manager, Mr. Hanlon, the miners' agent, Mr. Mathers, the workmen's delegate. It had been impossible to penetrate the smoke and steps were taken to try to divert its course by breaking through from the intake to the return airway which ran alongside the main incline all the way from the shaft. A bulkhead of brattice cloth was put up on the outbye side of the opening made to the return and the brattice continued down the incline, making the one half of it an intake and the other the return in the hope that the smoke would pass through the opening into the return. These methods met with some success for some time and they were able to go 140 yards from where they first encountered the smoke.

One of the overmen, Thomas Graham, was very dissatisfied with the method adopted and he suggested to the undermanager, Mr. James Henry, a better plan to reach the fire. He would shut off the main intake entirely at a point above the smoke and the passage to the return and then turn the whole of the ventilation to the south back dip and then along that road to the friction gear to deal with the fire. If that failed then they could go through the old workings to the south of the friction gear and get to the Nos. 5 and 6 districts where the workmen who had not been injured by the explosions were known to have been when Weir and Kenmore left them at 9.45 p.m. It appeared that the undermanager did not find Graham's theory practicable and neither he nor Graham consulted the manager and other superior officials that were on the spot. The work was continued to try to get down the main incline until the arrival of H.M. Inspector of Mines, Mr. J.B. Atkinson who arrived between three and four o'clock and on the 12th May. He found that the heat had become very intense and fearing another explosion, the Inspector withdrew everyone from the pit. Before leaving Graham's plan was considered and rejected as impracticable. A further consultation took place in the Colliery Offices at the surface and it was decided that nothing further could be done until safety appliances and rescue apparatus arrived at the colliery.

At 11 p.m. on the 12th May, Messrs. Thorne and Littlewood arrived at the colliery with their rescue appliances and were taken down the pit to the smoke but they were unable to penetrate it for only 80 yards. They were then withdrawn and a further consultation took place in the Offices. Mr. Atkinson, Abbott and Leek, H.M. Inspectors were present as were Mr. R.W. Moore, agent for Lord Lonsdale, Mr. R. Steel, manager, Mr. Turner, manager of the William Pit and other officials. It was decided that it was too dangerous to make further attempt to reach the entombed workmen and that air-tight stoppings should be put in the intake and return airways to shut off the ventilation from the fire. There was controversy as to whether Mr. John Hanlon, the Miners' agent, was present at this meeting but Dr. Harris said that he went to the door of the office with Hanlon while the meeting was being held and they left together without taking any part in the meeting.

In accordance with the decision of the meeting airtight brick stoppings were built on the 13th. May in the intake airway and a similar stopping was built in the return airway a few days later. The workings remained sealed until the end of September 1910. There were 51 workmen in the No.3 District, 26 in the No.5 District and 59 in the No.6 District entombed in the mine.

Before the date fixed for the re-opening of the mine the Miners' Federation of Great Britain arranged to meet all the workmen and their representatives at Whitehaven. Messrs. Andrew Sharp, Thomas Cape, John Hanlon, the Miners' Agents, and the local committee together with the men who had been at work on the shift proceeding the explosion and Weir and Kenmore attended the meeting and gave their views of the colliery prior to the explosion.

The Miners' Agents and the workmen expressed a strong desire to attend the re-opening of the colliery and accompany the exploring party to find out what had caused the explosion and fire and to find the reasons why the workmen in the Nos.5 and 6 Districts were not rescued. The mine was opened on the 29th. September at 9.30 a.m. and the Federation's representatives and Messrs, J.B. Atkinson and Mr. A.H. Abbott, H.M. Inspectors of Mines, Mr. R. Steel and Mr. R.S. Blair, manager and assistant general manager, James Henry, undermanager, Mathers and Mulholland, workmen and others went down the incline in coal tubs to Benk's Turn and from there continued on foot. Everything on the incline appeared to be in a normal condition down to the new fan site. The brattice that had been put up below fan site to try to get to the fire on the days following the explosion had been taken down, the opening made to the return closed and the ventilation conducted down the incline in the usual manner.

A little distance from the fan site, the roof had fallen and after going over the top for some distance the party found that the way was complete blocked by a fall and the way to the friction gears was impassable. They went through an opening into the south back dip, about 200 yards up the incline from the friction gear. At the entrance to this opening there was evidence of a very fierce fire and the coal on the side of the opening had been coked to a depth of about 18 inches. Following the south bank dip, they arrived at an opening from the incline to the friction gear and found that the roof had fallen at this point to a great height. In the opening between the incline and the south back dip they discovered the first body, a workman who had been employed at the friction gear. There was evidence of a great explosion and a fierce fire.

Continuing down the south back dip, they crossed into the main incline below the friction gear and found that the fall that they had met before, extended a considerable distance below the friction gear. The effects of the violence of the explosion was also seen at this point. They then went inbye along the main incline and found with the exception of a small fall, no evidence that the explosion had reached anywhere near the entrance to the No.5 District. From this point onwards, they discovered the bodies of all the workmen who had been employed in the No.6 District. They all had evidently been making their way out and had been overcome by smoke or afterdamp or both.

Entering the No.5 District they discovered written on the ventilation door in chalk-
"All well at 6.30. Hugh McAllister."

Passing through the first door about 50 yards further in on the level they came to a second door bearing the following inscription-

"All well at 7.30. William Robertson."

Passing through the door they went along the No.5 level for some distance. they discovered a bunch of paper suspended from the signal wire by a piece of twine which had evidently been put there to attract attention of anyone passing. While this was being examined one of the party found the following chalked on a wooden sleeper-

"All's well in this airway at 4 o'clock, 35 men and boys. J. Moore."

On the left hand side, going inwards, at this point was the airway that took the ventilation from the No.6 District to the No.5 District, about 25 yards in this airway from the level they party found 35 bodies who were uninjured by the explosion but, in the words of the report to the Miners' Federation of Great Britain-

"Had been the victims of appalling indifference and cruel neglect of any precautionary preparations at the colliery for dealing with the after effects of an explosion or fire. We have but to express the hope that this sad and bitter experience will infuse new energy into the movement by the Federation that at every colliery some workmen and officials shall be trained in rescue work, and the use of rescue appliances."

Having found all the bodies of the men employed in the Nos. 5 and 6 Districts, the seat of the explosion was sought., It was either in the friction gear or in the no. 3 North District. It was impossible to get to the friction gate because of the large fall and it was

several days before the No. 3 District was entered and all were agreed that this was where the explosion occurred. There were large falls, hundreds of yards in length which made the task of exploring the district very difficult and dangerous. The bodies of the men engaged on the haulage road were found at or near the place where they would have been employed and all of them were badly burned. Four workmen who had been working in the stone drift to the west of the No.3 level had apparently run from their working places and were discovered on the level, burned. Several attempts were made to reach the face of the workings but they party was driven back by gas and the last bodies were recovered with the help of electric lamps.

Those who died were-

Coal hewers:-

Henry McCluskey, sen., married.

Henry McClusky jun., married.

George Smith, married.

John William Heslop, married.

William Bell, married.

Joseph Heslop, married.

Christopher Heslop, married

John Wren, married.

R. McCourt, married

James McCourt, married.

Tom McCourt, married.

James McMullen, married.

M. McCumiskey, married.

George Brannon, married.

Thm Brannon, married.

John Brannon, married.

Edward Butler, married.

William J. Kelly, married.

Joseph Reid, married.

Joseph Hutchinson, married.

Joseph Farrow, single.

James Roney, married.

Edward O'Fee, married.

Jacob Glaister, married.

A, Brocklebank, married.

Edwrad Nicholson, married.

James McGee, married.

William Henderson, married.

William Todhunter, married.

D. Branch, single.

James McGorry, married.

Thoms McGorry, married.

John McGorry, single.

William Benson, married.

Arthur Trainor, single.

James McBrain, married.

Alexander Gregg, married.

James Riley, single.

A. Corkhill, married.

Jospeh Butler, Married.

Tom Reid, married.

John Joyce, married.
Tom Joyce, married.
Joseph Fidler, married.
John Connor, married.
Patrick Connor, married.
G. McCumisky, married.
Robert Weir, single.
William O'Pray, married.
John Lucas, married.
James Moore, married.
Henry Moore, married.
A. Finn, married.
W. Walker, married.
John Harrison, married.
Henry Harrison, married.
Jonathan Usher, married.
W.J. O'Hara, married.
John Armstrong, married.
George Armstrong, married.
Ralph Walker, married.
Henry Glaver, single.
W.J. Dunn, single.
Joseph Stevenson, married.
Fred Stevenson, Married.
Jos. Vaughan, married.
John Vaughan, married.
James Taggart, married.
Edward Taggart, songle.
Robert Johnson, married.
Joseph McQuilliam, married.
Mark Fisher, married.
John Reid sen., married
Joseph Reid, married.
John Reid jun., married.
Pefer Greenan, married.
William Benson, married.
Alexander Garroway, married.
John Garroway, married.
William Elliott, married.
John McAllister, married.
Tom Kenmore, married.
William Irving.

The shift hands-
Isaac Wren, joiner, married.
High McAllister, joiner, married.
George Ritson, joiner, married.
W.H. Robertson, joiner, married.
J.T. Wren, joiner, single.
A. Tinnion, shiftsman, single.
James McCormick, shiftsman, married.
William Walker sen., shiftsman, single.
James Connor, braker, married.

James McAllister, shiftsman, single.
George Ritson jun., lamp carrier, single.
Robert Cooper, rope splicer, married.
Tom McCourt, junction hand, single.
Thomas O'Neil, junction hand, married.
Jonathan Wright, junction hand, single.
J.D. Lucas, junction hand, single.
J. McAllister, shiftsman, single.
Edward Lynn, shiftsman, single.
R. Smith, shiftsman, single.
William Walker jun., shiftsman, single.
James Irving, shiftsman, single.
William Mitchell, brake hand, single.
James Taylor, bogie hand, single.
William Wilson, bogie hand, single.
James Ferryman, lockshop, single.
Henry McAllister, brake hand, single.
James Mason, shiftsman, single.
John Mullins, bogie hand, single.
James Smith, bogie hand, single.
John Davy, brake hand, single.
James McCormick jun. lamp carrier, single.
Thomas O'Hara, bogie hand, single.
Robert Carraway, lamp carrier, single.
Jospeh O'Pray, bogie hand, single.
James Southern, bogie hand, single.
H. Rogan, lamp carrier, single.
A.D. McLaughlin, lamp carrier, single.
Mat Welsh, lamp carrier, single.
H. O.Pray, bogie hand, single.
George Boyd, bogie hand, single.
Richard Cooper, shiftsman, singl.
Isaac Welsh, tail rope attendant, single.
Benjamin Cowie, overman, married.
Johnathan Wilson, bogie hand.
Edward Denvir, single.
Joseph Henry Walker, married.
M. Mulholland, married.
Edward Tonar, single.

The drifters-

Tom McAllister sen., married,
Edward McAllister, married and
John Anderson, married.

Seventy four of the hewers were married man and 31 single, of the shiftsman 16 were married and 36 single.

The village of Kells was badly effected by the disaster. the following were residents of Kells-

John Hutchinson, married with eight children,
William Henderson, married with six children,
Hugh McAllister, married with eight children, most of whom were married,
Joseph Fidler, married with six children,

Robert McCourt, married with one child,
Thomas McCourt, married with one child,
James McCourt, married with five children, All the McCourts were brothers,
John Joyce, married with four children,
Joseph Reed, married with a grown up family,
Thomas O'Hara, single,
James Ferryman, single,
Joseph Farner, single and
Dan Branch, single, who was to have been married the following Monday.

The men who were taken out alive were-

John Weir sen, hewer,
George Kenmore, hewer,
Stephen Gregory, shiftsman
Joseph Walker, shiftsman,
Tom Douglas, shiftsman and
J. Ferryman, shiftsman.

The bodies were conveyed to the pit head and the representatives of the Miners' Federation commented-

"Never have we witnessed workmen employed in a more severe and trying task than was performed by these workmen in conveying the bodies over the falls and other impediments from the working places back to the shaft."

The examination of the pit took 23 days and the Federation called upon the services of Professor Galloway, mining engineer from Cardiff who made a detailed inspection of the No. 3 District. Mr. R.A.S. Redmayne, H.M. Chief Inspector of Mines visited the workings as did all representatives in the interested parties.

The disaster had taken the lives of 147 men and boys and the inquest and inquiry under Section 45 of the Coal Mines Regulation Act 1887 was opened at the Town Hall, Whitehaven on the 15th. November 1910 before Edward Atter, the coroner for West Cumberland. The inquiry lasted for eleven day and 45 witnesses were examined.

John Bramon, the lampman gave out the lamps to the men but if the lamp was not available then a spare lamp was given out. On this occasion eight spare lamps were given out with put any record being made as to whom they were given. This omission did not help the proper identification of the bodies and the Federation stated that they were in favour of a complete record being held in a book at the surface. Professor Galloway gave extensive evidence of his evidence of his inspection as to the cause of the disaster.

The verdict of the inquest took the form of questions that were put to the jury by the Coroner and their replies.

"1). Were the 131 bodies of the men and boys who are specified upon the attached list marked A, those of the workmen who went down the Wellington Pit, Whitehaven, on the last shift on the 11th. May last, and which bodies have since been recovered and identified, and are now the subject of inquest? The answer was 'Yes'.

2). Were the three bodies which were respectively discovered in the Wellington Pit at Whitehaven, on September 29th and 30th. and October 13th. last, and have not since been identified, those of the workmen who were in the pit on the 11th. May last, and subsequently died there?. The answer was 'Yes'.

3). What was the cause of death of those 134 bodies? The answer was, 'An explosion or explosions'.

4). When did such and explosion or explosions take place? Answer, 'may 11th. 1910'.

- 5). At what part of the pit did such an explosion or explosions take place? Answer, 'No.3 North'.
- 6). Did all the deaths occur in the Wellington Pit and after the 11th. May last, and prior to the 13th. May last? Answer, 'Yes'.
- 7). Was the closing of the pit on the 13th. May last an expedient and rightful act? Answer 'Yes'.
- 8). Could any and if any what other means have been adopted when the occurrence had happened to get into the workings past the friction gear to recover the workmen who were in the pit? Answer, 'None'.
- 9). Was or where there any person or persons in any way negligent or responsible for all or any of the deaths, and if any person or persons was or were so negligent or responsible, who was or were such person or persons and in what way was such negligence or responsibility occasioned? Answer, 'None'.
- 10). If the deaths were occasioned by an explosion, was such attributable to non-observance of any statutory obligation? Answer, 'No proof'.
- 11). Was due and sufficient care and all responsible precaution taken for the due safety of the workmen in the 3rd, 5th and 6th. North districts, especially as regards preventing workmen from working in places where gas was the known top to be present by maintaining the airways of intakes and returns in proper conditions and by keeping all the working places supplied with a quantity of air adequate to render them safe and proper to work in and to render harmless all noxious gasses? Answer, 'Yes'.
- 12). Are there any recommendations to be made with respect to the future working of the Wellington Pit or other like coal pits? Answer, 'Yes'."

The following recommendations were made-

- "1). That there should be a register properly kept of all the names of the workmen who descend the pit at the different shifts.
- 2). That there should be a book kept specially and entries made in it containing records of the particulars such as the dates and times and when the names of the workmen and working places where withdrawals and by whose orders and for how long the withdrawals continued and the cause of the withdrawal and that the entries of all gas found should be recorded in the book.
- 3). That there should be a report book for the statutory inspections of the pit workings report below ground and to be accessible for the inspection of the workmen.
- 4). That the findings of gas in the working places by the officials should be more generally noted and reported in writing by them.
- 5). That the ventilation of the mine be made more adequate.
- 6). That a system of watering the main roadways by means of a spray be brought into operations
- 7). That a special rule be made that no lighted lamps be allowed to be placed on the ground of the working place whilst the getting of coal is being proceeded with.
- 8). That the workmen on being given their workings lamps should be supplied with a tally having the number upon it corresponding with that of the lamp.
- 9). That the doors on the return airways should have special keys provided for the opening of the doors by the return side of the airway.
- 10). That at every pit there should be a company of men trained for rescue and ambulance work with the necessary appliances.
- 11). That a strict observance of the special rules by all workmen and officials should be enforced."

HUNTERS HILL. Lanark, Lanarkshire. 13th. September, 1910.

This was sandstone mine which was owned by Thomas Gibb and Sons, Limited and the accident caused the deaths of four quarry men and a labourer and injured two other workmen. The owners had worked the mine for about 13 years and records showed that it had been worked since 1854 by the methods employed at the time of the accident and they thought they had a safe working practice.

A bed of sandstone in the coal measures about 40 feet thick was being extracted by 'stoop and room' working. The stoops that were left were about 30 feet square and the rooms about 40 to 50 feet wide. The stoops were not removed. There were vertical joints in the stone which ran N.E. or S.W., parallel to each other and from 30 to 50 feet apart. These had a considerable influence on the working of the rooms as it was usual to have one of these joints at each side of them to help the getting of the stone in as large blocks as possible.

The process of extracting the stone was as follows. A place about 5 feet high was driven in the inferior sandstone, above the bed of the stone, a distance of about 40 to 50 feet according to how far the joints were apart. While this was being done, the roof was supported by props about 12 inches in diameter which were withdrawn by being blown out by explosive. The roof was carefully examined and dressed down to hard stone about 3 to 5 feet up, so that the total height when all the stone was taken was about 50 feet. A slice of stone, or bench, was then taken down to the floor of the mine and 15 feet wide. The process was repeated until the whole of the stone uncovered by the first process was extracted.

After the props were withdrawn in the first instance the roof was not supported in any way, the strength of the stone being relied on to prevent falls. All had gone well and there had been few accidents at the mine. There had been small falls but no one had been hurt.

At the time of the accident a large area of roof had been undermined, ready to take a slice or breast off the stone down from the top of the seam. The props supporting the roof had been taken down and a bench started which was 33.5 feet from the floor. Four men were working on the bench in charge of a foreman and five others were working on the floor of the room below driving a steam crane and filling stone into boxes. Suddenly the roof over a large area collapsed without the slightest warning and buried the seven men and smashing the jib of the crane.

The crane driver and one of the men who was not injured went to get help. The injured men were released as soon as possible and the bodies of the men killed recovered.

Those who died were-

Patrick Armstrong aged 41 years, quarryman,
John Bradley aged 40 years, quarryman,
Andrew Raeburn Gibson aged 35, quarryman,
Alexander McDonald aged 33 years, quarryman and
Allan Gibson McDougall aged 38 years, labourer.

The foreman had a miraculous escape. as the stone fell over him, one end caught the top of the bench and was prevented from falling on him. The area of stone that fell was roughly 60 feet by 40 feet and varied from 3 feet 9 inches thick where it joined the stone and trailed to a feather edge where it was free. There were joints on three sides of it and over a large area it fell from a slippery clay parting which was the main cause of the accident and could not be seen before the stone fell.

Mr. W. Walker, the Inspector, thought that too great an area of roof had been left for safe working and that the management of the mine were guilty of a lack of judgement rather than carelessness. He suggested that in future that the rooms should not exceed

30 feet and the roof should always be supported by timber, girders, or railway to tram rails with timber placed at right angles between them. The owners came to the conclusion that the mine could not be worked profitably if the roof had to be supported and in consequence gave up the lease and it was not worked after the date of the accident.

HATTONRIGG. Lanarkshire, Scotland. 19th. January, 1910.

The colliery was the property of the Summerlee Iron Company Limited. The men were being raised to the surface at the end of the shift and the engineman failed to stop the cage at the proper place. It was overwound with the result that the cap of the rope broke and caused the cage to fall 192 fathoms down the shaft.

Those who died were:-

Joseph Olankis, miner aged 25 years.

Andrew Higgins, miner aged 35 years.

Andrew Wilson, miner aged 24 years.

Wm. Chappis, drawer aged 30 years.

Edward McConville, drawer aged 19 years.

Jas. Bruzinski, drawer aged 24 years.

George Alenskis, drawer aged 28 years.

HULTON No. 3. Pretoria Pit. Atherton, Lancashire. 21st. December, 1910.

The Hulton colliery was owned by the Hulton Colliery Company and was close to Atherton about 11 miles to the west of Manchester and comprised four different and distinct collieries. There were seven coal drawing shafts and prior to the accident about 2,400 tons of coal a day were raised. The colliery employed 2,400 people above and below ground.

The pit was commonly called the Pretoria and was one of the groups of shafts. The Nos. 3 and 4 shafts were sunk in 1900 and 1901 and were 18 feet in diameter and about 75 yards apart. The No.4 was the downcast and No.3 the upcast shaft. Both shafts were sunk to the Arley Mine which lay 434 yards from the surface. There were five seams worked from the two shafts, the Trencherbone at 146 yards which was 3 feet 6 inches thick, the Plodder at 274 yards which was 2 feet thick, the Yard at 306 yards with intervening parting of about 18 inches was 3 feet 11 inches thick, the Three-Quarter at 361 yards which was 1 foot 5 inches to 1 foot 6 inches thick and the Arley at 434 yards which was 2 feet 11 inches thick. The general dip of the seams was to the south at an average inclination of 1 in 5.5.

A large fault cut through the minerals worked from the Nos 3 and 4 (Bank Pit) shafts, east and west and another almost at right angles to the same made it necessary for an arrangement of cross-measure drifts and coal roads which allowed the three seams to be worked from one level in the No.3 shaft. These three seams were the Plodder, Three-Quarters and the Yard seams. It was on this level that the explosion occurred. The workings at this level were divided into five which were known as the North Plodder, the Three-Quarters, the Top Yard (or Up Brow) and the bottom Yard (or Down Brow) and the South Plodder. These were further divided into the north Plodder No.1 and 2 faces. The North Plodder old workings were not worked, the Three Quarters, The top Yard, the South Plodder, with the South Plodder old workings not being worked and the Bottom Yard, East Jig District and the Down Brow District. The most extensive workings were the Top and Bottom Yard and the other districts were workings in smaller seams below the Yard and connected to it by drifts.

Of these smaller districts, there were two rise workings, the North and South Plodder Districts. The Three-Quarters was a small dip district which employed a few men but the North Plodder, the highest district in the No.3 Pit employed 70 men. The coal in all these districts was worked on the longwall system and the total number of persons working in the No.3 Pit on the day of the explosion was 344 and 545 in the No.4 pit. Of those in the No.3 Pit 230 were in the Yard Mine, 90 in the Plodder mine and 24 in the Three-Quarter mine. In the No.4 District there were 109 in the Trencherbone Mine, 306 in the Arley mine and 130 in the Three-Quarters Mines.

The coal from the larger area of the Three-Quarter mine was brought to the Arley Mine level and was drawn to the surface at the No.4 shaft. From a mouthing in the No.3 shaft at the Yard Mine level, the coal from the Yard, Plodder and the small area of the Three-Quarter was raised. The Trencherbone coal was raised from a mouthing in that seam in the No.4 shaft.

There was a large Sirocco fan, 8 feet 2 inches in diameter, with a double inlet capable of exhausting 300,000 cubic feet of air per minute at 3 inch water gauge, was fixed at the surface of the upcast shaft. This fan was electrically driven and was used as a standby and was worked at the weekends when the underground fans were being overhauled or when there was something wrong with these underground fans. The speed of the fan could be varied only by changing the pulley on the motor which drove it which was an induction motor which ran at a fixed speed.

The mines were under the general control of Mr. Tonge who was also the agent and lived at the colliery and acted as manager but he did not go underground everyday. Under him there was an undermanager for each mine. Mr. Rushton who was killed in the explosion, was the undermanager for the Nos.3 and 4 Pits and held a first class certificate. He went down the mine every day at 6.45 a.m and came up for his breakfast at 10.30 a.m. which he had in the pit office and went down again between 11 and 11.15 a.m. He finally came to the surface about 3.15 p.m. Under Mr. Rushton there were foreman. The general manager saw his undermanagers but he did not see them every day. Of the 11 firemen in the Yard seam where the explosion occurred, six were in the day shift, four in the night shift and one in the afternoon shift. There were 344 in the pit at one time and six firemen.

As the mine was a 'single shaft pit' as regards coal getting and winding, the coal getting shift started to descend at 6.45 a.m. and began to be wound up at 2.45 p.m. The repairing and mechanical coal cutting shift which carried out work in the North Plodder only, was from 10.30 to 6 30 a.m. and comprised about 150 persons.

When the present manager, Mr. Alfred Joseph Tonge, came to the colliery it was ventilated by two furnaces and steam jets and shortly after his appointment, the change to the fans was made. Mr. Tonge said in evidence-

"Our seams, are generally speaking, very thin, and we required a fairly high water gauge. The fan that we put in first was put in to work between four and five inches of water gauge to give us the required amount of air. We found after starting it up that we were only getting one half of the air underground that we were getting through the fan."

This pointed to a great deal of leakage underground. This was detailed in evidence that at the Deep Arley pit and the actual amount of air that was coursing through the workings was about half that produced at the fan and at the Chequerbent Pits the amount was reduced to twenty five percent.

The ventilation of the workings in the Nos. 3 and 4 pits was done by four electrically driven Sirocco fan underground, three were exhausting and one was a forcing fan. These fans were placed in the Arley mine, the Three-Quarters, the Yard Mine and the fourth in the Trencherbone. The forcing fan was used in the No.3 Pit workings and this means of ventilation was used due to the fact that the coal was brought up the shaft at the Yard seam level and wound up the upcast shaft. If an exhausting fan had been

used it would have placed an obstruction in the mouthing and impeded with the drawing of the coal. The fan was placed close to the downcast shaft and sucked the air from there and forced it round the workings.

The air crossings in the No.3 Pit were built of brick with wooden tops laid on girders, the main road stoppings were substantially constricted of stone packing and faced with brick and the regulators were properly constructed with sliding wooden doors. The ventilation measurements were made every calendar month and recorded in the official book but the place where they were taken were not recorded.

The type of lamp that was used in the mine was the Wolf Safety Lamp and not other lamps except the electric lamps at the bottom of the shaft were used. They burned naphtha, a mineral oil with a low flash pint and were locked magnetically.

The coal was hauled by endless rope haulage which was powered by an electric motor. Where the coal was worked to the rise, it was jiggered down from the face to the cross roads or main roads. No horses or ponies were employed in the mine. All the main haulage roads of the No.3 mine, with the exception of the Down Brow Yards seam were in the return airways. This was an important factor in the explosion and was dealt with at the inquiry.

There was mechanical coal cutting in the Nos. 1 and 2 faces of the North plodder. The cutters were of the bar type and electrically driven. All the cutting was carried out on the night shift and the breaking down and filling of the coal was done during the morning shift when the conveyor which was also electrically driven was used. The conveyor at the face of No.2 North Plodder was a bogey which was hauled along the face by hand. The Gibb type conveyor was on the No.1 face and was electrically driven.

There was a large electric power plant between Nos. 3 and 4 shafts which served all the mines in the group. It generated three phase current at 2,500 volts and the exhaust steam from the winding engine was used to drive the turbines which drove the generator. The current at the No.3 and 4 pits was taken down the shaft at a voltage of 465. There were two separate cables down the No.4 shaft and two cables down the No.3 shaft to the Yard Seam. There were other cables in the shaft which carried current to the Trencherbone and the Arley seams.

Electricity was used in the Yard seam level at the shaft siding near the downcast shaft and in two of the five main districts. The Bottom Yard had two electric pumps and the North Plodder had haulage and cutters as well as conveyors. There was also a motor in the course of erection in the South Plodder section. It had not worked up to the explosion and the cable to it was not live. After the explosion it was found the several motors had been running at the time and the bulk of the coal had been cut during the night but the conveyor was working when the coal getting shift was at work.

For several years the coal had been got without shot firing. Where great force was required to get the coal down, a hydraulic wedge was used and the only blasting in the mine had been for ripping and tunnelling. The ripping shots were fired in the metal above and below the seams and the tunnelling shots fired in rock, not coal. The blasting was done in the afternoon when the coal getting shift had gone. Firemen were the only one authorised to fire shots and three firemen came down in the morning on the coal getting shift and three hours later fired the shots two hours after the coal getting shift had gone out. A record of shots fired was kept and the explosive used was ammonite which was detonated electrically.

There was no regular system of reporting from the undermanagers to the manager. The day shift fireman went down with the morning shift but did not make the statutory examination under General Rule 4. This was done by the night shift firemen. All the seams at the colliery gave off firedamp. The Yard seam particularly in the area known as the Top Yard was particularly gaseous especially when it approached the fault the traversed the mine from east to west and gas was not uncommon in the Plodder seam.

On the morning of the explosion and for some days previous to that Richard Wild and his two sons were working at a fall at the top of the intake to the No.2 face to make the inlet larger. The cutter had never cut across the face to the end. Alfred Teasdale, a dataller who had been working in the place on the afternoon before the explosion said that the fall took place on the Sunday night of the week before the disaster. He had been working under it the night before and seen that the roof was very bad. In all probability there was gas coming off from this weighting.

The explosion occurred at 7.50 a.m on Wednesday morning of the 21st. December when Mr. Tonge was in his house. He handed a written account of his narrative to the inquiry as evidence. It read-

“I was in my house and heard the report about ten minutes to eight and was informed shortly after that there had been an explosion. When I got to the pit, I found smoke coming from the upcast shaft. I saw that a portion of the casing of the upcast shaft had been wrecked. I went forward to the downcast shaft and was informed by the mechanical engineer that one of the cages was fast in the shaft as a result of the explosion. There was no damage to the engine and as the No. 3 shaft was out of the purpose for travelling purposes, we set to work to liberate the cage in the downcast. Fortunately one of the cages appeared to be free, but it could not be brought up because the other cage was fast. We had to disconnect the rope from the cage that was fast from the drum and after that the free cage was brought to the surface. I got to the pit about ten minutes past eight and the cage was free about nine o'clock.”

When we got the cage working took five men in the signal cage and went quietly down calling at the Trencherbone mine. Llewlyn Williams the undermanager of the Trencherbone mine was at the mouthing and I asked if all the men were all right there. He said, ‘Yes’. They had suffered from fumes but everything was clear. I took him with me in the cage and we went further down. On our way down we encountered obstacles in the shaft, broken signal wires and bearers, and we were in considerable alarm as to whether the cage was going to stick or not. But it kept freeing itself and broke through all the obstacles. We got to the Yard mouthing and, on going in, saw the underground fan blown inwards towards the downcast pit. Going forward through the electric haulage house, which was the main route to the upcast shaft bottom, we found great wreckage and got through into the No.3 pit bottom shunts where we found a boy. There was afterdamp and it was hot but we went forward. We picked up the boy and sent him back up the pit. Going forward we found Byres struggling, and we carried him to the cage. I looked about and found more dead bodies lying about, and then we decided to go down and see how the men in the Arley were. We first took the injured men up to the top and then set out immediately to go to the Arley mine. Having passed the Yard mine, I heard a shout, ‘Send the cage to the Yard mouthing’ which was repeated mechanically over and over again. We had been at the Yard mouthing and I could not understand it, but I remembered that it would be the other Yard mouthing and we found the source of the noise. It was a lad from the workshops, Staveley. We got him out and lifted him up and asked him what he had been doing and were there any more. He said that here was a lad close to him, dead. We took him to the top and then went down into the Arley mine again having difficulty as the cage kept sticking and freeing itself. We called to the Three-Quarters mouthing in the shaft, which was not used, instead of going down the tunnel and getting to the Arley mouthing. We asked if they were all right and they replied that they were and wanted to go up. I said there were others in a worse position than they, and they must be patient

When we got to the Arley, we found regular pandemonium. Men were crying to come up, they were ill with the fumes. Men were their comrades arms about.

Some were worse affected than others and the undermanager, John Bullough was amongst them calling upon them to be men and doing what he could. Do as we could not get quietness. I shouted to those round about, 'Put those men who are ill in the cage, and the strong keep back!'. I was afraid of a panic and that the men would rush the cage and seize ropes or anything, but fortunately they did not. The men who were ill were put in the cage and taken to the top. I went with the came back to the Yard taking others with me and sent the cage to the Arley to fetch another load. The Arley and the Trencherbone men were all got out safely and we soon had a fair number of the men down in the Arley rescuing.

Six of the Trencherbone men who had been in the cage at the Trencherbone mouthing when the explosion occurred, were raised to the surface after the suffering Arley men and the other Trencherbone men were all got out last. It was all done with one cage, signalling by knocking on the cage, as the proper signalling apparatus had broken down. There was no mishap whatsoever in getting the whole of the 545 men out and we had them all out in three and a half hours.

After getting down into the Arley Mine again, I took a few men and went on the East level, where we found a fire at an air crossing. I left instructions for the fire to be put out and went forward with two men to the down brow. I also instructed Turton and Scott, two reliable men, to proceed a short distance to the Plodder tunnel to see if there were any fires, and if so, to report. I then went forward down the down brow and at the bend of the brow, after calling out, heard a man respond. The man was able to give his name as Devonport. I gave him a drink and sent a man back for the doctor and a stretcher. Doctors Lee and Russell had come down with us in the cage. Devonport was carried out on the stretcher and taken to the surface. As the falls were so bad further on in the down brow, I decided to return to the pit, and it was there reported to me by Messrs. Turton and Stott that they had found a fire but had not been able to put it out. I asked them to return to it to do so but to be very careful of the fumes. I returned to the air crossing on the East level where the men were engaged in putting out a fire. By this time Mr. Gerrard, H.M. Inspector of Mines and several mining engineers had arrived at the spot. It was decided to restore the air crossing. At about this time news was brought to me that Turton, the fireman who had been sent to put out the fire had been overcome by fumes. We did what was possible for him and he was sent to the surface. The next operation was the restoration of the air crossing over the No.1 East North Plodder, Top Yard, and Three-Quarters districts. After restoring this, the air crossing over the North Plodder Jig was restored. The only ventilation that was being effected in the mines was the natural ventilation combined with a little assisted ventilation, due to the continuous running of the Trencherbone fan, all the rest of the fans had been put out of action by the force of the explosion. The stand-by surface fan was intact, but the casing at the pit top was damaged and had to be put right. This was completed early and the surface fan was ready to run in nine and a half hours after the accident. After restoring the air-crossing in the north Plodder Jig which gave the ventilation a chance to get into three important districts, I went along with the Inspectors and other engineers to consult with a Consultative Committee on the surface. It was decided not to put the fan into operation as there was still some doubt as to whether there was any fire in the mine. Returning down the mine, we again went into the down brow and fixed a tight cloth stopping in the brow with a view to forcing the air into the down brow workings. The finishing touches to this operation were affected by the men with 'rescue' apparatus. Shortly after this, Mr. Gerrard, himself, and a few others decided to make an inspection of the Three-Quarters mine thinking it possible that a few of these men, being near the shaft, might be still living, and that it was possible to bring them relief. We went in at the intake end and were able to get

into the workings and out by the haulage road to the pit, having found a dozen bodies and having been convinced that there was no one left alive in the mine. Shortly after this we returned to the surface and it was decided to start the surface fan. The fan was actually started at five minutes past six and after allowing it to have about half an hour's run we descended the mine again."

Sergeant-Major Hill who was in charge of the Howe Bridge Rescue Station heard of the disaster by telephone at 8.05 a.m. and he at once sent for a car to the motor garage at Leigh. This arrived at 8.17 a.m. and arrived at the colliery with the rescue apparatus at 8.25 a.m. and reported to Mr. Tonge at 8.45 a.m. The colliery had a trained rescue team that could use rescue apparatus but of these five, one was killed in the explosion was off sick and two were in the Arley Mine leaving John Hunt as the only available trained man at the colliery. He was at home at the time of the disaster but went to the colliery and arrived at 8.55 a.m. At about 9 a.m. Mr. Clement Fletcher, of Fletcher Borrows and Company Collieries, who was a qualified rescue man, arrived with two others from the colliery. They at once put on the apparatus and went down at 9.20 a.m. These men were used to put out the fires, first the fire in the haulage engine house near the No.4 downcast shaft and the one near the main air crossing, east of the No.4 shaft. While they were doing this, two members of the party were called away to fetch William Turton out from where he and Stott were fighting the fire at the top of the South Plodder tunnel. Afterwards Turton was found to be dead.

By this time there were 40 men with breathing apparatus at the pit and 148 trained men in the mine and there was later criticism that there were no rescue men sent to the fire in which Turton lost his life. A room was provided for Sergeant-Major Hill and J.G. Huskinson, his deputy and Dr. Arnold Green gave medical help. Mr. Arthur Ellis, the secretary of the Rescue Committee and Mr. Charles Pilkington the Chairman were constantly at the colliery. It was arranged that squads of rescue men should not be underground for more than two hours at a time but this was difficult due to the difficulties with the cage.

Of the 145 persons who went down the mine only two survive and the total death toll was 344.

Those recovered on the 21st. December 1910-

Richard Clayton of Church Street, Westhoughton, who was married with three children the youngest of which was 19 years of age,
John Livesley aged 15 years of 356, Park Road, Westhoughton,
William Turton, of 683, Manchester Road, Westhoughton, a married man with eight children. the youngest of which was aged 15 years,
William Green aged 14 years of 6, Bowden Street, Daubhill, Bolton,
Simeon Gibson aged 17 years of 13 Warrish Lane, Westhoughton and
Richard Tonge aged 14 years of 3, George Street, Westhoughton.

Those recovered on the 23rd. December 1910-

William Partington aged 40 years, of 10, Gladstone Terrace, Westhoughton,
Edward Rushton aged 32 years of, 50, Cecil Street, Walkden. Married with no children,
Mark Critchley aged 22 years of 9, Park Street, Westhoughton,
Fred Stanley Houghton aged 13 years of Chequerbent, Westhoughton,
Denis Doxey (Dorcey). aged 14 years of 14, Church Street, Westhoughton,
Peter Moss aged 18 years of 14, Wesley Street, Atherton,
Cyril Cathel aged 15 years of 41, Bella Street, Daubhill, Bolton,
Fred Lee of 310, Bolton Road, Westhoughton, who was married with two children aged 8 and 2 years,
William Naylor aged 16 years of 15, Waters Nook, Westhoughton,
Elias Houghton of 25, Manchester Road Chequerbent, Westhoughton

John Thomas Houghton aged 44 years of 26, Wingates Square, Westhoughton, a widower with no children
Thomas Houghton. aged 17 years of Manchester Road, Chequerbent, Westhoughton
James Partington aged 40 years of 10, Gladstone Terrace, Westhoughton
Thomas W. Molyneux aged 26 years of 366, Leigh Road, Westhoughton, married with three children aged 6, 2 and 11 weeks
Thomas Partington aged 17 years of Manchester Road, Chequerbent, Westhoughton
Harry Partington aged 19 years of 35, Dobbs Brow, Westhoughton
William Southern aged 29 years of 14, King Street, Westhoughton
John Roberts aged 24 years of 4, Waters Nook, Westhoughton, married with three children aged 5, 2, and 5 months
Joseph Topping aged 23 years of 9, Randall Street, Daubhill, Bolton
Sam Hardman aged 19 years of 16, Bolton Road, Westhoughton
Stephen Hulme aged 24 years of 383, St. Helens Road, Daubhill, Bolton, married with two children aged 4 and 10 months
Anthony Doxey aged 16 years of 628, Manchester Road, Chequerbent, Westhoughton
William A. Bond aged 28 years of 48, Wigan Road, Westhoughton, married with three children aged 8, 6 and 4 years
Thomas Greenalgh of 75, Park Road, Westhoughton, married with two children
Richard Sharples aged 33 years of 8, Hulton Lane, Chequerbent, Westhoughton
Robert Whittaker
Fred Hayes of 267, Park Road, Westhoughton married with two children aged 13 and 8 years
John Austin (Anotha) of 238, Park Road, Chequerbent, Westhoughton, married with four children aged 10, 8, 7 and 3 and one (No.9), not named.

Those recovered on 24th December, 1910.

Job ??? of 50, Derby Street, Westhoughton, married with an 11 year old child
Joseph Morris aged 29 years of 31, King Street, Westhoughton, married with one child 12 months old
Alfred Edward Woods aged 15 years of 15, George Street, Westhoughton
Orlando Gerrard aged 21 years, of 170, Church Street, Westhoughton
Walter Woodward of 487, Leigh Road, married with five children aged 10, 8, 6, 3 and 8 months
James Farrimond aged 15 yers of 13, Bolton Road, Westhoughton
James Potter aged 15 years of 169, Hindley Road, Westhoughton
John Robert Hargreaves aged 27 years of 6, Hilton Street, Atherton, married with two children 24 an 11
Thomas Tyldesley aged 17 years of 12, Chorley Road, Westhoughton
Thomas Gill aged 22 years of 47, Kersley Street, Westhoughton.
George Henry Perks aged 19 years of 208, Leigh Road, Westhoughton
Edward Hollingsworth of Daisy Hill, Westhoughton. Married with five children aged 10, 8, 6, 4 and 8 months,
Ambrose Coffey of 223, Leigh Road, Westhoughton who was married with two children aged 10 years and 12 months,
William Goulding aged 38 years of 25, Mill Street, Westhoughton, married with three children aged 12, 10 and 12 months,
James Lovert aged 28 years of 341, Manchester Road, Westhoughton,
James Higham aged 28 years of 8, Wilbram Street, Westhoughton,
Fred Dootson of Bolton Road, Westhoughton, married with two children under 14 years of age, Martin Marrin aged 31 years of 114, Bolton Road, Westhoughton,
James Morris aged 13 years of 230, Leigh Road, Westhoughton,

Albert Norman of 103, Market Street, Westhoughton, married with two children aged 12 and 10 years,
Thomas Langhua aged 23 years of 436, Wigan Road, Daubhill, Bolton,
Fred Coffey aged 30 years, of 355, Leigh Road, Westhoughton, married with two children aged 5 and 12 months,
William Hollingsworth aged 31 years, of 143, Daisy Hill, Westhoughton, married with three children aged 11, 9, and 12 months,
Fred Southworth aged 22 years of 6, Earnshaw Street, Westhoughton, married with a 12 month old child,
Charles Warton aged 38 years, 43, Alexander Steet, Daubhill, Bolton,
Peter Green of 56, Mabel Street, Westhoughton, married with three children aged 13, 5 and 3 years,
Richard Lawrence Spenser aged 28 years of 62, Church Street, Westhoughton, married with three children under six years of age,
Thomas Yates aged 30 years, of 14, Chorley Road, Westhoughton,
James Berry jnr., aged 21 years of 202, Manchester Road, Westhoughton,
Thomas Dunn of 11, Market Street, Westhoughton, married with no children,
Arthur Chetwynd of 180, Bolton Road, Westhoughton, married with one child,
John Houghton of Manchester Road, Westhoughton, married with four children aged 19, 10, 8 and 4 years,
Joseph Miller aged 31 years, of 115, Manchester Road, Westhoughton,
William Ashton aged 22 years of 8, Eckersley Street, Daubhill, Bolton, married with four children,
Mark Skeldon aged 28 years of 298, Seddon Street, married with a two year old child,
Richard Thomasson aged 51 years, of 33, Beaumont Road, Daubhill, Bolton,
James Hilton aged 25 years of 637, Manchester Road, Chequerbent, Westhoughton, single,
John Baxter snr., aged 58 years of 8, Earnshaw Street, Daubhill, Bolton, married with no children,,
Baxter aged 32 years, 501, Manchester Road, Westhoughton, married with two children,
Adam Bullough aged 38 years of 44, Wigan Road, Atherton,
Paul Thomasson aged 45 years of 457, St.Helens Road, Daubhill, Bolton, married with three children, one who was married and the others aged 19 and 13,
William Rigby aged 34 years, of The Valley, Atherton, married with no children,
George Williams of 14, The Valley, Atherton, married with two children,
Henry Dootson aged 24 years of 163, Bolton Road, Westhoughton, married with two children aged 4 and 7 months,
David Grundy of 380, Manchester Road East, Little Hulton, married with no children,
Joseph Scoble,
Daniel Simmonds aged 21 years of 316, Park Road, Westhoughton,
John Boardman aged 28 years of 280, Bolton Road, Westhoughton, married with two children aged 7 and 12 months,
William Smith aged 30 years of 148, Bolton Road, Westhoughton married with a three month old child,
Thomas Greenalgh,
James Edward Wittington aged 13 years of 3, Wood Street, Westhoughton,
William Potter. aged 39 years, 169, Hindley Road, Westhoughton, 12, 11 and 11 months,
Sam Farrimond of 132, Bolton Road, Westhoughton, married with three children aged 12, 11 and 7 years,
Peter Leigh of 2, Howarth Street, Westhoughton, married with a 14 year old child,
George Potter aged 16 years of 169, Hindley Road, Westhoughton,

James Smith of 43, Rosemary Lane, Middle Hulton, a widower with no children, Walter Aspden of 28, Hindley Road, Westhoughton, married with no children, Edward Haynes, married with three children aged 5, 2 and 3 months, William Shambley aged 28 years of 30, Mabel Street Westhoughton, Dan Thomas aged 34 years of 11, Waters Nook, Westhoughton, married with two children aged 11, and 10 years, John Edward Tumbelty aged 20 years of 54, Hindley Road, Westhoughton, John Rushton aged 32 years of 50, Cecil Street, Walkden, married with no children, Enoch Arthur Bates aged 23 years of 29, Brackner Street, Westhoughton, married with a 7 month old child, John Flood aged 27 years c/o. Mrs Doxey, 685, Manchester Road, Westhoughton who had no relatives, Walter Leigh aged 21 years of 2, Howarth Street, Westhoughton, James Hodkiss aged 31 years of 670, Manchester Road, Westhoughton, married with a two year old child, George Sharples of 145, Chorley Road, Westhoughton, married with a 6 year old child, Herbert Vickers aged 22 years of 8, Good Ladies, Westhoughton, James Price aged 42 years c/o. Mrs. McGrath, 5, Water Street, Atherton, Harry Bennett, Edward H. Green aged 35 years of Market Street, Westhoughton, John Coffey aged 28 years of 33, Wingates, Westhoughton, married with an 18 month old child, Edward Mather aged 36 years, of 10, Mabel street, Westhoughton, married with five children aged 9, 8, 7, 3 and 12 months, J. Thomas Aspden, aged 28 years of Hindley Road, Westhoughton. Married with no children, Thomas Howcroft of 489, Wigna Road, Westhoughton, married with no children, Nicholas Hartley, Albert Smith aged 26 years of 437, St.Helens Road, Westhoughton, single, Thomas Bennett, aged 17 years of 23, Bolton Road, Westhoughton, William Kay of 8, Albion Street, Wingates, Westhoughton, married with two children aged 3 and 12 months, William Hayes of 4, Leigh Common Lane, Westhoughton, married with two children aged 2 and 2 months, Ben White aged 20 years of 29, Water Street, Tyldesley, single, Sam Woodward aged 34 years of 17, Grundy Sreet, Westhoughton, married with four children aged 8, 7, 4 and 2 years, Sam Critchley aged 29 years, of 37, Bolton Road, Westhoughton, Richard Nelson Longmate aged 29 years of 389, St.Helens Road, Chequerbent, Westhoughton, John Prescott, William Mead aged 49 years of 42, Beaumont Road, Bolton, married with two children aged 19 and 13, William Bennett, Thomas Hurst of 4, Oswald Street, Daubhill, Bolton, married with a 17 years old child, Thomas Woodward aged 33 years of 39, Grundy Street, Westhoughton, Walter Crook aged 16 years, of 27, Hilton Street, Atherton, John Parr aged 51 years of 22, Tucker Street, Westhoughton, Thomas Hurst of 75, Chorley Road, Westhoughton, married with seven children all of whom were working, Thomas Alfred Calderbank aged 49 years, of 8, Bolton Road, Westhoughton, married with two children aged 7 and 9 years, Dan Mather aged 23 years of 6, Mill Street, Westhoughton,

James Seddon aged 21 years of 2, Wingates Lane, Westhoughton, married with a two year old child,
William Schofield aged 32 years of 345, Maypole Terrace, married with a nine year old child,
John Hundy aged 32 years of 44, St. Helens Road, Chequerbent, Westhoughton, married with one child aged 13 years,
William Brumby aged 37 years, of 19, Hector Street, Daubhill, Bolton,
Frederick Schofield aged 21 years of 343, Maypole Terrace, Chequerbent, Westhoughton, single,
William Eccleston, Joseph Darlington aged 28 years of 126, Elizabeth Street, Westhoughton, married with two children aged 7 and 5,
William Tyldesley aged 28 years of 12, Chorley Road, Westhoughton,
John Tyldesley jnr. aged 25 years of 12, Chorley Road, Westhoughton, James Eccleston aged 60 years of 34, King Street, Atherton, with a married daughter at home,
William Bellew aged 19 years of 3, Library Street, Westhoughton,
Albert Howarth aged 16 years of 278, Leigh Road, Westhoughton,
Abel Magnall aged 32 years of Manchester Road, Westhoughton, married with two children aged 2 and 3 months,
Robert Calderbank aged 23 years of 37, Park Road, Westhoughton,
Ralph Shaw aged 35 years of 33, Alexander Street, Westhoughton, married with four children aged 19, 9, 7 and 4,
David Nuttall aged 23 years of 49, Church Street, Westhoughton,
Percy Monks of 5, Peel Terrace, Westhoughton, married with four children aged 27, 24, 17 and 13,
George Tunstall of 3, Alick Fold, Westhoughton, married with six children under 13 years of age,
Sam Baxter aged 24 years of Manchester Road, Over Hulton, married with a five month old child,
Thomas Chad Faulkner of 184 Bright Street, Westhoughton, married with four children aged 6, 4, 2 and 2 weeks,
Fred Balforn of 16, Seddon Street, Westhoughton, married with one child,
James Holden aged 15 years of 240, Leigh Road, Westhoughton and seven unnamed.

Those recovered on the 25th. December 1910-

James Greenall aged 23 years, married with one child
John Monks aged 19 years of 3, Andere Street, Westhoughton
Thomas Greenall of 44, Leigh Street, Westhoughton, married with three children aged 9. 5. and 12 months
Sam Wharmby of 290, Leigh Road, Westhoughton
John Topping of 9, Randall Street, Westhoughton, married with two children and 19 and one grown up
Herbert Prescott
Israel Bennett aged 24 years, of 23, Bolton Road, Westhoughton
Joseph McCabe aged 22 years of 10, Smithy Street, Westhoughton
Walter Magnall aged 31 years of 87, Park Road, Westhoughton, married with three children 22, 18 and 12,
Ralph Croston aged 25 years of 321, Church Street, Westhoughton,
Henry Miller aged 32 years of 16a, Mosst Streetm Bolton married with two children aged 2 and 3,
William Calderbank aged 21 years of 16, Bolton Road, Westhoughton,
Richard Mather aged 49 years of 6, Mill Street, Westhoughton, married with three grown up children aged 30, 27 and 25,

James Mills aged 26 years of 12, Smithy Street, Westhoughton, married with two children aged 2 and 12 months,
Oliver (Walter) Southern aged 21 years of 316, Park Road, Westhoughton,
Royland Evans aged 33 years of 2, King Street, Westhoughton, married with four children aged 9, 7, 4 and 2 years,
Henry Whyker aged 21 years of 164, Park Road, Westhoughton,
George Tunstall of 3, Alick Fold, Westhoughton, married with six children all under 13 years of age,
Fred Hook aged 14 years of 8, Mather Street, Atherton,
Thomas Martin aged 23 years of 22, Wigan Road, Westhoughton, Thomas Hope aged 15 years of 10, Alick Fold, Westhoughton,
James Leigh, John Morris aged 36 years of 230, Leigh Road, Westhoughton, married with three children aged 9, 6 and 5 months,
Albert Unsworth aged 17 years of 42, Slaone Street, Daubhill, Bolton,
John Sanders aged 14 years of 7, Water Street, Atherton,
James Baker of 5, Henshaw Street, Westhoughton,
Jesse Chadwick aged 23 years of 20, Adelaide Street, Westhoughton, married with a two year old child,
William Gore aged 42 years of 105, Brackner Street, Chequerbent, Westhoughton, married with seven children under 13,
John Smith,
William Lees Ashcroft aged 15 years of 658, Manchester Road, Chequerbent, Westhoughton, Edward Saunders aged 19 years of 7, Water Street, Atherton,
James Edward Hewitt of 179, Wigan Road, Westhoughton, married with four children aged 22, 18, 15 and 11,
Peter Higson of 482, Wigan Road, Daubhill, Bolton married with five children aged 18, 14, 13, 9 and 4 years,
Stanley Hodgkiss, James Livesley aged 17 years of 356, Park Road, Westhoughton,
John Bradley aged 21 years of Leigh Common, Westhoughton,
Orlando Chadwick, William Bradley aged 50 years of 6, Park Road, Westhoughton, married with two children aged 12 and 7 years,
Walter Boardman aged 31 years of 282, Bolton Road, 321, Church Street, Westhoughton,
Fred Teasdale of 6, Bolton Road, Westhoughton, married,
William Morris aged 34 years, of 26, Mabel Street, Westhoughton, married with four children aged 7, 5, 2 and 8 months,
Edward Kenwright aged 28 years of 14, France Street, Westhoughton, married with two children aged 5, and 2
John Wilfred Seddon aged 20 years of 274, Park Road, Westhoughton and 4 that are unnamed.

Those who were recovered on the 26th. December 1910.

John L. Pemberton aged 21 years of 117, Bracken Street, Chequerbent, Westhoughton
H. Gibson
Richard Seddon aged 24 years of 2, Walker Street, Westhoughton
Michael Mulloy aged 26 years of 64 Park Road, Westhoughton
William Croston aged 38 yaers of 44, Chorley Road, married with a 10 week old child
Henry Doxey aged 23 years of 658, Manchester Road, Westhoughton, single
Thomas Emmett aged 18 years of 17, Park Road, Westhoughton
James Feeley of 105, Park Road, Westhoughton
John Andrew Wise aged 44 years of 9, Tithe Barn Street, Westhoughton, married with two children aged 11 and 9 years
Enoch Pemberton of 1, Silk Street, Westhoughton, married with a 12 month old child

Thomas Jolley aged 49 years of 440 Wigan Road, Westhoughton. married with seven children aged 27, 22, 19, 17, 14, 11 and 7 years,

James Unsworth aged 30 years of 449, St.Helens Road, Daubhill, Bolton, single,

Peter Duffy aged 24 years of 29, Back Moss Street, Bolton,

Thomas Horrocks aged 49 years of 76, Marer Lane Westhoughton, married with six children aged 13, 12, 10, 8, 6 and 2 months,

Robert Morris aged 43 years of 14, Howarth Street, Westhoughton, married with three children aged 21, 19 and 14,

William Unsworth aged 23 years of 194, Bolton Road, Westhoughton,

Richard Green aged 53 years of 11, Blackledge Street, Westhoughton, married with a 22 year old,

J. Thomas Dootson,

James Schofield a Widower of Daubhill with four children aged 14, 12, 10 and 7,

A. Calderbank of 42, Chew Moor Lane, Westhoughton,

Robert C. Curwen,

John Morris aged 21 years of 238, Leigh Road, Westhoughton,

Joseph G. Battersby,

Jehu Unsworth aged 43 years of 42, Sloane Street, Westhoughton. married with four children aged 20, 11, 8 and 5,

Peter Longworth aged 23 years of 156, Willow Lane, Westhoughton,

Josiah Lee aged 14 years of the Lord Napier Hotel, Bolton,

Robert Cope aged 19 years of 24, Woodhouse Street, Westhoughton,

Sam Thornley aged 25 years of 2, Church Lane, Westhoughton,

Thomas Worthington,

Lewis Hodgkiss aged 15 years of 53, Brackner Street, Chequerbent, Westhoughton,

Joseph Jones of Leigh Street, Westhoughton, married with a 17 month old child,

James Hurst of 56, Chorley Road, Westhoughton, married with eight children five of which lived at home aged 11, 10, 8, 6 and 3,

Albert Shabley aged 17 years of 30, Mabel Street, Westhoughton,

Sam Hundy aged 39 years of Church Road, Westhoughton, married with three children aged 14, 6, and 20 months,

Richard Jolly aged 25 years of 18, Seddon Street, Westhoughton, married with a 13 month old child,

James McDonald aged 27 years 6, Alice Fold, Westhoughton, married with six children,

James Partington aged 25 years of 27, Dobbs Brow, Westhoughton, married with three children aged 3, 2, and 9 months,

Matthew McCabe aged 25 years of 10, Smithy Street, Westhoughton,

Andrew Lowe aged 23 years of 15, Hurley Road, Westhoughton,

Henry Holden of 30, Bury Lane, Atherton, Ben Riding of 19 Balfern Road, Westhoughton, James Edward Hogan aged 15 years of 9, Robert Shaw Street, Westleigh,

Matthew Seddon snr. of 29, Brandswood Street, Daubhill, Bolton, married with two children aged 18 and 20 years,

Thomas Gibbs of 16, Rainhill Road, Westhoughton,

William Evans aged 26 years of 21, Burnaby Street, Westhoughton, married with two children aged 2 and 6 months, Thomas Green aged 23 years of Market Street, Westhoughton,

James Seddon of of 9, Cemetery Street, Westhoughton, married with a 2 years old child,

Robert Roberts aged 22 years 32, Seddon Street, Westhoughton,

Edward Houseman aged 15 years of 47, Brackner Street, Chequerbent, Westhoughton,

William Dawson aged 41 years of Waterloo Street, Bolton married with two children aged 8 and 2,
Fred Pemberton aged 18 years of 117, Brackner Street, Chequerbent, Westhoughton,
Fred Ratcliffe aged 21 years of 144, Park Road, Westhoughton, Henry Price,
Michael McCabe aged 20 years of 10, Smithy Street, Westhoughton,
Henry Partington,
James Clarke aged 23 years of 438, Ravenswood Terrace, Chequerbent, Westhoughton, single and one unnamed.

Those recovered on the 27th. December.

James Miller aged 50 years of 115, Manchester Road, Westhoughton,
Sam Cowburn of 18, Mabel Street, Westhoughton, a widower with a 29 year old daughter,
Matthew Seddon jnr. aged 24 years of 29, Brandwood Street, Daubhill, Bolton,
Walter Foster,
Thomas Henry Coop of 26, Leigh Road, Westhoughton, widower with three children aged 5, 2, and 5 weeks,
John Lee of the Lord Napier Hotel, Bridgeman Street, Bolton, married with four children aged 12, 7, 4 and 3 years,
Harold Pendlebury aged 15 years of 1, Croft Street, Westhoughton,
William E.G. Martland aged 17 years of 88, Brackner Street, Chequerbent, Westhoughton and
James Horrocks aged 19 years of 56, Bolton Road, Westhoughton.

Those recovered on the 28th. December.

William Doxey of 691, Manchester Road, Westhoughton, married with no children and
George Boardman aged 23 years of 22, Seddon Street, Westhoughton.

Those recovered on the 29th. December.

William Cowburn aged 42 years of 62, Croston Street, Westhoughton, married with eight children, four of which were working and the rest 9, 8, 6, and 18 months,
William Thomas aged 34 years of 11, Waters Nook, Westhoughton married with two children aged 11, and 10,
William Hesketh aged 27 years of 11, Platt Lane, Westhoughton,
Henry Blundell,
James Radcliffe,
John Higson of 7, Venice Street, Bolton, married with three children aged 15, 13 and 11 and
Thomas Smith aged 63 years of 83, Chorley Road, married with four children aged 19, 13, 11 and 10.

Those recovered on the 30th. December.

Wright Lovatt aged 15 years, 341, Manchester Road, Westhoughton,
William Riding aged 22 years of 22, Balfern Street, Westhoughton,
Thomas Owens, Sam Dootson of 5, Albion Street, Westhoughton, married with three children aged 6, 3 and 18 months,
Albert Lonsdale aged 37 years of 21 Manchester Road, Westhoughton, married with seven children aged 17, 16, 10, 5, 4, 12 months and 7 months,
George Sargent aged 28 years of 35, Dobbs Brow, married with two children aged 6 and 4.
James Seddon aged 18 years of 29, Broadwood Street, Daubhill, Bolton and
James Green aged 22 years of 211, Leigh Road, Westhoughton.

Those recovered on the 31st. December.

Fred Hindle aged 22 years of 11, France Street, Atherton, married with a 4 month old child,

Thomas Hurst aged 19 years of 4, Oswald Sreet, Westhoughton,

Richard Light of 38, Chorley Road, Westhoughton, married with six children and

James Eccleston jnr. aged 31 years of 32, Prospect Street, Tyldesley, married with four children aged 9, 5, 2 and 3 months.

Those recovered on the 1st January 1911.

2 unknown.

Those recovered on the 2nd. January 1911.

A. Roberts aged 15 years of 134, Bolton Road, Westhoughton,

William Higson of 7, Venice Street, Daubhill, Bolton,

Percy Hilton aged 25 years, of 211, Derby Street, Bolton and one unnamed.

Those recovered on the 3rd. January 1911.

John Wild aged 17 years of 53, Morris Street, Daubhill, Bolton, Albert Griffiths aged 28 years of 104, Church Street, Westhoughton, Gerald Hastie aged 19 years, c/o Mrs.

Best, Ravenswood Terrace, Chequerbent, Westhoughton,

Sam Doxey aged 25 years of 661, Manchester Road, Chequerbent, Westhoughton, married with an 18 month old child,

Thomas Hastie aged 21 years, c/o Mrs. Naylor, Ravenswood Terrace, Chequerbent, Westhoughton, Albert Hardman aged 17 years of 16, Bolton Road, Westhoughton,

Percy Woodward aged 18 years of 487, Leigh Road, Westhoughton, married with four children and one unnamed.

Those recovered on the 4th. January 1911.

Edward Clynes aged 15 years of 18, Gordon Street, Atherton,

William Wignall aged 14 years of 7, Mabel Street, Westhoughton,

John Hooker aged 16 years of 915, Atherton Road, Hindley Green,

William T. Brown aged 50 years of 6, Park Road, Westhoughton, married with three children aged 18, 12 and

7, William Anderton aged 15 years of 37, King Street, Westhoughton, William Ratcliffe and 2 unnamed.

Those recovered on the 5th. January 1911.

William Hilton aged 26 years of 32, Hargreaves Street, Westhoughton, married but no children,

Thomas Ratcliffe of 2, Seddon Street, Westhoughton, married with two children aged 19, and 17,

Edward Thomas of 616, Willows Lane, Chequerbent, Westhoughton, married with a four month old child,

Thomas Delafield and

James Worthington aged 59 years of 282, St.Helens Road, Daubhill, Bolton married with two children 27, and 21.

Those recovered on the 6th January 1911.

Moses Turner aged 21 years of 244, Leigh Road, Westhoughton,

Sam Partington aged 17 years of 45, Water Street, Atherton and Joseph Hilton.

Recovered on the 7th. January 1911.

Joseph Leyland aged 24 years, of 31, Unsworth Street, Daubhill, Bolton.

Those recovered on the 9th January 1911.

Lewis Hodgkiss aged 39 years of 53, Brackner Street, Chequerbent, Westhoughton married with two children aged 12, and 8,

William Harry Middlehurst aged 47 years of 60, Venice Street, Daubhill, Bolton, married with five children, one of which was working and the rest 22, 19, 15 and 14,

Thomas Howcroft aged 25 years of 125, Bury Road, Bolton and 1 unnamed.

Recovered on the 10th. January 1911.

James Higham aged 58 years of 74, Leigh Road, Westhoughton, married with six children all of whom were working except one son aged 30 who was in poor health.

Those recovered on the 12th. January 1911.

Ben A. Davies aged 23 years of 24, Broad Street, Hindley,

Thomas Wild aged 15 years of 53, Morris Street, Daubhill, Bolton,

Richard Fairhurst of 219, St. Helens Road, Daubhill, Bolton, married with six children and

Syd Delafield aged 25 years of 250 Bolton Road, Westhoughton.

Those recovered on the 13th. January 1911.

William Dyke aged 22 years c/o 46, Sloane Street, Daubhill, Bolton.

Those recovered on the 16th. January 1911.

Albert Holt of 13, Mosley Street, Chequerbent, Westhoughton, married with no children.

Richard Wild aged 43 years of 53, Morris Green, Daubhill, Bolton married with a 12 month old child.

Those recovered on the 26th. January 1911.

Joseph Edward Atherton aged 14 years of 4, James Street, Westhoughton.

Those recovered on the 28th. January 1911.

John Edward Hodern aged 15 years of 9, Robert Shaw Street, Westleigh.

Those recovered on the 29th. January 1911.

W. Capperall aged 40 years of 2, Springs Gardens, Atherton, married with six children aged 19, 13, 12, 8, 3 and 12 months and

James Tyrer of 482, Leigh Road, Westhoughton, married with two children aged 10 and 7.

Those recovered on the 14th. February 1911.

4 unnamed.

The list that appears in the Report is not complete. It contains 25 that are not named but gives a total of 344 victims if these 25 are included. Fountain Byres was also reported as being taken to hospital where he later died. This makes the total of the grim disaster 345.

The Mayor of Bolton advanced money to pay the men who had been thrown out of work by the disaster. The men were paid 5/- per week, wives, 5/- and 1/- a week for each child. The amount paid to the man included all the men in the family whether father or son. There were a number of cases where the relatives had to attend the pit every day waiting for the bodies of their loved ones. One man was at the pit everyday for two weeks waiting for the body of his son. In these case 20/- a week was paid.

The widows were paid 4/- and 2/- for each child but until they got their compensation they were paid double. In the case of old fathers and mothers, 3/- a week were paid. A Court met on the 16th and 17th. February when the pit had not worked for more than four days a week and sixty cases were dealt with and an average compensation of £249 per men was awarded.

The Pretoria Pit Explosion Fund was set up and in April 1912 the Committee decided to pay widows 7/- per week, children 2/- per week and to a father or mother who lost a son, 5/- per week during the rest of their lives. It was not decided at that meeting what should be done in cases where two or more in the family had been lost

At a meeting of the Miners' Federation of Great Britain in Derby on the 4th. and 5th. of January it was resolved that Messrs. R. Smillie and W. Straker would be appointed to attend the inquiry into the explosion and they later made their report to the Federation. At the same meeting they passed the following resolution-

"We strongly protest against this terrible slaughter of our comrades at the Maypole, West Stanley, Whitehaven and Pretoria Pits and this conference moves that the Federation appoints a strong deputation to meet the Home Secretary with a view to urging upon him the absolute necessity of introducing as early as possible such legislation as shall tend to reduce these appalling calamities to a minimum."

The inquiry into the disaster was conducted by Mr. Samuel Forster Butcher, Coroner and a jury when there were twenty one sittings over fourteen days. evidence of identification was taken as they were received from the pit and the proceedings to determine the cause of the explosions was opened at the Carnegie Hall, Westhoughton on the 24th. January 1911. All interested parties were represented.

Reference was made to some mining and places of exploration that were being driven in solid coal in the North and South Plodder. Eccleston's place was in the North Plodder about 30 yards beyond the last holing and the other which was Brown's 68 yards on. In the South Plodder there was another pair of such places. Some weeks before Brown's place had fallen and the manager could not say whether the place was ventilated by brattice or by air-pipes.

Attention was then turned to the presence of coal dust in the mine. Very little went down the shaft from the surface operations but dust was made on the faces where coal cutters were used. Water mains were laid along the main haulage roads and fitted with nozzles at regular intervals from which water came, twice a week.

Wolf Safety lamps were in use in the mine and they had been changed some time earlier from protector Lamps. The lamp was fitted with a re-lighter in the base of the lamp. This re-lighting was done by placing the lamp wick in contact with cotton wool soaked in naphtha and ignited by a strip match being pulled against at rough surface by means of a key inserted in the bottom of the lamp. Instructions for re-lighting lamps were as follows-

"A fireman on satisfying himself that it was safe to do so, may relight a lamp at any suitable place, that is, not in THE RETURN AIRWAY.

All other authorised persons shall relight lamps at the appointed stations.

by Order,

(Signed) Alfred J. Tonge,
General Manager."

A dataller, Paul Garswood, described how he fashioned a key for himself.

The motors of the coal cutter appeared to have been running at the time of the explosion but there was little shot firing in the mine and the system of reporting came in for some criticism at the inquiry.

The jury heard the evidence and were posed a number of question to answer. They were retired for six hours before they returned their verdict. The foreman said -

“On behalf of my colleagues and myself I tender the verdict that on the 21st, day of December 1910 at the No.3 Bank Pit, commonly known as the No.3 Pretoria Pit, Westhoughton, in the County of Lancaster and accidental ignition of coal dust and gas occurred in the conveyor face of the North Plodder mine in some manner unknown to the jury but probably from a defective or over heated safety lamp, and produced an explosion. That upon such ignition and explosion followed a large ignition and explosion of coal dust affecting the whole of the coal mines working in the said pit. That the said men (Here a list of the victims was read out), were with others at the time of the said explosions employed in the Yard Mine of the said pit and in consequence of such explosions and resulting afterdamp died there the same day so that the came by their deaths by accident and not otherwise. That Mr. Coroner, is the verdict of the jury.”