Q. At 9. a.m. the rescue team was under oxygen and entered the working lift under the lip of the fall? A. Yes, this way, to the left-hand side.

Q. Owing to the concentration of - it is actually CO2, is that right? A. CO .

Q. Affecting eyesight? A. No, smoke it was, I am sorry.

Q. It should be smoke? A.Yes.

Q. Owing to the concentration of smoke affecting eyesight it became necessary to return to the entrance of the fall area? A. Yes.

Q. Some smoke goggles were obtained and the team travelled then to the face area inspecting the ribs of the roadway on the way in? A.Yes.

Q. You continued to test for methane and carbon monoxide on top of the fall?A.Yes.

Q. The readings were then no methane and .01 carbon monoxide under the lip? A.Yes.

Q. Then the timbering operations and hosing down the fall area continued, and about 9.15 a.m. a stretcher and a blanket were obtained and at 9.25 the body of Mr. Stewart was brought back on the stretcher? A.Yes.

Q. And from down the tunnel there? A. Yes (indicating)- carried over the fall up to the loading point.

MR. LEE: To avoid the necessity of calling another witness, unless Your Honor consider it vital on this point, Mr.Longworth can in fact indicate where the body was found and the circumstances although he was not present. It is a matter for Your Honor.

HIS HONOR: I do not know that it really concerns any party particularly; perhaps Mr. Sullivan. Is there any objection to this evidence coming from Mr. Longworth? (No objection) I understand there will be some eviddnce and exhibits produced tomorrow which will locate where the body lay.

Q. Would you just show where they recovered Mr. Stewart's body? A. There (indicating).

MR. LEE: Q. You indicate near the timber bay? A. Yes.

Q. And in relation to the vent tube there? A. This is the off-take here, it is through a T-piece and the open end of the T-piece, assuming it was looking this way, was blocked by a piece of brattice and Mr. Stewart had put his head, I suppose seeking air -

Q. Into the vent tube? A. Yes.

HIS HONOR: Q. Mr. Stewart was found with his head into the vent tube? A. Yes.

MR. LEE: Q. I think his miner's lamp was on top?A. On top of the tube, yes, upside down, fallen over and there was a watch inside the tube itself.

HIS HONOR: Q. Were you there when the Police Officer or Officers took possession of the vent tube? A. No.

~~160~~. A. Longworth. x

150.

MR. LEE: Q. Does the fact of the miner's lamp being where it was have any significance in your mind? A. It was obvious that Mr. Stewart had had his lamp when his movements were associated with tests. Possibly tests - that would be the significance.

HIS HONOR: Q. When you say it was his miner's lamp, it was not his head lamp, not the battery lamp; it was an oil lamp? A. Yes.

Q. What is the suggestion? A. I would think the significance of the lamp being in close proximity to the body would be that Mr. Stewart carried the lamp with him and his movements would be governed by tests that he would make from time to time with his lamp.

Q. Was the lamp still alight? A. No.

Q. It was extinguished? A.Yes.

MR. LEE: We have had evidence, I think, that Mr. Stewart was with the other men up in the fire area, but he must have gone back down and carried the lamp with him all the way.

HIS HONOR: Yes; there is to be further evidence.

MR.LEE: I presume the calling of that evidence is being done by Your Honor?

HIS HONOR: Yes.

MR.LEE: Q. Then the body was placed into an empty skip. The lamp in fact at that time was still attached to Mr.Stewart's waist? A. That was his cap lamp - the battery of his cap lamp was still attached to his waist by the belt around his waist.

Q. And in fact the body was taken from 8 Right Panel at 9.15 a.m. Thereafter the foam machine, the plastic tubing, the drums of foam solution et cetera were cleared from the No.2 cut-through and loaded into a flat top at the loading ramp? A. Yes, there.

Q. At 10 o'clock you met Mr. Robinson, the Electrical Inspector? A. Yes.

Q. And another gentleman, Mine Electrician, and they proceeded to examine No. 67 shuttle car? A. Yes.

Q. That examination was concluded and after a small fault which had developed as a result of the fire had been corrected this car was declared fit to be used in the cleaning up operations? A.Yes.

Q.You then went to No.-0 shuttle car and you made tests for carbon monoxide? A.Yes.

Q. And you found the area to be clear there but a heating was found to be restarting in the rib adjacent to the car?A.Yes.

Q. You made arrangements for hoses to be brought down from the fall area and water was played on the hot area without delay? A.Yes.

Q. Up to this point you have spoken about, you found some methane at roof level? A. Yes.

Q. And a small reading of carbon monoxide? A. Yes.

Q. In the crib break I think Mr. Stone told you that he was going to pass air around the goaf edge? A. Yes.

Q. To use the words that you remember, he said, I think, to clear whatever was there in the inby end of A heading? A.Yes.

Q. That was done in what way? How did they do that? A. A brattice sheet was hung from the roof to the floor across this heading and air which was passing down there was diverted.

Q. So a brattice was put across the intersection of B heading and No.2 cut-through, channelling the air through into the goaf? A. Yes.

Q. I may be wrong on this, but was something done at the goaf edge at that point of time? A. No.

Q. After that you accompanied Mr. Roberts, the manager of Wongawilli Colliery, and Mr. Strang, the Assistant Manager there, and you went around the pillar between A and B headings and the goaf area and tested for carbon monoxide? A.Yes.

Q. The area was found to be clear of that gas? A. Yes.

Q. You went back to the fall area and you tested for carbon monoxide and methane? A. Yes.

Q. The tests showed the area to be clear of carbon monoxide but methane was recorded at the roof, 1.75%, and at roughly floor level adjacent to the car, 3% methane? A.Yes.

Q. So as to be clear in everybody's mind, you had previously tested that shunt area? A. Yes.

Q. And this discovery now of methane at roughly floor level in the shunt area had occurred after that brattice sheet was put at the intersection of B heading and No. 2 cut-through? A.That is the order of events.

HIS HONOR: Q. Where is this brattice then? Does it go across somewhere or does it merely go along the rib and die there? Would you indicate the position of the brattice? A. The temporary one?

Q. The one that was just put on after Mr. Stone spoke to you? A. There. Just across there (indicating).

MR. LEE: The witness said that channelled the air into where the cross sticks were and around the goaf edge.

HIS HONOR: Q. This methane, though, is being found in A heading across the No.2 cut-through around near the shuttle car? A. There (indicating).

HIS HONOR: Mr. Lee, you said that this brattice crossed B heading channelling the air down past the cross sticks into the goaf and into A heading?

MR.LEE: Yes.Previously there had been no circulation that way. Now it is going around to the rear heading in the direction of the shuttle car.

HIS HONOR: From where does that air come?

MR.LEE: From the main intake system of C heading. It goes up C heading.

HIS HONOR: It just can't get by in No. 2 cut-through in the direction of the extension?

MR.LEE: Yes, to all intents and purposes it is effectively blocked then.

Q. This is then your first discovery of methane at near floor level?A. Yes.

Q. You then called Deputy Kelly?A.Yes.

Q. To come to the scene and you told him you had discovered methane; you asked him to make a test for gas with his oil lamp in the position where you had discovered its presence?A. Yes.

Q. And you saw that test performed?A.Yes.

Q. Did the lamp show the presence of methane? A.Yes.

Q. You were able to tell from the cap that forms the percentage of methane? A.Yes.

Q. The cap showed at least 2½% methane at the floor and at least 1½% at roof level?A.Yes.

Q. I will stop there and deal with something which has been mentioned in evidence, and that is the use of the safety lamp in the detection of methane. According to your view what is the proper way of making the test? A. Well, the recognised way is to detect methane by its presence on a lowered flame of the oil safety lamp.

Q. A lowered flame? A.Yes, at roof level.

Q. What happens if you have the normal flame or the near-normal flame that you would use for carbon dioxide testing and you bring the lamp into contact with methane? A. It would tend to aspire. It would tend to creep higher going sort of to the point.

Q. Is it a matter of luminosity? A.Yes.

Q. That is affected by the methane on that normal or near-normal flame? A.Yes.

Q. But do you get a cap? A. No, you would not see it if the flame was raised but if you were looking carefully you would see an increase in the luminosity of the flame.

Q. When you have the small flame of the methane, that is when the discernible cap on the flame appears? A. Yes.That is when you discern or assess the actual percentage.

Q. So that to use the normal or near-normal flame as a test for methane, if you happen to miss the luminosity - A. Yes, you would not know.

Q. Your test has gone? A.Yes.

HIS HONOR: Q. How far would you lower the flame to test for methane? What is the standard? A. You lower it to just a non-luminous flame.

Q. What is the position with a deputy or anybody else who is testing with a lamp for bottom gas,which is a mixture we are told which may be layered or it may be mixed up? A. Yes.

Q. That is methane and carbon dioxide; what happens then when it goes down to the floor? A. It would depend on the position of the relative percentages of the two gases.

Q. Say you had a significant amount of methane, in other words sufficient quantity to ignite a spark or if a flame came near it, could you miss it if you merely had the flame on your lamp in the position in which you are testing it for carbon dioxide? Could you miss the methane? A.Yes, you could.

Q. Is there any way of detecting it by using the lamp - of detecting methane in any significant quantity, by using the lamp when detecting bottom gas? A. It is a very tricky one. Normally, methane is not present at the floor and one would look for CO2 at the floor and methane at the roof. To test for CO2 you would have a normal flame and lower it carefully and if CO2 was present then the effect on the lamp would be a loss of luminosity or illumination of the flame; the flame would reduce. If there was sufficient CO2 there and the lamp was lowered further into the body, then it possibly would expire, go out. Alternatively, if you were looking for CH4 associated with the bottom gas, then you would have to be very careful. You could lose your lamp quite easily. If you turned the lamp down to a testing flame for CH4 and lowered it you could lose it.

Q. Is it your opinion that it is an unsatisfactory way of testing for methane and bottom gas, this use of the safety lamp? A. Well, the deputy has no other means to test.

Q. It may well be the case that a deputy has no other means for testing, but at some stage I may have to make some recommendations, you see, as to whether the system ought to be changed; I do not know? A. I understand.

Q. It may be that this is a safe system, but what is your opinion as to whether an oil safety lamp is a satisfactory means of testing for methane gas in bottom gas at floor level? A. Well, a flame safety lamp is a satisfactory means of testing providing the operator or the person doing the testing is skilled enough or has had training or is able to go through the various methods that are required.

Q. I do not know whether you would care to or whether you are qualified to express an opinion on whether the training of the ordinary deputy, without trying to deride the training, gives him sufficient skill to do that. If you do not care to express an opinion, please don't? A. No. I would rather not express one.

Q. You would rather not express an opinion? A. No.

MR.LEE: Q.Is it not rather the position that the only way you can tell whether you are skilled enough to get the methane reading in bottom gas is if you get the methane reading in bottom gas; that is what it comes to? A.Yes.

Q. However, Mr. Kelly brought it over and he got this reaction which I think you and he calculated at 2½% methane reading on his oil lamp?A.Yes.

Q. Then Mr. Inspector Griffiths made a test at the same place for methane on the lowered flame of his safety lamp and the result you saw there was 2% methane at roof level? A.Yes.

Q. Then Mr. Griffiths, the inspector, left to get a methanometer. With that instrument you tested throughout the area? A. Yes.

Q. What is the methanometer? A. That one is an M.S.A. It is an instrument for detecting the presence of CH4.

Q. Is that one?(handed to witness) A.Yes.

Q. You might tell us the system upon which that thing is devised, wouldyou? A. There is a battery in here and an element which is heated when the button here is pressed. The battery is on a wired-in circuit. First of all there is an initial test to be made by inserting the pencil and shorting the switch and pressing the button and you test the voltage of the battery.If it is over four then it is all right (demonstrating) then you have to attach the business here and you have to draw air into here. The instrument is held so that any air that is suspect or that you want to test is in the instrument. That is in there, and you press the bulb and it draws air into the instrument. Then you give it a couple of presses, you press the button here and it registers on the scale, and the percentage.

HIS HONOR:Q.The actual percentage of methane is registered? A. Yes.

Q. It is only effective for testing CH4, is it? A.Yes.

Q.And the actual percentage is read on the scale? A.Yes.

Q. How accurate is this? Has it been checked, do you know, against any other instrument, for testing? A. Yes.

Q. And is it accurate enough for testing? A. In pure air, that is with normal oxygen, yes. With CO2 present it tends to affect the readings.

Q. With CO2 present it tends to affect the readings? A. Yes - I am not sure of that, I think that is the case.

Q. Do you know of any way of correcting this reading if it is interfered with by CO2? A. No.

. MR. REYNOLDS: I think Your Honor is putting your finger on what we believe is the problem.

HIS HONOR:Q. In fact, if you were testing for methane in bottom gas and if the reading is affected by the presence of CO2 - if it did in fact affect it - then it is not a very satisfactory method of testing for methane in bottom gas? A. Yes, it would indicate the presence.

Q. It would indicate the presence of methane? A.Yes, but not necessarily the correct percentage.

MR.LEE: I will be calling evidence to show that this instrument has been checked against other methods of testing and has been found accurate. It has not been tested in CO2 but we might be able to get that now that the question is raised.

MR. REYNOLDS: The witness says in the presence of pure air it is accurate.

HIS HONOR: There are two questions here: One whether you may be able to detect methane at all by the instrument, and the other one whether you are able accurately to check the percentage of the concentration. It may be the methanometer - I do not know, and perhaps evidence can be led about this - is very satisfactory in determining whether methane is present in bottom gas, even though it may not be very satisfactory for determining the concentration.

MR. LEE: Q. Then the methanometer was obtained and you tested throughout the area? A.Yes.

Q. And I think you traced methane at floor level to the edge of the goaf? A. There (indicating).

Q. You took it from where - where did the trace lead? A. From the back of the shuttle car along to there, the edge of the goaf.

Q. The maximum reading obtained was 4% at floor level at the edge of the goaf and 2% in the general body near the shuttle car? A.Yes.

Q. Those are significant quantities? A. Yes, and they were also checked with the flame safety lamp.

HIS HONOR: Q. What is the minimum concentration of methane which will in fact ignite? Have you any idea or have you any knowledge of that? A. Well, yes.

Q. Is there any recognised standard? A. Yes. If there is 6% present then it will ignite - it will explode within the flame of the safety lamp.

Q. It will explode in the flame of the safety lamp? A.Yes, and this is one of the things that an operator has to beware about.

Q. Adjacent to this shuttle car at floor level you have got 3% methane? A.Yes.

Q. What about that concentration - is that sufficient to ignite? A. It would burn.

Q. It would, assuming you have some ignition? A. Yes. There is some lower and higher limit, and somewhere in between there is a maximum ignition point and this is at the lower level.

Q. Would you say that again? A. Methane has a lower limit and a higher limite.In between there is a maximum explosive point - in between the lower and higher levels.

MR. LEE: Q. Would you tell us a little more about your comment that at 6 % the explosion can take place inside the safety lamp - and I think you said that is something the tester has to beware of? A.Yes.

Q. What happens if the explosion takes place in the safety lamp and there is 6% or more in the general body? A. Well, a skilled operator would not allow that to happen.

Q. But assuming it does happen? A. You have to withdraw the lamp very quickly and apply water or blow it out.

Q. But could you start a fire that way? A. No.

Q. If I may go on now with your report, after taking this test you informed Mr. Stone, the manager, that an approaching condition of danger existed in A heading? A. Yes.

Q. You also suggested that water hoses should be taken into A heading to water the rib sides at the floor to quench any potential incipient heating; as this would probably break up the accumulation of methane-carbon dioxide at floor level, Deputy Kelly was posted to watch the position on top of the fall area? A. Yes.

Q. At this point you might add something, if you would. You had found the methane at near floor level, for all intents and purposes. Had you also tested for carbon dioxide there? A. I didn't.

Q. Well, did somebody? A. Mr. Griffiths - no. You could get the feel of it.

Q. You were aware it was there? A. Yes, and Mr. Griffiths lost his light. He actually lost his light in blackdamp as he was bent, checking for CH4.

Q. So the test was made for carbon dioxide and it was present? A.Yes, it was discovered.

Q. As well asthe test for methane which was also discovered? A. Yes.

HIS HONOR: Q. Is it your opinion that what was down at floor level was bottom gas? A. Yes.

MR. LEE: Q. Then Mr. Stone and Mr. Puddle went with you to the edge of the goaf in A heading and I think the three of you decided that it would be a good thing to hang a sheet from the roof just clear of the floor? A. Yes.

Q. That was to dilute the bottom gas that was coming in from the goaf edge at floor level? A. Yes.

Q. And that sheet was hung? A. Yes, there.

Q. It is represented by the dotted line across the end of A heading? A. No, that is a second sheet.

Q. Well, was it in the position of the dotted line? A. Just in front of the dotted line.

Q. Then water was played on the rib up to the shuttle car to thoroughly wet the ribs and then arrangements were put in hand with Mr. Ryan, Assistant Superintendent, and Mr. Stone to have the area adequately stonedusted?A.Yes.

Q. And stonedust was then spread in copious quantities on the roof, sides and floor of the roadway. At 2.25 p.m. further tests were made in A heading and it was then found that methane was 4% on the left rib near the floor at the goaf edge? A. Yes.

Q. And 2% in the general body outby the brattice sheet? A.Yes.

Q. I think then it was discovered that the quantity of air passing around the goaf edge, notwithstanding the diversion of that area by the brattice of which you have spoken earlier, was low and on investigation it was found that the brattice sheet in No. 1 cut-through between A and B headings was partly open? A. Yes.

Q. And that was allowing the intake air to go up there?A.Yes, there. I should say that this sheet here which was put up during crib break was taken down afterwards to allow roof bolting to proceed, but then this sheet here was open as you say and allowing the short circuit of some of the air.

HIS HONOR:Q. Is not that the evidence, that that had been opened after the fire? A. This sheet here, the one up there, yes.

Q. Down below that there is a rigi seal?A .That was taken out.

MR. SULLIVAN: Q. That was taken out at the time, during the fire? A. That was taken out during the fire fighting operations during the night and this one here was erected on the rib side and it was extended in along there and from there air was taken in and the hoses and the water was applied to the fire. Afterwards this was sealed up again. Then I think the workmen had been setting timber and they had opened it inadvertently and we discovered it open and we had to seal it up again and that gave more air around there and the percentage dropped down.

MR. LEE: Q. There is one thing I want to get clear from you: You mentioned that the brattice that had been put up to create the diversion into the goaf had been taken down?A. Yes.

Q. To get a flow of air along the goaf edge, what did you do? A. When the shuttle car ran through the sheet here at the beginning of things and with the fire, presumably the fire consumed this sheet here at the fans, then that allowed a current of air to flow around there from some time during Tuesday after the fire started and there had been air going all round there all the time (indicating). That is why this area possibly was clear when we were able to go around the goaf edge but by putting a sheet around there there was still more air sent around there, but there was even air going around after the fire.

Q. You erected a brattice sheet along the goaf edge. That is the dotted line? A. Yes.

Q. And the air was directed across the face of that brattice? A. Yes.

Q. Following that, further tests for methane and it was found that the percentage of methane in the general body of air at the shuttle car was 1%? A. Yes.

Q. I think in your view the erection of the brattice sheet had successfully reduced the quantity of methane in that way?A.Yes.

Q. That is by directing the flow there. Then stonedusting in A heading was continued between the car and the goaf edge? A. There.

Q. Tests were then taken between A and B headings in No.2 cut-through at the intersection of No.2 cut-through and A heading when it was established that carbon monoxide and methane were not present? A. That was on top of the fall just passing along here.

Q. A further heating was noted in No.2 cut-through and water was directed to this point? A. That was up here.

Q. Some men were left there to attend to that and other areas of possible heating, and dusting was going on in A heading. Then further tests were taken for the presence of methane along the edge of the goaf with the methanometer but methane could not be detected on the intake side of the goaf? A. That is correct.

Q. Your report goes on that a bleed of gas was giving off and could be detected on the left hand lower rib side? A. That is there.

Q. This was being diluted by the intake air being directed across the goaf brattice sheet previously erected - that is CO_2, is it ? A.No, methane.

HIS HONOR: Q. Where do you say that bleed is coming from - from the rib itself? A. There - coming from the goaf past the rib.

HIS HONOR: Then it seems clear the gas is coming from the rib side.

MR. LEE: Q. I want to stop there because of the significance of that point. You have taken, made tests at that point on several occasions since the day of the fire? A. Yes.

Q. What has been the result? A. In each case there was gas, CH4, detected there.

Q. On each occasion? A.Yes.

Q. You went down the mine with myself and others - I think on Wednesday last week. You made a test then? A. Yes.

Q. You got methane ? A.Yes.

Q. And the last test I think you made was yesterday, was it not? A. No, not there - here, in there.

Q. And I think you have got the results in your head of your tests yesterday and what the methane content was? A.Yes.

Q. What was it? A. Well, the tests showed that yesterday the sheet had been put back here (indicating).

HIS HONOR: Q. Where is that sheet? A. Behind the shuttle car.

Q. In the shunt itself, the original stopping in the shunt?A.Yes.

MR. LEE:Q. The original conditions of just before the fire were created? A.Yes.

Q. With the brattice and so forth? A.Yes.

Q. And what did you get yesterday? A.I could find gas giving off and methane coming through/the cloth on the rib side on the right hand side and along the right hand side rib to the entrance there.

HIS HONOR:Q. Coming off on the rib side? A.Yes, on the side of the roadway.

Q.That is the right hand side? A.Yes. A sheet set across the roadway like that, and there was air leaking between the side of the sheet and the side of the roadway and CH4 was present on the lamp there and you could also - I also got a sensation of black damp in my throat, more particularly the black damp a little lower, a little lower to the floor , and the percentages of CH 4 varied from 5% down to 3%, 2½%.

Q. 5% to 3% or 2½%?A. Yes, but that was in the percentage of the air that was coming through.

Q. It was not down at the bottom? A. No, just in the air coming through between the sheet and the side of the roadway.

Q. Hou say you had not visited this area before the fire broke out on the 9th, but you told us the stopping had been restored. Was the ventilation system working? A. Yes.

Q. I mean the fans and so on; were they working at the time? A. When was this?

Q. Yesterday? A. Yes, the fans were working.

Q. In other words did you deliberately simulate the conditions before the fire, as far as you could; do you follow me? A. Yes, and the tube -

Q. And you got a flow of air, a leakage of air past the brattice stopping? A. Yes.

Q. Which contained black damp, the smell of black damp? A. Yes, and methane.

Q. You smelt the CO2 and you tested methane with the lamp and you got a positive lamp? A. Yes, with a detector and a lamp.

Q. And you got concentration in that flow of methane of 2½ to 5%, is that the position? A. Yes, and on the floor, at floor level in the shunt, a maximum reading I got was 2½%.

Q. The maximum reading was 2½% methane? A. Yes. Near the floor there was this layer of methane and nearer to the roof the reading was not so high. The methanometer showed 1.8%.

Q. Then could you tell me this: Do you remember you told me the methanometer may be affected by the presence of CO2? A. Yes.

Q. Is there any rule as to how it is affected? I mean does it send the reading down or up or what is the position? A. Well, I had a Toka methanometer and my colleague had an M.S.A. and the two meters showed different readings, but the lamp agreed more nearly to the Toka and it was the lamp I took readings from.

Q. How can you get a reading or concentration? A. The lamp shows the test for CO4, you reduce the flame, then the methane burns on top in the form of a cap and the height of the cap indicates the concentration and the percentage.

(Luncheon adjournment).

HIS HONOR: Before you recommence, Mr. Lee, an approach has been made to me on behalf of certain members of the Press seeking permission to examine and if necessary copy and publish the Exhibits or certain Exhibits in this case, in respect of newspapers. My attitude is that this is a fully public inquiry and that would include of course publication or report of any part of the proceedings including the evidence, and the evidence includes the Exhibits. Therefore I see no reason why any representative of the Press should not have an opportunity to examine the Exhibits, and to copy them if necessary by copying photographs, providing the Exhibits do not leave the Court Room and providing this is done at a time during adjournments in the presence of an officer of the Court.

I have possibly one reservation. That is in regard to a certain section of an Exhibit which I understand may be tendered tomorrow morning. I have no power to forbid the publication of any part of the evidence, as I understand the position, and should it become necessary in regard to any other part of the evidence I may make a request to members of the Press to use their discretion and not publish certain things. However, that problem has not arisen; if and when it does I shall then make certain remarks.

MR. LEE: Q. Mr. Longworth, would you please go over to the plan again, Exhibit "A". To continue with your activities on the Wednesday: At 4.30 p.m. the Kemira Colliery rescue team arrived in the section and I think a sheet was placed across No.2 cut-

through between A and B headings to increase the flow of air across the goaf edge and into A heading. We have dealt with that, have we not? A.Yes.

Q. Instructions were given to keep a careful check on the fall area for further heatings and inflammable gas being given off into A heading? A. Yes.

Q. At five o'clock you returned to the surface. On Thursday 11th November I think you went to the colliery again at about 8.15 a.m. and you there inspected at the Under-Manager's office the barograph recording for the period Monday-Tuesday 9th November 1965? A. Yes.

Q. And is this (shown to witness) a photostat - this is to avoid tendering the original - supplied by the company of the recording in question? Would you look at that? A.Yes.

Q. For the record, I think that shows on the Monday - what was the highest recording there? A. 28½".

Q. And by Tuesday midnight it was 29.3, was it not? A.That is correct.

Q. On Wednesday 29.42. I am sorry, you have not got these figures. Anyway, you examined the barograph recordings? A.Yes.

Q. You found on Wednesday 16th November, that is the following week, the recording then was 29.42. Tuesday 15th, 30.25. That cannot be right.

MR. REYNOLDS: He went to the office on 11th November; he could not have said what it was on the 15th.

MR.LEE: I was reading from his report of what I thought were subsequent barometric readings. I think there must be something astray with the report there. I will pass over that for the moment.

(Barograph recordings tendered and marked Exhibit "J")

Q. Does that record show that the most noticeable change in barometric pressure occurred between midnight on Monday and up till nine o'clock on the Tuesday?A.Yes - a little beyond.

Q. A little beyond that? A. Yes.

HIS HONOR: I take it the horizontal row of figures at the top under the days are the hours of the day?

MR. LEE: Yes.

HIS HONOR: Does the Roman numeral XII stand for midnight and the M for midday or vice versa?

MR.LEE: Q. Perhaps you can explain that, Mr. Longworth. You know the chart, do you not? A.Yes.

Q. It has Monday and then XII. What does that mean - midnight or midday?A.I think it would be midday.

MR. REYNOLDS: It may be XII is midday and the MT is midnight.

MR.LEE: Yes.

HIS HONOR: Q. So that according to this, on the Tuesday, the day when the fire occurred, the barometer had started to fall from midnight and in fact continued to fall until approx-

imately midnight on the Tuesday night? A. Yes.

MR. LEE: Q. In your experience what effect does a fall in the barometric pressure have upon any gases in a goaf in a mine? A. There would tend to be an expansion of the gases.

Q. While I am on this point, you had referred earlier to this consistent finding since the fire of methane at about floor level or a little above near the edge of the goaf? A.Yes.

Q. Would you mind telling His Honor does A heading from the shunt area to the goaf slope down to the edge of the goaf?A.Yes.

Q. And from the edge of the goaf at that point the land rises up towards C heading? A. Yes.

Q. I think it is your view, is it not, that that situation near the edge of the goaf there is probably the lowest point in that area of the goaf? A.Yes - accessible, yes.

Q. You have mentioned here that you took some readings over the weekend of the - A.I did not take them.

Q. Well, readings were taken which showed methane in that area? A. Yes.

Q. And the fact is that the barometric pressure at those times was nearer normal than on the morning of the fire? A. Yes.

Q. And I think you made the point in your report to the extent that you took samples, that that was a factor which had to be taken into account in the analysis of those samples? A. Yes.

Q. Your view was that the samples taken in barometric pressures nearer normal than the ones on Tuesday would give a more favourable or perhaps less toxic result than would be the position on the particular day? A. Yes.

Q. I think we can then pass over there and deal with the question of taking samples. When did you take samples? A.With Mr. Donegan.

Q. When? A. On the Monday following the day of the fire.

Q. Just indicate the areas on the plan from which you took them? A. One was back here near the edge of the goaf,looking into the goaf, as high as possible -near to the roof at that point, and a similar one was taken here looking into the goaf, at the highest possible point again.

Q. That again is at the edge of the goaf but is a slightly higher position?A.Yes. Then there were two taken near the brattice near to the rib side, one at approximately roof height and one about halfway in the seam. I should say at this point there had been a fall of goaf so that although actually the sample was taken as near as possible to the floor it was in fact mid seam height. Then there was one taken on this side of the brattice at floor level.

Q. How do you take these samples?A. They were taken in glass bottles.

Q. Those glass bottles were sent along to the analyst, Mr. Donegan? A. Yes.

MR. LEE: I have discussed it only with Mr. Reynolds, but I suppose my other friends are in agreement. Ido not propose to prove the chain through which the samples passed to get to

Mr. Donegan. I think it is accepted on all sides that those which were tested were in fact the samples taken.

Q. In the meantime the Coroner's party had arrived?A. Yes.That was in the beginning before we went in the pit.

Q. Then your report goes on and it deals with a visit to Mr. Kent's house which I think we can omit. On Tuesday 16th November you visited the colliery. You there saw Mr. Puddle,the Under-Manager, who explained the main ventilation system? A.Yes. This was prior to taking air measurements in the Right Section.

Q. And you walked into No. 8 Right Section along the transport road and took air measurements and the air quantity was measured at the brick wings, at the old door frame outby the transformers? A. Yes, here.

Q. That is in the vicinity of the transformers on the map and you there registered 25,500 cumins and hygrometer 69 degrees - 63 degrees?A. Yes, that is correct.

Q. Is that quite in order, those findings? A. Yes.

Q. Inby of this point it was noted that 8,000 cumins were coming into the roadway from old8Right. This was measured in the right hand cut-through opposite the transformer?A.Yes.

Q. What do you say about that reading? A. Well, added together, the two measurements, yes.

Q. Hygrometer 74 degrees-73 degrees; methane .02%, and I think you found that was diluted to nil by the main air current? A.Yes.

Q. Where was that methane reading taken? A. There (indicating near transformer).

Q. You proceeded then to car No. 40 and did you there see a piece of wood jammed between the disc brake and the output drive shaft flange? A.Yes.

Q. And I think you saw that removed? A. Yes.

Q. Who was present on that occasion? A. Mr. Griffiths, myself, Mr. Stone, Mr. Puddle.

Q. Was Mr. James there? A. No, I don't think so.

Q. While that is being obtained, I will proceed. I think the piece of wood had to be removed in three sections? A. Yes.

Q. And to remove the final section which was tightly jammed between the coupling and the casing, the brake disc had to be removed? A. Yes.

Q. Prior to and during its removal, the removal of these pieces, did you note that coal dust, lubricating oil and small pieces of coal were packed around the base plate up to a height of half an inch above the bottom of the brake disc? A. Yes.

Q. This coal and oil showed no signs of having been on fire? A. That is correct.

Q. The wood adjacent to the brake disc was charred to the appearance of charcoal and was very friable? A. Yes.

Q. And it had every appearance of having been on fire? A. Yes.

Q. (Exhibits "B1" and "C" shown). Does Exhibit "B1" show the piece of wood to which you have referred in the posiition in which you saw it before its removal? A.Yes.

Q. Does Exhibit "C" show the collection of what you have described as coal dust, lubricating oil and small pieces of coal packed around the base plate? A. At the bottom there, yes.

Q. The white section on the photo Exhibit "C" is the guard around the disc brake? A. Yes.

Q. That guard has a little floor at the bottom which is supporting that pile of material that we see in that position? A. Yes.

Q. Do you see in Court in the box which has been brought in the pieces of wood which came from the disc brake? A. Yes.

Q. Would you mind removing them please. Are they the only things in that box? A. No, there is just wood in here.

Q. All that is in the box is the wood from the disc brake? A. Yes.

MR. LEE: I do not know whether Mr. Longworth can say this, but I am informed that the piece that was cut off there was sent off to the Forestry Commission for testing and analysis.

Q. Do you know that? A. No.

MR. LEE: Perhaps my friends would accept that statement.

(Pieces of wood, together with the box, tendered and marked Exhibit "K").

Q. Did you make a test with a methanometer on that occasion? A. Yes.

Q. What area did you test? A. Along here.

Q. Along the shunt and beyond it in A heading? A. Yes.

Q. I think your reading then was .7% methane detected in the general body of air? A. Yes.

Q. You already told us you ascertained the position of the brattice which had been in A heading behind the shuttle car at the time it shunted in? A. Yes.

Q. You have given us that position. You took some measurements and a distance of 3 feet 7 inches was measured between the back of the car and the location of the brattice stopping above the car? A.Yes.

Q. And that would be to your satisfaction, that at the time of the fire the car had run through this stopping and would in all probability have collapsed the stopping? A. Yes.

Q. Although there may be some room for doubt as to whether it just pushed it back up to the level of the car. From where did you get the information as to the construction of that stopping and the nature of it? A. Well, there were samples of the brattice sheet still in the rib side.

Q. You looked at those and you observed that the brattice there had been constructed of two layers, the inner layer having previously been used on another similar stopping and

was cement washed? A. Yes.

Q. Was that fact that it had been used somewhere else given to you by somebody?A.Yes.

Q. By whom? A. Mr. Fred Wright, Assistant Under-Manager.

Q. What is the effect of the cement washing? A. To make it more impervious to the passage of air.

Q. The outer layer had been normal brattice and small samples of small charred pieces of these cloths were obtained from that position? A. Yes.

Q. Do you see the material that has been brought into Court? Are they any of the samples brattice that you have been referring to? A. Yes, that is right.

Q. You have picked out those articles? A. Yes.

(Samples of brattice tendered and marked Exhibit "L")

Q. One of the pieces, the harder piece, is that cement washed? A.Yes.

Q. You noticed a brattice man's stool was jammed underneath the car? A.Yes.

Q. That stool showed no signs of any burning? A. That is right.

Q. Mr. Fred Wright told you the last time he saw the stool it was adjacent to the stopping concerned? A.Yes.

Q. He stated when he first checked the car after the fire the brake was not in the on position? A. That is what he said.

Q. I think you saw that yourself also when you were there? A. Yes.

Q. An inspection of the car showed a fire extinguisher was in its normal position and had not been discharged? A.Correct.

Q. The hydraulic tank of this car was checked? A.Yes.

Q. It was less than half full? A. Yes.

Q. But you heard later on that somebody had taken samples of oil from that tank? A. Yes.

Q. Tests were then carried out with CO and CO2 detectors and the methanometer again along the goaf edge in A heading giving the following results (1) at the bottom of brattice approximately 12 inches above floor level left hand rib looking inby, 2.2% methane, 3.4% CO2, (2) at roof level in the same position 1% methane and less than 1% CO2, (3) at floor level in the same position 3.4% methane and 10% carbon dioxide. A spiralling flame was also noted on an oil flame safety lamp at this point. What does that mean? A. There was 4% of gas there.

Q. 4% of methane? A. Yes.

HIS HONOR: Where was this?

MR. LEE: Q. At the goaf edge, again? A. Yes.

Q. You discussed the movements of the two fans in series with Mr. Puddle and Mr. Wright and they informed you that the fans had been moved into their present position about three weeks before, somewhere round 26th October 1965? A. Yes.

Q. And in regard to the use of these fans Mr. Wright stated that when the men were working with one fan it was dusty and they preferred to have two fans operating as the dust conditions were then better at the face. Mr. Wright and Mr. Stone stated that two fans would increase the quantity. Mr. Griffiths pointed out that two fans would increase the effective water gauge and due to overcoming resistance would produce more air at the face but would not pass any more air than one fan could produce --

MR. REYNOLDS: Could we have that explained?

MR. LEE: I will come back to it.

Q. What is meant when it is said here in this report that Mr. Griffiths replied that two fans would increase the effective water gauge? A. Two fans were coupled end to end, or in series and then in that position the water gauge or the suction of the fans is increased but the overall quantity of those fans would not be much more than the capacity of one fan operating singly, but the effect of the increased suction would be that at the end of the tubes at the bottom there there would be more air with the two fans than there would be with one fan.

HIS HONOR: Let us clear it up. What is the trouble, Mr. Reynolds?

MR. REYNOLDS: I just do not understand what the witness has said.

MR. LEE: Q. Take it in a more elementary fashion if you would. You make a point that these fans would increase the effective water gauge but would not pass any more air? -

HIS HONOR: Q. What does that mean: Increase the effective water gauge? A. It is an increase of the difference in pressure between one side of the fan and the other side of the fan, in other words, an increase of the suction of the fan, if you like.

Q. Does that mean you would get increased suction with two fans? A. Coupled like that, yes.

Q. You get increased suction. What is the next step? A. So that if at the end of these tubes one fan was operating the men said it was dusty. Now, with two fans coupled together in the manner that they were coupled the effect would be a bigger suction would be created so that that would have the effect of overcoming the resistance of the tubes and perhaps making a little more air at the bottom.

Q. At the bottom? A. Yes.

Q. How about overall ventilation, would it assist there in any way? A. It creates a difference between pressure, between here and here and causes air to go down and be returned.

Q. For ventilation purposes it would be better to have two fans than one coupled in that way. Is that the position or do you disagree? A. There would be enough fan perhaps in the overall position with two but normally one fan is sufficient.

Q. Is there any disadvantage? A. Not in these circumstances. What I meant there - the water gauge - when you have two fans

working together you could tend to get a condition of re-circulation but in this case that did not apply. That is what I meant when I said that.

Q. You said that two fans - you might get - ? A. Re-circulation - air going in.

Q. In other words you might get the air that should be exhausted outside coming back? A. Yes, that would be one disadvantage perhaps of using two fans in series but in this case re-circulation did not occur.

Q. There was no re-circulation? A. No.

MR. LEE: Q. Just to get it clear: Your remark to His Honor that there was no disadvantage in the circumstances, does not mean to indicate you are saying the fans were located in circumstances where they were doing a desirable job? A. Yes.

Q. You are not suggesting that? A. No.

Q. Mr. Wright was asked about the location and construction of the stopping at the fans in the return airway and he stated that it was constructed of brattice fastened from rib to rib and there was a loose flap at the fan to provide entry into the return and that was located on the outby fan approximately on the outer third? A. Yes.

Q. Did the fan actually drop through the brattice? A. Yes.

Q. It did. This loose flap just rested on the fan? A. Yes.

Q. And let the air run through into the return airway? A.Yes.

Q. It goes on: All stoppings between intake and return airways in this section were made of brattice to which rigi seal had been applied. These stoppings had been erected during the initial solids development? A. Yes.

Q. That is before the pillar extraction took place? A. Yes.

Q. Following inspection of the face area an inspection was made of the return airway. One brattice stopping, two portions of which had been removed, was acting as the first regulation. Where was that? A. That was outby, along here somewhere.

Q. You indicate right over to the left hand side of the diagram? A. Yes - off the plan.

Q. Velocity through these two holes 800 feet. Total quantity being passed 30,800 cumins? A. Yes.

Q. That is quite satisfactory? A. Yes.

Q. Further outby along the return a tin stopping had been erected in which an opening 5 feet x 3 feet x 8 inches was acting as a regulator. We are right off the map now? A. Yes.

Q. Velocity through the opening 1,440 feet per minute. Quantity 26,640 cumins? A. Yes.

Q. So the system was effective there. Along the return airway from this point another split of the return airway was found. Quantity measured 9,000 cumins containing 0.4% methane by methanometer test, by M.S.A.? A. Yes.

Q. The outby section of the return airway traversed three overcasts before joining the main return airway. What are these overcasts? A. That is where return air is taken over the intake air.

Q. Is that done in a vent tube? A. No, the roadway is enlarged usually, depending on the height of the roadway, and then masonry is used to form two separate roads, one over the top of the other at right angles to each other, or some angle.

Q. To keep air intake and return air thus separate from each other? A. Yes.

Q. On the top of the third overcast props had been erected and a brattice screen placed to be used as a regulator on the 8 Right Split. According to a statement by Mr. Stone this brattice screen had been pulled down by the rescue team inspecting the return airways on Wednesday morning 10th November 1965. Cross sectional area above overcast 60 square feet velocity 850 feet per minute. Total quantity 51,000 cumins. So that the ventilation system you have described was effective? A. Yes.

Q. Does this map here show the entire ventilation of the mine? A. Yes.

(Map tendered and marked Exhibit "M")

Q. Photographs were taken of wood samples and oil taken from the braking system and from the tank of the hydraulic system and were sent along to the analyst for analysis? A. Yes.

Q. You can, if necessary, and I do not think it is directly relevant myself, but if anybody wants the information on that you can give figures to the Court as to the detail of the ventilation intake and output at various other parts in the mine? A. Yes.

Q. You collected all the other information there? A. Yes.

Q. You analysed the gas in returns - what do you call them? Rule 8, is it? A. Yes.

Q. You went through those? A. Yes.

Q. And had certain figures - perhaps I might read these on to the notes. This is in respect of 8 Right? A. Yes.

Q. From January 1964: 0. February 0. March 0. April 0. May 0, and then every other month through to December: 0. So, they are all 0 in 1964. January 1965: 0. February 0.10. March: 0.10. April: 0.10. May: 0.10. June: 0.10. July: 0.10. August: 0.10. September: 0.20. October: 0.10. November: 0.20. What do those figures mean? A. They are an analysis of the return, the air in the return airway from April - each month.

HIS HONOR: Q. Where did you get that from? A. From the statutory readings.

Q. The record? A. Yes.

Q. Who analyses them? A. They are taken on the meter - by M.S.A.

Q. Who does it? A. The Under-manager.

Q. In other words, they are the colliery's readings? A. Yes.

Q. That is their analysis? A. Yes.

Q. MR. LEE: You say: From these figures it was noted that the highest methane percentage in 8 Right Section return was recorded during September and November and was 0.20% methane. You go on: This represents a make of 52 cubic feet per minute with an average air quantity of 26,000 cubic feet per minute? A. Yes, that means with that quantity of air passing which was the quantity recorded in the ventilation book passing in those particular months and 0.20 represented in that quantity is roughly the figure there.

Q. Representing 52 cubic feet of methane in that airway? A. Yes.

Q. You got certain information from the colliery engineer, Mr. Langston in respect of the shuttle car, namely the diameter of the brake disc which was approximately fourteen inches; the diameter of the drive flange on the output shaft of the speed reducing gear which was given as approximately seven inches? A. Yes.

Q. The management also supplied you with the following information in answer to questions asked by you. The first question asked was when was the present 8 Right started. The answer was: The first row of pillars was formed by the seventeenth May 1965. The second question asked was: When pillar extraction commenced in 8 Right. The answer was: Pillar extraction began on 12th July 1965. The third question was: When the two fans were first arranged to work in series. The answer was: The two fans were first used in series during the last week in September. Later on the colliery gave you the following further information, that the amount of coal obatined from pillar extraction in 8 Right was 51,749 tons and the specific gravity of run of mine coal was on the average 1.75? A. Yes.

Q. You passed that information on to the analyst and certain other persons? A. Yes - I am not sure that should be 1.57.

MR. LEE: I wonder if there is any objection to that being corrected to the specific gravityof coal in fact being 1.57?

Q. I want you to tell us something: The goaf, and goafs in general, firstly could you tell us from your experience and knowledge about the formation of gases in a goaf? A. Well when coal is removed and a cavity is formed, depending on the area of the cavity, you get roof cave-in and you get an overall area open, depending upon the amount of coal removed and it is normal that in most cases there would be an accumulation of methane or mine gases in such cavity.

Q. Does the goaf continue to create - according to your knowledge and experience - continue to create gas? A. Yes, I think so.

Q. The goaf we are concerned with here, was it in any way subject to the ventilation system of the mine at this time we are talking about? A. Yes there would be a pull of air, a difference in pressure there, I would imagine. There would be a pull of air in that direction.

Q. Could you just make that a little clearer: The question is whether the goaf is subject in any way to the ventilation system. I know you are answering that. You pointed to something? A. Subject to any difference in pressure between here and here.

Q. You indicate the tear shaped item and the intersection? A.Yes, that is right.

Q. You pointed to A heading intersection? A. Yes, there would be a difference in pressure between there and there - just slight - I don't know what it is.

HIS HONOR: Q. You say a flow of air from one into the other? A. Yes.

Q. Pulled across the goaf and ventilating this part of the goaf? A. Because the return is on that side (indicates).

MR. LEE: Q. Have a look at this sketch. I think that is a sketch showing the ventilation position as you understand it to be and as described in the evidence here on the day of the fire? A. Yes.

Q. That shows the airway, the intake airway, C heading and how it distributes the air across into the working area? A.Yes.

Q. Is this a sketch showing the ventilation system as it was on 12th November after certain brattice had been introduced into it? A. Yes.

Q. There is another one here: Does this one show the system as it was on Monday 15th November 1965? A. Yes, these are both the same, aren't they?

Q. No, you will find in the one marked sketch 3 the brattice stopping between B heading and A heading in No.2 cut-through, the word is scored out. Do you remember it wasn't there? At that time? On the Monday? I think you have given that evidence? Do you see the one I am referring to? A. No.

(The witness approached Mr. Lee).

WITNESS: That was on the Friday?

MR. LEE: Yes.

MR. REYNOLDS: Can we know something about them before they are pinned up? Idon't know if my friend has tendered them yet?

MR. LEE: I was going to tender them. If you want to know something about them I will do it.

MR. REYNOLDS: I know nothing about it. I would like to know if I want to object or not. I would like to look at them.

MR.LEE: They are a copy, in effect a tracing from the original plan.

MR. SULLIVAN: They have got dates on them?

MR. LEE: Yes, of the particular system each day.

MR. REYNOLDS: I take it these are diagrammatic representations of what the witness has already sworn to?

MR. LEE: As I understand, that is so. There is one thing I will check on.

Q. At some point of time a fan was put in No.2 cut-through between A and B headings? A. Yes.

Q. Have you spoken about that in your evidence? A. Yes.

Q. You have referred to that? A. It was in the weekend.

Q. You have looked at these sketches and are all the stoppings referred to there, and the rigi seal and bratticing and so forth? Have you covered all those in your evidence? A. Yes, that is so.

Q. You do not need to go into it. You have looked at the plans? A. Yes.

MR. LEE: I will tender them, Your Honor.

MR. MURRAY: I can't follow them.

(Sketch showing system on the day of the fire; system on 12th November; and on 15th November, tendered and marked Exhibits "N1", "N2" and "N3", respectively)

MR. LEE. Q. Those three sketches show the alterations which were made over the period shortly after the fire, in the circulation of air in these workings?A. Yes.

Q. Would you take the sketch Exhibit "N1" and answer certain questions in respect of it? You have already told us that a drop in barometric pressure can cause the gases in the goaf to expand? A. Yes.

Q. On the set-up and the layout as shown in that plan, in your opinion where would the gases expand to?A. There (indicating).

Q. You say they would come out across the pillars, in effect, between A. and C. headings?A. Yes.

Q. In your view were there any features which made it perhaps a little more likely that they might come out at one particular place more than at some other place?A. It was more probable that they would come out on this road rather than that.

Q. What makes you say that?A. Well, this was the level line and that would be the level of the gases in the goaf and it would spread over this lower level.

Q. You are aware of the fact that carbon dioxide is heavier than air, are you?A. Yes.

Q. When the gases did get out or did get in, if they did, when the gases began to expand from the goaf, whether they went down A. heading or whether they did not, but assuming they went in either A. or B. heading and did travel out, what would happen when they met the intake airway?A. They would mix with the intake.

Q. They would mix with it and they would be taken away?A. Well, they would be taken either that way or this way.

Q. And you indicate the intersection?A. Yes.

Q. They would be taken along where the men were working?A. Yes.

Q. Is it in your opinion a safe way of dealing with gases from a goaf to have a situation that if they do get out, they get into the working area?A. No. The better arrangement is that if they do spill out, they should spill out into the return.

Q. You have told us that you have had experience with goafs in various places. Can you tell his Honour whether the spilling out of the goaf gases into a return is something that is unusual or usually accepted, or what is the position?A. Well, that is the case, that it is usually accepted that where possible the pull should be from the intake across the goaf into the return.

Q. On this plan here, what do you say about the system of air down C. heading and back along A. heading whilst ever three heading design was in operation?A. Well, when extractions are taken within the confines of the three roadways it was possible to arrange it so that the pull was from the intake into the return.

Q. And that would be quite satisfactory, would it?A. Yes.

Q. Can you tell the court at what point, if there was a point, in the extraction from this whole area a problem of ventilation and

leakage of goaf gas would arise?A. Well, I would think the problem would arise when coal was taken outside of the confines of the three headings.

Q. And you indicate the goaf area?A. Yes.

Q. When they struck off to the left there, you say the problem would arise?A. Yes.

Q. And according to the plan here and on the view you are putting forward, the problem was normally present when they went out there into the extension of no. 2 cut-through?A. Yes.

HIS HONOR. Q. Can you explain that more precisely for us? Do you mean with the creation of that extension, as it were a tunnel going off, that the gases in that case would tend to go down there instead of spilling out into the return airway? Is that what you are saying or are you saying something else?A. No, that is what I am saying.

Q. In other words, before that tunnel was created - that is, the cut-through to the actual working place as on the day - then these goaf gases in all probability would satisfactorily go into the return airway and be taken away?A. Yes.

MR. LEE: I do not know whether he suggests or wants it to be suggested that the set-up, once they got the goaf created, was ever appropriate to that ventilation system.

WITNESS: That is what His Honour was saying.

HIS HONOR. Q. I beg your pardon?A. What I said was that when extractions took place in the confines of these three roadways, it was possible for the air to go from the intake to the return, but when the problem arose when this beyond the confines was taken, you got this situation here, as it were, the goaf would spill out into the working place.

Q. So it is not a question of the extension of the no. 2 cut-through that is the problem, it is the expansion behind the pillar where on the map you have the word "goaf"; is that the position?A. Yes.

Q. Not by the creation of that goaf area?A. Outside that area.

Q. As is take it, what you are saying is that the fact that you have a goaf area beyond the line of A. heading, the system of ventilation that was used at the time was not appropriate?

MR. LEE: That is what he said.

MR. REYNOLDS: I think all the witness has said to this moment is that the problem of ventilation was not a problem until those winning the coal sought to exploit the area left of the three headings. That is as far as I understood him to go at this point of time. He said that raised a problem of ventilation, when they went outside the confines of that line of pillars.

HIS HONOR: There are questions of two occasions of extraction left of those three headings. One of them is this tunnel - the face that existed, which we have now discounted as having to do with it; the other one is that part of the area marked "goaf" which is left of these three headings. I was concerned to know whether the witness was saying whether the problem arose when in fact the goaf was created on that side.

MR. LEE: Q. Mr. Longworth, you have told us that the problem will

arise, would arise, in your view did arise, when the design departed from the three heading design?A. Yes.

Q. Would you now look at the map which has been tendered of the main ventilation system? (Exhibit "M" shown to witness). Just consider this: can you see on that how the workings in Section 8 were in fact developed?A. Yes.

MR. LEE: I think this might be an occasion when it will be necessary for the witness, as we have only one map, to go up to the Bench and explain it or do so out here.

MR. SULLIVAN: There is another one of these maps on subpoena, in the room outside. It is part of what is subpoenaed from the colliery.

MR. LEE: Mr. Reynolds has kindly had prepared a map which shows the development. It is small and easy to look at.

Q. Would you care to look at that (shown) and can you see on that the development of the working as you see it on the main plan, exhibit "M"?A. Yes.

MR. REYNOLDS. At the date of 9th November the goaf line was along where the figure 9 is and 3, and the yellow hatching above it. Your Honor has the intersection where the fire took place, the middle cross-section and Your Honor then has the picture of where this goaf had been extracted before 9th November. I say that by way of explanation.

MR. LEE: Could Mr. Reynolds make clear to the Court as to the area which is not hatched to the right of that - would it just be those tunnels or the goaf or what is it?

MR. REYNOLDS: At the end of these three main headings you come to what is a geological fault which means you could not drive them any further. This is exploitation of the coal to the left as you look inby of these three main headings. It is not goaf area as I understand it is a fault and the seam is at a different level. That can be seen on the big map. The faultis shown on the big map.

WITNESS. Yes.

HIS HONOR. I remember the fault being shown on the inspection.

MR. LEE. Q. Have you satisfied yourself that you are familiar as to the pattern of the workings in this particular area. A. Yes.

Q. As I understand it the three heading design as I have called it goes right out across the plan? A. Yes.

Q. And that was worked in that fashion and completed in that fashion, as you understand it? A. Yes.

Q. At some point there was this driving off up to the top of the plan? A. Yes.

Q. Will you tell us if you can when you think the ventilation system with the intake airway along the bottom tunnel of C heading going into the return airway A heading ceased to be strictly appropriate to the workings? A. Well the problem would arise from No. 2 , that is the yellow, increasing and when you got up to No. 10 and No. 11 it would become increasingly difficult

Q. No. 2 is the drive that goes in just below the yellow.
A. Yes.

Q. What is the fundamental reason why you say that this problem would develop? A. Well there is no relief from this area only at this point here and if this fills up with gas.

HIS HONOR. Q. Would you turn that around so that we can see it. Would you take it up to the board where Exhibit A is? (Sketch placed on Board) Can you explain that again? A. For as long as mining was contained within these headings then this was the return airway , the tendency was that any gases in goafs which might be created by the removal of this area would have to go this way. In other words it would be from this intake side to the return side. When this goaf was formed the last outlet below this point here was this line and any gases contained in this area could only come out this way which is in the working area and it would be neutralised or diluted depending on the quantity given off. A normal quantity would be neutralised by the intake air coming round this way but in the case of excess quantities the percentage would perhaps increase alittle.
MR. LEE.
Q. So bringing the situation back to where we were on 9th November with the extension of No. 2 cut-through you say that the goaf gases if they are going to come out anywhere are going to go into the headings either A, B and C ? A. Yes.

Q. And then the position of the goaf in relation to the air entering the workings is such that the gases must be drawn into the working area? A. Yes.

Q. They cannot get into the return airway without crossing that working area? A. Yes.

Q. Can you tell His Honor how the company might have dealt with the situation and for the moment restrict yourself to the position as at 9th November and assume they had gone that far without trouble and had devised a system which would meet with your requirements and with your views as to dealing with goaf gases - what do you suggest they should do or should have done? A. Well, there are two possible ways . They are not convenient possibly . The one is as convenient as the other but I would think with the return way on this side , then you couldn't difficulty coming this way.

Q. You say with the return air in C heading and the intake down A heading you would have the air passing down through the No. 2 cut-through and any leakage then from the goaf would be picked up there and taken into the return ? A. Yes.

Q. You say it was not convenient to do that. I am not so much concerned about convenience. I am asking you to assume that the system output on 9th November is in accordance with your view. How would one go out?A. The alternative is to bleed the goaf this way, to bleed outside - go this way.

HIS HONOR: What do you say the alternative would be?A. This is the goaf area here and because there is no outlet for it, the gas must fall in the goaf. If the roadway had been driven that way - Mr. Lee was asking me for alternatives - and if the roadway had been driven that way, there would have been a tendency for air to go round there and drain the goaf. Or, alternatively, if the return had been on this side, you would have had a tendency for the air to go along here and then into the return at that point which would be the opposide condition to what we have here.

MR. LEE. Q. From the point of view of feasibility, were either of those methods in effect open to the company?A. Yes I think so.

Q. Take the first one. What would the company have had to do to

reverse the ventilation system?A. Well, they would have needed to - this is of course is an intake and a track heading. It would have needed to have been a return in which case it would have had to be provided an air crossing at this point, to take it across.

Q. You would have to have an overcast?A. Yes.

Q. And you couldn't have the track in the return airway?A. In this one.

Q. You put the track down in three stages, B. heading, is it?A.Yes, but that is a major operation, of course.

Q. Quite so. If they did not do that, they could make the cutting end operate as a bleed from the goaf into what was their return airway?A. Yes.

Q. What do you say about that - is that a major operation?A. No, but these things, these innovations, would have had to be done ideally before the formation of a goaf here.

Q. Once you got the goaf things became a major operation, as you call it?A. Yes.

Q. So from the point of view of practical politics, if I may use that expression, once they got into that position -- A. This was improvisation, yes.

Q. The existing situation then became improvisation?A. Yes.

Q. But once they did get into that situation, they either had to face up to the major operation or devise some other less effective system?A. Or confine the mining within the confines of these three roadways.

Q. And not strike out the way they had?A. Yes, or alternatively they perhaps could have made a bleeder from the right into this section here.

Q. Can you show us that by holding it up?A. There, with an overcast here.

Q. What about that - is that a major operation?A. Well, it would have had to be done in the beginning.

Q. What is the system as you understand it from your experience, in the development of the workings? Is it good practice to have an initial plan which will show the whole of the intended operations in a particular area or do you just go on and find your way as you go?(Objected to by Mr. Reynolds; question read by Court Reporter).

HIS HONOR: Q. Can you answer that question? A. I think mining at Bulli Colliery is planned ahead.

MR.LEE: Q. Take this section we are concerned with: An area such as we are concerned with here; from your knowledge of it would you have reasonably expected that when the three heading design was first formulated that with that it would have been perceived that the workings would go in the way they did go? (Objected to by Mr. Reynolds)(Allowed).

Q. With this design, that is, three headings, is it your understanding or belief or experience, is it your understanding that the probability is that these other workings which in fact developed - (Objected to by Mr. Reynolds).

Q. Is it your understanding from your experience that when this three heading design was originally formulated that with that formulation would be the workings which were in fact carried out to the left of the plan as we have seen it? (Objected to by Mr. Reynolds).

HIS HONOR: Q. Did you understand that? A. I think so.

MR. LEE: Q. Would you answer it? A. I am a bit stuck for words.

Q. Just take your time? A. As I look at this, and I could stand to be corrected, it would appear the first mining operations were in the top of the pillars, that would be carried out in any case whether it went to the right or to the left but if it was planned to go off to the left you would still have to take these pillars out as a first operation and then it would appear that the mining to the left has been done additionally to the driving of the three headings.

Q. In other words you can't really say? A. No.

Q. From just that information? A. No.

Q. What the position was likely to have been in the beginning? A. No.

Q. Would you tell us about the positioning of the fans and the significance, if any, of the bleed tube being placed against the brattice or near the brattice in A heading? A. Well I would think that there is a tendency for this goaf to bleed, to pull, to bring this gas or whatever it was along here (indicates) and that there would be a problem at that point.

MR. REYNOLDS: Q. That is at the intersection point? A. Yes.

Q. MR. LEE: What do you say about the positioning of the fans and the bleed tube in relation to the problem? A. It would seem to me the bleed tube was put there to ventilate the area.

Q. In what way? More specifically, what was the bleed tube going to do? A. It would pick up any bottom gas at this place.

Q. And if it did not get the bottom gas into the tube where was the bottom gas going to go? A. As I have already said it could only go - come up to here and then it would be neutralised by the main stream of air down there and depending on the relative quantities of each it would have some figure of contamination and it would only go down to the work face or the fan stopping.

Q. The ventilation system with these fans: In your view does it

create any area of lower pressure where movement of gas may go to? A. There is a tendency in a low pressure area. I think it would be very slight.

Q. Where will it be if it is anywhere? A. There will be a difference between this side of the sheet and that side.

Q. Would you indicate? A. There is a sheet here. A difference of pressure would be between this side and that side - slight.

Q. Was any application made to you in respect of the use of these fans for the ventilation of the extension to No.2 cut-through? A. N o.

Q. Were you aware in any way at all of the use of two fans in this mine? A. No.

Q. Had you ever known of that happening before? A. At this mine?

Q. Yes? A. No.

Q. If application had been made to you or the matter had been drawn to your attention that the fans were to be used in the ventilation of No. 2 cut-through extension in the normal course of events would you have either seen the area or required a plan of the area? A. Normal installation would be the use of one fan and had application been made I possibly would have wondered why the use of two fans, and it would possibly have happened that there would be inquiries as to why.

Q. Was any information ever put before you by the company as to the manner in which they were dealing with this goaf and the ventilation system at that point? A. No.

Q. You make an inspection, do you not, or you had been making inspections at Bulli approximately once a month? A. You divide the number of times I have been there by the number of months and it would average a little bit better.

Q. You don't always go to the one section of the mine? A. No.

Q. Did you ever know when you were there in June 1965 that this was other than a straight three heading pillar extraction? A. Well, it wasn't, it was a solid development.

Q. Was any information ever given to you prior to the fire of the other development of that area? A. No.

Q. You were quite unaware of it? A. Yes.

HIS HONOR: Q. Does the mine management have to notify you of a change such as this under the Statute? Leave aside the question of two fans or the positioning of the fans: You have been asked as to development in this way other than a three heading development - I am sorry, it was solid development when you last saw it? A. Yes.

Q. Say that development is/changed in some way to produce a system such as this? A. I would say it would depend on the interpretation. Generally permission is sought for the introduction of auxiliary fans underground.

Q. But leaving aside the question of fans, you see, the matter of extracting coal, a change from solid development to this, is that just an ordinary matter of development? A. Yes.

Q. In other words no application would have to be made for this sort of thing? A. No. The thing is it is a repetition of previous mining,they have been extracting pillars for some time.

Q. You would expect them to do this very thing? A. Yes.

MR. LEE: I don't know whether that question is being answered- "You would expect them to do this very thing?" - -

MR. REYNOLDS: That is not understood to mean in respect of the fans.

HIS HONOR: I have already excluded the fans. The type of extraction, from solid development to pillar extraction in that way. The witness said this is what has already been done in the past and this is what he would expect. You might deal specifically, if it is of any significance, with the extension to No. 2 cut-through. I will deal with it myself.

Q. No.2 cut-through extension going down to the face, you know the one I mean? A. Yes.

Q. Is it a usual thing or is it unusual? A. Usual.

(Further hearing adjourned to 10 a.m. on Friday 10th December, 1965).

DEPARTMENT OF MINES
SYDNEY

10th.

Minute Paper

St. 9581 V. C. N. Blight, Government Printer

PERS:—

SUBJECT:—

BULLI COLLIERY DISASTER ENQUIRY. INFORMATION FOR THE MINISTER.

Herewith precis of depositions on Friday 10th December from the Chief Inspector of Coal Mines, and a copy of full transcript for that day.

For the Minister's information.

SPECIAL

UNDER SECRETARY.

13th December, 1965.

The Hon. T.L. Lewis, M.L.A.,
MINISTER FOR MINES.

Seen by Minister
14 DEC 1965

DEPARTMENT OF MINES
SYDNEY

Minute Paper

St. 9581 V. C. N. Blight, Government Printer

PAPERS:— WCA/IA

SUBJECT:— INFORMATION FOR THE MINISTER.

Precis of the evidence given on the Fourth Day of the Bulli Inquiry.

Dr. Francis Bartlett, Government Medical Officer, was called by His Honor to give evidence as to the cause of death of the deceased. He stated that Harold Smith, John Murray and Frederick Hunt had died from asphyxiation, the lungs having contained small particles of carbon. These three men had received major burns which, in themselves, were sufficient to cause death. Robert Stewart suffered no burns, but his blood contained large quantities of carbon monoxide which was the primary cause of death with asphyxiation.

Detective-Constable Parsons told the Court of having taken possession of three vent tubes on which messages had been written by Robert Stewart prior to his death. The messages were not read out in Court, but one of them did indicate a time of 10.20 a.m. which meant that Stewart was alive one hour after the fire commenced. The actual messages should be in the transcript.

Mr. Longworth returned to the witness box and cross-examination commenced with Mr. Murray, Counsel for Barry Kent. He was questioned on the ventilation, and again stated that the system of ventilation in operation prior to the fire was unsatisfactory. The use of the oil flame safety lamp, the manner of testing, and the efficiency of the lamp received considerable attention, Mr. Longworth demonstrating with the actual lamp of Deputy Stewart the manner in which he would detect either CH_4, CO_2 or bottom gas. He concluded this phase by stating that the detection of bottom gas with an oil flame safety lamp depended on the skill of the operator. The question of self-rescuers or the provision of oxygen cylinders on the miner was raised with Mr. Longworth. He stated that self-rescuers were available at some mines, but there was a reluctance by the men to use them.

His Honor was very interested - the use of oxygen cylinders was considered impractical - A point His Honor also showed considerable interest in was other means of detecting CO_2. ~~was examined~~.

The desirability of having deputies carry methanometers in addition to the safety lamps was also raised by other Counsel.

/ ... 2.

DEPARTMENT OF MINES, SYDNEY

Information for the Minister.

Precis of the evidence given on the Fourth Day of the Bulli Inquiry.

WCA/IA

His Honor particularly asked - is it good practice to draw the noxious gas away instead of across the working place. It was asked also whether this part was ventilating other parts of the mine - answer no.

Mr. ~~Monzie~~ Longworth retired to permit Clement Robinson to give evidence as he was the afternoon shift driver of shuttle car No. 40.

Robinson stated that he told the afternoon shift deputy that there could be gas in the shunt, as it was making him sick; within an hour the elephant trunk was put in and this was later extended. At times after this he noted a taste while in the shunt. He also stated he saw smoke coming from the cables in the shuttle car compartment, and the cable got very hot. He informed the electrician, and he had seen smoke coming from the motor of the shuttle car.

W. E. Anderson.

Chief Inspector of Coal Mines.
13th December, 1965.

Under Secretary:

IN THE COURT OF)
COAL MINES REGULATION) No. 1 of 1965
HOLDEN AT BULLI)

BEFORE HIS HONOR JUDGE GORAN

ASSESSORS: MESSRS. MAHON and BUCK

Friday, 10th December, 1965

- - -

IN THE MATTER OF AN INQUIRY IN PURSUANCE OF THE COAL MINES REGULATION ACT INTO AN ACCIDENT WHICH OCCURRED AT THE BULLI COLLIERY ON 9th NOVEMBER 1965 AND ITS CAUSES AND CIRCUMSTANCES.

- - -

(PART HEARD)

HIS HONOR: Difficulty has arisen as to sitting on Monday. It appears that I am required in a totally different jurisdiction for probably a short time on Monday morning in Sydney. What I propose to do rather than lose a day is to adjourn this matter for Monday to Sydney not before 11 o'clock. I understand from Brigadier Chapman No. 14 Court is available.

I wondered, Mr. Lee, whether you might have some of the technical witnesses available, possibly enough to fill in that time in Sydney. They may have to be interposed in the evidence of witnesses now giving evidence or who are to give evidence today and then we can come back here on Tuesday to complete such other evidence. The fact is that I cannot ignore subpoenaes myself.

I have available in Court today the evidence I said I proposed to call today. This is evidence as to the unfortunate victims of this fire and I propose to allow that to be given now, interposed in the evidence of the Inspector, Mr. Longworth.

MR. MURRAY: Do I understand Your Honor is sitting in Sydney on Monday and from Tuesday onwards till the hearing is concluded at Bulli?

HIS HONOR: Not till the hearing is concluded, as I have indicated yesterday, until the available evidence at Bulli of a non technical nature is exhausted. Then we will adjourn to Sydney for the Sydney witnesses, for the taking of evidence of a technical nature such as chemists and so on. If there is any evidence remaining after that we will come back to Bulli and submissions and addresses of counsel will be heard at Bulli and, of course, the ultimate decision will be given at Bulli.

FRANCIS KELVIN BARTLETT,
Sworn and examined as under:

HIS HONOR: Q. What is your full name? A. Francis Kelvin Bartlett. I am a legally qualified medical practitioner residing in Bulli and I am Government Medical Officer for the district of Bulli.

Q. Did you conduct a post-mortem examination of the four men involved in the fire? A. Yes.

Q. When did you do that? A. On the 10th, I think it was.

Q. Could you refer to your notes and tell us? A. (Refers to notes) 10th November, which would be the day after the tragedy.

Q. Would you take them in turn and tell us which body you examined first and what you found? A. Do you want details or just the findings?

Q. I know some of these details are sometimes painful but I understand there is some misapprehension as to the cause of death, so perhaps you had better give us the details? A. The first one we saw was the body of Harold Smith and he had quite a lot of burns, they were varied from first to sixth degree burns. They were worst on his legs, actually his left foot was missing, and also bad on his left upper limbs and on his face. The skin of the chest was tanned and the flesh was cooked.

Q. Perhaps you can cover the question of burns by telling us the severity of them without the details? A. The severity of the burns was very very severe, it ranged from very light on the chest to very very severe on the left leg and on the face and head. The lungs were completely congested and there were multiple petechial haemorrhages in them.

Q. What are they? A. Little spot haemorrhages - little spot bleeding.

Q. What do they indicate? A. They indicate a sudden death as would be caused, as I suggest here, by asphyxiation. The trachia, the wind pipe, contained small particles of charcoal, carbon matter. The cause of death was primarily asphyxiation. The secondary cause was burns. The feeling is that he became asphyxiated fairly quickly and that he was unconscious during the period of most of the burning, if not all.

Q. Does that mean whether he had been burnt or not he would have died from asphyxiation? A. He died from asphyxiation. That was the cause of death, yes. Had he not died from asphyxiation the amount of burns would have been sufficient to cause death, but he died, he did die of asphyxiation.

Jack Murray was very much the same. He had severe, very severe burns but he also had these petechial haemorrhages in the lungs plus the carbon particles in his breathing system. The cause of death was just the same, it was asphyxiation due to inhalation of gas and the severe burns were a secondary factor there. He would have died. He would have become unconscious rapidly with the asphyxiation but the severity of the burns would have been sufficient to have killed him had he not been asphyxiated.

Frederick Hunt was also severely burned and apart from certain findings here which we used to identify him the same thing holds here - asphyxiated and he had severe burns.

The fourth man, Robert Stewart, when we took the coal dust off him we could not find any burns at all but his blood was a cherry red colour as were his organs and he was asphyxiated by inhalation of gas which must have contained a reasonable proportion of carbon monoxide to have produced that cherry colour.

Q. That cherry red colour is a classical indication of carbon monoxide poisoning? A. Yes, carboxyhaemoglobin which is produced by carbon monoxide. In the other three there was not that colour.

Q. Would you say the cause of death would be primarily carbon monoxide poisoning? A. Yes, I would say so.

Q. He was not burnt at all? A. We did not find any burns on him, no. His skin was all red but it was due to the carbon monoxide.

CROSS-EXAMINATION:

MR. SULLIVAN: Q. In the case of the first three you did not find this cherry red appearance in the blood? A. No.

Q. However, they had been asphyxiated? A. Yes. There was considerable congestion in the lungs, et cetera.

Q. And these minute haemorrhages in the lung? A. Minute haemorrhages and the carbon particles.

Q. Would that suggest some other gas rather than carbon monoxide which had asphyxiated them? A. It would mean some other gas and it would mean some burning effect too because of the carbon particles in the lung.

Q. Burning effect and some other gas? A. Inhaling of fumes in which there were burnt particles.

Q. But not carbon monoxide? A. No.

Q. Could it have been carbon dioxide? A. Yes it could have been carbon dioxide, but carbon monoxide is very definite and it does not require a terrific lot to produce that coloured blood.

Q. But this appearance was consistent with carbon dioxide? A.Yes.

MR. MURRAY: Q. It is quite clear from your evidence that each of the deceased was unconscious for some time, however long or short, before he died? A. Yes.

Q. They would all have felt no pain? A. That is right.

Q. HIS HONOR: The carbon particles in the lung: That would be consistent, would it not, with inhalation of smoke? A. Yes, that is right.

MR.LEE: No further questions.

(Witness retired and excused).

KEVIN HENRY PARSONS,
Sworn and examined as under:

TO HIS HONOR: My name is Kevin Henry Parsons. I am a Detective Senior Constable of Police attached to the Criminal Investigation Branch, stationed at Bulli.

Q. When did you go down to the mine? A. I visited the scene of the disaster on 15th November.

Q. What did you find when you went down that is relevant to this inquiry? A. Well, generally carried out certain observations of the scene in relation to burning. I also made an examination of a section of the flexible vent tubing. I saw certain marks and writings on that.

Q. Where was this section - where was it located? A. Well, it was at the end of the tubing that ran up towards the working face, a distance of about 80 yards from the intersection where the burnt out shuttle car was present.

Q. Was that an open end of the vent tube? A. Yes, it was a T section, an open end, and I was informed that the body of the deceased Stewart had been found in that section.

Q. Who told you that? A. I was informed of that by the mine officials who were present when we went down.

Q. Was it indicated to you precisely where the body was found? A. Yes.

Q. Where was that? A. In the end of the vent tubing.

Q. Does that mean the whole body or part of it? A. Part of the body - the head section and the shoulders.

Q. When the deceased was found, he was found with his head and shoulders in the vent tube? A. Yes.

Q. And were you told about any other part of his equipment or any of his other possesions being nearby? A. Yes, his lamp was found nearby and had fallen down against the prop from the tubing. There was also a watch which was later identified as belonging to the deceased Hunt also recovered there.

Q. Was that still operating or had it stopped? A. It had stopped.

Q. Was that any particular time, do you know? A. I had not seen the watch but I know it had stopped.

Q. Who has that watch now? A. It is with the property of the deceased Hunt.

Q. That is with the Coroner, of course? A. Yes.

Q. I think you took possession of certain parts of the tubing, did you not? A. Yes. There were two sections of the tubing that I saw at the time of the inspection that I carried out on the 15th, they were brought to the Police Station together with a third section which had been removed prior to my inspection on the day of the 15th.

Q. What was the nature of those sections? What sections were they? A. Well, they are of the appearance of 44 gallon drums. One of them was in the shape of a T-section - I am sorry, two of them were in the shape of a T-section. The other is a 44 gallon drum appearance.

Q. They had formed part of this tubing? A. Yes.

Q. Was there anything that you noticed about them? A. Yes. There were certain writings in them which I examined on the two sections that were present on the 15th. When I examined the third section on the 17th I also found certain writings on them, which I recorded at the time.

Q. What were they written with? A. Well, the section that was not present on the 15th that I examined on the 17th, was written in chalk. The other two sections had writing in them that appeared to have been written by a piece of stone or some similar object.

Q. Were these writings in close proximity to each other? Are you able to tell us on what parts of the tube they had been placed? A. Well, the two sections which were in position which I examined were the last two sections of the vent tubing in which the deceased Stewart was lying when he was found, and the third section was approximately halfway. I was informed

that it was approximately halfway from the intersection where the burnt out shuttle car was and the end of the tube.

Q. You say you have transcribed that writing, do you? A. Yes, to the best of my ability.

Q. Have you it there? A. I have.

Q. Would you produce it? A. (Witness complies).

Q. You have marked certain parts here as first section, second section and third section? A. The first section that I refer to is the section with the chalk writing.

Q. And is that the end of the tube? A. No, that is the section about halfway along the tube.

Q. Halfway along the tube is the first section; what was written there is what you have indicated in this? A. Yes. I found that on the 17th. I have a number of other copies of this.

HIS HONOR: This will become part of the record as an Exhibit, and the copies may be handed to the gentlemen at the Bar table.

(Above document marked Exhibit "O").

Q. What is the second section? A. The second section is the section that I referred to as just a 44 gallon drum, not the T-piece at the end of the vent tubing; and the third section is the T-piece of the vent tubing at the end of the tubing.

Q. The third section is the last message or the last writing, is it? A. I would say that it was.

Q. Is that the one which was finally found? A. Yes. The distance between the writing in the second and third sections would be only a matter of a number of inches because those two sections joined. I would say that what I found in the part that I call the third section would have been the last thing that he did write and there is a tapering off at the end of the writing consistent with his not being able to write any further.

Q. In the second section there is a time, 10.25 a.m.? A. Yes.

Q. Were you told by anybody at the mine as to when these rescue operations commenced? A. From my information it would be as soon as the signal was given rescue operations commenced (objected to in that form by Mr. Sullivan).

HIS HONOR: There is evidence as to the commencement of rescue operations here and it does appear on the evidence that apparently this man was still alive.

MR. SULLIVAN: There will be further evidence.

(Counsel indicated they had no questions).

(Witness retired and excused).

(Short adjournment).

ALBERT LONGWORTH,
On former oath:

CROSS-EXAMINATION:

MR. MURRAY: Q. (Witness at plan Exhibit "A"). Firstly would you explain something you said at p.175 as an answer to a question from Mr. Lee, I think it was: "O". Would you turn that around

so that we can see it. Would you take it up to the board where Exhibit "A" is? (Sketch placed on board). Can you explain that again?" I will read the previous couple of questions. At p.174 Mr. Lee asked you:

> "Q. Will you tell us if you can when you think the ventilation system with the intake airway along the bottom tunnel of C heading going into the return airway A heading ceased to be strictly appropriate to the workings? A. Well the problem would arise from No.2, that is the yellow, increasing and when you got up to No. 10 and No. 11 it would become increasingly difficult.
>
> Q. No. 2 is the drive that goes in just below the yellow? A. Yes.
>
> Q. What is the fundamental reason why you say that this problem would develop? A. Well there is no relief from this area only at this point here and if this fills up with gas.
>
> HIS HONOR: Q. Can you explain that again? A. For as long as mining was contained within these headings then this was the return airway, the tendency was that any gases in goafs which might be created by the removal of this area would have to go this way. In other words it would be from this intake side to the return side. When this goaf was formed the last outlet below this point here was this line and any gases contained in this area could only come out this way which is in the working area and it would be neutralised or diluted depending on the quantity given off. A normal quantity would be neutralised by the intake air coming round this way but in the case of excess quantities the percentage would perhaps increase a little".

Would you please explain that again? A. When this area was extracted, this is the return here (indicating), the tendency would be for the intake to go this way through the goaf into the return. Right?

Q. Yes? A. As the mining progressed this goaf was formed here and this is the return again. Then down here, and bring it down here again, progressively. When this area here was being worked, there is only one way for any outlet from this goaf and that is this way into the return of course, which when you come to this point here the gases that are given off would be neutralised and taken down there or past the fans.

Q. So that in your view there should have been no mining across the return airway without the whole system being re-arranged, is that right? A. Yes, to get a satisfactory position, that is what -

Q. So in your view the whole plan was unsatisfactory from the beginning? The whole plan in the advancing of No.2? A. The unsatisfactory part of it was there was no relief from this area other than into the working area.

Q. Well, that is a fundamental inadequacy, isn't it; is that right? A. Yes, well -

Q. Well, is that right: It is fundamentally bad? A. It is not the best, put it that way.

Q. I am putting it to you: Is it fundamentally bad? Would you say Yes or No to that question? (No answer).

Q. Well, ventilation is fundamental to mining, isn't it? A. Yes.

Q. The ventilation system here was bad, wasn't it? A. Yes.

Q. Therefore the system was fundamentally bad, wasn't it? (Objected to by Mr. Reynolds; question pressed; last four questions and answers read by Court Reporter; last question withdrawn).

Q. Therefore the system contained a defect, a fundamental defect? A. Yes.

Q. Now, gas in old workings or goaf readily expands with a fall in the barometric pressure, doesn't it? A. Yes.

Q. And you examined the records; was there a fall in the barometric pressure prior to the accident? A. Yes.

Q. What was it, approximately? A. Half an inch.

Q. And that is a significant one in relation to gas and old workings in the mine, isn't it? A. Yes.

Q. Because gas in old workings will expand readily even with a very slight fall in the barometric pressure, won't it? A. Yes.

Q. A fall in the barometric pressure which is not easy to read on an instrument, is that right? A. I don't get you.

Q. The bas is very sensitive to falls in the barometric pressure, isn't it? A. Yes.

Q. It is sensitive to falls which are very difficult to read because they are so small, on an instrument? A. Well, if you like to put it that way.

Q. That is a fact, is it not? A. There is no instrument in the pits, there is an instrument on the surface for this purpose.

Q. I am not worrying about where the instrument is, but I am pointing out to you that the sensitivity of the gas to expansion with a fall in the barometric pressure is so great that it will expand even when the fall in the pressure is very slight? A. Yes.

Q. And gas from a goaf will move into the return airway or the workings for two reasons; firstly by diffusion and secondly by movement of the other air, won't it? A. Yes.

Q. So that even if there were no suction present in these workings, gas from the goaf would have moved into the intersection by the loss of diffusion, without the fan? A. There is that tendency.

Q. That is irrespective of the relative densities of the gases concerned, isn't it? A. Yes.

Q. That even a gas heavier than air will diffuse with air eventually and form a complete uniform mixture? A. Yes.

Q. And that applies to methane, doesn't it? A. Yes.

Q. And bottom gas? A. Yes.

Q. Although bottom gas does have a tendency to hang near the floor? A. Yes.

Q. The presence of black damp or bottom gas does have a significant effect upon the ability to detect methane in the mixture, doesn't it? (Objected to by Mr. Lee; question read by Court Reporter).

Q. Perhaps I misunderstood what Mr. Lee indicated in his opening by bottom gas. What is black damp then? A. CO2.

Q. CO2 and nitrogen; so bottom gas is a mixture of black damp and methane? A. Yes.

Q. What I am suggesting to you is that it is very difficult to detect the presence of methane in bottom gas because of the presence of black damp in bottom gas? A. It is possible to detect the methane -

HIS HONOR: Q. You are asked whether it is difficult or not? A. Yes, it is difficult.

MR. MURRAY: Q. It is very difficult with the safety lamp which was used in this colliery? A. Yes.

Q. Indeed I am suggesting to you that the safety lamp had a number of inadequacies. Do you agree that it did have any inadequacies? A. No.

Q. Well, its shape for a start prevents it being used close to the floor or close to the roof by some five or six inches, doesn't it? A. Yes.

Q. THat is an inadequacy, isn't it? A. There is a provision to test near the roof with the safety lamp. There is a device on the lamp which transfers the intake of air from the middle of the lamp to the top of the lamp.

HIS HONOR: Q. A number of witnesses, without specifying any, say you cannot detect methane on the roof with a safety lamp when the methane is confined to an area within five inches of the roof. What do you say about that? A. It is difficult. There is that difficulty but there is a provision on the lamp to overcome that.

Q. What is the provision? Where is it located and what does it do? A. It is a device whereby the intake of the lamp is transferred from the middle of the lamp to the top of the lamp.

MR. LEE: Would Your Honor like us to get a lamp?

HIS HONOR: I think it is time we did.

MR. MURRAY: Could it be tendered?

HIS HONOR: Mr. Reynolds is not volunteering.

MR. REYNOLDS: I have no authority to tender it. It is part of the mine equipment at the moment. I will have inquiries made.

MR. MURRAY: May I use it?

MR. REYNOLDS: Certainly you may use it.

MR. MURRAY: Q. Is that the safety lamp type that was being used at the colliery at the time of the accident? (Shown to witness) A. Yes.

HIS HONOR: Q. Was there a difference between an Inspector's lamp and other lamps? A. No.

Q. You know of no such difference? A. No.

Q. Do you know of any lamps which are not like that, which are not provided with any device? Do you? A. No.

Q. You don't know of any lamps not provided with the device that one has? A. No.

HIS HONOR: I throw this out to counsel as I would like some further evidence on this matter in view of the advice given to me by my assessors.

MR. REYNOLDS: Could we be told what the advice is?

HIS HONOR: Yes. Mr. Buck tells me there are two types of lamp. Mr. Mahon tells me this is not the ordinary lamp used by many deputies. For that reason I felt bound to ask the question.

MR. REYNOLDS: I am obliged to Your Honor.

MR. MURRAY: Q. Is that the standard lamp, in your view? A. Yes, that is the lamp used at Bulli.

Q. Are you sure of that? A. Yes.

Q. Where is the device on it which enables it to be used - -

MR. REYNOLDS: I am instructed that is Mr. Stewart's lamp.

HIS HONOR: I will need some evidence about this.

WITNESS: Would you repeat the question?

Q. MR. MURRAY: Where is the device on that which enables it to be used within an inch of the roof or an inch of the floor? A. The device that is provided on the lamp is this ring, perforated with holes to coincide with this leg here so that when it is turned the air which is drawn in there (indicates) is transferred to the top feed.

Q. Drawn in where? A. In here (indicates).

Q. You indicate holes which, I suggest to you, are about two inches from the top of the lamp? A. Yes.

MR. LEE: I thought they were right at the top of the lamp, some of them?

MR. SULLIVAN: No, it has a ring on that.

MR. MURRAY: Q. There are three rows of holes below the hook? A. Yes.

Q. Which rows of holes? A. These two rows of holes.

Q. The bottom two rows? A. Yes.

Q. So therefore that lamp cannot be used to examine gas an inch from the ceiling- an inch from the roof? A. If you put it in a cavity above the roof you can test above roof level but generally it is difficult to test at roof level for a layer of gas.

Q. To that extent then that lamp has deficiencies, hasn't it? In that it is difficult with it to test at roof level? That is right? A.Yes.

Q. Would you show me how with that lamp you could test gas an inch from the floor? A. It would be difficult - as equally difficult.

Q. It is impossible, isn't it? A. Unless there was a hole in the floor and then you could test by getting the lamp more or less at floor level.

Q. Will you show me where the holes are into which the gas would pass for the floor test? A. Under here (indicates).

Q. When you have moved the ring? A. Yes.

Q. That is at the top of the brass section a little above the glass? A. Yes.

Q. What? Four and a half - five inches from the base of the lamp? A. Yes.

Q. Methane in certain circumstances will travel in layers particularly if it is part of a slow moving tunnel of air? A. Yes.

Q. It is quite possible and, indeed, common to find a layer of methane, for instance, travelling in an airway going from a goaf? A. Yes.

Q. So therefore that lamp would be inadequate for the detection of a layer of methane travelling near the roof or near the floor it was, say, four inches deep? A. It would have that - present a difficulty, anyway.

Q. It is inadequate to test such a layer near the floor? A.Yes.

Q.And it would be inadequate to test a layer an inch thick near the roof? A. Yes.

Q. It is an illumination test, isn't it - basically - the lamp? A. Yes.

Q. Methane burns with a very difficult to see flame - a flame which is difficult to see - it has a low luminosity. That is the word? A. Yes.

Q. So therefore to test for methane with the lamp the lamp has to be turned down to reduce its own luminosity as much as possible? A. Yes.

Q. Otherwise the brightness of thelamp itself will hide the burning of the methane during the test? A. Yes.

Q. And if you are testing for methane which is part of bottom gas you still have to turn the lamp down? A. To ascertain the percentage, yes.

Q. Because once methane is mixed in the half flame test is inadequate to detect that methane, isn't it? A. The half flame- if a lamp with a half flame is introduced into an area with CH_4 you would get a tendency, depending on the percentage, get a tendency of the lamp to spiral.

MR. MURRAY: Could my question be read? (Question read by Court Reporter).

Q. The answer is Yes, isn't it? A. It is inadequate to determine the correct percentage in it.

Q. It is inadequate to detect with any worthwhile accuracy the presence of methane, isn't it? A. Yes.

Q. Once you have turned the flame down and you are testing in a mixture which contains black damp, in other words where testing in bottom gas, you run the real danger of the flame being lost before methane can be ignited inside the lamp? A. There is that possibility.

Q. That is a likelihood? A. It is a likelihood.

Q. So therefore the low flame test, the non flame test, the non luminous test cannot be used in bottom gas with any satisfactory accuracy? A. Well, I don't exactly agree with that.

Q. If the lamp is lowered into bottom gas which contains, say, 20% black damp the flame will be lost before methane is ignited? A. If the lamp were lowered into this concentration then it would be lost.

Q. That is a common concentration in the Old Bulli Mine, isn't it? A. No.

Q. What is the common concentration of black damp? A. It varies.

Q. Is it common to find 10% of carbon dioxide and nitrogen in black damp? A. Yes, you can find this percentage. This mixture does exist.

Q. 20% isn't uncommon, is it? A. Not in the goaf.

Q. Near the goaf it would not be uncommon? It would not be uncommon, would it? A. The gas ins't common in mining itself.

Q. A concentration of 20% of black damp in bottom gas is not uncommon in the fringe areas of the goaf in this mine? A. There are these quantities. I would not say they are common or uncommon.

Q. I suggest to you to lower the lamp into bottom gas which contains a 10% concentration of black damp, there would be a real probability the flame would be lost before the methane test began? A. That would happen.

Q. Inevitably, you say? A. I have tested CH4 in these concentrations you are asking and I got CH4 on the lamp.

Q. If you lower the lamp into the gas you will lose the light before you can conduct the methane test? A. I said it was likely that you could but not --

Q. Therefore the lamp does not give an adequate test for methane in bottom gas? A. It would depend on the operator, I would say.

Q. It is difficult to get an adequate test with the lamp for bottom gas? A. You need to be careful with it. You can do it.

Q. You can do it? A. I have done it.

Q. Can you always do it? Can you guarantee not to lose your light? A. No.

Q. How many years' experience have you had? A. More than you.

Q. That lamp is inadequate, I am suggesting to you for the carrying out of the test for methane in bottom gas because unless the operator is (a) highly skilled and (b) extremely careful, he will inevitably lose his light? (Objected to by Mr. Reynolds).

Q. The presence of black damp in gas affects the percentage of methane at which the mixture becomes explosive? A. It has a retarding effect. I think there are witnesses who can better answer these questions who will appear later.

MR. LEE: I will be calling experts who can give these precise flashpoints, explosive points and so forth.

MR. MURRAY: Q. It is almost certain when gas is moving from a goaf that the constituent gases of the volume will be completely diffused one into the other? A. Yes, they tend to mix.

HIS HONOR: Q. Would you tell me this: This bottom gas is known as Illawarra bottom gas? A. Yes.

Q. That is the full title or description? A. Yes.

Q. You yourself have had experience in many other mines- several other mines in different countries? A. I have had experience, yes.

Q. Is there a limited area in which Illawarra bottom gas is found? A. Yes, I say so.

Q. Is it just as common to mines in New South Wales? A. Yes.

Q. Have you had experience of it, for example, abroad? A. No.

Q. Have you worked in the northern collieries? A. No.

Q. Do you know whether it is found there? A. No I don't - hard to say.

Q. It appears to be a product of mines on the South Coast? A.Yes, I think it will be found in some mines and not in others even on the South Coast.

MR. MURRAY: I think there will be some evidence on this because my instructions are not in agreement with what the witness said.

HIS HONOR: It is called Illawarra bottom gas.

MR. MURRAY: It is called Illawarra bottom gas here, on the Illawarra.

Q. How often do you in your capacity as Senior Inspector go to the South Bulli Mine? A. I am not the Senior Inspector.

Q. District Inspector. Mr. Menzies is the Senior Inspector? A.Yes.

Q. How often, as the District Inspector, did you, prior to 9th November, go to South Bulli? A. You mean Bulli?

Q. Yes, Bulli? A. Bulli. I have been there twenty times, I think.

Q. You went in June. Was that the last time you went to this section of the works prior to November? A. Yes.

Q. Is there a pattern of inspection - regularly - say every month, of a mine in your area? A. Not necessarily a pattern.

Q. Are you able, because of your authority, to enter the Colliery any time you like? A. Yes.

Q. And at changes of the working, such as the one we are dealing with - do they have to be approved by the Department before they are started? A. No, I do not think so.

Q. Had you been asked to approve, assuming you had the power to veto, would you have allowed that drive down from No.2? (Objected to by Mr. Reynolds).

Q. The set up of the ventilation on the day in question, the double fans, were so positioned that they were sucking air from a couple of inches in front of the brattice. That is what we have been told. Do you agree? A. That is what we are told.

Q. The effect of that would be to bring some gas through the brattice itself? A. I think there would be a tendency for the gas to come through the brattice even without a fan.

Q. Because of the diffusion and also because of the fact that this being a return airway there would be a slow moving current of air along in A heading? (Objected to by Mr. Reynolds).

Q. Isn't A heading the return airway? A. Yes.

Q. Which is coming in from the goaf across the intersection? A. Where does an intake become a return?

Q. At the brattice near the fan, presumably? A. Well beyond the fan it is a return airway.

Q. Certainly there was a current of air moving slowly towards the fans from the goaf?A.There would be a tendency for a movement of air from the goaf into that area because of the slight difference in pressure.

Q. It would be moving slowly? A. Depends on what you mean by slowly, I suppose.

Q. The position of the bleeding tube near the brattice would suck air through the brattice, wouldn't it? A. It would tend to ventilate the area in the near vicinity of the installation.

Q. But it would draw air through the brattice, the mouth of the bleeding tube being only inches away from the brattice? A. I don't necessarily agree with that.

Q. I want you to tell me what you believe to be the fact? A. I said there would be a tendency for air to come through that.

Q. And also the position of the fan would tend to draw air under the brattice and around the side near the rib? A. No.

Q. We have been told the end of the bleed tube --

MR.LEE: I think the witness just shook his head.

MR. REYNOLDS: He said No.

MR. MURRAY:Q. We have been told the end of the bleed tube was inches from the rib and the edge of the brattice and inches from the floor? A. Yes.

Q. The brattice is not a complete air seal? A. No.

Q. Air can move under it and around it? A. Yes.

Q. If the fan was applying suction at the end of the bleed tube its position would have a tendency to draw air around and under the brattice edges? A. No, not in the sense you are meaning, I don't think.

Q. It is taking air from its immediate vicinity? A.Yes.

Q. Therefore there will be a slightly lower air pressure near the mouth of the bleeding tube, at its sides? A. Yes.

Q. Air would tend to come from the goaf side of the brattice into that area adjacent to the bleed tube? A. Yes, but not necessarily go to the tube.

HIS HONOR:Q. Would the tube have any effect upon the air coming out, assuming it is coming out? A. Yes.

Q. Would the tube not affect it at all or would it lessen the rate? A. It would not prevent it, anyway.

Q. Would it increase the rate, lower the rate -? A. I don't think so.

Q. Or have no effect at all? A. I don't think it would increase the rate.

Q. The position Mr. Murray is putting to you is that there would be a lower air pressure around the mouth of the tube. Would that be the fact? A. Yes.

Q. If that is the fact the area around the mouth of the tube is in fact in the vicinity of where gases are coming from the goaf. Would that not tend to come out into that area of lower air pressure? A. There is a tendency but there is the resistance of the brattice itself to the passage of the air.

Q. Nothing to do with the bleeder tube - the suction across? A. No.

MR. MURRAY:Q. The brattice does not go exactly to the floor or exactly to the actual rib? A.Not exactly.

Q. There are inches of space in places because of the irregularity of the coal face? A. Yes.

Q. Through which air would easily pass - around the side of the brattice? A. When you say "easily" I think you should - it is conditioned to some degree by the consideration that this has been put up purposely to prevent, so that it would not be so easily.

Q. But the presence of this suction would certainly increase the amount of air coming from the goaf side of the brattice into the shunt? A. I don't think so.

Q. Would you explain why it won't ? A. Because of the tendency of the brattice to prevent the passage of air. I said that there would be a tendency for the air to come through there without the presence of it.

Q. I am suggesting to you the movement of the air from the goaf side of the brattice into the shunt would be increased by the presence of the bleeding tube? A. I said it would not reduce it anyway but by how much I don't know.

Q. Will you agree with me the presence of the bleeding tube would to some extent increase the movement of air from the goaf side of the brattice into the shunt? A. I would rather not say. I do not think that necessarily is so.

HIS HONOR: Q. Do you feel qualified to answer that question? A. No, I don't really.

MR. MURRAY: Q. You are experienced with recognised mining practice not only here but in the United Kingdom? A. I have had experience.

Q. You, in your capacity as District Inspector exercise some supervision over mining practices in your District? A. Yes.

Q. You are qualified to do this? A. Yes.

Q. I think you have already agreed that it is not, in your view, recognised mining practice to work outby of an air return. I am sorry, to work across the inby of an air return. Do you agree with that? A. You are not making it clear.

Q. This method used here which was working inby of an air return in your view was not a recognised mining practice. Do you agree with that? A. No, I think it depends upon - there is a certain weakness in this, as I said yesterday.

Q. It would have been better, in your opinion, for instance, to have driven in a new heading parallel to A heading? A. No, not necessarily. That is one alternative but not necessarily the best one.

Q. Once they embarked on this system it wouldhave been safer to have sealed off the goaf with brick stopping thereby preventing goaf gas from coming into the working area at all whilst the extension of No.2 was being cut? A. You are depending on brick stopping being more impervious than brattice stopping, are you?

Q. Yes. An air seal of some sort? A. Well it is not - with pillar work it is not a regular practice.

Q. It would be safer once they embarked upon this system to have split your seals across A, B and C headings thereby prevanting gas coming from the goaf into those areas while the pillar was being mined? A. It is not a perfect seal.

Q. Certainly a brick stopping is a better barrier to air than loose hanging hessian brattice, isn't it? A. Yes, but this was not a loose hanging brattice.

Q. Wasn't it? A. No.

Q. How do you know? A. Because of the description I have in the pit.

Q. How was it attached to the coal face? A. It was fastened to the supports.

Q. To the prop? A. And the bars.

Q. The bar at the top and the prop at the side? A. Yes.

Q. The prop is - what - two feet from the rib? A. Yes, about.

Q. How was the brattice attached to the coal face? A. When a tight brattice is erected means are taken to see --

Q. How was it attached to the coal face in this instance? A. I would not like to say exactly.

Q. You would not? A. How it was attached, but having been told that it was a tight brattice, the common practice to set a tight brattice would be to put wood at the rib side as well.

(Short adjournment).

MR. PARKINSON: I have been requested by a member of the Miners' Federation sitting at the back here if you would request the witness to speak a little higher. They find it extremely difficult to hear what he is saying. The request, if I might say so with respect is also directed to you.

HIS HONOR: The transcript of today's proceedings will be available in the District Court Office in Sydney at the ordinary time on Monday but should anyone be unable to obtain it there it will also be available here on Tuesday morning. That is, today's proceedings will be available here on Tuesday morning together with Monday's transcript.

MR. MURRAY: Q. I am suggesting it would be possible to have erected, by the use of the labour needed and about 250 concrete bricks, a complete air seal across A heading at the entrance to the goaf before these pillars were mined? A. No, I don't agree.

Q. Why not? A. You have got to ventilate it.

Q. Ventilate the goaf? A. Yes.

Q. Continually? A. Yes, or the edges thereof.

Q. How long would the operation of this pillar extraction that was under way have taken, in your opinion? A couple of weeks? A. Which pillar extraction?

Q. The work that was being carried out at the time the fire took place? A. Two to three weeks, possibly.

Q. Would the goaf had had to be bled during that two to three week period or could they have relied on C heading and B heading? A. Are you asking me to defend the system?

Q. No, I am asking you to give me your views as to the practicality and the effect of putting up a brick air seal along A heading against the goaf. I suggest to you this would have had the effect of keeping the shunt free of goaf gas? A. No, it would not have been much different to the brattice there.

Q. The brattice that was erected for your test the day before yesterday was, you believe, erected in the same way as that which existed on the day of the fire? A. Yes.

Q. The brattice erected for your test was erected under your supervision? A. No.

Q. It was just there when you arrived; is that right? A. Yes.

Q. How was it attached to the coal rib? A. Which brattice are we speaking of?

Q. The one that was erected in the shunt for your test the day before yesterday? A. It was fastened to the sides of the rib.

Q. Was it double brattice? -

MR. LEE: He indicates - I don't think that is what Mr.Murray means. I think he means the one behind the shunt car?

MR. MURRAY: Yes, the replacement of the one that was there the day the fire took place.

Q. You said in your evidence - Mr. Lee asked you at page 159, "The original conditions of just before the fire were created? A. Yes. Q. With the brattice and so forth? A. Yes". A. I did not examine it closely but it was fast up to the rib, close up to the rib, there was a small leakage through there, as I said yesterday also.

Q. A small leakage - you detected that there not with the miner's safety lamp but with your Toka; that is right, isn't it? A. Yes.

Q. To be as high as 5%? A. Yes.

Q. You also detected the presence of black damp because of the sensation in your throat? A. Yes.

Q. That reaction gave you no idea of the concentration of CO2 in the black damp, did it? A. I put it down to CO2.

Q. What? A. The sensation would be CO2.

Q. You couldn't say whether 5%, 10%, 15% CO2 or not? A. No.

Q. It could easily have been, the day before yesterday, 20%, couldn't it? CO2? For all you know? That is right, isn't it? A. No.

Q. It could not have been? A. No.

Q. Tellme why not? A. Because it was tested.

Q. Someone else tested that CO2, did they? A. Yes.

Q. As far as you are concerned you, only with your Toka and your throat, you would not have been able to determine whether the percentage of black damp in the air was more or less than 35% at that point, would you? A. No.

Q. You do know if the methane present is as low as 6% and the black damp present is 35% the mixture at that point is explosive? A. Not necessarily, it depends on the oxygen.

Q. Assuming the oxygen was the ordinary content of oxygen in air, about 20% of the ordinary air content? A. I think these remarks would be better addressed to the person who has specialised in a knowledge of this field.

HIS HONOR: Q. You do not feel sufficiently qualified to give an opinion? A. No.

MR. MURRAY: Q. Relying only on your experience as a man in mines testing for gas --

MR. LEE: I can assure the Court that a qualified expert will be put before the Court.

HIS HONOR: Mr. Murray may wish to cross-examine on some of the other conclusions of the witness which are based upon this.

MR. MURRAY: . This man is the practical expert. I presume his evidence is going to be added to by technical experts.

HIS HONOR: A practical expert is not necessarily expert in all fields. You are asking him to talk about explosion points of various mixtures. He says he is not qualified and that is the end of it really.

MR. MURRAY: Q. Do you know, as a practical man, there are percentages where, with only a 6% methane reading the mixture of the air and gas can be explosive? (Objected to by Mr. Reynolds)

HIS HONOR: You might put it to him on the basis that he does know there are some mixtures which are explosive?

MR. MURRAY: Q. That is a fact? A. Yes.

Q. Do not answer this straight away - I will not ask that. It is quite clear that as far as you know that lamp won't detect carbon monoxide, will it? A. No.

Q. Have you ever in your experience in New South Wales - you have had experience in New South Wales, have you not? A. Yes.

Q. On these fields? A. Yes.

Q. I think you said you were manager or under-manager of two other mines? A. Yes.

Q. Australian Iron & Steel mines in this very area? A. Yes.

Q. Have you ever seen here or anywhere a provision whereby oxygen, for instance, is kept at the work face where there is no other exit other than the wheeling road? A. No.

Q. Can you see any practical reason why an oxygen bottle could not be kept at the working face when there is only one exit, namely the wheeling road? A. For what purpose?

Q. For breathing, in the case of fire at the exit? A. Would you qualify that?

Q. To enable someone to breathe if he were in a safe place because fire was between him and the rescue operations? A. You mean some more practical method?

Q. Do you see any practical difficulty as a coal mining person? A. Yes.

Q. In the putting of, say, a large oxygen bottle with one or more oxygen masks near the miner where the area being worked has only one exit and that is down the wheeling road? A. Yes.

Q. What practical objection do you see? A. Well, it is not practical.

Q. Why? A. If that is what you are wanting, a self-rescue device for each man to wear, actually there has been introduced on the Coast at some of the places - but there is a reluctance on the part of some of the men to wear them or carry them on the person.

Q. I suppose it will only last for a limited time? A. Sufficient for the purpose you are interested in.

Q. How long will it last? A. It would last long enough to get into fresh air.

HIS HONOR: Q. You say there is a reluctance on thepart of the men to wear them? A. To carry them.

Q. Is there any reason why they could not be stored in a place where they could be obtained in the case of a disaster such as this? A very readily accessible place? A. The thing is always - the idea is for them to be carried on the man's person because they could be stored in a place which becomes inaccessible.

if they, for instance, were stored at the crib room, which is a normal place to store things, they would not be available to these men in this particular incident.

Q. You say the crib room is a normal place to store things, but you are now considering a matter of safety equipment in the event of an emergency which is accessible to those who are in fact faced with the emergency, like these men, blocked off by fire. You suggest there cannot be a place which is more - and you may find practical reasons - I would like you to put them - because at some stage I will have to consider this. It would be impractical to base such equipment sufficiently close to the men who are working there so that in the event of a happening such as this they would be readily accessible to them? A. No, I did not say that.

Q. You do not say that? A. No, but I do say they are made to be carried on one's person.

Q. They are portable? A. Yes, clipped on to the belt.

Q. I suppose there is some impediment to a miner carrying out his work with this plus the heavy battery he wears? A. That would be the objection.

MR. MURRAY: Q. Have you weighed one? It weighs about 2 lb? A. Have you seen one?

Q. Does it weigh 2 lbs? A. I don't know just what the weight is.

Q. Is this a small metal cylinder which attaches to the belt? A. Yes.

Q. I have seen one. A. What do you think of them?

Q. Have you been to any of the collieries which are using them since 9th November? A. No.

Q. You know since this fire every miner in those collieries scrupulously wears the device now, don't you? A. No.

Q. Are tools carried with the miner - the continuous miner? Are tools carried with it? A. Yes.

Q. Therefore there must be a tool box? A. Yes.

Q. Several of these articles would fit in the tool box, wouldn't they - enough for the crew of the miner? A. Yes. You could do that. You could even affix a box to the miner.

Q. Certainly they could put enough of these devices in that box for the crew of the miner? A. Yes.

Q. You could put a large oxygen bottle on the miner permanently, couldn't you? -

MR. MURRAY: I heard that explosive negative, Your Honor.

MR. LEE: Mr. Long worth persists in shaking his head.

MR. MURRAY: Q. What do you say? Can't you put an oxygen bottle on the back of the miner somewhere? A. You could do that.

Q. Couldn't you put on the miner also a little box of masks giving access to that bottle? A. Why?

Q. Could you do it? A. You can do almost anything you set your mind to.

HIS HONOR: Q. I suppose you could provide them with protective clothing such as asbestos? A. This isn't common.

Q. But as you said, if you put your mind to it you can do almost anything?A. There is the practicability of it.

Q. Is it practicable or impracticable? Do you consider anything impracticable about that? A. Yes.

Q. What is impracticable? A. It would not be conducive to a man having to work, to do work, or perform work.

Q. I am not suggesting the practicability of him working all the time with it, but being accessible to him in the case of a disaster such as this. Would it be practicable then? A. Yes, you could have this but I think what you have to consider is something that is readily available to be picked up in a hurry and you can imagine these men there, they had a rush to get to freedom and they would hardly stop - I am posing this - would these men stop to don protective clothing when they were faced with an escape route and with danger being imminent? I would say I would run for freedom rather than be encumbered in any asbestos clothing.

Q. But I suppose one answer to that would be, and tell me if you agree, that Mr. Stewart was still alive at 10.25 a.m. and walked around chalking messages in tubes and would have been glad of it? A. Yes.

MR. MURRAY: Q. And with each of the four men they would have been glad of the chance to stand near the miner at the end of this tunnel and - (objected to by Mr. Reynolds; question withdrawn).

Q. You recognise that device, don't you (shown to witness)? A. Yes.

Q. That is the device to which I referred you a moment ago which can be carried by every miner and would enable him to breathe long enough to run through flame? A. Do you mean I reminded you? If you turn back in your notes you will find where I answered you, Mr. Murray, that as an alternative to oxygen bottles there were these self-rescue devices.

Q. You referred me to them but that is it (indicating), isn't it? A. Yes.

Q. And it has only to be attached to the belt which is already worn by every miner because it carries his battery? A. Yes.

Q. This device (shown to His Honor): In that cylinder which I am unable to open because this particular one is sealed, is contained a mouthpiece which goes on the mouth, is that right? A. Yes.

Q. A metal spring-loaded clip which holds the nostrils closed? A. Yes.

Q. And a device over the mouthpiece through which the wearer breathes? A.Yes.

Q. It is very light in itself? A. Yes.

Q. It is contained in a metal container (a) to seal it and (b) to protect it? A. Yes.

Q. It is of course not the final answer. It does not last more than an hour and a half, does it? A. That is right.

Q. And of course it is not impervious to flame? A. No, but it is very worthwhile to have.

Q. You say it is very worthwhile to have? A. Yes.

Q. It is self-contained, is it not? A. No, there has to be oxygen from the atmosphere.

HIS HONOR: Q. It is only a filter, is it? A. Yes.

MR. MURRAY: Q. But it is self-contained, isn't it? A. Yes.

Q. You do not have to add a bottle to that or anything of that nature? A. No.

HIS HONOR: Q. In other words it is not an oxygen container; it takes oxygen from the air, if it is there? A. Yes.

MR. MURRAY: Q. And, for instance, it enables one to run through smoke, if any? A. Yes.

Q. Up to a percentage; what is the percentage? A. I can't tell you.

MR. MURRAY: I will undertake to have information made available to Your Honor or Mr. Lee on this matter.

Q. As far as the detection devices are concerned I take it you are aware there is a wide range of detection devices now available? A. Yes.

Q. Other than the modified Davey safety lamp? A. That is correct.

Q. One has already been referred to in evidence as a methanometer? A. Yes.

Q. It requires a conscious act by the tester to get the reading; he hasto go to the place and do it? A. Yes.

Q. It is an efficient device for the detection of methane? A. Yes.

Q. It, however, in bottom gas must be read in conjunction with a device which will test for carbon dioxide in order to see the significance of the methan concentration in the light of the explosive range. Do you know that? A. But for all practical purposes this can be achieved by the methanometer or the safety lamp, the presence of gas.

Q. But whether the concentration of gas is explosive or not - I am asking you generally - depends on the concentration of carbon dioxide present? A. To some degree, yes.

Q. What device didyou have to use in this mine to detect the presence of carbon dioxide? A. Carbon dioxide?

Q. Yes? A. The safety lamp - do you mean on this special occasion?

Q. Yes. A. A Drager pump.

Q. Is that portable? A. The principle is that it is in two parts. One is a pump and the other is a metal, a glass tube containing chemical. The ends are broken from the tube, the tube is inserted in the pump and the pump then draws the air through the tube and discolouration takes place. The tube is graduated and the discolouration shows the percentage present.

Q. Is it a bulky device? A. No.

Q. Is it bigger than a methanometer? A. No.

Q. And there are other devices, are there not? There are certainly other types of methanometers: There is the M.S.A., the McLuckie and the Montlucon - do you know that one? A. No.

Q. In addition to these there are other devices which do not require the conscious efforts of an operator, are there not, which will detect percentages of methane? A. I don't know.

Q. Don't you know of these? A. No.

Q. Have you ever heard of Naylor's Automatic Spiralarm gas detector? A. Yes.

Q. You say that even Naylor's devices do not have your approval, is that a fact? A. Where are they? Where do you find these things?

Q. I don't know? A. There you are. I am surprised that you knew it.

Q. They have a library in Wollongong. Have you ever heard of a Ringrose Automatic firedamp alarm? A. Yes.

Q. These are devices that can be put on the wall of a mine, are they not - on the roof or on the rib or act by a ring? A. Yes, they can be attached, hung nearby the machine.

Q. Hung near the machine or hung near the brattice near a goaf? A. As you wish.

HIS HONOR: Q. Do you say that these are difficult to obtain; that you have never seen one? A. These were in vogue in 1937.

Q. They were in vogue? A. Yes.

Q. Do you mean they have gone out of fashion now? A. I think so.

Q. Why? A. I think they have been replaced.

Q. By what? A. By something - I really don't know.

Q. Is it an automatic device? A. I think there is an automatic device now.

Q. You think there is an automatic device in existence now which will at least do the same thing? A. Yes, even cut off the power to the machine momentarily.

MR. MURRAY: Q. At any rate, it would be practical to put the devices such as Naylor's or the Ringrose on the rib - hang it on a prop near the brattice in a shunt? A. You could do that.

Q. And it rings or makes a noise when the percentage of methane gets above a certain level? A. Or it indicates by a red light.

Q. But it also will make a noise, will it not? A. Not the Naylor's.

Q. But the Ringrose will? A. Yes.

Q. It will ring a bell? A. I am not too sure on that one. It is a long time ago since I have had anything to do with it.

Q. And they can be simply attached to the mine electrical circuit? A. No, not these ones.

Q. They are self-contained, are they? A. The new ones?

Q. No, the ones I am talking about? A. No. They take the trained person to observe them and to take certain actions when he has observed them, which we have provision for in the deputy to inspect with a safety lamp.

Q. And what about Ringrose's - does it not draw attention to concentration by a noise? A. No, I have not seen this.

Q. Certainly it would not be beyond the realm of practicality to have a device which would (a) detect methane and (b) ring a bell? A. No.

MR. CRANE: Q. You indicated you had seen a piece of timber taken between the disc and the brake drum? A. Yes.

Q. Would you describe that piece of timber? A. It was about - it was - here you are (indicating). That is it.

Q. Would you describe it as a piece of waste timber? A. Yes.

Q. It would not be used on the cars for any purpose whatsoever? A. No - I would not think so. It is just a piece of timber which I would say has been picked up that was lying on the roadway somewhere.

Q. In your opinion it could be picked up in any way if the driver travelled along the road? A. Yes.

Q. Could it be picked up in the timber bay in the workings itself? A. I don't know where it was picked up from but I would say it had been picked up.

HIS HONOR: We have learnt that this is going to be tested, that this is timber. Evidence will be led as to the nature of the timber, Mr. Lee?

MR. LEE: Yes. The nature of the timber and the ignition point and things of that nature in due course will be put before the Court.

MR. PARKINSON: Q. Had you inspected this 8 Right Section in the Old Bulli Colliery on 29th June 1965? A. Yes.

Q. And at the particular time at the inspection, the 8 Right Section was working solids? A. Yes.

Q. And just the three headings? A. Yes.

Q. With subsequent cut-throughs? A. Yes.

Q. The system of ventilation was precisely the same principle now, in relation to intakes and returns? A. Yes.

Q. When pillar extraction commenced in the 8 Right Section, you indicated yesterday that in your opinion that was when ventilation problems commenced? A. Yes.

Q. And was it your opinion as pillar extraction continued and goaf area extended, with those problems ventilation problems would also increase? A. Yes.

Q. What was your reason for that conclusion? A. Well, because the goaf having been formed, would tend to be filled with mine

gases and there was only - there was no bleeder or no second mate for the goaf ventilation or positive goaf ventilation, so the difficulty would arise with the mine gases spewing out of the goaf and into the working area.

Q. This was due entirely to the method of ventilation at that particular time? A. Yes.

Q. Would it not be normal to accept a situation that where the lines of, say, ventilation communication are being reduced, under normal conditions any problems that may have been encountered should also be reduced in relation to ventilation?(Objected to by Mr. Reynolds; to be put another way).

Q. Let me put it to you this way: Is it generally accepted that the shorter the lines of ventilation communication, the better results in the working faces for ventilation? A. If we base that upon the fact that the shorter the lines the less leakage takes place, then that would be correct.

Q. And in this particular instance our lines of ventilation communication were being reduced? A. Yes.

Q. Do you look upon this brattice seal that was in the shunt heading, A heading - the brattice seal that was erected some 15 or 20 yards from the intersection, this is prior to the fire - do you look upon that particular brattice seal or type of brattice seal as a seal that measures up to the Mines Department requirements in these conditions? A. It was suiting the purpose for which it was erected, but the degree -

Q. What did you say, I could not hear you? A. From what point of view do you ask that question?

Q. Well, there was a seal erected there, wasn't there? A. Yes. There was a brattice stopping, yes.

Q. Did that measure up to the Department's requirements in the conditions that were obtaining in 8 Right Section at that particular time? A. From what point of view, Mr. Parkinson?

Q. As a seal, as a stopping? A. Well, as a stopping, the porosity of the cloth could have been reduced by administering say a cement wash or rigi seal foam - is that what you mean?

Q. Then it was not an efficient and effective seal? A. Well - (Objected to by Mr. Lee).

HIS HONOR: It could lead to all sorts of ambiguous conclusions, but I think I can see what Mr. Parkinson is trying to get. Are you putting to the witness a question as to the Department's approval of this seal in the set of conditions that obtained or are you putting it to him as a seal by itself, isolated from the conditions where there is a possibility of gas leaking through?

MR. PARKINSON: I am putting it this way, that a seal is a seal and a stopping is a stopping. If the object of the company were to seal something off, to stop something, was this the type of seal that should have been used? That is what I want to try to get from the witness and I say that it in no way intrudes into the point of view that Mr. Lee has expressed in relation to the ventilation methods.

HIS HONOR: Q. Are there any standards for stoppings or seals in the Department? A. Well, if this was erected as a brattice then it was all right.

Q. We are told there are various kinds of brattices? A. Yes, well, the stoppings in between the intake and the return, they are normally constructed of brick. Now the temporary stoppings are constructed or were previously entirely constructed of brattice, but recently they have been a polyurethene coating that can be added to the brattice which makes them more permanent than the ordinary brattice they have.

Q. How does this particular brattice Mr. Parkinson is asking you about conform with those principles you have just stated? A. Well, I would say it was put up as a permanent stopping or a seal - I don't know.

Q. You say you do not think it was put up as a stopping or a seal? A. I don't know. I would say the intention was that it was put up as a brattice.

Q. Let us assume that it was used as a stopping. Do you know the Departmental attitude towards this particular type of brattice that you saw, as a stopping? A. Well, it would not be a permanent stopping so it would be in order to be a brattice. It could not be intended as a permanent stopping so it could only then be - it was sufficient for it to be a brattice.

Q. In other words a brattice was sufficient, is that what you mean? A. Yes, a brattice is sufficient if it is not going to be a permanent stopping.

HIS HONOR: Does that answer your question, Mr. Parkinson?

MR. PARKINSON: The answer confuses me further, Your Honor, but we will carry on from there.

Q. So in your opinion now, you are not convinced that it was there either as a seal or as a stopping? (Objected to by Mr. Reynolds; rejected).

Q. Well, the intake in B heading: It was going across the intersection in B heading there - No.2 cut-through and B heading? A. Across here (indicating).

Q. That is right. Why wasn't a brattice stopping place there then? (Objected to by Mr. Reynolds; question to be re-framed).

Q. I recognise the necessity for the words "in your opinion." In your opinion, Mr. Longworth, should there have been a brattice erected across the B heading between No.2 cut-through and the goaf? A. There could have been.

Q. There could? A. There could have been.

HIS HONOR: Q. You are asked whether it should have been? A. I do not necessarily think there should.

MR. PARKINSON: Q. Well, what was the object of the brattice in the shunt? (No answer).

MR. REYNOLDS: I do not know that he can answer that.

WITNESS: I don't know. I presume it would be to act as a deterrent to the passage along there (indicating).

HIS HONOR: Q. And would it not have been an added deterrent, if it was in fact a deterrent in the shunt, to have a similar device in B heading? That is on the inby side of the No.2 cut-through? A. Yes, it could have - you could have put one there.

Q. MR. PARKINSON: In your opinion what effect would that brattice stopping in A heading have if it acted as a deterrent of allowing ventilation to go down the shunt? What would happen if there was any bank-up of gas in that particular and immediate goaf area? A. The bank-up of gas would go across there due to the brattice.

HIS HONOR: THat is, go across behind the shuttle car? A. Yes, and across the corner of B heading.

MR. PARKINSON:Q. Now the bleeder tubes. Would you say in your opinion - and bearing in mind that evidence has already been deduced here that this bleeder tube was installed because certain complaints had been made by employees working in that particular area, of some sensations that they put down to gas - would you say that the bleeder tube was installed for purposes of trying to assist further ventilation in the shunt?(Objected to by Mr. Reynolds; rejected).

Q. Well, what purpose would it serve - that bleeder tube?A. It would tend to ventilate the shunt, I would think.

Q. Tend to ventilate the shunt?A. Yes.

Q. And would it have a tendency, bearing in mind the brattice's poorness, to bleed also anything that came from the goaf area in behind the brattice in A. heading?A. Well, if you think of the bleeder tube - this is the way I would look at it - if you consider the bleeder tube lying on the floor there and there is a difference in pressure so that air tends to flow into it, then air would flow through the course of least resistance and it would collect air from round the tube rather than bring it through the brattice.

Q. During the course of your investigation with your colleagues on the 9th November and subsequent to 9th November, were you able to read deputies' reports?A. They were available, yes.

Q.Did you find any report of any deputy who installed that particular bleeder tube?A. No, I didn't.

HIS HONOR. Q. Did you go through all the deputies' reports for the relevant period relating to 8 Right Section? A. Yes. The reports were gone through in my presence.

Q. They were gone through in your presence and you say you did not see the installation of the bleeder tube mentioned anywhere? A .I can't remember seeing it. I can't remember it being mentioned.

MR. PARKINSON: Q. Well, assuming that this was not reported? A. That was not reported?

Q. The fact that the bleeder tube had been installed was not reported in a deputy's report - should it have been reported? (Objected to by Mr. Reynolds as question of law; rejected).

Q. Is it necessary for any installation of this particular type in any colliery to be reported? (Objected to by Mr. Reynolds; rejected).

HIS HONOR:Q. As an inspector of so many years' experience, used to reading deputies' reports, would you have expected to find a report of this kind in a deputy's report? A. Well, I would expect to find in a deputy's report a mention of having detected inflammable or noxious gas if that were the case and-

Q. Would you expect to find any measures adopted to overcome the problem created by such gas? A. Yes.

MR. PARKINSON: Q. That clears up my point quite simply. That lamp there -

MR. PARKINSON: I take it the oil lamp, Deputy Stewart's light, is an Exhibit?

HIS HONOR: No, it has not yet been tendered.

MR. REYNOLDS: I will consider thematter.

MR. MURRAY: Is it Deputy Stewart's light or the deceased's?

MR. REYNOLDS: Deputy Stewart's.

HIS HONOR: You may ask questions about it.

MR. PARKINSON: Q. That oil lamp there, and it was mentioned this morning that it was Deputy Stewart's oil lamp - do you know to your knowledge that that is a similar type of lamp that is used by the deputies at Old Bulli Colliery? A. Yes.

Q. And it is a certified and approved safety oil lamp? A. Yes.

Q. By the Mines Department? A. Yes.

Q. Do you know the type of oil lamp that the miner operators use at Old Bulli Colliery? A. Yes - it is a little different to that one.

Q. It is a different lamp, is it not? A. Yes.

Q. But it is also a certified and approved oillamp, by the Mines Department? A. Yes, I would think so. I take it that it is.

Q. Let us get back now to this bleeder tube. You have already stated that in your opinion it would be used to ventilate the shunt, so then it would be picking up any gases that may be seeping from the floor or seeping from anywhere in the shunt? A. Yes.

Q. Assuming that what it was picking up was Illawarra bottom gas then it would be taking that into the tube itself, would it not? A. Yes.

Q. So when the fire occurred, would it be reasonable to assume that whatever was in the tube at that particular time would also ignite? (Objected to by Mr. Reynolds; question read by Court Reporter).

HIS HONOR: Q. What is your answer? Can you answer it? A. Well, I suppose that is right, yes.

Q. You say it would be reasonable to assume? A. Yes.

Q. MR. PARKINSON: When methane ignites does it generate a very intense heat? A. Yes.

Q. And if there was Illawarra bottom gas inside the tube, ignited, it would engender intense heat within the tube itself? A. Yes.

Q. And if Illawarra gas outside the tube in the shunt has ignited it would too engender intense heat? A. Yes.

Q. Externally on the tube? A. Yes.

Q. And would this create some melting? A. Yes.

Q. Of material on the tube? A. Assuming that it was inflammable and would not support combustion, I would say that it would be subject to melting with heat.

Q. And would this create these globulets of fire that we have had explained to us dropping from the tube after the ignition? A. I think so, but, Your Honor, there is expert evidence I believe in this respect.

Q. Let us now assume that this section was working normally. This, I understand, simulated the comparable conditions on Wednesday of this week as were obtaining prior to the fire? A. That is correct.

Q. Let us take it a little further and assume that the simulation was complete and our members were working in the coal face and you were making an inspection and you found bottom gas in the shunt the same as you did on Wednesday; what would you have done then? A. Well, the shunt could not have been used as a shuttle car shunt, or the place should not have been used as a shunt. That is for one.

Q. Would you have withdrawn the men from the face in No.2 cut-through? A. Well, I would have expected in these conditions that this would have already have been done.

Q. And that would have meant production would have ceased? A.Yes.

Q. When did you examine the goaf edge in A heading? A. When, about five o'clock on Tuesday the 9th.

Q. Five o'clock on Tuesday night? On Tuesday the 9th.

Q. Just exactly which way did you travel to get to the point of the inspection? A. I travelled along B heading, turned left and went down by the goaf side of the pillar and then had to negotiate this fallen area to the edge of the pillar there.

Q. Did you find any extreme difficulty in getting to that particular point where you made the inspection? A. No.

HIS HONOR: Q. Did you discover that way through yourself or were you shown? A. It was a joint venture.

Q. Between you and whom? A. Mr. Griffiths and Mr. Ryan. Mr. Ryan is the Assistant Superintendent of Collieries, A.I. & S.

Q. Did it appear to you as though the way had just been found then or did they already know of it? A. What happened, we were worried about conditions behind here (indicating) and the three of us decided we would go. We got to the point here and we could look down and of course we inspected it to goaf area, but when we looked carefully we could see that between the edge of the pillar and the goaf fall proper there was a small opening and some protection was afforded by this piece of pillar that had been left, but beyond that the goaf had fallen extensively but there were large stones which were in cantilever and hanging rather badly from the rib side and at that point we could see that from where we stood, looking in that direction, that would be the direction of an access route to this, behind the fire. And the venture was made and at this point here the fire could be seen quite clearly from the corner.

Q. Approaching it from the other way, that is from the goaf area, could you see that which is now an exit road, I suppose, clearly from there - going in the reverse direction - say, coming down to the end of the shunt? A. From here?

Q. No, the other end, taking it the other way? A. Well, from here it would have the appearance of a goaf fall but upon inspection it would have been noticed that that route existed.

MR. PARKINSON: Q. I think you did tell me you had not experienced any extreme difficulty in traversing to that particular point of A heading for the purposes of this gas examination? A. Yes.

Q. In the course of carrying out the statutory duties of a deputy, would you say that the periodic examinations, including gas examinations, could have and should have been made by the appropriately appointed official at that particular point where you made your examination? (Objected to by Mr. Reynolds; first part of question allowed).

HIS HONOR: Q. In your experience, could the official appropriately appointed have made an inspection in the area? (Objected to by Mr. McNally).

Q. Assume that - that the position was the same before the fire and after - could the official have tested around that area? A. May I crave Your Honor's indulgence in this?

Q. Yes. A. Well, at the time of previous to the fire - is that it?

Q. Yes? A. When this sheet was erected as it is now, the tendency was that the level of the gases in the goaf would come across this way so that entry to here would be limited by the point at which one would meet and encounter the mine gases. Now when the car overran this shunting position this sheet here I am presuming was collapsed, then when the fire consumed this sheet you would get a flow of air in that direction which would have the effect of ventilating this area to the position when we found it at five o'clock. In other words, with this condition here, the gases were down at this level which afforded us ingress into that area, so that before the fire I would say the gases would be across there and that this was as far as you could go.

Q. Because of the gas? A. Yes.

HIS HONOR: You might consider whether that is sufficient for your purposes or not over the lunch hour, Mr. Parkinson.

(Luncheon adjournment).

MR. PARKINSON: Q. I think we were dealing with the possible build-up of gases in the goaf area at the end of heading A. I wonder if we could have the last question and answer read. (Last four questions and answers read by Court Reporter). Now what you say is that in your opinion there was every possibility that the reason why these examinations were not made prior to the fire was due to the fact of a build-up of gas in that particular goaf area back to the heading? (Objected to by Mr. Reynolds; rejected in that form).

Q. Well, would you say that it would be inaccessible? A. Yes, and there were also cross-sticks here which would indicate that that was the limit beyond which persons were not to go.

Q. Would you say at that particular point that this was a dangerous situation? (Objected to by Mr. Reynolds; rejected in that form).

Q. Well, this build-up of gas as you have described: Would you say that that could be a dangerous position? A. Well, I do not know what the build-up was.

HIS HONOR: Dangerous from what point of view, Mr. Parkinson? That is the question you need to ask.

MR. PARKINSON: Q. I will put it this way: This build-up of gas in the shunt area, when the shuttle car apparently fouled the brattice stopping, where would that build-up of gas then go to? A. It would go in the return, I would imagine, I would say.

Q. It would go into the return? A. Come this way (indicating).

Q. And the fire was then - or there had been the ignition prior to the particular time when the shuttle car fouled the brattice stopping? (No answer).

MR. REYNOLDS: He was not there.

MR. PARKINSON: Q. Well, if there had been an ignition prior to the brattice stopping being fouled what would have been the result as a result of the release of that particular build-up of gas in that area? A. I would not like to express an opinion on that. I couldn't say.

HIS HONOR: Q. I suppose you would be prepared to say that if the brattice was at least partly moved by the shuttle car going through it, any escaping gases would have obviously a greater egress; would you say that? A. Yes.

Q. That might depend on all sorts of things, though, as to the atmospheric conditions obtaining as a result of the fire? A. And just where the gas was, yes.

Q. And also as to whether the ventilation system was operating in the same way? A. Yes.

HIS HONOR: I do not think we have had much evidence yet as to what happened to the fan?

MR. REYNOLDS: One witness said he heard them stop after the fire, at a certain point of time.

HIS HONOR: Q. I suppose that would be a factor you would have to take into account too? A. Yes.

HIS HONOR: It may be a little too complicated to help me, Mr. Parkinson.

MR. PARKINSON: Q. This build-up of gas in this particular goaf area which we are now talking about at the end of A heading and back down to B heading: Wouldn't it be most desirable to eliminate that build-up?(objected to by Mr. McNally: allowed and read by Court Reporter).

MR. PARKINSON: May I draw Your Honor's attention to the evidence of one of the members of the organisation on whose behalf Mr. McNally appears, namely Mr. Walker, who indicated that the reason why he did not examine that particular A goaf area was due to the fact of its inaccessibility. I would say it is inaccessible. This witness has already indicated he could traverse into the place to test it.

WITNESS: Could I say -

HIS HONOR: Q. What is the answer to that? Can you answer it? A. Yes. Can I say that the reason we travelled down there was because of an extreme emergency. You could hardly consider it safe to travel down there nor would I recommend that people travel down into that area which was a goaf area.

Q. From what point of view would it be unsafe? A. The condition of the roof - it is a goaf area. Inspections are not required to be made beyond the edge of the goaf.

HIS HONOR: Does that assist you, Mr. Parkinson?

MR. PARKINSON: Yes, only the other question that the Court Reporter just read out -

Q. Is it most desirable to eliminate any quantities of gas irrespective of the amount at the earliest possible opportunity? (No answer).

HIS HONOR: Q. What do you say to that? A. Well, of course it is.

MR. PARKINSON. Q. Now how would you get rid of the gas in that goaf say prior to the fire? A. Well, I explained yesterday that the idea would be to have a condition whereby the intake goes over the goaf into the return.

Q. That is right, you did explain that yesterday? A. Yes.

Q. Now that is not the position prior to the fire, is it? A. No.

Q. Then how do we get rid of that gas? A. Well, I said this was improvisation. They had to do something and this was what they did.

Q. So are we saying that we can't get rid of that gas in the way the Mines Department would like to get rid of that gas? Is that what you are saying? A. No, you are saying that.

HIS HONOR: Q. What do you say? What are you saying? A. What do I say?

Q. What do you say about it? (No answer).

MR. PARKINSON: Q. How would you get rid of it with the ventilation system as it was prior to the fire? A. Well, I would say this, that the bleed off from the goaf was being diluted by the main intake air current even on the simulated conditions to a degree which was bordering on nil.

Q. That is the bleed off from the goaf? A. Yes - was being diluted to a safe condition.

Q. And what about the seepage in the shunt itself? A. There was seepage in the shunt.

Q. Didn't you tell me this morning that if you found conditions such as those which you found on Wednesday you would have stopped the place? A. I did not say I would have recommended the use of that place, did I?

Q. Didn't you say to me that you wouldhave expected - A. Yes, I did.

Q. - that the men would have been withdrawn prior? A. I said I would have expected that this area would not be used as a shunt.

Q. So am I to understand that this build-up of gas in the goaf you would have been quite satisfied with that as it was, or how would you have got rid of it? A. There is only one way and that is to neutralise or dilute gas as it is given off.

Q. How would you dilute it? A. It is being diluted now.

Q. It is being diluted now? A. Under simulated conditions.

Q. Under simulated conditions it is being diluted? A. Yes.

Q. Under these conditions are you now saying the men could have been working at the face? A. You are, I am not.

Q. No, I am asking you: Would you say that the men could still be working at the face with the diluted conditions obtaining that you are referring to? A. In the place, yes, that would be correct.

Q. You would say they could work at the face? A. Yes.

HIS HONOR: Q. Is this the position: You are saying that they could not use the shunt? A. Yes.

Q. They could work the face but not use the shunt, is that your proposition? A. Yes.

MR. PARKINSON: Q. If they could work at the face and not use the shunt, they would not have been able to produce coal? (No answer).

MR. REYNOLDS: Unless they used another shunt.

MR. PARKINSON: Q. I asked you the question. Don't take any notice of Mr. Reynold's objection. Would they have been able to produce coal? A. So long as the concentration of percentage of inflammable gas was below the prescribed limit, yes.

Q. When they produce coal they have to load the coal into a shuttle car or some conveyance, haven't they? A. Yes.

Q. Well, if they could not have used that shunt what form of improvisation would have had to be indulged in? A. Your Honor, is Mr. Parkinson trying to get me to justify certain conditions or -

HIS HONOR: All you have to do is to answer questions which are admissible.

WITNESS: Do I have to justify whatever has been done or whatever I think has been done?

HIS HONOR: Q. Would you listen to the questions and if you cannot answer them, you tell me. If you are not able to answer a question because, as another reason, you do not feel qualified, you let me know? A. Yes.

MR. PARKINSON: Q. When you say am I trying to get you to justify -

HIS HONOR: Mr. Parkinson, just ask questions and we will proceed.

MR. PARKINSON: Q. This methanometer that you gave evidence about yesterday: When you make your ordinary routine inspections as a District Mines Inspector do you, in addition to your oil safety lamp, carry one of these methanometers? A. Not always.

Q. Would you think that it would be an advantage to have a methanometer in addition to an oil lamp? A. It would not be a disadvantage.

Q. No, but do you think it would be an advantage? A. In some circumstances it could be an advantage.

Q. You see, you said that there is some difficulty experienced in testing for bottom gas, didn't you? A. Yes.

Q. But it is by no means an impossible task to test for bottom gas? A. Correct.

Q. So under those conditions do you think it would be most advantageous for the person called upon to test if they had a methanometer in addition to their oil lamp? A. Yes, I suppose it would.

Q. Yesterday I think you stated that in your opinion CO2 did have some effect upon the registration of the methanometer when testing for this particular type of gas? (Objected to by Mr. Lee).

MR. LEE: Since this matter was raised we have had this methanometer tested in conditions of carbon dioxide and that information will be before the Court from an expert. Mr. Parkinson may see fit in those circumstances to take a particular course.

MR. PARKINSON: Q. Yesterday I think you indicated two alternatives to this particular type or method of ventilation of this particular area. One of the propositions you submitted was that the present method should be completely reversed. Was that correct? A. That would have been a better arrangement.

Q. That would have entailed the construction of an overcast, would it not? A. Yes.

Q. And the changing of the transport heading? A. Yes.

Q. And you said that that would be a major operation? A. Yes.

Q. In the interests of safety, the question as to whether it would be a major operation or not would not enter your head, would it, as a District Mines Inspector -(objected to by Mr. Reynolds; objection not pressed).

Q.As a District Mines Inspector you would be mainly concerned with safety? A. Correct.

Q. You would not be concerned with whether it was a major operation to change the air or not? A. No.

Q. Would you say that in what happened at Bulli on November 9th when the ignition occurred, the then method of ventilation played a part in that particular happening? (Objected to by Mr. Reynolds; allowed).

MR. PARKINSON: Those are all my questions.

HIS HONOR: Q. Did you answer that question? A. No.

HIS HONOR: You had better then.

MR. PARKINSON: In view of the fact that Mr. Reynolds objected, I withdraw the question.

MR. McNALLY: Q. I think you said earlier this morning, if I understood you correctly, that you had not come across Illawarra gas or gas like Illawarra bottom gas in any district other than this. Is that what you said? A. That is correct.

Q. When was it that you first contacted or had anything to do with Illawarra bottom gas and knew it? A. My first introduction to this particular circumstance was at Bulli Colliery, this colliery.

Q. By that do you mean your first contact with this Illawarra bottom gas was following upon this happening? A. No. This was in 1960.

Q. Before that you did not know of the existence of the gas, is that it? A. That is right. Not in that form anyway.

Q. I think people generally - is this your experience - are now only just beginning to understand what Illawarra bottom gas is? A. There has been considerable attention focussed on Illawarra bottom gas particularly since this incident.

HIS HONOR: Q. I cannot hear this. What did you say?A. I said there has been particular interest in this Illawarra bottom gas since the incident.

Q. What about before the incident - was anything done or anything written about it before that to your knowledge, or any reports about it in your Department? A. Well, I hadn't come across them.

MR. McNALLY: Q. Is this the position, that anything you now know about Illawarra bottom gas in the main you have learnt as a result of this happening on 9th November? A. No, I learnt in the interval between 1960.

Q. I think you said yesterday that the normal method of testing with the safety lamp is that you turn the wick right down and test up near the ceiling? A. Yes.

Q. You test up there for methane? A. Yes.

Q. And then you raise your flame - tell me if I am incorrect? A. Yes.

Q. You raise your flame and then test down low for black damp, carbon dioxide? A. No, I didn't volunteer that. That followed as a result of a question I was asked by someone as to whether it was possible to test for methane with a raised flame.

Q .Yes, but the normal method of using the lamp? A. Yes, with a lowered flame.

Q. Leaving aside for the moment Illawarra bottom gas, is to test at the roof for methane? A. Yes.

Q. And the rest of the mine or place below the roof for carbon dioxide? A. Yes.

Q.You turn your lamp down up at the roof and up when you test below? A. Yes.

Q. I wonder if you would be good enough to indicate the manner of holding the lamp, if you could use this lamp -

(Mr. Reynolds tendered safety lamp which was marked Exhibit "P").

Q. Would you hold it up and I wonder if you could just demonstrate the manner in which you hold the lamp when testing for carbon dioxide and nitrogen? A. Yes. We hold the lamp and lower it carefully, observing -

Q. Would you just do it for us and give us an illustration of what you do? A. We lower the lamp, assuming this condition that you are searching for - which now?

Q. Carbon dioxide, at that level? A. Carbon dioxide, you said. Well, you lower the lamp, observing the flame, and on the lamp being subjected to carbon dioxide the effect on the flame would be a reduction in the height of the flame or the luminosity of the flame.

HIS HONOR: Q. Imagine there may be carbon dioxide at floor level; would you show us what you do? A. Well, you lower it like that and watch the flame.

Q. Would you go right through it? A. If it is lowered quickly and there is gas there, well of course it is out so you have to approach cautiously and when you see the flame affected then that is as far as you go.

Q. But assume your flame has not been affected so far, would you please go through it? A. Yes, well, there you are. There is your gas now, you hold it and bring it back then.

Q. Say the gas is right at the floor level, lower down than you went? A. Well, if there was gas there it would be there now.

Q. My angle may be wrong from there but it is about a foot up? A. Yes.

MR. McNALLY: Q. Don't you go any lower than that? A. Yes, all right. Lower the flame, the flame is all right, nothing is happening and put it on the floor and there is no gas there.

Q. But do you actually put it on the floor when you are testing? A. Do you want me to dig a hole in the floor?

Q. Demonstrate, if you would. Just listen to the question if you wouldn't mind and then be so good as to do what I ask you. Would you demonstrate how you would search for gas, assuming you didn't find any gas? A. I am coming into a place now where there might be gas present and I am now going to test for it. I take the lamp and adjust the flame so that it is normal. I take it by that handle and lower the lamp carefully, observing the flame. So long as the flame is unaltered I take it there is no gas. If I saw at that point that there was a tendency for the flame to reduce, then I would lower it a little further then. Just a minute -

Q. I simply want you to demonstrate how you would lower the lamp when searching for carbon dioxide, assuming you didn't find any. Please don't say anything, just demonstrate, would you? A. I lower the lamp. If I let the thing drop it will go out. I lower it gently and watch the flame. If the flame is reduced in size by a half, there is 1¼%. If the thing goes out there is certainly more than 1¼%.

Q. How would you test if you were searching for Illawarra bottom gas? A. I would -

HIS HONOR: Q. Please do it without talking. Let us see what you do when you are on your own, you see; you do not talk? (Witness demonstrates).

MR.McNALLY:Q. When searching for Illawarra bottom gas how do you have the flame or how would you have the flame? A. I will show you again.

Q. I think we have gone far enough -

HIS HONOR: Q. Could you light the lamp? Is there anything combustible in it? A. Yes. (Witness lights lamp).

MR.McNALLY: Q. Where do you regulate the flame on that? A.Here.

MR. SULLIVAN: Q. Where is your intake - at the bottom?A.Yes. (Indicating).

MR. McNALLY:Q. As the light is showing now, would you carry it at that or would you have it higher than that?A. No, that is about right.

Q. Is that the flame with which you test for carbon dioxide? A. Yes, that is about right.

Q. And what about Illawarra bottom gas? A. Well, there you have got a combination of CO2 and CH4. I would (lowering flame) - there is the testing flame for CH4. You see the blue associated with it there.

(Witness crosses to Bench and demonstrates to His Honor and Assessors).

HIS HONOR: The witness said to me, holding his hands over the lamp glass, you can see the blue flame which is associated with the white. Then if you get methane you get a blue cap on top of that and the height of it indicates the percentage of methane. (demonstrated to counsel).

WITNESS: You will see the blue associated with the white there. If there was methane present you would have a blue cap on top.

MR.McNALLY:Q. Assume now that you were testing for bottom gas. Do you say you would use the same flame as when you were testing for methane near the roof? A. Personally, if I were testing I would lower the flame.

Q. You would lower the flame even more? A. Yes.

Q. Is that a normal procedure? A. This is to pick up the methane?

Q. Yes? A. You see my idea of this methane and CO2, it is not like oil and water where you have two layers, you have the oil and the water. It is a diffusion and you would inspect it, lowering it to get a little bit of methane that you would see on there before the lamp went out, but I would be careful -

Q. What would be the interval of time between your seeing it on there and your lamp going out? A. Well, if there was methane there - I have got methane (demonstrating). I test for CO2 with a lower flame, but Ihave inflammable gas I turn it up.

Q. You misunderstand me or perhaps I have misunderstood you. Searching for Illawarra bottom gas, a diffused mixture of Illawarra bottom gas, do you have the flame up or down? A. Let us take it that I was in there on Wednesday. Right?

Q.Would you answer the question? A. This is where for Illawarra bottom gas.

HIS HONOR: He is really giving you an answer, Mr. McNally. He is giving you the exact conditions where he is looking for that very thing.

WITNESS: And didn't lose my light.

MR. McNALLY. Q. Perhaps I can come back to that, but do you have the flame when testing for Illawarra bottom gas the same as when you are testing for methane?A. Illawarra bottom gas is a mixture of methane and CO2 and then methane will always show as a blue cap above, luminous, then CO2 will always show with a reduced flame. I said if I was looking for Illawarra bottom gas I would expect ~~expect~~ to find methane at the roof, but if I was looking for Illawarra bottom gas I would lower it down. If I got firedamp at this level, the firedamp is associated with the CO2 below the roof - some level below there (indicating) - and I would have the presence of inflammable gas. Now, practically speaking, when I was testing there, in the rib side there where the CO2 was, when I got down like that I could taste the CO2, but that is not necessarily always the case.

Q. But of course the percentage of CO2 in the Illawarra bottom gas varies from time to time?A. Yes, from time to time and from place to place. I could test here (indicating on floor of court) and lose my light there was so much, but I could test over there and find there was hardly any gas there with no firedamp in between, and find firedamp at the roof.

Q. You have got Illawarra bottom gas there and you are testing for it with a low light?A. Yes.

Q. You say you could lose your light over here but you might not lose it over there, is that right?A. Yes.

Q. Would that be because the carbon dioxide here is in greater proportion with the methane than it is over there?A. Yes, which was the case on searching.

Q. At some stage when searching for Illawarra bottom gas, the carbon dioxide may be such that the light can be put out?A. Yes.

Q. Assuming that to have happened, could a person be excused for believing that what put it out was carbon dioxide?A. Yes.

Q. That in fact happened?A. Yes.

Q. So that he would have failed to detect Illawarra bottom gas although it was there?A. Yes.

Q. I mean, this could happen quite easily, depending on the mixture?A. Yes, it could happen.

Q. Would you agree with this proposition, that if the carbon dioxide proportion exceeded the methane proportion, your lamp would invariably go out?A. Yes. If you put your lamp in - what I am suggesting is that you could pick the CH4 before lowering your lamp entirely and be low enough to be extinguished by the CO2.

Q. On the occasions you searched there since the fire, you have always had a methanometer with you, have you not?A. Yes.

Q. Is it fair to say that you have always located the Illawarra bottom gas by use of the methanometer first and then used the lamp?A. No, I have not used it all the time.

Q. On most occasions?A. On some occasions.

Q. You have always had a methanometer there?A. On each occasion I took the methanometer reading I have been able to substantiate it with the lamp.

Q. I think you said yesterday, and I think you said again to Mr. Parkinson, that whilst CO2 may affect your methanometer reading, you still nevertheless read methane, even though there is a high percentage of carbon dioxide present?A. Yes.

Q. Now, bearing in mind the possibility that the carbon dioxide present in the Illawarra bottom gas may well be in such a proportion that your light will probably go out, would you not agree that in those circumstances a methanometer should also be carried? Do you understand me?A. Yes, but don't forget on the one hand we can test for inflammable gas with a methanometer but you can't test for CO2. You can do both with the safety lamp.

Q. Are you suggesting the only reason why a methanometer should not be carried in addition to a safety/is lamp that you have two objects to carry?A.(No answer).

MR. SULLIVAN: I do not think the witness said it should not be.

WITNESS: I didn't say that.

MR. McNALLY. Q. Well should it be carried?A. Mr. Parkinson asked would it be advantageous and I said Yes, it would be.

MR. McNALLY: Q. Bearing in mind your experience and bearing in mind your experience in this 9th November happening and bearing in mind the knowledge now that there is Illawarra bottom gas or was on that day apparently in the mine, would you suggest it would be a reasonable thing to require people testing for Illawarra bottom gas to carry both the lamp and the methanometer? A. There are arguments for and against.

Q. What is your opinion? -

HIS HONOR: Q. What is the disadvantage in carrying a methanometer? A. No disadvantage.

Q. Is it an advantage? As a matter of precaution is it wiser to use a methanometer in addition to a safety lamp? A. Could I explain along these lines: The Act requires that a flame safety lamp or other device approved by the Chief Inspector shall be carried on inspection and then goes on to say about inspection for inflammable gas, certain observations. It specifically says the examination for it and the specific percentage shall be by safety lamp.

Q. That is what the Act says? A. Yes.

Q. You see, somebody may have to act on certain recommendations I may have to make? A. Yes.

Q. So that we may not be relying on the Act as it is at present. Assume you had a hand in altering the conditions - forget the Act, in other words - would you say it is desirable in the interests of safety for a tester to carry a methanometer as well as a lamp? A. I could not go against it.

Q. Would you be in favour - think it desirable from the point of safety, as an added precaution? A. In the interests of safety I would say it would be desirable but, Your Honor --

MR. LEE: I think he wanted to add something, Your Honor.

HIS HONOR: Say it.

WITNESS: I want to say Deputy Kelly was the first person to find gas with this flame safety lamp at the roof and at the floor after this incident.

Q. HIS HONOR: And I suppose Deputy X might miss it? A. Yes.

Q. Mr. McNALLY: What was on the roof was methane? A. Yes.

Q. It wasn't Illawarra bottom gas or top gas, or whatever you might call it? A. No.

Q. That is what he discovered first, Deputy Kelly, wasn't it? A. Yes.

Q. He had a pretty fair idea there was some Illawarra bottom gas hanging around apart from the fact there had been an accident? A. I told him there was methane on the roof and methane on the floor.

Q. You had previously found methane there? A. Yes.

Q. Incidentally the first test you carried out in that section generally, I think you first located Illawarra bottom gas - methane reading 0.25%? A. Yes.

Q. You would not find that with a safety lamp? A. No.

Q. In fact you would be pretty lucky to find methane present in a percentage below 1¼% or 1½%? A. Yes.

Q. You would find it with the methanometer? A. Yes.

Q. Is 1½% what you referred to earlier as the prescribed limit of inflammable gas? What were you referring to then? A. Referring to the fact that electricity should be cut off when there is 1¼% in the general body, at the machines on the face - when there is 1¼%.

Q. You might not pick up 1¼%? A. You are required to test by one of those for that percentage.

Q. You might not pick it up till approximately 1½%? A. To be precise I think the lowest limit you could see on that you would say was 1¼%.

Q. You wouldn't find anything under 1¼? A. Yes.

Q. When lowering into Illawarra bottom gas I suppose you would have to be careful to see your light doesn't go out? A. Yes.

Q. Would you agree with me a way of doing that is to hold your hand on the regulator button underneath the lamp ready to turn it up? A. No, you lift it clear.

Q. You would not hold your hand under for that purpose? A. No.

Q. When testing near the roof would you agree that it is generally accepted that those lamps will not test your air closer to the roof than from 5 to 10 inches? A. It is difficult.

Q. So that even though you may be holding the very top of the lamp right on the roof you may only be testing the air 10 inches below the roof? A. Yes, from the entry, about 5 or 6 inches.

Q. The air enters upwards; is that right? A. Or if you alter the feed it goes in here (indicates).

Q. From which direction - below or above the lamp? A. No, it goes in from below but when you alter the feed to the top it goes in here and then goes down and then up.

Q. Isn't there a current of air that enters the lamp - assuming you are using the top hole - enters from below the lamp and not above it - a current of air. Do you follow me? A. No, there are two conditions.

Q. There is a convection current? A. Yes, it goes in here and feeds through the gauze and goes down and feeds the flame or, if you alter to the top feed you cut off the intake here and transfer it to there - you are transferring the feed area nearer to the roof.

Q. When you transfer the feed to the top hole you are not feeding from the bottom hole? A. No, only from the top.

Q. Even then, because of this convection current you are only testing air somewhere between 5 and 10 inches from the roof. Do you agree with that? A. Now (demonstrates with lamp) hold that to the roof and there is air going in there.

Q. Have you heard of the convection current to which I am referring? A. Yes.

Q. Do you understand it? A. Yes.

Q. Just explain it, would you, how the air enters the lamp? A. Shall I take it to pieces?

Q. No. From which direction does the air enter the lamp using the top hole? A. Goes in there and down and then up until it gets here.

Q. I think you are misunderstanding me: When you hold that up to the roof - earlier I thought you agreed when testing air at the roof even using the top holes you are testing air from 5 to 10 inches below the roof? A. Yes.

Q. And you can't test any closer than that distance? A. For all possible purposes here; all right.

Q. Do you agree with me or not? -

HIS HONOR: Q. What is being put is that when you hold that up to the roof you have said you are testing air from 5 to 10 inches below the roof. What Mr. McNally is putting to you is doesthat mean you cannot test for methane any closer than 5 inches from the roof? A. What I said in answer to that is it is difficult to test for layer at roof level with a flame safety lamp. The only means of doing it are the means provided on the lamp, to transfer the feed from here to the top, but even then there is difficulty.

Q. There is still difficulty? A. Yes.

Q. Is one of the difficulties you are trying to feed into the lamp through the top holes- whether it be the top holes or not - a gas which is lighter than air? A. Yes.

Q. MR. McNALLY: You can test to the roof with a methanometer? A. Yes.

Q. You can test right to the floor with a methanometer? A.Yes. I believe now there is a flame safety lamp with a gadget,an aspirator, whereby you can collect samples at roof level and transfer them inside the lamp. I don't know the details.

Q. Is that out here or in England? A. I don't know where it is.

Q. I think the test you took when you first found methane or Illawarra bottom gas in the intersection or near the intersection of A heading and B cut-through was after the brattice screen had been placed across the entrance to No.2 cut-through and the air re-directed around through the goaf up A heading? A. Yes.

Q. Would you agree that from the time the fire knocked down the brattice screen near the fan and the brattice screen at the back of the shunt area in A heading the return would have started going around through the goaf into A heading? A. Yes.

Q. Do you agree that the effect of that would be to increase the draw of goaf gases into the intersection or near the intersection of A heading and two cut-through? A. Yes.

Q. The elephant trunks: These are in common use in mines in this area? A. Yes.

Q. To your knowledge they have been used in both Bulli and other mines for some time prior to 9th November 1965? A. Yes.

Q. And they are a commonly accepted means of ventilating? A.Yes.

Q. Assuming A heading was blocked off by means of a seal so that the goaf gases could not come into the area, would there be then a tendency for the goaf gases to build up; is that the position? A. Yes.

Q. Would this increase the danger associated with breaking through at the heading being dug towards the goaf? A. No.

Q. This build-up of gas? A. No because you have always got the gas still there at the corner of the heading.

Q. But assuming the goaf was sealed off completely? A. You still have the whole of the back side.

Q. This would increase the risk associated? A. Yes.

MR.LEE: Are we all in agreement on that? I understand what was put - the build-up occurs in this corner and the fact that it was up, that that fact would increase the risk to the men at the face when the goaf was broken through from the cut-through - I am not at all sure that Mr. Longworth is in agreement with Mr. McNally on that.

WITNESS: What I said was there is already a goaf created and there are mine gases in the goaf in this area but say you put a seal across there and it increases this, it doesn't alter this here (demonstrates) you still have the goaf.

MR. LEE: Mr.McNally is suggesting the men at the face are going to be in greater danger when they break through into the goaf at that far end because of the build-up at this end. I do not think Mr. Longworth was subscribing to that proposition.

MR. McNALLY: Q. I think in these goaf areas there are frequent falls take place? A. Yes.

Q. When a fall occurs in a goaf there is a rush of air that leaves the goaf and in this set of circumstances could go up A, B and C headings? A. Yes.

Q. And the possibility of the fall could well explain why the gases may also come out of the goaf? A. I would not subscribe necessarily to that.

Q. Assuming there had been a fall in the goaf there on 9th November, forgetting for the moment the barometric pressure, this could well force the noxious or inflammable gases to come further up A, B or C headings or A heading anyway? A. What happens in fact when the goaf caves in and falls, it leaves a space above more or less equal to the space below in which the stone fell and then the gas goes up in the roof and it is still contained on the initial fall of roof, if it is a big fall, depending on the size, there could be a tendency to go out that way (indicates).

Q. The air goes out of the goaf? A. And then goes back again.

Q. All the noxious and inflammable gas? A. Not all of it. There is a tendency, and then it goes back in.

Q. Air rushes back in. Would you agree that whether or not all the gas goes back is problematical? A. Yes.

HIS HONOR: Q. That is on the initial fall? A. Yes.

Q. It is not on the subsequent intermittent falling? A. No.

Q. Mr. McNALLY: I suppose the fire itself burning at the intersection would have a tendency to draw gases out of the goaf? A. Have a tendency to increase the flow over the fire.

Q. And draw inflammable gas or noxious gas or anything that might be in the goaf up from the goaf area? A. I would not like to say.

Q. Incidentally, you say the situation as at the date of the fire has been restored near the A 2 intersection? A. Correct.

Q. Would you agree that there has been a considerable period since 9th November when that area was not ventilated? A. Which area?

Q. The area around the A 2 intersection, that is the intersection of A heading and No.2 cut-through? A. It has been ventilated throughout.

Q. By a satisfactory system of ventilation? A. Yes.

Q. You have been ventilating that by the blower near the intersection of B heading and No. 2 cut-through? A. Yes.

Q. Getting back to the fall of the goaf for the moment: Assuming a fall had taken place in the goaf and there was a rush of air out of the goaf up A heading - not so much a rush of air but air moving from the goaf up A heading because of the fall? A. Yes.

Q. You might get a sudden rush after the fall is over that will knock stoppings over or you may get an increase of the flow of air. Assuming there had been a slight fall in the goaf shortly before the fire could that have had the effect of forcing the inflammable gases up A headingand leaving some of it there before the air rushes back into the goaf? A. I would not like to venture an opinionón that.

Q. It could happen? A. I suppose you could theorise and say that but I don't know, in fact.

MR. SULLIVAN:Q. As to the simulated conditions on the day before yesterday: You had the brattice stopping in between the goaf and No.2 cut-through in A heading; is that right? A. This one here (indicates).

Q. Behind here - behind the shuttle car? A. Yes.

Q. That was there on the day of the fire. Immediately after the fire - whilst the fire was burning and immediately after you tested for methane in the shunt, didn't you? You tested for it here (indicates)? A. Yes, five o'clock in the afternoon. And, some time after nine (indicates).

Q. You tested at five and gotrather a low reading? A. Yes.

Q. At that stage the brattice had been burnt out? A. Yes.

Q. This intake here, I am pointing to B heading, was operating then? A. No.

Q. There was brattice stopping there? A. Yes.

Q. Where was your intake? Where was your intake air coming? He points to C heading? A. The intake was coming along C heading down No.2 cut-through and was dividing, some going this way and some going that way (demonstrates).

HIS HONOR: Down the left and right - in other words outby and inby of No.12 cut-through.

MR. SULLIVAN: Q.Some going along B heading? A. Most going this way and some that way.

Q. Some going through B heading? A. Yes.

Q. Would there be approximately the same amount as would have been going through B heading if under the system of ventilation before the fire the brattice in the shunt had been removed. Supposing you did not have that brattice in A heading behind the shunt. Do you follow what I mean? A. Yes. Yes, I think there would have been.

Q. Just about the same? A. Yes.

Q. That would have been sufficient if that brattice had not been there probably to dilute these gases? A.Yes.

Q. Supposing you had that amount of air coming around the goaf picking up the gases, no brattice to stop them, would that in your opinion have been sufficient to dilute the gas? A. I think the main dilution would be with the major.

Q. But without the brattice there would have been a greater dilution in the shunt? A. Yes, with this going around here this is where the gas is. (indicates) On that corner.

(The witness returned to the witness box).

Q. Is it your opinion after having examined the set up with your colleages that the elephant trunk made very little difference?A. Yes.

MR. REYNOLDS: I have spoken to Mr. Lee and I have suggested that my friend might get rid of the witness Robinson this afternoon. I could not quite finish my questioning. I thought in the circumstances it might be desirable to get rid of Mr. Robinson and to defer my cross-examination perhaps till Monday.

MR. LEE: I would prefer to keep the sequence. There is no problem involved in having Mr. Longworth in Sydney on Monday. I would very much like to have Mr. Robinson give his evidence. He has been waiting all day and, I think, yesterday afternoon.

HIS HONOR: I wish to ask this witness some questions.

Q. As a matter of good practice from the point of view of the safety of the workmen, and I am thinking in terms of safety from noxious gas, is it good practice to draw the air in the ventilation system away from the working place, that is, to draw the noxious or polluted air away from the working place, rather than to draw the polluted air across the area of the working place? If you look from here at your plan the present system has an intake airway at C heading and the air passes places like the extension of B heading towards the goaf and, of dour se, the extension of the shunt which is really an extension of A heading? A. Yes.

Q. And then draws it up the return airway in A heading? A.Yes.

Q. In fact what you are doing is to draw polluted air in this case across the vicinity of the working place? A. Yes.

Q. You are doing that? A. That is what is happening there, yes.

Q. Is it better practice to draw that type of air away from the work place? A. Yes.

Q. Which was not done? A. Yes.

Q. This ventilation system: This return airway, for example, was that connected to any other working section? A. That is the tubes from the fans?

Q. Yes. A. No, they served the working area proper, that is at the bottom of the heading.

Q. What about other workings? There were other working sections in the mine at the time. The nearest working section, was that in any way connected up with the return airway or ventilation system of this section? A. No.

Q. Not in any way at all? A. No.

Q. So it had its own independent ventilation? A. Yes.

Q. The other matter is this: You inspect this mine regularly. I suppose you inspect it for all matters connected with safety? A. Yes.

Q. And rescue work. Did you inspect it for that purpose also? A. No.

Q. You may be able to tell us: What fire fighting apparatus was available near the section where the men were working? A. A fire extinguisher on both cars.

Q. They are the little hand extinguishers? A. Hand extinguishers.

Q. They work on a foam principle? A. Dry chemical principle - blow dust on the fire which produces CO2.

Q. What area of fire could they extinguish? Could they extinguish a big fire or a small one? A. A relatively small one.

Q. ARe they the sort of thing intended for a fire of the vehicle itself? A. Yes.

Q. What else is there? A. A water pipe with connections for fire hose.

Q. How far was the water pipe from the area where this fire broke out? A. It goes down the extension of No.2 cut-through to the face to serve the miner with water for the sprays to deal with the airborne dust.

Q. There is a hose going all the way down? A. A steel water pipe.

Q. Was that a flexible hose? A. It is a steel pipe. You can couple a fire hose at the end.

Q. You can couple a fire hose at the end of that near the face? A. They have special adaptors whereby you can couple a flexible hose on them.

Q. Near the face? A. Yes.

Q. Were there any such adaptors there on that day, do you know? A. They are in the face vicinity, I would not like to say.

Q. Was there any length of hose attached on that day? A. The hoses were used for the fire.

Q. Not down near the face, they were used from the other side, from the back of the fire - from the back of the fire or from near the side? A. The pipes go from outside right into the district, along C heading and down into the working place.

Q. From outside? A. Yes, it is a water reticulation service.

Q. Where are the hoses? A. At intervals.

Q. What is the nearest hose? A. I would not like to say. Hoses were transmitted there, obtained without delay to this water main and the water was used.

Q. Do you know what delay? If you can't tell me, I will have evidence. I want to know of the delay. The picture I have at the moment is of men running, pulling down brattice and so on but at some stage obviously fire fighting apparatus was used. I want to know at what stage? A. There was an interval of delay and that was occasioned by the dense volume of smoke coming back . It came up C heading to the cut-through, outside No. 2 cut-through and there was some difficulty in advancing from the fresh air side to the fire because of the quantity of smoke but then I think that fan stopping collapsed and then from there on there was some benefit obtained from the ventilation and by means of a sail or piece of brattice on crossed sticks, like a sail on a ship, held to the roof so that the air was directed over the roof level it was possible to advance slowly to the seat of the fire. That was the delay in getting water to the fire.

Q. Any foam fighting apparatus down there? A. Not down there but there was one brought on to the scene.

Q. From the surface? A. From the rescue station.

Q. That is a fair way away? A. It was down there. I arrived with it at 2.10 and they were not able to use it till some time after 5.

Q. Do you know anything about fire fighting? A. Yes.

Q. What is the method of fighting an electrical fire? A. With dry chemical extinguisher.

Q. What about foam? A. No.

Q. And not water, I take it? A. No.

(Witness stood down).

CLEMENT BARRINGTON ROBINSON,
Sworn examined as under:

MR.LEE: Q. Your name is Clement Barrington Robinson? A. Yes.

Q. You reside at 17 Wynn Street, Woonona? A. Yes.

Q. You have been connected with mining for about fifteen years? A. That is true.

Q. In what capacities? A. A variety - sometimes locos, sometimes on the machines, just recently on shuttle cars.

Q. In fact you were driving No.40 shuttle car which was Mr. Mangles car for one month prior to this accident? A. True.

Q. You drove the shuttle car which it replaced for about three months before that? A. Yes.

Q. You were on the three till eleven afternoon shift during the whole of those four months I have mentioned? A. Yes.

Q. And working in Section 8 Right? A. Yes.

Q. I think you had been working about seven working days in the heading which was the extension to No.2 cut-through? A. Between six and seven days, roughly.

Q. How long had the miner been working at the end of No.2 cut-through extension? A. Which one do you mean?

Q. Leave that. Were the fans during the seven days in the same position as they are shown on the plan? A. Yes, as far as I know.

Q. Was the set up from the fans the same during the whole of those seven days with bleed tube and so forth? A. The first time the miner was down the straight heading down there the shuttle car was up on B heading. Both shuttle cars were shunting in there. That was the first day and the second day. When they started to use the shunt in C heading where the fire was, that is when they started to use the bleeder.

Q. They started to use the bleeder after the second day? A. That was when they started to use C heading as a shunt.

Q. What heading? A. C. That is where the fire was. When they started to use that as a shunt.

Q. What is where the fire was? A. Not C - I have got it mixed up. It's A, I am sorry. I had it back to front.

Q. They used that as a shunt. Did you yourself use it as a shunt? A. Yes.

Q. Did you notice anything during the period you were working there as far as the shunt was concerned? A. Yes, I made a statement to the deputy. Like, I said I think there could be a bit of gas in there because it was making me a bit squirmish (sic) in the stomach.

HIS HONOR: Q. Who was the deputy? A. Mr. Cambourne.

MR. LEE: Q. How soon was this after you started on the extension of No. 2 cut-through? A. Do you mean when we started using that shunt?

Q. Yes? A. I could not say exactly but it might have been, like, two or three trips.

Q. Was it then the same day that you started using A heading as a shunt? A. Yes.

Q. After you said that to Mr. Cambourne was anything done? A. Yes, I would say within the vicinity of about half an hour or maybe an hour they put that elephant's trunk across from the existing vent tubes over the cut-through - overhead, into the cut-through.

Q. Into the shunt? A. Yes.

Q. How far from the shunt, from the brattice in the shunt was the end of the trunk, the elephant's trunk? A. I could not give you the exact distance but it was not right down to the

brattice. They never had enough of it. I think the dog watch had to put the extension on to make it go right back.

Q. When it was first put on it did not go as far as it ultimately did? A. No.

Q. When you saw it on some other occasion the tube had been extended by putting an extension on? A. Yes.

Q. The extension having been on, where did that lead to? A. At times there was still a little bit of a taste in the shunt, like, when the shuttle car went in.

Q. But when they put the extension on to the bleed tube - the extension on - do you understand? A. Yes.

Q. Where was the end of the extension? Where did it finish up? A. That was, like, you mean, when it was right down near the brattice?

Q. Yes. A. It went down to the brattice or just before the brattice and out to the heading itself, like, running parallel with the brattice.

Q. It went down towards the heading and turned? A. Down towards near the brattice and turned.

Q. So that the mouth was not aiming straight at the face of the brattice? A. No, not when they put the extension on.

Q. Before they put the extension on did you notice anything in the shunt area? Anything particular? From the time they put the bleed tube up but before they put the extension on? A. Just a slight taste, I would say of it. I was talking - (interrupted).

Q. No. What you noticed. You say you noticed a slight taste of gas- I take it? A. I took it to be gas.

Q. When the extension was put on what did you notice then? A. There was a big improvement.

Q. As far as you were concerned on the shift you were on, the three till eleven, after the extension was put on did you ever detect or be aware of gas in that shunt again? A. Oh, at times I did think there was a little bit of a taste of gas in there, yes.

Q. Did you draw that to the deputy's attention? A. Yes.

Q. Which deputy? A. The same deputy, Mr. Cambourne.

Q. Did you see him do anything further about the matter than what you have already told us? A. He had come to the shunt and when I told him I still tasted it he had walked past me. While I am sitting in the shunt I face away from the brattice and what he did behind me, I could not tell you.

Q. Is there something you can tell us about the electric motor of the shuttle car? A. I know they used to get very hot- exceptionally hot - because over a period of time, myself, I had made complaints to the electrician and to the deputy of the panel.

Q. What about the cables on to the shuttle car? Is there anything you can tell us about them? A. Yes. I complained about the cables being over heated and smoke coming from the

Q. How long before November 9th are you speaking of? A. It was really no particular date, it might be two or three times or even more over a long period.

Q. Over a long period?A.Yes.

Q. When you say they got hot could you give us some idea of how hot they were? I do not mean in temperature? A. The cables are covered by, like, two doors, like that (demonstrates) the cable roll and the smoke you could see coming through and when you opened the doors up the smoke - just like someone was blowing smoke with cigarettes.

Q. Did you see the electrician after this complaint you made do anything about the matter? Did you see what they did? A. I was informed by the deputy - (interrupted).

Q. I didn't ask you that: Did you see what they did? A. I asked them to report it.

Q. Did you see what they did? A. Well I don't think they actually did anything then because they just told me they were non inflammable. I never actually saw them do anything to them.

Q. Do I understand if you saw the smoke coming from them and were prompted to make the complaint, the smoke still came from them after making the complaint? A. Yes.

Q. That is what you say? A. Yes.

Q. You mentioned the cables getting hot. You have put your hand on the cables on the occasions they were hot? A. You could put your hands on them but if you went to pull themyou could only pull say once, that will be say three or four feet of the dable and if you kept the hands there it was just as likely to burn your hand.

Q. Over what period to your knowledge had these cables been getting hot in that fashion? A. I could not tell you exactly but I would say it was quite some time. I had been in that section - while they had been on pillar extraction.

Q. Was it only in Section 8 you saw this situation? A. I have not been on the shuttle car in any other section.

Q. Did you notice the braking system on the shuttle car and whether there was any heat generated there? A. No, I never took a great deal of notice because the brakes are very close to the motor and to really take notice you have to go around the front of the shuttle car, put your head down and have a look and, like, have a feel.

Q. Anyway, having made your complaint to the electrician and nothing being done you did not take the matter any further and refer it to the deputy? A. Yes, it was referred to the deputy.

Q. Which deputy? A. Mr. Cambourne.

HIS HONOR:Q. When do you say you spoke to the deputy about the cable? A. I spoke to the deputy and the electrician.

Q. When was it? A. It was not actually on any one specific day, it was like two or three times it had been mentioned.

Q. How long before the fire would this have been, say? A. It could have been anything up to about four or five weeks.

Q. Four or five weeks before the fire? A. Yes.

MR. MURRAY: Q. What is the electrician's name on your shift? A. Mr. Clarke.

MR. CRANE: Q. You say you drove shuttle car 40 on Monday evening shift? A. Yes.

Q. On 8th November last. What was the condition of your travelling road? Clean travelling road? A. Pretty reasonable.

Q. No rubble lying about? A. Not that I noticed.

Q. Have you ever experienced the picking up of any foreign matters on the wheels of your car? A. Not that I can remember.

Q. Would it be possible in your opinion to pick up a piece of timber, or a piece of timber thrown into the wheel, the back wheel of this car, 40? A. I really would not like to say. I could not give a truthful answer. I would be just be guessing.

Q. Have you experienced the generation of heat on the bearings of these cars? A. You mean the motor?

Q. No, the bearings near the braking? A. When you walk past the shuttle car you can feel the heat coming from it but I could not say whether it was the brake or the motor, but you could feel the motor was exceptionally hot.

Q. Did you use the brake drum very heavily on the afternoon shift when taking the pay load? A. No more than what the day shift would, I don't suppose.

Q. Would you have more heat generated towards the end of the shift? A. More so than the day shift, I take it, because they are reasonably hot when the afternoon shift come in.

MR. PARKINSON: Q. When you made these complaints, particularly about the heating of the cable on the shuttle car, were you ever advised not to worry about it? A. Yes, I made the statement to the deputy and the electrician, I said I did not want to wait till something happened and I might be at fault for not reporting it, so I think it was the next day or after one of the times I told him, he came to me and said he had taken it higher.

MR. MURRAY: Who?

WITNESS: The deputy, Mr. Cambourne, he came to me and said he had taken it higher. I don't know who it was, he never stated. He came back to me and said - I can't think of his exact words but he said: No fault would fall on you, or no responsibility because for one reason they are non inflammable. Then the overman told me, Cochrane, he even made the statement that the electrician, Mr. Clarke, said that for the cables to burn you would have to have an oxy torch on them and they would burn, and once you took the oxy torch away they would go out.

MR. PARKINSON: Q. Extinguish? A. Yes, that was more or less the answer to my complaint.

Q. Could you describe how hot the motor on your shuttle car developed towards the end of the shift? A. At times there was smoke coming out of the motor. Not actually - it was more so the other shuttle car than the one I was driving.

Q. You had reported the heating of the motor also? A. Yes.

MR. McNALLY: No questions.

MR. SULLIVAN: No questions.

MR. REYNOLDS: No questions.

MR. LEE: I have nothing further.

MR. SULLIVAN: Would Your Honor make the usual order as to his costs?

HIS HONOR: Yes.

(Witness retired).

HIS HONOR: Mr. Reynolds, the deputy, Mr.Cambourne, has been mentioned on a number of occasions and had matters referred to him. Are his reports going to be made available at some stage, particularly in relation to the fortnight before the fire?

MR. REYNOLDS: They will be here.

MR. SULLIVAN: In the matter I subpoenaed.

MR. REYNOLDS: Yes, all the reports are here.

HIS HONOR: I did not realise they had been subpoenaed.

MR. REYNOLDS: All the statutory reports from 8 Right Section are here.

MR. McNALLY: Might I have access to the deputies' reports?

HIS HONOR: Yes.

(Further hearing adjourned to Sydney on Monday, 13th December, 1965, not before 11a.m. at No. 14 District Court).

- - -

13th.

DEPARTMENT OF MINES
SYDNEY

Minute Paper

St. 9581 V. C. N. Blight, Government Printer

PAPERS:—

SUBJECT:—

BULLI COLLIERY INQUIRY - INFORMATION FOR THE MINISTER.

Herewith precis of proceedings for Monday, 13th December, 1965, submitted by the Deputy Chief Inspector of Coal Mines, and a copy of the full transcript for that day.

SPECIAL

UNDER SECRETARY.

14th December, 1965.

The Minister.

14 DEC 1965

DEPARTMENT OF MINES
SYDNEY

Minute Paper

St. 9581 V. C. N. Blight, Government Printer

APERS:—
JD/IA

SUBJECT:—

Precis of the evidence given on the Fifth Day of the Bulli Inquiry.

Proceedings commenced with the cross-examination of Mr. Longworth by Mr. Reynolds for the Company, and the first subject dealt with the examination for mine gases, and was bottom gas common in this mine, and could a person miss it? Answer, it is possible.

Mr. Reynolds suggested that a rule may be required to make it an obligation for the testing particularly of bottom gas, and then took up the question of ventilation, pointing out that with a reversal of ventilation, it comes to a point where the machine is working along the goaf edge.

Further methods of ventilation were discussed, and Mr. Reynolds said it appeared to be a reasonable method of ventilating the shunt. Questions were asked regarding reduction of pressure, and that tests indicate very little difference with the fans running, and contrary to Mr. Lee's statement in his opening address.

His Honor wanted to know whether the bleeder tube would suck gas through the brattice; Mr. Longworth replied that there would be a tendency for the gas to come through the brattice.

Mr. James, Senior Electrical Inspector, was then called and related having made several visits to the area checking electrical equipment and noting damage that had occurred, and also how, after hearing statements by various witnesses, he drew certain conclusions which were that an electrical fault in the traction motor or cables could have developed, also that the disc brake could have initiated the flash. He related how evidence was found indicating that the shuttle car has run through the brattice stopping, and the finding of a piece of timber jammed near the disc brake.

Mr. James was asked - from your examinations, did you find anything electrical, however small, that could have caused the ignition? Answer, no. Mr. James expressed the opinion that the piece of wood could be heated to such a degree that it could cause an ignition. In reply to a question by His Honor, Mr. Reynolds told the Court that the Company had,since the accident, found other pieces of timber in shuttle cars.

/ ... 2.

DEPARTMENT OF MINES, SYDNEY

Precis of the evidence given on the Fifth Day of the Bulli Inquiry.

JD/IA

Mr. Menzies, Senior Inspector, commenced with his evidence late in the afternoon, and gave details of the organisation for rescue operations and methods adopted to fight the fire, and pointed out that there was in no way any deficiency with the organisation. He told how at 5.30 a.m. he had been informed that the fire was under control, and confirmed this by inspecting the area, and how later he had checked reports and found that noxious gas had been reported on the morning of the 8th.

He then related some of the history of the mine, and how an explosion at the end of last century claimed 81 lives, and that the last ignition occurred last year during the welding of a rail, and resulted in the Department requiring the use of a methanometer during the time electric welding and oxy-acetylene apparatus is used underground.

Deputy Chief Inspector of Coal Mines.
14th December, 1965.

Under Secretary:

IN THE COURT OF)
COAL MINES REGULATION) No. 1 of 1965.
HOLDEN AT SYDNEY)

BEFORE HIS HONOR JUDGE GORAN.

Monday, 13th December, 1965.

IN THE MATTER OF AN INQUIRY IN PURSUANCE OF THE COAL MINES REGULATION ACT INTO AN ACCIDENT WHICH OCCURRED AT THE BULLI COLLIERY ON 9TH NOVEMBER, 1965, AND ITS CAUSES AND CIRCUMSTANCES.

(PART HEARD.)

========

HIS HONOR: I understand Mr. Lee is not present. Mr. Herron, are you prepared to continue?

MR. HERRON: Yes.

HIS HONOR: Are you going to call some further evidence today?

MR. HERRON: I think Mr. Longworth is here.

HIS HONOR: You are still going to continue with him?

ALBERT LONGWORTH
on former oath:

HIS HONOR: Mr. Longworth, you have already been sworn, so there is no need to swear you again. You are on your former oath.

WITNESS: Yes.

MR. REYNOLDS: Mr. Longworth, I want to ask you a few general questions to clear up some possible misconceptions, at least in my mind.

Tell me this: You would expect, I suppose, in mining in the Illawarra District to find gas of one kind or another pretty regularly? A.Yes.

Q.And the general problem, I suppose, is to detect these gases and eliminate them? A.Yes.

Q.Would you agree that as a general proposition the finding of gas of one kind or another is a common, every-day experience? A.In gaseous mines, yes.

Q.Could we fairly describe the mines in the Illawarra District as coming within that category? A.Yes.

Q.Would it not be fair to say that in those mines the stopping of work, for a short time at least, is also a common every-day occurrence? A.Yes.

Q.In these circumstances work is stopped until such time as it is found that any gas remaining is of such concentration as to be inconsequential? A.Yes.

Q.And then work goes on? A.Yes.

Q.And so far as the gas methane is concerned the problem is to ensure so far as possible that it is kept away from the source of ignition? A.That is correct.

Q.And specifically, to keep it away from working machines? A.Yes.

Q.Because they are suspect as a possible source of ignition? A.Yes.

Q.Now I want to ask you some questions about percentages. There is, is there not, a distinction between the percentage which may be shown on a device, and the percentage which may be found in the general body of the air? A.Yes.

Q.For example, you may find that there is methane emanating from a particular point in the mine? A.Yes.

Q.And it may show at that point a high concentration? A.Yes.

Q.And as you go further from that point you find that the gas is eliminated by the general body of the air until it becomes insignificant? A.Yes.

Q.And similarly, I suppose, you can detect a layer of inflammable gas which shows a reasonably high percentage in that layer?A.Yes.

Q.And this once again is different from the percentage in the general body of the air? A.Yes.

Q.Would it be fair to say that by and large the person carrying out the test in an area like the Illawarra area is primarily looking for two distinct gases: the C.O.2 and the methane? A.That is correct.

Q.And when you went down the other day and made the test which you have indicated to us, you were looking specifically for the gas known as bottom gas? A.Bottom gas and gas in the general body of --

Q.But you had reason to suspect -- ? A.Yes.

Q.-- the presence of bottom gas in this place? A.Yes.

Q.And for that reason you took specific tests to establish its presence there or not? A. That is correct.

Q.What I want to come to is this - we live in a real world with human beings - is it the situation that if you were not specifically looking for bottom gas, using the equipment which is generally used today, you might very easily miss its presence? A. That could be so.

Q.See, I am trying to get the picture before His Honor of the deputy who has got a job todo? A.Yes.

Q.He is inspecting a number of places on a number of occasions. In practice, would he make a specific test to see if there were bottom gas in a particular place if he had no special reason to suspect its presence? A. Well, he is required to test for noxious and inflammable gases; but because of the special circumstances that you have enumerated whereby methane is the most common gas and is normally found at roof level, unless a fair search for gas is made it could be that he could miss the bottom gas.

HIS HONOR: I do not understand. You say that a deputy working in mines where bottom gas could be found such as this - one may miss bottom gas because he does not look further, because he does not look for it?

MR. REYNOLDS: Would Your Honor allow me to go on to the next question? It may answer what is in Your Honor's mind.

HIS HONOR: Yes. I am a little confused by the answer.

MR. REYNOLDS: Q. Although it is known that bottom gas does exist in these South Coast mines -- ? A.Yes.

Q. -- is the establishment of its existence a common thing or not? A.No.

Q.What I am putting to you is that its occurrence is so rarely established that although if you try specifically to find it - in practice this has not been what was done in the past? (No answer.)

HIS HONOR: Q.Do you understand that question? A.No - I followed the line of thought from Mr. Reynolds, that bottom gas is not oftentimes found, in that we are human and that to err is human, and that unless one is conscious of looking for this bottom gas on every occasion, one might just miss it.

Q.Let me ask you this question - I do not want to interrupt Mr. Reynolds but I have got to clear this up in my own mind.

Do you mean that you would not expect a deputy to look for bottom gas in this mine? A.I would.

Q.You would expect him to? A.Yes.

Q.You mean then that having looked for bottom gas, he could easily miss bottom gas? A.No. If he looked for bottom gas, the occasions of his finding bottom gas would be far less frequent than finding CH4, which is the more common gas in the pit.

Q.And is that because it occurs less frequently? A.Yes.

Q.Than CH4? A.Yes.

Q.Or has the fact that it is difficult to detect when it does occur something to do with it? That is the confusion in my mind. (No answer.)

MR. REYNOLDS: Q.Do you follow His Honor's question? A.Yes. It is (a) difficult to detect and (b) it is not commonly found.

HIS HONOR: Q.Not commonly found? A.Yes, so that --

MR. REYNOLDS: Q.So that would I be right in suggesting to you that those two factors can combine to cause it to be missed when it in fact exists? A.Yes. That could be missed, although what one should not disassociate from the bottom gas - the property of being able to be detected by other senses. You have sometimes to smell it or sometimes taste it, you can.

Q.That is CO2? A.Yes.

MR. SULLIVAN: There is just one thing - the phrase "bottom gas" has been used without being defined. Does my friend,Mr.Reynolds, mean Illawarra bottom gas, which is a combination of methane and carbon dioxide - ?

HIS HONOR: I take it we are talking about the same thing.

MR. REYNOLDS: You mean Illawarra Gas, the mixture of the two, not CO2, but also could be called bottom gas which stays on the floor because of its weight.

HIS HONOR: When we talk about CO2 we mean CO2; when we talk about "bottom gas", we mean "bottom gas".

MR. SULLIVAN: You mean Illawarra bottom gas?

HIS HONOR: Illawarra bottom gas.

. Q.The deputy does walk around with a lamp in his hand? A.Yes.

HIS HONOR: Q. It has been suggested to me by Mr. Buck that if bottom gas were, say at a height of about a foot or perhaps a little more from the floor, he would be aware of something there which contained carbon dioxide because his lamp would suffer? A.Yes.

Q.Assume that you found, if the lamp in fact, the flame got dark, it may ob iously detect methane? A.Yes.

Q.But assuming that if you found the lamp flame start to go down, he must immediate say "Carbon dioxide"? A.Yes.

Q.Should he not then say, "There may be some methane mixed with this"? A.Yes. That would be a wise precaution.

Q.What would you expect the deputy to do, as the Mines Inspector? A.I would expect him to test for CH4 and for CO2.

MR. REYNOLDS: Your Honor will appreciate that I am not concerned to excuse anybody, but to expose to Your Honor for Your Honor's consideration possible weakness in what tests there have been.

HIS HONOR: I could see that line coming.

MR. REYNOLDS: If it is evident that people have got lax because of the common occurrence, it may be that there has got to be some specific rule in the future that you have to assume the presence of methane gas, and it may be that the human reaction has been the opposite to that, to make the assumption that it is merely CO2; and this may be within Your Honor's recommendations.

May I pass to another matter: that is to give some general ideas about the mining engineering problem of pillar extraction?

Q.Would you agree that pillar extraction always presents more serious problems of mining engineering than solid work? A.Yes.

Q.Would you also agree that in these mines at least it has been a common practice to drive two or three headings initially, and after the completion of those headings and the requisite cut-throughs, to exploit the coil found, to be found to the right or left of those headings when retreating? A.If you are looking in retrospect over a period of years -- ?

Q.Yes. A.I would say that this latter aspect of coal to the right or left has been a more recent development.

Q.Over the last four or five years, do you mean? A.Yes. To my knowledge. I was not with the company before then.

Q.But during that time you have witnessed this method of winning coal? A.Yes.

Q.And the practice has been to complete the solid work first? A.Yes.

Q.And then as I used the phrase, to go to one side by driving a cut-through or an extent to a cut-through to one side or the other? A.Yes.

Q.And thereafter to create pillars in that side and extract the coal from the side as well as from the original workings in a straight line, retreating? A.Yes.

Q.Substantially a straight line, do you mean? A.Yes.

HIS HONOR: You are talking about a right-angle cut at the top -- ?

MR. REYNOLDS: Yes.

Q.What I am putting to you is that in relation to 8 right forward, that is not untypical of what I have been discussing with you, leaving out ventilation for the moment? (Indicating plan). A.Yes, leaving --

Q.That you drive your three headings we have had and cut-throughs, and that you see solid work? A.Yes.

Q.Having got as far as you intend to go, then the project is undertaken of winning coal from a flank of those headings either right or left? A.Yes, but it does not necessarily follow that when one has driven headings out, then one should go to the right or the left.

Q.No; but this is the system of mining which for good or bad has developed in these mines in the Illawarra District? A.Yes.

Q.And then you extract the coal from the side as well as from the original work as you retreat? A.Yes.

Q.So that you have a line of goaf developing behind you, not only in the original area but in the additional area? A.Yes.

HIS HONOR: Can you explain that to me so that I may understand it? You talk about the place here on one of those larger ones. (Indicating).

Q.There is a process of winning coal? A. At the top. (Indicating).

MR. REYNOLDS: What I was putting was that the three headings are driven to a point which is predetermined or which is dictated by this in this case, as I understand it, a fault.

Instead of just exploiting that area to gain the coal in pillar extraction, he is trying to take it from one side or the other as you retreat.

HIS HONOR: What do you do then?

MR. REYNOLDS: Here it is, we will show Your Honor. (Indicating on plan).

HIS HONOR: Could you refer it back to the larger one for the time being? Do you see where that has been done? That has been done with that (indicating)?

MR. REYNOLDS: It has been done further.

HIS HONOR: That is your heading. Those are your three headings gone through (indicating).

MR. REYNOLDS: They in fact went up here (indicating).

HIS HONOR: Where on that is this area that you are speaking of to the left? Are you speaking about the same thing, the one going right up? (Indicating).

MR. REYNOLDS: That is part of it.

HIS HONOR: What happens? This is something I am not quite sure about, up to the top of that where in this case the miner was working. Assume he keeps going: you have now got a very large pillar?

MR. REYNOLDS: Yes.

HIS HONOR: What is the next step?

MR. REYNOLDS: Two things can be done: either you can put another cut through there in that way, or you could convert it into working a pillar. Here they were taking it from one particular point of time from this place in here.

WITNESS: Yes.

MR. REYNOLDS: Q.They were cutting a shift in here (indicating)? A.Yes.

Q.So that we could get it on the notes this way - you are familiar with this scale plan (indicating)? A.Yes.

Q.You know it to be a copy of the official mine plan which shows this working? A.Yes.

Q.Would you understand it to indicate that a cut-through was driven numbered 2? A.Yes.

Q.Wait until I give you a copy.

MR. REYNOLDS: Your Honor has one, I think,

HIS HONOR: Yes, there is one. It is amongst the exhibits, I think.

(Plan handed to witness. Mr. Reynolds returns to Bar Table.)

MR. HERRON: It has not been tendered yet.

MR. REYNOLDS: We will tender one.

Q.Would this indicate to you, Mr. Longworth, that the cut-through, if I may call it that, No. 2, has been driven as an initial step of the exploitation to the left? A.Yes, I follow.

Q.Do you agree with that; and that from there there has been an attempt to extract as much coil as possible from the area numbered 7? A. That would appear to be the case.

Q.And that at some point of time whether before or after the extraction of the area 7, another heading has been developed, numbered 1? A.Yes.

Q.And by that sort of process the coal to the left of the original heading, so far as it is possible, has been extracted? A.Yes.

Q.Would you understand it to be a process whereby the line of the goaf progressively comes towards the foot of this plan until we find it in the position where it was on the 9th November this year? A.Yes.

MR. REYNOLDS: Does that give Your Honor a picture of it?

HIS HONOR: I think that is clear.

MR. REYNOLDS: Q.The extraction of the pillars in the original solid work would have to commence in-by, would it not? A.Yes.

MR. REYNOLDS: Does Your Honor follow that: that if you wanted to take the coal in, say, the pillar here numbered 4, you start in-by and work -- ? A.Yes.

Q.-- out-by; and the reason for that is, I suppose, that the roof is going to be collapsed behind you, and if you went the other way you would get into a hopeless situation? A.Yes.

MR. REYNOLDS: Does Your Honor follow that?

HIS HONOR: Yes.

MR. REYNOLDS: Q.So you are collapsing the roof behind as you moveout-by? A.Yes.

Q.It is well known, of course, as we have heard here, that there is what is technically called gas make in the goaf? A.Yes.

Q.Gases generated in the goaf? A.Gases are liberated and contained in the goaf.

Q.I gather it is often referred to as gas make? A.Yes.

Q.This provides for the roof control, one of the problems of pillar extraction? A.Yes.

Q.This gas which is in the goaf? A.Yes.

Q.Whatever way you do this, there comes some point of time when the machine is operating right alongside the goaf line? A.That is the case.

Q.So that leaving out questions of ventilation, when the coal from the pillar in which the words "shuffle car 67" appear, the machine is going to be working at the rear of that pillar (indicating); right alongside the goaf line, is it not, at some point of time? A.Yes, at some point of time the machine must be --

Q.Likewise it will be working in the same position in the pillar where the words "shuffle car No. 40" appear? A.Yes.

Q.I suppose you would agree that if possible goaf gases must be kept away from the working places? A.Yes.

Q.But of course, it is not always possible? A. That is so.

Q.And when one says that, that they should be kept away if possible from the working places, this is the thing to be desired if it can be consistently with the solution of other problems. Do you follow my question? A.Yes.

Q.Let me put this to you: there are more problems in mining engineering than ventilation? A. Yes, that's right.

Q.I shall go back to the question if I may phrase it as nearly as I can the way I did before. The keeping away of goaf gases from the working places must be sought so far as it can be consistent with the solution of other mining engineering problems? A.Yes.

Q.May I put this to you as a general proposition, that no matter which way you circulate the air, there must be a point

of time when goaf gases tend to circulate in the working places? A.I would not go as far as to make as broad a statement as that, except that it can happen. You said that it must be.

Q.Yes; and I am prepared to press you on that, that it must happen at some point of time unless you repeat reversing your airway? A.You would have to lead on from there.

Q.Well let me put to you what I suggest. (Approaching). You have expressed the opinion that if this development which is going on in 8-right on the left were to be undertaken that it would have been better (and I think these are your words) if the air intake had been in A heading and the return in C? A.Yes, it would have been a better system --

Q.A better system? A.Yes.

Q.You specifically used the words "would have been better" for the reason that it is not possible to be absolute and say it was the only way, is it? A.It was not the only way.

Q.Let us then assume that this operation was going on, and the airways were reversed and the in-take was on in A and the return in C? A.You are putting forward now an alternative to the system that was in use, not specifying whether that was the best system -- ?

Q.No. I am assuming that the coal was being won in this way; and the question arises as to what was the best way in the circumstances to win it. A.If you are going to refer to alternatives, that might not necessarily be the best alternative.

Q.No. I understand that. But let us deal with the question of the reversal of the circulation, air? A.Yes.

Q.Because I think you did put that forward as being preferable to the way the air was circulated in this case? A. Well, I referred to several different methods.

Q.But do you -- ? A.Yes, I did say --

Q.Do you say it is preferable or is this a very open question? A.I said that.

Q.Do you adhere to it, that it would have been preferable to have reversed the air? A.Yes.

Q.(Approaching). Might I put this to you? If you did reverse the air as you come to extract the coal from the pillars in the original work, the men working there would be in substance in the same position as the men in this case were working left of the heading, would they not? (No answer.)

Q.Because the in-take air would be coming past the goaf here, would it not (indicating)? A. When you take those pillars first?

Q.Yes. When you take those pillars? A.Yes.

Q.When you come to here (indicating)? A.Yes.

Q.These men are being subjected to air, currents of air which -- A.No, not necessarily.

Q.Not necessarily? A.No.

Q.Why not? A.Because if the return is on the top side then the tendency would be for the air to go around the intake into the

return. The pull would be from the machine and not towards the machine.

Q.The pull of what? A. The pull of the air would be from the machine into the goaf.

HIS HONOR: Q.I don't quite understand that, Mr. Longworth.

Assume you get a position where the men have to work somewhere between the present working place and what is now the intake airway, but it would not be the intake airway in yours; it would be the return airway. Would not they be subject to the same conditions as the men who were working under the same conditions as obtained at the time of the fire? A.No.

Q.You say gases were being pulled away in some way? A.Yes.

Q.Where to? A.Into the return. You have now changed the return from one side to the other.

Q.True. But they are presently being pulled away from the airway into the return. The only different factor really is the position of the men to compare with the return airway or the intake airway. Put the position between the two, say about half-way, as they must get ultimately when they start to take away the other things. Aren't you creating exactly the same problem or has your solution made any difference to the problem? A.It has improved it.

Q.What is the improvement over the present situation? A.Because the return instead of being on the left side is on the right-hand side.

Q.What is the position? A.It is still pulled into the return.

Q.The difference is where the men are? A.No. It is now the pull of the air from the intake into the return, and it must cross the area where the coal - the air that is going down into the men, the working place.

HIS HONOR: Q.I am not an engineering or mining expert, but what I do not understand is this: Does it matter what happens when you have got your men half-way between the two airways? Are you not one way or the other pulling air across? A.No, the air can be taken on the back side.

MR. REYNOLDS: Q. Approaching Exhibit A. I do not know that we are at cross purposes. Would you make the assumption that the air is coming in the A heading. It would circulate, and assume we are working here. If you are going to have your men work at the in-by end of the pillar where shuttle car No. 40 is marked here, you must pass air along the edge of the goaf to ventilate that face, must you not? A. Yes, but you would not necessarily need to work along the edge of the goaf. You could come back and split the pillar and go that way.

Q.But at some point of time you have to work adjacent to the goaf? A.Yes, but -

Q.Just a moment; and whenever you work adjacent to the goaf you have to ventilate the working place? A.Yes.

Q.By air which comes from A heading and goes out C heading, is not that so? A.Yes.

Q.And that air, before it reaches the working place, will have had to have traversed a point where the goaf gases were accessible to it; that is the point I seek to make? A.Yes, well -

Q.Do you agree with that? A.No. I still maintain that by putting the return on the top side you have a better -

Q.Well, maybe we are not disputing that at the moment, but I want to put my question to you again and have your answer to it. You do not of course have to agree with me, but you appreciate there can be other views about this thing, do you not? A.Yes.

Q.What I want to know is this, that whichever way you have the air circulating there will come a point of time when the air circulating past the working place and ventilating will have previously have been exposed to the entry of goaf gases? A.This could happen but not in all cases.

Q.Would you agree that almost inevitably there is some place where this will happen? A.It could possibly happen that way.

Q.Have you yourself investigated to its logical conclusion the proposition of reversing the airway in this case? I mean, have you followed it out as a practical proposition and seen the implications? A. Well, don't push me into that.

Q.I do not want to push you into anything? A.If we sat down and said "Well, this system has its weaknesses but is there any other system which would be better?" I would not necessarily choose to follow this one of reversing the air. There are other systems besides that, but since you have chosen this one -

Q.I appreciate that, but I can only examine one at a time, do you follow? A. Well, since you are talking about this one, could you put your question again? (Question read by Court Reporter). Not to the degree where we could debate the point.

Q.And of course you would agree it is quite impracticable to reverse the air flow every time you find a situation where the men might be exposed to partially contaminated air? A. Well, I

would say that the system then in that particular case would not be entirely suitable.

Q.And would you agree with this, that when you do get this situation where the working place could receive ventilation which had been in some measure exposed to goaf gases, that you have to take particular and specific measures to lessen the problem? A.Yes.

Q.You can use things like brattice screen to try to improve the ventilation? A.Yes.

Q.You can indeed use booster fans or auxiliary fans? A.Yes.

Q.And you can use bleed tubes and air crossings? A.Yes.

Q.To deal with the particular situation that may arise? A.Yes.

Q.So far as ventilation is concerned, I think you have agreed with me that fundamentally it is desirable to keep goaf gases away from the working places? A.Yes.

Q.Would you agree that in the situation in which we find ourselves on the 9th November there were essentially two working places? A.Yes.

Q.The place and the shunt? A. Well, there was a working place where coal was being won and there was a shunt that was part of the road that was being used as a shunt to allow one car to pass the other.

HIS HONOR:Q.For the purposes of this Inquiry there were actually two places where men were working? A.Yes.

MR. REYNOLDS: Q.The shunt and the face? A.Yes.

Q.When I say the face, I mean where the miner was. A.Yes.

Q.I want you now to think about this, if you can, not on the basis of hindsight and by that I mean the natural tendency of all of us to be wise after the event, but to look at it as it was on the early morning of the 9th November. The bleed tube you would regard as an attempt to ventilate the shunt working place? A.Yes.

Q.And that, coupled with the brattice, what would you call it, not a stopping, just a bratfice? A.Yes.

Q.Was, on the face of it, a reasonable means of ventilating that shunt? A. Well, I think that it was inadequate to a degree.

Q.We know now that it was because of what happened, but I am asking you if you can to project your mind to the situation as it stood before this tragic thing happened? A.Yes.

Q.Would you not agree that it appeared to be a proper ventilation of the shunt? A. Could I answer that by saying it would in all probability have appeared to the person who did it to be a reasonable way to overcome the -

Q.I do not think that holds the solution to our problem here. Obviously it did? A. Well, I might not have done that. I might have used a brattice -

Q.I suppose no two people would solve a ventilation problem in the same way? A. Well, there are two alternatives. There is no reason to say that two people would use the same one.

Q.But what I am asking you is that looking at it objectively, it appeared to be a reasonable and proper provision for ventilation of that shunt? A. Well, I would have expected the deputy or the person who undertook to ventilate the shunt in that way that there must have been some condition existing there which required the use of a means for ventilating and that, having adopted one means available to him, then I would expect him to have checked the efficiency of the means that he had adopted.

Q.What, by testing with a lamp? A.Well, is that why - is that the position?

Q.Is that what you mean then? You must not ask me questions, you see. Is that what you mean? A.Yes, well, yes.

Q.Let me then put this to you, that if you had the brattice, bleed tube and periodical testing by a deputy, would you think that was in the circumstances a reasonable measure to provide that the shunt was properly ventilated? A.If following the making oftests or the efficiency of the system the place had been considered free, then it would have been all right.

HIS HONOR: Q.Do your answers to Mr. Reynolds assume that the tester had found methane, for instance - whether in the form of bottom gas or on its own? A. Well, I am assuming that some reason has been detected for requiring the use of this bleed tube and I can only assume that that reason would be that some noxious or inflammable gas or both or combination had been found.

Q.You have in mind when you give your answers that the tester may have discovered what you detected under the simulated conditions? A.I do not know - if the tester had found, was of the opinion that he had found noxious gas, that would have the same effect providing noxious gas was in a prohibited quantity.

MR. REYNOLDS: Q.I suppose one could make the assumption that the person who put it there was seeking to draw gases which would be found at floor level and not at roof level? A.Yes.

Q.Because of the position in which we find the opening to the bleed tube? A.Yes.

Q.Well, would you not agree now that assuming the proper steps were taken for detection, this was on the face of it reasonable provision to ventilate the shunt? A. It must have appeared that way to the bloke who put it there.

Q.But I am not asking you about that man. I am asking about you; whether you would not necessarily have done it the same way, but whether you think it would be by objective standards a reasonable way to do it? A.I qualify that by saying that if I were having to do that because of some particular reason, having done it I would check that it was satisfactory.

HIS HONOR: Q. Test it this way: assume that you and the deputy had found what you found later on and you said to the deputy "Get rid of that gas by ventilation" and the deputy then had the piece of brattice and the bleeder tube put in the position in which he did have them, and you had to inspect it, would you have said that was a reasonable way of dealing with the problem? A.Well, it would depend upon the - assuming now there is some contamination of the shunt which requires ventilation, it would depend on (a) the amount of contamination and (b) the quantity of air to deal with the situation. Now the bleed tube is limited to the amount of ventilation that it will direct into the place and if the bleed tube had to be fitted and that was ventilating the place adequately then it would have been all

right. But if it had been that there was more make of gas or whatever you like, requiring more air, you would have then to adopt, to get over the initial situation, some means whereby you could direct more air in the bleed tube. Does this cover what you mean?

MR. REYNOLDS: You say it was largely a problem of detection, is that what you mean? A.Yes.

Q.Because, you see, the theory which you have propounded involves by reason of the change of barometric pressure, such an emanation of gas from the goaf that this bleed tube could not cope with it? I mean, that is inherent in your theory, is it not? (Objected to by Mr. Sullivan).

Q.Is that inherent in your theory, that the fall in barometric pressure caused such an emanation of gas from the goaf that the existing arrangement, the brattice and the bleed tube, could not cope with it? A.No, I did not say that.

Q.I did not ask you whether you said it. I asked you whether it was inherent in your theory? A.No, at this stage what I was saying was that if the bleed tube had been there and it was ventilating the shunt adequately, then to get over that initial situation it would have been all right. But if -

HIS HONOR: If the bleed tube and the brattice cleared up the problem, that would have been all right. That is what that answer means.

MR. REYNOLDS: I think I have explored it sufficiently to understand the witness' viewpoint, and that is all I can do.

Q.May we just make this clear? (Approaching with Exhibit A). With the air coming in as it was in C heading and making down to No. 2 cut-through, any gas which came out of the continuation of C heading and B heading would be, you would expect, diluted by the stream of air? A. Well, it would mix, anyway, depending -

Q.Then that would dilute it in some measure, would it not? A.Yes - in some measure, yes.

Q.And the problem would seem to be that this shunt area provided a still pocket in some measure a dead end; that is what happened, is it? A. Well, it was a dead end in that it was being treated so.

MR. SULLIVAN: You mean after it is blocked off by brattices, do you, Mr. Reynolds?

Mr. REYNOLDS: Yes, exactly.

Q.So that we can understand it fully, I want to ask you your theory as to the combination of circumstances which led to this fire. I suppose you have discussed this at some length with other Departmental inspectors, have you, this question of what was the cause of the fire? A.Yes.

Q.With which other inspectors have you discussed it? A.My colleague, my immediate superior -

Q.Who is that? A.Mr. Menzies - Senior Inspector Menzies.

Q.With whom else? A.Mr. Griffiths.

Q.He is a colleague of yours in the southern area, is he? A.Yes.

Q.Anyone else? A.Oh, I don't know.

Q.If you do not know, who would? What about Mr. Muir - have you discussed it with him? A.The subject has been mentioned, but I have never sat down to discuss or propound a theory.

Q.When the subject has been mentioned, have you not discussed with him in considerable detail a theory as to what happened? A.Well, no.

Q.Have you discussed a theory with him at all? A.Yes.

Q.At what length? A.Not a great deal.

Q.Have you always held the same view? A.On what?

Q.On this occurrence? A.I don't get the drift of your questioning.

Q.Never mind about the drift. It is the content of it that matters. Have you always held the same view about this matter, the cause of it? (No answer.)

MR. SULLIVAN: The same as what, and which part of the matter? We have discussed the shunt and the ventilation. It must depend on which part.

HIS HONOR: I thought your question, Mr. Reynolds, was limited to the cause of the fire. Has he yet expressed his view here, though, as to the cause of the fire? I do not recollect the witness saying "The fire was caused in this way."

WITNESS: No.

MR. REYNOLDS: Q.May I ask you the question in a specific form: Do you have a view as to the cause of this fire? A. Well, yes, I have.

Q.Have you always had the same view? A.Yes.

Q.And I take it your view is that there was an accumulation of Illawarra bottom gas in the shunt area, is that so? A.Are you telling me what my view is?

Q.I am asking you. A.If you ask me what my view is, I would say -

Q.No, please do it my way. Is it part of your view that there was an accumulation of Illawarra bottom gas in the shunt area? A.Yes.

Q.And is it your view that the deputy had either failed to detect it or it had got there after his last inspection? A.I don't know when it got there but it was there.

Q.It follows, does it, or I suppose there are three alternatives, that he discovered it and did nothing about it - but I mean, is it inherent in your view that there was an undetected accumulation of Illawarra bottom gas in the shunt? A.There was an accumulation of Illawarra bottom gas in the shunt.

Q.You would not know whether it was detected or not? A.They tell us it wasn't.

Q.I beg your pardon? A. We are informed that it was not detected.

Q.And is it your view that this accumulation was associated in

some manner with a sharp drop in barometric pressure? A. I think that there would be a tendency for a gas making towards that shunt, to expect a drop in barometric pressure. It would have been on the barometric - associated with a barometric reduction of barometric pressure, there would have been more given off than otherwise.

Q. And would you envisage the situation that the bleed tube at the critical moment of ignition was full or partially full of Illawarra bottom gas? A. There would be some in there.

Q. Now I want to pass shortly to another matter and that is the matter of the alternative. I think you consider that there were two alternatives which were feasible in respect of the ventilation problem in this case, do you not? A. Several.

Q. Well, unless I am mistaken I think you mentioned two -

HIS HONOR: I think that may have been qualified by the answers of the witness.

MR. REYNOLDS: Q. We have dealt at some length with the question of which side the air came and on which side it went out. Now there is another matter that could have been invoked, and that is the matter of a bleeder - a bleeder through the goaf. You referred to that in your evidence, did you not? A. Yes.

Q. Can we define for this purpose a bleeder as being an opening which is external to the area in which the pillar extraction is being undertaken and which connects from the goaf to the return airway? A. That is one definition of a bleeder.

Q. Is it an accurate one for the purposes of this problem? A. Well, one of the problems associated with this is the ability to be able to ventilate the edge of the goaf and in this case that would be a bleeder as well. You bring a bleed of gas up from the goaf in which case you could be - I will withdraw that and not pursue that line of thought at this stage.

Q. Was that running into a dead heading? A. No, I was going to suggest we could get into all kinds of strife with this.

Q. Well, is my suggested definition sufficiently accurate for present purposes? A. Yes.

Q. If we can, let us deal with it on this plan so that it is clear to His Honor. If we take the opening which is marked in a purple colour 1 - do you follow that one? A. Yes.

Q. And if that having been driven, the working places are inbye of it, that could be called a bleeder which took the gases from the goaf area into the return airway outbye of the working places? A. Yes.

Q. And this is a method which you have seen adopted in these mines over the last five years? A. Yes.

Q. I understand you yourself have used that method when working for one of these mines, is that right? A. No, not personally.

Q. You personally have never used that system? A. It has been used.

Q. But not by you? A. No.

Q. It is an expedient which enables an outlet of goaf gases to a place which by-passes the working places? A. Yes.

Q. And do you regard it as within the bounds of reasonable mining practice to use that method of eliminating or reducing goaf gases? A. It is a method.

Q. I know it is a method - A. But it is not necessarily the best or the only one.

Q. I did not ask you whether it was the best or the only one. I asked you whether it was a reasonable one? A. Reasonable - I would agree that it is reasonable, in that it is better to have that than not to have it.

Q. This is not a completely exact science, mining engineering, is it? A. Well, it is not a pure science, not like some sciences are pure.

Q. Is this first of all not a reasonable way to seek to overcome the problem of drawing off gas from the goaf into the return airway? A. Yes.

Q. Were you in Court when Mr. Lee spoke about a method the Company evolved between the Mines Department and this mine? That was on the first day Mr. Lee opened that matter? A. No.

Q. If we go back to this Colliery chart, would you not agree that the set-up of the extractions left of the three headings indicates a system of bleeders? A. Yes.

Q. And would indicate that from time to time gases from the goaf would have been conducted into the return airway possibly while the working places were inby of the point of entry into the return airway? A. Yes.

Q. But at this point I suppose it is obvious that until the working place had holed into the goaf there was no present bleeder existing? A. Yes.

Q. So I suppose it would be right to say that at this particular time the bleeder system was not being strictly adhered to? A.Yes.

Q. But of course when you are cutting the bleeder itself - do you follow me? A. Yes.

Q. You are like a scaffolder erecting a scaffolding - you have not got any scaffolding for yourself, have you? A. No.

Q. And until you hole it it cannot act as a bleeder? A. That is right.

Q. If we assume that for some reason, good or bad, the company extracted the coal marked 11 before putting a bleeder in, then the only difference to the men working in making the bleeder would be that they were closer to the goaf than otherwise? A. As regards the proximity, yes, but you have the effect of the situation we have where any make of gas there goes down in the working place.

Q. Here? A. Down this way (indicating) and then of course you have the awkward situation of holing into the goaf. These two are disadvantages - they are to an extent the disadvantage that I referred to earlier.

Q. But of course you would be the first to agree that the problem of roof safety is just as important to the safety of the men as is ventilation? A. Yes, I suppose if a stone fell on a bloke and killed him he would be just as dead.

Q. That is right, and you would agree that the mine management

has to consider the both problems to find a reasonable solution? A. Yes.

Q. Now, did you in the mine within the last week carry out or take part in the carrying out of tests to see if there was an area of low pressure in the intersection? A. Yes.

Q. That is the actual intersection of No. 2 cut-through and A heading near the shunt, is that right? A. Yes.

Q. And did you find with the fans running there was no significant lowering of pressure in the intersection? A. Yes.

HIS HONOR: Q. Did you extend that test to measuring the area of pressure at the mouth of the bleeder tube, measuring whether there was a lowering of pressure in the area near the mouth of the bleeder tube? A. Yes.

Q. Did you find any significant lowering there? A. There was a difference in pressure but it was not significant, but -

Q. When you say significant, significant for what purpose? A. Well, I forget the exact figures. My colleague undertook the tests and I understand he is going to give evidence on this.

MR. REYNOLDS: Q. I will not trouble you any further? A. But it was insignificant compared with, say, half an inch over the goaf.

Q. Part of the original theory was, as I understand it, that there would be such a lowering of pressure in the area of the intersection of A heading and No. 1 cut-through and that this would tend to draw in the goaf gases to that intersection area? A. I didn't -

Q. I do not say you did, but this was one theory -

MR. SULLIVAN: It is not his theory. I submit it cannot be got this way, Your Honor.

HIS HONOR: Mr. Lee apparently had instructions of that kind from somebody or other.

MR. REYNOLDS: That is right.

Q. I am only really drawing attention to it because I understand the tests you participated in do not substantiate this point? A. No.

Q. You have found in matters of safety that you have had in the past co-operation from the management of this mine? A. I have.

Q. And what would you say about their general attitude and consciousness of the question of safety of the men? A. Well, in general, they are endeavouring to promote safety by safety campaigns, they have established a means of accident prevention or of a system whereby accidents and their various causes can be reduced by job study methods to find weaknesses. I am speaking generally. They come from the organisation and this one was one of several. They have a system whereby they find out the weaknesses in performance of jobs or danger points and try to have the jobs performed in an alternative method to overcome the weaknesses which have been found. But in particular at Bulli I know that Mr. Stone, the manager, has recently been trying to promote safety in the mine as to various gases and there has been some degree of success to that end.

HIS HONOR: Q. What co-operation from the men themselves do these

measures receive? A. They are received well.

Q. You might be able to help me in this - I am not saying this as a condemnation, but I had thought that if you have a system of bonus payments and the men were receiving fairly substantial sums as compared, say, with other miners - I understand that is the position in this mine, is it? A. Yes.

Q. That there might be a reluctance on the part of the men to stop working at times of danger; is there anything like that here? A. No.

MR. REYNOLDS: Q. Did you observe the efforts of senior officers of the colliery on the afternoon you were down there to save these men? A. I did indeed. There were senior officers of the colliery on the scene of the fire and they had no need to be there. It was a voluntary effort on their part and they set an example of leadership by their presence and they had their wealth of experience and they were able to assist greatly in organising the work of rescue, and now you have mentioned that I would say that there was not one instance where a man refused to go and do some measure or contribute in some way to the effort that was being made to rescue these people. It was a quite commendable effort on everyone's part and it was the fact that there were men who were missing that was responsible for perseverance when had it not been for that, had there been no men missing, I think the area would have been sealed up and left. It was the fact that there were men missing, the object and the desire was to rescue them, even though the thought was held that it might be too late anyway. Nevertheless efforts were pursued until the bodies were recovered. Unfortunately we were too late.

MR. HERRON: No re-examination.

MR. SULLIVAN: This matter seems to have arisen now in view of my learned friend's question, which I projected at the beginning of the hearing. That was the general position of the colliery qua safety, after the fire.

HIS HONOR: Are you wanting to open up this whole issue? Can you refer me to the part of the transcript when that was raised? I think I was reluctant to embark on something of that nature because I said it was not in the terms of reference.

MR. SULLIVAN: It is the question of the speed of evacuation of persons in the colliery after the fire broke out - not generally, at this particular time.

MR. McNALLY: It is at page 22 of the transcript.

MR. SULLIVAN: Q. (by leave) Is it true that more than an hour after the fire started all the men were still down below in the mine? (Objected to by Mr. Reynolds) A. I did say I arrived at the mine sometime early after 1 o'clock in the afternoon.

MR. SULLIVAN: This witness would not know but I can call evidence on that later on, Your Honor.

MR. McNALLY: Q. (by leave) You mentioned earlier when expressing your theory as to the sequence of events, if I understand you correctly, that any gas which might have been there at the time of the ignition need not necessarily have been there a half hour before? A. I don't know.

Q. I mean it is a possibility, is it not? A. Could be.

Q. Could be? A. On the other hand, since then there has been detectable gas ever since.

Q. Yes, but I understand a fire itself will cause gases from the goaf to move up into the fire area. Is this correct? A. I would think that that would happen.

Q. So would you agree that it is a possibility that even if there were bottom gas there at 9.15a.m. when the fire commenced, it may not necessarily have been there a half hour previously? A. Could I say I would agree, I would come your way and say it might not have been there in that particular quantity.

Q. To what particular quantity do you refer? A. Well, I don't, I didn't - we are talking of the presence of gas, and in reply to your question I said I would think that gas could have been present but it is a variable quantity, it varies with so many things, with the barometer, for instance, it varies -

Q. Would you agree with this; it may have been present there a half hour before in an undetectable quantity? A. It could have been.

HIS HONOR: Q. I think you have already cleared up one matter I wanted to ask you about but perhaps I will ask you some more about it. You have spoken about testing for pressure which you yourself did not carry out and as to which I am to have some evidence? A. Yes.

Q. That is at the end of the bleed tube where it was near the brattice? A. Yes.

Q. Is there any actual suction - I dislike the word as well as others - but is there any suction at the mouth of the bleed tube? A. Yes.

Q. How strong is that suction? A. Well, you can feel it by putting your hand in front of it.

Q. Assume then that that is present at the mouth of the bleed tube, there must be air immediately in the vicinity of the bleed tube going in, being drawn into the bleed tube? A. Yes.

Q. Or putting it the other way, probably the proper way: flowing into the bleed tube? A. Yes.

Q. And of course in that area there will be a mixture of gases? A. Yes.

Q. Assume you have a bleed of gas, a leakage or bleed of gas from the goaf area around the brattice; would not that gas tend to flow in the direction of the bleed tube? A. Yes.

Q. That is the very purpose for which the bleed tube is put there, is it not? A. Yes.

Q. And as that gas goes does it not necessarily create a flow of air and gas from the goaf into the shunt? A. Well, I think I said earlier that I would believe there would be a tendency of a flow of the goaf towards that area and past the brattice even with the fans stopped.

Q. Would it not be better practice - and this of course may be a question of hindsight - to have put the bleed tube through the brattice or over the brattice in some way so as to bleed the goaf on that side of the brattice? A. Well, I rather think that the purpose of the bleed tube was to attract air from a pure source

across and to dilute the make of gas that was coming into the shunt.

Q. What was the pure source from which this air was to come? A. The air coming down No. 2 cut-through, the intake.

Q. But you are assuming that the intake air is coming into the shunt? A. It is going past it.

Q. But the mouth of the bleed tube is very close to the source from which the gas is coming? A. Yes.

Q. Do you regard that as bringing air from a pure source into the working? A. Well, it comes back as to whether it was adequate.

Q. And you say it would not be good practice to use the bleed tube to bleed the direct source of the gas itself close to the shunt by putting it through or over the brattice? A. Yes.

Q. And so tending to draw gases away into the bleed tube but from the shunt? A. No.

Q. You say that would not be good practice? A. I would rather subscribe to the point of view of bringing air in from the intake to neutralise the make given off from the goaf.

Q. There is another matter. You were asked some questions in your evidence - I think I may have asked them - about the distance in which the fire travelled in this area? A. Yes.

Q. I think you said the fire only went about half way down the shunt, is that right? It went as far as the brattice stopping, did it? A. Yes.

Q. But very little beyond it? A. That is right.

Q. This may be contrary to everything we have been talking about here, but could that suggest that the fuel which was consumed in the fire, in other words the gas, did not come from the goaf but in fact was a local product within the shunt itself? You see, if it came from the goaf would you not have expected the fire to have travelled back towards the goaf itself and further than it did do - in other words go in towards the goaf? A. I think we had this mixing of CO_2 which would mitigate against that, which would tend to dampen the effect of the inflammability of the CH_4.

Q. Do you mean that the CO_2 or the decrease of oxygen in the CO_2 being there would dampen the fire and stop it spreading back towards the goaf? A. Yes, I think so.

Q. Is that what you think happened in this case? A. Yes, but I think Mr. Donegan may be able to tell you better about that.

Q. Can you get a leakage of methane from the ribs of a place like the shunt? A. You can get methane bleeding off from ribs, but I would think not in this case.

Q. Why not? A. Well, there is not - the immediate area there had been de-gassed, had been driven and stood there, so I would rather think that the gas in situ would be very small.

MR. SULLIVAN: Q.(By leave, approaching exhibit "A") I think what I put to you the other day was that in A heading there was a current of air? A. Yes.

Q. Going outby? A. Yes.

Q. And that also would have tended to keep the fire back in the heading, would it not? A. Yes.

(Witness retired.)

(Luncheon adjournment)

JOHN LESLIE JAMES
Sworn and examined as under:

MR. LEE: Q. Your full name is John Leslie James? A. Yes.

Q. Where do you live? A. 5 Torokina Ave., St. Ives.

Q. You are the Senior Electrical Inspector of the Mines Department? A. Yes.

Q. How long have you been connected with the Mines Department? A. It is approaching 18 years.

Q. What qualifications do you hold in that position? A. I am a qualified mine electrician.

Q. That is some course which you must pass, is it? A. That is right.

Q. On Tuesday, 9th November you were contacted and told to come to the Bulli Colliery immediately and you arrived at the colliery at about 1.45 to 2 o'clock in the afternoon? A. Yes.

Q. I think you were contacted through the Chief Inspector of Coal Mines? A. Yes, the Chief Inspector.

Q. I think the Chief Inspector mentioned to you that there could be an electrical fault and that is why you were required to come down immediately? A. Yes.

Q. You went down into the mine at between 6 and 6.30 in the late afternoon? A. Yes.

Q. On arrival at No. 8 Right Panel it was impossible, was it not, owing to conditions to advance further than the outby edge of the fall in the cut-through immediately inby the shuttle car No. 67? A. That is right.

Q. Did you see some cables in that area? A. Yes.

Q. Would you just show us precisely where that position is? A. (indicating on Exhibit "A") In that intersection there.

Q. The intersection of B heading and No. 2. cut-through. What was the condition of those cables? A. The majority of the dielectric was burnt away.

HIS HONOR: Q. What is the dielectric? A. That is the insulating media immediately surrounding the conductor, and the neoprene sheath was charred and in some places completely missing.

MR. LEE: Q. Is that (shown to witness) a photograph taken of these cables to which you refer? A. Yes.

(Photograph tendered and marked exhibit "Q".)

Q. Which is the way to look at it? A. That way. There are the roof support timbers which are roof bolted.

MR. LEE: I will put a little arrow pointing up for later reference so that we will all know the top side.

Q. Then you noticed also that the timber supports were blackened as also was the roof strata, the only electrical cables and equipment that were available for your inspection being the outby of roof fall sections of the feeder cable, winch and shuttle car cables, winch and starter cable, the power transformer, hot water urn and pie heater? A. Yes.

Q. Those lastmentioned items were approximately four pillar lengths outby? A. Yes.

Q. You saw the foam plug plastic conduit put into operation? A. Yes.

Q. I think you then went up, did you? Did you go up to the surface then? A. When transport was available we returned to the surface, yes.

Q. Later on in the evening in company with the Chief Inspector and the Minister for Mines you went down underground again and took several photographs of damaged cable and personnel adjacent to the fire area? A. Yes.

Q. Would you look at this bundle of photographs which I show you and tell me whether they are the ones you took then? A. No, they are a bit later. If I may volunteer, the only photos that we took on that occasion were those two of the cables and then, as I say, of certain persons who were in the immediate vicinity.

Q. So we have already in evidence at least one of the photos which you took on that day at that time? A. Yes.

Q. On Thursday the 11th and Friday the 12th you were present at the colliery and I think you heard some of the investigation of witnesses taking place? A. Yes.

Q. On the Friday afternoon was the electrical investigation of shuttle car No. 40 and the area immediately surrounding commenced? A. Yes.

Q. You had had at that stage the statements from shuttle car drivers, Messrs. Hope and Mangles, also the electrical fitter, Barry Kent, and fitter Dale Jones and deputies Stewart and Walker? A. Yes.

Q. You drew certain conclusions from those statements. I will read it from your report, what you deduced, in order to explain what you did: "Each of the latter statements" - referring to the statements by Mangles and Hope, in the case of those two statements "indicated that there was no sign of fire or flame as car No. 40 commenced to shunt, but as the car entered the shunt heading, a flame, yellow in colour, appeared towards the leading or inby end of the car and then appeared to spread out as a blue flame. From these statements I deduced that an electrical open flash in the vicinity of the traction motors or associated connecting cables and the terminals may have occurred."? A. Yes.

Q. You also thought that the disc brakes were highly suspect due to possible overheating or friction sparking? A. Yes.

Q. When you inspected No. 40 shuttle car it was completely in the shunt heading? A. Yes.

Q. There were minor quantities of roof and rib debris on the car; the car was full of coal, and rib and roof debris had accumulated around the car? A. Yes.

Q. Additional roof supports had been set and several such supports were set on the car? A. Yes.

Q. External cabling on the car had been affected by heat from an external source; sections of hose pipe protective covering on cables were missing, having been burnt, and other sections were severely scorched? A. Yes.

Q. There was evidence of a quantity of slack shuttle car trailing cable adjacent to and on the outby side of the car cable reel? A. Yes.

Q. Would you tell us a little more precisely about that? A. Yes. That would be on the opposite driver's side on the outby end of the car. That would be almost at the corner of the pillar at the intersection, just inby the shunt from the corner.

Q. And that, in your view anyway, was consistent with the car having free-wheeled with the hydraulic power off? A. Yes.

Q. You get that from the slackness of the cable, do you? A. Yes.

Q. The inby end of the car appeared to have passed through a brattice screen as a roof bar above the car still contained brattice tacks? A. Yes.

Q. You have heard the evidence that there was a brattice there and that the position of the car was measured in connection with that? A. Yes.

Q. And that that conclusion seems to be justified? A. Yes.

Q. The ratchet locking device on the foot-parking brake was not engaged? A. No.

Q. You thought that that condition may have beenthe result of timber men's movement during recovery work or due to the ratchet falling off when the hydraulic line burst due to heat or fire? A. I stated that in fairness to the shuttle car drivers.

Q. They were possible explanations? A. Yes, they were possible explanations.

Q. I think you heard Mr. Mangles say in the witness box that he cannot really swear as to whether he had the brake on or not? A. I didn't hear Mr. Mangles evidence on that, no.

Q. You went on in your own conclusions, that the car had apparently overrun its normal shunting station as a stool normally used by the brattice man had been run over and was under the front end of the car? A. Yes.

Q. The stool did not appear to have been affected by heat and it was within 4 or 5 feet of the traction motor and ℄ disc brake.

Q. Most of the flameproof enclosures and cable glands were then dealt with by you in your examination. I think you brushed them free of coal and stone dust? A. Yes. There were several of us carrying out that work.

Q. But this, however, was what was done by the men doing it? A. Yes, that is right.

Q. Did you check the flanges with feeler gauges for excessive gaps? A. Yes.

Q. Would you explain that a little further? A. There were several

of us with a set of feeler gauges and I had asked that each flange be checked with a feeler gauge to see if it had been inserted in any of the flanges. We saw nowhere where it could have been inserted. There was no gap between the flanges except, or up to ten thousandths of an inch, therefore they were in order. We are permitted up to 20 thousandths.

Q. Then you made an examination of the cabling on the car to the extent that you were able to make it at that time? A. It was somewhat limited but we did go over all the external cables for gas flash.

Q. And through the examination you made then you were not able to detect any fault? A. No, no electrical fault.

Q. As maintenance had been carried out on the car during the dog-watch shift preceding the fire, the control box enclosure was carefully examined and studs checked for tightness? A. Yes.

Q. The studs were crimp tight only? A. That could have been due to the expansion of the excessive heat they had been subjected to.

Q. Your report goes on that it was sufficient to prevent even a partial insertion between flanges of a 0.01" feeler gauge? A. Yes.

Q.What does that mean? A. Well, they were still in a flameproof condition.

Q. And in their ordinary condition of tightness you would expect, in their proper condition, would you expect these to be crimp tight only? A. Oh no, it would have been a normal hand tightness of a spanner, say.

Q. The lid was carefully removed and between flanges examined for any sign of flame pass? A. Yes, it is possible, and an accepted practice when carrying out flameproof tests and looking for any weakness in flameproof equipment, you can note any area where flame has passed. There is a certain amount of soot left behind and at times it shows burn.

Q. Did you see any signs of any flames having passed between the flanges? A. No.

Q. With the assistance of a fitter you had the guard and brake calliper block removed from the disc brake assembly on the front opposite driver's end of the car? A. Yes.

Q. Could you point out on this exhibit the guard and brake calliper block which youhad removed? A. There.

Q. Which is it? A.That is the guard on the outside and that is the calliper block.

Q. Your report then goes on and I want you to explain this to me, that you obtained coked evidence of excessive heating on the brake block and accumulated debris on the side of the brake disc. What do you mean by coked evidence? A. Yes, perhaps I should have mentioned coke-like and not coked. It was slabs, if I may put it that way, of fine coal debris that had built up alongside the brake disc. It had taken the profile of the brake disc due to the compaction and the heating and it was quite crisp on the outside. It had a sponge-like appearance and you could get slight reflection of light from these sponge cavities which gave me the impression it had been coked and that was in thicknesses varying from half an inch to three quarters of an inch but then there was more free debris behind that. Now, I did put those in a hand rag which we had with us at the time for wiping purposes

and I put it on a vent tube that was lying idle on the rib side and I didn't collect those, I left them.

Q. However, you have given us an accurate description of what you saw? A. Yes.

Q. Now the fitter in the meantime, I think whilst you were examining that aspect, was removing the brake calliper block from the disc brake on the front end of the driver's side traction motor? A. Yes.

Q.While he was doing that, a Mr. Young, Colliery Electrical Engineer, noticed something foreign jammed between the disc brake and the drive shaft universal coupling? A. Yes.

Q. You then examined that closely and that was found to be a piece of wood which had been forced up from floor level under the car and was considerably charred and heat cracked? A. Yes.

Q.And that is the exhibit which we already have in evidence here? A. Yes.

Q. I think you took the view from what you saw of that at that point of time and from what had gone on before that there appeared here to be a likely factor causing the ignition in the shunt area? A. Yes.

Q. So you left the piece of wood in position and the area was fenced off and later on it was photographed, as you know? A. Yes.

Q. On Monday the 15th you again attended the colliery in company with Senior colliery staff including Mr. Martin, also the District Coroner, police officers, the Senior Analyst, Mr. Donegan, Mr. Bunch, Mr. Hodge, Mr. Inspector Longworth and Mr. Electrical Inspector Robinson, and you went down to shuttle car No. 40 again and all those gentlemen viewed the piece of charred wood lodged between the brake disc and the universal joint on the driver's side front traction motor? A. Yes.

Q. Some discussion took place at the scene there and I thinkthere was general agreement that that might be a cause of the fire? A. Yes.

Q. Subsequently with the aid of two diopter supplementary lens on a single lens reflex camera and flameproof electronic flash, photographs were taken of the brake assembly and the piece of wood? A. Yes.

Q. The film was processed in the film laboratory in the Scientific Branch of the Wollongong Police Station and I think we have some of those pictures here, have we not? A. Yes.

Q. After that the piece of wood was removed? A. I was not present when the wood was removed.

Q. Then your report at that time went on that permission was given to the colliery management to remove No. 40 shuttle car to the surface for further detailed examination? A. Yes.

Q. And also it was intended at that point of time that all remains of cables which were in the area at the time of the fire were to be further closely examined on the surface? A. Yes.

Q. I think it was at the site on that day, the 12th, was it not, you found this (indicating) - was it near the shuttle car? A. No, that was given to me actually by Mr. Young, Colliery Electrical Engineer, who had removed several pieces when the gate-end boxes

were removed from the fall area. That is the control boxes switch which controls the power on the trailing cables.

HIS HONOR: Q. Mr. Young handed you this; where had this been obtained from? A. The gate-end boxes which had been removed from under the fall just inby the section where car No. 67 was standing.

MR. LEE: Q. Would you show His Honor on the map where that point is? A. That is where they were positioned, where it is coloured on the various little plans and shown as electrical boxes JCS fans.

Q. You had a discussion with Mr. Young about it, did you not? A. He told me where he had recovered it and we had taken photos of the boxes from where that sample came.

Q. Did you take that sample somewhere, this one (indicating)? A. I brought it to Sydney for attending the Chief Analyst to find the temperature, probably, that it melted at.

Q. Did you take it out to any manufacturer's place? A. I did not take it out. I got in touch with Electrical Control Engineering, the manufacturers of the box, and they gave me the code number for the alloy of which that is made, an aluminium alloy, and from that we determined that it took a temperature of approximately 1100 to 1150 degrees F. to run that metal.

Q. So the manufacturers of this actual box told you of the component which that was? A. Yes.

Q. Then you say "We were able to deduce the melting point." Who was the "we"? A. Well, that was the moulders who moulded the - we had that information from the actual people who moulded the enclosure.

Q. Who moulded this, or as it was? A. Yes.

Q. And they told you 1100 to 1150 degrees is the melting point? A. Yes. That was through Electric Control Engineering.

(Piece of metal tendered and marked exhibit "R".)

Q. Are these (shown to witness) pictures of the boxes? A. That is the box from which this piece of metal ran.

Q. First of all are they pictures of the boxes? A. Yes. That is the same box as that one only taken on the end showing what had happened to the flanges under the heat conditions.

Q. Is that one a picture of the boxes? A. Yes.

Q. Could you just pick out the one which will best show us where this exhibit "R" came from? A. Yes. That is the removal of all that metal.

Q. These might ultimately go in as exhibits "S1", "S2", "S3" and "S4". On what is to be exhibit "S1", what is that? A. That is the piece which was in plastic flow.

Q. There is a portion of the circular coverplate which is missing? A. That is right.

Q. It is in that section from which exhibit "R" came? A. Yes.

(Photographs tendered and marked exhibits "S1" to "S4".)

Q. Was the place where that exhibit "R" came from under the fall area or just nearby? A. No, it was actually under the fall area and those photographs were taken after they were removed from under the fall. The fall was loaded up to that intersection and then they were dragged up to the intersection. They were in a position between the two headings in the cut-through.

Q. That was not the actual site of the fall? A. Not where those photographs were taken, no.

Q. Did you make some further inspections later on of the shuttle car? A. Yes, on Monday of last week.

Q. At that time where was the shuttle car? A. In the colliery workshop.

Q. It had been brought up? A. Yes.

Q. What form did your inspections take? A. Under the supervision of the Colliery Electrical Engineer, all cabling was removed in the presence of my colleague and myself.

Q. Is there some cabling in Court? A. There is some cabling but not necessarily the cabling that was removed on Monday.

Q. Perhaps you had better continue with what you were saying about your inspection last Monday. What did you find? A. We found no deterioration in the insulation of the type of cable with which the shuttle car was wired. There was considerable damage to protective hoses on the outside where it had been exposed to external heat but where it went through the ducts within the car both the hose conduit and the cables were in good condition. There were no faulty glands that we could find and generally speaking the electrical equipment appeared to have been in good order and condition.

Q. Just going back I think you did take some cable from the mine at one stage, did you not? A. Yes, there were two samples of cable taken.

Q. From where were they taken? A. Adjacent to the intersection where car No. 67 was stationed.

Q. That is Mr. Hope's car? A. As you were, I beg your pardon - car 40.

Q. Car 40, Mr. Mangles' car? A. Yes.

Q. What was the cable that you took from that area? A. There was a portion of the trailing cable and portion of the miner cable. Incidentally I didn't remove those - that was my colleague who had those removed.

Q. But you know that to be so and you can tell His Honor that that is the position? A. I can vouch for that, yes.

Q. Are those cables in Court? A. There are portions of them, yes.

Q. Would you look at this (handed to witness) - is that a portion of the cable that was taken? A. That is a portion of the miner cable.

Q. What did you see on that? Did you see something on it which made you test it or did you test it just because it happened to be there? A. That is a sample taken of the cable to see if the

sheathing was all neoprene or not.

Q. You examined that specimen very closely, did you? A. Well, to be perfectly honest, not this particular section.

Q. Well, have a look at it now. Does it appear to you to be in a satisfactory order? A. Well, it is a cable joint that has been made in the cable, but in a sample that was taken, I understand - I did request the sample to be taken - it was to determine if the cable was in fact a neoprene sheath. There had been some discussion that the cable had burst into flame and fire had propagated along the cable and that would have been contrary to what we would have expected.

Q. What did your examination show? A. That was neoprene sheathing.

HIS HONOR: Q. Does that then rule out the question of it bursting into flame? A. It will not sustain combustion without the assistance of additional heat.

Q. In other words you have to put heat from outside, apply it from the outside? A. Yes, or within the cable.

MR. LEE: Q. And continue to apply it? A. Yes.

HIS HONOR: Q. Did you say or within the cable? A. Yes - providing that there is additional heat or some other substance on the cable such as coal dust, oil or some other combustible material. It will extinguish almost immediately when the heat is removed from it, but if there is any other combustible material it will assist it in maintaining the fire.

Q. What about this heat within the cable - are you now referring to this sort of foreign material that is on it or are you referring to electrical heat generated inside the wire of the cable? A. The cable in that condition would not propagate flame.

(Sample of miner fable tendered and marked exhibit "T").

WITNESS: Perhaps I should volunteer one other point. We were interested to know if the cable was of electrical symmetrical design.

MR. LEE: Q. Where did your interest lead to? A. It is electrically symmetrical.

Q. What is the significance of that? A. Well, it goes into an involved discussion, but -

Q. Does it relate to safety? A. Yes. It eliminates the possibilities of induction loops due to heavy loadings.

Q. And that then has to do, does it, with the ability of the cable to cause a fire or play a part in a fire? A. It could. Non-symmetrical cable could in certain conditions initiate a certain source of gas-air mix.

Q. But at any rate this cable lacks that feature or that ability? A. Yes.

HIS HONOR: Q. You get a certain amount of induction and overloading of one? A. Yes. It is the earth conductors which form an inductive loop and with two machines or a machine and some other earthed metalic substance it closes the circuit and we have had quite considerable current values across those loops.

MR. LEE: Q. I think you looked at some feature of the cable in this mine? A. Yes.

Q. First of all where was the particular piece of cable which you looked at on this score we are now speaking of? A. The first piece of cable was the section of the shuttle car cable immediately adjacent to the anchor of car No. 40.

Q. That would be in the shunt? A. Yes - it was not in the shunt when I saw it, it was on the surface.

MR. LEE: Q.Was the outside covering of it all burned off? A.Yes.

Q.But you got some information from somebody that there was a fray or it might be frayed? A.It had been frayed due to the handling while it was recovered and the strands had been burned and frayed in a partial break of the conductors.

Q.Who told you that? A.My colleague.

Q.Mr. Who? A.My colleague Mr. Robinson.

Q.Did you look at the cable to ascertain whether any such condition prior to the fire may have resulted in a defect appearing in the cable itself? A.Yes. It was closely examined for any metal globules which would have indicated either a partial break which would create an electric arc between the broken strands or arcing between the conductors.

Q.What did you find? A.Nothing.

Q.What did you find - nothing - no evidence? A.No evidence at all.

Q.Was there another section, miner? A.There was another section of the miner cable which was adjacent to that position where Mr. Barry Kent had stated that he saw the cable burning. That was given at the base of that statement and we did find there had been a cable joint --

Q.You tell us the place you saw Mr. Barry Kent said he saw the cable burning? A.I could not indicate the position. I would have to leave that to my colleague, because I was not there when that portion was collected.

Q.Mr. Robinson was there? A.Yes.

MR. LEE: I don't want to call any more witnesses than are necessary. Perhaps we can get around it or find some way of identifying this piece of cable with the position in which he said he saw the cable burning.

HIS HONOR: Q.Are you able to say where he said he saw it burning? A.It was in the position adjacent to where the fall had occurred; and when I was at the colliery that fall had not been cleared out; and it was while I was away from the mine that these cables were recovered and brought to safe keeping, to the surface of the mine.

Q.Did you see the cable? A.Yes, I saw the cable.

Q.How did you see them? A.A point, the tunnel point and the solder had certainly run out and the end of the cables and the ferrules where the cables had brought pointed into the ferrules, and had probably pulled apart. They were closely examined for arcing and there was none found.

MR. LEE: Q.From your examination were you able to find any item, ever so small which might have possibly have caused ignition, in the electrical system? A. We have looked very closely and found nothing.

Q.You did, however, discover a piece of wood? A.Yes.

Q.In the disc braking system? A.Yes.

Q.You know that that was sent off for analysis? A.Yes.

Q.To be inspected. What do you say yourself, assuming that the wood of the kind that was found there, they are capable of being formed in the disc braking section, from your inspections and so forth of the line, can you offer an opinion as to the likely cause, what the likely cause of the fire must have been? A.I can confirm opinions I held early from bench tests of pieces of equipment, similar pieces of equipment removed from the same position on the car on Monday of last week. We carried out laboratory tests.

Q.Just stop there. You confirmed your earlier opinions? A.Yes.

Q.As to what? A.That a piece of wood could be initiated by the heating of a disc brake and that it caused an ignition.

Q.You were going to add that last Monday you took some wood out from some place? A.Yes.

Q.Tell us what you did? A. Last Monday when the car was being dismantled for further inspection on removal of the drive motor, the traction motor, from the driver's and front end of the car immediately behind the position where I obtained a piece of wood and removed another, we removed in somewhat the same way a charred ending of the parts. It would indicate that this process had been in the same p as this piece which had been removed and had been forced back by the subject piece being forced up in front of it.

HIS HONOR: Q.The history this brake has shown shows similar conditions to the foreign matter you say existed before this piece of wood got into the brake. In other words, this had happened before; the other pieces had charred but not in fact caused a fire? A. That is how it would appear. I have not heard of it in any car than this one.

Q.Have you examined any other car? A.It is the usual practice when making the inspection you don't go into the details of looking -- of looking at these pieces. But we do go around. We have a spot light and make a minute examination of all cable entries and likely places, and I think if there had been foreign matter it would have been, although I think that might be an ambitious statement because it was not terribly obvious, but if there had been any larger pieces we would have certainly seen them.

Q.Could this piece have been found by ordinary examination without removal of the cover, with the use of your headlight or spotlight? A.No, I don't think it could.

Q.Could you tell us without expecting that, how you could see similar pieces of wood in other cases? A.I have stated that it would probably been seen when examining, but I perhaps have to retract some of that.

Q.Have you had any reports? Do you know of any other cars having these covers removed to see whether there are pieces, any other kind of foreign matter in the disc braking system? A.No.

Q.You know nothing; do you know whether any of them have been removed or not; are you able to say? A.No, I could not say.

MR. LEE: Q.Mr. James, you have been out to the company which makes the cable covers? A.Yes.

Q.What is the name of it? A. Joy Manufacturing.

Q.Joy Manufacturing? A. Mascot.

Q.You were present, I think, when certain tests were made in the disc braking system of a cable cover similar to the one that was in the mine? A.Yes.

Q.I think Mr. Donegan was also present? A.Yes.

Q.Without going into the technical result you did in fact see when wood was taken off the wood braking system, the section near the drive shaft, smoke came off the wood? A.Yes.

HIS HONOR: Mr. Reynolds, have you any instructions as to whether any inspections have been made in any of the other cars in this mine?

MR. REYNOLDS: Yes.

HIS HONOR: Are you able to put it to me?

MR. REYNOLDS: Yes. I shall in due course. I have not got it in the form in which I can give it to Your Honor accurately.

HIS HONOR: No, I am not asking for it now. But I was wishing to clear up the thing.

MR. REYNOLDS: I think there have been other instances since.

HIS HONOR: Other instances since?

MR. REYNOLDS: Q. Where we have been looking there. I think I am probably right in saying we have known of it before, but since this becoming known, around the various mines we have found one or two instances.

HIS HONOR: Q.There are four sets of brakes? A. Two on the drive motors.

Q.Did you examine both? A.Yes.

Q.Did you take off both covers? A.Yes.

Q.And you found this only in one? A.Yes.

MR. REYNOLDS: I think what I said is substantially right.

MR. LEE: Q.Mr. James, are you aware from your visits to Joy Manufacturing with the gentlemen from the Mines Department who have been out there that there is a question of foreign matter which might ignite when being lodged in this section, has it been taken up with the management of Joy Manufacturing? A.Yes.

Q.With a view to measures possibly being taken to obviate it? A.Yes.

Q.Is there any matter of your inspection which was not mentioned in your report? Perhaps in relation to your recent inspection, that you wish to say anything further about? A.No.

CROSS-EXAMINATION:

MR. MURRAY: Q.The piece of cable that you have referred to as being the one that was pointed out to you by your colleague as coming from the area where Mr. Kent had said he thought he saw the miner cable burning -- ? A.Yes.

Q. -- that is what I am drawing your attention to. A.Yes.

Q.So far as you know from your knowledge was that piece of cable taken with Mr. Kent's statement in mind? A.Yes.

Q.Taken from an exact spot, as exact a spot as could be determined from Mr. Kent's description? A.Yes.

Q.Am I correct in understanding that you could find no evidence at all of having burned from its one failure? A.No, we have not found any.

Q.So far as you are aware in fact, that if that cable was seen to be burned it could only be burned from some substance on its outside? A.Unless it was assisted by a hot material such as gas burning, something like that. It need not necessarily have foreign matter on its sheet.

Q.Did it have an appearance when you saw it which could have been consistent with a final burning? A.It could be because there was absolutely no dielectric on that section or sheet of cable.

Q.No dielectric? A.Dielectric. That is almost pure indian rubber directly in contact or association with the conductors.

Q.Those are the coloured pieces on the inside here, red and blue (indicating)? A.Yes.

Q.And what other one, yellow? A.Yes.

Q.They are made of rubber? A.Yes.

Q.They are - they will burn? A.They will burn freely.

Q.When the initial heat is applied they will continue to operate - combustion themselves? A.Yes.

Q.Is that barely sufficient to burn the neophrene sheet out of the cable? A.That is if they are exposed to the atmosphere. In that position within the sheet they will ignite outside the sheet. They must be in contact with the atmosphere before they will burn the neophrene.

Q.So that for the cable's own dielectric combustion, it could not have been burned off its own neophrene sheet unless the cable had been ruptured somehow? A.Yes.

Q.Did you or your colleague see any sign of the cable being ruptured? A.There was no sheathing on the cable at that particular point, so we could not determine if there had been a rupture or not.

Q.Do you know of any instances of miner cable being damaged to its conducting elements? A.Yes.

Q.What types of physical injury that you are experienced in can cause some damage to the neophrene sheet? A.It could be by a fall of bluestone, some mobile equipment damage.

HIS HONOR: Q.The shuffle car running over it? A.I don't think so because it would be rubber, and it would be rubber to rubber. It is quite substantial in its structure.

Q.What if it ground against a sharp object? A.Yes.

MR. MURRAY: Q.A steel corner against a prop? A.Yes.

Q.Have you known this happening in your experience? A. That is correct.

Q.It was a common occurrence in coal mines? A.It is not common. We have it too regularly.

Q.Too regularly? A.Yes.

HIS HONOR: Q.That does not mean because the neophrene covering or even the material is ruptured that necessarily you could get ignition? A.Yes.

Q.And you still have to have something to start off the ignition? A.Yes.

MR. MURRAY: Q.But if the damage, the wound to the cable were enough to expose part of the conductors -- ? A.Yes.

Q. -- that would have caused an application of heat to the rubber at that? A.No. It has to be more than that. We have heard of an open circuit in one of the conductors while the cable was unde me; and if it is a face fault, an earth fault, I don't think it would be possible because in most instances now earth faults are protected against eventually by having current limiting devices. Earth faults are limited to five amperes.

Q.You are referring to the device which was built into the transformer, whereby if it reached a certain stage the transformer would be automatically tripped? A. That is for earth faults only.

Q.For the cable to cause fire it has got to be quite serious damage to the conductors inside, hasn't it? A.Yes.

Q.Do you know of ordinary instances where that has occurred in mines? A.It is mostly an open circuit and we mostly find that at ordinary points in the conductors.

Q.This cable had a number of points in it when in the whole of its length from the junction box on to most -- ? A.It certainly had two - one I have mentioned and there is another one.

HIS HONOR: Q.No indication of burning at the points? A.No.

MR. MURRAY: Q.That point is intact, of course? A.Yes.

HIS HONOR: Q.Say if you were to strip the dialectric and the two conductors and put the current through, would you get a kind of arcing between the two conductors? A.Yes.

Q.Would you; so that if one can say there had been a rupture of the cable why for example some hard object, then a sharp object of its being forced against the sharp object and you had even a minor amount of stripping of the dielectric so that you got a ch ng of the conductors, you would get a sparking there, an ignitic point? A.Yes, that is a possibility there. May I make an explanation? Those cables are laid out --

MR. MURRAY: Q.Would you like to use your letters? A.I could do it with my fingers. The cable conductors are in a certain layout, a certain form as they are made up in the sheath. In between those three power conductors are three miner conductors.

Q.That is visible at the straight cut end of exhibit T? A.Three miner conductors which are earth conductors, and they are laid at the three outer interstices of the three main conductors, subject to that.

You earlier asked if there was damage externally, it is anticipated that that would have caused the cut in the sheathing of the dielectric and at the same time may have contacted with one of these earth conductors. This is like what happens when there is a striking of an arc when a welder is working.

MR. MURRAY: Q.Possible on an arc? A.Yes.

Q.This is one of the miner ones? A.One of the miner ones.

Q.One of the miner's ones. That is designed to assist the transformer when that arcing occurs of the main conductors? A.Yes. That will occur through one which is set to operate through a maximum operating current of .5 amperes; and in addition to that failing, it is limited to a fault current of five amperes.

Q.Is it possible or has it happened in your experience for an injury to a cable to expose both the miner conductors in the way they will occur without tripping the conductor by severance of the miner conductors? A.It is possible.

Q.Is it a very unusual or unlikely thing? A.It is not unlikely, but I have not seen many of them tripped.

HIS HONOR: Q.When you saw this looping of cable were you able to examine the whole of that area of cable? A.Not while I was in the mine.

Q.At any time at all? A.I have not. It has been examined.

Q.Are you able to tell me whether there was any burning there or fracture of this loose cable? A.I have not had this report. My colleague has gone over these cables very minutely and he reports that they are free from suspect.

MR. MURRAY: I did not hear the beginning of Your Honor's question.

HIS HONOR: Looseness, the witness said.

MR. REYNOLDS: Slack cables.

MR. MURRAY: Q.The cable car trailing cables that you referred to earlier in your evidence -- ? A.Yes, all cables were in there, in that heading, in that immediate vicinity.

Q.You have examined or had examined all the cables in-by of the junction boxes, of the gate; is that right? A. We did more than that. We were on the out-by and the in-by side.

Q.You were on the in-by of the transformer? A.Yes.

Q.You could find no detectable fault which could have been in any way relevant to the occurrence of the fire? A.I know of no fault .

Q.Coming to the transformer, what is the device on it which is tripped, and whereby the transformer is turned out on another section of earth fault -- ? A.Yes.

Q.-- you have examined this transformer? A.I have seen it but not examined it.

Q.But you know its appearance and the general principle of its operation? A.Yes.

Q.It does have a high tension and a low tension area? A.Yes.

Q.One end is high tension, and the other end low tension? A.Yes.

Q.Each is not only equipped with an automatic tripping device, but with a manual tripping device; is that so? A.Yes.

Q.You can trip it by pressing one lever at the top of the transformer? A.Yes.

Q.Or you can by another lever which will trip the low tension and trip the transformer? A.Yes.

Q.These are very similar at different ends of the transformer? A.Yes.

Q.In addition we have mentioned the automatic? A.Yes.

Q.When the automatic trips if it is on high, it will trip the high tension handle? A.Yes.

Q.When the low tension trips if it is on low tension it will trip the low tension handle? A.Yes.

Q.So that a person who may be not an expert could go to the transformer, it having been already tripped because there are high and low, and still see another conversion which could be pulled down? A.This could happen.

Q.Do you remember the evidence at p.68: "When you came out to the transformer the first time, how could you tell the power was still on in the section? A. The handle was still in the upright position." A.Yes.

Q.It is quite possible that the layman would have been describing exactly what he saw and that what he saw was with the transformer already having been tripped a certain way in the section off? A.Yes.

Q.Tripped by an earth fault? A.It could have been.

Q.Was the foam unit that was used in fire fighting operations electrically operated? A.Yes.

Q.From power or from a battery? A. From power.

Q.Was that power taken off the transformer we have just been discussing? A.Yes.

Q.Was it taken through the cables that were supplying this section of mine when the fire occurred? A.No, I don't believe it was. I can't say definitely. But there was a new gate end box, I think they call it a power centre.

Q.As a matter of experience cable faults do occur in cables of the type being used in this mine, don't they? A.Yes.

Q.They occur within the cable? A.Yes.

Q.They can be faulty in any of a number of ways. You could get a puff of smoke emitted from a cable. They could be demonstrated. Is that consistent with your experience? A.I have not actually seen one blow out. I have investigated them after they have blown out, but I would say that would be consistent.

Q.A puff of smoke? A.A fault inside the cable does blow the cable up and it balloons.

Q.Sometimes you get visibly discernible flash with a cable fault? A.Yes.

Q.They are evident later by the proper globules that you were looking at on these cables? A.Yes.

Q.Just to summarise it, although you entered this mine, having been informed that there was some suspected electrical fault associated with the onset of the fire, the sum total of your examinations and those of your colleagues lead you to the conclusion that that is not so? A. That is so far, yes.

HIS HONOR: Mr. Parkinson ?

MR. PARKINSON: No questions.

MR. McNALLY: Q.Just this, Mr. James, if a transformer is going to trip because of some earthing in the cable does that condition usually happen immediately? A.Yes.

Q.Were the lights in the crib room connected to the same transformer? A.Yes, they would have their series. They have the miner transformer. Again I think it was a 32 volt system, but the smaller transformer would have fed them through the main transformer.

Q.The brattice/sill that you referred to, am I correct in assuming that it was on the in-by side of the brattice? A.It would have been, yes.

Q.Am I correct in assuming it was under the front of the car? A.Completely under the front.

Q.You know the in-shore side of the shunt? A.Yes.

Q.Was it on the in-shore point side of the shunt or slightly that way? A.No. I would say that way under the car, immediately under the car.

Q.And at the back of the brattice? A.Yes, or it could have been directly under where the brattice had been --

Q.In any event it was not on the in-by side? A.No.

Q.Is it possible that a spark caused by static electricity could ignite methane? A.It has been proved it could.

Q.Do these cars create static electricity? A.No.

Q.They don't? A.No.

MR. SULLIVAN: Q.Did you conduct experiments with a piece of wood ? A.I conducted in association with one of Mr. Donegan's staff, Mr. Ken Bunce.

Q.Did you use a piece of wood approximately the same size? A.Yes.

Q.In a machine in thesame position? A.Yes.

Q.That appeared to be hardwood, a piece of hardwood? A.Yes, we were told similar to the piece.

Q.Similar to the piece? A.Yes.

Q.Did it ignite from the friction of the brake disc and another part or did it ignite from the heat generated by the use of the brakes? A. That piece, something was not ignited at all. It only smoked freely.

Q.It smoked freely. Did it smoke because of the build-up of the heat or fumes or through the brake? A.No. Building up of heat in the brakes.

Q.Actually the type of heat in the brakes was sufficient to make it occur? A.Yes.

Q.It smoked very freely; is that right? A.Yes.

Q.Would it not be anticipated that if this piece here, that is the exhibit here had become alight through the heat in the brakes, is it to be anticipated that this would have allowed freely to? A.No, not necessarily.

Q.Why do you say that? A.Because if it had been there for some time it would have slowly become hot and it would have been freed from volatiles to give smoke, but sufficient to blow in the event of sufficient heat being applied.

Q.Does it have a characteristic smell? A.Yes.

Q.It is very probable there would have been some smoke? A.Yes.

Q.As to the inspection plate on these machines: If the inspection plate is taken off can you see the build-up of carbon - carbonaceous material like coke and wood? A. That is between --

Q.Yes, and where the coke is shown in this form -- ? A.I don't get the first part?

Q.There is the inspection plate? A.There is a guard.

Q.When you mentioned inspection plates. I was thinking in terms - the guard that is secured by what? A.Secured by return bolts.

Q.Bolts with nuts? A.Not necessarily. They could be studs.

Q.They could be studs. Do they come out? A.It requires a spanner.

Q.If they were taken off you could see this material caught up in there? A.Yes.

Q.That is coal and other debris? A.In this particular instance we did not have to remove any because the cover plate was on the top.

HIS HONOR: Q.The cover plate, was that there? A.This was the top, the inspection cover on top of the guard. The guard itself was there but this is the removing on top to clean out, for cleaning out purposes.

Q.That was not there? A.Yes.

Q.Do you know what happened to it? A.No.

Q.Was there a plate of that kind on the other bracket or had that been removed too? A.No, it was not there either.

MR. SULLIVAN: Q.It was not there either? A.These are for ventilation purposes, I take it, for cooling. I don't think it plays any part in the wood getting in.

HIS HONOR: Q.I am not worry for the moment about how the wood gets in. I am interested to know about the two plates which are normally on top of the guard; is that right? A.Yes.

Q.And were not there when you examined them; did you ever see those plates? A.No.

Q.Did you ever make any inquiries as to where they were? A.No.

Q.The purpose of removing of the plates - assume you deliberately remove them - is what? A.For cleaning out purposes, adjustment of the checking caliper pad --

Q.In other words, you can inspect and also clean out? A.Yes.

Q.What about material? Can you get out when you clean these plates? Could you get all the material out? A.No, we could not remove the piece of wood.

Q.You could not remove the piece of wood. Could you be able to see the wood? A.Yes.

Q.The piece there. A. Could I explain if I had that photograph?

Q.Which one? A.No, the one similar to that showing --

MR. LEE: Bl, which one is that?

WITNESS: No. C.

MR. SULLIVAN: Q.This one,(indicating)? A.Yes.

Q.That is with the plate off? A.No, over the top.

MR. LEE: Q.Not with the plate off? A. The guard I --

HIS HONOR: Q.With the guard on, but the inspection plate off; it is a rectangular plate? A.Yes.

MR. SULLIVAN: There is the inspection plate, but it has been taken off? A.Yes.

Q.You say it has been taken off both sides -both sets of it taken in this shuttle car No. 40? A.Yes.

Q.Might it have been taken off by somebody - and we don't know why - we are saying in order to assist in cooling -- (Objected to by Mr. Reynolds.)

Q.I shall withdraw it, and put it another way. If one took those inspection plates off, would it assist incooling? A.It could do so. I may add it is an advantage to have it removed.

HIS HONOR: Q. When working the vehicle? A.Yes.

Q.Why? A. For cooling and observation purposes, remove for cooling and observation.

Q.Assuming it had been removed, whether for cooling or otherwise, then the debris that was in there could have been seen? A.Yes.

Q.Because you saw it was there through that same area? A.Yes.

MR. SULLIVAN: Q.The other situation is this: that it appeared that this coal that had accumulated there could have caught fire; is that right from what you saw after the fire? A.There were indications of coke-like evidence.

Q.That would suggest that the coal had caught fire? A.Or had been heated.

Q.Or if it had been heated to that extent would it cause it injury? A.Yes.

Q.And smoke? A.Yes, if impregnated with hydraulic oil and gear box oil.

Q.What I am putting to you is that on the whole of what you saw there should have been quite noticeable smoke issuing from the gear? A.Some time before, but not necessarily --

Q.Some time before? A.Yes.

Q.Smoke in a mine is always something that puts a person in a mine ... the alert? A.Yes. (Objected to by Mr. Reynolds.)

MR. REYNOLDS: I have no questions.

MR. LEE: No re-examination.

(Witness retired.)

ROBERT ADAIR MENZIES
Sworn, examined, deposed.

TO MR. LEE: My full name is Robert Adair Menzies.

Q.You reside at 19 Meade's Avenue, Corrimal? A.Yes.

Q.You are the Senior Inspector -- ? A.Yes.

Q.What is your exact title? A.Senior Inspector of Collieries South and West.

Q.Senior Inspector of Collieries, South and West; you have been in that position I think for two years? A.Yes.

Q.Prior to that you were the acting Senior Inspector of the Newcastle District? A.Yes.

Q.Prior to that were you an Inspector at Newcastle and Cessnock? A.Yes.

Q.An Inspector of the Western District? A.Yes.

Q.You have been a lecturer in mining engineeeing at the University of New South Wales? A.Yes.

Q.You are not doing that now, are you? A.No.

Q.And you have also been a lecturer in mining engineering in the Department of Technical Education? A.Yes.

Q.You have been a lecturer in mining engineering at the Wigin Technical College, Lancashire? A.Yes.

Q.And also at the Leigh Technical College, which is in Lancashire? A.Yes.

Q.You have been a colliery under-manager in Lancashire? A.Yes.

Q.Also a manager there for a short time? A.Yes.

Q.You have an Associateship of the Royal Technical College of Glasgow? A.Yes.

Q.That is an Associateship which you have without exam qualification? A.Yes.

J.L. James, ret.
R.A. Menzies, x.

Q.You hold the colliery manager's certificate? A.Yes.

Q.You are a Member of the Australian Institute of Mining and Metallurgy? A.Yes.

Q.A Member of the British Institute of Mining Engineers? A.Yes.

Q.Would it be fair to assume from this that you have been connected with mining all your life? A. All my working life.

Q.All your working life; you arrived at the Bulli Colliery on the day of the 9th November, at what time? A. One o'clock.

Q.One o'clock; andyou prepared a report as you were required to do, which covers the matter which occurred before you got there? A.Yes.

MR. LEE: What I propose to do, at least in respect of some of this is to put before Your Honor the information which Mr. Menzies got. This is in line with the evidence as to rescue teams and times of arrival, because I feel Your Honor should have that and should have it in this form rather than have individuals wasting the time of the Inquiry to prove facts which are probably not in dispute anyway.

Q.You got your information as to the events which had occurred before you got there from officials of the colliery? A.Officials of the colliery.

Q.And other men employed th re? A.By Inspectors and from the Superintendent of the Rescue Operations.

Q.The information that you got was that the southern district mining rescue station had been notified at 9.55 a.m.? A.Yes.

Q.And the first rescue team, which was apparently the Huntley No. 2 (who had been in training at the time) arrived at the fresh air base approximately 150 yards from the scene of the fire at 10.55 a.m.? A.Yes.

Q.And the officers of your Department were at the time of the fire in various locations? A.Yes.

MR. REYNOLDS: Mr. Lee, you might just ask how long it takes to get from the portal down there so that we can get that information.

MR. LEE: Q.The information we have is that the rescue station was notified at 9.55 a.m. and the Huntley No. 2 rescue team went in and got there at 10.55 a.m. What comment do you make on that time? A.It was first class time. I could not expect anything better.

Q.Your various inspectors were at different locations, not at the Bulli Colliery on the morning? A.No.

Q.They were all notified and they all got there; and I think again you take the view that they got there as quickly as the circumstances permitted? A.Yes.

Q.Your report goes on to outline the evidence which was subsequently obtained from the men who got down in the section, and your reconstruction of it and so forth. I propose to pass over that because we have had them give their evidence here.

I shall go on to further information you elicited from different people. I think you got the information that at

9.45 a.m. the Under-Manager arrived on the scene and took charge of operations? A.Yes.

Q.And in the initial stages the Under-Manager organised the necessary supplies of fire-fighting material, including fire hoses, nozzles, breech pieces, stone dust, brattice, etc. A.Yes.

Q.He also had the return airway examined by looking into two points and found that because of the smoke passing the observation points, there was no serious blockage in the return? A.Yes.

Q.This is in the early morning period, is it not? A.Yes.

Q.You were also informed that he had ascertained that the main transport roadway was clear for the rapid transport of the rescue teams from the surface to the fresh air base, which he was establishing at or near the right-hand sweeps in the track or "C" heading in 8-right district? A.Yes.

Q.Show us this fresh air base? A. (Witness indicates on plan).

Q.Show us on this one. A. An area here (indicating).

MR. EE: He indicates an area in the vicinity of the words "low tension cable" at the left-hand end of the "C" heading.

Q.Somewhat in there, the fresh air base (indicating)? A.Yes.

Q.You go on in your report, in referring to the Under-Manager, that he had also assured himself that all workmen in the Colliery had been warned to withdraw from their working areas and to proceed to an assembly area at the marshalling yard, which was out-by of the fire area? A.Yes.

Q.How far from the fire area is the marshalling yard? A. About a mile.

Q.About a mile. You were further informed that these men were taken out of the mine on the transport system as it became available? A.Yes.

Q.Mr. Menzies, do you know what happened when they got to the marshalling yard, what arrangements were then made for them? A.From the information I then obtained, quite a lot of them were held at the marshalling yard to allow the rescue teams to operate. The main object was to get the rescue team safely into the mine, to organise and conduct the fire-fighting. They had priority, and the men were held at the marshalling yard until the traffic position had eased and they could be sent out of the mine.

Q.What is your view about that procedure? A.It was the only thing that could be done. They were in a perfectly safe position, and the essential thing was for them to be kept underground.

Q.How was it so far as safety was concerned? A.Nothing wrong.

Q. At 10.55 a.m. the Colliery Manager and the Assistant Superintendent arrived. Which gentlemen are they? A.Mr. Stone and Mr. Ryan.

Q.They were accompanied by a complete rescue team which had been made up from sundry rescue personnel at the colliery, including members of the colliery staff and the Rescue Station Superintendent.

They must have got there then at the same time as Huntley No. 2? A.Yes.

Q.And to your knowledge who had organised that rescue team we are speaking of here? A. The Superintendent of the Rescue Station.

Q.This team on reaching the fresh air base and fitting on the self-contained breathing apparatus, attempted to explore into the track for "C" heading to the seat of the fire but were immediately driven back by the smoke, which completely obscured their vision and badly affected their eyes? A.Yes.

Q.That was the information you got? A.Yes.

Q.The further information was that this team then withdrew to prepare to erect a tight brattice stopping in the cut-through of the "sweeps" or number zero cut-through? A.Yes.

Q.The effect of this stopping was to drive all the air along the "C" heading, and upon this happening the team was able to make progress along the "CW heading, to No. 1 cut-through, where another tight brattice stopping was erected? A.Yes.

Q.Would you just show us that? (No answer.)

MR. REYNOLDS: Q.This cut-out"B" heading is an intake, I presume? A.Yes.

MR. LEE: Q.Would you explain what I have read out? A. The brattice is across there (indicating) which had the effect of putting all the air, instead of splitting the area some this way and some that way, it pushed all the air this way (indicating).

Q.Into the other heading? A.And a second brattice is erected in it to cut another, it was to achieve the same purpose. (Witness returns to box).

Q.Then it continues, that enabled the team to make some progress, and shortly after 11.20 a.m., according to the information you received, it reached No.67 shuttle car? A.Yes.

Q.But shortly after that a fall occurred and the team had to withdraw? A. That's right.

Q.As far as you know is that time of 11.20 to the time of the first fall? A. As far as I know, yes.

Q.11.20 was the time of the first fall. At 11.30 a.m. approximately, your information went on: "A second rescue team arrived at the fresh air base and they were accompanied by senior members of the B.H.P. - A.I.S. staff, including Mr.Wilson, General Superintendent of Collieries, Mr. Martin, Deputy General Superintendent of Collieries, and Mr. Grierson, Superintendent of Collieries."? A.Yes.

Q."And Mr. Wilkinson took charge of operations underground and at this time and for the next 24 hours, Mr. Pierce, Assistant General Superint endent, was in charge of the surface". A.Yes.

Q.The information further was that the rescue teams continued to fight the smoke with the use of "sails" and spray nozzles fitted to the water hoses and at one time reached the shuttle car parked in No. 2 cut-through near "B" heading, but ultimately they had to withdraw again because of heat and smoke? A.Yes.

Q.At approximately 1.15 p.m. recovery and fire fighting operations were still held at the corner of No. 2 cut-through and C heading? A.Yes.

Q.That is at the loading ramp? A.At the loading ramp.

Q.They could not get beyond? A.No.

Q.Then you arrived about one o'clock? A.Yes.

Q.You then went into the whole matter of what happened, what had gone on before, where the men might be; and arranged for certain things to be done? A.Yes.

Q.Just stopping there, from the information you had at that point of time, Mr. Menzies, was there any deficiency in your opinion in the way in which this fire was attacked from the time that it broke out? A.My opinion, and from the information that I received, there was no deficiency shown.

Q.It was expedited as expeditiously and efficiently as it could possibly be done. You were there from one o'clock on? A.Yes.

Q.And had personal experience of what was being done? A.Yes.

Q.Were you able to see or did you ever become aware of any deficiency at all in the attempts or efforts that were being made to bring the fire under control and rescue the men? A.No.

Q.Then if I may go on to your personal part in the operations now.

At this point of time you had Inspector Longworth amongst others there? A.Yes.

Q.And he went down to the area, and you were kept fully aware of what was being done? A.Yes.

Q.You have heard Mr. Longworth's evidence as to what he did? A.Yes.

Q.I won't ask you to go over the same field in that regard. I shall go ahead to when you yourself went down into the mine? A.Yes.

Q.Which was what time of the day or night? A. Somewhere around ten o'clock.

Q.Around ten o'clock; you relieved Mr. Longworth and Mr.Griffiths at about 10.30 p.m. according to your report? A.Yes.

Q.And when you got down there how far had the fire-fighting and rescue attempt got? A.When I arrived there the fire was being fought, tackled from two directions. One crew was on top of the fall directing water towards the main seat of the fire, and a second crew were advancing up the return airway from No. 1 cut-through towards the seat of the fire behind, towards the seat of the fire behind the fans, or beyond the fans.

Q.You made a survey of the whole area around 11 o'clock, I think. A.Yes.

Q.And you found that the smoke was confined mostly to the fall area in No. 2 cut-through between the "A" and "B" headings? A.Yes.

Q.Being very heavy in the return from the fire in "A" heading? A.Yes.

Q.The fire was under a fall of top coal? A. Top coal - top stone. It was not top coal.

Q.It was under a fall of top stone? A.Yes.

Q.In No. 2 cut-through between "A" and "B" headings, and down towards the return in "A" heading? A.Yes.

Q.Had stone dust been used on the fall? A.Not that I was aware of at that stage.

Q.Not at that stage; I don't know whether your report has perhaps gone on to a further time. You arrived down there at 10.30 p.m. it says? A.I say as regards that that I did very little testing on my own. I had Mr. Boslem with me and I delegated to him the work of testing for gases in the areas where the men were working. I just generally supervised, looked around and discussed the various aspects with Mr. Wilkinson, and Mr. Martin, but I did very little testing myself.

Q.Was that the position through the whole of the night? A.Yes, that was the position through the whole of the night.

Q.What was the position about 11 o'clock? A.Before we go to 11 o'clock, around 5.30 it was reported to me there was a possibility that the fire had been brought under control. I made an inspection of the area on top of the fall, looked down to the top of 40 shuttle car, looked down towards the fans, looked down to the return area of No. 2, looked down to No. 1 cut-through; and about six o'clock I formed the opinion that the fire was then under control.

One more point there: at 6.30 the rescue team entered the return area some half to three-quarters of a mile of the fire area and inspected the whole of the return airway right down to No. 1 cut-through and found no evidence of fire.

Q.What time was that? A.Round about 6.30 in the morning.

Q.Round about 6.30 in the morning. That morning about 11 o'clock did you, with Inspector Boslem, go out to the face? A.No, I went out to the pit, out to the men and got to the surface ramp about a quarter-to-nine, and both Mr. Griffiths and Mr. Longworth came across to me on the way in. I proceeded to the Manager's office when I arrived at the surface, and there shortly after I was informed that the fourth body was found underneath - not found, that their location was found.

After having a bath I met Mr. Griffiths who arrived at the surface, accompanying the body of the deceased Stewart; and after discussing various matters with him, we went to the Under-Manager's office, and there studied the General Rule 4 report, for the four shifts preceding the morning to that of the 9th November. Mr. Griffiths took a copy of these General Rule 4 reports; with the exception of on the previous morning, noxious gases being found by the Deputy in charge of the section, there was nothing special in the reports.

Q.When you say "on the previous evening", what date are you referring to? A.I am afraid I don't get "the previous evening".

MR. REYNOLDS: It was not the previous evening - the previous morning.

MR. LEE: Q.Was it the previous morning? A.On that morning after I had a bath.

Q.You continued the report? A.I met Mr. Griffiths and inspected reports of the previous four shifts, general Rule 4 reports of the previous four shifts, which were a night before, a dog-watch on Tuesday morning, afternoon shift on Monday, and a morning shift on the Monday and a dogwatch on the Sunday night; and with the exception of noxious gases being reported on the previous morning, that is the morning of the 8th November, where there were noxious gases reported, I found nothing under General Rule 4 reports. I misunderstood the implication of what you were saying.

Q.Then you went back down, did you not? A.No.

Q.No? A.I went to bed.

Q.At some stage you went back down, didn't you? A.I went back to the Colliery about half-past-four of that afternoon, Wednesday the 10th, where I met Mr. Griffiths and Mr. Longworth.

Q.They told you of their findings? A.They told me of their findings on the previous shifts and their consideration of the position as it stood at that time; and after consideration and discussion I concluded that the continuous supervision of an inspector should be withdrawn at that time, and the working, the safe working left to the mine manager, the safe working of the area left to the mine management.

Q.At what time was it that you made that decision? A. About five o'clock.

Q.On the Wednesday afternoon? A.Between five and six on the Wednesday afternoon.

Q.Did you have some further inspections of the area ? A.I never inspected the area again until the day I took you down, whatever day that was. That was Wednesday last week.

Q.When you were there certain samples were taken by the men with Inspector Boslem? A.Not samples, he was testing for methane gas, for carbon monoxide.

Q.But no samples were taken? A.No. One point I omitted to mention there - on the Wednesday afternoon round about four o'clock, the Chief Inspector rang you and I asked to have the Chief Analyst or the Analyst made available to obtain samples from the goaf area at 8-right in Bulli Colliery.

Q.One further matter that might be mentioned which is within your knowledge, is it not: that the main rescue operation continued on stand-by at the colliery until 7 a.m. on Saturday, 13th November? A.Yes.

Q.Some general information as to the colliery itself: The Colliery pit top is approximately 400 feet above sea leavel? A.I would say it was. The original Bulli Colliery I believe was somewhat below that.

Q.It was first opened in 1864? A.Yes.

Q.The workings of the Colliery are concentrated in the Bulli seam, which is the No. 1/top seam in the Illawarra or Upper Coal Measures? A.Yes.

Q.The Bulli seam in the area at present being worked is approximately 7-feet 6-inches thick, and is of good quality? A.Yes.

Q.The seam is not free from gas, and in certain areas of the Colliery in recent years ventilation difficulties have arisen because of gas emission? A.Yes, we reported gases, there have been numbers.

Q.There have been a number of recorded ignitions since the Colliery opened, the earliest being an ignition and explosion in 1887 in which 81 persons lost their lives and the last -- A.Yes.

Q.The last until the present one in May 1964, in which one man was slightly burned? A.Yes.

Q.I think the 1964 one came under your notice as Chief Inspector? A.Yes.

Q.It was an ignition of gas? A.Yes.

Q.That was methane at the roof level? A.Yes.

Q.And it was a fire which was not regarded as a severe fire? A.No.

Q.Is that right? A.Yes.

Q.Have you got a classification in the Department of the severity of fires? Do you call the minor or very severe? A.No. It is not a question of the severity of the fire or non-severity of the fire, but --

Q.A question of the conditions under which the ignition occurs? A.Yes. They are more of interest than anything else.

Q.You are not so interested in inquiring into the fire, I suppose as you are in what starts them? A. Possibly, yes.

Q.Are you able to tell me what started the one in 1964? A.Yes.

Q.What was that? A. Workman striking a light for a blowlamp.

Q.A workman striking a light for a blowlamp? A.Not a blowlamp, an oxy-acetylene burner.

Q.An oxy-acetylene burner? A.Yes.

Q.That created an ignition of methane gas? A.Yes.

Q.And the flame travelled some 40 yards to where the gas accumulation existed? A.Yes.

Q.Travelled from where? A.From the point of ignition.

Q.Travelled along the route? A. To about 40 yards to where the accumulation of gas existed.

Q.Are you able to tell me whether after that fire there were any tests of the area for gas? A.Prior to the --

Q.After the fire? A.Yes. We recreated the conditions after the fire. After the ignition we re-created the conditions and we found that the layering of gas that must have existed when ignition --

Q.What was the depth where the ignition occurred? A.One inch.

Q.What was the depth at the accumulation? A. Four feet.

Q.Four feet? A.Yes.

MR. LEE: Q. Whilst you are talking of that matter of the previous fi --

HIS HONOR: May I just put another question?

MR. LEE: Yes, certainly.

HIS HONOR: Q.Did you have a report of any tests for gas by the Deputy or anyone else during the shift when that occurred? A.Yes.

Q.Was there any positive report for gas? A.No gas was found.

Q.No gas was found. What was the means of testing for gas? A.Flame safety lamp.

Q.Flame safety lamp; that is the Davies safety lamp? A.Yes.

Q.You apparently failed to detect the presence of gas? A.Yes.

MR. SULLIVAN: I would not necessarily blame the lamp. It is going on the transcript in the form that the lamp failed, when it might well be that it was the person who used the lamp.

HIS HONOR: Q.The person using the lamp could have failed?A.The same position exists with me.

Q.The same position? A.I could not detect it. It was in the range where the Deputy was supposed to detect it.

Q.This was in the 1964 fire you are talking about? A.Yes.

Q.This was after you had re-created the conditions? A.Yes. The Deputy examined within 20 yards, which he is required to do by law, and he could not find it. I could not find it within 20 yards myself.

Q.Tell me this: after that failure to detect gas which was there and which ignited, were there any steps taken by anybody to prevent this sort of thing occurring again, or to assist in the detection of gas? A.Yes.

Q.What were the steps taken? A.In the use of oxy-acetylene burners it was laid down that where oxy-acetylene burners were used by the approval of the Inspector in any underground position, a methanometer was supplied to the deputy concerned, to take tests for -

Q.That is part of the present regulation? A.Yes. That is part of the seventh schedule.

Q.Part of the seventh schedule, but you see what was done to detect gas where there might be an ignition from any other source; what was done to assist the Deputy to find gas other than allowing him still to use this Davies safety lamp, as it is called, which cannot detect methane or failed to detect methane in 1964, and which I have been told cannot detect methane outside certain distance from the left and it was described to me as four or five inches? A.Nothing beyond that.

HIS HONOR: Nothing beyond that.

(Witness stood down.)

(Further hearing adjourned until 10 a.m. on Tuesday, 14th December, 1965, at Bulli.)

278- R.A. Menzies, stood down.

IN THE COURT OF)
COAL MINES REGULATION) No. 1 of 1965
HOLDEN AT BULLI)

BEFORE HIS HONOR JUDGE GORAN

ASSESSORS: MESSRS. MAHON and BUCK

TUESDAY, 14th DECEMBER, 1965

- - -

IN THE MATTER OF AN INQUIRY IN PURSUANCE OF THE COAL MINES REGULATION ACT INTO AN ACCIDENT WHICH OCCURRED AT THE BULLI COLLIERY ON 9th NOVEMBER 1965 AND ITS CAUSES AND CIRCUMSTANCES.

- - -

(PART HEARD)

(By consent last question on p.270 altered to read "That is an Associateship which you have with exam qualification?")

MR. REYNOLDS: My attention has been drawn to a report in the Daily Telegraph in the edition which circulates in this area and it does appear that what purports to be a quotation from my cross-examination yesterday is misleading: "It follows I suppose that the deputy discovered it and did nothing about it," and this indicates it is being put by counsel for the company that the deputy discovered it and did nothing about it. But in fact, Your Honor, the reporter has got it slightly out of context because I was in the course of putting three alternatives, then Mr. Sullivan intervened and said there was a fourth, and I withdrew the whole question anyway and put that there was an undetected accumulation. I do not know whether any measures can be taken, but Mr. McNally tells me it causes concern to his people that it should be put that way, that the company was taking the view or pressing the view that the deputy had failed to do the job, and that of course is not the situation.

HIS HONOR: I do not know whether the matter can be corrected; I think all I can do is to draw the newspaper's attention to it. These mistakes are of course almost inadvertent; someone is required not only to record accurately what is said in Court during cross-examination, then of course it is handled by a reporter and then sub-edited, and then what happens after that one does not know, but mistakes do occur and one certainly can be misreported.

(By consent last question on p.278 altered to read "... I have been told cannot detect methane outside certain distance from the roof...")

ROBERT ADAIR MENZIES,
On former oath:
Examination continued.

MR. LEE: Q. We might continue this morning with some evidence about methanometers. In the first place, since the fire in 1964 is it the position that every major colliery has had a methanometer or more than one available to it? A. Yes.

Q. That arose out of the specific circumstance regarding the use of oxy-acetylene torches? A. Yes.

Q. And the requirement in that regard that a methanometer must be available? A. Yes.

Q. So that the colliery has had it for that purpose or any other purpose that it may wish to use it for? A. Yes. Your Honor, may I correct one misstatement I made yesterday, inadvertently. The

1964 incident I referred to had been caused by an oxy-acetylene torch - it should have been an electric welder.

HIS HONOR: Q. I thought you said in connection with that, that somebody lit a naked flame? A. Yes, and that was naturally done by the electric welder - the same principle, the open flame was struck.

Q. To get the ignition? A. Yes.

MR. LEE: Q. Have you yourself had experience in the use of methanometers? A. Yes.

Q. And have you any observations that you wish to put to His Honor about the use of the methanometer? A. I find the methanometer is a very useful instrument. It is very useful for detecting layers of gas, methane gas near the roof, and I have found it invaluable in that regard. They are comparatively simple to operate. They require a certain amount of attention and calibration and adjustment at various times but this presents no difficulty to the technical staff at collieries and altogether I find them a very useful adjunct to the flame safety lamp.

MR. LEE: Q. Is it your view of the flame safety lamp that it has been a very valuable friend to the miner and still is a very valuable friend to the miner? A. A very valuable friend to the mining community and to the miner. I would hate to see it discarded.

HIS HONOR: Q. You could not supersede it with a methanometer because a methanometer does not do all the things a safety lamp does? A. There is one more objection, Your Honor. The flame safety lamp does things without being told, it becomes activated without being told to activate. If the person with a flame safety lamp goes into an accumulation of gas inadvertently he is immediately warned by the reaction of the flame safety lamp. If, on the other hand, the sole instrument is a methanometer he is entirely dependent upon his own reaction, in other words he has to use the methanometer, deliberately use it, to obtain an indication of whether or not he has an accumulation of gas.

Q. Is that entirely so? Of course this may be chasing a will 'o the whisp - I suppose if a man were accustomed to using a methanometer as he walked around the mine he would watch it? A. All the methanometers we have in use at the present time in New South Wales all require certain mechanical action for their operation.

Q. What is the nature of that? A. You must draw air into the instrument so that the methane which is present in the atmosphere is passed into the instrument and you must press a button to get the registration on the meter scale.

Q. There is no such thing as an automatically operating methanometer? A. Yes, they are available overseas.

Q. And in those you do not have to press a button? A. No.

Q. It will register just as a safety lamp flame? A. Yes.

MR. LEE: Q. You would have to be watching? A. In some instruments they are fitted with alarm lights.

HIS HONOR: Q. In which case as far as methane is concerned it is perhaps an identical purpose and perhaps with greater effect than a safety lamp? A. Yes, as far as methane is concerned.

Q. One fault is they do nothing about CO2? A. No.

Q. Except they themselves, we understand from the evidence, may be affected by CO2 so that you do not get an accurate reading of the quantity of methane? A. It is possible, Your Honor.

Q. How possible is it? How frequent is it? In other words, what concentration of CO2 will throw a methanometer registration of the quantity of methane out? -

MR. LEE: May I interrupt? This matter has been the subject of some testing by the analyst who will give evidence. I doubt if Mr. Menzies --

WITNESS: I can give no percentages. I can give a general indication.

HIS HONOR: Q. Can you tell me this: How heavy are these things to carry? A. A methanometer?

Q. Yes? A. Very light.

Q. They are very light? A. Yes.

Q. Would it be any great problem for a deputy to carry both a safety lamp and methanometer? A. None at all.

MR. LEE: Q. Just to continue with this view, I think it is your view that the methanometer can be a valuable adjunct to the safety lamp? A. Yes.

Q. But I think it is also your view that certainly so far as the knowledge in this country is concerned it is not established conclusively that the methanometer is the complete answer? A. That is correct.

Q. I think you are aware that in England, for instance, tests have been made and in fact as a result of those tests an oil safety lamp has been devised with a probe attachment which can do tests for methane at any point at all in the roof and on the floor? A. That is correct.

Q. I think that has only been on the market in England for a short time? A. Yes.

Q. In the last twelve months? A. Very few months.

Q. You are aware of other devices which are available overseas which have the alarm system - some with it and some without? A. Yes.

Q. It would be your view, I think, that before the methanometer were perhaps enshrined as being the answer to the problem that there be left at least with the Department the residuum of inquiry or ability to inquire to get even a better instrument than that? A. I feel that should be done.

HIS HONOR: That would be a very proper course.

MR. LEE: The Department is getting such information as it can. It suffers from certain handicaps.

HIS HONOR: Should I come to the point of making any submission in my report in connection with this matter I should certainly agree that it should be entirely left with the Department. They are the experts. They can administer it far better than the Court. It seems to me at this stage, subject to what counsel put to me, and other evidence which may be available, I shall have to make certain recommendations because one thing which appears clear, even if it does not explain this accident, it may

or may not, I will leave that question at large, is that the safety lamp as operated at the time, even though it has this magnificent history and is a very useful instrument, is not the complete answer and can in fact allow quantities of inflammable gas to remain undetected.

Q.Is that the position? A. Yes.

MR.LEE: That, we would submit to be a very fair and accurate appraisal of the situation.

HIS HONOR: Q. You mentioned a safety lamp with a probe. I take it you mean by that something which will enable it to draw in gas from an area which is very close to the roof level? A. At roof, to be able to draw air from roof level.

Q. A safety lamp, if it had that, would still not measure the concentration of methane at that point? A. Yes, Your Honor, it would.

Q. How? A.When the probe is pushed onto the roof level the aspirator draws the air from the roof level and it passes into the flame safety lamp, it is forced into the flame safety lamp and at the same time as it is found in the normal surrounds it will be found in the safety lamp, if gas is present.

Q.But what about the quantity. The methanometer has a dial to tell you how much? A. The cap on the flame safety lamp will tell you how much.

Q.With any degree of accuracy? A.With a degree of accuracy that will limit the work and the type of work that is carried on in the working place where the gas is.

MR.LEE: Q. Coming back now to one other matter with regard to the use of the methanometer in collieries, in New South Wales. I think you know the methanometer is in general use in Appin Colliery? A. Yes.

Q.That is regarded as what sort of a mine? A. That is regarded as the most gaseous in New South Wales.

Q.The most gaseous mine in New South Wales? A.Yes.

HIS HONOR: Q.Is that bottom gas as well? A. No, not up to the present, Your Honor.

Q.It has black damp? A. Just methane.

Q.No black damp? A.The analysis obtained from the seam gas at Appin shows the seam gas 98% methane.

MR.REYNOLDS: Practically no CO_2.

Q.MR.LEE: There is no a requirement for the use of the methanometer generally in the Appin Colliery, is there? There is no legal requirement you are aware of? A. No, it is simply the management saying that.

Q. What was that? A. The management have supplied methanometers to all officials above the rank of deputy.

Q.Do some deputies have them? A. Yes, I have seen deputies using them on occasions.

HIS HONOR: Q. As far as most deputies are concerned they still rely on the safety lamp? A. Yes.

MR.LEE: Q. Have you yourself had experience of the use of the oil safety lamp in bottom gas? A. In bottom gas where CO2 was the predominant component in the mixture.

Q. Where CO2 was? A. Yes.

Q. What isyour view of the efficacy of the lamp in those circumstances? A. The lamp cannot be bested.

Q. What? A. The lamp cannot be bested in those circumstances, The flame safety lamp is the only real method of detecting CO2, or detecting bottom gas where CO2 is the predominatn component of the mixture.

Q.You say it is the only --?A. The best.

Q.Would you just elaborate please on where it "beats" the methanometer, if I may say that? A. It is a positive indication at all times and when you use the flame safety lamp to detect CO2 in bottom gas, where CO2 is the predominant component,the lamp roacts quite quickly, quite visibly and apparent to anybody who knows the reaction of carbon dioxide on a flame safety lamp.

Q. Where does the methane test come into this analysis of yours? A. Where methane is the minor component to such an extent that in no circumstances can the bottom gas form an inflammable mixture the firedamp does not show at all but the carbon dioxide reacts in the flame before there is any possibility- there might be no possibility of the firedamp showing on the flame safety lamp.

Q.You say it will not show then in circumstances where the mixture is not inflammable; is that the position? A. Yes.

Q. But when the mixture is inflammable what is the accuracy of the oil safety lamp? A. When firedamp is present to a reasonable degree, such that when the gas is mixed with air it will form an inflammable mixture, the flame safety lamp, when used properly, will indicate the presence of CH4 and will also indicate the percentage of CH4 up to the limit of the lamp's capacity.

HIS HONOR:Q. In bottom gas where you have a mixture whichin fact may just be inflammable if air was present, how do you tell what is the proper use of a safety lamp in such an instance? A. When you have a mixture which you consider, you think might be on the borderline of inflammability, the test for such a gas is first of all to establish the presence of methane. That is established by lowering carefully into the mixture a lamp with a partially reduced flame - not fully reduced flame - a partially reduced flame and the lamp is lowered carefully into the mixture and you will have an indication of the presence of CH4 on the flame of the lamp by its increased luminosity or increased brightness and when that point is reached you withdraw your lamp from the mixture. You then establish the limits of bottom gas and you can approach that testing with the reduced flame which will indicate the CH4 percentage at that point, reduce your flame, carefully lower it to your predetermined position, the position you have already determined, if the firedamp is present, and then watch for the indications of CH4 on the reduced flame of the lamp.

Q. That requires, on your description, you will agree, a certain degree of skill? A. I will agree.

Q.By the operator? A. I will agree.

Q. If the deputy, for example, is suspecting black damp more than bottom gas, or bottom gas with a predominance of black damp he may well hurry that test through? A. Yes.

MR. LEE: We were not able in the Court room to have the benefit of a practical test to show us how the lamp does reveal the cap, but I have this pamphlet which is one issued by the Mines Department in England and was first published in 1928 but I am informed every word it says about the oil safety lamp is still completely accurate. It may be my friends will allow me to pass it up to Your Honor.

HIS HONOR: Would you like to tender it?

MR.LEE: It may be tendered, yes, by all means.

HIS HONOR: I am envisaging a time when the evidence and the inquiry into this matter will end and I have to sit down and come to a decision on the matter.

MR. REYNOLDS: I think it would be helpful to Your Honor.

MR.LEE: I will tender it. I have no hesitation in tendering it.

(Pamphlet marked Exhibit "U").

MR.LEE: Q. To summarise your views on the methanometer I think you would agree that the methanometer, if put in use, at least overcomes the problem of the methane test right at the roof? A.Yes.

Q.You say as to the testing of bottom gas that the oil safety lamp in the hands of a competent man is a perfectly good instrument?A.Yes.

Q.But that it may fail because of the lack of skill on the part of the operator? A. Yes.

Q.And the methanometer would get over that problem? A. Yes.

Q.I think that is as far as you wish to go in the matter? A. Yes.

Q.Perhaps I may continue with some general history of the Bulli Colliery which perhaps should be put before the Court. The present owners of the colliery are Australian Iron &Steel Pty. Limited who assumed ownership in 1936 and at the time of the accident produced around 4,000 ton a day with a work force of some 400 men --

HIS HONOR:Q. That is a pretty high production? A. Fairly high production, yes.

MR.LEE:Q. The line of technical management as I understand it, and which has been given to you,is as follows: Mr.H. Wilkinson, General Superintendent of A.I.S./B.H.P. Collieries? A. Yes.

Q. Mr. C. Martin, Deputy General Superintendent of A.I.& S./ B.H.P. Collieries? A.Yes.

Q. Mr. L. Pearce, Assistant General Superintendent of A.I.S. Collieries. Mr. J. Grierson, Superintendent A.I.S. Collieries? A. Yes.

Q.Mr. O.J. Ryan,Assistant Superintendent A.I.S. Collieries?A.Yes.

Q.Mr. D.Stone, Manager Bulli Colliery? A. Yes.

Q. MR. J. Puddle, Under-Manager, Bulli Colliery? A. Yes.

Q. Access to the existing workings is gained by a straight drive 12 feet x 8 feet in section 12,600 feet long with the portal being 260 feet below the level of the seam and rising on a gradient of approximately one in 140? A. Yes.

Q. Secondary means of egress are maintained through the transport road and haulage road to the older workings? A. Yes.

Q. Three shafts are sunk to the seam one of which is an upcast and the other two are downcast? A. Yes.

Q. The main fan at the upcast or No.1 shaft is exhausting approximately 325,000 cubic feet of air per minute against a water gauge of 3.65 inches? A. Yes.

Q. And that is a very satisfactory level of exhausting?A.Yes.

Q. 8 Right District is part of one of the two major air splits in the colliery? A.Yes.

Q. In the split known as 1 North, had 217,000 cubic feet of air per minute entering, according to the October 1965 air measurements? A. Yes.

Q.And that again is a very satisfactory level? A.Yes.

Q.8 Right, which is the first sub-split of the 1 North split, was regulated and according to the October figures 28,600 cubic feet per minute was entering this split? A.Yes.

Q.A nd the same comment applies there; satisfactory?A. Yes.

Q.According to the measurements taken by the colliery, this air in 8 Right Section contained in October and November .20% of firedamp?A. Yes.

Q.What is your comment on that percentage?A. Satisfactory-nothing to worry about.

Q.Well within safety conditions? A.Yes.

HIS HONOR: Q. That is the return air? A. Yes, the return air from the section - it contained .2%.

MR. LEE: Q. According to your information, 8 Right District was commenced about May 1965?A. Yes.

Q. Initially it was composed of three headings with their associated cut-throughs driven towards a fault which was known to exist some 18 chains distant from the point of entry from the extreme right hand road in the 1 North development? A.Yes.

Q. Ventilation in the development stage was assisted by the typical auxiliary fan layout for this colliery? A.Yes.

Q. The development of the three headings reached its limit near the fault and pillar extraction began on 12th July 1965? A.Yes.

Q.Coincidental with the extraction of the pillars formed during development, a block of coal to the left of the three developments heading was also extracted? A.Yes.

Q.This block of coal extended some 90 to 100 yards out from the left hand or A Heading of the development?A.Yes.

Q. Up till 9th November, 51,749 tons of mined coal with a specific gravity of 1.59 had been extracted from that area shown as the goaf on the plan? A. Yes - 1.57.

Q. 1.57, yes; we had that before. During the period of pillar extraction firedamp and black damp had been detected by the deputies at various times? A.Yes.

Q.Ventilation at the working face was accomplished by means of an auxiliary high flow contra rotating fan of 32 inches diameter and ventilation tubes? A.Yes.

Q. Such fans are theoretically capable of exhausting 12,000 to 15,000 cubic feet of air per minute against a water gauge of 12 to 13 inches? A. Yes.

Q.The use of such fans is governed by a set of special conditions laid down by the District Inspector when the manager

gives notice of his intention to introduce such fans as required by the second paragraph of general rule 3, Section 54 of the Act? A. Yes.

Q. And that (shown to witness) is a copy of the requirements in regard to fans? A. Yes.

(Copy of requirements in regard to fans tendered and marked Exhibit "V")

Q. According to the information that was given to you, in the last week in October 1965 an identical extra fan was installed in series with the one in use? A. That is right.

Q. It was your view that there would be little or no increase in the quantity flowing in the system because of that? A. Yes.

Q. In addition to the ventilation tubes which ventilated the working face there was a 12" spiral tube coupled into the fan system and this spiral tube passed into the back of the shuttle car shunt and had its open end close to the floor? A. Yes.

Q. You had a view as to what the purpose of that bleed tube could be; what was the view you held as to what its possible purpose might be? A. There could be two purposes for the bleed tube: (1) To ventilate the shunt and (2) To attract gases coming off from the goaf to the bleed tube and prevent them from passing into the general air body in the working area.

Q. We will come back to that later on. Also in this shunt was a tight cement washed brattice sheet which in your view was placed there to restrict the flow of gases from the goaf into the wheeling road and intake air? A. Yes.

Q. So that the set up on the morning of 9th November 1965 according to the information you collected was as follows: Two identical 32" fans were operating in series in the A Heading just outby of the intersection of A Heading and No. 2 cut-through? A. Yes.

Q. Towards the extreme outby position of these fans a tight brattice screen was erected? A. Yes.

Q. To the fans was connected a 22½" ventilation duct line which extended through two right angle bends and about 125 yards to the working face? A. Yes.

Q. Also coupled to the fan duct line was a 12" spiral tube which extended across No. 2 cut-through into the shuttle car shunt and ended near the floor just in front of a tight cement washed brattice screen placed some 7 or 8 yards in from the intersection with No. 2 cut-through? A. Yes.

Q. You could not get the precise figures but I think you estimated that the fan was exhausting some seven or eight thousand cubic feet of air from the working face at the end of the 125 yards of fan ducting? A. Yes.

Q. And probably some two or three thousand cubic feet of air per minute through the spiral tube? A. Yes.

Q. Your report goes on, and perhaps I may read this without objection, that you took the view that while there was no direct evidence that the goaf contained noxious or inflammable gas just prior to or at the time of the incident, there was evidence collected later that this goaf did contain both noxious and inflammable gas? A. Yes.

Q.On the day following the fire those gases were detected by a number of your inspectors? A. Yes.

Q.And we have the precise detail before us of the inspection of Mr.Longworth and the various findings which he made?A.Yes.

Q.That was the day following the fire. Further evidence of the presence of the methane was found again on the Friday? A.Yes.

Q.And to cut it short on this point, it has been found consistently since? A.Yes.

Q.You left it to the analyst to analyse the mixture of the carbon dioxide and carbon monoxide which the various inspectors found?A. Carbon dioxide and CH4.

Q.So, as a result of that, you took the view that at the time of the incident the goaf did contain inflammable gas in the form of firedamp, and also carbon dioxide which is non-inflammable? A.Yes.

Q.You were aware that the highest percentages of the gas were found near the floor; that is of the methane gas? A.Yes.

Q.And the only deduction you could draw from that was that the inflammable gas and the carbon dioxide formed that gas known locally as Illawarra or bottom gas? A.Yes.

Q.You noted that as the coal seam in the 8 Right District dips generally towards the goaf area, it could readily be concluded that the Illawarra gas given off in the working of the coal would tend to remain in the lowest part of the district? A.Yes.

Q.And would thus eventually fill the goaf? A. Yes.

Q.You express an opinion in your report on this matter and I will, again with the concurrence I am sure of my learned friends, lead that opinion, Mr. Menzies. You go on to say "In my opinion it can now be postulated that prior to the incident on 9th November 1965 the goaf area in 8 Right was filled with a mixture of gases comprised largely of firedamp and carbon dioxide"? A.Yes.

Q.And that normally such gases were given off into the district airways in quantities which could be handled by the ventilation of the district? A.Yes.

Q.You went on also to say that it could be postulated -

MR.REYNOLDS: Would my friend read at such a pace that we can make notes?

MR.LEE:Q. Prior to the incident on the 9th the goaf area in 8 Right was filled with a mixture of gases comprised largely of firedamp and CO2, and normally such gases were given off into the district airways in quantities which can be handled by the ventilation of the district ? A. Yes.

Q.I think you also took the point that it could be postulated that the spiral tube fitted to the auxiliary system was set up to handle such quantities of the gas as were given off in the shuttle car shunt and that the cement washed brattice sheet inby of the shuttle car shunt was placed there to retain as far as was possible such excess quantities of the gas as were driven off from the goaf? A. Yes.

Q.In other words the brattice was there to deal with the position and in your view also the spiral tube was there to deal with the position of gas? A.Yes.

Q.You went on to refer to the figures you had got as to the extraction of coal from the goaf: 51,749 tons with a specific gravity of 1.57 and you calculated, and these are approximate figures only, that the removal of that coal would leave a void of some 42,000 cubic yards?A.Yes.

Q.Your report goes on "Such voids,however, do not remain so and are generally partially filled by collapsing roof. The volume of such roof expands considerably as it falls"? A. That is correct.

Q.But unless it is subjected to crush by the overlying strata, the collapsed roof does not form a compact mass? A. That is correct.

Q.It has been proved experimentally that broken material such as rock will occupy a volume one third greater than the compact mass?A.Yes.

Q. As far as you could see there was no evidence that the goaf area in question had been subjected to excessive weight? A.No.

Q.And you thought that it was reasonable to assume that the goaf had void spaces equal to approximately one third of its total volume? A. Yes.

Q.That is some 14,000 cubic yards? A.Yes.

Q.And so you thought it reasonable to assume that the goaf area in 8 Right Section contained some 14,000 cubic yards or 378,000 cubic feet of a gas mixture? A.Yes.

Q.And as a result of what the analyst has told you, a mixture which in your opinion was one which could be described as rich in firedamp and carbon dioxide? A. Yes.

Q.Then your report goes on to note the fact of the barometric fall between 12 midnight on the 8th November and 9 a.m. on the 9th November? A.Yes.

Q.I will notpress that any further because we have all been told as to the significance of barometric pressure. You go on to say that it now seems clear that around ten past nine on Tuesday the 9th firedamp was seeping into the airway of 8 Right and particularly into that part known as the shuttle car shunt in such quantities that it could not be readily removed by the ventilation system? A.Yes.

Q.You say it also seems clear that carbon dioxide in sufficient quantity was associated with the firedamp so that the firedamp was kept near the floor instead of at the roof where it is normally found? A. Yes.

Q.You say that it seemed clear to you that the amount of carbon dioxide present was not of such large quantities as would render the firedamp non-inflammable when mixed with air? A. Yes.

Q.That is a conclusion taken after the event, of course, because of the fire that took place? A. Yes.

Q.Now, on that set of circumstances then,it was your view that all that was needed was an ignition point? A. That is so.

Q.You considered three possibilites? A.Yes.

Q.The first one you considered is what you describe as contriband? A.Yes.

Q.That is the presence in the mine of inflammable, or agencies capable of causing ignition, such as matches, cigarettes, cigarette lighters and things of that nature? A.Yes.

Q.And you could find no evidence at all to justify even a suspicion of contriband?A.No.

Q.Then your next thought was the possibility of an electric arc? A.Yes.

Q.And you had at that point of time when you made the report the examination made by Mr. James which discounted any such suggestion? A.Yes.

Q.So thelast matter which you considered was the heat caused by mechanical friction? A.Yes.

Q.On that score you had the evidence of the piece of wood in the mechanism of the shuttle car?A.Yes.

Q.You had the views or the information supplied to you by Mr. Donegan as to the ability of that mechanism to ignite the wood in that situation?A.Yes.

Q.And your own personal appreciation of the possibility, apart from analytical evidence, of the wood igniting in that situation? A.Yes.

Q.Your view was that that was the probable source of ignition? A.Yes.

HIS HONOR: Q.Had you considered the question of the coked coal or coal dust in the brake area as a possible source of ignition? A. I considered it, Your Honor.

Q.And did you discount that? A. I discounted that.

Q.Why did you discount it? A. Because I consider the evidence in that piece of wood so conclusive that I could find no other reason for this piece of wood being such as it was.

Q .What I am suggesting to you is that there may be actually in the one area, of course, two sources of ignition? A. I feel that even allowed there was slight evidence of coking of material found adjacent to the disc or the disc brake system, there was also associated with that coal dust and what-have-you, hydraulic oil and there may have been lubricating oil, but I feel that if this had been in any way on fire or heated up to any degree, the combination of coal dust and oil and grit would have ignited very very readily.

Q.Is this what you are saying, that the wood heated up, that the heat generated there was not sufficient to ignite the mixture of the coal dust and oil? A. No.

Q.Not sufficient to ignite the gas? A. The point of ignition was removed from the accumulation of coal, oil and stone dust and coal dust.

Q.What do you mean by that? A.Well, the coal dust and oil et cetera were all on the lower edge of the disc brake, the disc and disc brake system. The coked piece of wood was

probably some six or seven, maybe five inches higher, and slightly displaced from the position of the coal dust and oil.

Q.So you mean that the gas that ignited was higher than the area of the coal dust and oil? A. Yes.

Q.Do you know anything at all about this hydraulic oil or hydraulic brake fluid that is mixed with it; do you know anything about whether that is inflammable? (no answer).

MR. LEE: This will come from Mr. Donegan.

HIS HONOR:Q. Assuming that that is so, that it is inflammable, would you as an experienced inspector regard the presence of that, whether it is a factor that caused this fire or not, a source of danger? A. It is definitely a hazard.

Q.The presence of the accumulated coal dust and oil is a source of danger in that location? A. Yes.

MR. REYNOLDS: Is Your Honor referring to the spilt oil or the oil in the reservoir and pipes?

WITNESS: No, the oil, the spilt oil.

MR. LEE:Q.To get your description of that, I think the position was that coal dust, lubricating oil and small pieces of coal were packed around the base plate up to a height of half an inch above the bottom of the brake disc? A. Yes.

Q.This coal and oil showed no signs of having been on fire? A.Yes.

Q. The wood adjacent to the brake disc was charred to the appearance of charcoal and was very friable? A. Yes.

Q.You have seen the piece of wood and you know Mr. Donegan tested it? A. Yes.

Q.I think you could see on it, could you not, the obvious impregnation of some hydraulic oil? A.Well, you could see the obvious evidence of charring.

Q.I will leave that to Mr. Donegan. You then went on to say it was your view that at about 9.15 on Tuesday the 9th the ignition, whatever it was, from the wood coincided with the presence of an accumulation of inflammable gas near the floor in the shuttle car shunt when shuttle car No.40 was being driven into the shunt in the normal course of producing coal? A.Yes.

Q.When this ignition occurred at the piece of wood, you took the view that it rapidly spread throughout the accumulation?A.Yes.

Q.What accumulation - that is the accumulation of gas?A. The accumulation of gas,yes.

Q.Into the spiral tube?A.Yes.

Q.Which was exhausting part of the accumulation and accordingly, on your view, would naturally be expected to have inflammable gas in it if there was any there? A. Yes.

Q. Along the spiral tube across No.2 cut-through and so produce the ribbon of flame which I think was either referred to by several witnesses or, if not referred to specifically,such an impression was created by them? A. Yes.

HIS HONOR: There is no evidence I can recall of a ribbon of flame.

MR.SULLIVAN: Fingers.

MR. REYNOLDS: Someone said "finger".

HIS HONOR: That would be reaching down. That is not the same thing.

MR. LEE: I think that was a bad description "ribbon of flame" if I may say so. The impression we got was the flame coming from the shuttle car up the tube and across and clearly being at roof height for a short space of time anyway and not coming down at all because when the men ran through they ran through and -

HIS HONOR: It dripped down. That was what one witness said. I think it was Mr. Stewart, the Deputy, said he had a couple of burning drips that came, apparently, from the bleeder tube which was aflame at the time, probably melted, probably burning. There is more to this, as to the way the gas ignited.

MR.LEE: He does make some further observations.

HIS HONOR:Q. Did you take into account the fact that the shuttle car when coming into the shunt would have in fact swerled any gas around? A. I considered it, yes, Your Honor.

Q. That is probable, is it not? A. Yes.

Q. If there was any addition to the gas below the point it would obviously have travelled anyway but probably because methane is lighter than air it would have travelled upwards; would you agree with that? A. No, Your Honor.

Q. You would not? A. No.

Q. Tell me why? A. The bottom gas, when given off, is given off as a completely diffuse gas and a diffuse gas does not easily separate and when it was disturbed by the shuttle car it would still retain its heavier than air quality and if it did go to the roof it was against the normal gravitational force at the time.

Q. It would not be the methane from the admixture of methane and CO2 which comprises bottom gas? A.No.

Q.It would not do that?A. No.

Q.Did you consider the possibility of another layer of methane at roof level?A. We found no evidence to indicate methane existed except as a component of bottom gas.

Q.I thought we had evidence and it was on that I was basing my questions. I thought Mr.Longworth tested for methane? A. Can I re-phrase my answer?

Q.Yes. A. We have no evidence that methane existed in large quantities other than as a component of bottom gas.

Q.You have evidence that methane did exist at roof level?A.Yes.

Q.Was the evidence sufficient to show that the methane was,at times, of a concentration sufficient to ignite in air? A. No.

Q.Do you know the concentration that is necessary? A.Yes.

Q.I suppose you do, in view of your answer?A.Yes, 5.4% in air. 5.4% of methane in air.

Q.5.4% is ignitable?A. The lower limit of inflammability. Below that percentage it will burn if you put a light to it but if you take the light away it will go out.

Q. Assume you have a flame coming up from the bottom gas and perhaps a swerl of bottom gas and you have a flame applied to it? A. Yes.

Q.Assume the bleeder tube was running close or through this layer of methane at roof level and it was on fire, would there be another layer of methane? A. I could find no evidence to indicate such a layer in fact existed.

Q. It was possible, in your opinion, for you to rule out the possibility there was a burning layer of methane at roof level? A. In my opinion,yes.

Q. We have had descriptions from the witnesses here that there was a fire which was at roof level. I do not want to summarise it so as to make it inaccurate. The first witnesses, the two first witnesses saw that there was a fire above them and they had to bend down to miss it. They are the two witnesses who escaped. I think you have seen their reports? A. Yes.

Q. Mr. Stewart and Mr. Jones, Dale Jones. They ran through without apparently getting burnt? A. Yes.

Q. Mr. Kent, when he came through, said he ran through a wall of flame? A. Yes.

Q. So thick that he believed the men behind him would not have been able to see him when he fell or tripped and that was within seconds, one might say, of the first man getting through unscathed?A. Yes.

Q. So that in that short time, if I accept that evidence, the fire above these two men suddenly transformed itself into a wall of fire? A. Yes.

Q.Now, I want to know what was burning? -

MR.LEE: His Honor wants you to express an opinion.

WITNESS: Your Honor, it was brought up before. My opinion was the ignition was caused underneath the car and at the same time as the ignition was caused the spiral tube was exhausting the same mixture from the accumulation that was ignited, the flame spread and it spread into the spiral tube and followed the inflammable mixture along the spiral tube.

HIS HONOR:Q. Inside? A. Inside the spiral tube, across the intersection, and the heat of combustion developed by burning gases within the tube caused the tube to melt, caused the hanging pieces of the tube to break and the spiral tube fell and struck the floor. If I could revert to the instant when the ignition occurred, you find from Mr. Mangles that he stopped his car with part of the boom still in the No.2 cut-through. In other words he did not really reach the full central position and he says he tried to apply the brakes but he was not sure if he did apply them or not. There is evidence that when the brake was first examined it was not on. It was my opinion that when Mr. Mangles left the car the car continued to move under its own power because it was on a downgrade, under its own gravitational weight, and passed through up to the brattice, dislodged or knocked down the brattice and in so doing liberated the gas already behind that brattice. That gas then being liberated went through A shunt, the shunt in A Heading towards the intersection and by the time it reached there the spiral tube over the intersection fell to the ground and ignited the mixture that was now present at floor level, from the stopping

being damaged at the back of the shunt. To my mind that is the only reason I can give for the rapidity with which the fire developed.

Q.Yes, the rapidity was the thing that struck me at the time. Did that in any way explain why the fire only burnt in the shunt some short distance beyond the brattice? A. To my mind, yes, Your Honor. I consider that the reason the flame did not travel too far behind the shunt towards the goaf was that it reached a position where the concentration of gas and lack of oxygen was insufficient to support combustion.

MR. McNALLY: Your Honor did refer to the bleeder tube. The other day Barry Kent did say he saw the bleeder tube fall to the ground after the deputy and the other man had run through.

HIS HONOR: Could you or other counsel remind me? This was a question being discussed by us this morning before we came into Court: Mr. Kent was only burnt around the area of the face, was he? Is that the evidence?

MR.REYNOLDS: That is the fact. I am not sure that it is the evidence.

MR. LEE: He did say this in his statement, which may be what Your Honor is looking for, and this squares up with what Mr. Menzies says: "As we were running towards it ... with a slow swerl".

HIS HONOR: I accept that as quite consistent.

(Short adjournment).

MR. LEE:Q. I think you have covered your views on the reasons for the fire and you have covered the position of the significance in your view of the cement washed brattice being dislodged in some way by the shuttle car? A. Yes.

Q. Is there any evidence this brattice was cement washed?

HIS HONOR: Yes.

MR.REYNOLDS: There is evidence both ways. There is the evidence of the men who put it up who said it was not and there is the piece produced by the inspector and, if it came from that brattice, he said it was cement washed.

MR. MURRAY: There are two pieces. One is and one isn't.

MR. LEE: They both came from that area and one was cement washed and one just hessian.

HIS HONOR:Q. You are unable to say if this is the brattice from the shunt? A. Yes. My opinion gained since my report is that cement washed brattice trim was recovered from another part of the section, the 8 Right Section, taken to the position where it was found and erected, or re-erected and in front of it the normal brattice screen was erected. In other words it was a 2 ply screen, one part of it was, one ply of it was cement washed but not in situ and a second brattice screen which was not cement washed.

Q. Where did you get that information from? A. One of my inspectors obtained it from, I think, the Under-Manager in the section.

HIS HONOR: Perhaps we may have evidence as to whether it was or was not.

MR. LEE: I think Mr. Longworth said he got that piece from that area and it was made of the two component parts.

MR. MURRAY: The men who put it up said it was not cement washed.

MR.LEE: I realise someone else said it was not.

MR. REYNOLDS: There is evidence both ways at the moment, Your Honor.

MR. LEE: I think Mr. Longworth said he got it from there.

HIS HONOR: If there is evidence both ways I will have to decide the matter.

MR. REYNOLDS: If it is important. It may be there had been an antecedent screen there and what the inspector picked up was not the screen that was in situ.

MR. LEE: I got the impression from what Mr. Menzies just said that the cement washed brattice was recovered from some other part of the mine, put in A Heading and another one, the ordinary hessian brattice, was put in front of it.

HIS HONOR: Q. Is that the position? A. Yes.

MR.LEE: So for a man to say it was a hessian brattice would in fact be exactly what he would see unless he went to the other side.

HIS HONOR: I think this is the first occasion we have had any evidence of it being a double layer of brattice.

MR.LEE: I think it is clear that that was the effect of Mr. Longworth's evidence - two pieces.

HIS HONOR: That may be so. I did not appreciate that at the time. I do not know if it will become important but if it does I will have to make up my mind. Do you suggest it is very important?

MR.MURRAY: It is a question of imperviousness to the passage of air and also the flame. I note that we have evidence now of a double barrier being erected. My recollection is that the only evidence to date was that those who put it up say it was a single brattice erected. I do not know what relevance it will have but unless we found ourselves factually our deductions may be false.

MR.LEE: Q. I want your opinion in a general way on this matter, that is, why you think the methane in the bottom gas only burnt and did not explode? A. The reason for concluding was there was no evidence of an explosion taking place and my understanding of the position was that there was sufficient methane present to cause an explosion of some violence if it had been there only in association with air so there had to be some reason why an explosion did not eventuate and to my mind the depressant or the suppressant effect of the carbon dioxide was sufficient to prevent an explosion being propagated but was not sufficient to prevent an inflammation.

Q. Tell His Honor what view you hold as to the appropriateness of the ventilation system devised by the management to ventilate the extension to No.2 cut-through? A. Would you repeat the question?

Q. Would you tell us your views as to the appropriateness of the ventilation system devised by the management to ventilate the working place in connection with No.2 cut-through? A. In the light of what has happened the ventilation system was obviously inadequate, the reason for the inadequacy lying in the fact that the methods adopted were not sufficient to control the emission of what I think must have been a fairly large body of gas from the goaf inby, off the shunt.

Q. Tell us in what way in your view they were inadequate? What would have been done, in other words? A. What should have been done. That can only be answered provided one knows the conditions that prevailed there before the incident of November 9th. We have evidence from various people of noxious gases and firedamp - (question objected to by Mr. Reynolds).

HIS HONOR: The question can be put in this way, and I shall put it myself: What do you say would be the correct method of ventilating? -

MR.REYNOLDS: If there is a correct way. Your Honor's question assumes there is a correct method.

HIS HONOR: Q. Is there a correct method of doing it? Is there one or more correct method? I will put it that way? A. As the panels stand at the present time there is no method - I retract that - there are methods which can be used to ventilate that section which might remove lots of possibilities of gas being emitted into the working area. Whether such methods would prove completely successful could only be determined in the light of the results on your alterations.

Q. What is the position if the management tries a method and finds that it is unsuccessful? What alternatives face the management? A. No alternative - change it.

Q. What? A.No alternative - change it.

Q.What do you do about work in the meantime? A. If you cannot carry on work while you change you must stop work.

Q. You have said no method is completely successful. I suppose some method may be - ? A. I refer particularly to the section as it stands.

Q. You mean you could not get a completely successful method of ventilating this section as it stands? A. Not unless they change direction of air flow.

MR.LEE: Q. I will put it to you in a slightly different fashion. Forget all about the ventilation system as it was, as we know it was, and bear in mind the features of the area and the presence of the goaf. Can you tell His Honor what is desirable in dealing with gases which may come from the goaf - what factors you take into account in endeavouring to create a ventilation system? A. The most important factor involved in a ventilation system is to prevent the emission of goaf gas into the working area. That can only be completely sudcessful if the gases from the goaf are drawn off in such a position, in such a way, that the direction of air flow in the goaf is always away from the work face, the work area.

Q. With the ventilation system as we know, which did exist, was that situation you have mentioned as desirable achieved? A.No.

Q.Why not?A.It was not feasible.