

MILFREN Trerthen, Monmouthshire. 4th. March, 1902.

The colliery was the property of the Blaenavon Iron Company, Limited. The shaft was 240 yards deep and had two cages which ran in four rope guides made of seven eighths inch steel rope. They had worked for some years and had 8 to 9 inches clearance from the girders. There was an accident in which the men were flung out of the cage to the bottom of the shaft to their deaths.

Those who lost their lives were-
Edward Stallard aged 53, collier,
William A. Stallard aged 15, collier's boy,
Elias Griffiths aged 13 years, collier's boy,
Elias J. Griffiths aged 13 years, collier's boy and
David Phillips aged 37 years, collier.

Nothing was found to indicate that the cage had struck the wall and the accident could be accounted for only by too much slack in the rope and the cage getting into a swing by being picked up too quickly. This was denied and the possibility of larking about was considered and dismissed and one of the men was subject to fits and was in the cage and it was thought that the others were trying to subdue him but this theory was also dismissed.

Thicker guide rope were substituted to provide greater stability and so reduce the likelihood of a recurrence of such an accident.

GARSWOOD HALL. Ashton-in-Makerfield, Lancashire. 2nd. April, 1902.

Explosion took place in the No.9 sinking pit when fourteen men were killed and fifteen others injured. The Colliery was owned by the Garswood Hall Colliery Company.

The shaft had reached a depth of 270 yards and had just reached the Ravin Coal Seam which was known to give off a considerable amount of gas. The ventilation to the sinking pit was by a fan and air-pipes from the surface to within seventeen yards of the bottom of the pit. The fan was 50 inches in diameter and was running at 600 revolutions per minute at the time of the accident. The diameter of the shaft was 14 feet 6 inches.

The lighting in the shaft was by means of a 100 candle power electric light with a cable being run down the shaft and the lamp was supposed to be kept above the heads of the men at work so as not to risk it being hit by any tools. It was wound up the shaft when shots were being fired. There were safety lamps at the bottom of the shaft to test for the presence of gas. The Inspector in his report says that, "*nothing had been spared in providing proper fittings and apparatus for carrying on the work*".

Some months before the accident the Inspector had received a complaint that the contractor, Mr. Bradley, hurried the work to such an extent that safety was prejudiced. The specific complaint was that the men were sent back down after a shot had been fired before the smoke had properly cleared. On receiving this complaint Mr. Hall, the Government Inspector made a visit to the colliery and warned the contractor that he should take more care.

The accident occurred in the sinking pit at the Garswood Hall Collieries at Edge Green which was being sunk to the Arley Mine at 260 yards deep. Ten men, including eight sinkers and two bricksetters, were at work at the time when there was a sudden outburst of gas from a feeder. It was thought that the gas had made its way up the shaft and became ignited, causing a terrific explosion. It wrecked the headgear, forty feet in height and a large area of staging was destroyed at the surface was wrecked. A large piece of timber being blown twenty yards and smaller pieces of timber one hundred yards across the fields. The engine house was damaged as was the inside and the outside of the shaft.

The pit browman, Joseph Naylor, of Ashton was killed instantly and of the ten men down the shaft only four were rescued alive. Work to clear the shaft and get the unfortunate men to the surface began immediately at 3 a.m. on Thursday, four were brought out alive but fearfully scorched all the other fellows lie dead. The banksman was married and he leaves seven children.

The gas was undoubtedly ignited by the electric light, either by the lamp being struck and broken, or through some short circuiting at some point in the cable. The evidence at the inquest showed that the cable had been bared at some time in the past or scraped for a short length in order to attach a cable to fire shots. It also emerged at the inquest that the lamp had been lowered from its safe place the day before the accident and there was a real risk of it being stuck by the men's tools as they were working.

The fuse that should have melted if there was a short circuit did not operate and when it was tested under experimental conditions failed to operate again.

The explosion had a very great force and the whole of the fittings in the shaft were destroyed and much of the heavy timber reduced to match wood. Eight of the twelve men at the bottom of the shaft were killed and also the banksman who, at the moment of the explosion was near the edge of the shaft.

Immediately after the explosion the shaft was filled with firedamp and there was great difficulty and danger in removing the dead and the survivors. The rescuers went down the shaft with no lights and had to grope at the bottom and then make their way to the surface through an atmosphere of explosive firedamp.

The shaft remained full of gas for some months in spite of persistent efforts to clear it. Eventually it was cleared and the gas from the Ravin Seam is now piped to the surface and sinking was resumed.

Mr. Hall reached the colliery at noon on the day following the explosion. Four survivors had been brought out of the pit. The rescuers lowered their lamps down the shaft but they were all extinguished by the gas. Although this was so Edward Jones and his son made an attempt to descend but the Inspector would not let them go beyond the point where the lamps were extinguished which was about forty yards from the surface. Strenuous efforts were made to restore the ventilation in the shaft and it was not until 6th. April that the bodies of the six dead were recovered.

Mr. Smethurst, the manager of the colliery and the Inspector went down the pit and found that so much gas was still being given off the Ravin Seam through which the shaft passed that the ventilation was quite ineffective in clearing it. The gas started coming out of the Ravin the day after it was reached and the volume of the gas increased and it is probable that at the moment of the explosion there were large quantities of gas not only at the bottom of the shaft but also above the heads of the men as they were working. The presence of this gas was known to the officials at the colliery and the steps that had been taken when a shot was about to be fired namely, that the lamps were withdrawn led to the conclusion that they were afraid of keeping them down when the shot was fired.

How the gas was ignited was not certain but it is certain that it was fired electrically and there was evidence from the survivors that they saw flashes from the lamp and that the cable to the lamp was tangled with the rope and that the cable was bared for shot firing was also known to the men.

In the opinion of the inspector the explosion was the result of continuing to work when the ventilation had broken down and there was a build up of gas in the shaft. It also seemed strange that the ventilation pipe was not brought further down the shaft and that lamps were taken away when tests were needed very urgently. The certificated manager did not appear to have properly appreciated his position and responsibility when the problem of the gas arose and it was very ill judged for Bradley to withdraw the lamps when he did and the only explanation was that he was afraid of the conditions in the shaft in which case he should have withdrawn the men.

The men who died were-

John Wall aged 47 years, sinker, of 55, Rainford Street, Parr, St.Helens,

David Jones, aged 27 years, a married man of 6, Legh Street, Golborne,
Michael Toughy aged 30 years, a married man of Warrington Road, Abram,
John G. Roberts aged 22 years, Robert Davies aged 49 years,
Thomas Gilbert aged 21 years, bricksetter, of 275, Warrington Road, Ashton,
William Hurst aged 41 years, a married man of Ashton,
Joseph Naylor aged 42 years, banksman and Casimirz Ridlewicz known as Carl Armond.
A Polish Jew of 3, Commercial Square, Ashton.

The four men rescued and were taken to Wigan Infirmary. They were:-
Patrick Stanton, a married man, Robert Davies, a married man
Thomas Holden, aged 35 years, of Bamfurlong,
John Griffiths, a married man of Stubshaw Cross and the latter was in a critical condition.

When the explosion occurred some of the men were sinking and others lining the shaft. One coal seam had been passed through and the bricksetters were mouthing and they had worked to a short distance. Some of the men were rescued in the mouthing and the others on a scaffolding six feet below. Suddenly the shaft was filled by a blinding scorching flame and the area around heard and shaken by the dull rumble of the explosion. The shaft is two miles from the Garswood Hall Offices and was being sunk to save the colliers a long journey under the surface. the shaft was light by electricity and ventilated by means of a fan on the surface. The gas that caused the explosion may and probably did enter the shaft from a fissure in the mouthing.

The Managing Director of the Company say that at present nobody can tell anything. Mr. Edmondson, the Director of the Company, was in Westmoreland when the accident occurred and last night he returned to Lancashire immediately on hearing of the disaster. He said that the rescuers had done exceedingly well.

The management and staff set about recovering the six bodies that are lying at the bottom of the shaft and water had gathered some fourteen feet deep. This had first to be removed and a large amount of debris removed from the bottom of the shaft. A temporary tackle was being rigged and on Sunday morning parties were ready to search for the missing men and the bodies were very soon found lying in water and brought to the surface. It was seen that some of them were shockingly mutilated. Not only did they bear the results of the explosion but they had been crushed by falling debris. They were removed to a shed on the premises.

The rescue operations were witnessed by thousands of people but they were not allowed ear the shaft and there many pathetic scenes. While doing the recovery work men became seriously affected by gas and one men need the efforts of another four to bring him to the surface.

The death roll was added to by the deaths of Robert Davies and John Griffiths they are married men who left families. The other two survivors in the Infirmary Walden and Stanton are doing well.

The inquest was opened at the Rams Head Hotel Stubshaw Cross The coroner said that on Wednesday another explosion had taken place at a pit that was being sunk at Garswood Hall as a result of the explosion a men was killed.

The father of the deceased was not in a fit state to appear Ann Taylor gave the necessary evidence of identification. On Tuesday morning the Coroner convened the court again. On a report from the Infirmary, Thomas Holden would come before the court in two weeks. The body of John Hurst, of 538, Warrington Road, Ashton, was identified by William Hurst, his brother who lived at 267, Wigan Road. He was a bricksetter with the Garswood Hall Company and was 41 years of age. William Gilbert, father of Thomas, of 275, Wigan Road, Ashton, a bricksetter aged 21 years. Annie Sedovski identified the Pole who lodged with her. He was a sinker aged 33 years. John Toughy of 361, Warrington Road, Abram identified Michael Toughy as his father of 195, Warrington Road, Abram, a sinker aged 51 years. James Wall of 55, Rainford Street, Parr identified John Wall who

was his father aged 43 years and a sinker. Margaret Jones identified David Jones as her husband of 56, Leigh Street, Golborne aged 27 years a sinker.

Richard Davies of 309, Bryn Road, Ashton was at the surface at Richard Evans Colliery when the explosion occurred and his father was working at the Garswood Coal Company Colliery as a sinker. At 8.45 a.m. On hearing the explosion and he went with his father in the colliery ambulance to the infirmary and he was told that the Pole was spreading mortar with a spade when he cut the cable with the spade.

They saw some sparks fly off the cable and the accident took place. His father also told him that he had put his hat over his face to stop the gas coming into his mouth but he could not get the hat into his mouth and wished he had had a cap. His father did not think he was as badly burnt as he was. It was Tom Walden who was in the ambulance and it was he who made a statement Arthur Causey the blacksmith at the colliery was also in the ambulance and heard the statement. the witnesses father died at 5pm.

Molly Roberts, the young widow said she lived at 19, Lily Lane, and her husband was John Griffiths Roberts who was a pit sinker she saw him after the explosion but he was too ill to make a statement.

Thomas Walden, at an interview in the infirmary said that they were walling the bottom of the pit and the next thing he heard was a great crash and a tongue of flame leapt up the shaft and the machinery and headgear came headlong down with a lot of debris and they felt as though they were being suffocated. The fumes were dreadful. He tried to get help but soon got exhausted and remembered no more. He had three others were brought up the put at 7 o'clock and a fourth man who was nearest him was brought up later.

I then found myself in bed here. What became of the six men I do not know. He said that he had no idea how the explosion happened but he had heard that it was caused by one of the men cutting an electric cable with is spade but he cold not say that this was certain. I can not tell you how we felt at the bottom of the shaft cut away from help.

At the resumed inquest on Wednesday at the Rams Head Ashton. Mr. Smethurst the first witness was called who was the certificated manager of the mine. Evidence was given that the Pole could not speak any English and he had heard that the Pole had struck the cable with a spade and caused sparks.

Charles Bradley, of 164, The Thorns, Wigan Road, Bryn stated that he had been a contractor for twenty eight years and he was contractor for this job. He employed the sinkers and the firm employed the bricksetters. Wall took the place of the regular chageman who had not turned up. The work went on in three shifts and the shaft was light by electricity. The witness left the ten men below on the day of the disaster.

After passing the Ravin Mine they used electric cable to fire shot and he showed how they spliced the cable. The statements given by the two survivors to the Police was read out and Stanton heard a man say that he had hit the cable.

William Fletcher and Edwin Jones were the first to go down the pit in the rescue operations. Jones went down twice and tried to go an third time but he was affected by the gas and the shaft had been full of gas ever since despite the ventilation.

It was stated at the inquest that lamps we taken from the pit as dirt was falling from the sides and water kept putting the lamps out. Thomas Holden, one of the survivors had had a conversation with the Coroner in an adjournment and told him that Walden was drunk and said that he had had enough and wanted to talk in front of his betters but the Coroner was not sure that he was in a fit state to give evidence. Witness said he was 56 and he was one of the two survivors and he had been on the 'Bust' since he came out of the Infirmary. The coroner threatened to deal with him severely and said- "I thought that you had had a great deal more than was good for you when I saw you down stairs."

Patrick O'Neil, of Golborne said he was a chargehand at the colliery and he could not account for the explosion and the inquest was adjourned until Monday.

Patrick Walden, one of the survivors continued his story said that he had noticed gas on the day of the accident he saw the cable cut and sparks begin to fly and then the explosion followed. Stanton, the other survivor, said that he saw sparks and he turned round and a moment later he was knocked down by the explosion.

The contractor, Bradley, was recalled and said that lamps went out through dirt and water not gas. John Jones of Ashton, who was chargeman until March 22nd. said the gas was not met with until they had reached the Ravin Seam and then they commenced to fire their shots by electric cable. They had used an ordinary attachment but when used this broke and then they stripped the wire to get a connection.

The Polish workman could not speak more than a few words of English but he was good at his work. James Kirkham, who was chargeman at the pit said they had fired shots by bearing the cable but had wrapped the cable afterwards.

Mr. O'Brien, an electrical engineer of Manchester who had installed the electrical appliances at the colliery, said that it was of the best material and in his opinion the cable had been so weakened by the cable being broken that it subsequently broke and brought about the explosion.

The jury retired to consider it's verdict and after an hour they said that the explosion was caused by a gas which was incited by an electrical cable. The ventilation of the shaft was not sufficient to render the gas harmless and the amount of gas known to be given off by the Ravin called for greater safety precautions. They recommended that no person not skilled in the use of electricity should be allowed to operate electrical appliances and that no person should be employed sinking pit unless they understand immediately any order that they might be given.

It was the opinion that the moral guilt rested on Bradley the contractor. The Wigan Borough Coroner held the inquest into the bodies that died in Wigan Infirmary. Robert Davies, of 369, Bryn Road aged 49 years and John Griffiths Roberts, of 19, Lily Lane, Ashton.

George Roberts retracted his evidence which said that the cable was bared and said that this was the first time he had done so. The jury found that the explosion was due to the careless use of electric cable and the management were not sufficiently protective of the men as shown by the taking of the lamps away.

The formal verdict read:-

- “1). That the seven deceased persons met their deaths as the result of an explosion at the Edge Green sinking pit.
- 2). That the explosion was caused by the ignition of gas which ignition was brought about by some damage to the electric cable.
- 3). That the ventilation on the day of the explosion was not sufficient to render the gas harmless.
- 4). That the amount of gas given out by the Ravin Mine demanded greater precautions for the safety of the workmen.”

The jury further recommended that-

“None but workmen skilled in electrical apparatus should be allowed to manipulate the electrical appliances, and that also no person should be employed in a sinking pit unless he could understand immediately any order which may be given to him.”

A formal verdict of 'Accidental Death' was recorded.

The Mines Inspector took proceedings against the manager of the mine and there were two charges-

- “1). for not supplying adequate ventilation as required by No.1 General Rule, and
- 2). for not withdrawing men where danger existed as required by the No 7 General Rule.”

A fine of £10 was inflicted on each case.

WINDSOR. Abertridwr, Glamorganshire. 3rd. June, 1902.

The colliery was the property of the Windsor Steam Coal Company (1901), Limited. It had two shafts, 19 feet in diameter which had been sunk to a depth of 644 yards and had been completely walled with the exception of 18 feet at the point where they intersected the Four Feet seam at a depth of 608 yards. It was intended to put arches in at this pint to

form a landing and the unwallled portion of the shaft was secured by iron rings and wood backing deals.

The walling had been completed up to the seam and side walls, on which to build the arches, and been constructed in the east and west headings. As they were building the walling, the men stood on a stage which was on a level with the floor of the seam. The stage was like two half moons and of a framework of pitch pine 9 inches by 7 inches, bound by iron brackets. It was covered with planking, 3 inches thick which strengthened further. In the centre of the stage there was a space, 6 feet square, through which water was occasionally wound from the bottom of the shaft. When not in use, this was covered by planks. The stage was supported by 12 wrought iron bolts two and a quarter inches square and three feet long which were fixed to the walling, except opposite the two headings, where they simply rested on the walling. The two halves were secured together by two iron bolts two and a quarter inches square. The rope that raised and lowered the two halves were left attached to the west half for convenience.

On the night of the 1st. June, operations were started to make room for the arches. Two pairs of timbers were knocked out, leaving two others standing, but shortly afterwards, they were crushed by the weight on them and the ground fell. The iron rings secured in the sides of the shaft also fell or were crushed out. The quantity of rubbish that fell was 80 tons and a portion of this and the iron rings fell on the stage.

At noon on the 3rd. June, there was very little rubbish remaining to be filled off the stage. an hour before the chargeman and two sinkers, who had been to the surface, decided in the 'bowk' and as they stepped onto the stage t gave way, one half falling into the water 21 feet below and carrying eight men with it. The chargeman saved himself by catching hold of a piece of timber. He shouted to left the bowk down and the only two men who could rescue themselves were brought up alive in it. One body was recovered that day and five the following day.

Those who lost their lives were-
Griffth Wood aged 45 years,
William Richards aged 34 years,
William Davies aged 38 years,
Sammuel Matthews aged 23 years,
Thomas Davies aged 26 years. and
Edgar Brace aged 22 years, all sinkers.

Mr. Gray arrived at the colliery on the 4th June and made a thorough inspection of the scene of the disaster. He found that the top of the walling of the shaft had been heaved up by over 8 inches. The east half of the stage was in the water and the other half found in it's proper position and taken to the surface for repairs. The Inspector found that the timber was good and the accident could not be attributed to rot or lack of maintenance.

After his inspection he came to the conclusion that accident was caused by the weight of rubbish and shaft supports falling on the stage, aided by the 'pucking' of the walls which would buckle the stage up in the middle and tend to draw the supporting bolts out of the walling. he commented-

"f the shaft below the stage had been inspected on the days preceding the accident, this 'pucking' would have been detected, but an examination was impossible on account of the rubbish on the safe.'

It was stated that the stage had been examined on 28th. may and found to be in good condition.

The inquest was held before Mr. E.B. Reece, Coroner, on the 11th. June and the jury returned the following verdict-

"We find Edgar Brace and the other men lost their lives at Windsor Colliery by accidental drowning, caused by the collapse of the stage, this collapsing being caused principally and primarily through the upheaving of the masonry at the mouths of the

headings and secondly by the weight of the accumulation of debris which fell on the stage."

VOCHRIW No.2. Gellingaer, Glamorganshire. 4th. June, 1902.

The colliery was the property of Guest, Keen and Nettlefold's, Limited and eight men lost their lives in an explosion. It was in the Parish of Gellingaer about three miles from Dowlais. There were two shafts, the No.1 was the upcast and the No.2 the downcast. They were 44 yards apart, oval, 22 feet by 12 feet and 420 yards deep. Coal was drawn up both shafts but only during the day. The Rhas Las and Red Coal seams were worked from the downcast and the Upper Four Feet and the Big Coal were worked from the upcast. All the seams produced steam coal and the colliery had worked for 30 to 40 years.

The agent was Mr. H.W. Martin, mining engineer who was assisted by his son, Mr. Stuart Martin. Mr. John H. Jones was the manager with Mr. Thomas Roberts, snr. and Mr. Thomas Roberts, jnr., as the undermanagers, one for each pit. On the day shift there were two overmen and four firemen in the No.1 Pit and three overmen and four firemen in the No.2 Pit. On the night shift there was one overman and three firemen in the No.2 Pit and an overman and three firemen in the No.2 Pit. The No.1 employed 397 men during the day and 111 at night and the No.2 Pit, 550 were employed by day and 114 by night but on the night of the explosion there were 105 persons at work.

The explosion affected only one ventilating district in the Rhas Las seam which was at a depth of 420 yards and was worked to the dip of the shafts by an engine or drift for a distance of 1,600 yards. The seam dipped 3 inches to the yard. The coal was worked by the longwall method that was practised in the district, with stall roads about 11 yards apart. In the longwall method, the whole of the seam was removed in one operation and the necessary roads were maintained through the goaves by means of pack walls. The roof immediately behind the working face was supported by cogs and props and the goaf filled with rubbish partly got from working the coal, and partly from falls, and the roof rippings on the roads. Double timbers stood on the roadways for supporting the roof and sides, where the management considered timbering necessary. There was no shotfiring in the seam.

The ventilation of the colliery was provided by a Schiele fan, 15 feet in diameter which was driven by a belt from an engine which had a 32 inch cylinder and a 3 feet stroke. When the engine was running at 50 revolutions and the fan at 152 revolutions per minute, 223,600 cubic feet of air was circulated through the mine at a water gauge of 3 inches. The air was well distributed and there was no doubt that the mine was well ventilated and 50,000 cubic feet per minute went into the west district of the Rhas Las seam in which the explosion occurred. This was supplied to two ventilating districts within the meaning of the 'Coal Mines Regulation Act, 1887'. Of this quantity, about 26,000 cubic feet per minute went to Clark's district on the right hand side of the engine plane and 26,000 passed round Gwilym's level district. The whole of the district was worked by locked safety lamps which were Clanny's which were bonneted and fitted with an old fashioned screw lock, during the night as the management thought that there was more danger from gas being liberated by repairing roadways and the falls of roof that were necessary following such work, than during the day shift when the coal was won. As a result naked lights were allowed on the day shift.

Firedamp was not given off freely as the seam had been worked downwards from the outcrop which had drained off the gas to a considerable extent. The only occasion that gas had been reported in 1902 was on the 9th. January, when a fireman recorded, "A small diluted blower in Joseph Shapland's No.9 heading."

The main engine pane was naturally wet, especially on the floor owing to water running down it from the shafts and in places there was water pouring down from the roof. The double parting of Gwilym's level was also wet. Although the workings inside that parting were dry, they could not be said to be very dusty but there was no watering down.

On the night of the 3rd. June, in the Rhas Las seam there were 37 persons at work engaged on repairers. On these 24 were in Clark's district and 13 in Gwilym's level district. Of the thirteen, three were engaged in clearing a fall, a haulier was taking away the rubbish that was produced and three men were stowing this rubbish. Another man was stowing rubbish that was being produced by a repairer on Gwilym's level and brought to them by another man. Apart from these men there were three repairers at work on the main drift below Clark's level. All these men had safety lamps which had been locked at the lamp station before they went into the workings. They were supervised by two experienced firemen.

About 10 p.m., a fall took place on the main drift, 120 yards above Clark's level. The two firemen, having been told of the fall, were quickly on the spot and set men to clear it. They succeeded in partially doing so several times, but fresh falls continually occurred, so that it was not until the day overman, who had been sent for, cleared a way through about 5 a.m. on the following day, that there was any reliance on keeping the passage over. Meanwhile, Griffith Davies, the fireman on Clark's district examined his workings and found them clear of firedamp, and took the precaution to warn his men to be careful of their lamps and keep them near the floor, as there was not the usual amount of air circulating. William White, the fireman of Gwilym's level district, stated on oath that he examined his workings about 1 a.m. and found nothing wrong. He however, did not think it necessary to tell his men of the fall and warn them to be careful.

The fall was still being cleared when the explosion occurred at about 3 a.m.. William White was in the main drift, just below Clark's level and he felt the reversal of the air but heard no report or saw any flame. He and two men went down the drift and tried to get along Gwilym's level but were beaten back by the afterdamp. They then went further down the drift and made their way along the face as far as Edward Lewis's dip but failed to go further and had to retrace their steps as the afterdamp was too strong. When they reached the main drift, they were joined by others and the fireman and one of the men became unconscious and had to be carried out.

Griffith Davies, the other fireman, went along Gwilym's level a short time after and 88 yards up Lloyd's heading, found the bodies of Edward Williams, William Eustace and William Strange and the body of a horse. The haulier and the horse were burned but the two other men were not probably through them having been in the rubbish stall at the moment of the explosion so that they were out of the course of the flame.

The manager arrived on the scene soon after and along with others, restored the ventilation, explored the workings and discovered the bodies of Robert Hughes and David Evans at the face of Lloyd's stall, off Joseph Lloyd's heading and the bodies of E.J. Cheek, William Jones and O.H. Williams of Lloyd's heading. These were all the men in the district at the time. The other five had been taken to clear a fall and do some repair work on the main drift.

Those who lost their lives were-

William Eustace aged 19 years, labourer,
W.J. Strange aged 17 years, labourer,
Edward Williams aged 38 years, haulier,
R.T. Hughes aged 19 years, labourer,
David Evans aged 17 years, labourer,
E.J. Cheek aged 24 years, repairer,
William Jones aged 30 years, repairer and
O.H. Williams aged 48, labourer.

Mr. Gray, H.M. Inspector of Mines for the District, was at the Windsor Colliery when he heard of the disaster and caught the first available train and arrived at the colliery at about 2 p.m. and met the agent and the deputy agent with whom he had a consultation before descending. A good sized passage had been made through the fall on the main drift through which adequate ventilation was passing.

They found a smell of afterdamp about 40 yards before they reached Gwilym's level and found that the two separator doors had been blown out towards the main drift. There was evidence of great heat in this level all the way to the face. At the face of Lloyd's stall, where two bodies had been found, they found a safety lamp with the gauze off. Two days later another lamp with part of the gauze removed was discovered where three bodies had been found.

The ventilating sheets had been blown down and the face had travelled over a large portion of the workings and it was clear that a considerable quantity of firedamp had been ignited. The explosion was stopped by the wet workings in the main drift and the wet staple pit in the return airway, otherwise the Inspector thought, the effects of the blast would have been much more widespread.

The inquest took place on the 10th. June and the jury brought in the following verdict-

"The jury find that the deceased met their deaths by an explosion of firedamp whilst following their occupation at the eastern workings off the west main drift of the No.2 Pit, Fochriw. That the fall in the main drift took place on Tuesday night, June, 3rd., caused an accumulation of gas interfering with the ventilation of the workings in question. That the evidence points to one or the other of the open lamps found as the cause of the explosion. The jury are of the opinion that when the fall took place the better course of action would have been to have withdrawn the men. We recommend the adoption of lamps for use in the pit fitted with a more secure type lock."

Mr. Gray thought the explosion was brought about in the following manner-

"The fall in the main drift was of such a nature that the quantity of air which would find its way through it and over the timbers would be very small, and not sufficient to keep the workings clear of firedamp, therefore in four or five hours a quantity of firedamp would accumulate, which would, after a sufficient opening had been made through the fall, thus increasing the air current, be carried up the face, and be ignited at the naked light at the face of Lloyd's stall."

MACLAREN, (No.1 Pit). Abertysswg, Monmouthshire. 3rd. September, 1902.

The colliery was on the Monmouthshire side of the Rhymney Valley between Tredegar and Rhymney and belonged to the Tredegar Iron and Coal Company. Mr. H.E. Mitton was the certificated manager for the Ty Trist and Whitworth Colliery and acted as assistant to Mr. Tallis who was the General Manager. Mr. John Evans was the certificated manager of the colliery but took over from Mr. John Powell in July 1901. Mr. David Evans was the certificated undermanager and there were three overmen and thirteen examiners. Mr. Tallis went underground about once a week as did Mr. Mitton. John Evans lived at the colliery and devoted the whole of his time to his job. David Evans was called the undermanager but his position was more of an overman at the No.2 Pit and he had no supervision or control over any other part of the mine. The Inspector commented that this was not consistent with the position of the undermanager under the Act.

Of the three overmen and 13 examiners, there were, in the No.1 Pit workings, two overmen and five examiners during the day and four examiners at night. One of these, Thomas Lodwick was in charge of the Ras Las and Polka workings on the west side, on the night of the explosion. He was assisted in the examination before the night shift commenced by James R. Thomas, a shotman and acting examiner.

There were 777 men employed underground at the colliery of whom 403 worked in the No.2 Pit and 214 in the No.2 Pit by day and 110 in the No.1 Pit and 50 in the No.2 pit at night. There were 43 employed in the west side workings on the night of the explosion.

There were two shafts, the No.1 was 16 feet in diameter and 294 yards deep to the Ras Las Seam and was halfway between New Tredegar and Rhymney. The upcast shaft the No.2 was 12 feet by 16 feet oval and was 154 yards deep to the Yard Coal. This was 2,600 yards to the north close to the Rhymney Station on the Brecon and Merthyr Railway

which formerly belonged to the Rhymney Iron Company, Limited. Coal winding commenced in 1893 and production was steadily increased to 1,250 or 1,300 tons a day.

The following seams passed through the No.1 shaft and were worked from there. They were the Big Vein which was five and half feet thick and was at 250 yards, the Yard Coal which was three feet eight inches thick at 252 yards, the Polka Coal, three feet nine inches thick at 292 yards and the Ras Las Seam which varied from two feet nine inches to five feet thick was at 294 yards. All the seams gave off firedamp and were very dry and dusty. the seams were worked by longwall, the South Wales system of having stall roads about 15 yards apart but also to some extent, on the Barry and Nottingham system in which trams were taken along the face, the stall roads being 60 to 80 yards apart.

The workings in the Polka and Ras Las seams The main west level extended 450 yards to the west side and divided the rise and the dip workings which were about equal in extent. From the main level there were single headings driven at an angle to the rise and dip from which the stall roads were turned away from the face and the intermediate spaces packed with rubbish. The road were secured with timber where necessary in addition to the gobs.

The ventilation was provided by a Parson's steam turbine fan which was at the top of the No.2 shaft. It was erected with the expectation that it would produce 150,000 cubic feet of air per minute through the workings at 3 inches water gauge but it did not exceed 74,000 cubic feet at 4 inch water gauge due to either the fan or the conditions underground. The Inspector would not commit himself on this discrepancy. The last record made on 1st. September showed that 64,194 cubic feet passed through the working with 19,075 in the No.1 Pit on the west side workings and the Polka and Ras Las Seams. A new fan which would produce 300,000 cubic feet had been ordered some months before the explosion but had not been delivered to the mine. The air that went through the Polka and Las Ras workings joined air from the No.1 pit Big Vein and Yard Coal workings which was, in the opinion of the Inspector,'most objectionable and entirely wrong but is not directly connected with this explosion.'

Locked safety lamps of the Ackroyd and Best bonnetted Clanny lamps were exclusively used in the mine except near the bottom of the shaft where there wee electric lamps. The workings were dry and dusty

There were about 85 working places in the west side workings and at the time of the explosion this face was about 700 yards long with 450 on the dip side and 250 on the rise side. Those workings on the rise side had extended a further 150 to 160 yards before the previous June when a crush occurred in the workings in the north west corner. Owing to the consequent interruption of the ventilation, Amos' Barry and the face on the other side were stopped and gas accumulated.

Blasting was allowed only in the workings on the deep side of the Main West level and was carried out between shifts, 6.15 to 7.30 a.m, when all the men were out of the mine with the exception of the shotlighter and a limited number of men which was in accordance wit the Explosives in Mines Order and was in no way connected with the disaster.

The explosion occurred on Wednesday 3rd. September, 1902 about 11.30 p.m. when 16 men lost their lives, three others were seriously injured and 15 more or less so. The effects of the explosion were confined to the workings in the Polka and Ras Las Seams on the west side on the No. 1 pit. It was heard at the surface of the No.1 shaft but none of the force that often accompanied explosion were noticeable and there was no damage to the shaft or to the surface installations.

The men who lost their lives were-

William Rawlings aged 25 years, timberman, who was severely burnt.

Thomas Minton aged 37 years, haulier, who was severely burnt and died 7th. September.

These two were repairing the Main West Level about 30 yards inside the new stables.

George Wilkins aged 41 years, labourer, who died from the effects of afterdamp.

George Grainger aged 32 years, labourer, who died from the effects of afterdamp.

These two were repairing the Main Level, just outside No.4 Dip.

Evan H. Evans aged 25 years, collier, who died from the effects of afterdamp and was getting coal at the bottom of No.3 heading.

John T. Jones aged 23 years, haulier, who died from the effects of afterdamp and was hauling from above, back to the No.3 dip.

Albert Williams aged 19 years, labourer, who died from the effects of afterdamp who was working with the repairers.

Rees Jones aged 26 years, labourer who was severely burned and was cleaning the cross road from No. 3 to No.2 heading.

William J. Jones aged 17 years, severely burned and was working on the cross road with Rees Jones.

John Jones aged 30 years, collier who was severely burned who was working at the face of the No.3 heading.

William Baker aged 24 years, collier, who was very severely burned.

William H. Brown aged 32 years, collier, burned very severely. Brown and Baker were working at the face of Amos Barry.

Gwilym Roberts aged 34 years, haulier who was very severely burned and was hauling from above.

Walter Griffiths aged 25 years, haulier, burned but not severely who was stowing rubbish from Morgan's heading.

Gwilym Morgan aged 41 years, collier, burned but not severely who was opening out the airway between Thomas Death's stall and Morgan's heading.

Azariah Probert aged 25 years, haulier, burned but not severely who was hauling from Morgan's heading.

Three or four others were seriously injured but recovered from the pit alive, including the examiner, Lodwick. At the time of the report, they were said to be recovering.

Of the sixteen deceased, 16 lived in Monmouthshire and two in Glamorganshire and the proceedings came under the jurisdiction of two Coroners, Mr. J.B. Walford, Coroner for North Monmouthshire and Mr. R.J. Rhys, Coroner for East Glamorganshire. Mr. Walford held and inquest on the 14 bodies and took evidence fully and completely and Mr. Rhys held a formal inquest taking sufficient evidence to arrive at a verdict.

The Monmouth inquest opened on the 6th. September and evidence of identification was taken and the proceedings were then adjourned until Thursday 25th. September at Tredegar. Mr. Walford presided at the adjourned inquest when all interested parties were represented with Mr. Smillie of the Miners' Federation of Great Britain appearing for the workmen.

The inquiry extended over three full days and 28 witnesses gave evidence. Thomas Lodwick was too ill to give evidence at the inquiry but had been on his rounds of inspection during the night shift and was on his way back to the pit when the explosion occurred and he was found in the main west level about 70 yards from the pit bottom.

The origin of the explosion appeared to be fairly clear in the extreme north and Rise corner of the Ras Las workings off the No.1 heading where the fall had blocked off the ventilation which as a result the working places to the rise of the stall road known as Thomas Death's Road when had turned off a heading called 'William Davies's or 'Talybont' had been abandoned and fenced off as a 'Dangerous Place'

As the fall was too large to remove a small ventilating current was driven through the fall into the No.2 heading. The intention was to make the work good and restore the ventilation. It was generally agreed that the gas ignited either in Amos's Barry or at Gwilym Morgan's working place. In the former was found a broken lamp but whether the damage came from the explosion or before it could not be determined. Morgan's lamp was not found and was thought to be under fall.

The jury arrived at the following verdict-

"The deceased persons lost their lives by an explosion of inflammable gas in the No.1 McLaren Colliery, Abertysswg, either near or at Amos' Barry Heading or at the

face where Nos. 15 and 16 (Morgans' Heading) were working. That there is not sufficient evidence for us to decide whether a naked light or a broken lamp fired the gas or whether the gas fired at an intact lamp. A large majority of the jury consider the ventilation of the colliery at the supposed points of explosion was satisfactory, apart from the question of ventilation the jury consider all interested persons believed these places safe for working. A large majority of the jury there is no one to blame for the matter."

Two riders were added by the jury-

"1) The jury think it should be strongly kept before the colliers that their lamps should be put in secure positions.

2) That gas showing in a lamp should be taken as a danger signal and men not allowed to work in or near it until some responsible official has decided whether the position is dangerous or not."

TIRPENTWYS. Tirpentwys, Monmouthshire. 8th. October, 1902.

The colliery was owned by the Tirpentwys Black Vein Steam Coal and Coke Company, Limited and was in the Cwnfrwdoer Valley in the Parish of Trevethen about one and a half miles from Pontypool. Five men, who had been working in the Big Vein Seam, were killed when they were thrown out of the ascending cage. The shaft was 290 yards deep and had two cages which ran in four seven eight inch rope wire guides. They had been at work for a number of years and had 8 to 9 inches clearance from the girders.

There were two shafts at the colliery, a downcast sixteen and half feet in diameter and 430 yards deep to the Black Vein Seam and an upcast, fifteen feet in diameter, sunk to the same seam which was used for winding coal from the Big Vein Seam. There were 900 men and boys employed underground and 760 of these were wound at the downcast shaft and 140 at the upcast. The total output was about 1,200 tons of coal per day of which 1,050 were raised at the downcast shaft and the remaining 150 tons at the upcast.

The accident occurred at the upcast shaft which was connected to a 24 feet diameter Walker's improved Guibal Fan by a large culvert which was known as the Fan Race and was a few feet below the surface. In order to prevent the short circuiting of the air and to make it travel down the downcast shaft and through the workings, there was tower at the top of the shaft and a space around it to allow the trams to be taken off and replaced by empties. Communication with the outside was through a passage with double doors arranged in such a manner, that when the trams passed through, the outer door was closed.

The tower was 45 feet high and was within about 15 feet of the centre of the pulleys. the top was flat and covered with two and half inch planks. In the cover there were two holes, 7 inches square, for the ropes to pass through and to allow for the swaying of the rope. In order to minimise the leakage of air through these holes, there was aboard, 14 inches square and two inches thick, with a 3 inch hole through which the ropes passed over each. The loose board allowed the rope to sway. It was not realised that this could be dangerous by anyone at the colliery.

The winding ropes were 1 inch in diameter made of Elliot's lock steel and consisted of 92 wires. The breaking stain was 42 tons when they were new and the ordinary working load was 4 tons and at the time of the accident, 38 tons to two tons with the eight men in the cage. The rope had been in use for two years and four months and immediately after the accident, a section, take as near as possible to the break, was taken and sent to Lloyds Bute proving house at Cardiff where the breaking strain was found to be 36.5 tons. When opened, the rope was clean and without any signs of corrosion and showed no undue signs of wear, even after it had been working for over two years.

The winding engine had two cylinders and the diameter of the conical winding drum was 12.5 to 14 feet. the pulley was 14 feet in diameter and ran truly on it's axle which was 7 inches in diameter. The trough was suitable sized for the rope and the lead from the

pulley to the drum, 95.5 feet was good as was the lead from the pulley to the cage. The centre of the pulley was 60 feet above the top of the shaft. The engineman had been working the engine for over three years and had been on duty all day and was regarded as a reliable man. He stated that the accident occurred when the ascending cage had passed the descending cage and he still had the steam on and the cages were running at full speed. The first thing he noticed was a noise and the engine running away on the loss of the load. He immediately put on the brake and shut off the steam and succeeded in stopping the engine within four or five strokes. He said there was about 18 inches of slack on this rope and when at the bottom and he came away steadily, feeling the weight of the load before starting to run up the shaft. The Inspector commented that he did not think that the slack winding was necessary but it had nothing to do with the accident.

Those who died were-

William H. Strong aged 42 years,
William H. Strong aged 20 years,
James Lloyd aged 26 years,
James Parsons aged 27 years,
John Edward Price aged 21 years and
Grantley Rudge aged 21 years, all colliers and
John Strong aged 16 years and
William T. Hawkins aged 17 years, both collier's boys.

The cages had three thimbles or shoes attached to the top and bottom bands of each, through which the wire rope guides passed. As an additional precaution in order to prevent the possibility of the cages touching when they passed at the meetings, there were two 2 inch wire ropes suspended between them to act as rubbers or fender off guides. There were various byatts or beams in the shafts to carry steam pipes and the stages at the various mouthings with sufficient space for the cages to pass without touching. Close and careful examination of the bayatts and the cages indicated that they had not been touched and it was concluded that the accident did not occur by the cage striking anything in the shaft.

Upon examination of the pulley there was a distinct mark which indicated that some wood had been squeezed into the trough as well as indications from that point on the grease, that the rope had climbed over the flange on the side of the trough and there was a mark on the gudgeon of the pulley which showed that the rope had dropped on it with considerable force. The speed at which the engine was running it was possible for this to cause the rope to break. There were also indications on the roof of the tower that the rope has sawn its way through the planks to take the line of the gudgeon instead of the circumference of the pulley. The board that had covered the holes was found, broken, near the corner of the engine house evidently having been carried over the pulley by the rope.

Since the accident there were similar cases but without fatal results at the Dowlais, Ferndale and Company, Colliery and a fatal case at the Harris's Navigation Colliery in 1892. The Inspector commented-

"The precautions for preventing such an occurrence are of the simplest and most inexpensive description, so that no possible question of cost can be imported into the matter. It had simply been that danger from this source never occurred to any person connected with the place everyone considered that the weight of the board itself would suffice to prevent what has occurred."

DEEP NAVIGATION. Glamorganshire. 11th. November, 1902.

The colliery was the property of the Ocean Coal Company, Limited and five men lost their lives and two others were injured in the accident which occurred in the South Pit

which was 690 yards deep and sunk to the Four Feet seam which was the downcast shaft. It was the deepest pit in the district at that time. The shaft was 17 feet in diameter and was fitted with steel guide rails, two to each cage, which were supported by 'byatts' which were fixed in the walling.

Water was raised in the shaft by a Cornish pumping engine which had a cylinder of 100 inches in diameter, an 11 feet stroke in the house and 10 feet in the shaft. The water was raised from a depth of 665 yards in seven lifts. The first lift had a 26 inch plunger and lifted it 80 yards, the second lift also a 26 inch plunger lifted 90 yards, the third lift with a 26 inch plunger lifted 100 yards, the fourth lift with a 22 inch plunger lifted 99 yards, the fifth lift with a 22 inch plunger lifted 95 yards, the sixth lift with a 10 inch plunger lifted 95 yards and the seventh lift with a 10 inch plunger lifted 92 yards. The engine worked at two stokes per minute, day and night and delivered 250 gallons of water per minute to an adit level, 28 yards below the top of the shaft. The column of pipes in which the water was lifted was constructed of cast iron. Each pipe was 9 feet long, flanged at both ends, 26 inches in diameter and one and three quarter inches in thickness. the pumps and pump rods were placed behind the 'byatts' carrying the guide rails.

Coal was raised in this shaft with a two-decked cage, each carrying two trams containing 22 cwts. Thirty two people were allowed to be lowered and raised in each cage, sixteen in each deck.

On the 11th. November, 1902 at about 4.45 p.m., 31 men were being raised and were within 300 yards of the surface when the banksman heard a crash and noticed the winding rope swaying very much. He signalled the engineman to stop at once which he did as soon as possible but not before the cage was raised a further 100 yards. The engine was travelling at full speed and it would have been dangerous to stop it too quickly. The pumping engineman was standing near the handles of the pumping engine, when he heard the banksman shouting him to stop and a noise in the shaft. He noted that the engine was beginning a down stroke when he stopped it.

Mr. Ray, the agent and Mr. Roberts, the mechanic were quickly on the scene and lot no time in finding out what had happened. They went down the North shaft to a landing in the Brithdir seam, in which there was road from one shaft to the other and from there they were able to communicate with the men in the cage which was about 30 yards higher up the shaft. The men replied that they were all right but afterwards it was found that the reply was made by the men on the lower deck who were not aware of the serious state of affairs on the upper deck.

Shortly afterwards the mechanic and the pitmen descended the south shaft in a box which was lowered by a capstan engine and found that four of the occupants of the upper cage were dead. It was first thought that this was the number killed but an overman found the body of another in the sump. he had fallen or been thrown out when the cage was struck. On further examination it was discovered that apiece of the third pipe from the bottom of the second lift had burst and had fallen on top of the ascending cage. All the men, dead and living were taken up the pit in a box and attended to at the surface by medical man.

Although the top of the cage was smashed in and two of the bridle chains attaching the rope to the cage were broken, the cage was found to be in the guides. The damage had been done by a falling pipe, part of which was in the cage.

Those who lost their lives were-

J. E. Davies aged 34 years, collier,
Llewellyn Davies aged 20 years, haulier,
Cyrus Jones aged 20 years, haulier,
D.J. Hughes aged 20 years, haulier and
Owen Griffith aged 23 years, repairer.

Mr. Gray was summoned by telegraph and arrived at the pit the following morning and made a detailed inspection of the shaft and cage, and pumps. he found a piece of metal

about 6 feet long that had burst out of the third pipe from the bottom of the second lift. The fracture was quite fresh and there were no signs of corrosion. The pumps and pipes had been put in the shaft about 28 years before the accident and had been continuously worked since then.

A new section of pipe was put in and the pumps started and it was found that there was nothing wrong with the pumps and they worked as they always had. Mr. Gray thought there was possibility that water and air might have been drawn into the barrel and pressures could have been generated which were sufficient to fracture the pipe when the plunger struck the water.

The inquest was held before Mr. R.J. Rhys, Coroner and a jury on the 20th. November and the following verdict was returned-

"We find that death was due to misadventure, and also that there is no blame to be attached to anybody."

After the accident the pumping engine was stopped when men were being raised or lowered.

ALDWARKE MAIN. Rotherham, Yorkshire. 23rd. February, 1904.

The colliery was the property of Messrs. John Brown and Company, Limited. The No.2 Parkgate shaft at the colliery was used exclusively for raising and lowering men to the Parkgate inset, 406 yards from the surface. It was an upcast shaft and an outlet for exhaust steam from the hauling engines. At about 5.20 a.m., eight men were being lowered in the top deck of the cage and when they were about 50 yards from the bottom, the winding rope snapped at a point six yards below the surface. The cage fell 400 yards to the bottom of the shaft. One man was killed on the spot and five died shortly afterwards after being liberated from the tangled mass of steel that was the cage. Two died the same day in Rotherham Hospital. the eight man, Arthur Ramsden, recovered after some months in hospital

The rope was three and a half inches in circumference. It was examined at 3 p.m. on the day before the accident by the appointed examiner and reported to be all right. It had been in use for 18 months and the breaking strain should have been 56 tons and the working load about five and half tons and the weight on the rope when it failed was three tons seven and a half cwt.

Those who died were-

Martin Marsh aged 46 years,

Mark Dyson aged 41 years.

Peter Rockett aged 54 years and

Thomas Ramsden aged 55 years, all colliers and

Henry Wright aged 36 years, W. Downing aged 30 years an

Albert Kent aged 26 years, all trammers.

The inquest into the men's deaths was held on the 25th. February for formal identification and resumed on the 3rd. March under the direction of Mr. J. Kenyon-Parker, Deputy Coroner, at the Station Hotel, Aldwarke. It was attended by Mr. W.M. Gichard who represented the owners and Mr. J. Raley who was instructed by the Yorkshire Miners' Association and appeared for the relatives of the deceased.

E.W. Thirkell, the manager of the mine, said he heard of the accident before 6 a.m. and immediately went to the place. He could see that the rope was broken. The cage was on the low landing with the lower deck telescoped into the top deck. The rope was made of improved plough steel and was installed on the 14th. August, 1902. The rope was replaced after two years use and then used as a haulage or balance rope. During he last

nine years no rope had worked for longer than two years. The total number of draws in the shaft was a bout 134 in 24 hours, 67 for each cage. The ropes were examined every day and he said that there was steam in the shaft and the pit water was slightly salty.

John Walker was the winding engineman on duty hen the accident occurred. he had gone to work at 4 a.m. and had worked at the colliery for 28 years and had learned to wind 35 years before. He was letting down the third cage load of men at the usual speed and shut off the steam before he had got half way down. When the cage was about six revolutions off the bottom he reversed his level to pull up. At about four revolutions the cage came to a stand still for a moment and the ascending cage began to descend. The broken end of the rope came over the engine house. He had tried the ropes before he began winding the men and had found everything all right. he swore that there was no sudden application of the brake and in fact he had not used the brake at all before the accident.

Thomas Brameld told the court it was his duty to examine the drawing rope and he had inspected it at 3 p.m. The inspection took about 10 minutes. He examined it by holding a piece of rubber and letting the rope run through. Sometimes they put callipers on the rope and there had been a slight reduction in the diameter due to wear.

The rope was examined by experts and John Edward Stead, F.R.S. who practised as a metallurgical chemist in Middlesborough and he did not think that there was any fault in the rope but that the accident was caused by a sudden strain being placed on it and W.H. Pickering, Chief Inspector of Mines in the York and Lincoln Districts thought the rope had been weakened by internal corrosion which was probably hidden. He expressed the opinion the winding ropes should be re-capped every six months.

The jury returned the following verdict-

“That the deceased lost their lives through the breaking of the rope whilst descending the Parkgate shaft, but there is not sufficient evidence to prove the cause of the rope breaking and the jury further recommend that the ropes in the upcast shaft be more frequently changed.”

BURNEYAT'S NEW SINKING. Ynysddu, Monmouthshire. 13th. August, 1904.

The accident occurred in a sinking pit, which was known as the West Pit, and was the property of Messrs. Burnyeat, Brown and Company, Limited. It was in the Sirhowy Valley, between Ysysddu and Nine Mile Point.

Two pits, the East and West Pits, were being sunk with diameters of 21 feet inside the walling, to the Black Vein Seam of steam coal between two well known faults, the Merthyr Vale or Pengram and the Risca which run down the valley. At the time of the accident, the East shaft was sunk to 230 yards and the West shaft at a depth of 172 yards. There were 17 men working at the bottom of the West shaft which was walled with 12 inch brickwork to within about five and a half yards of the bottom. As the fault had been met, the men were engaged in preparing a bed for another wall walling curb in order that this length could be bricked up and made secure for the resumption of work on the following Monday. A previous length of walling, anout 13 feet was built on ground that was not good. The curb on which it was built had two iron plugs in the ground that would hold them and the remainder of the curb was supported on props.

One side of the shaft was cut through a fault the two walls of which were about four and half feet apart. The list or leader, the intervening space, was composed of soft shale, which, when water got to it, was washed away. The result was that suddenly and without any warning, the first fall occurred carrying away almost the whole of the last length of walling and fell on the 17 men at the bottom of the shaft. One man noticed something and as the bawk or kibble was leaving the shaft bottom he jumped in and on reaching the surface, he gave the alarm.

The foreman sinker, with others who were close at hand, immediately and were soon followed by the manager and further assistance. Nine others were rescued but while work

was going on to get to others who were alive and were talking to the rescuers, there was second fall and the men had to go up in the kibble. This fall carried away about 6 to 7 yards of the next length of the walling.

It was too dangerous to make further descents to recover the men at the bottom of the shaft who were now presumed to be dead. Falls continued until the cavity reached a height of 18 to 19 yards from the bottom. Steps were taken to secure the sides and this involved the shaft being filled to within 6 feet of the top of the fall so that men could have a solid footing to work on while fixing a heavy baulk framing across the shaft. The frame rested on the walling at one end and the other on the floor wall of the shaft and was hung with chains and plungers. When this was completed, the shaft was filled out to allow for another framing to be put lower down. Cogs were inserted and temporary walling built and the bodies were recovered on the 28th August.

Those who died were all sinkers-
William Everson aged 21 years,
John Gabb aged 21 years,
William James aged 28 years,
Joseph Norman aged 36 years,
William Ridout aged 30 years,
Samuel Wall aged 24 years and
Thomas Richards aged 47 years.

Among those rescued were:-
William Davies aged 43 years.
John Horne aged 48 years.
David Jones.
Evan Jones aged 24 years.
Martin Jones aged 42 years.
Christopher McQuirk aged 41 years.
James Perks aged 33 years.
Mat Smith aged 41 years.
Thomas Thomas.

Mr Martin, the Inspector commented-

“Three or four of the ten men who escaped were more or less seriously injured, and the rest had marvellous escapes. The rescuers fully maintained the noble characteristics of miners who are at all times ready at risk to themselves, to render help to their comrades in danger. Great credit is also due to the mining engineer or agent, the manner, foreman sinkers and others employed for the safe and successful manner in which the work of securing the side of the shaft and working their way down to the bottom was carried out. It was an exceedingly difficult and dangerous piece of work and was effected without injury to anyone, showing that it is not always at the really dangerous undertakings that accidents occur.”

BOLD. St.Helens, Lancashire. 20th? January, 1905.

The Bold Colliery was a few miles outside St.Helens and owned by the Collins Green Coal Co. This was one of those dangerous occurrences that follow miner's lives and resulted in the deaths of five persons and thirteen others, mostly young people, received injuries and they were all very shocked.

The day had not started well at the colliery. The morning was bleak and cloudy with a bitter east wind blowing. There had been an accident that morning when the rope got off the pulley while winding dirt and in consequence the men were late in being lowered to their work. There was a big crowd of workmen at the pit head waiting to be lowered.

The day shift commenced at 6 a.m. and the men assembled at the mine and they went down to their work about 5.50 a.m. On the ninth cageful of men was being lowered when the accident occurred. The winding engines were in the charge of James Fowler, who had only been employed at the colliery about a month, and came from the Wigan district.

The cage, in which there were eighteen persons in the two decks went down the usual way but it soon became evident to the occupants that something was wrong by the speed at which they were travelling. In the ordinary course of events it would have stopped at the mouth of the Yard Mine which is about 500 yards from the surface. There was a platform made of balks of timber, but instead of stopping, the cage crashed into the platform and sped down the shaft until it was stopped by a stronger platform 30 yards further down.

This platform had been used in sinking operations which had recently been completed and fortunately been left in position, otherwise the occupants of the cage would have gone into the dib hole contain 30 feet of water and been drowned. The impact of the cage with the scaffold was terrific and the state of the occupants of the cage pitiful. Their lamps had gone out and the dark added to the terrifying position.

Mr. G. Thompson, the manger of the colliery was on his way to the colliery at the very moment of the accident. He saw the lights on the pit brow go out and he knew something was amiss and hurried to the scene. He at once directed the operations to recover the men. One youth was found under the cage terribly mangled and it would seem that he had tried to jump clear of the cage and it had crushed him to death if he had not already been killed by the fall. Some of the other men were passed all human aid and these were removed to the Cock Face Inn at Bold pending an inquest.

Meanwhile the news of the disaster was going round St. Helens and local Doctors Jackson and his assistant, Dr. Tough, Dr. Bates and Dr. Casey arrived at the colliery as the fourteen injured men were brought to the surface. All was done to relieve their suffer as was possible and they were taken by colliery ambulance and Dr. Bate's car to the St. Helens Hospital where their injuries were attended to.

It was seen at once that a youth, John Mcavenny, was in a serious condition. He had a compound fracture of the skull and a fracture of the leg and other injuries. Every effort was made but he died about an hour later.

The following were killed:-

John Mcavenny aged 14 years, of 14, Mercer Street, Burtonwood,
John McHenry aged 14 years, of Choral Cottages, Collins Green,
John Swift aged 24 years, of 69, Romford Street, Parr,
Thomas Rothwell aged 14 years, of 19, Fairclough Street, Burtonwood and
Evan Davies aged 19 years, of Francis Street, Sutton.

Those injured were:-

Thomas Bradshaw aged 15 years of, 5, Penny Lane, Collins Green, who had a fractured of right thigh, damage to right eye and general bruising. He was also believed to be suffering from internal injuries and his condition was very serious,
William Rigby aged 17 years, of 18, Houghton Road Sutton. He had a severe scalp wound, a wound to the left leg and general bruising,
Edward Rattigan aged 26 years, of 6, Moss Nook, Sutton. He had a serious cut over right eye and sprain of right knee,
Aaron Grant aged 16 years, of Collins Green Villas. He had injuries to his back, sever bruising and cuts about the head,
John Jarvis aged 17 years, of 117, Derbyshire Hill Road, Parr. He had bruises about the face and injuries to the back,
Edward Hughes aged 18 years, of Ashcroft Street, Parr. He had injuries to the back right eye and right knee,
Richard Murray aged 36 years, a married man of Four Court, Moss Street, Prescot. He suffered injuries to back general bruising and sprain of left leg,

Harry Eden aged 14 years, of 79, Derbyshire Hill Road, Parr. He had a scalp wound and general bruising,
Arthur Hardy aged 19 years, of 96, Houghton Road, Sutton. He suffered a cut over right eye, damage to left shoulder and general bruising,
Frederick Pye aged 50 years, of 54, Brunswick Street, Derbyshire Hill, Parr. He had a dislocation of left knee and general bruising,
John Eden aged 15 years, of 79, Derbyshire Hill Road. He had a fractured thigh, a severe cut over right eye and brushing,
James Rothwell aged 17 years, of 19, Fairclough Street, Burtonwood, had general bruising and sprain to left leg and
David Rothwell. A married man, of 65, Judson Lane, Sutton had an injury to the back and right hip and general bruising.

Apart from the damage to the descending cage and the people in it, the engine house was also severely damaged. The ascending cage went up into the headgear and the Ormrod detaching hook held it. The winding rope then flew off and the top of the enginehouse was demolished, breaking beams. Everything tumbled into the enginehouse but the engine was not damaged. The damage to the shaft kept the four to five hundred men out of employment for some days until it was repaired.

Mr. Thompson and Mr. Fairclough, the managing director, Mr. Wall, consulting engineer and Mr. Hall, the Government Inspector all made a full inspection into the circumstances in which the accident happened. Mr. J. G. Thompson, the manager of the colliery for many years, was appalled to see what had happened and was very upset that such an appalling thing could have happened at the colliery. As to the cause of the accident he could only attribute it to forgetfulness on the part of the winder.

The news of the accident spread quickly and despite the cold, there was soon a gathering of people at the pit bank. Most of the men and boys lived in Parr and Sutton and there was great anxiety as to whether they were in the fatal cage.

James Rothwell, a youth aged 19 years was the brother of Thomas. There were many distressing scenes at the colliery. Only two of the injured were men, the others were boys and youths engaged in pony driving. Rothwell and Mcavenny attended the evening school conducted by Mr. Gawthorpe.

It was felt by the workforce that the accident could have had something to do with the hours that were worked by the engine winder. At the colliery, the winder worked thirteen hours on the night shift and eleven hours on the day shift. In Staffordshire, eight hour shifts were worked which was considered enough for men engaged in such responsible work.

At the Bold colliery, the night shift winder would go on at 5 p.m. on Sunday night and work until 6 a.m. on Monday morning. This accident happened few minutes before the end of the shift. The work men were alarmed that a box had been 'pullied' and driven up into the headgear that morning and it was thought that this might have effected the engine man's nerves. It was thought that the winder was not accustomed to take sole charge of the winding but that he had always had another man with him. The colliers certainly have a strong opinion that there should be two men.

Some of the men feared an accident on that morning. When the first accident occurred they waited on the landing to see how the next cage would come down. Comment is also made of the fact that there were eighteen men in the cage when sixteen was the recognised number but as some were boys this was the usual when there was a rush of men to go down.

The men who were waiting on the pit bank waiting to go down were terribly affected by the accident. When the cage reached the bottom the men were heard screaming and shouting as everyone knew, as experienced colliers always do know, that the descent of the cage was out of hand. Some of the men fled from the shaft and there were pitiful scenes. One man had a relation in the cage and ran home and never looked back. The

accident took place in the No.3 pit which is one of the deepest in Lancashire there are only two others that are deeper one being at the Rose Bridge Mine in Wigan.

The gearing was thrown out of order by the accident and the men were brought up out of No.2 pit. All the men at the colliery stopped work and no others went down. Much credit was given to the medical men who gave prompt assistance at the scene. Dr. Jackson who lived the furthest away at Cowley Hill, was the first on the scene with in an hour.

The inquest was held at the Clock Face Inn under the County Coroner Mr. S. Brighthouse. The roads were frozen and covered with snow and getting to the inquest was a matter of difficulty. Proceedings took place in a quaint low room hung with fitches of bacon and other victuals and no less than twelve old guns of various descriptions.

The colliery was represented by Mr. Peace and Mr. J.G. Thompson the general manager. Mr. Pennington Riley appeared for the relatives. The Coroner asked Sergeant Turner the Police Officer, where the winder was and he said that he did not know. He had been warned to attend but he could not be found. His name was James Fowler and the Coroner said that it very important that he be there. His address was given as 2, Brunswick Road, Earlestown but he had not been seen since the accident.

Evidence of identification of the victims was heard and John Swift of 69, Romford Street, Parr, identified son John, Caroline Williams her cousin Evan Davies, Isaac Rothwell of Fairclough Street, Burtonwood his son Thomas, Patrick McHenry of Coral Terrace, Collins Green, John McHenry and John Mcavenny of 83, Mercer Street, Burtonwood his son. Miss Olds of the St. Helens Hospital said the Mcavenny was admitted at 7.30 a.m. and died at 9 a.m.

At this point there was adjournment and the inquiry continued at St. Helens Town Hall on Friday 27th. at 9.30 a.m. The proceedings resumed with a statement of sympathy from Mr. Peace of behalf of the Company.

The funeral of John McHenry of Collins Green took place at Burtonwood cemetery on the same day. The Reverend Davies conducted the ceremony at the graveside and blinds were drawn at every window where the funeral passed. The procession was seen from near the Council Schools where the pupils were assembled by Mr. Gawthorpe, on each side of the road with bare heads. Father Ainscough delivered a short address t the graveside. Davies and Swift were buried on Friday at St. Helens and Rothwell and John Mcavenny were buried at Burtonwood cemetery.

James Fowler, the enginewinder of 2, Brunswick Street, Earlestown, gave his evidence to the inquiry. He had been engaged as a winder for sixteen months by the Collins Green Company since last February. He had previously been at the Moss Hall Colliery, Wigan for thirty years during which time he had been winding fourteen or fifteen years. There were double engines at all the pits and he had replaced a man named Cook but did not know why he had taken his place.

He 'pullied' the first time on the day of the accident when six empty and six full boxes were being wound. He ran the cage to the bottom of the top deck below the landing place, about half a yard and then stopped and had to go back again. Thinking he gave it steam and the cage went up. The damage was repaired about 5.25 a.m., when the men were assembling to go down. There was a standard indicator on the engine and he had not previously been used to working without a dial.

When the accident happened, he shut the steam to quarter way and then shut the steam off and allowed it to run half way. He then put the reversing lever on. Realising that she was running quickly, he put 'steam against her but still she ran' and the impact occurred.

The Coroner asked that when he thought it was running too quickly he lost his head and gave it some steam instead of shutting it off and the witness replied that he did not. Mr. Brighthouse said that the engine had been examined and nothing was found to be wrong with it. The very best men make mistakes that does not make them unreliable, "Do you think that you unwittingly put on steam?" he asked. "I can not account for the engine running away. I did my best to stop the engine." replied Fowler.

In reply to Mr. Henry Hall, the Inspector, the witness stated that he came to work about 9.10 p.m. and had been at work on Sunday until 1 p.m. He found the reversing of the engine difficult and the brake was of the type very much used in Lancashire and acted on both sides of the drum. He had seen this type of indicator many a time. It was rather an old fashioned one and he did not make any complaints about the indicator. He was asked if he had had any mishaps while at Moss hall and the Coroner said that they had better clear this up now as there were all sorts of rumours going around as Fowler was involved in a incident at that colliery.

In reply to a question about the brake on the engine, Mr. Glover, the Miner's Agent, said that the brake would not hold the cage and it would not stop the cage when it was going at full speed unless the steam was reversed. Fowler was asked if he had possible made a mistake. He said that when he 'pulled' earlier in the shift he had smashed the brake.

Llewellyn Spurling had stated that he had let men down. He felt the engine go quicker and he tried to pull it back and the engines did not pull up and it did not seem to have any effect at all. The Coroner said that of this statement was correct then it would stop us going further. If you did through forgetfulness then why don't you say. "I am telling the truth. Sir", said Fowler.

Spurling said that he had been a enginewinder at Collins Green for eighteen years and in charge of engines for thirteen years and he had never found any defects in this winding engine and had never noticed that the brake was inefficient. He thought it was quite capable of holding the cage.

Fowler said that Spurling had said that the brake was 'not fit for snuff'. He told him that he should work the reverser and the foot brake and nit to trust to the foot brake with engines of this kind. Spurling had once 'pulled' but that was two years ago and he had instructed Fowler. The latter was on the night shift. The question of the brake was questionable since the cage had gone 140 yards beyond where it ought to have stopped.

The Winding Society had campaigned for compulsory steam brakes to be fitted to all engines. Thomas Cook, a farmer of Burtonwood, and former winder at the colliery said that he had had ten years experience with this kind of engine. His explanation was, that as they were going down, Fowler had tried to reverse the engine, which was difficult, and failed to do so.

Mr. John West, the engineer at the colliery, and a joiner by trade said that he was in the engine house when the accident occurred. He could not say that Fowler reversed the engine. The first thing that he knew was a tapping on the enginehouse and he shouted at Fowler, "For God's sake shut the steam off". The brake, in it's day was thought to be the best kind but now there were better brakes on the market.

Obidiah Harrison underground manager of the No. 2 pit sated that about 5.40 a.m. a man came to him and told him that the cage had gone down. He went to the bottom and found that three boys there, two of them dead and the other injured. He found the others, and held them until assistance came, for fear that they should fall further. They were all seriously injured but the boy found under the cage was dead.

Mr. Edward Burleigh, a mechanical consulting engineer, of Manchester was called by Mr. Wilson to report on the results of the tests he had made in the colliery and described the brake as 'inadequate'. He said he would not care to be let down the shaft relying on that brake. He also said that the engine was difficult to get into reverse gear since it tended to stick in the middle.

Mr. Hall had inspected the machinery and he found no fault with the indicator but when using big engines in this way he thought that there should be a steam brake. He thought that the Colliery might do something in future.

The Coroner surmised that the calamity was due to either to the negligence of the winder or the inadequacy of the machinery or both. The record of the colliery was favourable since there had been no accidents for along time with the winders but in his opinion Fowler was trying to overtake the work that had built up from the previous

accident. He had every sympathy with the man and every enginewinder in Lancashire was always one moment of forgetfulness could cause an accident.

The jury brought in verdict of 'accidental death' and added a rider that steam brakes should be used in future in such large engines. They did not attach any blame to the enginewinder.

Following the disaster there were claims for compensation under the Workmen's Compensation Act. Dr. A.P. Thomas, the Deputy Judge at the St. Helens Court dealt with the claims under the Act.

Patrick McHenry of 12, Choral Terrace, Collins Green claimed £150 for the loss of his son. John Mcavenny made a similar claim for the loss of his son John and Isaac Rothwell of 19 Fairclough Street claimed for his son Thomas.

The first case was on behalf on Thomas Rothwell the only question was to what extent the parents were dependant on him. They were paid £20-8s by the Court. At the time of the accident, the family consisted of ten persons and the calculated income for the house was 32/7d per week and divided by then this gave 3/3d per head taking 3/3d from 7/7d the deceased owed his parents what was left 4/4d and to that extent the father and mother were dependent on him. This worked out over 156 weeks at the sum of £3-10s which was claimed.

All the claims with respect to the accident had been dealt with the exception of these and the Company said that they would pay the claim since a few pounds did not make much difference to the Company.

Mr. Smith heard that funeral expenses could not be allowed as these had not fallen upon the relatives. The first case he awarded £23-4s. and the second £25 and costs were made £19-3s, which was similar to those of the first claim.

ELBA. Gowerton, Glamorganshire. 21st. January, 1905.

The colliery was the property of Messrs. Baldwins, Limited who owned several other collieries in the Swansea district. it was a small colliery on the southern outcrop of a seam which was locally known as the Three feet Seam which together with the Six Feet and Five Feet which were above and the Two Feet below had been worked in the neighbourhood for many years. The coal was bituminous and was used in the Company's steel works. The seams lay a considerable angle and were worked by the means of slants. The slant where the explosion took place was stated a few years before on the Three Feet Seam which was worked until 1903. Since then, the workings had been confined to the Six Feet Seam which was won by continuing the slant at a lesser dip than the gradient of the dip of the strata until the seam was reached. The slant was then driven into the Six Feet Seam and working developed on each side. The workings were levels at intervals of 40 to 50 yards out of which topholes were driven at intervals of 18 to 20 yards to the full rise which was about 18 inches to the yard.

In working the Three Feet Seam, naked lights were used but since the Six feet had been opened only safety lamps were in use. The lamps were bonneted Clanny type usually termed Cambrian bonneted safety lamps and were locked by means of a screw. Mr. Robson, the Inspector for the District, thought that this system of locking lamps was unsatisfactory and lent itself to tampering with lamps.

Explosives were not used in the colliery except in drifting through hard ground or cutting through faults. There was no blasting on the day of the disaster. The roof and floor were soft and there was great difficulty to get any height in the roads, so the height off the tophole, which was four feet at the face when newly cut, was soon reduced to half that height. On the levels, sufficient height for the trams to pass, was maintained by removing some roof or floor but, as the trams were not take to the topholes, these were allowed to remain narrow and closed up when finished. This meant that sometimes before a tophole had been driven 50 or 60 yards, a slice, called a 'skip' had to be cut from one side of an adjoining pillar of coal to permit a passage of the coal from the tophole. The coal slid

down these 'skips' or was drawn by lads calls 'coal shifters'. These were the conditions in an inclined seam which produced firedamp and added to the difficulty of providing adequate ventilation where it was most wanted, at the faces of the narrow working places which were working to the full rise.

A Waddle fan at the mouth of the upcast slant produced the ventilation and the last measurement before the explosion was given as 17,566 cubic feet per minute by Herbert Griffiths, the certificated manager. The main slant, which was the intake airway, was 700 yards long and dipped at about 18 inches to the yards. The inspector thought the distribution of the ventilation satisfactory as the current a taken to the lowest point on the main slant and there it was split with an equal portion going to each side, the No.7 East and West. From the workings in these levels, the air passed upwards into the No.6 East and No.6 West, ventilated the workings and the topholes to the rise of them before the two slits joined and passed up the return slant to the fan. The ventilation of all the places on the inbye side of the last 'holed' topholes was effected by means of canvas pipes, 18 inches in diameter and fully extended by rings that were fitted at intervals. This was a common method in steep workings and in others where with a bad roof where it was difficult to erect brattice. When the distance is great for the air to be carried in this way, it was necessary to erect close-fitting doors or sheets on the outer ends of the pipes and this restricted the flow of air.

The working places in a colliery like this one were limited and there was an inducement to work the double-shift system which was the practice in this colliery. The day shift started at 7 a.m. and finished at 4 p.m. and the night shift started at 9.30 p.m. and finished at 6.30 p.m. A repairing shift started at 2 p.m. and finished at 9.30 p.m. and this overlapped with the coal-getting day shift by two hours. On pay-days, which were alternate Fridays, the day shift followed the day shift without any interval. Between 47 and 50 men were employed on each of the coal getting shifts.

Four or five hours before the explosion, the No.7 West level, which was 68 yards long and included Nos. 4, 5 and 6 topholes depended on 'piped' air. To get the pipes reduced, it was decided on the previous shift to push on with the No.4 tophole. this was the outer unholed tophole and it was decided to get it holed. William Henry Jones, the day fireman, took it upon himself to stop the No.5 tophole. He crossed it off and throttled the air pipe which was there to ventilate it. At the inquest, he said he did this to, "*send more air to the No.4 tophole.*" This resulted in No.5 quickly filling with gas which was found by the night fireman, John Davies, within four feet of the level when he made his examination just before the night shift commenced.

It had been arranged between the two firemen, that as soon as No.4 was holed, a wooden door was to be fixed just inside No.4, which would take the place of a canvas sheet then outside the No.3 tophole. On Friday 20th. January, which was a pay-day, the night shift of about 48 persons went down the pit at 5 p.m. During the first hours of the shift, Davies kept the men out of the No.6 tophole and the level and directed the efforts to get No.4 held. This work was completed about 7 p.m.. After that, he told two roadmen, John Long, who was killed in the disaster, and Thomas Bevan to do the work which was completed about midnight. While the door was being erected, the men worked in the No.6 tophole and the level and there was traffic from these places as well as the No.4 tophole.

When the door was finished, Davies told the two men to cut off the pipes outside the door. He pulled down the brattice sheet outside the no.3 and then left the place to go to the No.7 East. The shift had almost finished when the explosion took place. The exact time was not known but it was between 12.30 and 1 a.m. on Saturday. Within half an hour, when he was returning, he felt a rush of air and arrived at the entrance of No.7 West and found the air still full of smoke. He entered the level and found several dead and dying men and with men from the No.7 East, did everything possible to rescue the men.

With the exception of three men known to be in the No.3 tophole, all the others were speedily recovered. A large fall had occurred in this tophole and the last three bodies were not recovered until the following Wednesday. They had been buried by the fall which had been brought down by the shock of the explosion. All three were badly burned. The eight

others who had died and four out of the five injured were found in or near the No.7 West, one of the injured in the No.6 West at the top of the No.3 tophole where he was building a stopping to check the air from returning by the shortest route.

Six of the victims were killed on the spot and five others who got out alive died later of their injuries within a few days. Of the remaining 36 or 37 in the mine, five were seriously injured or burned but these recovered. at least 31 in the mine when the blast occurred escaped injury and four of them came from the extreme end of the No.7 West, to which the explosion was confined.

Those who lost their lives were-
William Davies aged 60 years, collier,
David Davies aged 26 years, collier,
Edward Rees aged 26 years, collier,
Thomas Pratt aged 18 years, coal shifter,
George Rees aged 32 years, trammer,
W.H. Morgan aged 20 years, trammer,
George Williams aged 14 years, door boy,
Alexander Ogilvie aged 20 years, trammer,
William Bowen aged 18 years, coal shifter,
David J. Rees aged 21 years, trammer and
John Long aged 49 years, repairer.

The inquest took place on the 10th. February and the 4th. March. Mr. Robson came to the conclusion that the explosion occurred on or near the level of No.7 West, inside a door which had been fixed in this level during the shift. In the Inspector's opinion the primary cause of the explosion was defective ventilation. Firedamp had been reported by the firemen on six occasions in the previous three weeks and it was clear that the amount of air going to the No.7 West on the day before the explosion and the places inside the No.3 tophole filled with gas.

A grave error of judgement was made in allowing men to work in the No.7 West except the work that was absolutely necessary to improve the ventilation and the Inspector thought that there should have been no coal getting in No.6 West as the two ventilation systems were linked.

There was no direct evidence as to how the gas was ignited but it was not thought it fired at a lamp as they were recovered and found to be in perfect order but pipe tobacco, some matches and two implements for opening lamps were found belonging to the dead an injured. There was indicipline in the mine and it was thought that the ignition was caused by exposure to a naked light.

CAMBRIAN. Clydach, Glamorganshire. 10th. March 1905.

The colliery was at Clydach Vale, near Llwynypia and was owned by the Cambrian Collieries, Limited. There were three shafts Nos.1 and 2 were the downcast shafts and No.3 the upcast. No1 was 16 feet in diameter and 509 yards deep, No.2 15 feet in diameter and 425 feet deep and No.3, 21 feet in diameter and 524 yards deep. There were two landings in No.1 shaft, one at Six feet and the other at the Coronation Seam. The drum of the winding engine was 16 feet in diameter for the Six feet Seam and 20 feet in diameter for the Coronation Seam. Nos.1 and 2 shafts were sunk in 1875 to the six feet Seam which was the only seam that was worked for 15 or 16 years. in 1891, No. 3s haft was sunk to the Coronation Seam which was intersected at a depth of 520 yards. No 1 was the deepened to the same seam. the coal from the Six feet and Coronation Seams were worked from Nos.1 and 3 shafts and the Red Vein Coal from No.2 shaft.

The Six feet Seam, had an average thickness of six and a quarter feet and had proved to be free from faults over a great area. The Coronation Seam was six feet thick and all the coal that was produced was steam coal.

The agent for the colliery was Mr. Leonard Llewellyn who had held the position for five years. Mr. David Davies was the certified manager of No.2 and Mr. Trefor Price the manager of the No.1 and 3 shafts. Both men had held the positions for nearly four years. Mr. James James was the undermanager of No.2 and Mr. Morgan Davies the undermanager of Nos. 1 and 3 shafts.

There were usually 3,424 persons employed underground in the three seams and 385 on the surface. Only the workings in the Six Feet Seam of No.1 shaft were affected by the explosion. The ventilation was produced by an improved patent Waddle fan, 35 feet in diameter which was erected in 1901. It was worked by a compound condensing steam engine with cylinders of 22 and 36 inches diameter and a 3 feet stroke with an ejector condenser attached. The steam pressure was 120 lbs. per square inch and the vacuum produced was 12.5 per square inch. When the fan was running at 79 r.p.m., 348,000 cubic feet of air per minute circulated through the mine at a water gauge of 4 inches. The air was well distributed and the seams were well ventilated.

A Schiele fan, 21 feet in diameter, with duplicate engines with 36 inch diameter cylinders and a four and half feet stroke was connected to the upcast shaft and could be put into operation in a few minutes. Of the 348,000 cubic feet of air, 75,625 cubic feet per minute passed into the workings of the Six Feet Seam. There were four ventilation districts within the meaning of the Coal Mines Regulation Act, 1887. No.1 covered the workings which were opened off 5 crosscut and the total quantity of air going into these was 7,980 cubic feet at the last measurement before the explosion. No.2 comprised the workings to the north of the No.30 heading and was supplied with 10,020 cubic feet and No.3 were the workings from the face of the main west level to face of No.30 heading and had 11,470 cubic feet. No.4 comprised the workings in No.20 heading and the Hard Heading district through which passed 13,000 cubic feet to No. 29 heading workings and 11,600 cubic feet along the hard Heading and both currents joined at face of the latter. In addition, 14,000 cubic feet ventilated the No.1 Dip stables on back side of the downcast shaft and the steam pipe roads.

There were four firemen but the districts assigned to them did not correspond with the ventilating districts. One fireman looked after Nos. 1 and 2 districts, one took No.3 district and there were two firemen for the one ventilating district of No.29 and the Hard Heading. There was also an overman and four firemen during the day and the same at night and each of the firemen had a bratticeman to assist them.

The workings were on longwall method with headings turned off levels at 50 yards intervals and stall roads turned off the headings 12 yards apart. By this method the whole of seam was removed in one operation and necessary roads were maintained through goaf by pack walls. The roof immediately behind the workings was supported by 'cogs' and props and the space between the roads was filled with rubbish partly produced in working the coal and partly by ripping the roof on the roads. Double timbers or 'flats' were stood on roads where the officials considered timbering was necessary.

It was customary that main intakes were used for the transportation of the coal. The whole of main haulage was performed by an engine placed at the side of the main west level, 170 yards from the downcast shaft. This was worked by steam conveyed down the upcast shaft from the surface. The system of haulage was 'main and tail rope.' The auxiliary haulage was performed by horses between fourteen and a half to fifteen and a half hands high. There were 66 of them in the seam, all of which with the exception of one on No.1 Dip stable, were killed in the explosion. The one that survived was badly burned and was found suffering from shock and had to be destroyed.

Clanny safety lamps with a single gauze, bonneted and locked with lead rivets were used exclusively beyond the lamp station. The lamps burned mineral colza. The fireman and bratticemen carried two lamps, a Cambrian fireman's lamp for examination purposes

and a bonneted Clanny in case of losing the other light so that they could return to the lamp station and re-light them and carry on with their inspection as quickly as possible.

Only two naked lights were permitted, one at the lamp station at top of the No.1 Dip, close to bottom of the shaft and the other at the lamp station on the west main intake, 870 yards from the shaft. The downcast shaft bottom and the main west level as far as the engine house were lighted by electricity at 110 volts.

There was, practically speaking, no shotfiring in this seam and according to evidence at the inquiry, only one shot had been fired in that year, on February 11th, a month before the explosion. All the men were out of the mine with the exception of a few officials and it was said that during the last five years only five shots had been fired.

Like all the collieries working the coal in the district, the colliery had considerable quantities of firedamp given off. It was a daily occurrence for the fireman to report gas but for the three months prior to the disaster the findings had been reported as '*blowers diluted*' and not as accumulations of gas. The fireman said at the inquiry that it was their practice to report the finding of gas, even when they were able to clear it very quickly.

The colliery was naturally very dry and very road over which coal was transported would contain a large amount of coal dust and the roads were liberally watered. Pipes from the shaft were laid along the west main level to 28 heading, David Jones' heading, the Hard Heading and No.25 heading. Another pipe was laid along No.1 Dip and west stables which made a total length of 4,125 yards. The water pressure that was available was about 600 lbs. per square inch and the pipes were one and a quarter inch in diameter with provision for attaching hoses at every 20 yards. One man attended to the repairing of the pipes and nozzle attachments and another whose sole duty was to water the roof and sides of the roads along which the pipes ran. All the evidence pointed to the roads being well watered on the day before the explosion and the main west level from David Jones' heading was wetter than any other part of the colliery.

Beyond the limits of the pipes, the roads were watered by casks drawn on trams from which the water was allowed to run when the plug was withdrawn. This was recognised as being a crude method and wet only the middle of the road leaving the roof and sides dry.

At the suggestion of the Inspector, an appliance had been placed each '*parting*' from which the coal was drawn to the shaft by ropes, by which the coal on the trams was wetted. This prevented coal dust being blown off on the outwards journey. The appliance consisted of a vertical pipe attached to the main pipe at the side of the road and a horizontal pipe carried from this across the road near the roof. These were perforated with on eight of an inch diameter holes about six inches apart. As the trams were drawn out from the parting the rider opened a valve and the coal was showered with water as they passed under. This was found to be a very efficient way of suppressing the dust from the loaded trams.

The output from the seam averaged 700 tons per day about 175 tons of which was small coal. All the coal was raised during the day shift when 334 persons were employed underground. About 276 were employed on the night shift, made up of rippers, hauliers, labourers, ostlers and firemen and a few colliers who worked in the leading headings. This was the general custom throughout the coalfield. To within 250 yards of the face, the main roads had been ripped so frequently to maintain the height, that the gob had been buried below rail level, so that they were like hard headings in stone drifts.

At the time of the explosion there appeared to have been 47 men in the Six Foot Seam. Of these, eight were firemen and bratticemen seven of whom were inside the lamp station. The remainder were night shift men and these were between the shaft and the lamp station. Fifteen were recovered alive near the downcast shaft but all were burnt and injured. The whole of the day shift men had left the mine an hour before the explosion when their shift ended.

The explosion occurred at 6.25 p.m. on the 10th. March. From the evidence of the banksman and others at the top of the shaft, it appeared beyond doubt that only one report was heard. There was a rush of dust up the downcast shaft but no flames were

seen. The covering of the upcast shaft was not damaged and the fan continued to work. The engineman saw that the water gauge had reduced from 4 to 3.4 inches.

At the moment of the blast, the agent was leaving his house and his two managers joined him soon after and at once started an investigation. They found that at the No.1 shaft, the cage that worked the Coronation Seam was at the bottom and could not be moved. It was discovered that the upcast shaft was on fire and the only means of descent was by the No.2 shaft. A party went down this shaft to the Red Seam and made their way to the upcast shaft and got into the cage which had been lowered for them and descended in it to the Coronation Seam. They found the hitcher alive and uninjured.

Burning material kept falling down the shaft until the planks over the sump caught fire. This made ascent by that shaft impossible so they went to the bottom of No.1 shaft and found 60 men alive and uninjured. After about an hour and half of hard work they were able to free the cage at the bottom of the shaft. On the top of the cage they found the bodies of two hitchers and a collier who had been blown into the shaft at the Six Foot landing. The living and the dead were sent to the surface and the officials ascended to the Six Foot landing. There they found three men alive near the shaft, seven in the 'slim' and five in No.1 Dip, all badly burned and very severely injured. These were quickly sent to the surface and all recovered with the exception of one man. Two bodies were discovered near the air crossing and four at the top of No.1 Dip.

They then turned their attention to the fires that were burning. The timbers in the Main West Level were burning as far in as they could see, and the enginehouse, Nos. 1 and 2 crosscuts and the west stables were on fire. They worked on the fires all night but to no purpose and they decided that the best course of action was to seal the shafts as there was a danger of a second explosion.

The Inspector, Mr. Gray, received the following telegram at 7.30 p.m. on the 10th. March, "*Slight explosion in 6-feet seam No.1 pit only officials down*", and he concluded that no one was injured and that the investigation would wait until the morning. In the morning he read the papers which showed him the seriousness of the situation. He left by train and arrived at the colliery soon after 11 a.m. Mr. Dwyer and Mr. Trump, Assistant Inspectors were already at the colliery when the circumstances of what had happened were made known to them.

In case there was a possibility that men might be alive, Mr. Gray decided to inspect the mine before the decision was taken to seal the shafts. He saw the fires and came to the conclusion that they could be extinguished. He found that in the West Main Level, the timbers had been burnt away and there had been a heavy fall of roof which was causing the ventilation to short circuit up No.1 crosscut because the doors had been blown away which kept the air away from the burning mass. This proved to be the salvation of the colliery. There were still fires burning in Nos.1 and 2 crosscuts, the west stables and the mouthing in the upcast shaft were burning fiercely.

A good supply of water was available and with plenty of willing workers work went on until by 14th. March all the fires were extinguished. The main level was still smouldering. On the 14th. March the main level was reached by travelling through the west stable and No.5 heading and it was found that the fire had not extended to this point.

Blackdamp was passing strongly from the fire and was a danger to life. It was then decided to build a stopping across the level. This was 20 feet thick made of 17 feet of turf, 3 feet of concrete, 3 feet of clay and 3.5 feet of brickwork. This prevented the escape of the blackdamp.

The West Main level was explored as far as the top of the Hard Heading. Near the air crossing the bodies of nine men were discovered but not that of the man who was in charge of the lamp station. From the appearance of the bodies and the plain footprints made in the dust it was concluded that they had retreated there to shelter from the main blast of the explosion and had run out after it had passed. The innermost man had probably been in the lamp station and had run 54 feet. Neither were burned. The others had probably been sitting in the shelter of the crosscut leading into the return near the air crossing. They were burned but had not been subjected to any violence. The lamp station

was not damaged and there were three lamps in the table with their shields off ready for examination by the fireman.

Due to the many falls, the quantity of ventilation had fallen to between 8 and 9,000 cubic feet and gas was accumulating in the workings. The workings could be reached only by concentrating the whole of the ventilation into it while the others filled with firedamp. There was little damage to the roads and the return airways were found not to be severely damaged but they were blocked by falls. In spite of these difficulties, small holes were made over or under the falls and the ventilation restored but it was three weeks before all had been examined and the last fireman's body in the workings recovered. Two bodies were not recovered, that of the fireman whose duty it was to inspect the return airways and that of another man. The fireman's lamp was found near the No.1 Dip and the other man was known to be alive after the explosion. It was thought they were under a fall in the west level

Those who lost their lives were-

Edwin Thomas aged 33 years, hitcher.
Thomas John aged 41 years, hitcher.
Thomas Davies aged 21 years, collier.
John Ridge aged 48 years, roadsman.
William Gronow aged 52 years, haulier.
David Lewis aged 55 years, repairer.
Edward Jones aged 48 years, repairer.
Adam Lewis aged 49 years, labourer.
Henry Harvey aged 45 years, haulier.
Morris Harding aged 48 years, master haulier.
Thomas Hawkins aged 46 years, ostler.
Frank Sallish aged 36 years, ostler.
Joseph Chalker aged 38 years, ostler.
John Griffith aged 39 years, shoer.
Thomas Morgan aged 28 years, shoer.
Evan Evans aged 37 years, labourer.
Jenkin Davies aged 49 years, ripper.
D. Williams aged 24 years, ripper.
Noah Edmonds aged 49 years, repairer.
Robert Williams aged 24 years labourer.
John Jones aged 39 years, repairer.
John Owen aged 42 years, repairer.
William Evans aged 45 years, repairer.
William Griffith aged 68 years, lamplighter.
William Lewis aged 37 years, bratticeman.
Joseph Jones aged 50 years, bratticeman.
David Enoch aged 35 years, bratticeman.
Thomas Richards aged 42 years, fireman.
W.H. Tudball aged 41 years, fireman.
Rees Lewis aged 52 years, bratticeman.
William Harris aged 33 years, fireman.
Evan Davies aged 42 years, fireman.
David Morgan aged 35 years, rider.
The bodies of Evan Davies and David Morgan were not recovered.

Those who were badly burnt were:-

George Brace.
Thomas Evans.
David Griffiths.
James Hall.

Morgan Harding.
John Jones.
John Lloyd.
Richard Pugh.
Morgan Thomas.
Lewis Thomas.
David Wilde.

The Inspector made an examination of the mine and found that the explosion had traversed the whole of the district and had passed through the roads and there was evidence of great heat at the downcast shaft.

With the exception of Thomas John, William Evans and William Griffiths, all the bodies were burned as had the horses. The bodies at the top of the No.1 Dip were subjected to great violence. The body of Joseph Jones was blown to pieces and that of William Lewis badly mutilated. David Enoch was found lying on his back, slightly burned and he had died from the effects of afterdamp. Thomas Richards was found lying face down with his arm sheltering his face. William Tudball was found sheltering his face with his arm. Rees Lewis was on an old fall and was badly burned and William Harris was lying with his head under a tram as if for shelter.

Thirty two of the victims lived within the jurisdiction of Coroner, Mr. J.J. Rhys and one with the jurisdiction of Coroner, E. Bernard Reece. Mr. Rhys held an inquest on the thirty two and Mr. Reece held a formal inquest on the other body taking only sufficient evidence to enable the jury to arrive at a verdict. The inquest was held at the Central Hall, Clydach Vale on the 13th. March, 1905. After an inquiry lasted three days and all interested parties were represented.

Mr. Gray was convinced that the explosion had originated at a safety lamp, a bonneted Clanny, belonging to David Enoch. He thought that Thomas Richards had examined No.5 crosscut and had found an accumulation of gas in a hole. He left Enoch to put up a sheet to direct the air current and dilute the gas. It was thought that while this was going on a stone fell and broke the glass of the lamp and so ignited the surrounding gas. Mr Gray told the jury-

“When gas enters the Davy lamp there is only a flicker produced with little or no energy, but in a lamp of the Clanny type there is a sharp explosion inside the lamp, sometimes accompanied by a loud report. this is more pronounced when the flame has been reduced. The glass in a lamp is a very useful thing of account of the extra light it allows to pass, but it is an element of weakness or danger, as when gas explodes in a lamp the glass acts as a cannon - the longer the glass the greater effect - and causes a strong upward force or blow. thus it will be seen that with a gauze partially displaced, or lightly held in place, this upward force would lift it up and free from the lamp, causing an ignition of the outside gas. I have no doubt that glass will continue to be used in the construction of safety lamps on account of the light, but I think its dangerous action should be neutralised by having two complete gauzes with well flanged bottoms to each lamp instead of one. The glass should not be less than one quarter of an inch thick. the bonneted Clanny carried by David Enoch may have had the gauze displaced in this manner or the glass may have been broken by a fall.”

Mr. Gray pointed out that a similar lamp had caused an explosion at the Aberaman Colliery on 30th. December, 1904 when a bratticeman man was putting up a sheet under a cavity where an accumulation of gas had been discovered. The gas exploded in his lamp which was on his belt. he saw the flame and ran away leaving the sheet on fire. The gauze of the lamp was found to be loose.

During the building of the stopping several men were affected by the atmosphere and Mr. Gray had felt an acute pain at the back of his head and when he returned to the surface Dr. Morgan found that his pulse rate was between 108 and 130 beats per minute and his face was crimson. His right arm was partially paralysed and the headache lasted

for five hours during which time he shivered and suffered from tight constriction across his chest.

After inspecting the mine on the 21st. March after four and half hours at the face he felt the symptoms of carbon monoxide. He said-

“The worst feature of carbon monoxide is that it causes no difficulty in the burning of a light, in fact it makes it more brilliant, and so deceives the uninitiated and shows no ‘cap’ on the flame of the lamp.”

The deadliness of the gas was demonstrated by Dr. John Haldane who stated-

“As little as 2 per cent of carbon monoxide in air may produce fatal effects if breathed for over an hour and 1 per cent will gradually disable a man completely. Even 0.05 per cent, if breathed for several hours, may cause fainting and dizziness on exertion and probably anything over 0.02 per cent, will, after some time, reduce distinctly a man’s power of doing work.”

The jury brought in the following verdict-

“1. We are unanimously of the opinion that the explosion occurred in No.6 crosscut of the No.5 district.

2. We are also of the opinion that the explosion occurred in consequence of something happening to David Enoch’s lamp.

3. That no blame whatever can be attached to anyone for the explosion.”

They added the following rider-

“We recommend the management to spare no effort to enforce Rule 179. We desire to express our appreciation of the heroic efforts made by the explorers and rescuers.”

Mr. Gray commented-

“I think the verdict very reasonable and I agree with the rider that Special Rule 179 should be enforced. The rule is as follows *‘every lamp shall have a number and so far as practicable, the same lamp shall consistently given to the same person for use.’*

The rider was the result of evidence of some of the witnesses, that they were not given the same lamp consistently. The agent explained the reason was, that the method of relighting was being altered, and the alteration necessitated the keeping in of lamps for some days.”

NATIONAL. Wattstown, Glamorganshire. 11th. July, 1905.

The colliery was in the Rhondda Fach Valley about two miles north of Porth and was owned by the United National Collieries, Limited, Wattstown near Pontypridd. There were two shafts which were sunk in 1880 to the Six Feet Seam which was reached at 454 yards. The downcast was seventeen and a half feet in diameter and the upcast fourteen feet in diameter. For about 14 years the Two Feet Nine and the Four Feet seams which had been sunk through, were the only seams that were worked. About 11 yards before the disaster, the upcast shaft was deepened 101 yards to the Lower Five Feet Seam and a heading was driven in it for a distance of about 5 yards and left.

Nine years before the explosion the Nine Feet Seam was opened out from the same shaft at a depth of 479 yards and a staple pit was sunk from the six Feet Seam to give ventilation and a second outlet. The coal was drawn up the upcast shaft and from that time, both the upcast and downcast shafts were coal winding shafts. The coal from the Two Feet Nine and Four Feet Seams was worked from the downcast shaft. the Two Feet Nine was six and a quarter feet thick, the Four Feet was six feet thick and the Nine feet Seam was six feet thick. The dip of the seam was four inches to the yard to the north west. all the seams produced steam coal.

A plan was drawn up to deepen the downcast shaft to the Lower Five Feet Seam without interfering with coal drawing and a year before a pit was ‘roofed’ or risen up, from the Nine Feet Seam to within 15 feet of and exactly vertically under, the downcast shaft

bottom in the Six Feet Seam. a hole was then bored from the centre of the downcast to the rising pit. An electric winding engine with a two foot diameter drum, worked by a totally enclosed Peebles polyphase 30 h.p. motor, was erected in the Nine Feet No.1 North Level and the pit sunk in the same vertical line to the Lower Five Feet Seam which was won at a depth of 101 yards below the Six Feet Seam or 555 yards from the surface.

The Certificated Manager was Mr. William Meredith who also acted as agent. Mr. Evan Williams was the undermanager and Mr. E. Prosser the overman. Mr. Edgar Watts, one of the directors of the Company, visited the colliery at regular intervals but took no active part in the management. There were usually 934 men and boys employed underground in the workings from the two shafts and 125 on the surface.

The workings in the downcast shaft were not affected by the explosion and affected only the Nine feet and Lower Five Feet Seams. The ventilation was produced by a Schiels Fan fifteen and a quarter feet in diameter, belt driven by a horizontal engine with a 32 inch diameter cylinder with a three feet stroke and an attached condenser. The pressure of the steam was 70 lbs. per square inch and the vacuum, produced was 10lbs. per square inch. With the engine running at 53 r.p.m. and the fan running at 159 r.p.m. the last measurement gave 166, 530 cubic feet per minute of air circulating through the mine at a water gauge of 3.1 inches. There was a Waddle Fan, 45 feet in diameter with a 36 inch diameter engine and a three feet stroke erected nearby and connected to the upcast and worked alternately with the Schiels or in case of it breaking down. the air currents were well arranged and the ventilation of the colliery was generally good.

The air was last measured on the 1st. July when 20,170 cubic feet ventilated the south side workings of the Nine Feet Seam and 11, 020 cubic feet passed around the north side workings and the heading at the bottom of the sinking pit.

There were two ventilation districts within the meaning of the Coal Mines Regulation Act, 1887. No. 1 embraced the workings north of the shafts, which were being filled with rubbish as coal working had been discontinued six months before the explosion. No.2 comprised the workings of the south side of the shafts and in which the coal was being worked on the day of the explosion. The air for this came fresh from the surface by the downcast shaft to the six Feet Seam and from there by the staple pit, which also acted as a second outlet for the Nine Feet Seam and was provided with iron ladders for this purpose.

There was one fireman by day and one by night, the day fireman was occasionally assisted of a bratticeman. The work in connection with the sinking pit and driving the heading in the Five Feet Seam was under the charge of Mr. William Jones who was an experienced master sinker.

The workings for the most part, were on the longwall method as practised in the South Wales coalfield and had headings turning off the dips every 40 to 60 yards and stalls turning off the headings, 12 yards apart. The whole of the seam was removed by this method in one operation. The roads were kept open through the goafs by gob walls. The road immediately behind the face was kept up by 'cogs' and props and the space between the gob walls of the roads, filled with debris, partly produced in the working of the coal and partly by taking down the roof on the roads to make and maintain sufficient height.

About 99 yards of face from Taylor's to Gibbon's dip was worked on the 'Barry' method in which trams were taken along the face. The road was shifted laterally as the face advanced and the space behind filled with rubbish. in the 'Barry' face, the roof was supported by 'flats' and props. In this district, the main returns were used to transport coal which was not the usual practice in the district. Mechanical haulage had not been introduced and horses about 15 hands high were used. There were about 30 of them and all were killed in the explosion.

Single gauze Clanny lamps were used with a short gauze cap on the top. They were bonneted and provided with pneumatic locks. They burned colza oil which had a flash point of 280 to 300 degrees. The fireman used Cambrian firemen's lamps which was really a Davy with a bonnet and a movable glass. They also carried a bonneted Clanny when making their first examination in case they lost a light. During the shift they generally

used the bonneted Clanny because they gave a better light. There were no naked lights in the Nine Feet Seam, except one in the lamp station in the intake, near the bottom of the staple downcast pit. The upcast shaft bottom and the top of the sinking pit were lit by electricity.

There was very little shotfiring in the Nine Feet Seam and according to evidence at the inquiry, the last shot fired in this seam was on the 27th. May, six weeks before the explosion. They were fired at the parting of the No.1 south level and were charged and fired between shifts as which had been the practice for the previous twenty years.

As with all the steam coal seams on the district, both the Nine Feet and Five Feet Seams produced firedamp freely and constantly, the latter more frequently than the former. In the experience of other collieries. The Five Feet was as fiery as the Upper Four Feet in which a great number of serious explosions had occurred. On the morning of the explosion the fireman had reported finding a 'blower' of David Rees' heading and another on Gibbon's dip. Both were stated to have been diluted as given off. The Report Books showed that gas was frequently found in the three months previous to the explosion and was recorded 108 times but of that number 107 were entered as 'diluted blowers' so that in that time only one accumulation of gas was found. H.M. Inspectors of mines commented-

"In a thick seam like the Nine feet, especially with the Red coal only 1 to 3 feet above it, it would be very remarkable if issues of gas were not occasionally found, and if the reports contained no records of such findings they would be viewed with suspicion."

The heading in the Five Feet Seam had been examined by William Jones, the master sinker, on the morning of the explosion but he appeared to have made no report of the examination. The last entry by him in the Report Book was on the 10th. July when the heading was reported free from gas. The only other occasions that gas had been reported were on the 28th., and 29th. June when he entered 'small blower on straight' and 'small blower on top.'

The overman did not visit the Nine Feet workings but devoted the whole of his time to the Two feet Nine Seam workings from the downcast shaft. The undermanager had been off duty for six weeks before the explosion due to illness so that the Nine Feet and the Five Feet Seams would be looked after by the manager, fireman and master sinker.

The colliery was naturally dry and warm and the haulage roads, unless watered, would constantly contained quantities of coal dust. Pipes for watering the roads had been laid in the other seams but not in the Nine Feet. The only means of watering these roads was by casks filled with water drawn along by trams and allowing the water to run from holes in the casks. This was not a very good method as it wet only the middle of the roads between the rails and the sides of the roads and the timbers were not watered. The trams had both ends closed which prevented coal loss and the dust to be kept down.

The seam produces about 170 to 180 tons per day. No coal was drawn during the light shift which were devoted to repairing, ripping and stowing rubbish. The day shift usually employed 132 underground but on the day of the disaster, 12 were not at work. Forty were engaged during the night shift and there were 606 at work in the Two feet Nine Seam on the day of the accident.

The explosion occurred at 11.45 a.m. on the 11th. July. According to those who were near the top of the shafts, there was no great noise but a large quantity of dust was blown up both shafts. according to the banksman's statement, the dust was so thick that they were unable to see for some time as they got dust in their eyes. The pitman, the man in charge of the shafts and fittings, was in the lodge room in the No.2 Rhondda Seam, within five feet of the sides of the upcast shaft at the time. He said, "*I heard the rush of wind knock against the pump, and saw an amount of vapour coming up the shaft by no flame.*" According to the winding engineman, the cap covering the top of the upcast shaft was blown 10 feet into the air and then it dropped back into place. The Schiel fan was not damaged and continued to work but at a decreased speed. It was found that the brickwork near the doors leading into the fan chamber were blown down and the fan was being fed by fresh air from the surface. The reserve fan, the Waddle, was put into service at once.

With the exception of the hitchers, the men in the workings of the downcast shaft were unaware that anything was wrong. The hitchers had seen the sump planks blow up but they thought nothing of it and replaced the planks. They were about to go back to work when Mr. Kane, the surveyor, came to them from the Two Feet Nine Seam. He sent messages to bring the men out of that seam and with the overman, pitman and others started at once on the work of rescue.

After putting up sheets in place of the separation doors, which had been blown away on the Six Feet Seam, they had the cage raised to the Two feet Nine landing and they descended to within a few feet of the bottom. Further descent was prevented by trams and other things being blown on to the sump planks. About six feet from the shaft they found one of the hitchers and near him a 'cogman' In the lamp station they found the lamp locker. These men were alive and were removed at once to the surface. Only the lampman survived, the other two died later of shock. One body had been blown into the sump and another was at the edge of the shaft. at the turn leading to the sinking pit they discovered the manager's body and a few yards further on they found the body of the master sinker. Near the e top of the sinking pit they found the bodies of three sinkers and that of the electric winding man. in the lamp station, where the lamp locker had been discovered alive there was the body of a haulier. It was sometime before he was discovered as he was sunder one of the benches.

As soon as the living had been sent to the surface, attention was given to restoring the ventilation. As the sheets replaced the main separation doors, the air then passed along the No.2 south level as far as the doors near the top of Taylor's dip. The level was the explored to this point.

One of H.M. Inspectors of Mines, Mr. Gray, heard of the accident while he was attending an inquest at Bargoed. He left on the next train and was at the colliery by 7 p.m. Mr. J. Dyer Lewis, the Senior Assistant Inspector of Mines in the district could not get a train and arrived the following morning and Mr. F.J. Trump another Assistant Inspector was at a colliery at Aberdare and arrived at 6 p.m. and immediately went down the mine.

They heard of what had been done and studied the plans of the colliery. By this time the explorers were restoring the ventilation and the afterdamp filled the upcast shaft which could not be used and the ladders in the staple pit had been blown put. When the exploring party returned they reported that good progress was being made. They had reached the workings and travelled down Gibbon's dip and around the faces but were prevented from getting up Taylor's dip by a heavy fall and afterdamp. They had made such good progress going in that they had had to stop to let the afterdamp clear. They reported finding fifty eight bodies and thought that no one could be left alive.

After a consultation it was decided that as the upcast shaft had not been examined from the Two Feet Nine up to the surface and work was done on the shaft to repair a guide rope. The Inspectors and several colliery agents and managers together with about 80 men descended. They inspected the shaft bottom and the top of the sinking pit. They then travelled down Gibbon's dip, explored the workings in the Red Seam and discovered nine more bodies. In the workings off David Rees' heading it was seen that the men had had time to run fro the face, in some cases about 30 yards. The men in the Red Seam seemed to have lived longer than the others and most of them had been suffocated, several of them sheltering their faces with their caps. In the 'Barry' face which was 99 yards along, twenty six bodies were counted. These men had been killed before they had time to move. The fall prevented the exploration of Taylor's dip and as the men were taking the bodies out of the pit, the idea of making a road round the fall was abandoned. Twenty five bodies were sent out that first night and the party came to the surface at 7 a.m. on the 12th.

The next shift of explorers cleared a passage over the fall and a great many bodies were discovered in Taylor's dip. After seeing the whole of the workings and the position of the bodies, the Inspectors came to the conclusion that the flames had traversed the whole of the district with the exception of the workings off David Rees' heading. The roads were

not very badly damaged and the work of exploring the whole seam was quickly completed and all the bodies recovered.

The men and boys who lost their lives were-
William Eastment aged 5 years, hitcher.
Thomas Lillycrop aged 25 years, haulier.
William Meredith aged 55 years, manager.
William Jones aged 60 years, master sinker.
Elias Roberts aged 25 years, sinker.
James Baines aged 55 years, sinker.
Isaac Davies aged 29 years, winding engineman.
Richard Morgan aged 59 years, haulier.
Arthur Kemp aged 43 years, repairer.
John Morgan aged 59 years, repairer.
Thomas Edwards aged 23 years, haulier.
David G. Davies aged 23 years, haulier.
W.G. Basset aged 14 years, doorboy.
James Healing aged 14 years, doorboy.
W.H. Goldsworthy aged 20 years, haulier.
George Chidley aged 18 years, haulier.
J.M. Williams aged 14 years, doorboy.
Thomas Davies aged 38 years, master haulier.
Thomas Flower aged 41 years, collier.
Thomas King aged 47 years, collier.
James Gibbon aged 48 years, collier.
O. Pritchard aged 38 years, collier.
Idris Williams aged 21 years, collier.
John Probert aged 20 years, collier.
Edwrad Morgan aged 16 years, collier boy.
D.J. Rees aged 15 years, collier boy.
David Rees aged 38 years, collier.
Sam Bird aged 16 years collier boy.
John Gibbon aged 25 years, collier.
Charles Davies aged 18 years, haulier.
E.J. Sampson aged 17 years, collier boy.
John Howells aged 42 years collier.
Thomas Howell aged 15 years, collier boy
Isaac Jones aged 17 years, collier.
William Hudd aged 16 years, collier boy.
John E. Davies aged 18 years, collier.
Fleury Mahoney aged 17 years, collier boy.
Alf Richards aged 46 years, collier.
W.J. Evans aged 18 years, collier.
Evan John aged 18 years, collier.
Robert Hallet aged 38 years, collier.
William Hallet aged 17 years, collier.
D.G. Davies aged 26 years, collier.
M.J. Stuart aged 15 years, collier boy.
D. Johnson aged 64 years, labourer.
Ben Walters aged 37 years, collier.
Robert Cross aged 38 years, collier.
John Jones aged 36 years, collier.
John Tingle aged 14 years, collier boy.
J.R. Walters aged 15 years, collier boy.
Sam Smith aged 14 years, collier boy.

W.T. John aged 23 years, collier.
Thomas Perryman aged 19 years, collier.
Thomas J. Prosser aged 16 years, collier boy.
Fred Fletcher aged 25 years, collier.
E. Beard aged 14 years, collier boy.
Sam Mason aged 34 years, collier.
George Perryman aged 38 years, collier.
William Perryman aged 14 years, collier boy.
Thomas Williams aged 15 years, haulier.
William Daniel aged 40 years, collier.
C.H. Davies aged 15 years, collier boy.
C.E. Perry aged 19 years, labourer.
Alf Uzzel aged 40 years, collier.
John Uzzel aged 15 years, collier boy.
George Evans aged 26 years, collier.
David Phillips aged 26 years, collier.
John Rees aged 37 years, collier.
Robert Yell aged 20 years, haulier.
Amon Billit aged 22 years, collier.
David Davis aged 37 years, collier.
D.T.,. Morris aged 15 years, collier boy.
W.T. Morley aged 27 years, collier.
Thomas H. Smith aged 17 years, collier.
D. Williams aged 26 years, collier.
Robert Billit aged 34 years, haulier.
David Davis aged 32 years, collier.
Thomas Jones aged 15 years, collier boy.
John Davis aged 26 years, haulier.
David Johnson aged 16 years, labourer.
David Powell aged 32 years, collier.
John Tuberville aged 14 years, collier boy.
Thomas Davies aged 40 years, collier.
W.A. Williams aged 13 years, collier boy.
Ben Lewis aged 16 years, collier boy.
Ben Lewis aged 53 years, collier.
Able Marshall aged 33 years, collier.
W.H. Lloyd aged 16 years, collier boy.
Alf King aged 22 years, collier.
William Thomas aged 17 years, collier.
R. Williams aged 43 years, collier.
Edward Williams aged 16 years, collier boy.
John Clancy aged 38 years, collier.
C. Clancy aged 17 years, collier.
John Rees aged 17 years, collier.
John Rees aged 50 years, collier.
Thomas Jones aged 51 years, collier.
F. Wiltshire aged 14 years, collier boy.
J. Williams aged 44 years, haulier.
W.H. Evans aged 17 years, haulier.
T. Owen aged 33 years, sinker.
William Morgan aged 17 years, collier.
John Morgan aged 25 years, collier.
M.R. Evans aged 25 years, haulier.
C.E. Perry aged 39 years, radman.
Sam Hughes aged 21 years, haulier.

F. Woodham aged 33 years, collier.
James Evans aged 29 years, sinker.
D.S. Powell aged 15 years, door boy.
David Davis aged 47 years, fireman.
John Reeves aged 19 years, hitcher who lived 6 hours but died of shock.
J. William Dando aged 27 years, cogman who lived 15 years and died of shock.

As soon as all the victims from the workings had been recovered, men were set to work to repair the top of the sinking pit. This was done and the shaft examined and found to contain 27 yards of water. The upcast below the Nine Feet Seam was then examined and it was found that water was 45 yards lower than it had stood for years. Mr. Gray found from the firemen and sinkers that a heading had been driven in the Lower Five Feet, 24 yards to the south east of the sinking pit from where it was cut up into the upper coal and driven in at right angles towards the upcast shaft. About 3.15 a.m. on the Monday before the explosion, a borehole was made in advance of the heading and struck water. It was plugged and a pair of props placed as close to the face as possible with planks across. It was intended to strengthen it later.

Nothing was done in the heading during Monday and the sinkers were told that other work would be found for them. The pitmen and carpenters were believed to be repairing appliances for drawing water and sludge out of the upcast at nights and it was thought by the colliery people that this arrangement would be carried out. When the water was lowered a few yards in the sinking pit, the body of the last of the sinkers was recovered and as the water lowered in the pit it lowered at the same rate in the upcast shaft.

The mouth of the heading was uncovered and it was seen that the timbers had fallen and there was firedamp in the heading. The fall was cleared by the 28th. July and travelled from pit to pit. A careful search was made for traces of the coal barrier but not a sign of it could be found.

The inquest was opened on the 12th. July, 1905 at the Wattstown Hotel, Wattstown before Coroner Mr. R.J. Rhys when evidence of identification was taken. The proceedings were adjourned until 31st July when all interested parties were represented and a full and searching inquiry lasting over three days was conducted. The jury reached the following verdict-

“That in our opinion Richard Morgan and the other men lost their lives by an explosion at the National Colliery on the 11th. July, and that the explosion was caused by shotfiring in the barrier of coal in the cross heading from the sinking pit to the upcast.”

They added the following rider-

“That in our opinion shot firing should be absolutely prohibited except between shifts, and the shot men should be in the pit at the time.

The Reports conclude by saying that-

“We are convinced that the explosion was prevented from passing into the Two Feet Nine seam workings where 606 men were employed by the wet condition of the staple pit, the downcast shaft and the upcast shaft. We believe the dust was blown up the shafts on the force returning, after having traversed the workings.

With regard to the recommendations as to shotfiring only between shifts, we desire to say that we allude to the mines of South Wales. We are not prepared to say that this measure need necessarily extend to all mines in the United Kingdom. We are inclined to believe that the greater number of owners would welcome the change for, apart from humanitarian grounds, a big explosion is a very costly matter to the mine owners when it occurs.

We are, of course, prepared to admit that there may be something to be said on the other side, but upon the whole the balance of our opinion is in favour of the prohibition in South Wales.

With regard to watering, we do not mean necessarily to advocate a complete drenching of the whole mine with water. The isolation of districts by a well-arranged

system would in many cases be sufficient. But this explosion had confirmed out view of the importance of this subject and we think it merits very serious attention. We quite concur with the view that the authority at the mine should stringently see to the issue and use of the explosives.”

NEW BOSTON. Haydock, Lancashire. 16th. July, 1905.

The colliery was one of a group known as the Haydock Collieries and owned by Richard Evans and Company of Haydock. The accident occurred at the colliery which claimed five lives. The men were engaged in repairing a brow in the Ravenhead Delf on a Sunday. The road which was fifteen feet wide had been falling and under repair for about a week. They were putting a large baulk of timber across the road to complete the timbering when another fall occurred burying all five and two others.

There had been a certain difficulty at the colliery in a place where water had been finding its way from old workings and weaken of the roof the place is about 300 yards from the pit eye. The roof there was known to be dangerous and Mr. Sam Cook, the experienced undermanager, arranged to go down on Sunday when coal getting was suspended. Fourteen men accompanied him to secure the roof and his two brothers James and Harry they began work at 6 a.m. and in two parties some distance from each other they were replacing old props with new timber. All seemed to be going well when between 1 and 2 p.m. the centre of the roof came down and a group of eight men who were fixing heavy baulks into position most of them were buried under the enormous mass of many tons weight. The unfortunate ones were on the outside of the area and the alarm quickly went out with the terrible news went through the village and soon brought hundred of anxious enquiries to the pit.

There were quickly twenty volunteers and Mr. Robinson, the manager and other officials soon arrived to direct the operations. Drs. Heywood, Thompson and Bromley were soon on the scene to give medical attention. Of the eight men working at the spot where the fall took place the one least hurt was just on the edge of it. He was Henry Naylor of 6, Liverpool Road, Ashton who was knocked down but was able to get up and walk to the bottom of the shaft and on being drawn up he went home on a tram. Wright Pimblett, of 21, Nelson Street, Earlestown was badly hurt and unable to free himself and on the other side of the fall Naylor could hear one of the Cook's shouting for help. This was Harry Cook of Blackbrook who badly injured and lay on his left side with his leg held fast. He had to lie for hours before the rescuers could reach him and five others must have been killed instantaneously.

The rescuers worked in great danger to themselves from other falls and with all possible speed but it was about six in the evening when he was freed and taken up the shaft he was taken to the Cottage Hospital. Nearly two hours later they got through to the spot where Harry Cook lay. He was removed to the hospital. All through the night and all through Monday the relief men obtained the bodies of Baines and Woolam and early on Monday those of Sam Cook, Waterworth and James Cook were recovered about midnight.

The officials mentioned remained the pit almost all the time Messrs. Lionel and Charles Pilkington and Mr. Hall the Inspector was there on Monday.

The men who lost their lives were-

Samuel Cook, aged 34 years, overmanager, a single man,
James Cook, aged 36 years, manager aged 36 years. A married man,
Thomas Woolam, aged 47 years, a dataller. Married with six children,
Thomas Waterworth also known as Layland, a dataller aged 42 years. A married man with twelve children

and Daniel Burn aged 42 years, a dataller with seven children.

The inquest was held at the Waggon and Horses by Mr. Brighthouse, the County Coroner and evidence of identification was taken. Daniel Baines and Thomas Woodland were both identified by Mrs. Baines and Mrs. Woolam. Mr Johnson, the general manager of Richard Evans and Company said he knew Samuel Cook, Layland and Waterworth. He also knew James Cook. Mrs. Cook lived close by the colliery.

The funerals of the victims took place yesterday afternoon The two Cooks were buried at Newton the service being taken by Reverend Allatt. Baines was a member of the Bible Class at Haydock and was interred at Haydock Churchyard, Woolam and Waterworth at Ashton.

Mr. Cook, a retired colliery manager, of 369, Church Road, identified the bodies of his two sons James and Samuel. The coroner asked Mr. Cook if he would like to attend the inquest and asked any questions and Mr. Cook said that he would. Jane Cook, of 34, Vista Road, Earlestown identified the body of her husband James. Elizabeth Waterworth of Penny Lane identified her husband aged 43 years the bodies of Woolam and Baines had previously been identified.

The Coroner said that a great mass of roof fell and buried the men alive. Thomas Stocks, of Penny Lane said he was a fireman at the colliery for twenty two years. On Sunday he went to work at 5 a.m. and was in charge of the work until Samuel Cook came at 11 a.m. The work was being carried out in the Wigan Five Foot Ravenhead Mine. At the end of the jig brow there was a place where the coal had been taken but had never been filled up with dirt. The level had begun to sink on the Monday and there had been repairs during the whole of the week. There were fifteen men on the job on Sunday working in two places. Up to 10.30 when the witness had been in charge the place had been made safe and there was no extra weight on the props.

The accident happened about 1.30. When Cook came on he said that they would put up a baulk to strengthen the place. They did not get the baulk into position and Cook said they would have to get some more dirt put to get it up. He came away and went to the landing he did not know what had happened he heard someone say that the timber was giving way and he heard Sam Cook shout 'Tom'. The witness rushed to the place. Cook was very capable and knew what he was doing and there was no suspicion that the timbering was not strong enough but if Cook had thought it so he would have put up more timber. The coroner said that he did not think that Mr Cook who was in charge of his own safety and the lives of others would do anything that was not in their interests. He said that he did not view an accident by the magnitude of the calamity.

Mr. Robinsion said that Henry Cook who was in the Cottage Hospital could attend the inquest as the Doctor had given his permission. Mr. James Cook said that he had seen his son and he was only too anxious to come and tell the coroner what he knew of the accident. Mr. Cook said that he had seen his son Henry and also Wright in the hospital on Monday morning and he gave a detailed and very straight forward story. He said he was at the back end of the fall and in order for the rescue party to get him they had to strip coal off the face. He had been held down by timber from 8.30 am to nearly 8 p.m.

At the time of the accident the men that were buried were standing under the timber some moving dirt and some stripping off the sides to get the baulk round. Sam Cook went in and said that the bars moving and called for a jack at once. He had just got the words out when he was struck by one of the bars behind the ear and the shoulder and it knocked him partly away from the fall. Harry was struck by one of the bars Baines was struck down close to his feet and pinned by the neck and killed. Samuel had been undermanager for eight years he had worked nowhere else except that place. The pit was sunk in 1852 and 1853.

The Coroner said that the work was carried out by an experienced man who was intellectual enough to see that the work was carried out properly and the employers had provided sufficient materials to do the work. The Coroner went on to express the sympathy of the village to Mr. Cook who had lost two sons. They all knew that the work was of a dangerous character and they all appreciated the way in which Lancashire colliers did their work. They knew that the men descended the shaft with their lives in their

hands and extended deepest sympathy and he wanted everyone to know that the inquiry was a deep searching one.

The jury returned a verdict of 'Accidental Death' and expressed their sympathy with the relatives of the deceased.