LEWIS MERTHYR. Pontypridd, Glamorganshire. 11th. February, 1882.
On the same day as the colliery owned by the Lewis Merthyr Navigation Collieries Company Limited, two men, George Warlow, pitman aged 56 years and Jacob Thomas, hitcher aged 51 years were killed when they were burnt through them upsetting of a paraffin lamp on the cage in the shaft and there was an explosion in which four men lost their lves in an explsion of firedamp.

Those who died were:-
Thomas Williams, banksman aged 45 years.
Joseph Rowlands, master haulier aged 24 years.
Benjamin James, labourer aged 66 years.
James H. Lewis, collier aged 16 years.

COEDCAE. Pontypridd, Glamorganshire. 13th. February, 1882.
The Coedcae Steam Coal Colliery was about three miles from Pontypridd. The minesr had left the pit early as it was pay day. George Wallow and Jacob Thomas went down in a carriage to do some repairs about 40 to 50 yards down. They went down the slope with naked lights and before they had been there many minutes there was an explosion caused by a blower which ignited at their lights.

Twenty minutes after the gas was supposed to have cleared an exploring party of three men went down n the carriage. They had gone about 12 yards when there was a second explosion. The carriage was thrown into the roof with great force. Some of the watchers at the surface were blown over including Mr. Davies, the manager. For two hours no one could get into the pit but steps were taken under the direction of Mr. Davies, to restore the ventilation. It was found that another blower had caused the second explosion. The dead were brought to the surface.

Those who died in the first explosion.were-
George Warow and
Jacob Thomas

In the second explosion:-
Thomas Williams,
Benjamin James and
Joseph Rowlands.

The inquest was opened by Mr. Overton, Coroner at the New Inn, Pontypridd. The first men had gone down with a naked light when the fan had stopped and the second explosion was caused by the first setting fire to some staging about 50 yards down.

TRIMDON GRANGE. Trimdon, Durham. 16th. February 1882. The colliery was owned by Mr. Walter Scott of Newcastle who purchased it in August 1880 from the late Mr. Matthew Forster together with the adjoining colliery of East Hetton also know as the Kelloe colliery. Trimdon Grange was a series of three pits and was connected to the Kelloe pit two miles away which was also owned by Mr. Walter Scott.

The shafts at the pit were sunk on the southern edge of the Durham coalfield and were within a few yards of Trimdon station on the Hartlepool and Ferryhill Railway and were sunk about ten years before. The seams worked are the Harvey, in which the explosion occurred and the Low Main. The Harvey seam which was the deeper of the two at 180 fathoms as compared to 130 fathoms of the Low Main seam. About five

hundred men were employed in the three pits and they worked a three shift day with an average of one hundred men and boys in the pit at any one time. Eighty men and boys were supposed to have been in the Harvey seam at the time of the explosion and about thirty in the Low Main.

The colliery worked the Low Main seam at ninety seven fathoms and the Harvey seam, at one hundred and forty three fathoms. The pit was divided into three districts, the Pit Narrow Board district to the north, the Headway district to the south and the Cross-cut district between the Pit Narrow Board and the Headway districts. An entrance from the Kelloe pit by of the Kelloe headways was closed by a door at the Trimdon engine. The longwall face to the north of the goaf in the Pit Narrow Board district was approached on the flat by three ways, 1st, 2nd. and 3rd. south and the pit was worked by cutting the pillars back along the wall though the whole level. The shots were fired by '*kitties'*, straws filled with powder, and an unexploded cartridge was found the day after the explosion near Martland's place and the brattice showed signs of burning.

The pit was ventilated by a furnace twenty one feet by six feet close to the upcast shaft and could be worked as either an intake or a return air furnace. On the day of the explosion it was working as a return air furnace. The pit was lit by the hewers using Davy lamps and the drivers 'midges' which were not safety lamps which were not thought to be dangerous.

The greatest vertical depth was nine hundred and seventy five feet. The mine was dusty but it did not make a lot of gas. The only report of gas by a shift overman that was reported in his book was recorded by the overman who was killed in the explosion. The only safety lamp that was used in the mine was the Davy type with a sliding shield and naked lights, called '*midgies'*, were used by the driver boys. They were allowed to take them as far as caution boards, which were placed at safe distances from the workings. It emerged at the inquiry that there was no evidence to show that the explosion was caused by naked lights.

The Special Rules used in the mine were drawn up by the Committee of the North of England United Coal Trade Association. The discipline in the colliery was good and there was no smoking, concealment of matches or disobedience of orders of the deputies. There was nothing to indicate that the cause could be put down to the misconduct of the miners.

The question of the number of deputies employed at the mine was a point that was raised at the inquiry. Three days before the explosion the number of deputies had been reduced from four to three which meant that the others had to do more work looking for gas in the Pit Narrow Board. The number of hewers had gone down and this was the reason for employing less officials. The cause of the explosion was in no way attributed to neglect of duty by the overmen or the deputies.

The readings of the barometer taken at the pithead were lower on the morning of the explosion that they had been at any time during the proceeding month and it was evident that the explosion occurred on a day when the atmospheric conditions were dangerous.

The condition of the roof was also noted at the inquiry. On the 16th., a hewer named Connor, was withdrawn because of a 'bad place' in the roof and the goaf behind the face was also considered dangerous since it might form the conditions, coupled with the state of the roof, that would liberate and trap gas.

The explosion took place at 2.40 p.m. during the back shift. At that time there were sixty four hewers, five deputies and twenty five boys in the Harvey seam, a total of ninety four persons. Every man and boy in the Narrow Board and the Headways district was killed. The men at the Cross-cut district felt a sudden shock and compressing of the air and they made their way to the shaft through the advancing afterdamp and were rescued. It was immediately clear that the explosion had taken place in the Pit Narrow

Board district, opposite the southern extremity of the second south way. There was no time lost and exploration started at once.

The rescue work was hampered by the fact that the cages were stuck ten fathoms from the bottom of the shaft where the force of the explosion seemed to have spent itself. The rope was broken and the bucket of the cage had been upset and sent to the bottom of the shaft. Communication by means of the Low Main was also found to be impossible and the exploring party went by way of the Kelloe shaft.

A committee of colliery engineers who had arrived at the colliery to give assistance, sat continually with Messrs. Bell and Willis the Government Inspectors and Mr. Wood the resident viewer of Trimdon Grange colliery. On Sunday the exploring parties penetrated through the drifts from the Harvey to the shaft at the Kelloe. They found parts of the mine free from gas and the ventilation was almost restored.

Many of the bodies were burnt and the marks of violence were most numerous in the Pit Narrow Board district. There were many victims of the afterdamp scattered throughout the mine. In the Pit Narrow Board district eleven bodies were found burned to death and only one body, that of Maitland in the whole of the pit had the same appearance. Most of the men were found in their working places but Hyde, Smith and Hunter, who worked at the first and second pillar to the east of the second south but their lamps were found in their working places indicating that they must have seen some warning of the impending disaster.

All the bodies had been recovered and by Friday the number brought to the surface was 27 and on Saturday eight more were taken from the pit and by 5 p.m. on Sunday evening. The whole of the remainder were been found with the last body being brought to the pit bank on Monday morning. All the recovered Davy lamps were tested and some were found to be defective.

Those who died were-
Hermon Carl Schier aged 23 years.
James Boyd aged 13 years.
Joseph W. Burnett aged 23 years.
George C. Burnett aged 19 years.
James W. Burnett aged 17 years.
William Burns aged 35 years.
Michael Docherty aged 14 years.
Edward Spencer aged 19 years.
Joseph Dorman aged 14 years.
Thomas Dorman aged 13 years.
Patrick Durkin aged 13 years.
Joseph Hyde aged 23 years.
William Jefferson aged 14 years.
George Jefferson aged 14 years.
John Williams aged 31 years.
William Jennings aged 17 years.
Michael McHale aged 21 years.
John McHale aged 16 years.
Thomas McHale aged 13 years.
Samuel Richardson aged 17 years.
George Simon aged 16 years.
Frederick Bowen aged 23 years.
William Bowen aged 16 years.
Henry Burke aged 39 years.
Richard Dawe aged 20 years.
John Edmunds aged 13 years.

David Griffiths aged 19 years.
Michael Hart aged 45 years.
Cornelius Jones aged 18 years.
John F. Jones aged 38 years.
Ralph Mercer aged 18 years.
Henry Miller aged 24 years.
Thomas Priestley aged 29 years.
Andrew Smith aged 23 years.
William T. Stubbs aged 31 years.
George Wigham aged 28 years.
William Williams aged 31 years.
John Wilson aged 33 years.
John Allison aged 19 years.
Thomas Clark aged 24 years.
William Day aged 13 years.
George Dobson aged 26 years.
Thomas Peat aged 21 years.
Thomas Pryor aged 26 years.
John Smith aged 26 years.
Robert Edwards aged 17 years.
John Errington aged 33 years.
Thomas Horden aged 50 years.
William Maddrell aged 40 years.
Christopher Prest aged 35 years.
John Ramsay aged 26 years.
Frank Ramshaw aged 17 years.
William Robinson aged 34 years.
Ralph H. Robinson aged 17 years.
George Slack aged 21 years.
Robert Soulsby aged 60 years.
Jacob Soulsby jnr. aged 27 years.
Richard Thwaites aged 27 years.
John Wilson aged 15 years.
Jacob Berriman aged 37 years.
William J. Hyde aged 26 years.
Henry Joyce aged 16 years.
Enoch Sayer aged 18 years.
William Parker aged 16 years.
Thomas Sharp aged 42 years.
Thomas Hunter aged 37 years.
William J. Hyde aged 26 years.
Henry Joyce aged 16 years.
Enoch Sayer aged 18 years.
George Richardson aged 29 years.
Peter Brown aged 60 years.
Thomas Blenkinsopp aged 27 years.
Robert Maitland aged 46 years.
Matthew French aged 13

The Reverend Oates Sagar, Minister of Deaf Hill and curate in charge of the Parish of Trimdon gave an account of the disaster in a sermon:-

> “On a sunny day, in a remarkably summer-like February, when the birds (early returned) were singing cheerily in the sky, that happened, which, to many among

us, turned the light of the sun into darkness, and caused sounds of lamentation and bitter weeping arising to heaven. At half past two o'clock o the afternoon of the 16th. of that month, an ominous sound was heard at Trimdon Grange, and even for some distance around, which has been described as like the sound of a boiler explosion. Anxious eyes were turned toward the mouth of the pit, and smoke and ashes were seen rising from the Harvey shaft, and then dismay and apprehension filled the minds of all. Too soon it was known that an explosion of gas had taken place, and it was felt that many lives must have been sacrificed. The sad intelligence spread rapidly through the neighbourhood, and multitudes spread to the spot. Help came speedily from all directions. Mining engineers and their officials miners in great numbers, with their agents came to tender their services an the surgeons of the locality were there, ready to discharge their necessary duties. Men were found willing to descend through the choking stithe into the mine, and the greatest exertions were ,made to discover the extent of the disaster, but it was some time ere this could be done. Meanwhile, it was found that the area of the explosion was not confined to the Trimdon Grange Pit, but that the deadly gas had forced its way through a connecting passage to the Kelloe Pit, which is worked by the same owner and the miners there were compelled to flee for their lives. Six men, however, perished there some of them gallantly led by the manager, H.C. Schier, M.E., died in an attempt to keep open the communication between the mines. It was some time before it was known haw many lives had been lost at Trimdon Grange. The living were brought to the surface in a few hours, the less exhausted of their number bravely waiting at the shaft till the others had been brought to bank. Nine of them had been saved through the presence of mind of a veteran miner, the back overman, J. Soulsby, snr. who had kept them out of danger. The last of the saved was brought up shortly after non o'clock and it was felt that those who were still in the pit could not possibly have survived what was found to have been a most destructive explosion. Out of the 93 men and boys who had gone down into the Harvey Seam that morning, only 26 were saved.

No exertions were spared by day or by night and no expense was begrudged, in opening out the pit. Many volunteers ran great risk in performing this task and in recovering the dead. Early on Monday morning the last body was carried home. It is supposed that all must have died in a very few minutes (say some five) and thus their sufferings could not have been prolonged. One man, J. Errington, was found with a boy on each arm and another laid over him. he had evidently been trying to save them and lost his life in the attempt. On of the 26 saved, the fireman, P. Brown, was so dreadfully burnt that he died on the following Tuesday, after great sufferings. he was ministered to by members of the Primitive Methodist body. The engineman, H. Ramshaw, and his assistant, a boy, W. Taylor, were among the saved, but the former had been blown by the force of the explosion some distance from his engine. On recovering his senses he exclaimed. "Whatever shall we do?" The boy's reply was. "I think thou had best pray."

Such was the first thought that arose in the mind of this boy, and such, we may well believe, must have been the first thought of those who perished, if they had time to think at all. Many of them were only boys out of the 68 who perished at Trimdon Grange, 31 were under21 years of age, many of them, it is consoling to know, were Sunday scholars whilst of the older ones, some were Sunday School teachers and members of Churches. I myself personally know many of them for years, as well as their friends, and they were very dear to me. I have had some of them in my own Sunday School some I have prepared for confirmation, and other clergy others while not a few of them have worshipped with us in various ordinances of the Church, both here and at Old Trimdon, And now, within the short space of men

week, they have disappeared from, our view, and their places shall know them no more. “My heart is ditressed for you, my brothers!”

The inquest was opened by Mr. Crofton Maynard Coroner on Saturday on the thirty bodies at the Trimdon and six at Kelloe which had been recovered and identified. Formal evidence was taken at the Trimdon and a adjournment to March 29th. Mr. Thomas Bell, Her Majesty’s Inspector of Mines and Mr. Willis and Mr. N. Atkinson, Assistant Inspectors were present as were members of the Miners’ National Union.

At the Kelloe inquest the evidence was given in regard to the explorers who had died and a verdict returned that Scheir and Blenkinsop were suffocated in the attempt of the rescue whilst engaged in their work.

The seat of the explosion was in the Pit Narrow Board opposite the second south and a fall in the goaf, caused by a squeeze had liberated the gas. It would be possible for the increased velocity of the air caused by the fall to go through the lamp gauze. The Inspector had seen this happen at falls and on some occasions it had blown out his lamp.

Two theories were put forward as to the case of the explosion. Nicholas Wilkinson thought it had been cause by a ‘*flushed kittie’* (a blown out shot), which blew down the stopping and blew the gas into the men's lamps. The Inspectors, Mr. Bell and Mr. Willis did not agree with this theory and they thought that the explosion occurred throughout the whole of the pit. If this theory was true then the Davy lamp afforded no security in circumstances of this kind and the Inspector thought that in dusty mines with longwall workings, they should be prohibited.

After all the evidence had been heard the jury came to the following verdict-

“We are all agreed that John Ramsey and William Jefferson and sixty six others, men and boys, lost their lives by an explosion of gas in the Pit Narrow Board Longwall in the Harvey Seam of the Trimdon Grange colliery on the 16th. February last but from what cause the explosion took place we have no sufficient evidence to show.

We recommend that in future that no shots be fired in the day time or during the time when the men are in the pit within forty yards of a standing or fallen goaf and we would recommend that more deputies are employed at the pit.

We also recommend that a general report book be kept and that each officer’s report book be copied in the book daily.”

The Inspector said that the recommendations of the jury were not worthy of attention.

HENWAIN. Blaina, Monmouthshire. 27th. February, 1882.

The colliery was the property of J. Lancaster and Company and had been sunk 25 years earlier and was 165 yards deep. The colliery employed about 330 men. The accident occurred on a Monday morning when the fireman James Hoskins took some men in with him before he had made his examination which he had no right to do and was against the special rules of the colliery.

The explosion occurred in the Three Quarter Coal and when Mr. Cadman made his examination after the blast it appeared to him that Hoskins had either permitted or ordered Bennett to go through the separation door into Colborne's stall without having satisfied himself that the place was safe. He lent Bennett his lamp which was found near Bennett's body about 80 yards from Hoskins.

The mine was worked by naked lights and an open light was found near Bennett and it was thought that he went into the stall with both a safety lamp and an open light. There was nothing wrong with the ventilation but the canvas sheet had been left open or not been close properly on Saturday night.

The men who lost their lives were-

James Hawkins aged 65 years, fireman.
John James aged 49 years, repairer.
James Jones aged 42 years, repairer.
Thomas Miles aged 25 years, hauliers.
William Bennett aged 18 years, labourer.
Edmund Harris aged 66 years, labourer.

At the inquiry evidence was given that the seam gave off small quantities of gas and that the ventilation was good. The general custom was for the fireman to meet the men at the bottom of the shaft before he allowed them to go into the workings. Hoskins appeared to have done this in the past except on Sunday nights when he took the men with him for company. The manager stated that he did not know that this was going on.

The jury returned the following verdict-

> "We find that the explosion occurred at the Henwain Pit by the neglect of the fireman in not obeying the rules of the Colliery in making an examination of the working before permitting the night men to enter with their naked lights."

The jury added that they could find no fault whatever with the management and censured the deceased man Hoskins.

TUDHOE. Tudhoe, Durham. 18th. April, 1882.

The colliery was the property of the Weardale Iron and Coal Company and was about 5 miles to the west of Durham in the western portion of the Durham Coalfield. There were three seams worked at the colliery, the Hutton at 45 fathoms from the surface, the Busty at 67 fathoms and the Brockwell at 87 fathoms. The coal that was produced was used principally for making coke but was also sold for the manufacture of gas.

The colliery was worked by three shafts, the East shaft, the West shaft and the 'Success' or ventilation shaft. The explosion occurred in the Brockwell Seam and caused the deaths of 37 men and boys, was confined to that seam and the shafts were damaged. The East and West shafts were about 58 yards apart with the Success shaft about 180 yards away from them. The Brockwell seam was worked from the East and West pits and the Hutton Seam was worked from the West shaft only.

The ventilation of the whole mine was produced by a fan an, 40 feet in diameter which was at the Success shaft and was assisted by exhaust steam from three pumping and hauling engines in the East and West pits. The steam for these engines was carried from the pit bank by means of pipes. the workings in the Brockwell Seam were divided into the northern district including the Sunderland Bridge way and the branch districts call the Shieldfield way, the Croxdale way and the Coldstream way. The south district, which was not affected by the explosion and the western district, included the Main West was and Alma bank, with branch districts called the No.6 way, new No.5 way and Old No.5 way. The North and South districts were worked from the East pit and the West district from the West pit. The Brockwell Seam was connected by a drift from the Croxdale way with the workings in the adjoining Croxdale Colliery, which belonged to the same company. There was a brick stopping placed across this drift.

The total air current passing through the workings was estimated at 174,603 cubic feet of air per minute with 89,000 going to the Brockwell Seam, 23, 898 to the Sunderland Bridge way, 32, 928 into the Main West way and Alma bank and 28,117 into the South District. In each district the intake and return airways were distinct passages although they were separated by a single door in some places.

The coal was worked on the bord and pillar system and in the greater part of the West and North districts had been worked to the limits and the pillars were being withdrawn. The floor consisted of a hard seggar, and the coal, except in places, came away easily from the roof which was composed of a grey metal and post girdle. The rolley ways were

watered nearly every day and this had been practice for the previous 10 to 12 years. The dust was occasionally taken off the timbers. considering the character of the roof it had been sufficiently timbered.

Naked lights were allowed in the Brockwell Seam as far as caution boards but after these points only safety amps could be used. The lamps were mainly Davy lamps but a few Stevenson and Clanny lamps were used. The output from the seam at the time of the disaster was about 6,00 tons per week. The Brockwell was worked in shifts, each shift being composed of 220 hewers of whom 144 were employed in the north and South districts and the remainder in the West district. the staff of the North and South districts consisted of one fore-overman, one back-overman and 13 deputies and in the West district, of one fore-overman, one back-overman, one night shift overman and 9 deputies. It appeared from the evidence that in one or two instances the officials, whose duty it was as overmen, deputy or master shifter, to make a report on the state of the mine after inspection, were unable able to write and had a somewhat vague knowledge of the rules as applicable to the mine.

William Johnson was the certificated manager of colliery and had worked in mines for over 50 years and had held every position in the mine except that of a putter. He had worked for the Weardale Company for over 30 years and had been the manager of mine for 9 years. At the time of accident he was also acting as manager of Tudhoe Grange Colliery and as the agent for the Croxdale Colliery. Until shortly before the accident Johnson had acted as sole agent and manager of Tudhoe Colliery but about two months before the explosion the managing director had appointed Mr. Crone, a mining engineer of Tow Law as consulting viewer of colliery. This position meant that Mr Crone was in a superior position to Johnson but he was seldom went down the mine and Johnson stated in evidence that complete management of the mine was left in his hands. Mr. Bell, the Inspector commented-

> "In my opinion, William Johnson, from long experience in different grades of employment, had obtained a thorough practical knowledge of coal mining and in his position of manager took every precaution and spared no pains or trouble in order to successfully and safely to work the mine, but I think it doubtful whether he had not too much responsibility thrown upon him and whether he did not, upon matters of detail, rely too much upon his own personal supervision, and not sufficiently on overmen and deputies who were acting under him and by so doing loses the safety of the complete system of responsibility, which the different grades of overmen and deputies, each having their own department to supervise, were intended to give."

The general ventilation plan of the mine was good but there were two points that gave rise to consideration. At the north end of Sunderland Bridge way, a mile from East Pit, there was aslant to the Coldstream district. From that point the ventilation was carried along edge of goaf for 1,100 to 1,200 yards before reaching the last working in Coldstream district. This meant that the air that was carried to men must have carried gas swept from the goaf and in several places the ventilation of workings depended on single doors . This was the case in one point in the Croxdale way, at another in the Coldstream way and two places in the Alma Bank near the junction of old No.6.

The mine had been inspected on behalf of the colliers under General Rule 30 of Coal Mines Regulation At, 1872, the West Pit on 6th. and 7th. April 1882 by James Lindsley and Robert Blenkinsopp and on 11th. 12th. and 13th. April by Charley Hetherington, Michael Mahedy and John Goulden when they reported, *'We found all things in good order and free from gas.'* Gas had been found in different part of the workings but never in considerable quantities. When gas had been found in the working faces it had always been removed by setting brattice. the mine was consider as a safe mine but even so it was treated as a fiery mine with inspections made under General Rule 2 of the Act and with special rules and regulations for safety lamps. the provisions of General Rule 2 did

not seem to have been strictly applied. One of the witnesses at the inquiry admitted that he made no report or entry in a book when he found gas in any part of the mine when he was bale to remove it by setting brattice.

The backshift men came out of the mine at midnight but stonemen and others were in the working preparing them for the next shift of miners. At a quarter past one on Tuesday morning a loud report was heard which was felt some distance from the colliery. This was followed by a second report but not quite so loud. Immediately afterward, voices were heard from the Busty Seam and when the cage was lowered, five men came up who reported that most of the men in the seam had made their way out by the Tudhoe Grange shaft. They also reported that they had encountered afterdamp.

William Johnson organised a party of explorers that included John Nesbit and William White, back overmen and descended the East Pit about half an hour after the blast. They succeeded in getting about half a mile into the workings when they found gas in large quantities. Nesbit and White then went forward about 10 yards and were overcome by the afterdamp. Before they could be got to the pit bank, White died and it was some time before Nesbit recovered.

The exploration continued until the parties got about 500 yards inbye when they encountered some very heavy falls. A number of colliery viewers from other collieries came to the pit to give their help and advice and the work of recovering the bodies was very difficult and 69 of the86 horses and ponies in the mine were killed.

Those who lost their lives were-
Michael Cairns, (Carnes), died of burns.
Andrew Coldwell, died from burns.
Joseph Faulkner, died from burns.
Jospeh White, killed by afterdamp.
Peter Strong died from burns.
Henry Warret Sloggart, died from burns.
W. Thomas, died from afterdamp.
James Rhymer, died from afterdamp.
William Lambton, died from afterdamp.
Robert Artus, died from afterdamp.
James March, died from afterdamp.
Thomas Cook, died from afterdamp.
William Smith died from burns.
John Brown, died from afterdamp.
James Whitter, died from afterdamp.
Thomas Jefferson, died from violence and afterdamp.
John Lawson, died from burns.
George Stevenson, died from burns.
Thomas Armstrong, died from burns.
James Gair, died from burns.
William Pinkey, died from burns.
George Bowes, died from burns.
Matthew Rutter, died from burns.
Joseph Midgley, died from burns.
Thomas Snowden, died from burns.
Robert Cairnes (Cairns), died from afterdamp.
James Shorn, died from afterdamp.
William Pattison, died from burns.
William Curry, died from afterdamp.
James Richards, died from burns.
Edward Robert Jones, died from burns.

John Lambton, died from burns.
John Cherry, died from afterdamp.
Michael Rivers jnr., died from afterdamp.
Thomas Cavines, died from burns.
Hugh Armstrong, died from burns.

The Coroner's inquest was opened by Mr. Dean, when three theories were put forwards as to where the explosion originted but in no case was the evidence conclusive. One proposed a sudden escape of a large quantity of gas freed by a falling stone.

At the time of the explosion a set of 50 tubs was being drawn in by the hauling engine near the bottom of the West shaft by a double rope which was fastened to the innermost tub and passed round a pulley at the landing some distance along the No.6 was and the tail rope being fasted to the outermost tub. This meant that the tail rope was being drawn in after the set. Six men were riding in the tubs and a naked light was being carried by one of the men. The fall of stone completely covered the last twelve tubs and four of the men wee riding in them at the time. The other two men were found a short way in from the fall. All six bodies were badly burned. The tail rope was found broke off close to the tubs and one of the links of the coupling chain was found to have been forced open while the rope was not broken. The drum of the hauling engine which operated the tail rope was also broken.

The suggestion was put forward by the owners that the set of tubs was being drawn in, by some accident one of the timbers was knocked out and something happened to disturb the supports causing a fall which liberated gas which was ignited by one of the men carrying a candle. Mr. Bell did not think that this was the explanation as the bodies were burned and charred and under falls which indicated that the explosion took place before the fall.

It was thought that a shot fired in the Sunderland Bridge was the cause. Michael Rivers, the master shifter, was on his way out of the pit and had examined the district shortly before the explosion, when he passed men who were preparing a shothole. The explosion occurred about half an hour later but he did not know whether the shot had been fired. An examination of the place after the explosion found that the shot had been fired and two bodies were found in the places where they would have been talking cover from the shot but it was difficult to say how there was gas in that place. It was suggested that there could have been an accumulation between two doors that were nearby.

It was suggested that a large accumulation of gas from the goaf at the western end of the Alma Bank which forced its way down to a lantern at the caution bord on the Alma Bank. It was admitted that gas was given off from the goaves but the gas was taken along the return airway. The ventilation of this part of the workings depended on single doors and if these were damaged or let open, then gas could accumulate and pass along the Alma bank to the caution board where naked lights were permitted. There was evidence that Ralph White, the deputy blew out the lamp on the night of the explosion a few minutes before 12 p.m.

As a result of the inquiry into the disaster, the following conclusions were reached-

"1) The mine was generally well and carefully managed with every desire to provide liberally for safety of the men employed.

2) The general system of ventilation was good and effective, with exception of two points where too much reliance was placed on single doors and the length of goaf face along which the air current had to pass in Coldstream way before reaching the working places in that district.

3) More care should have been taken to insure a thorough knowledge and understanding on the part of the overmen and deputies of rules applicable to their

respective duties, especially with reference to reports of gas wherever found and however small quantities."

The jury returned the following verdict

"The jury is quite unanimous in the opinion that the cause of the explosion was through the fall of stone in the engine plane, but how or by what means the said stone fell there is no distinct evidence to show and we also find that the deaths of Andrew Cauldwell, Joseph Faulkner an other, were purely accidental."

WEST STANLEY. Chester-le-Street, Durham. 19th. April, 1882. The day after the Trudoe explosion there was an explosion at the West Stanley colliery near Chester-le-Street, County Durham. The colliery was owned by Mr. John Henry Burn of Newcastle. There were four Seams worked at the colliery. The Shield Row at 39 fathoms, the Low Main at 93 fathoms, the Hutton at 97 fathoms and the Busty at 140 fathoms. There were two Seams at the colliery which were not worked since they were worked out. These were the Five-Quarter and the Brass Thill Seam.

There were four shafts at the colliery two of which were used to work the Busty Seam. They were the 'Busty' shaft which was the downcast and the 'Lamp' shaft which was the upcast. In addition to these there was a third shaft sink to the Hutton Seam and a fourth to the Shield Row Seam. The Busty shaft was 12 feet in diameter and 140 fathoms deep and was used to draw coal from the Bust and Hutton Seams. the lamp shaft was 12 feet in diameter and 140 fathoms deep and was used to draw coal from the Low Main and the Shield Row Seams. The coal from the colliery was mainly used to make coke and gas.

The workings of the Busty Seam covered a limited area and the boundary had been reached on the north, north east and north west. They were divided into three districts, the 'North Headways', the 'South Headways' and the 'West Narrow Boards' with the branch districts called the 'South and North Cross Cuts'. The workings covered about 70 acres and this included the goaves. At the time of the disaster a drift was being driven from the West Narrow Board into the Tilley Seam to open that Seam from the Busty Seam. This operation was to avoid making another opening into the shaft and there were many faults which generally ran north. These varied from a few inches to 23 feet in height.

The ventilation for the mine was produced by a Guibal Fan in the Lamp shaft. The fan was 32 feet by 10 feet and ran at 42 revolutions per minute sending 27,000 cubic feet of air per minute into the Busty Seam. The air then divided to the North Headways, the South Headways, the West Narrow Boards and the stables. There was also some allowance made for leakage.

The officials at the colliery were, George Greenwell, consulting viewer, William Johnson, manager and resident viewer, William Anderson, overman and wasteman, Thomas J. Coulson, back overman and Robert Hunter, master shifter. The last two lost their lives in the explosion. William Johnson and been the manager for five years and had practical control of the mine. Mr. Greenwell visited the colliery once a month.

There were 200 men and boys employed at the colliery but there were only 18 below ground when the explosion took place and of these 5 were rescued and brought out alive but the remaining 13 where killed. All the ponies and horses in the mine were killed with the exception of one. There were two deputies and an average of twenty five hewers on each shift.

Clanny lamps were used in the mine. This decision was made by the findings of the inquiry into a Welsh explosion some years earlier when Mr. Burns, the owner of the colliery had wanted to introduce Meusler lamps for the Clanny's but the men did not want them because of the poor light that they gave. The Meusler had been improved and gave a higher standard of safety as the flame in a strong current of air and it went

out in the presence of an explosive mixture. On the other hand it went out if it was placed in a slanting position and it did not give a very good light.

The last report on the state of the mine on behalf of the men was on 23rd. November 1881 and the report in the overman's book read as follows-

> “We, the undersigned, have examined the intakes, main area, return and working places and find them in good working order.
> We, the undersigned, have examined the Busty Pit and found it all right.
> (signed)
> ALEXANDER JOHNSON.
> GEORGE ANDERSON.”

The examination by the overmen and deputies on the day before the explosion showed nothing unusual in the mine. The ventilation was good and there was no gas discovered. the last report of gas was on the 18th. March but the report books were not complete. It was well known that in the east going bords in the West District there was generally a considerable amount of heaving and that a hissing sound was frequently heard from the fissures in the coal.

The effects of the explosion were confined to a small area in the Busty Seam. The North District was hardly damaged at all and the four men who were working there as shifters were uninjured and only met with the after effects of the explosion when they were making their way to the shaft. this they did some time after they heard the report which one of them at first thought was caused by the firing of a shot. The South District was also not damaged and it was obvious to those who inspected the pit after the disaster that the explosion had occurred in the western workings.

Five men were found dead at the bottom of the shaft and it was thought that they were standing ready to ascend at the time they were struck down. The timbers of the main intake were blown about and the stopping and the air crossings were destroyed in the West Narrow Boards. The bodies of McCabe and Middlemass were found in the North Cross-district and form the evidence of the direction of the burning and the direction in which materials were blown, it was thought that this was where the explosion originated.

Thomas J. Coulson, back overman.
Robert Hunter, master shifter.
John Westgarth.
Riley.
John Clark.
James Clark.
Curry.
Turner.
Jobson.
James McCabe.
W. Middlemass.
R. Hutchinson.
John Douglas.

The inquest was opened by Mr. John Graham the coroner for the district but adjourned until 10th May after the evidence of the identification of the victims was heard. At the resumption it was resumed on the 25th., 26th. and 27th. May 1882.

It was said in the Inspectors Report that the management of the mine was defective and there were irregularities in the provisions laid down by the Mines Regulation Act. Gas had been reported during the four or five months before the explosion but the

manager would not admit that the mine was a firey one with all the attendant regulations and less care appeared to have been taken in the Busty Seam.

There were two theories as to the where the gas was ignited. The first was put forward by the owner of the mine and supported by expert witnesses was that the explosion originated at the face where two men McCabe and Middlemass were working. At the head of this bord and not far from the face a large stone measuring five yards long and two feet broad and from ten inches to one foot in thickness had fallen. When this was examined after the explosion it was found that there was a large hole running several yards in the strata above the coal. It was suggested that the fallen stone released quantities of gas which was confined in this space and was later ignited by the lamps of the men who were working there. The position of the bodies of the men supported this theory. They looked as if they had been struck down when they were retreating from where they were when the gas escaped. Their cans and their food was lying some little way up the bords if the men had been eating at the moment of the accident. Two lamps were found in the place and they were both locked but there was a considerable amount of gas in the bord when it was examined.

The theory put forward by the men was that the explosion occurred in the South Cross-cut where a shot had been fired in the stone near the face, not many yards from where Hutchinson's body had been found. The shot had been fired and the stone brought down but there were inconsistencies in the evidence. The first man into the place said he found a cracket or stool and a pick on top of a heap of stone which must have been place there after the fall of stone and before the explosion took place. This testimony could not be shaken and Mr. Bowey on behalf of the men, gave up the theory that the explosion had occurred in the South Cross-cut.

The question as to how the gas collected and how it was ignited. there was no doubt that there was gas in the coal and in McCabe's and Middlemass's place and hissing and bubbling noises had been heard in the place. gas could have collected in the space in the roof left by the stone and this was what the Inspectors thought had happened.

The gas could only have fired at one of the lamps of the two men as no other source of ignition was in the area but it was possible that the flame could have passed through the gauze of the lamp when the men ran away against the current of air.

The lamps that were found after the explosion were thoroughly examined and tested. Two miners were appointed on behalf of the men, Mr. Berkley and Mr. Colquhon for the owners and Mr. Atkinson for the Inspectors to conduct the investigation. The lamps were numbered and the men's names were attached to them. The number of revolutions that were required to open them was noted and the same number was to be given in screwing them up after they were cleaned so that they were tested in the same position as they were found. The lamps were the tested in a box into which gas was slowly admitted.

> “REPORT OF THE EXAMINATION OF LAMPS.
>
> Lamp No.55. John Westgarth.
>
> Unlocked but screwed close. 2 poles over the glass had been taken out. Apparently uninjured. No washer. Takes two complete turns to unscrew the oilpan. 1st. Stood the test and went out. 2nd. Closed the windows and tested again. Went out.
>
> Lamp No.67. Riley.
>
> Found locked. two and a quarter turns to unscrew. Leather washer both top and bottom of glass. Screwed full up.
>
> Lamp No.12. James McCabe.
>
> Locked. Saturated with oil. One and one eighth turn to unscrew. Washer top and bottom. Cleaned and put together again. screw was tight when unscrewed, but when put together again took about one eighth more turn to screw tight. tested and found all right and went out. screwed only with one and one eighth turn as found.

Lamp No.2. W. Middlemas.

Locked. Screwed up very nearly tight. One and three quarters to unscrew. Washer top and bottom. Lamp dusty and oily. Sent out to be boiled. Gauze had slight indentation but wires were all good. took one and a quarter to screw on. Stood the test all right and went out, one pole slightly bent.

Lamp No.28. R. Hutchinson.

Not locked but screwed up. One and three quarter turns to unscrew. Small coal dust slightly coked on gauze and saturated with oil, one and three quarters turns to unscrew. Washer both top and bottom. Lamp gauze boiled. Took a little more than one and three quarters to screw on. tested all right. Lamp went out.

Lamp No.124. John Douglas.

Not locked but screwed up. One and three quarter turns to unscrew. Small coal dust coked and saturated with oil. One washer at bottom of glass, none at the top. A little fine dust on the cap of gauze. One and three quarters turns to screw tight. Tested and found all right. Lamp went out."

The Inspector was critical of the condition at the colliery before the explosion.

"1). No certified copy of the rules could be found and some doubt appeared at first to be entertained as to which of two sets of special rules were in force in the Busty Seam but afterwards it was stated that the Lamp Pit special rules were in force, they being the rules applicable to firey mines. Mr. Johnson, the manager, admitted that he had never seen any certified copy of the rules since he became manager five years before and no certified copy was produced.

2). One of the deputies, John Mossom, who gave evidence stated that he was unable to read and that he had never had the special rules applicable to his particular duties, as deputy, read over to him. He admitted that Mr. Johnson had told him to enter gas in his book whenever he saw it, but he stated that as a fact he never did so in cases where he was able to remove the gas by altering the position of the brattice or by other means. This appeared to be the usual practice in the mine, and although it was certainly not approved that it was done with the sanction or even the knowledge of the manager, Mossom himself gave as his reason for not having reported on one of the occasions on which he found gas, that the overmen William Anderson, had told him that it was not necessary. In other instances the officials had a very imperfect knowledge of the rules and did not appear to appreciate the responsibility of their positions in the mine.

3). By the general and special rules in use at the colliery, the reports made by the overman and deputies should have entered in separate books kept for the purpose, but this was not done, and all the deputies, the fore-overman and the back overman, made their reports in the same book, which was kept in the colliery office, in the manager's house, at some little distance from the pit mouth. It was provided by the special rules that the master wasteman should report upon the ventilation in a book kept and signed by him and that a copy should be sent daily to the manager or the under viewer. The master wasteman's duties were however, performed by William Anderson, in addition to his duties of overman but no suck book was kept by him. No copies were sent to the manager and any reports which he made as master wasteman were entered together with the overman's and deputies reports in the book already mentioned.

4). General rule No.30 provides for the inspection of the mine on behalf of the persons employed, and that a book shall be kept at the mine, in which the reports shall be recorded and signed. No suck book was kept at the mine, and the reports of the inspections made and signed in the overman's pocket book.

5). No register of the thermometer was kept, as provided by the special rules and the readings of the barometer at bank only were registered and this was done on a

sheet almanac hung up in the office. No register was kept of the barometer underground and no such barometer appears to have been in use.

6). No record was kept of the names of men who were authorised to carry keys or to fire shots and no written licences were given in accordance with special rule No.3 under the head of 'Safety Lamps'. The manager stated that the number was so small that he could remember the names without any list, but admitted that it might be better if a list was kept. Two of the four lamps found at the South Cross-cuts, where four men were working at the time of the explosion were unlocked and only one of the four men was stated to have been authorise to carry a key, so either the lamp had been passed by the lamp man in an unlocked condition or the men themselves had transgressed the special rules with reference to the use of safety lamps."

The jury returned a verdict in the form of answers to questions submitted for the coroner to consider-

"Question.

1. What was the case of death?

Answer.

1. As stated in each case by Dr. Benson.

Question.

2. Was the Busty Seam in safe working order when the deceased men were allowed to go down on the 18th. April?

Answer.

2. We consider it was in perfect working order.

Q3. In what place did the explosion take place?

nswer.

3. In McCabe's place.

Question.

4. How ws the explosion caused?

Answer.

4. By quick movement of lamp.

Question.

5 Who, if any one, is or are, and in what respect culpable?

Answer.

5. No one.

Question.

6. (If necessary) was the explosion the result of causes beyond human control?"

The Inspector commented that greater care should be taken to carry out strictly the provisions of the Mines Regulation Act and the special rules that were in force at the time.

VICTORIA, Bruntcliffe. Leeds, Yorkshire. 1st. May, 1882.

The colliery was the property of J. Haigh and Sons and Michael Harle was the manager. The pits worked by the Company were the Middleton Main, the Little Pit and the Stone Coal Pit and it was in the Middleton Main Pit which worked the Middleton Main Seam that the explosion took place. The shaft was 180 yards deep and the seam consisted of 2 feet 6 inches of top coal, three inches of dirt, four inches of coal, three inches of dirt and 15 inches of bottom coal. It was worked by holing the four inches of coal, putting shots in the 2 feet 6 inch top coal and wedging the bottom coal.

The pit had been worked for about 30 years and there had been no loss of life from an explosion. It was worked day and night and there were 70 to 80 people on the day shift and about 35 at night. The night shift went down at 8.30 p.m. On the night of the 1st. May and in the ordinary course of events have ascended at 6 the next morning.

There were two explosions one about 10 minutes to midnight and the second about 2 a.m. They occurred in Stringer's Bord which was a district out of the south endings. Five colliers and boy and a deputy were engaged in the district. They had eight safety lamps with them, six Davy lamps and two Clanny lamps. Moss, the deputy had a lamp key with him. The other people at working in the pit at the time were in the west side and were not affected by the explosions.

Stringer's bord was an entirely separate district and the air into it came directly from the shaft, along the south endings which was distance of about three quarters of a mile. Measurements had been made a day or two before and recorded in the book as 12,000 cubic feet per minute. Thomas Gamble, a deputy in charge of this district, examined it on Monday afternoon thoroughly as he was going to fire a shot that afternoon. He also examined the goaf and failed to find any trace of gas.

The shot was fired about 2 o' clock in the bunk on the south side of the bord. No shot was fired on the north side that afternoon. N. Render, a shot lighter, went down to relieve Gamble and saw Frank Moss, the deputy, at 8.30 at the pit bottom. There was no communication between them to say that anything was wrong or in any way unsafe. Render went to the west bords where he remained until the explosion when he felt the blast. He had a boy with him and together they made their way to the bottom of the pit and met afterdamp on their way. The furnaceman said that the doors of the furnace had been shaken violently but there was nothing else to show what had taken place. Render ascended the shaft and raised Mr. Laing, the manager, Mr. Haigh one of the proprietors, Gamble the deputy and others. These men descended to find out what had happened and to try to save lives if possible.

The men on the north side of the pit were got out and they had not been aware that anything had happened. Having found that the explosion was on the south endings, the party turned their attention to that part of the mine and went towards Stringers bord making temporary repairs to the ventilation as they went. There was large amount of afterdamp present and the explorers experienced considerable difficulty and risk in making progress.

The first body was found in the intake bord and close by there were two others and the body of a horse. A little further on there were two tubs, one full one empty. The full tub was still on the rails but the empty one had been blown off the rails. The body of the hurrier was found just beyond the tub. Beyond the slit in the intake bord there were two more bodies, one of them, Moss the deputy. His lamps was found close by and along with all the others found they were extinguished.

The party then went through the slit into the return bord where the seventh body was found. Mr. Laing went forward to the face to satisfy himself that there was no fire. All the bodies showed that they had died from the effects of afterdamp and they were not badly burnt. Arrangements were made to take them out of the pit and they were put into corves. It was the that the second explosion took place.

All their lamps went out except Mr. Laing's. He and the other men succeeded in running the 300 to 400 yards in the direction of the shaft. They were exhausted and almost suffocated by the gas and it was questionable if they could have got out alive if it was not for the efforts of another exploring party that had just come down the pit accompanied by a doctor. The first party was sent to the surface and Mr. Laing went down again with managers of other pits that had arrived.

It was the advisable to postpone rescue operations as there was no one left alive underground and nothing more was done for a few hours. At 8 o'clock operations started again and the scene of the explosion approached with great caution. The ventilation was found to be moderate and the afterdamp had almost disappeared. Seven bodies were recovered and sent to the surface. They were them burnt as a result of the second explosion. It was thought that the corves were between the explorers and the second blast and this saved them.

Those who lost their lives were-
F. Moss aged 57 years, deputy.
James Brooke aged 19, hurrier.

The colliers-
C. Purcer aged 57 years.
G. Bray aged 39 years.
W. Brooke aged 28 years.
J. Cain aged 34 years.
E. Makinson, age not recorded.

At the inquiry into the accident, Mr. Waddell commented that the ventilation was good and all the lamps that were recovered were in tact. No matches or any naked light was found and the shots were fired by a heated wire passed through the gauze. He concluded that-

> "It is possible some gas may have existed in the goaf which had not been reported, or that a blower was given off concurrently with the firing of a shot."

BADDESLEY. Atherstone, Warwickshire. 1st. May. 1882.

The colliery was in the estate of the late W.S. Dugdale and was a few miles from Atherstone and the property of the owners of Merevale Hall. An explosion of gas caused the loss of twenty three lives and nine others died from suffocation including the owner Mr. Stratford Dugdale. The explosion was serious and unusual and what took place from the time of discovering the underground fire and to the sealing of the shafts was of great mining interest at the time.

The colliery consisted of two shafts, No.1 and No.2 both of 7 feet in diameter and 840 yards deep. There was also another shaft known as the ventilating shaft or fan drift and all the three shafts were connected by a drift. There was a pumping pit pit called the Speedwell Pit which was 771 feet deep and 8 feet in diameter and the pumping engine there was capable of pumping over a million gallons per week. At the bottom of the No.1 shaft there was a double roadway going towards Hurley and this led to the deep workings. Communication between the two roadways by short passages at then end of which there were folding doors with the exception of the one nearest the shafts. The roadways to the deep workings were steep and were 1 in 3 at one place.

The workings were about 1,000 yards at the deep from the bottom of the shaft and an engine was placed near the shaft bottom which was used for raising coal from the deep to the upper levels. Along the bottom level a small quantity of water had found it's way from the coal workings to the bottom of the incline and up to a short time before the disaster the water was drawn up from this point in tubs and thence to the pumping engine. These tubs were made of wood and they leaked along the incline causing considerable damage to the floor which lifted.

To stop this some other was of raising the water had to be found. A self contained engine boiler was place n the return airway at the extreme deep of the workings which supplied steam to work a small engine to pup the water up the incline. The boiler was set on it's end and the roof cut away so that the smoke, steam and flame passed down the top of the airway. The airway was driven in the solid but there was coal on either side. It was supposed that this coal was set on fie from the boiler. The boiler was installed with the full consent of Mr. Gillett, the colliery engineer, and he was given instructions by the manager to insulate the boiler with bricks but this was not done.

On the morning of 1st. May, Mr. Day, one of the deputies going to work descended the upcast shaft and met his father Charles, at the bottom. he told his father that there

was smoke in the shaft and he did not know where it was coming from. Charles Day immediately went up the shaft to see for himself and found a lot of smoke and had great difficulty in the shaft with noxious fumes and a considerable quantity of smoke which left him exhausted when he reached the surface.

Day sent for George Parker the manager and asked him to follow him into the mine when he arrived. Day went into the workings but he could not get down the incline because of the large amounts of smoke which was so dense that eh could go only a few yards. Parker with some other men had descended and arrived just as Day was coming back. They made several attempts to penetrate the smoke but found that is was impossible.

Matters were now so serious that the owner Mr. Dugdale and the agent Mr. Podmore were sent for and it was decided that the assistance be sort of Mr. Smallman a mining engineer who lived quite close to the colliery. Smallman, after making himself familiar with the underground layout of the colliery, devised schemes to drive the smoke from the mine and hoped that they would be able to get into the first communication between the intake and the return and reach the seat of the fire. All efforts were driven back by the smoke and fumes and several men wee overcome. Fresh volunteers were called for and they also met with no success. This was the final effort to reach the nine men who were known to be in the workings.

The call for volunteers was readily answered and at the request of Mr. Smallman and Mr. Pogmore and his son were amongst them and many of the workmen. very soon after Mr. Dugdale descended although he did not anything about mine procedures but thought that his presence would aid the confidence of the men and lead then to greater efforts to save their fellow workmen. He went down the shaft and reached the place where the explorers were at work. The new arrivals brought fresh materials with them and Mr. Smallman started to put his plans to recover the mine into operation. they started about 6 p.m. and worked until 8.30 a.m. when the air suddenly became motionless. There was a loud report like a roar of thunder and flames which burnt Messrs. Dugdale, Podmore and son, Parker and others and killed twenty three men. Of the 18 men in the advance party only one survived and he made his way to the shaft and ascended with others who were injured and went to the engine house.

Mr. Evans received a telegram at his house but he was away from home and Mr. Stokes his assistant was sent for and did not get to the colliery until 9 a.m. where he found Smallman lying very badly burnt in the engine house. He did not recognise him until he spoke. He told the Assistant Inspector what had happened and that here wee men in the mine but it would be dangerous to go in as there might be another explosion any time.

Without hesitation Mr. Stokes asked for volunteers and accompanied by Mr. Spruce, a mining engineer of great experience, and Messrs. Marsh, Mottram, Charles Day and William Morris went down the pit and groped their way in the dark along the level of the engine plane which they found filled with noxious fumes and smoke from roof to a small distance from the floor. On hearing a voice they rushed into the smoke and brought out Mr. Dugdale who was in a very weak state. They wrapped him in blankets and brought him to the surface.

Other descents were made by William Pickering, Joseph Chetwynd, Mr. Stokes, Mr. Marsh and Mr. Mottram and they succeed in bringing put Rowland Till and John Collins alive. These men died later and the final death toll was twenty three.

When Mr. Evans arrived at the colliery he found smoke coming up the shafts indicating to him that there was fire raging underground. He held a consultation with Mr. Gillett of Derby, the mining engineer at the colliery and decided that further attempts to at rescue would be foolhardy and reckless. After another consultation the following day it was decided that there could be no one left alive in the pit and that the only way of

extinguishing the fire and saving the colliery was to seal the shafts. This was successfully done during that day.

From that time until the end of November the pit remained sealed and when the covering was removed the mine was explored and the bodies recovered. The Waddell fan had not been damaged and the colliery was well ventilated which made the relighting of the furnace unnecessary.

Those who died were-
William Stratford Dugdale aged 54 years, owner.
John Pogmore aged 57 years, agent.
Frank Pogmore aged 27 years, solicitor.
John Parker aged 58 years, manager.
Joseph Clay aged 52 years, underviewer.
Joseph Day aged 31 years, deputy.
Joseph Ball aged 48 years, enginewright.
Amos Ball aged 26 years, collier.
Thomas Day aged 22 years, collier
Charles Evans aged 32 years, collier.
William Day aged 22 years collier.
William Orton aged 56 years, stallman.
John Evans aged 25 years, stallman.
Richard Evans aged 28 years, stallman.
Rowland Till aged 29 years, carpenter.
Samuel Boonham aged 49 years, stallman.
John Atkins aged 35 years, collier.
Charles Albrighton jnr. aged 20 years, loader.
Eli Smith jnr. aged 19 years, loader.
Thomas Besson aged 41 years, collier.
John Collins aged 17 years, loader.
Richard Archer aged 32 years, inclineman.

Those who were left in the mine-
William Smith aged 46 years, stallman.
John Ross aged 51 years, collier.
Joseph Scattergood aged 13 years, incline boy.
Joseph Orton aged 35 years, collier.
George Bates aged 38 years, stallman.
Henry Ratford snr. aged 51 years, stallman.
William Blower aged 26 years, collier.
William Knight aged 31 years, collier.
William Day aged 71 years, collier.

The inquest into the deaths of the men was held at the Town Hall, Atherstone by the County Coroner for Warwickshire, Dr. Iliffe. Mr. Stokes gave a graphic account of what had happened when he and others went down the pit.

> "The six of use set off round the shaft and I found the air coming from behind us very strong from the shaft and we decided to relight one of the lamps. We had only three lamps between the six. We got a tub to shade us from the wind. I though it was perfectly safe and we started forward and found the roadway quite clear until we got some distance. When we arrived at the top of the incline it was just as if you had drawn a black curtain the smoke was so dense, and it was as straight as if you had cut it with a knife. We went 50 yards very well. I stooped down and shouted, 'Is there anyone beyond?' and almost immediately someone shouted,

"Here". I said to the men who were with me, ‘Now I will take the middle, one of you get on my right and the other on my left and the three will follow us. We will make a rush for this man. The three must follow behind so that is one falls the other is ready to pick him up and drag him out.’ I shouted again, ‘You must keep shouting and we will find you.’ We started off down the road. I do not know how far we went. We went with our heads as low as possible and I found that foot from the ground the ventilation was good. There was at least 11 feet of dense smoke. Indeed it was a regular wall of smoke and we had to keep out heads close enough to the ground I kept shouting again and again and received the same help, ‘Here. Here.’ After a few yards I stumbled over Mr. Dugdale. I took his right arm and Mr. Marsh took his left arm and Mr. Mottram took the back of his collar of his coat. He lay upon his back upon the floor. I said ‘Pull,’ and we dragged him away. We had not gone far when I fell. I got up and we pulled until we had got away from the smoke. I said, ‘Who is it?’ and he said, ‘Mr. Dugdale.’

We had ascended and were on the bank a little time when Mr. Spruce said to me, ‘Do you remember when Mr. Dugdale was callin.?’ Noting as if the sounds were going away. I said that there could be another behind Mr. Dugdale. We went down again and found a man named Collins. It was evident that the had crawled up the incline. We took him to the engine house and treated his burns. He told us that there was another man behind him and Chetwynd went in with a rope which he tied round the body and we dragged him out. It was a man Named Till.”

The Coroner head all the evidence and then summed up. The jury retired and the jury returned the following verdict-

“We find that the 12 we viewed on the 4th.May met their deaths in accordance with the medical evidence adduced at the inquiry held on the 5th. May and was of an accidental character. We also consider it an error of judgement to have place the engine and boiler so far from the bottom of the shaft in the return airway, and in such an imperfect and unprotected manner, subjecting the pit to great risks, and which, in this cause of the cause of the fire.”

First Class Albert Medals were bestowed by Her Majesty to Reuben Smallman, mining engineer, Arthur Henry Stokes, Inspector of Mines, Charles Day, collier and Charles Chetwynd, collier. Second Class Medals were awarded to Samuel Spruce, mining engineer, Frederick Samuel Marsh, colliery manager, Thomas Henry Mottram, colliery manager, William Morris, collier, William Pickering, collier and Jospeh Chetwynd, collier. The men were presented with the awards at the Corn Exchange, Atherstone on Monday 19th. February 1883 by Lord Leigh, Lord-Lieutenant of the County of Warwick. Lord Leigh said-

“I do not believe that any brave soldier who ever had the Victoria Cross presented to him, had performed an action more gallant than any of these heroes.”

At this point there were loud cheers and His Lordship then pinned the medals on the left breasts of each man and congratulated him wishing him a long life to wear the decoration and heartily shaking hands with him.

PARKHOUSE No.7. Clay Cross, Derbyshire. 7th. November, 1882.

The colliery was the property of the Clay Cross Iron and Coal Company which was founded in 1837 by George Stevenson when the colliery was operated under the name of George Stevenson and Company. In 1847 the Clay Cross Company took over the colliery. The total area of the coal of the Company amounted to 7,500 acres of which 2,050 had already been worked. To develop this large area sinkings had been put down at different places and the shafts were numbered starting at No.1.the accident took place at the No.7 Pit which was at Park House near Danesmore.

The pit was sunk in June 1886 to work 1,200 acres of coal with the objective of connecting with two other pits Nos. 2 and 4. a large portion of the coal that used to go up the No.2 shaft was then worked from the No.7. In sinking the Park House work was carried out on the upcast and then the downcast alternately. The diameter of the downcast was 13 feet and it was 179 feet deep to the Black Shale Coal. The upcast was 10 feet in diameter and 180 yards deep to the bottom coal.

A ventilating furnace, eight and a half feet wide and seven feet long was fixed near the bottom of the upcast shaft. The furnace on bars and a dead plate was put down in October 1868 and had been the means of ventilating the pit ever since.

The main roads north and south from the pit bottom, the cross cuts on the north side of the incline on the south side were worked by endless chain haulage. The engine plane was worked by a single rope driven from the chain gearing by a part of a horizontal steam engine which was driven by steam from surface boilers and taken down the downcast shaft. After 445 yards on the south side the chain incline connected with the south level of the No.7 pit which was the old south level of the No.2 pit. The workings to the rise of this were called the ‘top pit’ and those to the east and immediately west of the No.7 levels were called the ‘bottom pit’.

As the workings in the top pit advanced to the rise in a westerly direction it was found necessary to sink a shaft near Clay Cross in order to facilitate the entrance to the exits in these parts of the workings. This shaft was the No.8 pit which was 9 feet in diameter and 120 yards deep with a ventilation furnace 7 feet square on bars and a dead plate at the bottom of this pit.

The water made in the No.7 pit and the workings was pumped to the surface by a direct acting pump fixed close to the bottom of the No.7 downcast shaft and the steam to drive this engine was taken from the steam pipes for the hauling engines. The north and south levels in the No.7 pit were driven in 1868, 1869 and 1870 and coal was first worked on the north side in 1869 and on the south side in 1870. The chain incline was driven in 1871 and 1872 and the ‘straight up’ incline driven between 1871 and 3. This formed the old part of No.2 and No.7 pit and connected with the No.8 shaft which ventilated the rise portion of the workings.

The dip workings in No.7 were started in 1869 and coal was first worked from there in 1876. The district was ventilated from the No.7 downcast and the air returned to the No.7 upcast shaft and crossed over the main chain level by an overcast. The north cross cut was driven between 1877 and 1879 and coal was first worked from there in 1879. This was the district where the explosion took place. The level was driven for about 350 yards to the north east and the working were divided into three districts called Nos. 1, 2 and 3 flats. The ventilation to the first two flats went up the the first gate, passed the workings of the first two flats and returned on the low side of the second flat by an overcast into the main return of the cross cuts. The third flat was ventilated by air passing above the afore mentioned overcast, from where it went through a head, round the faces and into the main return. The ventilation of the No.7 pit was separate from the others except on the north side where air was passed through to keep the old workings clean. The air passed down the No.7 and returned through No.2 upcast.

Mr. Crudace was the certificated manager of the colliery and the persons under him at the No.7 pit were, George Dunn, the underviewer who was assisted by the deputies and assistant deputies or corporals. James Parker, William Renshaw and Walter Cutts were the corporals in charge of the part of the pit where the bodies were found after the explosion. All the corporals and deputies also took orders from Mr. Dunn. James Parker, William Renshaw, Michael Parkin and Joseph Stone were among those killed in the disaster. George Dunn jnr. had charge of the blasting in the pit and naked lights were in use in the No.7 pit.

George Dunn, the underviewer at the colliery, said that the workings were satisfactory and the ventilation good. He had been unwell for several days before the explosions and

had not been down the pit for a week but while he was ill both the deputies called at the house to keep him informed of the state of the pit.

He lived close to the pit and heard the explosion from his bedroom. He jumped from his bed and could see smoke and fumes coming from the downcast shaft. He immediately dressed and went to the No.8 pit and was among the first to go down that shaft. When he got to the bottom he made his way with others to the No.7 shaft and they met gas along the incline and had to take another route. After several attempts they managed to get as far as the old junction and made their way to the engine house where they found three doors blown out. In the furnace there was a small fire and he believed that the blast had blown out the fire. Joseph Philips was in charge of the furnace that day and his body was found to be badly burnt. He went along the intakes towards the cross cuts but he was overcome by the afterdamp and had to be brought to the surface and was not strong enough to go down the pit again.

Someone thought he heard voices from the Parkhouse Pit and shouted down, “Hello. Are you all Right?”

“Yes, we have come from the workings but we have no lights.”

It was considered too dangerous to send lights down the shaft and the men went to the No.8 Clay Cross shaft and came up safely.

After the blast, George Parker of Flax Place Road who was the underviewer at the No.2 Pit, went down the pit and found the bodies of John Buckberry and some others who he did not know, in the third flat. The day after he went up the north incline where he found several more bodies. George Hewitt and his two sons were found in the north incline and John Stanley was in No.82 stall and that of Richard Taylor in the wind-way.

Edward Reeves of Danesmore, a miner who went down with several of the exploring parties, discovered the bodies of Richard Dunn, Thomas Chappell and John Beeson at the bottom of the old junction, about 20 yards from the stalls in which they worked. In the enginehouse at the bottom of the north incline they found the bodies of Joseph Stone, Joseph Dunn, William Slinn and Berry and Michael Parkin outside the engine house. At the bottom of the pit they found James Parker, William Dunn and William Martin. The two Dunns were alive but the other two were dead. On the third flat they found William Briggs, William Renshaw, George Michell, Thomas Goaler and William Vickers.in a stall to the north side they found Phineas Baker, the ‘old pensioner’. The bodies of Samuel and Edward Baker were found a little way down the gate from their stalls and that of William Squires was in a heading near the engine house. He also saw the bodies of Philip Scothern and John Holmes at the entrance to the first flat and those of Emmanuel and Edward Clarke in the first stall in the dip workings.

The men who lost their lives were-
William Dunn aged 19 years, inclineman.
John Beeson aged 15 years, driver.
Thomas Chappel aged 22 years, labourer.
Richard Dunn aged 37 years, dataller.
James Parker aged 25 years, corpral.
Joseph Stone aged 35 years, corpral.
Joseph Dunn aged 32 years, dataller.
Michael Parkin aged 47 years, corpral.
William Slinn aged 37 years, bricklayer.
Thomas Berry aged 34 years, bricklayer.
William Martin aged 21 years, engineman.
William Clark aged 20 years, loader.
Aaron Beeson aged 32 years, loader.
Joseph Phipps aged 47 years, furnaceman.
William Martin aged 21 years, engineman.

William Clark aged 20 years,loader.
Aaron Beeson aged 23 years,loader.
Joseph Phipps aged 47 years, furnaceman.
William Renshaw aged 36 years, corpral.
William Vickers aged 20, chainman.
Thomas Goaler aged 28 years, loader.
William Squires aged 35 years, labourer.
Edward ??? aged 15 years, loader.

The stallmen:-
Joseph Walters aged 27 years.
James Edwards aged 32 years.
Phillip Scothern aged 47 years.
Emanuel Clark aged 43 years.
Henry Beeson aged 44 years.
Richard Taylor aged 30 years.
John Holmes aged 50 years.
William Shelton aged 21 years.
Owen Richards aged 36 years.
James Smith aged 32 years.
John Fowler aged 52 years.
Joseph Stone aged 50 years.
James Simms aged 41 years.
Thomas Birkin aged 38 years.
Jacob Stone aged 35 years.
John Buckberry aged 37 years.
John Stanley aged 45 years.
Richard Taylor aged 25 years.
Elias Bowler aged 34 years.
George Mitchell aged 45 years.
William Briggs aged 28 years.
Thomas Hewitt aged 23 years.
Gerge Hewitt aged 46 years.
Phineas Baker aged 53 years.
Samuel Barker aged 42 years.

The inquest into the deaths of the men was opened at the Victoria Hotel, Clay Cross before Mr. C.G. Busby, Coroner for the Hundred of Scarsdale. All interested parties were represented and Marmaduke Lee, a miner of Danesmore, Thomas Downing, miner of Clay Cross and John Eaton of Staveley were several of the explorers who gave evidence of finding bodies in the mine.

Mr. Evans, the Inspector, examined the mine after the disaster and found that the effects of the explosion were mainly in the cross cuts in the Nos. 1 and 3 flats and he believed that there had been three explosions almost simultaneously. Up to then, he believed that safety lamps were not required in the collieries of the Midland counties but he recommended that safety lamps be used in future.

The Coroner summed up the evidence and the jury brought in the following verdict-

> “The jury agree that the deaths of the 45 men seen by us were caused by an explosion in the Parkhouse or No.7 Pit on the 7th. November last. e believe the explosion occurred in the cross-cuts in No.1 or No.3 flats and that the weight of evidence indicates it's origin in No.3. We are agreed that there has not been any negligence or carelessness on the part of the Clay Cross Company or their officials. We believe that proper precautions were taken for the ventilation of the

pit. We are agreed that explosion was caused by a sudden influx of gas, but no one was to blame for the same. We also make the following recommendations-
That the night deputy should make his examination as late as possible previous to the men going down to work in the morning that the day deputies should make more frequent examinations on the days when the pit is not at work. We are also of the opinion that safety lamps should be used in the deep part of the mine. We also appreciate the services of the explorers, who risked their own lives to save others, and to recover the bodies. And we also express our deep sympathy with all the bereaved ones who had suffered in this calamity."

NEW DUFFRYN. Rhymney, Glamorganshire. 25th. June, 1883.

The colliery was the property of the Rhymney Iron Company. There is some doubt about the date of this incident as the Inspector says the explosion took place on the 20th. In his Report but in the Appendix that lists the victims of the disaster, he states that it took place on the 25th.

The coal was worked at a depth on 130 yards from the surface and the seam was eight feet ten inches thick, divided by two bands, one four feet nine inches from the bottom and the other, on inch thick, two feet ten inches higher. Only the bottom four feet nine inches of coal was worked and the clod over it was taken down to make the height with the coal above retained to make the roof.

The colliery was worked on the longwall principle and was arranged so that trams could be taken along the face between two rows of props, the road being advanced as soon as sufficient coal had been worked to make room for it, the back row of props was then drawn out and the space filled with rubbish and the tops allowed to settle down onto the gobs. The coal worked was in districts 60 to 70 yards wide, each of which was in the charge of a timberman, in addition to the overmen and firemen.

During the morning the place began to 'work' and the men were withdrawn to the heading for safety. in a short time, a very heavy fall occurred extending for 30 yards along the face and almost immediately afterwards an explosion took place.

Subsequent examination showed that a large natural slip originated in the strata and the gas no doubt came from this which was ignited by the naked lights that were used in the mine

The men who died were-
Patrick Farrell aged 52 years, labourer and
Elias Thomas aged 24 years, colliers who both died in the initial explosion,
E. John Griffiths aged 13 years, collier died on the 27th,
John Roberts, aged 55 years, timberman, died on the 29th.,
David Evans aged 23 years, collier died on the 3rd. July and
Edward Price aged 24 years, collier died on the 21st. July.

Those who were injured were-
Joseph Griffiths.,
William Griffiths,
David Davis,
David Davis,
Richard Roberts,
Jenkin Jenkins
Samuel Roper and
Francis Stokes.

Immediately after the accident it was found that a large natural slip existed in the strata over the coal and the fall originated from this. Gas came off at the fall and it was fired at the naked lights that were in general use in the colliery.

As the colliery was close to the Glamorganshire- Monmouthshire border, two inquests had to be held on two consecutive days. It was learned that the mine had been free from firedamp and explosion for over forty years and the manager said the place was well timbered and ventilated and had not known falls to occur until the present incident. The verdict of the Glamorganshire inquest was that-

> "The cause was accidental injuries received by an explosion of gas unexpectedly discharged from a fall underground.

The Monmouthshire jury brought in the verdict that-

> "Accidentally killed by an explosion of gas caused by a fall of top which unexpectedly discharged a quantity of gas and there is no blame attached to any of the officials employed at the colliery."

WHEAL AGAR Redruth, Cornwall. 15th. August, 1883.

The mine ws the property of the Wheal Agar Mining Company and at the time of the accident the mine was being worked at 235 fathoms below the adit or 253 fathoms from the surface and at the time had a single shaft and one skip road. For some months before the accident the miners had been raise and lowered by the winding machinery in a two decked cage capable of holding up to tent people. the Inspector thought that the shaft was not a good one for this purpose as it changed it's inclination several times which made the use of rolls to break the engine necessary.

During the night of 14th-15th. August the engine had been use to draw minerals from a depth of 225 fathoms. On 15th. August, between 1 a.m. and 2 a.m. the rope was found to have stripped for some fathoms from the shackle due to a breakage of one of the strands. Captain Ralph Danniell, the agent in charge of the mine at the time climbed the shaft by ladders and inspected the rope but could see nothing wrong. On arriving at the surface he ordered the damaged part part of the rope to be cut off and the shackle reset.

The work was not completed by 6 a.m which was the time for the mining core of men to go up and the day core to go down. Instead of making the men use the ladders, Danniell ordered the cage attached to the capstan rope and sent it down to draw men from the 195 fathoms level before he had made a careful examination of the rope as made.

The drawing engine when disconnected from the winding drum, worked the capstan drum and when driven at it's normal speed it would take about 18 minutes to raise the cage from the 195 fathom level to the surface which was a distance of 213 fathoms. If the winding drum was used this journey would take about five minutes. There was an indicator to show the position of the cage in the shaft but there was no indicator on the capstan.

One cage load of men reached the surface in safety and another cage full was lowered. In the next trip there were 10 men the cage and three on the outside. At about 7 a.m. just as the cage reached the top of the landing brace, one of these men, Henry Cardines, jumped off. At that moment the rope broke 10 feet above the shackle and the cage fell down the shaft and the other 12 men were dashed to pieces.

All the victims were miners.
Charles Trevena aged 27 years,
William Carrill aged 27 years,
Edward Dawe aged 19 years,
Thomas Cock aged 18 years,

George Clemens aged 25 years,
Joseph Roberts aged 43 years,
James Caddy aged 21 years,
Paul Pope jnr. aged 22 years,
Charles Osborne aged 23 years,
Henry Thomas aged 17 years,
Thomas Richards aged 19 years and
Francis H. Woolcock aged 19 years.

At the inquest held at Pool on the 22nd. August, the Inspector thought that a serious breach of the Metalliferous Mines Act had been committed for the following reasons-

> "1. The only reason of letting the engine driver known when to stop the cage was by a mark on the rope, and the communication of signals from underground by ringing. As this would not be sufficiently exact, a gate to arrest the descent of the cage was put across the shaft at the 195 fathoms level. The signal line communicated first with the lander who had the to ring the enginemen so that, in all probability there was some delay in stopping the engine, resulting in slack rope being let down, which might have taken up a kink when the engine started again. This would tend to separate the strands of the rope, and by throwing the weight unequally on the wires to promote a fracture.
>
> 2. In taking up the cage with a slack rope, the pull on the rope at starting would be at least double the amount of the working load, consisting in this case of the cage, the 13 men and the weight of the rope hanging over the pulley at the poppet-heads. This would have been in excess of the strain of that the rope used should have been subjected to when human life depended on it, even if it had been in good condition."

Mr. Frenchville also pointed out that there were men rinding on the outside of the cage which was against regulations and that their extra weight contributed to the disaster. He found the capstan rope was four and a half inches in circumference made up of six strands of steel wire, round a hemp core, with eighteen wires in each strand. No invoice of the rope was produced and there ws no satisfactory evidence as to how long the rope had been in use but it was clear that it had been used for at least two years before the accident. During this time the pit had been renovated and it must have been subjected to severe strains. James Pentecost, at pitman, told the court that the rope had been lowered with a weight of 20 tons and a few days before the accident had raised a lift of pumps which weighed at least 10 tons.

Mr. Frenchville examined the broken ends of the rope after the accident and fond that many of the wires were very much corroded. The state of the rope had not been discovered because of the many layers of tar and grease that masked the defects.

The shackle was sent to Mr. Thomas W. Trail, Engineer in Chief at the Board of Trade and Inspector of the Chain Cable and Anchor Proving Establishments who inspected the rope and gave the following evidence-

> "I examined the rope as well as the wires at the fracture point. I consider the breakage was caused through the rope not being sound. Several of the wires were very much corroded and I can form no opinion as to how long they had been in that state, but in the ordinary course of events, for some considerable time unless the rope had come into contact with chemicals or some other corroding influence but I may say that the wires were not visable to a mere external examinations. In addition to the rope being injured by corrosion, it would have been injured by load of 20 tons being put on to it. If the rope were in good condition it might have worked worth a strain of from 5 to 6 tons but I would not put this amount of weight on it raising men. If there had been a kink in it it would have been more liable to break

especially as there was no swivel in the connections between the cage and the rope. I think It possible that the accident might not have occurred if the wires had not been corroded, but putting a stain of 20 tons on it would shorten it's life. I attribute the accident to the corroded state of the rope coupled with the fact that it was subjected to a strain of 20 tons.

I think that is the rope had been inspected the flaw would have been discovered. The breaking strain of the rope when new would have been from 27 to 36 tons but that entirely depended on the quality of the material."

The corner brought in verdict of 'Accidental Death' with a rider that all cages should be fitted with catches to ensure greater safety in case the rope broke. The Inspector commented that, '*the question of catches was not as simple as the it would seem.*'

GELLI. Ystrad, Glamorganshire. 21st. August, 1883.

The colliery was the property of Thomas and Griffiths and was also know as The Globe. It was about 300 yards deep and over 400 men and boys were employed. The manager was Mr. Daniel Thomas who was the son of one of the joint proprietors, Mr. Edmund Thomas.

Five men lost their lives in an explosion of gas. There was some work going on at the furnace half of which was out and the other half was damped down. There were men working in the mine and one of them ripped the head of his stall without making special precautions and had a man hold a lamp in an improper position. The resulting explosion caused the deaths of the following men.

Those who died were-
Thomas Woodliffe aged 26 years, collier,
David Thomas aged 32 years, collier,
John Lewis aged 34 years, collier,
John Jones aged 46 years, collier and
John Chubb aged 44 years, undermanager and was the undermanager at the Dinas Colliery at the time of the 1879 disaster.
Benjamin Woodliff, brother of Thomas was badly burnt.

After the inquest verdict which brought in a verdict of 'contributory negligence', there was a case presided over by Judge Stevens. He fund there could be no compensation when the plaintiff contributed to the accident. He also commented that the Employers Liability Act would be faced with many legal difficulties.

NELSON. Tyldesley, Lancashire. 2nd. October, 1883.

The colliery was the property of Mr. William Ramsden of Shackerley and six men lost their lives when the rope to the cage broke sending them down the shaft and into the sump. The pit was 280 yards deep to the Trencherbone seam and over 100 men had been lowered to their work when the accident happened. James Horridge, a fireman saw the rope break and James Ashton, the hooker-on at the bottom heard a scream and then the rumbling of the cage in the shaft. He ran away and when he returned he saw that the cage had gone into the sump. There were four men in the cage and two in the sump.

The men who had made safe descents were waiting at the shaft bottom for their tools. They heard the cage strike the scaffolding at he pit bottom. Two men John Edwards and Robert Evans heard the cried of their ill-fated comrades. The men at the bottom were wound out of No.2 Wellington pit to which they had to travel 8 to 900 yards downbrow.

Prompt attempts were made to recover the bodies and James Beswick, the manager, Alexander Almond, John Kay and Joseph Hayes, deputy underlookers were among the first to put the operations into effect that would recover their dead comrades. By eight p.m. the disfigured bodies of Thomas Aldred alias 'Herritt' of Chowbent and Edwin Wild. By 9.50 p.m. another body had been recovered and the bodies were laid out in the enginehouse for identification. Liversage was the last to be brought put and his widow had waited for almost three hours

Those who lost their lives were:-
Thomas Aldred alias Herritt,
Edwin Wild,
William Liversage, married with a child,
Ashton Hayes,
Patrick McGuire and
Jonathan Williams aged about 19 years.

At the inquest into the disaster conducted by Mr. J.B. Edge, Coroner, at the George and Dragon, Tyldesley. James Gerrard the engineer said that the day before the accident there was no jump or jerk from the engine and no slipping of the rope. He had no idea what caused the accident.

James Horridge, fireman at the pit, said he went to work about 4.45 a.m. on the morning of the disaster. The engine tenter, George Pent, was at the pit but the banksman had not yet arrived. He made his inspection and saw the cage make several windings of men and none of them made any complaint. The first he hard of the accident was a sort of scream in the shaft as the cage rushed past. he supposed the rope had broken and he looked for the chain attached to the rope.

Mr. C.M. Percy, of Wigan, consulting engineer to the colliery, had made a careful examination of the ring that attached the rope to the cage and told the court that there was more clearance between the cages and the landings than was usual in any colliery. The iron that formed the ring was of good quality but there was some crystalline structure round the break which could have been caused by repeated shocks. John Collins, Fellow of the Chemical Society, made a detailed examination of the broken link and the iron from which it had been made appeared to be sound. he told the Coroner that he could not have expected the link to have been made from better quality materials. There was evidence that the engineman did not jerk the cage.

The Coroner summed up and the jury returned a verdict of 'Accidental Death' on the men and the failure had been caused by repeated shocks which caused a weakness that could not have been detected.

WHARNCLIFFE CARLTON. **Barnsley, Yorkshire. 18th. October, 1883.**

The colliery was owned by Messrs R. Craik and Company and was worked by them in connection with the East Gawber Colliery to which it was connected underground. The colliery was about a mile and half from Barnsley close to the Manchester Sheffield and Lincolnshire Railway Company's main line. There were four shafts at the two collieries, two downcast and one upcast and one pumping shaft. The Wharncliffe Carlton Colliery had only a downcast shaft 13 feet 6 inches in diameter and the return air was carried by the connecting passage referred to and was drawn up the upcast shaft which was the same diameter and at the East Gawber Colliery about a mile and half away. The downcast shaft was 160 yards deep and the upcast 155 yards deep.

The workings at the Wharncliffe Carlton Colliery were divided into what were known as the 'Rise' and 'Dip' districts and it was in the latter which the explosion took place an to which the damage and the loss of seventeen lives was contained. Th coal was won

from the Barnsley Seam which was nine feet thick on average and dipped slightly from east to west. the mine was worked on the longwall system, and as a rule, all the coal was extracted but in some places, near faults, pillars were left to support the roof. The faults occurred frequently and in one place was a throw of 30 yards, called the St.Helens throw, had been met and passed. The main intake through this fault was by a stone drift, 130 yards long, driven through the stone at an angle to the seam to the north of the fault. The return air passed through the fault by a vertical staple pit, 30 yards long. the 'Dip' district was sub-divided into Gilliot's level, the 'Jump' district and the 'Low South' district which lay to the south of the main intake and extended almost east-west and those known as No. 1 and No.2 slants lying to the north of the main intake.

The main intake was used as an engine plane for drawing coal from the workings in these districts to the pit bottom. the area of coal that had been worked south of the St.Helens fault was 31 acres. In addition to this there were about six acres of 'straight work' or of roadways. The 'Rise' workings were smaller in extent and work had only recent commenced in that district. The coal face was about 80 yards long at the time of the explosion.

Joseph Mitchell, was the civil and mining engineer and consulting engineers at the Wharncliffe Carlton and East Gawber Collieries, John Slack was the manager of the two collieries, Herbert Fisher the underviewer, John Dearnley, the overman and Herbert Burrows, George Micklethwaite and Albert Button, the deputies. The mine was worked on a double shift system but only a small number of men went down in the second or afternoon shift and at night, a shift of stonemen went down to repair the roads and to arrange the props. The average number of men in the different shifts were 140 in the first or day shift, 36 in the afternoon and 20 to 25 at night and some of these in each case, would go to the 'Rise' workings.

John Slack had been the certificated manager at the colliery for 15 months and he and his deputies understood their duties except George Micklethwaite. Mr. Arnold Morley commented-

> "He did not in his examination favour the impression of being a fit person to hold a responsible position in a colliery. He appeared uneducated and incapable of giving clear of definite information on any of the questions upon which he was examined and although it would be obviously unwise to form a definite judgement, from his demeanour and appearance in the witness box, as to his capacity for the practical underground work required from a deputy in a coal mine, I think Messrs. Craik would do well to consider whether he does possess of his post, but especially whether he would be a competent to deal with any of those extraordinary occurrences to which the fiery mines are invariably liable and which constitute the greatest danger of their management. I am afraid too little attention is sometimes paid to these considerations in the selection of officers to whom the supervision of the underground work is mainly entrusted, and who have especially the important duty of examining the various places where danger may be expected from gas."

There were distinct systems of ventilation for the 'Dip' and 'Rise' district. The air was separated at the bottom of the Wharncliffe Carlton downcast shaft and carried by separate returns to the upcast at East Gawber Colliery where there was a Guibal fan, 40 feet in diameter which revolved at an average speed of 38 to 39 r.p.m. The main ventilation current for the 'Dip' passed down the main engine plane, through the stone drift and on to No.1 and No.2 slants, then round the longwall face to the main return And the Staple pit and so to the upcast shaft.

There were several splits off this main current the main one going to Gilliot's level and Denton's level, which was ventilated by one main split passing down Gilliot's level ands some smaller scales of air which were allowed to pass off the engine plain to keep the workings to the south-west of that district free from gas, and the 'Jump' and 'Low South' districts, also to the south of the main intake. The return from Gilliot's level was carried

by an undercast under the engine plane and joined the main return close to the Staple pit.

The main intake and return passages, exclusive of the systems in the three southern districts were respectively 2,200 and 2,000 yards long and there wee also 660 yards of air passing Gilliot's district. The main intake was about 6 feet 6 inches high and 8 feet wide and the No.1 and No.2 slants, and the gateroads leading to the coal face were 5 feet 6 inches high and 7 feet 6 inches wide. the average size of the return air ways was between 36 and 40 square feet and the Staple pit through which the return air went was 9 feet long by 4 feet wide.

The last reports of the ventilation were on the 13th. October, 1883 when 19,480 cubic feet were in the Intake a main engine plane and 'Dip' workings. It then divided into 7,000 cubic feet to the Detons district and 12,480 cubic feet to the remaining workings. The rise side intake took 5,040 cubic feet which gave a total intake of 2,520 cubic feet of air per minute.

The examination of the workings before the explosion was carried out in accordance with the regulations and had not found anything unusual or that pointed to any danger. Gas had been frequently encountered in different parts of the mine, especially in the main engine plane and at one point a blower had been encountered that was so large that fenced off for five to six weeks. In addition to blowers giving off gas at the face, cracks were frequently found in the floor from which large quantities of gas flowed. There were occasional falls from the roof in the travelling ways but these were not serious and both the floor were composed of a hard substance which gave little trouble and did not require much timbering. The last report of gas being found in the deputy's book was on 11th. October in working place No.311 which was in the longwall face but it was cleared and reported free from gas the following day.

On the night of the explosion 25 men had gone down the pit. Of these 20 including the deputy Albert Button were at work in the 'Dip' district, four were working in the 'Rise' workings and John Clover, the colliery horsekeeper was in the stables attending to the horses. Of the 20 men in the 'Dip', three were at work on the main engine plane, below the bottom of the stone drift, two in the 'Jump' district, three wee believed to be at work in the 'Low South' district and the remainder near the longwall face in Nos. 1 and 2 slants. All of the 20 men in the 'Dip' lost their lives and because of the necessity to flood the mine, only 17 bodies were recovered. The other three were believed to be at the far end of the engine plane in the 'Low South' District.

Immediately after the explosion, steps were taken to restore the ventilation which had been damaged and to recover the bodies but it was not until the evening of 21st. October that the 17 bodies were recovered. At this time the 'Low South' district had not been examined, partly because it was the furthest district from the shaft and partly because of a fall which blocked the road.

At about 8 p.m. on Sunday following the disaster, one of the exploring parties discovered a fire smouldering in the goaf in the face near the top of No.1 slant. The fire was immediately reported to the manager and to Mr. Wardell, the Inspector of Mines. Attempts were made to extinguish the fire and these continued until Monday afternoon when there was another explosion which slightly injured two or three men. After consultation it was decided that the best way to deal with the fire was to flood that part of the mine and steps were taken immediately. Pumps took water from a neighbouring steam and sent to the workings. It was decided that the pumping should continue until the water was level with the top of the Staple pit and the upper end Stone Drift. It was estimated that this would take some weeks and that the re-opening of the pit and the pumping out of the water would take a longer period.

The men and boys who lost their lives were:-
James Flatney aged 14 years.

Gerge Mason aged 16 years.
George Phillips aged 19 years.
Frederick Holland aged 25 years.
Edward Weller aged 28 years.
Albert Button aged 32 years.
Charles Starkey aged 36 years.
William Goulding aged 40 years.
William Mason aged 40 years.
William Fisher aged 41 years.
John Hallam aged 41 years.
John Wright aged 46 years.
William Lawson aged 49 years.
Richard Garbutt aged 49 years.
Charles Phillips aged 54 years.
William Shaw aged 54 years.
Henry Fisher aged 54 years.
Thomas Wood aged 55 years.
Ellis Ambler aged 58 years.
George Egley aged 65 years.

The inquest on the seventeen bodies that had been recovered was opened by Mr. Thomas Taylor, Coroner for the district. Unfortunately the remaining three bodies were still in the mine and there was no opportunity to examine the workings in which the explosion took place because of the flooding of the pit.

Arnold Lupton of Leeds was in the pit when the explosion occurred. He said that the blast was not great but it knocked him down but he soon recovered. he had lost his lamp but thought it too dangerous to go back to get it. There were several men who had survived but they had only three lamps between them and the had great difficulty on getting over falls as they made their slow progress to the pit eye. When they got to the pit eye, the injured were taken up first and he realised that Mr. Nash was missing so he and another collier went to try to rescue him. They took a lamps and found Mr. Mash and Hedley suffering and helpless but they had not lost hope. Lupton told the court he was sure from Saturday morning that there was fire in the colliery.

Four men who had been working of the ‘Rise’ side of the pit came out alive and no damage was done in that district. At the time of the explosion, the horsekeeper was in the stables and was struck down but not seriously injured. None of the horses in the stables were killed. The force clearly came up the engine plane from some point in the ‘Dip’ workings. All the witnesses at the inquiry the evidence of the part of the workings that had been examined indicated that the source of the blast must have been somewhere in the region of the longwall face.

A theory was put forward on behalf of the men that the explosion originated on the main engine plane and was caused by the firing of a shot near the Stone Drift. Cartridges and the Davy lamp which was used for shot firing had been taken down the pit by William Fisher which was the shotfirer at the pit. The Davy lamp was found close to his body at the foot of the Stone Drift and where he and two other men were at work but there was evidence that no shot had been fired.

After hearing the evidence, the jury brought in the following verdict-

> “That William Fisher and 16 others were killed by an explosion of gas on the night of the 18th. October in the Wharncliffe Carlton Colliery but how the explosion was caused there is no evidence to show.”

Mr. Morley concluded the report by saying-

> “I regret that this is one of the cases in which the inquiry had not led to any practical results but this is mainly owing to the necessity fro the closing of the mine

in consequence of the apprehended conflagration. It has, I think, conclusively proved that there are no grounds for believing that the catastrophe was in any way due to bad management or misconduct of any person connected with the colliery and I have therefore to report that, in my judgement, there is no occasion for instituting proceedings against any one, either for an offence against the rules in relation to colliery management, or for criminal responsibility wit reference to the loss of life resulting from the explosion."

LEYCETT. Madeley, Staffordshire. 21st. October, 1883

The colliery was owned by the Madeley Coal and Iron Company when there was an explosion while trying to build off a gob fire and 6 men were killed

Those who died were:-
J. Kirkwood and 6 others

MOORFIELD. Accrington, Lancashire. 7th. November, 1883.

The explosion occurred on the morning of Wednesday 7th. November at the Moorfield pit was one of the Altham Collieries between Accrington and Clayton-le-Moors and the disaster caused the deaths of sixty eight men and boys and seriously injured thirty nine. It was one of two pits owned and worked by the Mr. Alderman Barlow for the Altham Colliery Company.

The second pit, the Whinney Hill, had been in operation for twelve years but the Moorfield colliery had been in operation only two and a half years and was sunk to 293 yards to a coal seam which was from 24 to 26 inches thick. The pit had been sunk on the most up to date principles and there was one shaft that had two main drifts, one to the east on an incline and one to the north on a decline. The main chainway was in the east section and extended about 180 yards and coal was wound by double cages which brought eight tubs to the surface at once.

The pits were worked with safety lamps and there were variable quantities of gas produced in the mine. There were three firemen employed in the pit and they went to work as usual on the morning of the explosion at 5 a.m. They found nothing unusual and the men and boys descended the pit between six and seven o'clock when about 111 men and boys descended the pit and proceeded to their work in the workings.

The manager of the colliery, Mr. Thomas Macintosh, was in the habit of going down the pit at 6.30 a.m. with the last of the miners to go down on the day shift, but on the morning of the explosion he was a little late and he only got down about seven a.m. and from the evidence of the hooker-on given at the inquest, he and the fireman went straight to the No.1 level. On his return to the pit bottom, he heard the of the alarm in the No.2 level but there was no reason to suppose that he saw any gas.

The explosion took place at 8.50 a.m. and fortunately the workers at the surface were a short distance away at the time, emptying wagons into boats on the Leeds Liverpool canal which ran besides the colliery. The report was described as loud report and a sustained rumbling was felt that blew out all the lamps and rolled along the floor.

At the time of the explosion the cage was sixty yards from the top and the other a similar distance from the bottom. The top cage was not damaged but the bottom one was stopped and blown back. One part of it left the conductors tore up the framework and became firmly embedded in the shaft.

News of the explosion as carried to the Whinney Hill pit and since the Moorfield shaft was blocked this was the only way that the miners had to escape. The hookers on at the bottom of the shaft soon ascended and parties were made to explore the mine. The recovery of the dead and the living was started.

Among the dead where the manager Mr. Thomas Macintosh. The explosion was a very violent one and many of the bodies were unrecognisable but most of the causes of death were from burning and suffocation.

The exploring party continued work until one o'clock on Thursday morning by which time 21 bodies have been recovered from the Moorfield pit and eighteen from Whinney Hill. The cause was thought to be a large blower of gas that was ignited by passing through the gauze of a Davy safety lamp. There were no naked lights allowed in the mine and there was a lamp station at the bottom of the downcast shaft.

The fireman went down the pit at 5 a.m. to test for gas an inspect the workings. They found nothing wrong and allowed the men to go down between 6 and 6.30 a.m.. About 8 a.m. the firemen were on their way up the pit for breakfast and to enter their reports in the report book and an assistant fireman was left down the pit.

The manager was in the habit of going down the pit at 6.30 a.m. with the last of the miners to go down on the day shift, but on the morning of the explosion he was a little late and he only got down about 7 a.m. and from the evidence of the hooker-on, he and the fireman went straight to the No.1 level. On his return to the pit bottom, he heard the of the alarm in the No.2 level but there was no reason to suppose that he saw any gas.

The boy, William Smales who brought the news of the gas to the shaft, escaped with his life but was burnt in the disaster. He had been working in the No.2 level and had been as far as the slants three times that morning but there was no gas but then he had seen a drawer coming through the slant with gas flaming in his lamp and it blazed in his own lamp.

Tim Yates, a collier working in the No.2 level, said his place was filling with gas and he was running about telling the men to get out. John Mann came and saw the gas which filled his lamp and he could not put it out. Many of the men took his advice and ten or twelve persons were soon at the bottom of the slant and some went to the shaft and some went to warn others in the workings. Stephen Clough came down in the dark and gave the boy Smales a ride out on a sledge. Having gone about one hundred yards on the level they met the assistant fireman Mr. T. Macintosh, who told them to hold on a minute while he tested for gas. At first there was a little and then it jumped in his lamp. Mackintosh refined to worn others and was lost in the explosion. Smales went to the shaft and gave the alarm there. As they were waiting to get into the cage at the bottom of the shaft, a boy came along the No.2 level to tell John Rushton, one of the firemen, to tell him that he was wanted as there was gas in his part of the workings. Ruction's first thought was that someone had left a door open and at once went down tee jig-brow.

The manager, Thomas Macintosh, heard the word 'gas' and went to the No.2 district, by the travelling road. Neither of these two men returned alive. Peter Broadley, another of the firemen, also went into the workings to see of his district was affected. Meanwhile, the men and boys who had seen the gas in their lamps, came hurrying to the shaft bottom, some of them without their clothes and demanded that the hooker-on should take them up the pit at once. The hooker-on had five tubs in the cage and there were three more to complete the load and would not consent to the men going up but told them that they would have to wait for the empty cage to come down.

There was some delay in getting the cage away from the bottom of the pit because of the alarm and a quarter of an hour elapsed before the cage was signalled off.

By that time it was 8.15 a.m. and thirty three persons were at the bottom of the shaft. At least one of whom had asked to ride with the tubs but was refused. Some had taken up good positions so that they could get into the cage as soon as it descended. The cage had not run far from the bottom of the shaft when the blast of the explosion came

form the jig-brow, sweeping partly into the No.1 level and partly towards the shaft. It tore into the people who were waiting there to ascend the pit and swept on up the shaft. The cages were blocked in the shaft and the landing platform at the surface was forced up, the plates at the top stopping ingress and egress.

The workings at the Moorfield pit were connected by air-ways and an engine-brow one thousand two hundred yards long with the Whinney Hill pit which was the downcast pit. The blast of the explosion was felt at Whinney Hill and the head fireman, William Hope, knew that something was wrong. The assistant manager of Whinney Hill, Mr James Macintosh, happened to be in the pit at the time and went to the aid of the men in the Moorfield pit. He checked the state of the return air coming from Moorfield to see that the ventilation furnace was in full operation. He then went down the engine-plane, which he could do in fresh air, as the upper part was ventilated from Whinney Hill and only the lower part was ventilated by air from Moorfield.

After they had gone some distance, they met firedamp and they had to return. The ventilation was adjusted so that Whinney Hill was supplying more air and they tried again. This improved the air and they were able to go forward. About one hundred yards from Moorfield they were met by some of the injured men coming out of the Moorfield pit in the dark. These men were attended to by a following party and taken out of the pit.

Macintosh arrived safely at the bottom of the Moorfield shaft with William Hope following him. They found that the explosion had blown out all the lights and that every person at the shaft bottom was either burned, dead or injured. Most had been injured partly by the afterdamp and partly by dense smoke from a roll of smouldering brattice that had caught fire. Fresh air was now coming down the shaft and they were given lights and the survivors that were able to travel were sent to Whinney Hill with the assistance of others.

Macintosh resumed the search for more survivors. He found one of the double doors at the bottom of the engine-plane was blown towards Whinney Hill but the other door, which opened by sliding into a recess where it happened to be at the time of the explosion, was undamaged. This door was partly closed by the rescuers to send air into the inner workings in the hope that anyone who happened to be alive and to clear the air-way as a means of escape. They heard cries for help on the No.1 level and on investigating they found ten dead and some injured. Two men alive at the far end of the workings had felt a puff and waited until the afterdamp came, knowing that they were trapped. They went on up the jig-brow but found only bodies.

All the stoppings were blown out and the air was taking the nearest course to the upcast shaft. They put up tarpaulins and screens which took the fresh air along, so that they could go forward and found more of the dead including the body of the manager who had been leading a team that was investigating the reports of the gas before it fired.

By 4 p.m. the Moorfield shaft had been repaired enough for the cages to be operated. Mr. Morton Her Majesty's Inspector of Mines, arrived and join the explorers. Mr. Joseph Dickenson was at the Home Office when he got the telegram that informed him of the explosion and he arrived at the colliery the morning after to find the first shift that had gone down, coming to the surface at 10 a.m. They had come with the sad news that one of the engineers Mr. J.F. Seddon had been thrown out of a conveyance and killed.

The landing and the platforms at the pit head were still in disorder but this work was left to Mr. Macalpine who was attending to the problems at the surface. Mr. Joseph Dickenson joined the third shift with Mr. Morton and they were accompanied by Mr. P.W. Pickup who had been on the second shift and had just come out of the pit. They found that broken tubs had been cast to the side of the road by the rescue teams and a tram-road with trolleys had been constructed to transport men and materials to the workings. Brick setters were rebuilding the stoppings and new air doors were being constructed. The return air from the workings contained a lot of firedamp and had to pass through the

ventilating furnace. This was obviously a source of anxiety to the men down the pit who feared a second explosion.

The further the explorers went into the mine the more difficult it was to combat the gas and the firedamp stood like a wall until stoppings were built in the No.2 level. When this was done, the gas did not go down the return air-way but it came back and fired at their lamps and the exploring party had to withdraw. After two hours, the ventilation cleared the gas and a careful watch was kept on the furnace. The extinguishing of the furnace was considered but then there would be no ventilation so it decided to keep it going.

By Friday, two days after the explosion the main source of the firedamp was discovered. The roof had fallen in two places near a small fault and from the inner fall there was a noise like steam rushing through water. Gas was also coming from the fall at the other side of the fault. There was so much gas that the air could not dilute it and the exploring party had to leave.

On Saturday morning, the third day following the explosion, the Inspector and William Hope visited the far end of the No.2 level with Mr. John Higson, a mining engineer, who had been called in by the owner as a consultant. They tried to clear the gas from the main blower but it was too strong for the air. He approached in the dark, without a lamp, holding his breath ‘against suffocation’. The air was fouling the return air-way and that part of the workings where the rest of the bodies lay.

Work went on to restore the ventilation of the mine, shift after shift and by Sunday, the fourth morning of the rescue efforts, the last of the bodies was reached and brought out of the mine.

The boy, William Smales who brought the news of the gas to the shaft, escaped with his life but was burnt in the disaster. He had been working in the No.2 level and had been as far as the slants three times that morning but there was no gas but then he had seen a drawer coming through the slant with gas flaming in his lamp and it blazed in his own lamp.

Tim Yates, a collier working in the No.2 level, said his place was filling with gas and he was running about telling the men to get out. John Mann came and saw the gas which filled his lamp and he could not put it out.

Many of the men took his advice and ten or twelve persons were soon at the bottom of the slant and some went to the shaft and some went to warn others in the workings. Stephen Clough came down in the dark and gave the boy Smales a ride out on a sledge.

Having gone about one hundred yards on the level they met the assistant fireman Mr. T. Mackintosh, who told them to hold on a minute while he tested for gas. At first there was a little and then it jumped in his lamp. Mackintosh refined to worn others and was lost in the explosion. Smales went to the shaft and gave the alarm there.

As they were waiting to get into the cage at the bottom of the shaft, a boy came along the No.2 level to tell John Rushton, one of the firemen, to tell him that he was wanted as there was gas in his part of the workings.

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Meanwhile, the men and boys who had seen the gas in their lamps, came hurrying to the shaft bottom, some of them without their clothes and demanded that the hooker-on should take them up the pit at once. The hooker-on had five tubs in the cage and there were three more to complete the load and would not consent to the men going up but told them that they would have to wait for the empty cage to come down. There was

some delay in getting the cage away from the bottom of the pit because of the alarm and a quarter of an hour elapsed before the cage was signalled off.

By that time it was 8.15 a.m. and thirty three persons were at the bottom of the shaft. At least one of whom had asked to ride with the tubs but was refused. Some had taken up good positions so that they could get into the cage as soon as it descended. The cage had not run far from the bottom of the shaft when the blast of the explosion came form the jig-brow, sweeping partly into the No.1 level and partly towards the shaft. It tore into the people who were waiting there to ascend the pit and swept on up the shaft. The cages were blocked in the shaft and the landing platform at the surface was forced up, the plates at the top stopping ingress and egress.

Those who died were-
Cuthbert Almond aged 12 years.
John Almond aged 20 years.
Thomas Alston aged 15 years.
James Ashworth aged 39 years.
James Atherton aged 10 years.
John Bentley aged 32 years.
Thomas Blackburn aged 38 years.
James Broadley aged 40 years.
Westwell Broadley aged 28 years.
Waddington Walter Brown aged 23 years.
George Clegg aged 18 years.
Henry William Clegg aged 19 years.
James Clough aged 27 years.
Stephen Clough aged 19 years.
Walter Henry Coles aged 32 years.
John Crabb aged 40 years.
Jackson Cronshaw aged 21 years.
James Cronshaw aged 27 years.
Thomas Cronshaw aged 25 years.
Henry Crossley aged 11 years.
John Edge aged 16 years.
Thomas Edge aged 14 year.
?? Gordon aged 30 years.
John Grimshaw aged 20 years.
Thomas Grimshaw aged 26 years.
William Gimm aged 26 years.
John Thomas Hall aged 15 years.
Thomas Hamriding aged 36 years.
Job Whittaker Haworth aged 11 years.
Robert Haworth aged 36 years.
Rothwell Haworth aged 34 years.
William Henry Haworth aged 32 years.
William Hollin aged 25 years.
William Edward Jones aged 13 years.
Joseph Leeson aged 12 years.
Thomas Mcintosh aged 56 years.
Thomas Henry Mcintosh aged 35 years.
William Mackrell aged 21 years.
John Mahon aged 15 years.
Michael Mahon aged 13 years.
Thomas Metcalf aged 33 years.

James Osbalderstoon aged 33 years.
Richard Osbalderston aged 12 years.
John Ormerod aged 41 years.
Matthew Henry Perry aged 17 years.
Aaron Riding aged 10 years.
Robert Riley aged 17 years.
John Rushton aged 27 years.
Lawrence Rushton aged 44 years.
Willam Rushton aged 14 years.
James Scholes aged 19 years.
John Shorrock aged 19 years.
John Edward Smith aged 11 years.
Thomas Smith aged 45 years.
George Tapper aged 18 years.
James Taylor aged 35 years.
Thomas Taylor aged 29 years.
William Taylor aged 24 years.
Wilson Taylor aged 29 years.
Joseph Thornton aged 24 years.
John Threfall aged 46 years.
Robert Threlfall aged 25 years.
Thomas Tillotson aged 28 years.
Peter Tomlinson aged 19 years.
Thomas Walsh aged 27 years.
Timothy Yates aged 29 years.
William Yates aged 46 years.

Those who were injured in the disaster were-
George Almond
Lawerence Almond.
William Thomas Aspden.
Timothy Gumm.
Samuel Halstead.
Thomas Leeming.
John Bickerstaff.
Peter Broadley.
Thomas Clegg.
William Clough .
James H. Cronshaw.
James Crook.
Thomas Duckworth.
James Fielding.
William Grace.
Lawrence Metcalf.
Fred Parker.
George Rawcliffe.
Moses Riding.
Henry South.
Christopher Taylor.
John Walsh.
John Walton.
John Wolstenholme.

It was reported in the local papers that the local Relief Fund is making good progress and stood at over £5,000 .

The inquest into the disaster was held by Mr. Henry Robinson, the Coroner for Lancashire. There were several sittings and much interest was shown in the proceedings. The jury returned the verdict to the effect that out of the sixty eight dead, forty three were burned and gassed, six burned, eighteen suffocated and one drowned in the sump and that the explosion was caused by a sudden blower of gas but they could not fix where or how the gas was ignited.

Joseph Dickenson, the Inspector, agreed with the verdict. He had seen the blower and it was still there weeks after the explosion before any decrease could be observed. In five weeks the noise slackened and in two months the noise ceased. Four months later on the 10th. March when he visited the colliery and the gas was humming off and had lodged in the gutter cavity which extended four yards above the coal.

The place where the blower occurred was on the inner cutting and that on the floor was a shovel which was charred but still had the fireman's chalk marks on it showing, that he had visited the place on the morning of the explosion.

There was no one working at that place on the morning of the explosion but on the previous evening, a collier David Bradley, had driven across a small fault and before he left work he noticed that the place was making gas but there was no noise. He set timber to support the roof at the fault. The fact that he was not at work on the morning of the explosion had nothing to do with the gas. At the outside of his place the workings were thickly covered with dust but the inner workings were clean.

So many of those who could give useful information were dead and the fall at the place could have occurred before the explosion and interfered with the ventilation.

Under the circumstances the hooker-on made a mistake in delaying the ascent of the cage but in justification, it was said that it was unusual for men to leave the pit early and he did not think there was any danger and what danger that might exist, he shared. He was one who was severely inured and he had seen the boy Swabs, who brought the message go back into the pit with Rushton. They went to the top of the jig-brow to fetch his clothes. This took him about five minutes after which he took up a position where he could get into the cage.

With bore holes made into the seams and gas had been found in the Upper Mountain series and a large blower was encountered in this seam when Whinney Hill was mining it and when the shaft was sunk at the Hampton Valley colliery there was an extraordinary outburst of gas into the Whinney pit one thousand yards on the rise and gas was encountered some years afterwards at the sinking of the Moorfield shaft one and a half miles from the Whinney Hill colliery.

In December before the explosion at the Duckworth Hall pumping shaft a candle was lowered down the shaft to test for blackdamp. This had been done for some time and there had been no firedamp at the colliery for seven years, yet there was an explosion in the shaft.

It was known that firedamp will be forced through a Davy lamp and the Inspector recommended that the use of this type of lamp should be discontinued and replaced by the Marsault type lamp which gave off more light and had been found safe in explosive currents. The length of bratticing should be reduced by making more cut-throughs and the furnace was replaced by a ventilating fan.

The Inspector thought that the conduct of all concerned with this explosion although only such as occurs of these occasions is yet desiring mention:-

> "The great discipline shown by the crowd of men and boys who rushed from the gas without their clothes obeying the orders of the hooker-on at the bottom of the shaft the assistant fireman, when he saw the gas coming, staying to send his men out, the fireman at the shaft, on being told of the gas, going to assist the other fireman who went from the shaft to see if his workings were safe the manager and

the fireman at Whinney Hill in going to the rescue and the speed at which the wreck and gas were dealt with and the bodies cleared by the fourth morning."

The Coroner summed up and the jury returned the following verdict:-

"That the deceased Thomas Mackintosh and others received certain injuries at Moorfield Pit Altham by an explosion of gas on the 7th. November of which they died either in the pit or in their homes that the explosion was, in the opinion of the Jury, caused by a sudden outburst of gas but how it exploded there was not sufficient evidence to show."