

WATH MAIN. Wath-on-Dearne, Yorkshire. 24th. February, 1930.

The colliery was the property of the Wath Main Colliery Company, Limited, with Mr. G.H. Ashwin as the agent, Mr. M.C. Martyn as the manager of the colliery. The explosions occurred in the Billingley Drift District of the colliery in the Barnsley Seam between six and seven p.m. and cost the lives of seven men with three others injured.

The Billingley District of the Barnsley Seam was two miles from the shafts and was an area of coal to the rise of a fault known as the Billingley fault. The seam was seven feet six inches thick and overlain with a shale roof. It was worked by longwall and pack walls were built on each side of the gate roads. No packs were built between the gateroads and the timber supports were withdrawn and the roof allowed to fall into the goaf. The Billingley Fault was being stripped on both sides of the district. There was a working known as the 30's next to the fault on the south west side and it was seen that two faults, the first a seven feet dipper and the second a four and a half feet riser ran almost at right angles from the fault to cross the 30's gateroads.

The ventilation did not rely on brattice and the quantity of air entering the district as measured on the 17th. February was 7,400 cubic feet of air per minute, half going to the right side and half to the left. Flame safety lamps of the Davis-Thorburry type and electric flame safety lamps of the Davis-Derby Pillarless and Oldham 'C' type were used throughout the district. Each pair of men were provided with a one flame lamp and one electric lamp.

There were three deputies in the Billingley District, one per shift and the inspection was made before the commencement of the shift by the deputy of the preceding shift but it was not made within two hours before the commencement of work which was a breach of the regulations. The contravention was frequently acknowledged by the manager who explained to the inquiry that it had arisen through neglect when work restarted after the 1926 stoppage to alter the hours of work of the deputies. The inspection that was made prior to the shift was also regarded by the manager as the second inspection of that shift which the Inspector considered a breach of the regulations.

There was no record in the deputies reports of finding any gas during August 1929 to the 8th. January 1930 but from that date to the date of the explosion, except for the 9th. 10th. and 11th. January the report of each deputy showed that firedamp was present in the vicinity of the 30's left bank. The working differed. Arthur Bird, the night shift deputy, recorded that 'a small percentage of gas in 30's left bank' the day shift deputy, John Enoch Jones reported '*a small percentage of gas at 30's fault*' and the reports of the afternoon shift deputy, John Russell who lost his life in the disaster read '*a small percentage of gas in 30's fault side*'. Again on the 18th February he reported '*a small percentage of gas in 30's bank*'.

In addition to the inspections made by the three deputies, there was an occasional inspection by the manager, the undermanager, Walter Kelly and the overman, Albert Fairhurst. The most recent of these inspections was on 7th. February by the manager, 3rd. February by the undermanager and the 27th. January by the overman. The undermanager and the overman found gas on the low side of the left pack in the 30's left bank during these inspections which was where they understood the fireman had found gas.

On the 7th. February the Billingley District was inspected by Mr. T. Gawthorpe, H.M. Sub-Inspector of Mines accompanied by the manager and the day shaft deputy Jones, and found one per cent gas in 30's left bank low side. Mr. Gawthorpe asked the manager to have a brattice sheet erected to carry the air current across 30's left bank and in his report written on the same day Mr. Gawthorpe said-

"There was 1 per cent firedamp in the general body of the air in the fast end of the fault end of the fast side of the stall. This fast end was about 16 yards long and not ventilated. The manager ordered the deputy to carry the air into the fast end by brattice."

Mr. Gawthorpe thought that the request had been carried out but in fact it had not. In stead the officials after a full consideration of the matter had a wooden door fixed on the outbye side of the brattice sheet already fixed across 62's gate road and the reporting of firedamp went on as before.

The conditions in the 30's working place immediately prior to the first explosion were quite normal on the evidence of two men who were working there when the first of the two explosion occurred. Samuel Walton was building up the goaf side corner of the pack on the left side of the 30's gateroad and William Hart was busy lying rails about nine feet from Walton. Hart had his flame lamp hanging on the inbye side of the prop next to the goaf close to the side of the pack. The bottom of his lamp would have been about two and a half feet from the roof. It was intact and the flame was burning steadily. The roof of the goaf had not fallen over an area of about 8 yards long by four or five yards wide immediately behind where Walton was working but nearer the Fault it had fallen close up to the doubling props.

Walton and Hart heard a bump in the roof and then it fell into the goaf starting from the Billingley Fault and travelling towards 30's gateroad. What followed is not too clear but Walton went down to the floor and the next thing he saw was a flash. Hart was kneeling on the floor putting a sleeper under some rails, looking towards 30's gateroad when there was a bump, a fall and then a flash. This was the first explosion.

Hart had his electric lamps and although he was burnt he was bale to help Walton who was more seriously injured. They went out of the place to the to of the jinny where they saw the afternoon shift deputy, John Russell. On the was out they saw three men, John Thomas Ridgewell, a corporal was one of the and Hart told these men to go up the 61's and bring the men out 'as there was a bit of fire at 30's'. These men however went outbye with Walton and Hart and heard Hart tell Russell that they had had a 'a bit of fire' and he should send down the low side of the district (70's, 36's, and 60's) and warn the men to come out. This Ridgewell did and he had returned to the main intake opposite 30's level when 'another bump went off'. This blew open the doors on the 30's level and raised a large cloud of dust. This was the second explosion.

What Russell was doing before the explosion was gathered from the evidence given to the inquiry by George Hopwood, a hewer was working in 61's, Fred Hopwood, his son who worked as a trammer and Alphonso Lenton a corporal. George Hopwood said that sometime after six, following a check on the ventilation, Russell came to his place and told him that he would have to go out because something had happened in 30's. At the time his son was along e face having gone to fetch some empty tubs. He waited for a minute or two and the went outbye. He was standing between the ventilation doors on the 30's level when these doors were both blown open and he was blown against the horses which were standing on the main road. There was a strong rush of wind and a lot of dust and the flame of his oil safety lamp was extinguished.

Fred Hopwood had left his father in 61's and went into 12's stall to get some empty tubs. On his way back he met Russell which did not speak to him but spoke to John Poole and Hopwood understood him to say that there was a lot the matter in 30's but he did not say what it was nor did he tell Poole or Hopwood to go out. He then went straight on 61's and no finding his father there, went straight down the gate and was on the 30's level when there was ' a bit of a bump and then a rush of wind and then it was like a gale of wind'. His electric lamp was blown out of his hand but although he could not see it at first as it was covered with coal dust, he recovered it and made his way put of the mine.

At about 6.15 p.m., Alphonso Lenton took a pony, Jumper, and a run of empty tubs from the passbye in the 30's level in the 12's face for a driver, William Johnson, who was having his snap. About five minutes after he got to the face, something occurred which seemed to him, 'as if someone had cut off the air on the low side (61's) of us and then it rushed forward again'. The colliers Poole, Unwin, Dyson and Allott were in the face and either Dyson or Unwin said he thought there had been a heavy fall and the other said 'a run had gone down the jinny'. Allott and Dyson were the walking towards 62's and Lenton followed them. He saw King and Cusworth at the face of 62's and went down

towards 30's. Lenton was returning to the pony when he met Russell between 12's face and the empty slant end. Russell asked him where the men were and he told him that and he told them that Dyson and Allott had gone towards 62's and he asked, '*What have they gone up there for?*' Russell also asked where Cusworth and King were and he told him they would be up in their own place. Russell then passed on without telling him to go out. He heard Russell tell Unwin and Poole that there was 'fire in 30's'.

When Lenton got into 12's empty slant, his pony was there and he remained there and was there, about 10 to 15 yards from the face, when the second explosion occurred. He saw no flame but the air became hot and '*just like a fog, dust rising off the roof - thick dust*'. There was no noise. He was wept off his feet. he shouted to Poole and Unwin but got no answer. He did not know where his pony was as he had left it rearing and kicking. He was eventually taken outbye by some men from 66's. He had Pool's electric, lamp and Poole had this oil lamp. Between the first reversal of the air and the second explosion there was an interval of 20 to thirty minutes.

It was surmised from the evidence given at the inquiry that Dyson and Allott had been overtaken by Russell who was on his way to 30's when the second explosion occurred. Cusworth's body was found in his working place where he and King were filling a tub. It appeared that Cusworth had returned to his working place after Lenton had seen him turn down 62's gate with Dyson and Allott.

Those who died were-

John Dyson,
Herbert Allott,
Ernest Cusworth,
Tom King,
John Russell,
John Poole and
Leon Unwin.

Walked out:-

Fred and George Hopwood,
Sam Walton and
William Hart.

The inquiry into the causes and circumstances attending the explosions which occurred at the Wath Main Colliery, Wath-on-Deerne, Yorkshire on the 24th. February 1930 was made by by Sir Henry Walker, C.B.E., LL.D., H.M. Chief Inspector of Mines in the Council Chamber of the Wath-on-Deerne Urban District Council. Mr. W.P. Richardson and Mr. J. McGuirk appeared for the Miners' Federation of Great Britain, Mr. Herbert Smith and Joseph Jones for the Yorkshire Minerworkers' Association and W.T. Miller for the General Federation of Firemans, Examiners and Deputies' Association of Great Britain and all other parties were represented. The proceedings opened on the 22nd. May and lasted for seven days. The report was presented to E. Shinwell, Esq., M.P., Secretary of State for mines on the 1st. October 1930.

An inspection of the explosion area after the event revealed that in the 30's left bank the roof had fallen close to the timber from the pack on the left side right down to the low end and the goaf side of the pack was partly down. Walton's safety lamp was found lying at right angles to the face of the pack with it's top lying towards the pack and its glass broken. This lamp was suspected as the source of ignition and Captain Platt extensively tested the lamp and gave the inquiry the following report-

"The lamp was lighted and suspended in a a gas chamber containing normal air. The lamp was adjusted to normal working height. A mixture of firedamp and air at 5.5 to 6 percent firedamp was allowed to descend slowly on to the lamp the lamp flame increased in height to about level of the bottom edge of the gauze ring, when

a flame of the burning firedamp propagated to the external mixture. This test was repeated with similar results and a 8-9 percent mixture of air and gas. In none of the tests was any diminution of the light observed prior to the ignition of the gas mixture.”

Samuel Walton was sure that his lamp could have been struck by a stone from the gob. Mr. Frazer said:-

“When I got to the colliery they told me there was man getting dressed in the ambulance room in the baths. I did not wish to distress Hart with a lot of questions so I said, ‘*What has happened?*’ He said, ‘*We were putting a pack on and the place broke down, and must have broken the lamp.*’ I asked him if he saw it break the lamp and he said, ‘*No, but it most have done so.*’ I asked, ‘*Did you bring the lamp out?*’ and he said, ‘*No.*’ I said, ‘*What sort of flame was it?*’ and he said ‘*It was a fairish big flame.*’”

The inquiry came to the conclusion that the first explosion was due to Walton’s lamp breaking and the presence of firedamp brought down by the fall in the goaf which both Walton and Hart heard.

LYME PIT. Haydock, Lancashire. 26th. February, 1930.

The small village of Haydock in Lancashire lies between Wigan and St.Helens and was typical of many small mining villages in the Lancashire coalfield. Coal had been mined there for many years under the directions of Richard Evans & Co. who owned all the collieries in the village and which were collectively known as ‘*The Haydock Collieries.*’ The Lyme colliery was one of five collieries belonging to Messrs. Evans and Co. of Haydock and it was three miles east and slightly north of the Borough of St.Helens.

The Lyme Colliery had a chequered history. Sinking had started in 1876 and had reached a depth of 110 yards when there was a serious problem with water due to the geological conditions. The pumps of the time could not keep the shaft free from water as the feeders were supplying so much water and the operations were abandoned. By 1912 the technology of sinking shafts had improved and the work was continued and many large surface buildings were completed for the processing of the coal that was hoped would be mined but the sinking work again came to a halt by the Great War.

Sinking was resumed in 1919 when again there were further developments in the technology of sinking shafts. Concrete was pumped into the shaft to control the flow of water from the feeders. This technique proved very successful and the colliery at last began to produce coal in 1922.

There were three shafts in use with the Nos.1 and 2 being used for coal winding and the No.3 shaft was used as a pumping shaft. The No.1 downcast shaft that was started in 1876, was later widened from 16 feet in diameter to 18 feet and reached the Florida Seam at a depth of 395 yards in 1922. This shaft wound coal from the Higher Florida Seam. The No.2 shaft was sunk to the same depth and was the upcast shaft. Coal from the Potato Delf and the Wigan Four Foot seams were wound in it when the Potato Delf seam was intercepted. Both shafts had steam winders that raised two deck cages which held three 12.3 hundredweight capacity tubs per deck.

The No.2 shaft was the upcast shaft and was 18 feet in diameter and reached the Florida Seams in 1922. New coal screens were installed in 1923 and a coal washery was completed in 1926.

About a quarter of a mile east from the shafts, a large fault with an upthrow of 240 yards to the east, interrupted the strata and brought the Wigan Four Foot seam, in which the explosion occurred nearly to the same level as the Potato Delf seam. The Wigan Four Foot seam was recovered by a pair of stone drifts or tunnels driven across the fault from workings in the Potato Delf seam.

At the time of the explosion the workings of the Wigan Four Foot Seam and the roadways in the Potato Delf seam connected the workings with the shafts. These workings are known as the No.1 West District of the No.2 Lyme pit.

Immediately adjacent to the fault and for some distance beyond it, the seam was developed by headings driven in the solid coal. At a later stage a longwall machine-cut conveyor face was opened out from a level known as the 'Conveyor Level'. This included a short length on the deep side of the level. The face was 100 yards in length and was advancing nearly parallel with the line of full dip of the seam at a gradient of 1 in 5Å. Both the coal cutting machine and the conveyor engine were driven by compressed air was also used for drilling shot holes, and for auxiliary haulage and pumping in the district.

The Wigan For Foot seam had a roof of shale, a roof of coal 1 foot 10 inches thick. The coal was 4 feet 8 inches thick and the floor was of fireclay. The shale roof went on for 16 yards above the seam where a bore hole had proved the existence of another coal seam. A boring downwards had also proved a third seam of coal at a similar distance below the Wigan Four Foot seam.

The supervision of the colliery was carried out by the following staff. Mr. F.B. Lawson the General Manager and Agent of all the collieries of Messrs. Evans and Co. Ltd., Mr. Harold Whitehead, the manager and Mr. C.M. Coope, undermanager for the No.1 pit.

At the time of the explosion, the post of undermanager of the No.2 pit had been vacant for five months and an underlooker, Mr. J.F. Pickett, who held a second class Certificate of Competency, was performing the usual functions of an undermanager in the No 2 pit on a temporary basis, but he had not been formally appointed undermanager. In addition to the undermanager, there were nine firemen in the No.2 pit, four on the day shift, two on the afternoon shift and three on the night shift. Normally during the afternoon and night shifts, the workings were not visited by any official superior to a fireman. The inspection required by the Coal Mines Act, 1911 to be made within two hours of commencing work in any shift, was made and reported, generally by the fireman and the preceding shift.

Flame safety lamps were general used throughout the workings, but electric lamps were issued to coal cutting machinemen, conveyor panmen, drillers and fitters and a few working men were provided with two lamps.

Shots were fired in the rippings in the coal in the No.1 West District. The permitted explosion used was Polar Viking Powder with No.6 H.T. detonators. Shots were fired on all of the three shifts, but in no great numbers except on the night shift, during which an average of about twenty shots were fired by a shotfirer in the freshly cut coal. There was a shotfirer on the day shift to fire shots as required in the Conveyor Face and in the pillar workings to the dip. Firing on the afternoon shift was confined almost entirely to the rippings and it was done by firemen without assistance.

The quantity of coal dust in the face and on the roadways did not appear to have had a very great and in accordance with the provisions of the General Regulations of 30th. July 1920, it was diluted by the application of Chances Mud, a carbonate of lime which was a waste material of certain large chemical processes and had been proved by experience to be extremely suitable for the purpose. In a period of six months prior to the date of the explosion, Chance's Mud was distributed in the roadways of the mine at the average rate of 2lbs. per ton output.

There was also inert dust which was applied by hand, daily in the roadways of No.1 West District and in the face, prior to the firing of shots in the coal. The dust was applied by means of a blast of compressed air from a pipe placed in a bucket of dust at the intake end of the face.

General supervision of the stone dust arrangements was exercised by an assistant of the Agent, who was responsible for taking samples and for having them analysed. When the results of the analysis were known, each manager was given them and he was then responsible for seeing that remedies were applied in any case in which the analyses showed they were necessary.

The Wigan Four Foot seam was a seam that was recognised to give off firedamp freely but in these workings, the general ventilation of the mine was so good, that firedamp was rarely present in sufficient quantity to be detected on the flame of a safety lamp, but after the opening of the longwall conveyor face, the first heavy weighting was accompanied by water being driven into the workings and a very large volume of firedamp which, for a short time, overpowered the ventilation current and compelled a temporary suspension of work in the district for several days.

The roof in the conveyor face was supported by steel props (tubes with a timber core) and corrugated bars or straps. The roof in the roadways was supported, where supports were required, by steel arch girders which used right up to the face of the caunches in the Conveyor Level and the Main Slant. A considerable length also of the Main Brow was supported in this manner. In the pillared portions of the district, where the top coal was left up as a roof, little artificial support was necessary but where support was required props or props and bars were used as well as a chock here and there.

The explosion, which occurred in the main haulage way of the No.2 pit at about 6.15 p.m. on Wednesday 26th. February 1930, was the worst in the Haydock Collieries since the Wood Pit explosion of 1878. Forty five men on the afternoon shift went down the pit at 3.10 p.m. and were due to be on the surface again by 11 p.m. The explosion of firedamp occurred in the Wigan Five Foot Seam following the firing of a shot. The first that was known of the disaster on the surface was when a 'phone call came from a man named Burrows to tell that something was amiss and there had been an explosion.

An official statement from the Evans Company stated,-

"A local explosion of firedamp following the firing of a shot in the Wigan Four Foot Seam at Lyme Pit, Haydock last night took place in the evening. Rescue parties headed by the General Manager, Mr. F. B. Lawson, Mr. D.J. Whitehead, the manager and Mr. C.M. Coope descended the mine and proceeded to the seat of the explosion."

There were five killed by the full force of the initial explosion which occurred on a conveyor face where compressed air was being used. Twenty six men were injured and fourteen escaped from the workings.

Directors of Richard Evans and Co., Colonel Pilkington and Mr. Gardener were told of the disaster by telephone and went to the pit as soon they could. H.M. Inspectors of Mines, Mr. Davies and Mr. Roberts quickly arrived at the colliery and took an active part in the rescue operations. All the men in the pit had been withdrawn after the explosion and everything that could be done had been for the unfortunates.

On going into the mine, Mr. Lawson found that the coal was burning in two or three places and the workings were filled with smoke and fumes. The party had to put on gas masks and carry oxygen bags on their backs. In addition to the fumes, the rescue party had great difficulty in getting to the injured as there were some very nasty falls of roof and smashed and more than half a dozen trucks that were standing near the scene of the explosion had been reduced to a twisted mass of broken metal and wood.

Mr. Lawson said that shots had been fired in the Wigan Four Feet mine in the No.2 Pit and soon afterwards there was an explosion. The men that were nearest were badly burnt and others many yards away were thrown against the walls of the pit and badly scorched as the burning atmosphere flashed round the workings. The first that was known about the accident at the surface was from Burrow's telephone call.

A local female doctor, Dr. Winifred Bridges, described as '*a good looking and comparatively young woman of athletic build*', went into a mine for the first time in her life and did heroic rescue work as she tended the injured underground. In the 1930's women doctors were not common and the fact that she went down a mine in these circumstances was a very notable event. She won a place in the hearts of the mining community of Haydock when she went below ground to tend to the injured.

On the night of the explosion she was in the surgery about 6.30 p.m. when the call came for medical help as there had been a serious accident at Lyme pit. She contacted Miss. Bone, the Matron of Haydock Cottage Hospital and both of them went in the

Doctor's car to the pit about three quarters of a mile away. The journey was made in darkness, along the railway lines and rough paths.

When they arrived at the colliery they saw the colliery officials at the pithead with Dr. Dowling of Haydock and Dr. Jones of Ashton. Dr. Jones had just recovered from a serious illness and it was impossible for him to go down the pit. Dr. Dowling had served the people of Haydock for many years as a general practitioner and as the Medical Officer of Health. He had often been down the pits to injured miners but he was not a young man and Winifred Bridges had no hesitation in going down the pit with him.

Dr. Bridges, reluctantly, gave her account of the events to the 'Guardian' reporter-

"They gave us miners lamps and we went down in the cage to the bottom of the shaft. After that we went along the colliery road we found ourselves walking and occasionally climbing over boxes which had been strewn about the roadway after the explosion. We had to travel like this for about three quarters of a mile, stooping in the low portions. We came to the scene of the explosion where we met colliers carrying a stretcher on which lay a man with a broken leg. By the fitful lamp of the miners lamp Dr. Dowling and I put the limb in splints and made him as comfortable as possible. Our work went on in the pit for an hour and a half and we put arms and legs and fractured thighs in splints and was to the men's injuries as best we could. We saw the bodies of three men who had died before we got into the pit and when we got to the pithead again we found Miss Bone doing valuable work in assisting the injured men before they were removed in the ambulance. It was an extraordinary experience and one I do not wish to have again but I would do it again if necessary."

Other first hand accounts of the rescue work were given to the press. Sammy Forshaw, of Common Row, Earlestown, was called from his bed to help in the rescue operations and was accompanied by John Gaskell a worker in a neighbouring pit. He said the pit was about 500 yards deep and 900 yards under the surface. The explosion occurred at the face. He went down the pit with fourteen other men including Mr. Kay and Paddy Crehan, Mr. Whitehead, the manager, Mr. Coope, the assistant manager, Mr. Lawson, the general manger, Col. Pilkington, Dr. Dowling and his woman assistant.

Mr. Forshaw was very impressed with Dr. Bridges as were many in Haydock and further afield. He said she went straight down the pit and never hesitated, to the face and stayed down for about an hour and a half until everyone was attended to. The first two bodies that the party found were huddled together under a big iron tub large enough to carry 15 cwt. of coal and the bodies were terribly mutilated and difficult to recognise. A further three dead were found at the face, badly disfigured. The colliery was fairly clear of fumes except for the last 100 yards to the face.

One of the men involved was comparatively uninjured and that was a man named Burrows. He was knocked out by the explosion and had the prescience of mind to crawl through the inky blackness his lamp being useless. He went through the stone and dust and got to the 'phone about twenty yards from the face when he gave the alarm.

The evacuation of the dead and injured from the mine was speedy and efficient and an official statement was issued at 11 p.m. on Wednesday by Mr. F.B. Lawrenson, the general manger of Richard Evans & Co, who had come from down the pit after being involved in the rescue work. The statement said-

"At 6.15 tonight an explosion of firedamp owing to shot-firing occurred in the Wigan Four Foot Seam. A party headed by the General Manager (myself) and the Manager, Mr. Whitehead, and the undermanager, Mr. Coope, made a descent of the mine and organised a rescue party. Two small fires were put out and the injured were brought to the surface on stretchers. The mine had been cleared by 11 p.m. The casualties are 5 killed and 20 in hospital with burns and shock, Two the others were able to proceed home."

There were ambulances waiting at the surface when the men were brought out. Matron Bone, who had gone to the colliery with Doctor Bridges, was there and administered first aid before the injured were taken to Hospital. There were so many

casualties that the St. Helens Hospital had to be asked for help and some of the injured were transferred there.

The sad scene at the pithead was captured by a reporter of the 'Newton and Earlestown Guardian' who was obviously very moved by what he was seeing. The crowd had had to wait along for news of their friends and loved ones.

"Heart rending were the scenes near the pit shaft when over a thousand relatives and friends were keeping acts of vigil. It was a horrific sight to see the tear stained faces full of hope and yet fear as the solemn stretcher bearers filed past. There was no moon and only the glow of the colliery lights. The hiss of steam and the clouds of smoke brought the pallor of death to the scene. Mothers, whose sons were not yet out of boyhood, had gone to the pit on that afternoon shift, to hear news of their dear ones and were told 'No news yet'. Everywhere there was the impression of eagerness but we could only wait and see. The waiting continued. They did not know. They could not say but I had heard when I said 'I can not say'. It was wiser to spare the pain in such a truth as that.

At the shaft itself there was a crowd of officials all waiting helpless until the rescue party came up. 'Make way', they cried. With a rumbling the door opened and a solemn face grimy faced Lancashire Lad backed out and then another. A gentle heave and the stretcher with its dreadful burden came into view. Not a sound. Not a word. Only bowed heads here and there and a hat or two removed. Some poor mother's son passing for the last time from the colliery to be interred this time in a grave not so deep or as large as the one from which he had just emerged and one that would smell sweetly of flowers.

At the slow pace, the five stretchers bearing five corpses which, but a few short hours before had been full of joy and living. The crowd looked on and wondered how men could give their lives for the lives of others for their sacrifice was as great as any warrior that laid down his life for another."

A survivor told the press of his experiences as he was having his injuries dressed at the surface-

"We were ready to take coal from the coal face when I heard a rumbling at the far end of the pit. There was a terrific pressure of gas and someone shouted, 'Firedamp'. I heard one or two men cry out and with a couple of others I rushed down but could not get near the scene of the explosion. We were driven back by the fumes and we struggled to the pit face. Someone telephoned from above and when I donned a fire mask. I helped to drag out some of my friends. It was terrible to have to drag them out like that when a few moments before I had been talking to them."

Accounts of what had happened below ground were given to the Press by the injured men that were released from hospital after treatment. James Sowerbutts was sent home suffering from shock and he told Reporters-

"I was working in a dip in the road and had just left me mate to draw a tub. When I got about ten yards away there was a terrible crash and everything seemed to be falling about my ears. I was unable to speak and after a minute or so I heard my mate calling 'Are you alright Jim?' but I could not answer. Again he called and I was able to shout back to him. We then both made towards the motion where we thought there might be a way out, but after running about one hundred and fifty yards we were overcome by the gas and fumes and forced to turn back. We ran on the opposite direction and met the rescue party. We reached the scene of the accident and there we picked up some of the injured man and decided to get together, Everyone was wonderfully patient and all willing to do their best for the injured, Somewhere we heard voices calling 'Don't leave me Don't Leave me' and once again we tried our best to find a way out. We half carried and half dragged the injured with us but several times we were forced to lie down to get fresh air. I was nearly dropping when we did eventually reach the brow. Keenan, whom I had been carrying was my first care as I knew I was not seriously injured. One of my mates'

hands was terribly cut and burnt and he eventually fainted, Some of those reported injured must have been in the rescue party. I know almost all the men in the district but I don't recognise some of the names."

Another eye-witness account came from Jack Burrows, the man who phoned the surface with the first news of the disaster-

"I owe my life to the fact that I had just left the spot where the explosion occurred, to have a drink of tea. We had just finished one job and we were waiting further orders. No sooner had I left my working place that I heard the terrific explosion. This was followed by a blinding flash and a thick wall of coal dust seemed to come towards me. I was temporarily blinded but I had an electric lamp and immediately returned to see if I could help any of my mates. I came across one of my pals. He had been badly injured and was burnt about the body and his clothing ripped off. I took off my shirt and wrapped it around him and then crawled back to the telephone and inform them at the haulage house of what had happened.

I then started to make my way back to see if I could do anything to help some of the injured men, but before I had gone many yards I collapsed and the next thing I knew was that I was in company with Bert Chick and two other men and I was being attended to at the bottom of the pit shaft."

Two brothers named Hennigan spent four hours were searching the mine for their brother Jack, whom they knew had descended the mine during the afternoon. They did not see him among the injured and he had not returned home after the accident occurred. They made their frantic journeys to the hospitals and back again to the mine and finally their search came to an end when it was discovered that he was among the dead who had up to then not been identified.

Among the men who were taken to the Haydock Cottage Hospital and were treated for their injuries some were later allowed to go home. They were, James Sowerbutts of Newton Road, Parr, Albert Lowe of Juddfield Street, Haydock, Arthur Burrows of Cheery Street, Earlestown and William. J. Plant of Clipsley Lane, Haydock.

Arthur Burrows, aged 23 years, of 26, Cherry Street, Earlestown was in the explosion area when it occurred. He scrambled and crawled two hundred yards over debris to the 'phone and raised the alarm on the surface. He was exhausted when rescued he was taken home suffering from very sever shock and the effects of gas. His statement to the Press read as follows-

"I have worked down the mine for about two years. Just after six o'clock I was having a drink when I heard a loud bang and a big black cloud rushed towards me and I was thrown 6 or 7 yards backwards but I managed to get up and scrambled and crawled along the ground for perhaps 200 yards. On the way I had to climb over overturned tubs and when I came up some of the fellows were nearly done up and I carried on to the telephone as the urged me on. It seemed like hours to me but it was about twenty minutes to cover the two hundred yards. George Parr and Bill Muldowney found me and took me to safety."

Another collier who had a lucky escape was William Plant, of 272, Clipsley Lane, Haydock. He was filling boxes at the time of the explosion and he could not say what time it was but he thought it about seven o'clock. He was working in a place that was about eight feet high and about the same in width. He said-

"I could see nothing. Like a fog of dust came across me and I went as best as I could to the shaft. I was working with James Cunliffe of Clipsley Lane who was killed and T. Ogden of Ashton-in-Makerfield. Near us were J. Garbutt of Parr and Albert Lowe of Juddfield Street, Haydock. The shock mesmerised us for a moment or so and drove us back we put our caps over our noses and mouths and used them as gas masks. After several attempts we made our way from the Cinder Brow to the main haulage way. We met a party of injured man and one of them was Duggie Conway who was badly injured and almost worn out. We were not much better ourselves but we did what we could. The men were badly burnt and had little clothing left. They were shouting for help. We only missed being burnt to a cinder."

Clambering over the 15 cwt. tubs which had been swept over by the force of the explosion and they almost blocked the way. They were met by a second rescue party led by a fireman named Spurgeon Green of Grosvenor Avenue, Haydock. The lamps were going out and they were going along in single file. He continued-

"I had a man in front of me and one behind and we would not leave go of each other. The one behind me, I don't know who he was, said 'Don't leave me' and I said 'I'll not so long as I can keep on.'"

James Cunliffe, of Clipsley Lane, Haydock who lived opposite the Cottage Hospital was another who got out of the explosion area. He was suffering from shock and the effects of gas. He was working with William Plant when a cloud of gas bore down on them. It was so bad that they used their caps to cover their noses and tried to make their way out. They met a party of thirteen men all of whom were badly burnt and together they stumbled over tubs and staggered along rather dazed.

"We had done all that we could for the injured men. I have never seen anything so terrible as the sights I have seen in that pit. It was the most terrible sight I have ever seen and I never want to see it again."

Continuing out of the pit, he said he came across the youngest casualty in the disaster, Kenneth Forshaw, only 17 years of age, who was suffering badly from his injuries but he kept a stiff upper lip and they gave him drinks and rallied him. James Cunliffe stated that at that time he never thought that they would get out of the pit alive because the smoke and gas were so bad.

Eight of the injured died in the local hospitals as a direct result of their injuries. The medical treatment that they received was primitive compared to the technology that we have today. The final death toll reached thirteen.

All the men were badly burnt and had coal dust fused with their skin in addition to broken limbs that had been caused as they had been thrown around by the violence of the explosion. One man was so badly charred that he was so easily identified until late on Thursday morning. Clemment Elliot, of 28, Burley Street, Newton-le-Willows, was in the Haydock Cottage Hospital, so swathed in bandages and recognised by the fact that he was known to have a nail missing on his big toe. There was a rumour that he had died in the explosion gave but his condition was very serious with terrible burns to his face, body and arms. When he was rescued, the greater part of his clothing was burnt away.

Eight of the men who were taken out of the mine alive and taken to hospital died giving a total death toll of thirteen.

John Hennigan aged 37 years, a haulage hand who had extensive burns and other injuries, James Cunliffe aged 34 years, a fireman who had extensive burns, Frank Thomasson aged 27 years, a daywageman who had extensive burns, William Seddon aged 33 years, a collier who had extensive burns and other injuries, Roundel Cecil Page aged 20 years, a daywageman who had extensive burns and other injuries.

These were the men who died in the initial explosion. The eight that follow were taken from the pit alive but badly injured and died of their injuries later:-

Kenneth Forshaw aged 17 years, a haulage hand and the youngest of the victims. He had extensive burns,

John Foy aged 39 years, a daywageman who had extensive burns and fractured thumb.,

Clement Elliot aged 49 years, a daywageman with extensive burns,

William Conway aged 45 years, a collier who had extensive burns,

Albert Page aged 29 years, daywageman. Extensive burns,

George Franklin aged 43 years, a collier with extensive burns,

George Hollis aged 43 years, a putter-on who had extensive burns and

William Molyneaux, aged 45 years, a collier with extensive burns.

The men that were injured were-

Joseph Muldowney aged 42 years, a panman suffering from burns,

Arthur Pilling aged 25 years, a fitter suffering from burns,

John Duffy aged 40 years, a daywageman suffering from burns,
Francis Keenan aged 22 years, a collier who was burnt,
Thomas McGuire aged 39 years, a contractor also burnt,
Sidney Marsh aged 44 years a daywageman who was burnt and had severe head injuries,
George H. Chick aged 34 years, a pumper who suffered burns and a fractured leg,
John Brown aged 25 years, a coal-cutter man who had burns and a fractured leg,
Thomas Clarke aged 34 years, coal-cutter men with burns and fractured thigh and
James Clarke aged 26 years, a coal-cutter man suffering from burns and a fractured thigh.

With the human toll of the disaster known it was for the formal inquest to ascertain the cause of death of the men. The first inquest was opened by Mr. F.A. Jones, the Deputy County Coroner, at the Waggon and Horses Hotel, in the billiard room, when evidence of identification was taken and the proceedings adjourned until the 14th. March.

After expressing his personal sympathy to the relatives of the dead he read a message from Mr. Samuel Brighthouse, the County Coroner. Mr. Brighthouse had been the Coroner for many years and in 1930 was an old man. It had been his painful duty over the years to visit Haydock and officiate at many inquests into the deaths of men in the mines.

He sent a letter to the court which Mr. Jones read out in which he expressed his sympathy at the disaster and was sorry that he could not conduct the inquiry as he was suffering from a cold. He went onto say-

“Would you say to the relatives of the poor dead fellows that I am sorry. They will know what I mean. I Say this. During the many years that I have held inquests it has been my unfortunate task to be present at many colliery disasters and I never do so without wishing that some means could be designed to prevent them. The Lancashire collier is a brave fellow, a man of character, and one who is always prepared to carry out his duty to the best of his ability. He will always do anyone a good turn. I have a great admiration for the Lancashire collier and I can safely say, we like each other. Tell them at the inquest that I am full of grief for those that are left behind and we all appreciate the great usefulness of those who labour in coal mines and that they shall be assured that an impartial inquiry into the circumstances of the explosion and the manner of their deaths and we pray for their souls departed.

Signed S.BRIGHOUSE (Coroner).”

At this first session of the inquiry, evidence of identification was taken from the relatives of the dead. John Victor Page, a driver, of 36, Vista Road, Earlestown, said that Roundall Cecil Page was his brother he had worked in the pit for only two weeks and he had made no complaints.

Mr. Lawson, the general manager of the Haydock Collieries, expressed sympathy on behalf of Richard Evans and Co. The secretary of the Miner’s Association said that were many brave deeds done below ground that day and he would like to express sympathy to the grieving relatives.

With the formal identifying over, the court was adjourned to a future date when the causes of the men’s deaths would be examined and the grieving relatives could bury their loved ones.

The formal inquest was opened at the Colliery School in Haydock with a large attendance of local people and mining experts. The Deputy Coroner, Mr. F. Jones presided over the proceedings and also present were Mr. J. Charlton, the Divisional Inspector of Mines, Mr. D. Coatsworth, Mr. T. E. Davies and Mr. D. McBride, the Inspectors of Mines. The inquiry opened at 10 a.m. and a break was taken for lunch and on returning, the business went through till 4 p.m. when the verdict was returned.

Addressing the jury, the Coroner said that the inquest was being held to find the immediate cause of the deaths of the victims and to find out how those deaths came about. He went on to instruct the jury-

“If you find the deaths were caused by explosion, then you can say how the explosion was brought about. If you satisfy yourselves how brought about the you will have to satisfy yourselves if it could be avoided. You have only two verdicts, Misadventure or Manslaughter against the individual. In this court, however you can say anything that will save life in the future. If you return a verdict of misadventure I will ask you if you have any recommendations to make which will be carried out.”

Mr. Peace, solicitor, on behalf of the directors of Evans and Co. repeated his message of sympathy and referred to Miss Bone of the Haydock Cottage Hospital as a ‘ministering angel’. Evidence was given as to the cause of deaths.

With the formalities over, the court got down to the business of looking for the cause of the men’s deaths. Several men were able to add to the story of what happened underground immediately after the explosion. The first was Clarence Edbrook, the manager of Lyme pit No.1, who lived at 212, Haydock Street, Earlestown, said he was called from his home at 6.20 p.m. on the 28th. February. When he descended the mine, he noticed two coal fires and two dead bodies. Thomas Hughes then joined him and they found the body of Cunliffe, the fireman, about thirty yards from the face. They then came across a man with a broken leg and he told the witness that there were two further up. they went to search and found Thompson but there was little hope for him. His electric light was burning all right.

Spurgeon Green, a fireman at the colliery who had worked in the mine for twenty three years and had been a fireman for twelve years. He was at work on the day of the explosion in the No.2 district and left at 5.45 p.m. having been delayed by repairs that had to be done. He was going towards the pit bottom, when he suddenly felt a change in the ventilation. He was about one hundred yards from the seat of the explosion and by his watch it was 6.02 p.m.. He knew that an explosion had occurred in the No.1 District and he gave orders that phone calls should be made to the hospitals. He said Mayor was the first man out of the No.1 and then he came across John Folley twenty yards down. He had three others with him suffering from shock, one of which was Thomas Hughes.

John Canny, contractor, of Vicarage Road, Haydock had worked in the pits for thirty years and stated that he had found no gas. After the disaster Cunliffe, the deceased fireman, had come towards him and the dust nearly choked them. He turned off the compressed air and went to look for Hennigan. Elliot and Conway then stumbled up to him and Elliot’s feet were on fire.

The course of the inquiry then turned to the question of shotfiring in the mine and Mr. Lawson, the manager was called. In reply to questions he said he was surprised to find four other shot holes charged at the scene of the explosion. In reply to a question from the Divisional Inspector of Mines he said that after the explosion he examined the place and found that a shot had not been fired but four shot holes where charged. This did not necessarily breach the Coal Mines Act but it was against the Rules of the colliery and the orders given by him were, that only one shot had to be charged and fired at one time. Mr. Lawson added that the shots were vertical and not horizontal as they should have been.

Mr. Whitehead. the manager of the colliery, also gave evidence of the events underground during the rescue operations. He came across Albert Page and had to ask who it was. Page said he was not so grand. The manager continued along and found four shot holes with the detonators hanging out and he knew that it was against orders that had been issued. The witness described, with diagrams, the pattern of the shot holes and showed how a break ran right across the coal over the holes.

Mr. A.J. Cook, the Miners Secretary and Mr. Jack Jones, Secretary of the Yorkshire Miners Federation took up the questioning of Mr. Whitehead and pointed out that there were regulations stating ‘that no shot should be fired unless it be inspected by a fireman with an approved safety lamp and satisfied that there was no gas within a radius of twenty yards’. If there was a cavity where gas could be lurking then the shot should not

be fired. Mr. Whitehead said that he had seen a break in the coal. The seam had been opened about two years ago and there had not been much gas since it had been opened. The manager stated that Cunliffe, the firemen, had booked the number of detonators before the accident at 20 and 15 were found in the tin.

Mr. Whitehead continued-

“I was not there when the shots were fired and I do not know if the regulations were carried out but the holes were all together and against my orders. I came here from Abram Colliery and had been mining since about 1900.”

It was put to him that he was responsible for seeing that the regulations were carried out. There were vertical holes drilled by the contractor who was paid by piece work. It emerged that it was easier to make vertical holes than horizontal holes.

John Francis Piggott of 306, Newton Road had worked in the mine for twenty eight years. He had tested for gas and found it all right and he accepted the fireman's report. On Thursday he noted a little gas and noted four shotholes that had been drilled and he thought the shot had been fired at night he did not think that the four vertical holes contributed to the cause of the accident.

The Coroner began his summing up and the jury retired. They returned a verdict of 'Misadventure', stating that the accident was caused by gas and they also thought that the afternoon shift was too big for one fireman and drilling one hole at one time was common practice at the pit and thought that it should be stopped but in no circumstances should coal be thrown in the gob and left there. Vertical holes should not be drilled because it was not always possible to stem the holes satisfactorily. In conclusion they thought that H.M. Inspector of Mines should visit the mine more frequently. The foreman also said that all the jury had worked in the mines until recently.

The formal verdict read as follows-

“Death due to misadventure, through ignition of gas unforeseen by the fireman”.

To this the jury saw fit to add the following five riders.

- 1).The Jury think the work in the district in the afternoon is too much for one fireman.
- 2). We are of the opinion that the stemming of more than one hole at a time is a common practice and should be stopped.
- 3).We are of the opinion that under no circumstances should coal be thrown into the gob.
- 4). We strongly object to vertical holes being drilled, as we think it is not always possible to stem the holes satisfactorily.
- 5). We are also of the opinion the His Majesty's Inspectors should visit the mines more frequently.”

The verdict was recorded and the only other formality following the disaster was the Government Inquiry into the cause or causes of the calamity.

The Official Inquiry into the disaster was ordered by E. Shinwell, Esq., M.P., Secretary for Mines and a full report was submitted to Parliament. The report was made by Mr. F.H. Wynne, B.Sc., H.M. Deputy Chief Inspector of Mines and the report was submitted to Mr. Shinwell at The Mines Department, Dean Stanley Street, Millbank, London S.W.1. on the 12th. September 1930.

The Inquiry was opened into the Council Chamber of the Town Hall, St.Helens, on Tuesday 29th. April and was went on until Friday 2nd. May 1930. There were many eminent mining people present at the proceedings. Mr. W.J. Charlton, H.M. Divisional Inspector of Mines, Mr. T.L. McBride, H.M. Senior Inspector of Mines, Mr. Edwin Peace of Messrs Peace and Darlington, Solicitors of Liverpool, who acted for Messrs. Evans and Co., for Mr. F.B. Lawson, the agent, and for Mr. W,J. Whitehead, the manager.

Mr. A.M. Henshaw, JP, FGS., M.Inst. CE. represented the Institution of Mining Engineers, Professor R.V. Wheeler, D.Sc., appeared for the Safety in Mines Research Board, Mr. Arthur Roberts and Mr. James Hilton attended for the Lancashire and Cheshire Colliery Undermanagers and Underlookers Association, Mr. A.J. Cook and Mr. Joseph Jones represented the Miner's Federation of Great Britain and Mr. John

McGuirk, J.P. and Mr. M.W. Foster. For the Lancashire and Cheshire Miner's Federation. Mr. W. Frowen J.P., represented the Federation of Colliery Firemans and Deputies Association of Great Britain, and Mr. W.T. Miller and Mr. J.T. Hesketh for the Lancashire and Cheshire Colliery Deputy's Association.

At the inquiry, a detailed account of the accident was heard. and confirmed that five were killed outright and twenty three were injured by the explosion. Of the injured, eight later died from shock due to sever burning. The places where the bodies of those killed were found are seen on Plan 2 as well as the approximate positions of the injured at the actual moment of explosion.

The evidence collected after the explosion, showed the passage of force and flame in the roadways, There was much flame in the Conveyor Face and some force but the flame produced by the explosion was the most destructive and it came, outbye along the conveyor Level for a few yards only. It must also have found it's way out via the Main Slant in which, prior to the explosion, there were seven brattice screens which were completely destroyed. At the main junction of the Main Slant to the Pump Dip, indications of it ceased although the effects of force were observed further inbye on a set of trams. Flame apparently extended outbye along the Main Brow as far as the fault for near this point the timber lagging of steel arches supporting the roof and sides of the haulage road was found to be on fire the three places.

There were indications of great force after the explosion. A tram of full tubs in the slant at the entrance to the Conveyor Level had been pushed in the Brow near the junction had been literally flung about pell mell. At the junctions of the Main Slant and the Main Brow with the Conveyor Level, chocks had been dislodged and the single blocks scattered all over the place.

In the Main Brow the air crossing built of steel joists and concrete had been lifted bodily from its seating and collapsed in fragments on the floor below. No doubt the force was augmented in this locality owing to obstruction caused by the bends in the path of the blast and also by the tubs standing in the roadway.

One feature commented on by the inquiry was that two ponies stabled in the Conveyor Level in stalls consisting of only a few props and battens with brattice cloths nailed on them and situated 120 yards from the coal face, were not injured at all and the flimsy erection in which they were housed showed no signs whatever of any disturbance.

The majority of the men in and near the Conveyor Face, after they had recovered from the initial shock of the explosion and the air current had resumed its normal course, were able to find their way out toward the Main Brow where they were met first by some of those who were injured and later by parties coming inbye from the pit.

The conduct of a fireman, Spurgeon Green, who had worked in the No.2 District took the initiative in organising exploratory operations and relief of the injured was complemented by the inquiry. It will be remembered that he sent men to the surface and gave instructions for messages to be sent by telephone to the agent and the manager asking for ambulances, medical assistance and helpers generally.

The inquiry then turned to the question of the cause of the disaster. There was no doubt or difference of opinion at any time either as to the point at which this explosion originated or as to it's cause. It was caused by the firing of a shot of Polar Viking Powder in a shot hole in the caunch of the so-called Main Slant which was in fact the return air way from the conveyor face. This is proved by the evidence of Mr. James V. Clarke, a coal cutting machine attendant, who was present with the deputy James Cunliffe when the shot was fired. Clarke said in evidence that he was sitting besides Cunliffe when the shot was fired. He saw him turn the handle of the firing box and the explosion followed. He was with two other coal cutting men, T. Clarke and J. Brown.

Clarke's evidence proved to be quite conclusive and it was corroborated by what was found after the explosion. The positions of the shot cable and the battery, the rammer and the handle of the battery and the body of the dead fireman and the signs of force and coking.

It was a rare event that men who have seen an extensive pit explosion survive to tell the tale and the evidence of James Clarke and of another man named Ernest Pilling. They gave their evidence to the inquiry and Mr. Wynne commented-

“The evidence of these two men established that there was a small initial explosion immediately the shot was fired, followed after an interval of a few seconds by a bigger explosion. The first explosion caused a large volume of firedamp to be sucked into the slant from crevices in the strata and from cavities in the goaf and that this firedamp was ignited by the flame of firedamp left burning after the first explosion.

Examination of the caunch after the explosion revealed that the shot hole, bored horizontally, had penetrated a break which crossed the roadway diagonally and extended over the dip side of the pack towards the waste or goaf below. In the shale roof outbye of the caunch several more breaks existed which were easily to be seen. There was a further break crossing the roadway at right angles in the top coal inbye of the caunch.

It was possible that these breaks were interconnected with each other and also with further breaks and cavities in the roof over the goaf on the dip side and over the pack on the rise side of the slant and that firedamp was present in these breaks and cavities goes without saying. After the explosion a number of samples of gas were drawn from some of these breaks at depths varying between 12 inches and 4 feet 6 inches by means of a copper tube with an aspirator attached. The firedamp content in some instances was small and almost negligible in others it was present in proportions that were within the explosive limit of a mixture of firedamp and air.

It was because firedamp is so likely to be lurking in breaks that the charging of a shot hole in which a break has been detected is strictly prohibited.”

The commissioner thought that coal dust played little or no part in the explosion. He based his conclusions on the small extent to which coked dust could be observed afterwards in any part of the mine and the results of a minute investigation carried out by Professor R.V. Wheeler at the Safety in Mines Research Laboratory in Sheffield. A large number of sample of dust which were collected systematically in the face and roadways after the excursion and the absence of carbon monoxide in the afterdamp. As far as is known neither those killed or injured showed any sign of the symptoms usually associated with the instillation of this gas.

Without the presence of inert dust in ample quantity in the roadways there is little doubt that the explosion would have been extended throughout the workings of the mine instead of being confined as in fact it was to a comparatively small portion.

The evidence as to the origin of this explosion was so clear. It was due to the firing of a shot in contravention of the provisions of the Clause 6(d) of the Explosives in Coal Mines Order of 1st. September 1913 as amended 30th. March 1915, 14th. November 1919, 31st. August 1922, 1st. September 1924 and 10th. November 1926 which read as follows:-

d) Every shot shall be charged and stemmed by or under the supervision of a shotfirer. before the hole is charged a shotfirer shall examine it for breaks running along or across and if any such break is found the hole shall not be charged except in stone drifts if special permission had been given in writing by the manager or the undermanager.

It was not clear from the evidence whether or not James Cunliffe, the fireman who fired the shot, made an examination for breaks in the shot hole, but he had the knowledge of the presence of a break in it. Cunliffe was killed and had had therefore no chance to defend himself and in order however to avoid the possibility of doing Cunliffe an injustice, the evidence of the manager, Harold Whitehead, and the fireman, Spurgeon Green, relating to a conversation between the former and Albert Page upon which the opinion is founded.

Albert Page was the contractor who bored or supervised the boring of shot holes in the caunch and which, in this instance, had actually bored the shot hole in question.

Page was also killed and could not give evidence on this crucial point. There was no reason to think that he would not have confirmed the very circumstantial account of the conversation as given by these two witnesses.

Under examination by Mr. Charlton in reference to the events following the explosion Spurgeon Green said-

"Mr. Whitehead after he had examined for gas looked underneath the caunch and I assume he saw the wires hanging down. He said to me 'Now then this is not fair Spurge' and then all at once a voice replied 'It was straight in shot he fired, Mr Whitehead. On looking round we saw this Albert Page laid up against the face. So Mr. Whitehead said to him 'Now then Page what are you doing here'? and he said 'I couldn't get out. Parr had gone for some more assistance to get him out, so Page said, 'I drilled through a break Mr Whitehead.' Mr. Whitehead asked him if he had informed the fireman. He replied 'Yes' Then Mr. Whitehead asked him if it had been stone dusted and the man replied 'No'. Mr. Whitehead had informed both shotfirers and fireman that they must not ram more than one shot at a time and we found four. They disregarded the rule."

Under examination by Mr. McGuirk, Harold Whitehead the manager said:-

"I met Albert Page about 70 yards from the face. That is the first time I saw Page. Spurgeon Green and Parr were busy with artificial respiration with a man and I saw a man sitting down besides them. I said, 'Who is that?' Either he said or one of the other said, 'It is Page' and I said, 'How are you' or something like that I cannot exactly remember now. He said 'I am not so grand but I can walk out.'" The next time I came in contact with Page was when he spoke to me in reply to a remark I made to Spurgeon on the face of the slant. He heard me say to Spurgeon Green 'This is not fair Spurgeon' and Page replied, 'I did not know Page was there at the time- 'The hole that was bored (I am not quite sure whether he said the hole that was fired) was a straight one' I said 'Oh' and he said 'Yeas' He said 'Yes I bored into a break with it'. I said 'Did you tell the fireman?' He said 'Yes' I said 'Was it stonedusted?' He said 'No'. That is all the remark I had with Page."

It was evident that the shotfiring practice was at the root of the matter it was only natural that a good deal of evidence was led to ascertain whether the shot firing practice at the colliery was in accordance with statutory requirements. Three fireman were closely examined in this respect but they stoutly maintained that as far as they knew no irregularities had occurred.

The Commissioner commented-

"I should have been glad for Cunliffe sake if I could have come to the same conclusion in regard to him and to have been able to suggest that this was an isolated instance of neglect of statutory requirements on his part. I regret however that in view of the evidence I am unable to do so."

It was definitely established that both the agent and the manager had gone to considerable lengths to warn the firemen and shotfirers about their duties generally but specially and particularly on two points connected with shot firing. In the first place, against charging more than one shot at a time and secondly against firing shots in holes bored vertically into the roof. Yet in the coal roof under the caunch, there were four vertical holes positioned roughly at the corners of a four foot square, and every one of these holes was charged ready for firing. In addition two other vertical holes were found uncharged, one in the roof a few feet outbye.

There was an attempt was made by the representatives of the Fireman's Association to gloss over the charging of five holes at once by suggesting that Clause (g) (ii) of the Explosives in Coal Mines Order suggested that it be left to the shotfirer to decide whether or not the firing of one shot would be liable to relieve any part of the work to be done by another and that Cunliffe had exercised the discretion allowed to him. This might have been Cunliffe's favour were it not for the definite instruction that had been given to the all the firemen and shotfirers on this point.

Cunliffe's competence as a shotfirer and fireman was not questioned and those who are in a position to speak on the subject gave him an excellent character and it was not to be believed that he charged and fired the hole without regard for the possible consequences. In fairness to him the Commissioner thought it reasonable to suggest that his sense of danger was dulled by the freedom of the air in the vicinity of the caunch from detachable firedamp.

There was little doubt that there were greater risks of firing shots in caunches in long-wall workings than in any other situations since breaks are more likely to be formed in roof strata there. For this reason the fewer the number of shots in such caunches the better. It was known that ripping in certain classes of rock can hardly be undertaken economically without the use of explosives. There are many rippings however in which although explosives were extensively used it is a moot question whether any advantage is derived from this practice.

From the conditions in the Wigan Four Foot Seam it was suggested that the firing of shots in such start could be reduced, almost, if not quite to vanishing point. It was pointed out that for some time prior to the explosion shotfiring had been discontinued at the caunch in the Conveyor level and it was a matter of regret that it was not discontinued in the Main Slant at the same time. Shotfiring in the caunches was not carried on after the explosion.

An effort was made by the representative of the Fireman's Association to establish a case that the district allotted to the fireman on the afternoon shift was too large for him properly to carry out his statutory duties and that owing to the pressure to get through his work, he was hurried and it was possible he did things in a hurry that he would not have done with plenty of time on his hands.

The fact that steel arch girders were used extensively for supporting the roof in the roadways minimised the effect of the explosion. If props and bars only had been used, falls would have occurred and created difficulties of escape and rescue which might have added seriously to the toll of dead and injured.

In the 1930's coal faces were becoming mechanised and the new methods called for new arrangements in supervision. Earlier in the report, it was mentioned that during the afternoon and night shifts supervision was normally exercised only by the fireman who happened to be on duty. No official superior to a fireman visited the workings during these shifts.

Mr. Wynne felt that if visits to the workings by superior officials during the afternoon shifts had been the custom in the mine, better discipline would have been maintained and the probability of detection would have been kept by the fireman from disobeying the very definite orders that they had received.

Mr. Wynne finished his Report by saying-

"It is not out of place here to mention the fireman and workmen witnesses who gave evidence at the Inquiry. Speaking from a fairly wide experience, I can say that generally the manner in which they approached the questions put to them and gave their answers was most impressive. They exhibited a degree of intelligence considerably above the average and seemed not only to know exactly what they wanted to say but also how to say it."

With the publication of the Report, the village left the public gaze and was left to cope on its own with the feelings of sadness and sense of loss.

ALLERTON BYWATER. Castleford, Yorkshire. 10th. March, 1930.

The colliery was about one and half miles north of Castleford and was the property of the Airedale Collieries Limited. Mr. H.F. Smithson was the agent and Mr. F. W. Milson the manager. There were 1,400 men employed underground and 462 at the surface. The Silkstone Seam was cut by the shaft at 312 yards and a rising haulage road about three quarters of a mile long led to the Old East District in which the explosion occurred.

Despite its name the District was started in April, 1929 to work out an area of coal between two wastes. The face had been extended to a length of 147 yards and there were six working places known, from left to right, as 11's, 16's, 15's, 7's, 101's and 8's, the numbers being those under which the colliers occupying the places were entered in their pay books. No.8's men had a slant gate and an end gate. At the extreme end of this small district was strip of waste, 33 yards wide, which had been worked in 1893-4 by two roads which led to a district that was abandoned at the time of the accident. On the left side of the face there was a goaf of working places which were abandoned in 1920.

The Old East District was worked on longwall, end-on to the cleavage. a compressed air driven disc coalcutting machine was used to undercut the face to a depth of 5 feet 6 inches. The seam was 4 feet 9 inches thick and the colliers drilled holes by hand about 18 inches from the roof at intervals along the face as they considered them necessary, except in the place at the right end of the face, where shotfiring was prohibited because of the broken nature of the strata due to the nearness of the waste. In this place, 8's slant gate, coal was got down and ripping was done by pneumatic picks. the shot holes were charged and fired by a deputy.

The coal was loaded into tubs and trammed into the gate, from where it was taken to the rope haulage by horses. Two shifts of coal getters were employed in the morning and afternoon. The third shift was being devoted to coal cutting and repairs.

Packs were built on each side of the gates from the material got down by ripping shots but no intermediate packs were erected. Timber was drawn from the gobs, which were allowed to fall between the packs, normally 15 or 16 yards apart. As the immediate roof of the seam consisted of about 18 feet of fairly hard bind and there were stone bands above this, falls in the gob did not occur regularly each time the back timber was withdrawn. The roof was subject to hang and be subject to periodic weighting which was not so severe to impede the working to any extent. these weights did cause breaks right up to the coal face which were closed but as the face advanced they opened out and were left behind in the gob. At intervals an exceptionally large break showed displacement of the roof at the lower edges and, after a time, opened, allowing stones to fall out, leaving crevices, open joints and cavities in the roof of the gobs. These openings in the roof were not in evidence opposite packs and not so well exhibited in the gates as in the gobs. in short, the roof was only partially supported by supports. The examiners had Ceag electric hand lamps and the deputies Hailwood combustion tube flame lamps.

The mine was ventilated by a steam driven Sirocco exhausting fan and the quantity of air as measured on the 4th. March was 174, 222 cubic feet per minute at 3 inch water gauge. of this 5,837 cubic feet per minute was measured 100 yards from the first working place in the Old East District, Silkstone Seam. The first area that was ventilated were six stalls in a small district to the north east of the area where the explosion occurred. the air reaching 8's stall already contained about .4 percent firedamp and by the time it had done about half its work it had gathered 23 cubic feet of firedamp per minute.

The current turned in to 101's gate by a door and two sheets and was further diverted into 8's slant gate by two sheets in 101's gate. the outbye sheet of the latter was not as efficient as it might have been as there was gas at the sides and at the top. It was said that it was not necessary to have these sheets tight since there had been no trouble with gas in 8's stall and it was not desirable to force all the air into it. There had been no sheet in 8's end-gate until the night before the explosion and the air was free to travel to the face either by this gate or the slant gate.

Gas had been reported by the deputies on 30 occasions at 8's ripping between 20th. November and 23rd. December, 1929 at the time when 8's end-gate was being started from the slant gate. In three other reports on 9th. January, 1930, gas was reported from a cavity in 8's gate and was cleared on the following day shift. After 9th. January, no gas was reported until 9th. March when Ben Robinson, the afternoon shift deputy, found 2 %, 6 inches from the roof of 8's slant gate. he erected a hurdle sheet in the end gate and after waiting a few minutes the gas cleared and also opened a compressed air pipe in the slant gate and the gas there cleared immediately. At 11.10 p.m. he left the district

and reported that he had found gas and cleared it to the relieving deputy, J.G. Bratt who did not find any gas on his inspections.

From noon on Saturday, 8th. March to 11 a.m. on Sunday 9th. March, the main ventilating fan was slowed which reduced the ventilation to 70% of normal. from 11 a.m. to 4.30 p.m. on Sunday the water gauge was raised to three and a quarter inches which was maintained until 10 p.m. and from that time the water gauge varied from two and half to three and a quarter inches.

On Monday, 10th. March, 1930, the normal complement of colliers, and drivers were at work in the district and nothing unusual had occurred up to 9.30 a.m. The day shift deputy, George Paley, went along the face from left to right, and fired 8 shots before reaching 8's end gate. There were two shifts to fire at this place, one on each side of the gate. One shot was heard by men in the adjoining gate, No.101's, followed at an interval, which was estimated at 5 minutes, by a flask like lightning a flame was seen in 101's gate and flame or the reflection of it in the 15's right bank.

from the right corner of the face to the main road, 15's, the air was full of smoke and dust which was so dense that the men could no see. beyond that to the left end of the face there seemed to be only a thick dust cloud. All the men immediately left the face and went outbye to where the air was clear. Amongst these were two men who had been badly burned, Albany Taylor and William Townsend, from 8's stall. Townsend was taken to the shaft on a stretcher but Taylor walked out. Taylor died the same night and Townsend the next day.

Rescue parties quickly found the body of John Allan, a pony driver who had been flung out of the 8's slant gate against the side of 101's gate had many broken bones. Further rescue operations were delayed by the presence of thick smoke in 8's gate and 8's slant until the arrival of the manager, undermanager and other officials who tightened up the brattice sheets and erected a sheet to replace a door which had been damaged in the explosion.

Ventilation removed the smoke and in the course of half an hour it was possible to recover the bodies of Arthur Richards, collier and George Paley, deputy. Underneath Paley's body was found his own flame safety lamp and the electric lamps of Richards and Taylor. The magneto to his exploder was strapped to his waist, his explosive canister was by his side and his shot-firing cable stretched forward to a shot hole on the right side of the 8's gate. The detonator leads of the shot were fast in the shot hole and still attached to the shot-firing cable.

Signs of flame could be traced back almost to the outbye end of the 8's slant, a distance of 184 feet and a for about 192 feet along the face, including the short length of open ground near to the old waste. The explosion had been violent and hurled John Allan against the side of the road. It damaged a door in 7's slant so that men passed through it without opening it. A youth, Harold Collinson at the outbye end of 7's slant was peppered on the back by flying stones and pieces of bind were driven into timber at the end of 8's slant gate.

Those who lost their lives were-

George Paley,
Arthur Richards,
Albany Taylor,
William Townsend and
John Allan. Harold.

Collinson was injured by the force of the explosion.

The inquest was held by Mr. Will Bentley, H.M. Coroner for Pontefract. All interested parties were called and the jury returned a verdict that death was due in four cases to burns and the fifth case, John Allan, to injuries due to an explosion of methane ignited by the firing of a shot, no negligence being attached to anyone.

The official report on the disaster was made by E.H. Frazer, H.M. Divisional Inspector of Mines and presented to Mr. E. Shinwell, Esq., M.P., Secretary for Mines on 27th. June 1930.

The explosion immediately followed the firing of the tenth shot by the deputy George Paley who was killed in the position in which he fired the shot. All the safety lamps were recovered and sent to Captain Platt at the Mines Department Testing Station where they were all found to be in perfect condition and not capable of causing an explosion. The explosive and detonators were also found to be perfect but the exploder that Paley used was a three-shot dynamo electric machine of an old pattern which did not comply with the Explosives in Coal Mines Order and ought not to have been used. It was not provided with any form of switch and the current could travel to the handle and risk the accidental firing of a shot.

Paley had used a six ounce charge for all the shots and an inspection of the coal round the fatal shot hole showed that it had been cracked and eased without displacing it to any great extent. Everybody agreed that the shot had done its work. On close inspection it appeared that the stemming had blown out although it was not generally known as a blown out shot but these conditions could have led to an ignition of gas.

Gas was present and it was a question to be answered why Paley did not detect it. The question was carefully examined at the inquiry and Mr. Frazer stated-

"I believe the simple explanation was the correct one, namely, that a mixture of firedamp and air had accumulated in the workings before the explosion. Had this mixture existed in 8's slant gate and in the right hand side of the face, with a tail of gas near the roof extending to the shot hole, there could have been sufficient volume to produce, upon ignition, all the effects seen.

No one had been working in 8's slant since deputy Bratt left at 5.30 a.m., four hours before the explosion. Firedamp had been seen there the evening before. The ventilation was comparatively weak in 8's slant. In my opinion there is strong circumstantial evidence that a large volume of firedamp was present when the shot was fired and the evidence seems to point to the fact that Paley did not make a full examination for a radius of 20 yards from the shot hole."

In his report, Mr. Frazer came to the following conclusions-

- "1). The explosion was one of firedamp very slightly extended by coal dust.
- 2). The explosion was of small extent but of a violent nature, indicating that a highly explosive mixture was involved.
- 3). The initiating cause was the projection of flame or burning particles from a shot in the coal face at the right hand side of 8's end-gate.
- 4). The cause of the peculiar manner in which the shot blew part of its stemming had not been definitely ascertained.
- 5). Circumstantial evidence, the only evidence available, points to the conclusion that examination for firedamp required by Clause 6 (f) (i) could not have been made to the full extent required by the Explosives in Coal Mines Act.
- 6). Owing to the presence of breaks in the roof near the shot hole which could not have been examined properly, the shot was one which should not have been fired.
- 7). The provisions of Clause 6 (f) (i) of the Explosives in Coal Mines Order regarding the thorough treatment with stone dust or water of the vicinity of shot-holes were not observed by the shotfirer."

ANCHINRAITH. Blantyre, Lanarkshire. 30th. August, 1930.

The colliery was the property of Messrs. Merry and Cuninghame, Limited. The manager of the colliery was Mr. David Chalmers Gemmell with Mr. William Paterson as undermanager and there was one fireman for each of the three shifts in each of the two sections, the Old and New Conveyor Sections and the Dunsmuir's Section. During the

morning shift in the latter a shotfirer, William Sprott and during the night shift the fireman, John Russell for that shift in the Ell Coal and the Virtuewell Section of the mine, came to Dunsmuir's to fire shots.

The workings in the Blackband Seam at the date of the explosion were 750 yards from the shafts. The seam varied in thickness from 22 to 31 inches and the roof was of light flakes from 2 to 5 feet. Above the flakes there was a stratum of hard sandstone known locally as '*kingle*'. The floor was of fireclay and the working were dry.

The coal was worked by the longwall system. The face, 300 yards long, consisted of four ordinary longwall machine cut places at the intake end, a conveyor face, 100 yards long which was known as the Old Conveyor Run, a second face 100 yards long, the New Conveyor Run and seven ordinary longwall machine cut places at the return end. These last seven places were known as '*Dunsmuir's Section*' consisted of a main slope road (Dunsmuir's Slope), a slope to the right, No.2 Right Slope from which branch roads 1, 2 and 3 led to the face. On the left was the Old No.12 level from which Jack's Slope ran parallel to Dunsmuir's Slope to the face. Off Jack's Slope, two branch roads, known as N.1 Branch (Engine Road) and No.2 Branch were turned. The explosion was confined to the workings within Dunsmuir's Section.

The coal was undercut by electrically driven chain machines, in the coal to an average depth of 3 feet 9 inches. On the two conveyor faces, the coal was conveyed to two main roads by electrically driven, shaker conveyors.

The mine was ventilated by a Guibal fan, 30 feet in diameter which delivered 55,000 cubic feet per minute for the whole colliery. In the Blackband Seam there was an auxiliary electrically driven fan in the intake airway about 270 yards from the face. 8,500 cubic feet per minute went into the Blackband Seam but about 4,000 cubic feet were lost through leakage. Some of the leakage was used to ventilate the stables which had been in use a few weeks before the accident but were unused at the time. The doors or sheets were placed to guide the air current were all single.

Flame safety lamps were used by the firemen and by the shotfirers. In addition they carried electric hand or cap lamps. Flame lamps were also used where electric machinery was installed and electric lamps, either cap or hand lamps were used by the workmen.

In addition to the shots required to bring down the brushing in the roads, shots were also fired in the coal, these shotholes being 10 feet apart. The holes in the coal were bored by the miners and charge stemmed and fired by a fireman. The stemming was plastic clay brought from the surface. Limestone dust, flue dust and ground blaes were used for stone dusting.

The explosion originated at the face of the No.3 branch road of No.2 right slope off Dunsmuir's Slope and only firedamp was involved. Earlier in the year, in May, 1930 when the workings were crossing the five feet downthrow fault and being opened up, considerable amounts of firedamp had been encountered. The gas had been reported in the firemen's books but as they made only one report per shift and the shifts were continuous, if there was gas at any other time it would not have been reported in the book. This could have been the explanation when ten days prior to the explosion, gas had been found and was not reported in the book. One of the fireman, Thomas Hegginson, stated that he found firedamp in Nos. 1 and 2 branch roads off Jack's Slope during the afternoon shift before the explosion but this was not during his inspection for the next shift so he did not report it. Mr. Walker commented-

"No doubt this was within the law at present, but been if the manager of any mine requires the fireman to send him direct written reports other than those required by the law, as the manager of this mine said he did, I still think that whenever firedamp is found by a fireman, the fact should be reported by him in the prescribed book."

The Blackband Seam was known to be gassy and the provision of single sheets and doors were a source of potential derangement to the ventilation. The remedy was to use double or triple doors and sheets.

Archibald Millar was the fireman in charge of the district comprising the New Conveyor Run and Dunsmuir's Section during the night shift of 29th. August, the shift prior to the one on which the explosion occurred. His report of his inspection made between 4 and 5 a.m. on 30th. August, about three hours before the disaster. The report read-

"Noxious or inflammable gas - None. State of ventilation. - Good. Condition of roof and sides. - Roof heavy in parts of Conveyor Run, remainder in safe condition. Supply of timber a) working places. - Sufficient. b) pass-byes, sidings etc. - None. Other matters affecting safety and remarks. - None."

Millar said that he had not found firedamp in his section since the 15th. August. During the night shift of 29th. August, he had fired six shots, one of which was in the Engine Road and he noticed that the roof near the face of that road was on weight. He report this to the oncoming fireman, William Anderson, on the morning shift of the 30th. August when they met at the bottom of the shaft between 5 and 6 a.m. on that day.

In addition to the six shots fired by Millar there were six brushing shots fired during the same shift in Dunsmuir's Section by John Russell, fireman in charge of the Ell Coal and Virtuewell Section of the mine. he was in Dunsmuir's Section from 10.15 p.m. on the 29th August to 3 a.m. on the 30th. August and did not find any firedamp between these times. One of the shots he fired was in the brushing of No.3 branch off No.2 right slope and he did not make the required examination for a radius of 20 yards around the shothole and did not stonedust the place. His explanation was that he thought that the place was already stonedusted.

William Anderson left the shaft bottom about 6 a.m. At the outbye end of the No.6 road, he left his jacket and flame safety lamp and after collecting his shotfiring battery or exploder, shotfiring cable and a stemmer and carrying an electric hand lamp, explosives and detonators, he went towards the face of Jack's Slope. On the way down he remembered that he had left his flame lamp behind but. knowing that there would be a lamp hanging at the motor of the new conveyor, he did not go back for it.

He went into engine slope and had a look at the roof because Millar had told him that it was low over the conveyor and took the lamp that was near the conveyor motor. After this he fired eight shots in coal and then returned the lamp to place near conveyor motor. Whether he used it to test for gas was not known. Some of miners working in the places where Anderson fired shots swore that he had not got a lamp with him and some of these men told inquiry that it was customary for the firemen to leave the flame lamps outbye and go to the face with their electric lamps only. Anderson admitted that he did not spread any stonedust before he fired shots. he had been a shotfirer at the Auchinrath Colliery for three and half years prior to explosion.

During the morning shift of 30th. August, the shotfirer in Dunsmuir's Section, William Sprott, was seen by a pony driver, John Copland aged 25 years, at No.12 level putting detonators into cartridges for primers. Copland told Sprott he was wanted in Regan's place to fire shots. Sprott replied that he was going into Paterson's Road first. Alexander Paterson said that Sprott arrived in his place. Paterson saw him charge the shothole in the coal opposite the left side of that place. As the shot was fired the explosion immediately occurred. Paterson said that only lamp that Sprott carried was an electric cap lamp and this was recovered after disaster. It was quite possible that before shot was fired there was no test for firedamp. The manager expressed surprise at what he had heard about testing for gas while using shots and the lack of stone dusting when a shot was fired.

The size of the return airway gave cause for concern. It was about 200 yards long and was a crawling road about two feet high and two and half feet wide. For about two weeks before the explosion, a return airway was available for the air but it was not in a fit state for men to travel. Subsection 3 of Section 36 of the Coal Mines Act, 1911 required that every part of the mine in which ten or more persons were employed should be provided with at least two ways of egress to the surface and so arranged that, in the event of either becoming impassable at any point, the other will afford means of egress to the surface. The manager said that he had given instructions to the undermanager and his

own son, William Gemmell who was described as the assistant to the undermanager, to pay special attention to this part of the return airway and to travel it twice a week. The undermanager told the inquiry that the manager told him to travel from the end of Kelly's old airway up to No.2 Pit bottom twice a week and Mr. William Gemmell said that they were told to travel the return airway from No.2 Pit to the intake at the centrifugal pump. Neither of these interpretations on the instructions was the restricted part of the return airway included.

Those who lost their lives in the explosions were-

George Shorthouse,
Joseph Regan,
Richard King,
William Sprott, shotfirer,
Andrew Kalinsky and
Richard Dunsmuir died 31st. August, 1930.

Those who were injured-

John Smith,
William Stoddart,
John Copland,
Alexander Paterson,
James Russell,
Robert Buchanan,
John Wailes and
William Fox.

The men who were not injured were-

John Wildman,
Peter Scullion,
Robert Inglis,
George Rhodes,
Robert Lowden and
William Anderson, fireman.

After the explosion very little damage was found in the district. The effect of the shot which Sprott had fired was to bring down the coal but not as much as usual but there was no evidence that the shot had blown out. George Elliott, a member of the Rescue Corps from Coatbridge, found Sprott's body on the right hand side of a tub at the roadhead of No.2 branch. The battery of Sprott's electric cap lamp was attached to his belt and the lamp was still alight and in his right hand was the key of the shotfiring battery and exploder.

The ventilation was quickly restored and Messrs. Dominy, McKerril, checkweigher at the colliery, John Littlejohn, overman in the No.2 Pit and Archibald Millar were searching for the flame lamp which Sprott should have had with him, found some firedamp off Jack's Slope.

The inquiry was held at the Justiciary Buildings, Jail Square, Glasgow by Sir Henry Walker, H.M. Chief Inspector of Mines and lasted nine days. All interested parties were represented.

A full examination had been made of the possible causes of the disaster when the lamps, exploders and cables were investigated. It was found that the explosion was caused by firing a shot of Polar Dynobel in the presence of inflammable gas but whether the gas was ignited by flame from the explosive or by a spark across the conductors of the shotfiring cable was in dispute.

Commenting on the fact that firemen did not always carry flame lamps, the manager said that the firemen had been supplied with flame safety lamps fitted with an internal

relighter. The men did not like them because, as they were longer than the normal lamp, they trailed on the ground when they were crawling to the face with the lamp slung round their neck. One of the fireman stated that the lamps with relighters were not easy to relight and often went out when shots were fired.

Sir Henry concluded his report with an acknowledgement of the Coatbridge Rescue Station on their prompt actions at receiving the call for help.

GROVE. Brownhills, Staffordshire. 1st. October, 1930.

The colliery was the property of Messrs. W. Harrison, Limited with Mr. N. Forrest, the agent and Mr. J. Patterson, the manager of the colliery. The Shallow Seam was worked at the mine and it was in this that the explosion took place. A strip of coal, roughly 150 yards wide, had been recovered by a pair of cross measure drifts on the downthrow side of a 40 yards fault. The area of the coal in this strip had been developed by a pair of winnings which started from the bottom of the drifts and went on a line running slightly north east and reached the boundary of the royalty, a distance of about 900 yards. From the boundary the coal was being extracted by a system of retreating longwall panels. At the time of the explosion three of these panels had been extracted. A new face had been prepared at the rise side of the next panel to be worked. The coal cutting machine and the conveyors from the abandoned face of the No.3 panel were being moved into and installed in the new face on the day of the explosion.

The seam was about six feet thick and was immediately overlain by two feet of bass followed by eight feet of strong rock bind. In the longwall faces, from a foot to half a yard of coal was left up to form a sound roof to avoid trouble with the bass immediately above it.

The ventilating air entered the district by the main haulage road and just inbye of the No.2 road a single stopping with two door in it, one for each of the rails, diverted the air to the new face along either No.1 or No.2 road. From the new face the air travelled back to the main level by no.3 road where it had a choice of two returns, one by slits S1 and S2 or by the main cross road. The quantity of air ventilating the district as measured on 24th. October at a point 100 yards from the new face was 3,480 cubic feet per minute.

Safety lamps were used in the seam and there had been an ignition of gas in the cross measure drifts which were being driven which caused injury. In other districts naked lights were permitted. There was a conspicuous notice posted 100 yards from the downcast shaft at the entrance to the Shallow Coal workings prohibiting naked lights being taken beyond this point. With the exception of the firemen and coal cutting machine men, all the workmen were provided with electric safety lamps. Out of a total of 17 lamps in use in the district at the time of the explosion, three were flame safety lamps which had been issued to the fireman in charge of the district, to a fireman who was working as an ordinary workman and one to the coalcutting machineman.

To comply with Section 35 (2) of the Coal Mines Act, 1911, ten percent of the men forming the shift in this district were searched for matches and other contraband articles before they entered the district. Electricity was used to drive the coal cutting machine and the conveyors while compressed air was also laid and was used for boring shot holes and for working two turbo electric lamps. When necessary, the machine cut coal was got down by explosives which was permitted explosive fired by a magneto exploder.

During a normal working day there were workmen in the Shallow Coal district all day and night and so there were three firemen, one for each shift, day afternoon and night respectively but all the firemen's time was spent in the machine section. Each fireman had to look after a small area of workings, in which the coal was got by hand, neat the foot of the cross measure drifts, if and when work was proceeding in these areas.

Supervision was exercised during the day and afternoon shifts by the Manager, Mr. J. Pattison, who was also the manager of another mine, and an undermanager, Mr. T. Hyde. The night shift was supervised by an overman, Mr. G. Stenton. Work during the

afternoon and night shifts was almost entirely in the Shallow Coal. Only a few repairers and pump attendants were employed in the other districts of the mine. Over and above these officials, Mr. N. Forrest, the Agent, paid regular visits below ground at regular intervals.

On the day of the explosion coal getting operations in the Shallow seam had been temporarily suspended and during the morning shift the extraction of coal from the No.3 panel had been completed and the rest of the shift had been dismantling the conveyors and removing them from the old No.3 face and the afternoon shift had been organised to complete the removal of the machinery and to install it on the new face.

Reginald Ashcroft, the day fireman made the statutory inspection prior to the commencement of work on the afternoon shift. Three workmen, George Locke, a fitter, Joseph Harold Dodd, and assistant electrician and Horace Tate, electrician's mate went to work in the district. Nothing was known of the state of the district after the day shift left.

Ashford made his inspection between 2.30 and 3.20 p.m. and at the end he met the afternoon fireman, John Scoffham, in the main level near the bottom of the No.2 road and handed over the district to him. Ashford had found no indications of firedamp during his inspection. The ventilation up to that time had been satisfactory and there was nothing to indicate that there was anything amiss with any part of the workings. It was understood between Ashford and Scoffham that during the afternoon, the doors in the main level just inbye of No.2 road, would have been taken out in order to allow some of the larger pieces of machinery to be brought from their old positions to their new ones at the bottom of the No.2 road. The two doors really acted as one since they were fixed abreast, one for each line of rails.

Locke, the fitter, had been dismantling the machinery in the main level all day. During the afternoon shift one of the doors in the main level had been removed and a brattice cloth had been erected in its place. as far as he could judge, this made no difference to the ventilation. When he left at 5.30 p.m. to go to the surface everything was quite normal. Dodd, his mate, and Tate arrived in the district about 3.30 p.m. to dismantle a bell which was fixed on the frame of the doors. After they had done this they went to trail cables in No.1 road. The air current was passing through this road and there were no falls of the roof or sides to obstruct the passage of the air nor were there any indications that a fall was likely. Later while they were trailing cables in No.3 road, Scoffham, the afternoon fireman joined them on his way to the new face to make his inspection.

About half an hour later at 6 p.m., Dodd and Tate went up the No.3 road towards the face. at this time, two workmen were moving the coal cutter along the face from No.2 road to No.3 road. As far as Dodd could judge that the ventilation was all right and there was nothing unusual in any respect. Going outbye along No.2 road, Dodd passed several men at work at the bottom. Some of them were taking a conveyor motor up the road on a trolley, others were getting bottom up in the level and some were doing other work which Dodd could not specify. The time was 6.30 and nothing had happened to alarm anyone.

What happened between the time Dodd and his mate left the district and the time of the explosion is wrapped in mystery for of the fourteen working there, none survived. During the afternoon shift of 1st. October these fourteen were the only men working in the Shallow Coal. None of the effects of the blast were felt near the downcast shaft, one and a half miles from the downcast shaft and it was known at what time the explosion took place but judging by the amount of work that had been done it must have been about 9 to 9.30 p.m.. This was borne out by a watch belonging to one of the deceased, that had stopped 9.18.

The first indication that all was not well was at 10 p.m. when the night fireman, Abraham Joseph Dodd, went down the pit and was surprised not to find the afternoon fireman, John Scoffham at their usual meeting place near the pit bottom. Dodd went inbye expecting to meet Scoffham at any moment with the other members of the shift. Dodd first became aware that something was wrong when he reached a point in the main level in the Shallow Coal where he saw that a separation door was smashed down and blown towards the return airway. he advanced with caution about 50 yards along the

level when he found the roadway obstructed by a jumble of tubs, displaced roof supports and a heavy fall of stone. He shouted, hoping to get a reply but hearing nothing, he realised that there was little he could do so he quickly went outbye.

At the top of the cross measure drift he met the men from his own shift and the overman. George Stanton and reported what he had found. Stanton went into the return airway and found it foul with the smell of burning. he then sent one of the men to warn the manager and with the fireman Dodd and the other workmen he hastened inbye. Firedamp, afterdamp and the threat of a fall barred their progress beyond the place in the main level that Dodd had previously reached. Brattice cloth was placed to try to reduce the leakage caused by the broke door.

At this point, the manager, John Pattison arrived and he and Stanton made further unsuccessful efforts to advance beyond the fall in the level. They climbed up on the debris, but in the cavity in the roof there was a large accumulation of firedamp with blocked any further progress. It was now recognised that there had been a serious incident and a call was sent for the Rescue Brigades. In the meantime steps were taken to level down the obstruction and when this was done it was found that they could get to the bottom of No.2 road.

A few yards outbye of the No.2 road a body was found. There was a large fall at the bottom of the No. 2 road and four bodies were found there. Just beyond No.2 road there was another and larger fall. the atmosphere in the main level as far as No.2 road was now fairly good but because of afterdamp nothing could be done on Nos. 1 and 2 roads without breathing apparatus. While they a party was waiting for the Rescue Brigade the bodies that had been found were removed and temporary repairs were made where possible.

When the Rescue Brigade arrived the whole of the district was explored. No.1 road was blocked by a heavy fall and there were falls in No.2 but not so bad as to stop the exploration of the face where four bodies were discovered. In the main level near the old face of No.3 panel a further four bodies were located which left one men not accounted for. This body, William Whittaker, was not discovered until the following day when it was located in a narrow part of the no.3 road between a cock and the rib-side. The ventilation was restored with no serious difficulty and the bodies removed.

Those who lost their lives were-

Alfred Boden aged 50 years,
John Brownridge aged 38 years,
Benjamin Corbett aged 52 years,
John Hackett aged 31 years,
Alfred Heath aged 33 years,
John Holland aged 41 years,
David Richard Howdle aged 30 years,
James Malley aged 34 years,
Alec Martin aged 32 years,
William Robins aged 46 years,
John Scoffham aged 46 years,
Harry Smith aged 38 years,
John Bernard Whittaker aged 44 years and
William Whittaker aged 62 years.

The inquest on the deaths of the man was held at the Memorial Hall, Brownhills before Mr. F. Cooper, H.M. Coroner for the South-East District of Staffordshire. The jury brought i the following verdict-

“The fourteen men met their deaths as an explosion at Grove Pit on 1st. October, 1930. There is not sufficient conclusive evidence to prove how the explosion occurred.

We consider that the fireman Ashford carried out his duties efficiently.”

The inquiry into the disaster was held by Sir Henry Walker, H.M. Chief Inspector of Mines at the CO-operative Hall, Walsall from the 28th to the 31st. October and the 3rd. and 4th. November, 1930. There was general agreement that the point of origin of the explosion close to the left hand side of the top of No.2 road. It was also agreed that coal dust played little part in the disaster. the presence of an explosive mixture as gas had been encountered for a few days before the explosion.

All possible sources of ignition were examined. Electrical causes, shotfiring, spontaneous combustion, sparks from falling stones, an exposed flame from a safety lamp and sparks from the broken filament of an electric lamp were all ruled out as sources of ignition. The circumstantial evidence pointed to the source being the flame from a match. The clothing of the deceased was searched which revealed that out of the fourteen that lost their lives, six were found to be carrying contraband and four of these six were working on the new face where the explosion originated.

Sir Henry Walker came to the conclusion that-

"I find that the explosion was caused by a naked light, used in connection with smoking, which ignited a considerable accumulation of firedamp, the fringes of which extended into the new face. This accumulation of firedamp existed in the headings on the rise side of the new face and probably also in the goaf of the recently worked out panels to the left thereof

I do not find, however, as I was urged to do so by the representatives of the Miners' Federation, that there is evidence to justify charging the management with a breach of Section 29 91) of the Coal Mines Act, 1911. At the same time, this is not to say that the ventilation arrangements were beyond criticism. On the contrary, I look upon a single unchecked doors in the main haulage roads as bad mining practice in any circumstances."

There was no evidence available in regard to searching of the men on the afternoon shift but it was clear that searching was done in a very perfunctory manner. The report strongly recommend that no system of searching should be approved that did not include a provision for a complete search at frequent but not regular intervals. Preferably the search should take place at the surface before the men entered the cage.

HOUGHTON MAIN. Barnsley, Yorkshire. 12th. December, 1930.

The colliery was about four miles east of Barnsley and was the property of Messrs. Houghton Main Colliery Company Ltd. Mr. J. Barass was the agent and Mr. John Taylor, the Manger of the pit, had been appointed only two months before the explosion.

The colliery employed about two thousand men and the seams that were worked at the colliery were the Barnsley, the Parkgate and the Melton Field. The explosion affected only a small part of the latter and it was worked by three shafts at a depth of 346 yards. The Nos.1 and 3 shafts were downcasts and the No.2 the upcast and coal winding shaft. From the shafts, parallel levels, intake and return, ran north and west to the top of the North West dips. They then turned at right angles and there were two roads driven for three quarters of a mile at a dip of 1 in 12 and passed four levels, the Nos. 11, 12 13 and 14 at the inbye end. These levels were the gates serving the Nos. 12 and 14 conveyor faces. Nos. 11 and 12 were the centre and main gates of the No.12 conveyor face and Nos.13 and 14 gates served the same purpose for the No.14 face.

Out of No.11 gate, a slant had been driven as an intake airway. both faces were new, having been started in the spring of 1930. The seam in this area was four feet inches thick and the roof required careful support.

The two longwall faces in 12 and 14 were almost continuous and there was only a step of six yards between the low end of 12 and the top end of 14. Both faces were along the dip, about 1 in 14 and were 170 yards long. The coal was undercut, five feet, by electrical coal cutters and two shaker conveyors on each face delivered the coal to a transfer point in the main gate of each district from which it was loaded into tubs to be

taken to the surface. gates were supported by steel arches and the main gates were eleven feet wide and eight feet high.

The system adopted was called intensive mining' and involved cutting, pan shifting, ripping, packing and loading in a cycle which was completed every twenty four hours so that each day five feet was taken from the face and about 700 tons of coal produced. The workforce worked this system by shifts and there were few times that there were not men in the gates and faces. The coal cutters started at 4 p.m. and worked to midnight and the pan shifters, rippers and packers from 10 p.m. to 5 a.m. Loaders on the day shift worked 6 a.m. to 1.30 p.m. and those on the afternoon shift from 2 p.m. to 9.30 p.m.

On Wednesday and Thursday the 10th. and 11th. December the face was not cut due to a shortage of wagons and the pans were not moved forward on the night shift but the work resumed on the night shift of the 11/12th. December.

Most of the men were supplied with electric hand lamps, the ordinary Ceag, Geag pillarless, Kingsway and Oldham and a few had Cambrian flame lamps. a deputy was appointed on each shift who fired the shots. They looked after 170 yards of face with three levels in the No.12 face and two in the No.14 face. The deputies in the afternoon shift fired shots in the coal but the two on the night shift fired only ripping shots. An explosive permitted under the Explosives in Coal Mines Order, Hawkite, was used for all shots.

Gate side packs, from the ripping debris, three to four yards wide were built and the gob packs, three yards wide at intervals of about twelve yards, were built from the material that fell in the goaf after the timber had been withdrawn. This was the packer's job and the roof fell easily into the goaf leaving cavities in the roof. This system encountered difficulty when the system was interrupted, which had occurred the day before the explosion. There was a tendency for the breaks in the roof to become wider and for the roof over the goafs to fall more heavily.

The ventilation to the Nos., 12 and 14 conveyor faces entered the No. 11 slant and descended the faces to the No.14 main level returning to the upcast shaft by the main North West haulage road. Firedamp had rarely been seen and the only report was on the 9th. September 1930 when Joseph Netherwood reported slight traces on the ripping edge of the No 11 Rise. Two workmen's Inspectors appointed under the Coal Mines Act 1911, Mr. H. Clarney and Mr. A.J. Poyner made an inspection on the 25th. August and reported one and a half percent firedamp at the ripping edge of the loader gate in the No.12 level. The Undermanager Mr. T.D. Watson accompanied these men and a hurdle sheet was erected and the gas cleared away the following day Mr. Clarney was informed. No firedamp was found since and one of H.H. Sub-Inspectors of Mines Mr. F.E. Stone made examination of the faces on the 14th. May and the 25th June without detecting an gas. The ventilation was prevented from leaking to the return airway along the No.12 level by four brattice sheets.

At the time of the explosion, which occurred at 12.45 a.m. on the 12th. December, the coal cutter men had gone home but the rippers, packers and panmen were at work with a party of twelve men in the No.12 level who were preparing a new loading point for the belt conveyor was approaching it's full length. There were fifty five men in the No.12 district and forty one in the No.14 which was connected to the No.12.

On Thursday, 11th. December at 10 p.m. the night shift rippers, packers and pan shifters for the No.12 district descended the mine and arrived at their place of work just before 11 p.m. Three of these men, Dudley Chance, John Quinn and David Williams were rippers on the No.12 level and were working at one of the loading gates. They proceeded to drill four holes in the ripping with a compressed air drill with a six foot bit.

The first hole was on the left side to remove a piece of side left by the previous ripping shift. The second hole was in the new ripping, which was intended to be four and a half feet thick and eleven feet wide, two feet up and including upwards and to the left. The third hole was also to the left and inclining upwards so that it would blast out the left hand corner. The fourth, and as it will unfold, the important shot hole began at two feet two inches up the ripping face and rose at 1 in 2Å. The mouth was three feet to the right of

the centre line of the gate and the hole was inclined at 1 in 5 to the right. The depth of the hole was important and will be discussed later but if it was five feet deep, its inner end would have been four feet two inches above the original roof coal and four feet to the right of the centre line of the gate.

The deputy, Joseph Netherwood visited the rippers when they were boring the third hole. He went to the face and when he returned the fourth hole was almost finished and he tested for gas, applied stone dust round the first shot hole, tested the depth with a stemming stick then charged and stemmed it. While this was being done, Chance knocked out a bar under the ripping. The deputy sent men as sentries to the face and after connecting his cable, followed the men along the gate. He stood to the right, back from the shothole, shouted 'Fire' and fired the first shot. The rippers were sheltering behind tubs about twenty five yards away. About ten minutes later, which was probably an over estimation, Mr. Netherwood went back to the ripping followed by the rippers and tested for gas.

He followed the same operation for the second shot but did not apply stonedust. This was fired along with the third after the same routine had been followed and after the third had been fired, David William, ripper, saw the deputy test for gas in the cavity that had been left but he did not turn off his own electric light while the test was being made. The deputy then asked if there was plenty of clay and pushed some to the back before inserting the charge. Dudley Chance, who saw him do this, never questioned him about it as he had seen him do it before. At the inquiry Netherwood denied that he had done so.

According to the evidence, the fireman did not make an inspection for gas before he fired the fourth shot at 12.45 p.m. Almost immediately an explosion took place. Flames extended along the face for at least forty four yards on the rise side of the No.12 level and through into the No.14 conveyor face for a distance of seventy nine yards.

The packers in the No. 12 face who had taken shelter behind the pack and others up the face were burned and the three men in the No.14 face who were moving the conveyor were very badly burned. All five men on the No.12 face and twelve in the No.14 face were burned but no one in the No.12 level was injured. All the men in the No.12 face made their way up the face to the No.11 level. Three men came up the No.14 face and out into the No.12 level where they collapsed. Three were badly burnt and died later. The other men on the No.14face escaped by the No.13 level.

The overman, George Naylor, was in charge of men further back on the No.12 level at the time, opened the sheets and allowed the smoke and fumes from the No.12 face to pass direct into the return instead of being forced down the No.14 face. Some smoke from the No.14 face came back into the No.12 gate.

First Aid was given to the men and despite the distance from the shaft and the gradients, all the men were treated and sent to Barnsley Beckett Hospital by 4.45 a.m.

Those killed were-

Albert Holden aged 32 years a panman,
James Lackey aged 30 years a packer,
Jacob Newberry aged 50 years a packer,
Norman Nicholson aged 24 years a panman,
John Pearson aged 22 years a panman,
William Richards aged 24 years a panman and
Charles Watson aged 38 years a panman.

Those injured-

Sidney Blackwell aged 21 years a panman,
George Burgess aged 24 years a packer,
Fred Davies aged 42 years a packer,
Joseph Dixon aged 55 years a roadman,
William Duffield aged 26 years a packer,
James Hopkins aged 30 years a packer,

John Charles Parkin aged 42 years a packer,
William Penry aged 27 years a packer,
James Ramsbottom aged 59 years a packer and
Clark Sykes aged 31 years a packer.

The Wakefield Coroner, Mr. C.J. Haworth conducted the inquests into the deaths of the seven men and the proceeding lasted three days. Mr. A. Meal, solicitor represented The Houghton Main Colliery Company Ltd., and a deputy, Mr. Joseph Netherwood. The Yorkshire Mine Workers' Association were represented by Mr. Joseph Jones, secretary, Mr. Alf Smith, Mr. H. Clarney and Mr. T.W. Illsley and Mr. George Cook, H.M. Senior Inspector of Mines, along with Mr. E.H. Frazer, H.M. Divisional Inspector of Mines were all present.

Twenty one witnesses were called and the jury brought in the verdict that-

- “1). Death was due in each case to burns caused by than explosion initiated by No.4 shot in Houghton Main Colliery.
- 2). We are not satisfied there was neglect, according to the evidence before us.
- 3). We believe a longer time should be allowed between shots.
- 4). We think something should be provided at collieries to prevent these explosions because we understand that if there is a good hole without leakages there is a sweet shot. If something of the nature of suction or compression could be put into operation it should be possible to tell by a gauge whether the hole is a good one.”

The findings were discussed in the Report of the Inquiry.

The “Report on the Causes and Circumstances Attending the Explosion” by Mr. E.H. Frazer, H.M. Divisional Inspector of Mines, was presented to the Secretary of Mines, Mr. E. Shinwell, Esq., M.P. in April 1931.

The cause seemed obvious, the firing of the fourth shot but other possibilities were investigated. All the safety lamps were tested and ruled out as a source of ignition and no electrical machinery was working at the time. The exploder used to fire the shots was tested at the Mines Department Testing Station and was found incapable of producing a ‘break flash’.

Examination of the ripping found that firedamp was present in the cavity left by the third shot and gas was coming from the goaf across the path of the fourth shot. This shot was found to have done hardly any work and only a portion of the side towards the centre had been blown down. Drill marks to three feet ten inches could be seen and it was possible to insert a stemmer five feet into the hole.

It was thought that the third shot was bored nearly to a break and had blasted down the ripping to expose part of the break. The ventilation had then forced firedamp from the waste through this break where it was ignited by the fourth shot.

The deputy denied that he detected the break and that he put clay into the hole before inserting his charge which could have plugged a break. There was no suspicion that this was being done until George Cook found a twelve inch length of an old shot hole filled with clay on 12th December. The back of the fourth hole had disappeared but there was no sign of shattering at the back of the hole.

Netherwood denied plugging the hole before charging it but John Quinn stated on 13th. December, that he saw him put three ‘pills’ into the hole before charging it but at the inquest said he did not see clay put in first. David William Jenkins, a ripper, said he did not see what the deputy, Netherwood did to the hole.

Mr. Frazer said-

“On the balance of evidence, I am firmly of the opinion that the deputy was aware of a break and took the view that, sooner than waste a hole, it would be better to reduce its length and limit the size of the charge. Such a course is illegal.”

He continued-

“Though the jury were satisfied, on the evidence before them that there had been neglect, I consider that there was neglect in respect to-

a) The failure of the deputy to make examinations for inflammable gas as required by clause 6 of the Explosives in Coal Mines Order immediately before each of the three shots were fired.

b) The failure of the deputy to examine four shot holes for breaks running along and across as required by Clause 6 of the Explosives in Coal Mines Order.

These two failures, I believe, can be proved. Had the provisions pointed out been observed in the spirit of the Order, there would have been no explosion.

c) The firing of a shot hole in which a break had been found. Though it has been stated that the deputy did not take steps to examine the shot holes for breaks, I believe that he was aware of a break and used clay in an endeavour to plug it."

The suggestion of the jury to use compression or suction to find breaks in a hole were considered by Major H.J. Humphrys, the Senior Inspector with the assistance of the Manager of the Cadeby Main Colliery. It was found that by placing a handful of stone dust in the shot-hole and blowing in compressed air it was possible to see breaks that could not be found with a scraper.

HAIG PIT. Whitehaven, Cumberland. 5th. February, 1931.

The No.3 North District where the disaster occurred was part of the Main Band Seam and was two and a half miles underground at a depth of 1,100 feet. Mr. George Marron was the manager of the colliery and Mr. Andrew Naysmith the undermanager. They visited the workings of the mine on a daily basis and Mr. William Morgan, the Agent, visited at frequent intervals. There were four shifts of deputies, one deputy in each, in the No.3 North District for three shifts of workmen. In addition, an overman supervised this district as well as the No.2 South District which adjoined on the morning and afternoon shifts. During the night shift, there was one overman for the Haigh Section of the mine.

The No.3 North District was reached from the shafts by the Haigh Engine Plane which was also the main air intake. This road averaged 9 feet in height, was about 13 feet wide and extended approximately two miles. The No.3 North Dip extended for 400 yards. It was level for 150 yards and then dipped at a rate of 1 in 6. The workings making up the No.3 North District extended to the west and east of this dip for about 300 yards and 200 yards respectively. The coal was worked by bord and pillar with the roads about 50 yards centre to centre.

The Main Band seam in this district was about half its normal thickness of about 11 feet, the top coal being thinner and the bottom or 'Benk' coal was missing. The seam in this district resembled a saucer, the main dip starting at the rim and cutting the saucer in half. The roads to the east were more or less level for a short distance and then rose in that direction. Those to the west dipped for a short distance then rose.

The district was ventilated by a split of 19,000 cubic feet of air per minute. The split was then divided into three, one containing 3,500 cubic feet entered at Hodgson's place, a second of the same amount went east and ventilated the broken workings and a third of 12,000 cubic feet went west by way of Bailey's level.

Limestone dust was used for dusting the roof, floor and sides and was distributed in No. 3 North district during December and January at a rate of about 5 lbs. of dust per ton of output. Bailey's level was treated on 27th. January and the roads to the east of the main dip on the 28th.

The workmen used Oldham electric lamps and the deputies and other officials Patterson flame lamps. A top cauch in Hodgson's level was being taken down and Samsonite No.3 explosive was used. In Bailey's place, the coal was found to be difficult to get and the men working there as asked the underground manager for a special price, in order to enable them to earn reasonable wages. The undermanager suggested that if they would agree to undercut the coal to a depth of five feet, he would supply Cardox shells to blow down the coal. This bargain was struck and on the 27th. January two shells were fired and when third was fired, the explosion took place.

The explosion occurred on a Thursday night without any warning and was felt almost a mile away. It partially destroyed the ventilation system and was followed by great gusts of gas. Within two hours of the accident this gas could be smelled a few hundred yards to the windward of both the Haig and the Wellington Pit tops. It occurred in the No.3 North District and was close to the sealed off area where the thirteen men and officials were killed in 12th. February 1928 while they were conducting exploration work. The stopping to this Development District was unaffected by the explosion.

At the time of the disaster which occurred at 8.15 p.m. 169 men were underground, 45 of whom were working in the No.3 North District. Of these 24 lost their lives and a further 12 were injured or gassed and removed to hospital. One of these men later died. Two workers in the adjacent Wellington Pit which was reached by a drift from the Haig Pit were fatally gassed and 30 others overcome by the afterdamp but only one needed hospital treatment.

Immediately after the explosion the afterdamp surged along the main roads but rolled back as the air current, which had been reversed by the explosion, again reversed and swept down Jolly' Drift into the Wellington pit. John Ruddy and Thomas Quirk were overcome by this gas and the others had to flee for their lives.

The men underground that were not involved in the explosion but were battered and bruised, gallantly went into the shattered workings and dragged six of their fellow workmen to safety although they were injured and seven other men owe their lives to the actions of these men. They went down the pit without breathing apparatus and went for about a mile through the mine before they were driven back by the gas.

About 9 p.m. an improvised Rescue Team was assembled by Mr. Marron, the manager and Dr. E.H. Ablett. The party consisted of Mr. G. Marron, the manager, Mr. J. Nasmith, the underground manager, Mr. A.B. Dawson and Mr. McCuskery the manager and the undermanager of the Ladysmith colliery, Mr. W. Tweddle, the manager of the William pit, Mr. W.B. Brown the Cumberland Inspector of Mines, Councillor J. McAllister, Mr. Charlton of the Brigham Rescue Station and Mr. Thompson the senior deputy at the Haigh pit. He was responsible for the rescue of Joseph Smith who unfortunately was so badly injured that he died in hospital on Saturday.

They descended the mine without respirators and battled through clouds of dust and gas and got to within a mile of the explosion area. They rescued seven men and recovered three bodies. When they emerged at the surface they were all suffering from the effects of gas and were in danger of losing consciousness.

By midnight specially equipped parties arrived at the colliery. A Team from Brigham Rescue Station arrived with the new 'Meco' rescue apparatus which helped men work in gas while breathing oxygen. Other teams came from Siddick, Morseby and Lowca as well as the local Haigh, Wellington, Ladysmith and William pits. They descended and found that although there was great damage there were no great falls of roof that would hamper their efforts.

Later the team consisted of Mr. W.H. Johnson the general manager of the Colliery Company, Mr. A.H. Bryan and Mr. Rogers, H.M. Inspectors of Mines attached to the Northern Division, Mr. T.S. Durham mining engineer to Lord Lonsdale, Mr. R.H. Garside surveyor to the Colliery Company, Mr. D. McKenzie, Mr. T Banks the general manager of the Siddick Colliery, Mr. H. Skerry secretary to the Deputies' Association and Mr. Greenland-Davies Chief Northern Inspector of Mines.

They made good progress with the men with the breathing apparatus working out in front restoring the ventilation so that men without apparatus could follow. They worked in relays for 38 hours before the last body was recovered.

An official at the pit who had had previous experience in explosions at the Haigh pit said-

"Never have I seen rescue Men work to better effect. They were splendid. The worst job was that of carrying out the bodies some of which were in a terrible state."

During the night, Dr. Ablett was joined underground by Dr. A.V. Harris whose father was one of the heroes of the 1910 explosion at the Wellington Colliery and worked at the

surface with other local doctors, nurses and ambulancemen who helped the men who were suffering from the effects of gas.

The management of the colliery made a statement-

"An accident occurred at the Haigh Pit about 8.15 p.m. on the 29th inst. Rescue work is now in progress and so far 25 men have been rescued and 11 bodies have been recovered. The cause of the explosion is at present unknown."

Mr. W.H. Johnson, general manager of the Whitehaven Colliery Company, issued the following statement at Friday noon:-

"Out of the 45 men involved 19 have been rescued alive and 25 dead bodies have been recovered. The explosion occurred in the new section of the pit known as the No.3 North and as localised."

There were distressing scenes at the pithead where relatives of the doomed men waited throughout the night in the forlorn hope that there would be further survivors found in the mine. As the night advanced the crowd grew and made its way to the pit yard. They divided into small knots and discussed the situation in hushed tones. The moon shone through the headgear and there were lights in the colliery offices. Telephones were heard and busy workmen hurried to and fro and materials were taken to the Haigh and the Wellington pits.

The assembled wives, parents and close friends and relatives waited and bore the ordeal bravely. A large detachment of Police was rushed to the pit yard but the crowd estimated to be at least one thousand but it posed no problem for them and they maintained perfect order and it was not until the first survivors arrived at the surface that there was any change in the mood of the assembled crowd.

There was a tiled chamber at the pit head and as the cage came up carrying the first of the survivors, wives, parents and friends rushed forward looking for their loved ones. The fortunate ones rushed to their men and hugged them and eyes filled with tears of wild hysterical joy. In the others the tears that had been so long held back began to flow and with the arrival at the surface of the first mangled body women broke down and sobbed and were led away by relatives. Those left bore their disappointment and grief in silence.

Many of the survivors told their stories to the press at the time. John Broatch said that he had finished work and was walking out when there was a bang and a violent rush of air along the working that flung him on his face. Almost semi-conscious he struggled to his feet and eventually reached the bottom of the shaft. When he got to the surface he and the men that were with him were said to resemble snowmen since they were covered from head to foot with stone dust. The man who worked with Broatch was Robert Timmins who was severely injured.

Another survivor was working in a remote district when he heard a thud but he continued to work until he noticed that the air was becoming foul. The alarm was given and he and his companions dashed headlong for the shaft. When they got to the pit eye they were exhausted.

The rescue parties found great damage to the mine with a small stationary engine veing flung bodily for forty yards down the road. On top of the engine they found the body of young Gainford who was its driver. Props had been reduced to matchwood and steel girders twisted like pieces of tin.

The men that were found were in the act of doing everyday things when they died. One was in the act of putting on his coat and another held his lamp in one hand and his bait tin in the other showing that there was no warning of the explosion.

Another anonymous survivor told the press-

"Me and my marrer were filling our last tub when there was noise like a big gun going off and I felt as if somebody had hit me like a crack in the lug. We were in Humbug district about 600 yards away. I said, '*There's something wrong*' but my marrer said, '*It's nowt*'. I felt the air current turning so we went outbye. My marrer went right out but I turned inbye again and met blinding clouds of stone and coal dust. Men were running everywhere shouting for help and stretchers. We got a

stretcher and got a man onto it but he died before we could get him far. I couldn't stand it so I came outbye and was glad to get out."

Mr. T. McGlennon another survivor was knocked down by a rush of air. He picked himself up but remembered nothing more and Douglas Amos of Newhouses told the press-

"I was working in another district and I was going to ride out to the shaft which was two miles away when I saw a flash and heard a rumbelling noise. Then I saw men falling down all around. men falling all over each other. I picked up man and carried him for 40 yards and found he was dead."

Daniel Bailey aged 19 years of York Road Whitehaven had just got to the hsfat when the exploiosn occurred.

"I realised that my elder brother, George, was in the district and I went back to try to rescue him but I was blinded by the gas and had to go back."

Some of the men that stayed underground and tried the first rescues without apparatus were half a mile from the No.3 district when the disaster struck. Many were hurled to the ground by the force of the explosion before they heard the report. William Birkett was one of these men. He was a hewer of Duke Street and as he went towards the explosion he found Mr. Thompson, the overman, trying to contact the No.3 district by telephone. He got no response and they went forward and quickly came across some bodies which they left but they succeeded in rescuing six men who were injured. Some of these rescue men stayed under ground until 2 a.m. without breathing apparatus, helping the official Rescue Teams.

The conduct of Mr. Harry Stevenson who worked as an overman at the Wellington colliery was brought to the notice of local press men. he was workig of the afternoon shift due to the illness of a colleague. Soon after 8 p.m. the air suddenly thickened and the lights went out. He thought that there had been a fall which had stirred up the dust or that the compressor had failed. He tried to phone the engine house and Mr. Heslop who was in the engine house who was in the 1928 explosion, when asked if anything was wrong said- "It's that ---- great pit".

On ringing the manager of the Haigh pit, Mr. Marron, Mr. Stevenson told him that the air in the Wellington pit which joined the Haigh pit through Jolly's drift, which joined the two pits, was 'thick' and he was informed that all was well and that the Haigh pit was drawing coal.

In the meantime the men who had been working in the Bannock district, except four who were working in the farthest places. It was also found that another four men, Quirk, Ruddy, Coates and Pearson were beyond a set of tubs on the main road. Leaving others to warn them, Mr. Stevenson went back into the Bannock district to warn the four men at the end. He went about 700 yards and he phoned back to Heslop to find how things were going. Heslop replied, "Joughlin". This was one of the men who hhe was going to warn and then Heslops's voice tailed off.

Just the the gas arrived and Mr. Stevenson fell on his hands and knees but he managed to crawl into a side road and open the brattice double doors which cut off the air from this part ofthe working. The air got better and the road which went round to form three sides of a square and then joined the main road again. The road was four feet high and 700 yards long. He passd through a door at the far end and reached the men who said that Mr. Stevenson must have broken the 100 yard record to reach them!

The men were sitting on the ground and Mr. Stevenson told them to get a move on and just then a cloud of gas swirled down the road. They staggered throughthebrattice into relatively clear air and travelled back into the Main Haulage road through san old disused working. They had to climb an old 'chain pit' twenty two yards long by an old ladder and they eventually joned themain road just by the compressor below the entrance to Jolly's drift from which the gas was coming.

As soon as they got there, Mr. Stevenson asked if anything had been heard of the men there. Heslop said that they had had a phone message twenty minutes before that they were proceeding outbye but they ad not turned up. Mr. Stevenson tied a

handkerchief over his mouth and started out to find the men. After staggering about 440 yards he heard a loud snore and found Pearson unconscious. His efforts at artificial respiration failed and he was crawling on to Coates who was a few yards further on when he was overcome by the gas and he knew nothing more until he was at the bottom of the shaft. The rescue party arrived soon after Mr. Stevenson was overcome and got him out with the four other men. Unfortunately two of the other men were dead

A message of sympathy arrived at the colliery, forwarded through Lord Lonsdale. The message read-

“The Queen and I are shocked to hear of the terrible accident at Haigh pit and at the serious loss of life which it has involved. Please convey our heartfelt sympathy to the bereaved relatives and make enquiries on our behalf to the progress of the injured.”

As the bodies were brought to the surface at the Haigh pit, they were taken to a temporary mortuary at the pit head and later to the hospital mortuary to await identification. The work of identification was gruesome and difficult owing to the state of the bodies and in many cases identification could be made only from clothing, birthmarks and personal possessions. Remarkably, on one or two of the bodies watches were still found to be in working order.

The men near the site of the explosion met a violent and sudden death and the bodies were so frightfully disfigured that identification was very difficult. The men that were further from the immediate scene were killed by concussion and gas.

John Holliday, aged 50 years. A married man who worked as a hewer of 26, Main Street, Parton.

William Wilkinson, aged 24 years a married man who was a hewer of Plumblands Lane, Whitehaven.

Joseph Henry Gainford, aged 18 years. A single engine driver of 28, Hill Top Road, Arrowthwaite. He had worked at the pit since he was 14 years old.

Robert Parkin, aged 53 years a hewer of 68, High Scotch Street, Whitehaven.

Matthew Storey, aged 28 years a married hewer of 16, George Street, Whitehaven. He left a wife and two children and there had been six deaths in the Storey family in the last fifteen months.

Joseph Kelly, aged 51 years a married hewer who lived at The Bungalow, Low Road, Whitehaven. Mrs. Keely was told that her husband had been taken to hospital with slight injuries but this proved to be William Kelly. Joseph had worked at the pit for only three weeks and left a widow. He had previously worked in the gold and diamond mines in South Africa and returned to England in 1913.

John Edward Slack, aged 30 years a married stoneman of 53, Ennerdale Terrace, Whitehaven. He had been out of work for over a year and had found a job at the William pit only seven weeks before the disaster and had recently been transferred to the Haigh. He left a young wife and a daughter aged four years.

Robert Hewitson, aged 22 years. A single man of 56, Buttermere Avenue, Whitehaven,

James Richardson, aged 45 years. A married man who worked as a hewer of Union Terrace, Whitehaven.

John Richardson, aged 45 years. A single hewer of Union Terrace, Whitehaven. James Richardson and John Richardson were father and son and both were well known cricketers in the area.

William Cowan, aged 47 years. a married deputy of 6, Countess Terrace, Whitehaven. He left a widow and five children, George Parker (senior), aged 58 years. A widower who worked as a hewer of Middle Row, Newhouses, Whitehaven

George Parker (junior), aged 31 years a single man who was a hewer and lived with his father, George (senior). The younger was to have been married to Miss Margaret Mather a few days later. Margaret waited for hours at the pit head awaiting news but he was the last to be brought out of the pit.

John Telford, aged 33 years a married man who was a hewer of 62, Middle Row, Newhouses, Whitehaven.

Edward Cockbain aged 40 years a married hewer of 8, Ennerdale Terrace, Kells.

Wilfred Hocking, aged 24 years a married hewer of High Harras, Whitehaven. He had been married for only three months.

Joseph Rogan, aged 49 years a married hewer of Thwaiteville, Whitehaven.

John Thomas Rogan, aged 22 years a married hewer of Thwaiteville, Whitehaven.

Joseph Rogan and John Thomas Rogan were father and son. John left a wife and a fifteen week old child.

James Knox, aged 43 years a married hewer of 31, Old Arrowthwaite, Whitehaven. He was identified by his clothing. He left a wife and eight children, His body was found by his brother George.

Fred Armstrong, aged 37 years a single hewer of 19 Buttermere Avenue who lived at Plumbland, Aspartia.

John Bailey (junior), aged 21 a single man who worked as a hewer of 9, York Road, Arrowthwaite. He had narrowly missed death in the last explosion at the colliery, Robert

Vincent, aged 50 years a married man who was a deputy of Hill Top Road, Kells. He left a widow and nine children.

Richard Hayton, aged 49 years a married man who worked as a shifthead of 20, Front Row, Newhouses.

Robert Groggins, aged 23 years a single man of 25, Mount Pleasant.

John Ruddy, aged 58 years a married deputy of 65, Hill Top Road, Arrowthwaite. He was one of the dead from the William pit had started work at the pit when he was 13 years old and he left a widow and two sons and two daughters.

Thomas Quiry, aged 59 years a widower who worked as a timberman of 8, Littledale Lane, Whitehaven.

The following men were admitted to the West Cumberland Hospital:-

Joseph Smith, aged 27 years a single man of East Road Kells. He had a fractured leg and burns and later died in hospital. He had been out of work for some time and had worked at the pit for two weeks and had not drawn his first pay packet.

G. Pritt, aged 37 years of North Road, Bransty who was suffering from shock.

R.J. Timmins, aged 42 years a married man of Thwaiteville, Arrowthwaite who had a fractured leg and shock.

Thomas McClusck, aged 40 years a married man of High Street, Whitehaven who was concussed and suffering from shock.

Joseph Bell, aged 38 years a single man of Long Row, Arleedon who had shock and a cut head.

G. Geer, aged 36 years a single man of Montreal Street, Cleator Moor who was shocked and was discharged after treatment.

James McGlennon, aged 52 years a married man of Hill Top Road Arrowthwaite who was suffering from shock.

Joseph Kermeen, aged 36 years a married man of York Road, Arrowthwaite who was shocked.

John Hornsby, aged 53 years a married man of Back Row, Newhouses who was suffering from shock.

Aaron Housby, aged 33 years a married man who was shocked and concussed and lived at Scotch Street.

Myles Knox, aged 54 years of 54, Newhouses who was shocked and had injuries to the knee and ankle.

David Johnston, aged 29 years a married man of Railway Terrace, Newtown, who had a cut head and shock.

William Kelly, aged 28 years a married man of Quay Street who had cut head and was shocked.

All the men were suffering from the effects of gas and other men who were gassed were taken to their homes. Most discharged quickly from hospital and only R.J. Tinnins, J. Bell and M. Kox were kept in hospital.

The town buried their dead and the Mayor Mr. Thomas Reed opened a Relief Fund stating that £600 was required. This target was reached by the end of March with donations from all over the country. The inquest into the deaths of the victims was held and the official inquiry into the disaster was opened in February 1931 by Sir Henry Walker the Chief Inspector of Mines at Whitehaven Congregational School Room.

The inquiry lasted for three days and ended on a note of indecision. There was an explosive 'Cardox' used in the mine and one theory as to the cause of the explosion was that a flying Cardox shell had struck a tub causing a spark which had exploded the firedamp mixture which was believed to have come suddenly from the floor.

All parties agreed that the explosion originated in Bailey's place and that it was an explosion of firedamp propagated by coal dust. Two men were killed in the Wellington section of the mine by afterdamp that was carried through Gallows drift and damage was done as far as 530 yards outbye of the Haigh main haulage road.

The explosion occurred at thirteen minutes past eight but what happened in that place between two minutes to eight and the explosion when McGlennon saw Cowan, Armstrong and Bailey jnr. at work there, can only be surmised. Inspection after the explosion revealed that the coal in Bailey's place had been kirved to a depth of 4.5 feet right across from side to side, and the other apparently about the same distance from the right side, both being started about 8 inches from the roof. The hole of the left side was 4.5 feet deep and had not been charged. That on the right had been bored 2 to 3 inches into the solid, had been charged and fired but little work had been done as the Cardox cartridge had blown out leaving a socket about 15 inches deep. The cartridge with a piece of cable still attached was found on the floor next of the face of the opposite heading, the one in which McGlennon and Walsh were working. The exploder was found in Bailey's level with an electric safety lamp besides it. besides it was William Cowan's body who had evidently used the exploder. The bodies of Armstrong, Walsh and Vincent, two flame lamps and an electric lamp were a few feet outbye.

The shotfiring cable was found in three pieces, one about 16 feet long with two leads at one end formed into loops. A few feet outbye on the other side of the road from the exploder, there was another piece about 7 feet long and at third piece, 105 feet long stretched out along the road with its outer end entangled with some iron rapper wire around the hook and wheel of an upturned tram.

The lamps were tested and found that were not responsible for the explains but the exploder was found to be capable of igniting a mixture of firedamp and air. The inquiry came to the conclusion that the explosion was due to firedamp accumulating in Bailey's place because of the derangement of the brattice doors. It was difficult to understand why Cowan did not detect the gas unless he examined the place before charging the hole and not immediately before firing. the ignition was due to either a spark from the exploder or by spark or heat caused by the Cardox cartridge when it struck the end of a steel tub. The explosion was spread throughout the district because of the dampness caused the limestone to bond and not to rise and intermingle with the coal dust.

Henry Walker thanked all those involved with the inquiry and the proceedings were closed.

NEWDIGATE. Numeaton, Warwickshire. 3rd. September, 1931.

The colliery was the property of Messrs. Newdigate Colliery (1914) Limited. Mr. D.S. Newey was the Colliery Manager and Mr. Arthur Pugh the undermanager. Mr. J.L. Smith, who held a First Class Certificate of Competency acted as Assistant to Mr. Newey. At the time of the explosion, Mr. Newey was on holiday but he returned to the colliery as

quickly as possible and made an underground inspection on the evening of the day of the disaster.

The explosion occurred in the No.1 District of the Two Yard Seam at the Newdigathe colliery which was near Nuneaton at about 10 a.m. on Thursday, 3rd. September, 1931 when four men were killed and five others burned. Four of these, five later died in hospital.

The No.1 North District was about 2,200 yards from the shafts and consisted of a long wall face which was known as 6's face. This was about 60 yards long with one intake road and another left as a return. About 3,700 cubic feet of air per minute of ventilating air entered the intake.

The coal that was being worked, the Two yard Seam, was about five feet thick and consisted of the top leaf of the Warwickshire Thick Coal. The seam was under laid by fireclay, 6 inches thick which was undercut by an electrically driven coal cutting machine. When the coal was got it was loaded on to a shaker conveyor which was driven by an electric motor at the top end of the face, just beyond the entrance to the return road. The conveyor delivered into a mechanical tub loader which was in the intake road. There was a gentle rise of about 1 on 20 along the face from the intake to the return.

The workmen used Oldham electric safety lamps and Hailwood combustion tube flame safety lamps in the proportion of four to one. The Hailwood lamps were also used by the officials. Shots, when required, were fired by the deputies and qualified and properly appointed shotfirers.

'Pixie Powder' was used for stonedusting the roof, floor and sides. Samples of dust were taken from intake, thirty and forty yards from the face on the 22nd. July, 1931 and the roof sample was found to contain 28.66 % and that from the floor, 25.66% of combustible matter.

In the No.1 District there were three shifts of deputies and three shifts of men and the district was visited by an overman during each shift. On the 3rd. September, the day shift deputy, Walther Casey who was off the previous shift, got to the face about five minutes to eight. Casey had told him that everything was all right with the exception of a slight fall about five yards to the right hand of the loader in No.6's gathe.

On arriving at this fall, Yorke found three men of the previous shift securing the roof over the fall. They had set two eight feet bars and had started to chock up the bars to the bind above. Yorke got up into the cavity and tested for firedamp but found none. He then sent the three men home and set two dayshift men, J. Marston and H. Byard, to complete the job.

Just beyond the fall, Yorke saw that the coal supporting the face of the stall bars which were needled into the coal at the face end and supported by a prop at the other, had fallen. This coal was of a powdery nature and he told two men, Harry Harlett and Sam Wright, to set eight feet bars between the five stall bars and to needle them into the coal as far as possible. He then made an examination of the face, setting men to work as he travelled along. He found no firedamp anywhere until he arrived at the top end of the return airway where he found less than one percent. He found that a brattice cloth, which extended from the pack on the right side, had sagged a little from the top, so he tacked it up and then returned down the face. There was no evidence that there was anything abnormal with the ventilation.

In the top end, Yorke left a collier, W.J. Hollis, whose job it was to get put the cutting side of the face and to look after the conveyor. Hollis had an electric lamp and a flame lamp. He hung the flame lamp on a bar at the side of the conveyor motor.

As Yorke came down the face he passed three men, J.J. Miles, J. Casey and A. Casey, who were repairing to clear up the cuttings and get the bottoms out behind the coalcutting machine. A. Casey was sent out of the face to another job shortly after. He then passed three men, W. Harward, H. Marsden and E. Owen who were attending to the coalcutting machine. He then came to the part of the face where the coal had not been cleared. He put two men, J., Blackwell and J.W. Morris to hew it down. He was then called to another part of the face where he had told Harlett and Wright to set the eight

feet bars. On arriving there, he was told by Wright that in making the needle, he had cut into a slip and he thought it was the gob. Yorke made an examination of the hole and told Wright that he was mistaken and what was there was a drop or slip fault of about 9 inches. Yorke made tests for firedamp in the hole but did not find anything. He was at this part of the face when the overman, George Wright came in to see the fall in the 6's face. Having seen that the repairs were almost completed, he met deputy Yorke and travelled up the face with him where the deputy showed him the part of the face where Wright thought he had struck a gob.

Wightman thought it was a small slip and after he had left, Yorke went into the face where he noticed some coal had broken away from a bar about 5 yards on the outbye side of the coalcutter. He told a man to set a middle-set bar, leaving enough room for the cutter to pass under. He then went down the face again to where Harry Harlett and Sam Wright were setting the bars and while he was giving a hand with the work, the coalcutter driver, Hayward, came down the face to tell him that the mid-set stall bar had snapped off in the middle and partly buried the cutter. This was about 9 a.m.

Yorke went to the cutter and told Hayward not to work it again until two 8 foot bars had been drawn on each side of the stall bar which had snapped. Hayward and Miles went to get the bars and Yorke went beyond the fall into the top end to test for firedamp where he found that the slight trace he had found on his first inspection, had cleared.

Hayward and Miles were not successful in their search for the bars and they returned to the face. Yorke then went to get some bars, taking Harry Harlett with him. The explosion occurred at about 10 a.m. as Yorke and Harlett were returning to 6's face by way of 6's dip and were between 500 and 600 yards from the face. Yorke said he felt a sudden rush of wind accompanied by dust which he thought was the road dust picked up from the floor. Harlett said there was a gust of strong wind and just a bit of a thud. The gust of wind stopped him walking.

E.J. Robinson, the stallman was working at the loader at the intake gate, heard no report or saw a flash but felt the gust of wind. His lamp which was standing on a girder was knocked down and went out but came on again. J.G. Marston was working at the intake end of the 6's face throwing his coal directly on to the loader. At the moment of the explosion he was facing the coal face bending down. The noise he heard was a loud crash and then there was a blast of hot air. and he was thrown onto the conveyor at the foot of the loader. Harry Byard was facing the waste about 10 yards from the face of the headway when he was blown over. Neither of the two men was burned.

At the moment of the blast, Samuel Wright was working on the face. He heard a terrific bang which seemed to come from the far end and he was burned on the upper part of his body, blown over and peppered with small coal. All the men working outbye of Wright were badly burned and none of them survived.

When the explosion occurred, Yorke sent Harlett for Wightman, the overman but on his way he met Mr. Smith, who was the acting manager who immediately went down 6's dip towards the face and met Whitman and several of the haulage hands in the return where it joined 6's dip. Whitman told Smith that the air was not moving and the face was not clearing. The men were anxious to go down the return airway and he agreed to this and went with them for about 200 yards. There was no blockage and the air was quite good and no smell of smoke but he thought it foolhardy to go further and so brought the men back to the 6's dip and then went towards the face.

The brattice cloths across 6's dip which divided the intake from the return were all in position and had not been damaged by the blast. Whitman sent for a shotfirer and relief deputy, James McCullum and with him leading, they tried to get long the face though the air was very thick with smoke. Byard, Marston and Dick Roberts succeeded about 11.45 in getting as far as the cutter where they found the body of J.W. Morris and later the bodies of J. Casey, J.J. Miles and W.T. Hollis.

McCullum made an examination for firedamp but found none. A further examination was made later which also proved negative and the bodies were recovered.

Those who lost their lives were-
J.W. Morris.
J. Casey.
J.J. Miles.
W.T Hollis.

5 others burned and 4 died.

The inquiry into the disaster was opened at the Co-operative Hall, Abbey Street, Nuneaton on the 10th. November and was concluded on the 14th, November, 1931. It was conducted by Sir Henry Walker, CBE., LL.D., H.M. Chief Inspector of Mines and the report presented to Isaac Foot Esq., MP. Secretary for Mines. All interested parties were represented and Mr. W.E.T. Hartley, H.M. Inspector of Mines for the Midland and Southern Division appeared for the Mines Department with Mr. E. Rowley and Mr. G.N. Scott who were Senior and Junior Inspectors respectively.

After the disaster, Mr. Smith, the undermanager and David Casey, overman, examined the face and the return airway and found no obstruction and a test for firedamp by Casey was made and no gas found. The roof was weighting and Mr. Smith gave orders that props should be set to keep the face open.

Mr. Rowley and Mr. Scott, Mines Inspectors, inspected the face later in the day and found that the weighting to the roof was very severe, especially near the coalcutter. They thought that if the extra timber had not been set the face would have been lost and any inspection impossible. Mr. Rowley found that there was very little damage caused by the explosion and there was very little firedamp present. Mr. Rowley considered the explosion had been quite small and had covered a limited area. He said-

“Except that the timbers were a bit blackened with dust at the top end, I quite think I could have been taken into that face and probably come out without having realised that an explosion had occurred.”

At the inquiry there were several opinions as to the source of the firedamp which had caused the disaster. Mr. J. Ivon Graham, Deputy Director of the Mining Research Laboratory at the University of Birmingham thought that there were two possible sources, from the waste owing to the barometric changes and from the spot coal where Samuel Wright was making a ‘needle’ hole for a bar. The first suggestion was discarded as there was, in his experience, little firedamp in the wastes of this colliery and neighbouring collieries and he thought that the gas came from the mushy coal.

Smith Yorke and Wightman thought that the gas came from the slip fault. Rowley said-

“There was a lot of thin coal operating that day which to my mind would tend to produce gas. You had a low barometer and you had the place on weight. You had the face somewhat disturbed and you would have gas give off from all these causes chiefly through coming from the waste because of the low barometer.”

Mr. James McCullum thought the gas came from the heavy weighting which was along the whole length of the 6's face.

After the explosion an electric lamp, No. 348 was found with its glass and bulb broken lying on the floor next to the conveyor on the face side. It was thought that the gas was ignited by the glowing filament of the lamp which had been issued to J.W. Morris with whom J. Blackwell had been set to work to hew off a knob of coal. The events were surmised that Morris inadvertently broke the lamp in hewing the coal and the gas ignited at the filament.

Mr. J. A. Bernard Horsley, H.M. Electrical Inspector of Mines, thought that the gas could have been ignited at the conveyor motor and he had found defects in the contacts in the plug connector.

Sir Henry Walker considered all the evidence and came to the conclusion that-

“The firedamp was suddenly ejected from the waste by a heavy fall and that an explosive mixture was formed at the end of 6’s face and there ignited by an arcing in the plug connector of the conveyor motor.”

BOWHILL No.1. Cardenden, Fifeshire. 31st. October, 1931.

The accident occurred at Fife Coal Company’s colliery when ten men lost their lives as a result of an explosion of firedamp. Mr. John Clark was the manager of the colliery and had held the post for seven years. The accident occurred in the East Conveyor section of the Five Foot seam which was reached from the No.1 shaft. There were in the Bowhill Colliery, certain safety lamp sections where only safety lamps were to be used. Hutt’s Dock and the East Conveyor section formed one of these sections. There were electric lamps in use and the firemen had flame lamps to detect gas. Electricity was used in the section to run a coal cutter, conveyor pans and there was also auxiliary ventilation system worked by electricity.

The firemen’s reports were produced from October 20th., 1930 to August 2nd., 1931 and there were no reports of gas or firedamp. The presence of gas was first reported on 2nd. August, 1931 and on that occasion, it was noted by the fireman, that the fan was standing. From 2nd. August to October 31st. the section was clear. The reports showed that the fireman had been very careful in the performance of their duties. Mr. Clark thought the ventilation was sufficient and he did not agree that it was necessary to use flameproof machinery in the section as it was section in which inflammable gas was not likely to occur. In his opinion the section could have been worked by waked lights during the last nine months.

On the day of the disaster John Clark was coming to the section when he came to the conclusion, judging by the air current, that the fan was out of action and he started pumping in fresh air. Describing the rescue operations the second rescue brigade got to the scene of the accident about 7.30 p.m. and it was about 3 a.m on Sunday before anyone could go in without rescue apparatus. That was about 16 hours after the accident

Samuel McGuire was the undermanager and was in charge of the No.1 Pit and the development in the East Conveyor section. On the day of the accident the roof was weighting at the point where the fan was situated. As it would take a few hours to move the fan, he instructed Donaldson, the overman to get a squad of me and move the fan on Saturday 31st. October, which was an idle day in the pit.

The party left the pit bottom about 6 a.m. and McGuire came out of the pit and knew nothing of the accident until 1.20 p.m. When he reached the scene of the accident the poisonous gasses spread about 50 yards down the face and 150 yards down the return airway. John Birrell, overman, was the leader of the second rescue team and they got to the seat of the accident about 7.45 p.m. and they found the men lying dead in the return airway

The men who died were-

James Drummond Paterson, miner,
James Smith, miner,
Alexander Dempster, fireman,
Charles Baxter Fernie, miner,
William Ireland, overman,
Thomas Smith, miner,
James Martin Cairns alias James Anderson, fireman,
William Bruce Dodds, electrician, Andrew Smith, miner and
John Donaldson, overman.

The inquiry into the disaster was held at Dunfermline Sheriff court in January, 192 before Sheriff Umperston and a jury. Evidence of search of the clothing of the victims

when the bodies were brought to the surface on the day following the accident was given by Police Inspector Andrew Clark of the Fife Constabulary. In only one case, James Anderson, alias Cairns, was found a tin box containing seven Lucifer matches wrapped in paper in his right vest pocket. In his right trouser pocket there was a pipe which was slightly less than one sixth full of burned tobacco.

John Clark, the manager was asked if he had any idea where the explosion occurred and he thought the centre of ignition seemed to be at a point eight feet to the right hand side of the fan near where five men were lying. Donaldson, the leading man, was lying near the switch box but he did not think he had been operating it at the time. Clark noticed that the lid of the original fan box was broken and it was out of commission, and that the switch box had been coupled up to the fan was the switch box of the coalcutter.

Questioned on the possible causes of the explosion. Mr. Clark dismissed the possible cause as smoking and he considered that it was only a lapse of memory on Anderson's part in taking a pipe and matches into the pit. He thought that a damaged electric lamp was the most probable cause of the explosion. It was possible that, at the point of ignition, a man broke the glass of the lamps which exposed the filament and this caused the ignition. He did not rule out the possibility of tools striking a hard portion in the working place and causing a spark but he could not explain how the gas came to be there as everything possible had been done in ventilating the place.

Harold Taylor Foster, Senior Inspector of Mines visited the scene of the accident on the night of the 31st October and his first impression was that the man lying nearest the fan motor must have been in the act of switching it on and off. A switch of that sort required a great deal of effort and to operate it he must kneel in the position in which the man was found. His first impression, that the explosion occurred at the fan motor was replaced by the opinion that it occurred at the gate end box. The motor and the fan were out of alignment and the fan had jammed. The leads that connected the fan motor were not connected by an electrician.

There were several expert witnesses who implied that the system of ventilation was defective and Mr. Macgregor Mitchell, acting for the Company said that the attack on the ventilation system was not well founded and asked the jury to find that the explosion was caused by a broken lamp.

The jury, under the direction of the Sheriff returned a formal verdict stating that they were unable to say what was the cause of the ignition. They further agreed to refrain from saying whether in their opinion any person was to blame. They added to their formal verdict the following recommendations-

- “1) In regard to the ventilation, that so long as men are working in the section with the present system of ventilation, an auxiliary fan ought to be constantly in operation, and that the men should not be sent to work there unless there is an auxiliary fan in operation.
- 2) That all the electrical apparatus in this section should be constructed and maintained in a flameproof condition
- 3) The encasing glass of the electric cap lamps ought to be laminated or triplex glass.”

Sheriff Umpherston added that he would be sure that the jury also desire to express their admiration for the courage and promptitude and James Clark, overman, Joseph Mackie, overman and James Crichton, underground fireman, in their efforts to reach their comrades. In particular the feat of James Clark in penetrating a far along the face as he did without safety lamp appeared to be worthy of the highest traditions.

The jury, along with counsel and agents, joined his lordship's tribute and the suggestion was made from the bar that these acts of heroism should be brought to the notice of the Carnegie Hero Fund Trustees.

BENTLEY. Doncaster, Yorkshire. 20th. November, 1932.

The Colliery was the property of Messrs. Barber, Walker and Company Limited and the explosion took place in the north East District of the Barnsley Seam at 5.45 p.m. on Friday 20th. November 1931. The workings were divided into eight districts with independent intake and return airways so that any district could quickly be isolated. The coal was worked by longwall method and gates from 40 to 44 yards part and crossgates 150 yards apart. The packs at the side of the gates and crossgates were 3 yards and those in the banks 2 yards wide, the wastes between the bank packs were 14 feet wide. The gateside and crossgateside packs were built of bind and clunch (shale and fireclay) but for the bank packs it was necessary to use a proportion of coal since there was no other material available. The coal that was used was the Top Softs or 'Conny' Coal and it was left as the roof at the face but ripped down in the gates, None was filled out of the wastes. A section of the seam that was taken in the southern end of the north East District the September before the disaster was 1 foot 9 inches of coal (Day Beds), 2 feet 9 inches of Clunch, 4 feet of Top Softs (Conny Coal), one inch dirt parting, 3 feet 10 inches of Barnsley Coal, 5 inches of Jacks, 1 foot 8 inches of Bottom Softs and finally 3 inches of fireclay.

The mine was ventilated by a Capell single inlet fan. There were two such fan but both were not used at the same time and according to the measurements taken on the 2nd. November, the total quantity of air passing per minute was 370,282 cubic feet at a water gauge of 1.7 inches. According to the same record there were 28,044 cubic feet per minute entering the North East District by two intakes. The workmen used electric hand lamps and in addition one man in each stall took in a flame safety lamp to make tests for firedamp. The flame lamp for any individual stall was not necessarily always taken in by the same workman. Checks, one for each stall, were hung on a board in the lamp room and the first man of a stall to arrive took the appropriate check from the board and exchanged it for a flame lamp. This lamp and his electric lamps he carried inbye and made an examination for firedamp in the gate road and along the stall.

On average one hundred tons of stone dust were sent into the mine each month. The material that was used was the material that was got down in back ripping the roof of the roads and ground to the required fineness at the colliery. Dust samples were collected and examined by the Colliery Chemist and the attention of the Colliery manager and Agent were called to any sample in which the incombustible matter was 60 per cent or less. The chemist sent the particulars of samples to the overman on a special pink form and the overman made arrangements to be sent to the places that required attention. He also telephoned the deputy in the district to say that he was sending in stone dust and told him where it was to be used. At the end of the shift the deputy reported on the pink form the length of the road which had been redusted and the number of tubs that had been used.

Mr. Donald McGregor was the Agent and Mr. Albert Longdon and Mr. Thomas Cook were the Manager and Undermanager. On each of the three shifts there was an overman on charge and under him there were two district overmen, each of whom had four districts under his supervision. the eight ventilation districts were divided into nine deputies' districts each of which was supervised during the 24 hours by four deputies, so, as each deputy worked an eight hour shift, there was an overlap in each district amounting to eight hours in the 24. Every deputy made two examinations during his shift and recorded the results of the examinations in the statutory report book. There were also eight other deputies whose duty it was to inspect and supervise the work done in the main, travelling and return roads. They also recorded their results in the report book.

In addition one overman and three deputies, known as the P.F.G. (Prevention of Gob Fires) staff, were employed solely for the purpose of dealing with heatings detected whether by themselves or others. These deputies made their reports in the statutory report book at the end of their shift and also recorded their findings in the P.G.F. book, the work that had been done by the men under their supervision. The overmen in all cases made reports using a copy of the Deputy's ' statutory report book for the purpose.

On average 1,000, 990 and 400 men and boys were employed on the day, afternoon and night shifts respectively and their hours and those of the overmen and deputies, made a complicated system with the men going down on the day shift at 6 a.m. until 1.30 p., those on the afternoon shift going down at 2 p.m. and coming up at about 9.45 p.m. and those on the night shift descending at 10 p.m. and coming up at 5.30 a.m.

In the North East District workings at the time of the explosion there were 85 men working. Of these 2 were deputies, Harry Hartley and James Hughes, 49 colliers, 11 byeworkers, 2 bricklayers, and 21 connected with the haulage. The 140's new crossgate had cut off the rib-side gate, the 140's Old Gate, and as was customary seals were being put in at the inbye and outbye ends of that old gate. All the supports had been withdrawn from the old gate and a seal at each end had been made during the day. Men were engaged in reinforcing these seals by packs at the time of the explosion.

At 4.20 p.m. the outgoing deputy Edward Gold Swift completed his second inspection. The deputy in charge of the district, James Hughes, after conferring with Swift, left the meeting station at the outbye end of the 140's new crossgate at 4.30 p.m. on his first round of inspection. Hughes had been informed by Swift that a little gas was being given off at the seal at the outbye end of the 140's Old Gate and he went to this place first. He found J.H. Rowe and W. Brockenhurst at work there finishing off the third pack of the seal. He made a test for gas and found a trace just as Swift had. This was the only indication of gas that he found during his inspection which he had completed by 5.40 p.m. and with the exception of a fall in the 149's left bank, which did not impeded the ventilation everything was in good order. As Hughes described it as ' Everything seemed beautiful' .

Having finished his inspection, Hughes went down 140's crossgate to its junction with the main road, 148's , and when he was there about 5.4.5 p.m., to quote his own words, "there was a regular flash of wind and dust". Hughes telephoned to the pit bottom office explaining that something was very serious that had happened and that the management should be notified. a telephone message was sent at once from that office to Mr. Cook the undermanager at his house, Mr. Cook telephoned the Manager, Mr. Longdon who in turn telephoned the Agent's house and went to the colliery office where he found Cook waiting for him. Further information was then available and Longdon sent Cook underground, summoned members of the Colliery Rescue Teams, telephoned local doctors, H.M. Inspector of Mines, the Central Rescue Station and sent a message to the house of the local representative of the workmen Mr. W.J. Ballham.

Cook, on getting down the pit, found that William Fisher, the overman in charge of the shift, had already summoned rescue men and ambulance men at work in several districts of the mine to collect stretchers in their districts and bring them to the pit bottom. After telling Fisher to send these men with others into the North East District to render assistance, Mr. Cook went inbye.

Deputy Hughes was at the 140's crossgate junction. Soon after he had felt the rush of wind and dust, and before the dust had settled, Dan Maloney, who had been at work in the 142's stall, came down 144's new crossgate. He was badly burned. He was followed by Arthur Kirkland from 143's stall. Kirkland, although badly burned had lifted a tub off a boy, Thomas Hannon, whose foot was trapped near the 143's junction and Hannon followed him out. Hannon was followed by a collier Horace Windle who had been at work in the 140's stall. He too was badly burned. These four men were assisted by some of those in the district who had not been injured and taken to the pit bottom where they received first aid. Only one other man, Harry Roberts, came out of the face. He was helped by a driver John Ward, who at the moment of the explosion was at the outbye end of the passbye and had heard someone trying to get outbye past the tubs. He went at once to help Roberts and took him to the 140's new crossgate junction. Roberts, aided by a contractor, George Bailey, walked to the pit bottom where he also received first aid.

In the meantime one of the stallmen, Harry Clarke, had come out to the main road from 150's stall by way of 149's stall and the junction of 150's crossgate with the main

road and saw Hughes, who finding that Clarke was from 149's and 150's were uninjured, told Clarke to bring them out to give assistance. Other uninjured men led by a corporal, Frank Sykes, had gone up 140's new crossgate as far as the door just beyond 142's junction, they looked through the door but did not go further because it was too hot.

A gob fire deputy, Harry Hartley, who was supervising work on the main road about three quarters of a mile outbye felt the ventilation change which stirred up a great cloud of dust. At first he thought that a compressed air pipe had burst and went 200 yards outbye with one of his workmen, found nothing and returned inbye, followed by two haulage hands. Some of these together with the uninjured men already in the district under the direction of Hughes went to the face starting at 148's and moved some of the injured men from 148's, 147's and 146's stalls into the gates. They could do this since the ventilation had been retired and the dust had cleared. While they were taking these men out, the undermanager, Mr. Cook arrived.

A few minutes later the Agent. Mr. McGregor came in with William Brown, the night overman after visiting the 148's stall and 146's crossgates telephoned Mr. Longdon whom McGregor had instructed to remain at the surface to wait for H.M. Inspectors. to organise a dressing station, to get blankets, stretchers, dressings and to ask the neighbouring collieries to send their motor ambulances. From this time onwards the work of recovering the injured and the dead was carried on until 11 p.m. when as far as was known at the time all the bodies had been recovered. Later it was found out from deputy Hughes that some of the men had been working in 141's return, outbye of the junction of 140's new crossgate and an attempt was then made to rescue these men by getting into the return via 140's old crossgate but owing to intense heat and smoke this attempt had to be abandoned and the bodies of five men, J.W. Rowe, W. Brocklehurst, S. Mason, J.H. Smith and T. Dove were not recovered.

The work done to recover those who had been enveloped by the explosion divides itself into two parts, namely, the work done immediately following the explosion and that done later.

Immediately following the explosion there were at or near the outbye end of 140's new crossgate the following persons:- James Hughes, deputy, Frank Sykes, Corporal, Richard Edward Darker, road contractor, Norman McMullen and Norman Moulton, drivers and Henry Oakland, road contractor. On the main haulage road (148's) between 140's new and 140's old crossgates were Oliver Soulsby and William Follows, haulage hands Phillip William Yates, haulage engine driver and William Heath, pony driver, were on 148's road between the doors across that road at the outbye end of 150's crossgate. John Ward, pony driver was at the outbye end of the face passbye in 148's gate and Ernest March, corporal, was in the same gate some eight yards on the outbye side of Ward.

In 149's stall there were Alfred Stringfellow, Leonard Yeomans, Albert Taylor, Charles Rooke and Arthur Eveson, colliers, in 150's stall, Harry Clarke, Percy Devey, Frederick Franklin, Clarence Harding and Irvine Spencer, colliers near the outbye end of 150's gate Arthur and George Bailey, contractors.

Harry Hartley, deputy, George Rollinson and Thomas Holloway, bricklayers J, Glancy and Richard William Booth, byeworkers were at the junction of the old North East and new North East haulage roads and at or near the same junction were Sydney Walter Waddoups, Arthur Wakelan and James William Beardsley, haulage hands.

All these men and youths gave help in one way or another after the explosion and details of some of their work are as follows-

Frank Sykes, Corporal, who was standing on the main haulage road (148's) opposite 140's new crossgate at the time of the explosion, felt a sudden rush of wind outbye along 148's followed by a very thick cloud of dust. he was blown over and could hardly see the light of his lamp. Before the dust had settled, he and Norman McMullen, pony driver, went inbye on 140's new crossgate and at the travelling road (147's), met Daniel Maloney who had been working in 142's gate, walking out by himself. They took him to

the main road junction and put some clothing on him and then started up 140's new crossgate and met Arthur Kirkland, who had been working in 143's gate just inbye of the travelling road. Kirkland told Sykes that there was lad under some full tubs who had asked for help but he could not do so as he was much burnt. Kirkland was taken to the main road junction by Sykes and McMullen and they then went inbye again and near the door just beyond the travelling road, met Thomas Hannon, pony driver, the lad whom Kirkland had said was under some full tubs and had not been able to help because he was burnt. As a fact, Kirkland had liberated Hannon. Hannon was taken to the main road junction and Sykes and McMullen again went inbye and on this occasion near 144's gate they met Horace Windle, who had walked out from the fast end of 140's stall.

Further work by Frank Sykes will be referred to later. Norman McMullen and George Bailey were on their way outbye with Windle and Hannon when they met Harry Hartley, deputy, and his four men on their way inbye. One of the latter, Thomas Holloway, turned back and helped to take Windle first to the ambulance office at the pit bottom and thence to the surface ambulance room where Doctors Young, Erskine and Lind Walker attended to him. Holloway, as will be found later, returned underground to give further assistance.

Arthur Bailey started outbye from 140's junction with Daniel Maloney but, more assistance being required, George Rollinson joined them and they got as far as the junction of the old North East and new North East haulage roads where a stretcher was improvised and Maloney was carried to the pit bottom on it by Bailey, Rollinson and two haulage hands, Arthur Wakelan and James William Beardsley. Kirkland was accompanied outbye by the two driver lads, Norman Moulton and William Heath.

Maloney and Windle died the following day and Kirkland five days later. Happily, the boy Hannon, survived.

John Ward, the pony driver, at the moment of the explosion was standing in 148's gate some 20 yards from the face with his back to it. He was thrown forward on to his face, and his pony which was facing him, on its hind legs and then falling just missed him. Ward saw no flame but the dust was choking - it was so thick he could not see the light of his lamp which was on his belt. He called out to Ernest Marsh, corporal, who was some eight yards further out and Marsh replied that he was all right. He (Ward) heard the men in 148's face shouting, so, guiding himself by the rails and the tubs, he went towards the face. He met and helped out a man, Harold Robertson who had his right arm broken and was burned down to below the waist but who happily recovered. He could not see Roberts because of the dust but feeling his way out by the rails, helped him out to 140's new crossgate end where he saw the deputy, James Hughes and others, including the injured collier, Daniel Maloney and the injured driver boy, Thomas Hannon. He told the deputy that the men were fast in 148's stall and taking up his drinking flask, he returned to that stall and there found W. Middleton on the flat sheets with a leg fast under two full tubs and one of them broken. Ward moved the lumps of coal and then a collier, G. Bentley, came out of the right bank and Ward assisted him as far as the middle of the full set of tubs in the passbye, but could get no further because the empty set blocked the way. He tried to push out the empties but could not do so, so he went outbye for help. On his way outbye he met the deputy, James Hughes, who told him to go into 150's face and tell the men there to hurry out. He, however, saw a haulage hand, Sydney Walter Waddoups who had come inbye from the junction of the old and new East haulage roads, and asked him to come into 148's face to help him and then was on his way to hurry 150's men when he met them coming put, gave them the deputy's message and returned to 148's face. The men from 149's and 150's then came and with Ward and Waddoups, shoved the empty tubs outbye to the haulage rope end, whence a pony driver, Richard Edward Darker drew them out on the haulage engine.

Atkinson, Bentley and Middleton were carried a short distance outbye by 1549's and 150's men, who, after going into the other stalls and recovering injured men from them, later acted as stretcher bearers to the surface ambulance room, and some of whom namely, A. Stringfellow, L. Yeomans, A. Taylor, C. Rook and F. Franklin, returned underground to give further help.

After Atkinson, Bentley and Middleton had been moved from the face, Ward went to 140's new crossgate junction, passing Samuel Cook, deputy, on the way, where he saw Frank Sykes, corporal and Oliver Soulsby, driver. Wards's further work is interwoven with that of Sykes and Soulsby, and is referred to later.

Of those at or near the outbye end of 140's new crossgate when the explosion occurred, Richard Edward Darker, pony driver, was blown on to his face on the main haulage road (148's). he walked a short way outbye and then joined Oliver Soulsby and William Follows, haulage hands. The three then went, via 140's old crossgate, from the haulage road (148's) to the travelling road (147's) and then turning inbye came to 140's new crossgate, where they saw Frank Sykes.

Henry Oakland, road contractor, who, with Henry Beastall, was, prior to the explosion, setting steel arches in 146's crossgate, had come out of 140's new crossgate to get a foot block and had just gone a few yards on his return journey when the explosion occurred. He spoke to the deputy, James Hughes, wondering what had happened, and saying no matter what the consequences might be, he was going for his mate Beastall. William Follows said he would go with him and they (Oakland and Follows) set off inbye and went up 146's crossgate, where they found Beastall and Hopkinson, just beyond where the door had been. Oakland went outbye for help Follows staying with the injured men, and shortly returned with Phillip William Yates and Oliver Soulsby and a stretcher. Oakland, Yates and Soulsby carried Beastall's body outbye to 140's crossgate junction, where it was laid on one side, and Oakland returned with the stretcher to fetch Hopkinson. H. Clarke one of the men from 150's stall, and R.W. Booth one of H. Hartley's men, going with him, and these four men carried Hopkinson to the ambulance room at the surface.

Hopkinson died in hospital the following day. He had been badly burned and had a broken thigh he was an ambulance man and, through in such great distress, he had the great fortitude to direct those who came to help him, exactly as how to treat his broken thigh.

To return to Frank Sykes, corporal, when Darker, Soulsby and Follows, returning inbye via the travelling road (147's) met on 140's new crossgate. He (Sykes) with Soulsby and Darker went inbye on 140's new crossgate and found pony driver Hannon's pony between 144's and 143's , but seeing no men, took the pony to the main haulage road. Sykes there saw H. Roberts whom Ward had assisted out of 148's and then telephoned to the pit bottom office asking for stretchers and assistance and said there had been an explosion extending from 140's to 148's . He and Darker then went up the new crossgate again and Sykes, looking through the door between 142's and 141's , saw that beyond the door the crossgate was full of smoke and very hot. They returned to the main road and went inbye. Sykes, with John Wards Ernest Marsh into 146's crossgate and Darker into 148's stall. Sykes Ward and Marsh passed Beastall, who was being carried out, and which they carried out Albert Edward Huckerby and another man. Sykes and Marsh then got John Llewellyn out of 147's stall and took him outbye via 158's and 140's old crossgate to the travelling road, where they met Mr. T. Cook, undermanager, on his way inbye, and ten two men, William Henry Potter, and George Robinson, with a stretcher. They put Llewellyn on the stretcher and he was carried to the pit bottom by Marsh and Robinson, Sykes returning inbye, Potter going with him, to 146's crossgate, where they met the deputies. James Hughes, Harry Hartley and Oliver Soulsby and John Ward in the 148's crossgate. Richard Edward Darker in the meantime had gone into 148's stall, and having assisted to bring out the men there rejoined Sykes and Ward, and with them had Hughes and Hartley and Phillip William Yates carried four men out of 147's stall. The men from 149's and 150's stalls, with T. Holloway, R.W. Booth, J. Glancy and R. Pritchard, then came, and with their help the injured were moved from the faces into the gate-roads, 145's and 143's men being taken in to the 144's gate.

Ward and Soulsby assisted in this work as far as 144's and then, being exhausted, returned along the face to 146's and then down the crossgate to the main road (148's) where at the haulage engine they saw J.E. Peck, who was receiving attention of Doctor

Lind Walker, and they, with A. Stringfellow and two others, helped to carry Peck outbye to the pit bottom, arriving there about 9 p.m. when they went home.

Phillip William Yates assisted on the face as far as 145's, but the sights becoming too much for him, he retired outbye and thereafter assisted to carry out stretcher cases.

Sykes, T. Holloway, Darker and another man who had come from the shaft bottom carried an injured man from 144's gate to the pit bottom, and Sykes and Darker, being asked by the overman (Bernard Frost), who was in charge there, to return to the district, they did so and with R. Pritchard and another lad helped to carry out the body of a dead man, R. Derrick from 143's gate to the surface. Holloway went on to the infirmary, where he gave further assistance until after midnight.

John Moss, deputy, accompanied by Henry Murray and Vernon Kerry, also deputies, arrived at the pit bottom from other districts of the mine shortly before seven o'clock and going inbye into 147's gate carried an injured man from there to the main road (148's) and then going along the face beyond 143's gate with deputy Frank Beal and Joseph Edward Sharpe, a rescue man, brought out of 143's left bank and 142's stall five injured men and carried them into 144's gate where Dr. Lind Walker and deputies James Hughes and Samuel Cook and the ambulance men had established a dressing station and where they were joined later by Dr. Hargreaves.

Samuel Cook, the afternoon shift deputy in the North West District, had already done good work in the faces, bandaging the injured and helping to get them out into the gates.

Moss, Kerry, Beal and Sharpe did not get into 141's left bank but carried to 14's gate another injured man who was brought out by Robert Bestwick, Ernest Allport and Alfred Clay, rescue men and then a further injured man, also brought out by these rescue men with the help of a deputy Frank Lee, who was not wearing breathing apparatus.

At this time there was a fire in the first waste on 142's right bank and a prop in front of 141's left side gate pack was smouldering.

All the injured and dead from the face between 148's and 141's had now been accounted for and there remained those in 140's stall (with the exception of H. Windle who, as has been told, walked out) those in 141's airway and Rowe and Brocklehurst, who were working at the seal at the outbye end of 140's old gate.

Two rescue men (Frederick Tonkin and Henry Bond) at the request of Mr. P.L. Collinson, H.M. Junior Inspector of Mines who had gone down the pit in company with Messrs. Ballam and R. Curry, and who was at the time dealing with the prop which was burning, went into the 140's fast side. They saw a body on 140's flatsheets and another body 7 yards down 140's new crossgate. Tonkin made a test for firedamp at the flatsheets and found three and a half per cent in the general body of the air. They came back and reported to Mr. D. Macaskill, the Rescue Station Superintendent, who was on the 140's new crossgate at 144's junction. They were then sent to assist other rescue men, Robert Bestwick, Joseph Ward, Alfred Clay and Ernest Allport, to put out a fire at 104's new crossgate between 142's and 141's gates.

Mr. Thomas Cook, undermanager, who had gone down the pit about 6.20 p.m., went inbye to the North East District with T. Renshaw, deputy. On arriving there he found the work bringing the injured out of 148's, 147's and 146's stalls being done as has already been described. He travelled along the face to 142's stall where, from the waste in the right hand bank, smoke was issuing. He came down 142's gate on to 140's new crossgate and saw a fire on that crossgate between 142's and 141's gates.

He then went to the meeting station and from there reported to Mr. Longon, manager by telephone, and asked for doctors, rescue men ambulance man stretchers and blankets. He then took charge of the rescue operations generally until the arrival of Albert Longdon, manager, who, on the instructions of Donald McGregor, Agent, was at the surface organising arrangements there and awaiting the arrival of Mr. E.H. Frazer, Divisional Inspector and Mr. H.J. Humphrys, Senior Inspector.

Mr. Longdon, Mr. Frazer and Mr. Humphrys went underground about 8.35 p.m. and after passing many stretcher parties on their way outbye arrived at 140's new crossgate junction where they saw Mr. McGregor who had gone underground two hours earlier and

of whom more will be said later. Mr. McGregor, who was suffering from the affects of afterdamp, told them that the top end of the district alone remained to be cleared and that rescue men had been right to 140's stall.

The party then separated, Mr. Frazer going by way of 143's gate and the face to 140's fast end Mr Humphrys to the fire in the 140's new crossgate, and Mr. Longdon, after seeing Mr. Thomas Cook, up 140's new crossgate and into 142's stall by way of 142's gate. Mr. Longdon there saw smoke issuing from the first right hand waste of 142's stall, but saw no fire. he travelled outbye along the face to 145's stall, going into 143's and 144's gates on the way. Retracing his step, he went to 141's gate end and then down that gate to it's junction with 140's new crossgate, back up 1416s gate and then along the face into 140's stall where smoke was coming out of the second right hand waste. Near 140's flatsheets he saw a body. He went into the fast end and there making a test for gas and found one and a half percent to be present. He came down the crossgate and saw another body. He then came back by way of the face and 142's gate and 140's new crossgate.

Mr. Frazer had already been through the face between 143's and the fast end and had seen the smoke coming out of the first waste on the right side of 142's gate and out of the waste immediately to the right of 140's gate. He had tested for firedamp in the fast end, finding under two and a half percent to be present, and, after seeing the two bodies, just referred to, he retraced his steps and joined Mr. Humphrys at the fire in 140's new crossgate.

Mr. Frazer and Mr. Humphrys, after receiving from Mr. Collinson a report as to what he had seen and down, went into the face by way of 143's gate and on their way to the fast end passed Mr. Longdon who was on his way out. In the fast end they found the percentage of firedamp to be between two and two and a half they turned into the crossgate and came down it to 141s, the return airway, where the atmosphere was thick with smoke from the fires in 142's ad 140' right side wastes and the fire in the crossgate, Mr. Frazer heard someone in the return airway moaning, so he and Mr. Humphrys ran back to 142's junction by he way they had come for rescue men to get this live man out. Before the rescue men were ready, Mr. Frazer returned to the airway by way of the face , leaving Mr Humphrys to follow with the rescue men.

In the meantime, Mr. Humphrys and Mr. S.J. Temperley, Assistant Surveyor, two rescue men, William Henry Hall and John Jones, Mr. Macaskill, rescue Station Superintendent, these last there wearing rescue apparatus, and Samuel Watkinson, ambulance man and Henry Turner, collier, were on their way from 140's new crossgate via 142's gate and the face to the airway, when as they were passing through 140's stall there was second explosion and flame poured out of the waste, burning Hall, Watkinson, Turner and Mr. Macaskill, Hall a so severely he was confined to hospital for several weeks afterwards.

Mr. Humphrys and Mr. Temperley went on, the others returned to 142's junctions. and joined by Mr. Frazer at the entrance to the airway. They told him what had occurred and the egress via the face was impossible, whereupon they and he went down the crossgate, passing through the fire between 141's and 142's on their way.

Mr. Frazer asked for volunteers and Ernest Allport, who has already been mentioned, Walter Gillman and Cyril Davies, the two latter, members of the Bullcroft Colliery Rescue Brigade, all in rescue dress, went up the crossgate through the fire there and brought the two men out of the airway into the crossgate where they helped to take them outbye by Mr. Frazer, Mr Temperley and Samuel Watkinson.

There were still two bodies to be recovered, one in the fast end and the other neat 140's flatsheets, and Mr. Frazer and Mr. Temperley went up 142's gate with the intention of recovering the one in the fast end. They went along the face to 141's but could not go beyond because of the afterdamp, smoke and heat, and they could see flames ahead. Accordingly, they turned down the 141's gate then up 140's crossgate, where the fumes were very bad, to the flatsheets they picked up the body there and managed to carry it down the crossgate to near 141's junction. Mr. Frazer was the

exhausted and feeling he must get out, Mr. Temperley led him out by way of 141's gate and the face as the fire in the crossgate between 142's and 141's had by then become much worse.

The question of the recovery of these two bodies, the only ones at that time known to be within the area affected by the explosion was then discussed by Mr. Frazer and Mr. Longdon, Mr. J.H. Allcock (Manager of the Bullcroft Colliery), Mr. Humphrys and others taking part. The feeling was that there was a great risk of losing more lives, but Mr. Frazer, in his anxiety that everything possible should be done, pressed that an attempt should be made, but feeling unfit to do so himself, asked Mr. Temperley, who knew where the bodies were, if he, although without apparatus, would lead the rescue men as far as he could get for the smoke and direct them where to find the bodies, Mr. Temperley at once agreed and he and four rescue men, Ernest Allport, George Needham, Isaac James Hallam and Edward Jenkins, the last three being members of the Bullcroft Colliery Rescue Brigade, with Mr. Allcock and Mr. Frazer, went up 142's gate to the face, where Mr. Allcock and Mr. Frazer remained, thinking it was not advisable for them to go into the smoke again. The others went forwards, Mr. Temperley as far as the 141's gate, passed two fires in 140's wastes and brought out the body from the fast end of 142's pass by, where it was put onto a stretcher and then carried by Mr. Allcock and Mr. Frazer to the bottom of the 142's gate.

The rescue party and Mr. Temperley returned in by and passing from the face down 141's to the crossgate, Mr. Temperley remained at the face although the smoke was then so dense they should not see, recovered the body which Mr. Frazer and Mr. Temperley as has already been described, carried down the crossgate from 140's flatsheets and brought it out by way of the face and down the 142's gate to 140's crossgate.

There was grave risk of a further explosion in the area where this work was being done and those without apparatus also ran the risk of being overcome by the foul atmosphere. As a fact a further explosion did occur shortly afterwards, but happily by then all persons had been withdrawn from this area.

The name of the Agent, Mr. Donald MacGregor, has already been mentioned but nothing recorded of his movements. As mentioned in the Report, after instructing the Manager to remain on the surface to attend to essential work, Mr. MacGregor went down the pit and into the North East District where he arrived at about 7 o'clock. Being informed that the men in the 147's and 148's had been got out, he started at 146's, intending to travel along the face to the return end. Ernest Hayes, an ambulance man, accompanied him as far as the left bank of 143's, where he (Hayes) had a tragic experience of finding his own son terribly burned. Mr. MacGregor then went forward alone, but finding the atmosphere bad he returned along the face and went down 143's gate to 140's new crossgate, where he met three rescue men, Robert Bestwick, Ernest Allport and Alfred Clay. He returned with them, they coupling up their apparatus in 143's gate, and led the way past a fire in the right waste of 142's stall to 141's stall. In 141's stall, opposite the left gate pack, a broken wooden prop was burning and this Mr. MacGregor tried to put out with his cap. There were injured men in each of the banks and as stretchers were needed on which to remove them. Mr. MacGregor went to the telephone on 140's new crossgate to hurry up their dispatch. He was by this time badly affected by afterdamp and although unable to do any further work on the face, he remained in the district until the bodies were recovered and the injured removed.

Such is the bald narrative of work well done. It should be added that offers of assistance were made by all the neighbouring collieries and that many volunteers came forwards and offered their services, whilst others stood by with their rescue brigades at their collieries ready at a moment's notice should their services be needed.

HENRY WALKER.

There was a third explosion at about 1 a.m. just at the time when the exploring party was trying to get into 141's return from the 140's old crossgate. Prior on the attempt it was evident that fires were raging and that further exploration of the district would have

to be abandoned and the district sealed off by three seals at appropriate points. This work was taken in hand at 2 a.m. and completed 12 hours later. The work of reinforcing the seals went on for several shifts.

The men who died were-

From stall 140-

W. Agnew, L. Guy and H. Windle, who died the following day.

From stall 141-

H. Womack, G. Singleton and L. Sleath.

From stall 142-

J.W. Grain, W. Prichett, C. Wilcock, H. Hibbert and D. Maloney.

From stall 143-

R.T. Derrick, J. Prichett, J.R. Greaves, A. Kirkland, C. Hayes and J. Callaghan.

From stall 144-

W. Farnsworth.

W. Ward, J. Brett, J. Leyland and A. Calladine From stall 145-

S.W. Templeman, H. Cheetham, H. Lawton and S. Buxton.

From stall 146-

T. Hopkinson, J. Allsop, A.E. Huckerby, J.E. Peck and Hopkinson.

From stall 147-T. Green, J. Brown, L. Jones and J. Llewellyn.

From stall 148-G.R. Bentley, W. Middleton, C. Atkinson, Beastall, A.E. Barcock and Cawood.

The bodies of five men were not recovered-

J.W. Rowe, W. Brocklehurst, S. Mason, J.H. Smith and T. Dove.

The injured-

Walker and Hall injured in the second explosion and Hannon and H. Roberts ????

The inquiry into the causes and circumstances attending the explosion which occurred in the North East district, Barnsley seam at the Bentley Colliery, Doncaster, Yorkshire on the 20th. November 1932, was conducted by Sir Henry Walker, C.B.E., LL.D., H.M. Chief Inspector of Mines, at the Co-operative Hall, John Street, Doncaster and opened on the 29th. December 1931. All interested parties were represented and the proceedings lasted for eight days. The Report was presented to Isaac Foot, esq., M.P., Secretary for Mines on the 18th. April 1932.

Owing to the fires that were found after the explosion the consequent risk of further explosions, the work of recovering the bodies and the injured had to be done as quickly as possible and there was little time to take detailed observations as to the point of origin of the explosion. There was sufficient evidence to place the point of origin at the neighbourhood of the 140's stall. Props at the face had been blown from south to north and the door at the 141's had been blown outbye.

As to the cause there were several alternatives, spontaneous combustion or a damaged safety lamp. There was no shotfiring and electricity was not used and the Inspector considered that matches or any other such means of ignition were unlikely. The inspector concluded that -

"I think the explosion was caused by a gob fire either in the waste between 141's and 140's or in the old gate and in lean to the former for the reason that if the explosion originated in 140's old gate and the force behind it, the brattice led into 140's fast end would have been blown away and it was not."

The inquiry also recommended that some other material be used in the packs other than the 'Conny' coal and the fact that there were discrepancies in the Report Books was also commented on. The Inspector concluded the report by saying-

"I would like to put on record my admiration of the conduct of those engaged in the work of recovery, conduct which fully upheld the high traditions of the miner."