## NORTH EASTERN RAILWAY.

Railway Department, Board of Trade, 8, Richmond Terrace, Whitehall, London, S.W.,

3rd February, 1916.

SIR.

I have the honour to report for the information of the Board of Trade, in compliance with the Order of the 17th December, the result of my Inquiry into the circumstances under which a collision occurred at about 7.20 a.m. on the 17th December, between a passenger train, a light engine, and an empty passenger train, near St. Bede's Junction, on the North Eastern Railway.

In this case, as a light engine was moving slowly forward on the up main line near St. Bede's Junction, it was run into by the engine of the 7.5 a.m. up passenger train from South Shields to Newcastle, consisting of an engine and seven vehicles, which was travelling at a speed of about 30 miles an hour. Both engines were derailed, fouling the down line, and almost immediately afterwards the wreckage was run into by the engine of the 6.58 a.m. down empty passenger train from Hebburn to South Shields, consisting of an engine and eight vehicles, which was running at the time at a speed of about 10 miles an hour. The light engine and the engine of the up train were thrown down the embankment on the up side of the line, and the two leading vehicles of the up train were considerably damaged, being telescoped together; these two vehicles subsequently caught fire, the whole of the first and the leading end of the second being consumed. The rear vehicles were, however, promptly uncoupled and were drawn back clear of the burning vehicles. Eighteen passengers in this train, most of whom were travelling in the leading vehicle, were killed, and it is believed that all those killed in that vehicle were killed instantaneously by the collision. Their bodies were however subsequently completely consumed by fire, and their identification was a matter of great difficulty. Two or three of the killed, however, were travelling in the leading compartment of the second coach, and it is feared that in one, and possibly two cases, death was due to the fire. There were also 81 people injured, including 11 railway servants, six of whom were travelling as passengers, and some of these injuries are of a serious nature. The driver of the light engine and the driver and fireman of the up passenger train were amongst those injured.

The engine of the down train was thrown down the embankment on the down side of the line, and was seriously damaged. The leading vehicle of the train came to rest close to the two front vehicles of the up passenger train, and it also eaught fire and was completely consumed. In the case of this train also, the rear vehicles were uncoupled and drawn clear of the fire. There were no passengers travelling in this train, but the driver of the engine was seriously injured, and the fireman was killed.

The light engine was a six-wheels-coupled tank shunting engine, and it had been running chimney first from Tyne Dock to St. Bede's Junction; it was fitted with a steam brake working blocks on all six wheels.

The engine of the up passenger train was a four-wheels-coupled tank engine with a trailing bogie, and it was running chimney first at the time of the accident; it was fitted with the Westinghouse automatic brake working blocks on the four coupled wheels, and with a hand-brake working the same blocks. The train consisted of the following vehicles, attached to the engine in the order given :--

One Brake Third 8	wheels.
One Third	"
One Composite 8	,,,
One Brake Third 8	"
Three Thirds 8	"

These vehicles were fitted with the Westinghouse automatic brake, working blocks on all their wheels.

(4716) Wt.60/8956. 875. 2.16. B &F.Lul. Gp.13/9.

The engine of the down empty train was a four-wheels-coupled tank engine, with a pair of radial wheels at each end, and it was running chimney first at the time of the accident; it was fitted with the Westinghouse automatic brake working blocks on the four coupled wheels, and with a hand-brake working the same blocks. The train consisted of the following vehicles, attached to the engine in the order given :--

Two Thirds	• •	 	 • .	• •	۰.	8	wheels.
One Brake Third		 	 			8	,,
One Third		 	 			8	27
One Composite		 	 	·`.		8	,,
Two Thirds		 	 			$\mathcal{E}$	·•
One Brake Third		 	 		• •	3	

These vehicles were all fitted with the Westinghouse automatic brake working blocks on all their wheels. All brakes are reported as having been in good order.

Details of the damage done to rolling-stock and permanent-way are given in Appendix I.

# Description.

St. Bede's Junction, near which this accident occurred, is situated between Jarrow and Tyne Dock stations on the Newcastle and South Shields branch of the North Eastern Railway. There is one pair of up and down main lines running through the junction in directions which are almost exactly cast and west, the up line being ou the south side. The signal-box is on the south side of the line, and immediately opposite to it is a double junction at which a pair of up and down goods lines branch off in a north-easterly direction to Tyne Dock Bottom.

On the up, or west, side of the signal-box there is a cross-over road between the up and down main lines, the trailing points of this cross-over on the up main line being situated 92 yards from the signal-box. At this point there is also situated a signal bridge, fixed across the line; this bridge carries a number of down signals, including a signal for running from the up line through the cross-over on to the down branch line.

The up main line, on which this accident occurred, is provided with the following signals :--

An up distaut signal				792	yards	east o	of the s	signal-box,
An up home signal				85	**	,,	••	
An up starting signal	• ,			274	;,	west	,,	-,
The up branch line is provided with the following up signals :								
An up distant signal	• •			290	yârds	N.E.	of the	signal-box,
An up home signal		• •		141	;;	,,	••	,,

The gradient for an up train approaching the junction on the main line is a falling one varying from 1 in 100 to 1 in 300 for rather over a mile. The gradient for a down train approaching the junction on the down main line is also a falling one, varying from 1 in 100 to 1 in 660, for a distance of about  $1\frac{1}{2}$  miles. The gradient for an up train approaching the junction on the up branch line is a rising one, varying from 1 in 49 to 1 in 240, for a distance of  $\frac{2}{4}$  mile.

The collision occurred at a point situated 231 yards to the west of the signal-box; the main lines at this point are almost straight and are on an embankment about 20 feet in height.

The accident occurred at 7.20 a.m., when it was still dark : it was a foggy morning, and the drivers state that they had to be near their signals before they could see them. The fog appears to have become more dense near St. Bede's Junction just about the time that the collision occurred.

The following were the positions in which the engines and vehicles concerned in this accident were found after its occurrence:—The light engine was lying obliquely on the embankment on the up or south side of the line; its chimney end, which had been the leading end whilst running on the up branch line, was pointing in the down direction, showing that it had been nearly reversed by the collision. The engine of the up passenger

train was lying close to the light engine on the same embankment, its chimney end being at the bottom and its bunker end near the top; its cab showed signs of having been damaged by fire. The front vehicle of this train was uncoupled from its engine, and was derailed to the left of the line, its leading end being a little way down the embankment; it had run past its engine and its underframe was lying against the bunker end of it. The underframe of this vehicle was greatly bent, showing that it had suffered severely in the collision; the whole of its upper portion had been completely consumed. The second vehicle was immediately in rear of the first one, and its rear bogie was on the rails; the leading end of this vehicle and the rear end of the first vehicle were telescoped together, the three rear compartments of the leading vehicle being completely smashed in. The whole of the upper portion of the leading vehicle, and the front portion of the second vehicle, were subsequently consumed by fire. The remaining five vehicles of the train were not derailed at all, and they did not suffer from the fire, as they were drawn away before it could reach them. The engine of the down train was lying on the embankment on the north or down side of the line, and it was uncoupled from its train. The leading vehicle of this train was derailed, but it was standing upright, and was overlapping the leading carriage of the up train by three compartments, the two vehicles lying close together; the upper portion of this vehicle was also entirely consumed by fire. The remaining vehicles of the down train were not derailed at all, and were still coupled together; these vehicles were not damaged by the fire.

All the vehicles of the up train and, with one exception, all those of the down train were lighted by means of gas, each vehicle having two, three or four cylinders housed underneath it well up into the frame. The following are the details of the gas cylinders on the three vehicles which were burnt on this occasion and the condition in which those fittings were found after the accident.

The leading vehicle of the up train was fitted with three gas cylinders, one near its front end and two near its rear end. The front cylinder was knocked off the coach by the force of the collision, and it was found lying under the cab of its engine; it was burst at both ends. One of the rear cylinders was also burst at both ends, and the other was delved in at the bottom, though apparently not broken. All the connections of these cylinders were however broken away, and it may be regarded as certain that all the gas from two of these three cylinders escaped before the fire on the coaches broke out.

The second vehicle of the up train was fitted with four gas cylinders, two at either end; they were all intact, except the leading right hand one, which had a connection broken and its straps shifted; the low pressure pipes were however severed in the case of all the cylinders.

The leading vehicle of the down train was fitted with three gas cylinders, two at its leading end and one at its rear end. The two front cylinders were found in good order and in position on the underframe, but the rear one was burst at one end; the pipe connections of all these cylinders were also broken.

#### Evidence.

Robert Jewett, acting fireman, states :-- I have been about 3½ years in the service of the Company, and I have acted continuously as fireman for seven months. Previous to that I had acted as engine cleaner and temporary fireman in the sheds. I have been working seven months with driver Hunter on the pilot engine. I came on duty at 2 a.m. on the 17th December to work till 11.15 a.m. I had come off duty on the previous day at 1.15 p.m. I was working on the 17th December on the pilot engine with driver Hunter. My engine was No. 2182. It was a sixwheels-coupled tank shunting engine. It was fitted with a steam-brake working blocks on all six wheels. As far as I know, my brake was in good order. It had also a hand-brake working the same blocks. My engine was employed in assisting the 6.50 a.m. up goods train from Type Dock to St. Bede's. My engine assisted that train from the rear of it without being actually coupled to it. The train was standing in the Tyne Docks New Yard when my engine joined I do not know at exactly what time the goods it. (4716)

train started from the New Yard, but my engine started with it. After we started from the Tyne Docks with the 6.50 a.m. train my engine did not come to a stand until we reached St. Bede's Junction. On reaching St. Bede's Junction we came to a stand just after passing the signal bracket. The goods train did not come to a stand at that point at all, but my engine came to a stand. When running from Tyne Dock to St. Bede's my engine was running chimney first. After coming to a stand near the bracket my driver moved the engine a bit back so that he might be able to see the boards, and when wo stopped the second time we were quite close to the bracket. I then put a red light on the bunker end of the engine. Whilst running up the bank there had been a green light on the bunker end of the engine. A down goods train then pessed us on the down line going to Tyne Docks. The driver then whistled for his signal to go back to Tyne Docks. The signal was then put to danger for the Tyne Docks line and the signal for the down main lowered. The

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driver then explained Rule 55 to me, and told me that if the signalman did not let us away as soon as the train had passed on the down main I had better go to the signal-box. A down passenger train went down on the down main line and the heard was put to danger behind it. The driver then gave me a hand-lamp, and told me I had better go to the signal-box. I was on my way to the signal-box when I heard the up passenger train coming. 1 got down near to the signal-box and the signalman opened the window and asked me what was the matter, and I told him that the engine which had shoved the goods train up wanted to get back to the Dock Bottom. He told me then to put a red light against the up passenger train. I did so. The signalman went back to his levers, but the up passenger train went past me with steam turned on. I cannot say what sort of speed it was running at when it passed me. It was going fairly fast. It did not appear to me to be checking speed at all. I do not know whether its brakes were applied, but the steam was turned on when the engine passed me. I heard the noise of the collision occur. I do not think that more than five minutes elapsed between the time my engine came to a stand and the time I went back to the signal-box. I myself had never carried out Rule 55 before. I had read Rule 55 before, but I did not know exactly what to do. I am not sure whether I had ever worked on an engine which was acting as pilot engine on that train before, but I am sure that I had never done so with driver Hunter. At the time my engine came to a stand at the bracket it was dark. It was very foggy and I could not see the signal cabin from where the engine was standing. After the up train had gone past; the signalman ran down the stairs, and he told me that he had not known that there had been a pilot engine with the goods train, but the driver of my engine only whiatled once and that was just after the goods train went by. At the time of the accident I did not know that there had been a down passenger train concerned in the accident. After the accident I walked up towards the scene of it, and I met the guard of the up passenger train and he sent me back with some fog signals to protect the up line. Whilst I was walking back to the signal-box I did not see the position of any of the up main line signals as I could not see them on account of fog. When I left my engine to walk back to the signal-box there was still a red light on the bunker end of my engine. The lamp was showing a good light. I have always had a green light on the bunker end of my engine when running up from Tyne Docks. After I had put down fog signals I-returned to the scene of the accident and I assisted to move back the rear carriages of the up train. At that time the leading carriage of the up train was on fire and the leading end of the second carriage, and the remaining vehicles of that train were drawn away from them. Last October I was supplied with a Book of Regulations. When I got back to the scene of the accident none of the vehicles of the up train had been uncoupled from it. We uncoupled the vehicles one by one from the rear of the train and shoved them back singly. When engines are shunting in the Dock Bottom we usually have a red light on the climney end, and on the bunker end we have sometimes a white light and sometimes a green light. I did not shift the lights on the engine at all before we began assisting the goods train up the incline. When my engine first joined the goods train the engine of the goods train shoved the whole train back towards the river. The train, was shunted back towards the river in order to get clear of some points. It was foggy when we left the Dock Bottom, but not as loggy as it was when we got to St. Bede's. I was firing whilst we

were running up the bank, and I did not notice whether the weather changed much. When I loft the engine to go back to the signal-box the driver warned me to look out what I was doing. The driver did not discuss with me the advisability of my going back, but simply told me that as soon as the train had passed I had better go back. We use a white light at the bunker end of our engine when we set back against wagons.

Robert Jewett, acting fireman, recalled, states: The lamp which I took with me when I returned to the signal-box was one which showed either a white, red or green light, and as I walked back it was showing a white light. I remember looking out when my engine had just passed St. Bede's signal-box, and at the time my engine was close up to the rear of the goods train and remained close up until we reached the bracketed signals. After I spoke to the signalman I changed my lamp so as to show a red light to the up passenger train.

William Hodgson, signalman, states :- I have been 42 years in the service of the Company, and I have been a signalman for 40 years. I am now stationed in St. Bede's signal-box, and I shall have been stationed there 40 years next March. I came on duty at 6 a.m. on the 17th December to work till I had come off duty at 2 p.m. on the previous 2 p.m. day. I remember the 6.50 a.m. up goods train from Tyne Dock passing my signal-box. It passed my box at 6.55 a.m. I was watching the train as it passed my box and I saw a red lamp on the rear of the tail of the brake van, and I did not think that there was a pilot engine at the rear of it. I am certain that the tail lamp at the rear end of the whole train was a red one. I knew nothing whatsoever about the light engine having come to a stand on my main up line, nor did I hear any whistle from the light engine. A down goods train running into the branch siding passed my box at 7.2 a.m. Th next train that passed my box was a down passenger train on the down main line and that passed my box at 7.12 a.m. The 7.5 a.m. up passenger train from South Shields was offered to me from Harton signalbox at 7.8 a.m. and I accepted it forthwith. At that time I had not received the "Train out of section" signal from Jarrow for the goods train, but at 7.11 a.m. I did receive the "Train out of section" signal from Jarrow for the goods train. After I received this "Train out of section" signal from Jarrow 1 lowered my distant, home and starting signals for the 7.5 a.m. train. At 7.13 a.m. the fireman from the light engine came back to the cabin and that was the first intimation which I received of there being a light engine on the line. When the fireman told me that there was a light engine standing on the line 1 told him that there was now no time to get him back. and I at once threw all my up signals to danger At the time that I put the home signal to danger the engine of the 7.5 a.m. train was passing the signal. I cannot say whether the driver saw that signal put to danger. I saw the train run past my box. I cannot say whether steam was turned on the engine at the time nor can I say whether brakes were applied I cannot say whether the train was checking speed. I had not time to exhibit my red hand lamp before the train passed my box. I noticed that the fireman had a white hand lamp and I asked him where his red one was. I should something more to him about his light but I cannot remember what it was. The train passed my box at 7.14 a.m., which was one minute after the fireman had arrived at my box. I heard the noise of the collision at that time. All my np signals were at danger. My down signals were also at danger. At 7.12 a.m. I had accepted

the empty passenger train from Jarrow and I never lowered any of my signals for it. I heard a second crash which I should say occurred about one minute after the first crash. I had received at, I think, 7.12 a.m. the "Train entering section" for the down empty passenger train. I did not lower any of my down signals for the empty passenger train as the section to Harton was blocked. I have frequently been on duty when the 6.50 a.m. up goods train has passed my box. About three times a week that train has a pilot engine assisting it in the rear. The only way in which I know whether there is a pilot engine is by looking to see whether there is one. The pilot engine usually comes to a stand on the up main line ahead of the crossover road. At the time that this accident occurred it was dark; it was foggy. I could see from my box to the back lights of the down main line signals fixed on the signal bridge, but I could not see the road. Before I pulled the signals off for the up train I looked up the line and could see nothing of the fireman. He told me that there was a light engine standing on the up line. I looked up to see if I could see the light on it, but I could not do so. When there is a pilot engine at the rear of the up goods train it should carry a red light on its trailing end, and they generally do do so, but I have known the pilot engine running up in the rear of a goods train with a green light on its trailing end. When the 6.50 a.m. up goods train passed my box I saw three red lights at the rear end of it. To the best of my belief two of these were side lights and the third was a tail lamp. If there had been an engine on the rear of the train there would have been no side lights, and it was on that account that I thought there was no pilot engine at the rear of the train. I do not get any information from the Dock Bottom as to whether there is an assistant ongine. The signal showing that there is an assistant engine thus :—" 2-2," is not used on this line. There is no signal arranged by means of which the Dock Bottom signal-box could let me know that the engine has a green light instead of a red light, but he could always send me the "Stop and examine " signal.

Frank McArdle, fireman, states :-- I have been about eight years in the service of the Company, and I have been a fireman just turned three years. 1 came on duty on the 17th December at 3.45 a.m. to work till 12.45 p.m. I came off duty the previous day at 12.45 p.m. On the 17th December I was working as fireman on the 7.5 a.m. np passenger train from South Shields. My engine was a four-wheelscoupled tank engine with trailing bogic, and at the time of this accident the engine was running chimney first. My engine was fitted with the Westinghouse automatic brake, working blocks on the four coupled wheels, and with a hand-brake working the same blocks. My brakes were in good order. I was on the engine with driver Smith. We left Shields, I believe, about right time, which would be 7.5 a.m. We stopped at High Shields and Tyne Dock. Before the accident occurred our brakes were made use of in stopping at these stations. It appeared to me that the brakes acted well. It was about 7.13 a.m. when we left Tyne Dock Station. I am acquainted with St. Bede's Junction. I have often run over the line between South Shields and Newcastle and am well acquainted with it. Nothing unusual occurred to my train after leaving Tyne Dock Station until we reached St. Bede's Junction. I am acquainted with the signals at St. Bede's Junction. I myself did not see the distant signal for St. Bede's Junction. When we passed it I was employed at the time breaking coal. My train was not checked when passing the distant signal. I did not myself see the position of the home signal at St. Bede's. I do not

remember passing the St. Bede's signal-box. At that time I was still breaking coal. The first I knew of this collision was hearing a noise, and my engine began to shake. I do not know where we were at the time that I felt this happen. My driver did not call attention to snything before 1 felt the engine shake. All that I can remember about my driver at the time was that he was looking out of the engine. The engine then came to a stop. When the engine came to a stand 1 found it was down the embankment and I believe that it went down the embankment when it began to shake. It went down the bank on its left hand side. I do not remember the engine actually leaving the rails. The engine did not alter its position after it once came to rest. I thought that my engine had run into something on the line in front of us but I did not know what it was. I was still breaking coal at the time the engine began to shake. I was bruised on the head, body and hand by the accident. I got off the engine as soon as it came to rest. At that time I did not notice another engine lying near ours. As soon as I came to myself I proceeded towards the signal cabin and I met driver Tolliday. I said to him we must have both trains protected. He said I will look after that-you go and get yourself looked after. I was still proceeding to the back of the train when a soldier got hold of me and took me into a house. When I got my wounds washed I came out again and I then proceeded back to the engine. I had my head and finger bruised and I think it was about a quarter of an hour before I came out again. I saw nothing of the down train, I cannot say whether my engine came into collision at all with the down train. I knew nothing about I did the down train until I came out of the house. not notice my train being checked at all while it was passing through St. Bede's Junction. I estimate the speed of my train at the time the engine began to shake at about 30 miles an hour. I cannot say whether steam was still turned on at the time, nor can I say whether the brakes were applied at all. It was dark and very foggy at the time. The last signal I saw was the Tyne Dock starting signal. -I was able to see that all right, but I did not look for any of the signals at St. Bede's Junction. The accident took me quite by surprise—I had no warning of it at all. When I left my engine to go back to the signal-box the first carriage of my train was on fire. At that time the fire was not burning fiercely. It appeared as if it was just starting. I did not notice any fire in my engine, but it was the front of the front carriage next the engine which was on fire. At that time driver Tolliday was endeavouring to extinguish the fire on the front vehicle. When I came back from having my wounds dressed the train was still on fire and the leading vehicle was on fire, but only the leading vehicle. When I got back to the engine I felt faint and I went towards the house again. I jumped off the engine and I saw the driver follow me. After that I saw nothing more of the driver. I ultimately went up to Newcastle with him. I do not know whether any of the fire out of the fire-box was thrown on to the footplate. I had just finished breaking coal, and had put the hammer down when the engine began to rock. I was not thrown down by what happened. I did not feel any blow of the collision from the time the engine began to shake until I got off the engine. When my engine came to rest the bunker end of the engine was near the top of the bank and the chimney was down at the bottom.

Alexander Mitchell, guard, states :--- I have been 24 years in the service of the Company, and have been a passenger guard for six years. I came on duty at 5 a.m. on the 17th December to work till 3 p.m. I came off duty the previous day at 3 p.m. On the

17th December I was guard of the 7.5 a.m. train from South Shields. My train consisted of the following vehicles attached to the engine in the order given :-One brake third, eight wheels; one third, eight wheels; one composite, eight wheels; one brake third, eight wheels; three thirds, each eight wheels. The vehicles were all fitted with the Westinghouse automatic brake, working blocks on all wheels. My brakes were in good order. I mysell was riding in the brake third in the middle of the train. We left South Shields at scheduled time, viz., 7.5 a.m. and we stopped at High Shields and Tyne Dock Stations. When stopping at these stations it appeared to me that the driver had his train well under control. I am acquainted with the line from South Shields to Newcastle, and I know St. Bede's Junction. I am acquainted with the signals at St. Bede's Junction. When we were approaching St. Bede's I did not see the position of the distant signal. When I was approaching St. Bede's Junction I looked out in order to see the distant signal. My compartment was fitted with a top ducket and it was out of that ducket window that I was looking. I account for my not seeing the distant signal owing to the fog and the smoke from the engine. As far as I could observe my train was not checked at all when passing the distant signal. I did not see the home signal for St. Bede's. I was looking out for that also and I account for my not seeing it owing to the log being very dense at that point. I did not observe the signal-box when we passed it. I do not remember running through the Junction points. I do not think that the train was checked at all when running through the Junction. I should estimate the speed of our train when passing through the Junction at from 25 to 30 miles an hour. The first I knew of the collision was my being thrown from my seat on to the top of the steps. It seems to me that the speed of my train was suddenly checked. I was then thrown from the top of the steps on to the floor. It appeared to me that after the first check my van went on again. It was then checked a second time. When I was thrown on to the floor the van came to a stop and never moved The speed of my train was not checked at all again. until the first check occurred. My hand lamp had been thrown on to the floor and went out. I got up and re-lit it. I then got out of the van and saw the position of our engine. The engine was lying down the bank. I at once enquired whether there were any subulance men in the train. I found a volunteer who was well acquainted with ambulance work. It was driver Tolliday. Whilst I was talking to Tolliday my driver passed towards the signal cabin supported by two gentlemen. He then told me that all lines were blocked. I went back to the signal-box and told the signalman that I would leave my train in his charge. I then found one of our clerks who volunteered to go back to protect in the Tyne Dock direction. I then proceeded from the St. Bede's signal-box towards the head of my train. I found I could not get down the permanent-way and I went down the side of the embankment. I then climbed over the railings and got down by the fields to the other side of the wreckage. That was the first time. that I discovered that there were three trains involved. Seeing that there were two trains due from Newcastle at that particular time I walked to Jarrow to protect the wreckage from the train in that direction. On arriving at Jarrow I met the foreman and two porters whom I instructed to get all the medical men they could, also ambulances and stretchers. 1 then met the 7.15 a.m. express Newcastle and informed the driver what had happened, also telling him that that would be his terminal point. When I got out of my van I did not know that the down passenger train had run into the wreckage, but I think that it must

have been when I felt the second check. I had got out of my van on the left hand side of it. The bunker end of my engine was lying near the top of the embankment. The leading vehicle of my train appeared to me to be between two engines. At that time I did not know what the second engine was. I cannot say whether the loading vehicle was still coupled to the engine; it was derailed. It was standing upright, at the time. It was not on fire. The second vehicle of my train was on the top of the embankment. The leading vehicle was some way down the embankment, I do not know whether the second vehicle was coupled to the first vehicle. The second vehicle was standing upright. The second vehicle was not on fire at that time. The remaining five vehicles of the train were not derailed at all. The five rear vehicles were all coupled together and standing upright. At that time I saw nothing of the engines or vehicles of the down train. When I came from the St. Bede's signal-box my engine had not to my knowledge shifted in position at all, but I cannot say whether any of the vehicles had shifted in position. When I returned from Jarrow signal-box the leading vehicle of my train was on fire, but so far as I know the second vehicle was not on fire. Driver Tolliday and a brake-examiner were doing their best to extinguish the fire. I did not help them to extinguish the fire but went towards Tyne Dock, because the fire brigade was at the wreckage. I went towards Tyne Dock in order to make sure that my train was protected from that direction. I am not sure, when I left to go towards Tyne Dock, whether the leading vehicle was the only one that was on fire. There were plenty of volunteers in the train helping to get the passengers out of the carriages. I myself did not take any part in assisting to get the passengers out. There was in my van one set of tools specially for use in case of accident. The tools consisted of 2 pinch bars, 2 bafflers, 1 large hammer, and saw, 2 lamps, some steel wedges, folding ladders, 2 fire extinguishers, 3 fire buckets, and 1 case of first aid requisites. I did not get these tools out myself, but somebody got them out and they were made use of. I cannot give any information as to whether there was any difficulty in getting passengers out of the train. My time was fully occupied in protecting my There was also a fire under the engine of my train. train at the chimney end. The fire appeared to me to be coming from the fire-box towards the cab of the engine. I did not notice any fire underneath the cab of the engine. When I came back from Jarrow the fire on the leading vehicle was burning very fiercely. It appeared to me as if gas was escaping. Most of the fire seemed to be below the carriage, and that is why I think gas was escaping. I got back from Type Dock in about half an hour. The fire from Type Dock in about half an hour. was then raging very furiously. I do not know whether anything was on fire except the leading vehicle. At that time the five rear vehicles had been uncoupled from the train and had been drawn back The fire brigade was still there and clear of it. endeavoured to subdue the flames. I heard that the extincteurs on the train had been used, but I did not myself see them used. I felt that I was suffering from shock, and I then asked Mr. Carrick if I could go home and I did so. The fire was still burning at the time I left. At the time I left I knew some passengers had been injured, bat I did not know for certain that any had been killed. I had a conversation with the guard of the down empty passenger train. I met him when I returned from my first visit to. St. Bede's signal-box. This was the first intimation As that I knew there was a second train concerned. he was an elderly guard, I told him I would go back to Jarrow and I thought I could do it quicker than he. He agreed to my doing so. I did not have any

conversation with fireman Jewitt. I did not tell him to go back and protect my train. There was a second set of safety appliances in the leading van of my train, but I do not know whether they were brought into use at all. The second check which I felt came very quickly after the first one. I was satisfied that I had left a competent man in charge. of the wreekage, and I refer to driver Tolliday. Before I left South Shields that morning a telephone message came that the 6.25 a.m. ex Newcastle had a late start of 15 minutes, and thinking that the milk van was conveyed by that train, which would utilise five or 10 minutes en route, making in all 25 minutes' delay, that was my point in getting on back to Jarrow, as I did not think I had passed that train. I found out subsequently that I had passed it in the Tyne Dock Tunnel.

Robt. Taylor, guard, states :-- I have been 36 years in the service of the Company, and have been a passenger guard about 24 years. I came on duty at 5.15 g.m. on the 17th December to work till 4.45 p.m. I came off duty the previous day at 4.45 p.m. I was acting as guard on the 6.58 a.m. down empty coaching stock from Hebburn to High Shields. My train consisted of the following vehicles attached to the engine in the order given : Two third class carriages, 8 wheels ; 1 brake third, 8 wheels ; 1 third, 8 wheels ; 1 composite, 8 wheels; 2 thirds, 8 wheels; 1 brake third, 8 wheels. These vehicles were all fitted with the Westinghonse automatic brake working blocks on all wheels. My brakes were in good order. I myself was riding in the rear broke. We left Hebburn at 7.5 a.m. seven minutes late. After leaving Hebburn we did not come to a stand at all until the accident occurred. I am pretty fairly acquainted with the line between Jarrow and St. Bede's Junction. When I was approaching St. Bede's Junction I was looking out several times, but I could not make out any of the signals. It was the weather that prevented my seeing the signals. It was a foggy morning, and it seemed very foggy as we approached St. Bede's. I did not see the position of the St. Bede's distant siguel. I think that my train was slackened after passing the distant signal. I did not see the position of our home signal at St. Bede's Junction. The first I knew of this accident was feeling the shock of the collision. I estimate the speed of our train at the time at from 12 to 15 miles an hour. I thought that we were going to be stopped at the Junction. My vehicle was very suddenly checked by the collision, and I was thrown down on the floor of the van. My van was brought to a stand and never moved again. I then got out of my van on the left-hand side. I went forward and found the front vehicle of my train was off the road with all wheels. I went further forward and saw that the engine was down the embankment. I looked for the driver and fireman, but could not see or hear anything of them. After that I went underneath my train and got on to the up line and I saw the engine of the Newcastle train down the embankment. Just after that I came across guard Mitchell, and he said he was going away to Jarrow to get doctors. I said that I was going back to protect my train. He said that he was going back to Jarrow, and as he could go quicker than I he would protect my train, and he then said I might go and see if the up line was protected. I then went on the up line towards Type Dock to make sure that the line was protected. In going I met a platelayor, who told me I need not go further back as the line was already protected. After that I returned by the signal-box to the rear of the Newcestle train. I found most of the doors of the carriages of that train open and the compartments empty. I asked one of the men standing about if all the passengers were out.

He replied that he could not say whether they were all out of the front carriage. The engine of my train was uncoupled from its leading vehicle. The feading vehicle was on top of the embankment. It was standing upright; it was derailed. It was still coupled to the other vehicles of my train. The other vahicles of the train were all on the line and were coupled together. The first time I saw any sign of fire was when I came back from St. Bede's signal-box after going to see whether the line was protected. It was the front carriage of the Newcastle train which was then on fire. I did not notice any fire in connection with the engine of the Newcastle train. was only in connection with the leading vehicle. The fire was burning foriously at the time. My impression at the time was that the fire came from the roof lamps of the vehicle. It was the roof that was alight, but not the lower part of the carriage. I did not remain long by the fire. At the time I was there I did not see anybody attempt to extinguish the fire. The second vehicle of the train was still attached to the train at that time, but the other vehicles of the train were mostly uncoupled and had been shifted back by hand. The third vehicle was not alight at all. I did not myself take any steps to get it uncoupled. I cannot exactly say why I did not do so. I saw no passengers in the leading vehicle of the train nor did I see any in the second vehicle. There was a case of tools in both vans of my train provided for use in the case of accident. Those in the front van of my train were made use of. I myself assisted to open the tool-box in my ven, but I did not use the tools myself; they were used by three men whom driver Tolliday had sent for them. It was before I left my train that I handed over these tools. I cannot say whether there was any difficulty in getting any of the passengers out of their carriages. I did not actually know what it was that my train ran into. I was busy seeing to the removal of the carriages which had been taken off the Newcastle train, and did not see the fire extinguished on the leading vehicle at all. I never saw any fire connected with the engine of the Newcastle train or with the second vehicle. None of the lights were burning in my train when we left Hebburn. I am not sware that any of the carriages on my train were burnt at all.

Michael Lucas Vernon, pilot-guard, states :-I have been about 31 years in the service of the Company and have been a pilot-guard for about 13 years. I came on duty at 6.25 a.m. on the 17th December to work till 2.41 p.m. I had come off duty at 2.41 on the previous day. On the 17th December I was acting as guard on the 6.50 a.m. up goods train from Tyne Dock to Jarrow. My train consisted of 21 loaded and 10 empty vehicles and a brake-van at the rear end of it. I myself was riding in the brake-van. My train was assisted from the Dock Bottom up to St. Bede's Junction by a pilot-engine from behind. That pilot-engine was not coupled up to my train. That pilot-engine remained behind my train right up to St. Bede's Junction. The pilot-engine did not leave my train until it got over the crossover road at St. Bede's Junction. I remember my van passing the St. Bede's Junction box. . At that time the pilot. engine was close up against my van. We had two red side lights but no tail lamp. There was a green light on the rear end of the pilot-engine. I know it was a green light because I saw it was at Tyne Dock Bottom before we started. I have often acted as guard to goods trains from Tyne Dock which were assisted by a pilot-engine behind them. Sometimes the pilot-engines have a green light and sometimes they have a red light; one as often as the other. I did not think there was anything unusual in this

pilot-engine having a green light. I think that the reason for having a green light is that it saves the fromen time changing the light at St. Bede's Junction. After the pilot-engine left my train I fixed a red lamp at the rear of my brake-yan. It was just after I had passed the signal-bridge at St. Bede's Junction. I felt that my couplings had straightened out when I fixed the red lamp on the rear of my brake van. The weather was pretty hazy that morning. I could see the length of my train when we were passing St. Bede's Junction. I saw the green light on the engine before my train was drawn out on to the main line. I allowed the engine to start with a green light because it is the habit to do so. As 1 was fixing the red lamp on the rear of my brake-van I saw the signalman come to the window of the box and look out. My side lights were in the centre of the van, one on each side. It is always customary with the 6.50 a.m. train for the pilot engine to push the train right up to the cross-over road. I have known the 6.50 a.m. train come out of the dock without the pilot, but not often. I have been on the turn for about two years.

Samson Tolliday, driver, states :- I have been in the service of the Company 41 years, and have been an engine driver about 37 years. On the 17th December 1 was travelling as a passenger in the 7.5 a.m. up train from South Shields to Newcastle, joining at Tyne Dock. I was not on duty at the time of the accident. I was travelling in the second vehicle of the train and in the second compartment of that vehicle from the front. I am well acquainted with the line between Tyne Dock and Newcastle, and I know the signals at St. Bede's Junction. The speed of my train was not checked at or before we passed St. Bede's up home signal. The first I knew of there being anything wrong with my train was a very severe jerk. It seemed to me that the vehicle in which I was travelling was suddenly checked, and the moment after that there was a second heavy check. There were two jerks with a short interval in between, and during that interval my vehicle seemed to continue on. After the second jerk the carriage seemed to be going to pieces; the sides and bottom of the carriage seemed to be going in altogether. I think there were about four other passengers in my compartment. They seemed to lose control of themselves and I told them to keep very coal. We tried to get the doors of our compartment open but we could not. Then I got the window down and the next thing I found myself down the embankment altogether. I got out of the window and fell down the embankment. When I got out of the window I told the other passengers to do the same and to keep themselves very cool. All the passongers got out of my compartment. At that time my vehicle was not quite upright; it was derailed. It was still on top of the embankment. The van in front of me was all smashed to pieces. I could see it very plainly. It was lying down the embankment. The rear portion of the leading vehicle was partly inside the leading portion of my vehicle. The two vehicles were still coupled together. The engine of my train was down the embankment with its funnel at the bottom of the embankment. There was also another engine lying on the bank opposite our engine. When the collision occurred I did not know what we had run into. It was not until five minutes later that I noticed there was a down train mixed up in the collision. I think that the second jerk that I felt must have been due to our having come into collision with the down passenger train. As soon as I got out of the carriage I went straight away to the St. Bede's signal-box to see that the roads were blocked. I then met the guard of the

up frain and he informed me that he had blocked the roads, and he said : " Are you an ambulance man ?" and I replied : " Expert." He asked me if I would go back and attend to the passengers. I said : "In a minute as I must go off and send a message to our Localnotive Superintendent at Type Dock to ask him to send all the ambulance men he has to spare. and to wire for doctors." I sent that message from the signal-box to 'Fyne Dock. I then came straight back to the scene of the accident, and as I went along the train I should to the passengers to get out at once. I then went up to the compartment next to mine in order to liberate the men that were fast. I asked for volunteers and the public responded, We got three of the passengers out of the compartment next to my compartment, but that was not all the passengers that were in that compartment, That compartment had collapsed and the passengers were tightly held in it. Before these three passengers were liberated I had sent some of the passengers to the brake-van to get some tools and they got them and returned. It was after getting these tools that we liberated the three passengers. While I was working to get the fourth one out the fire broke. out. It seemed to me that the fire broke out at the gas cylinder immediately under the compartment at which we were at work. I am quite sure the fire did not break out at the roof of the carriage. At that time there was a fire burning on the engine, but there was no fire burning on the leading brake-van. 1 saw a small jet of fire rising from the top of the gas cylinder. I at once sent three men to fetch the extincteurs which I knew were on the train. They brought them. I left the people whom we were trying to get out and went in under the carriage and tried to put the fire out by means of the extincteurs. I am well acquainted with the method of using the extincteurs. I did not succeed in putting the fire out; it was a dead failure. When I found I could not put the fire out under the carringe I went to the side of the compartment in which the passengers were last and used a second extincteur from that side of the carriage. I still was unable to put the fire out. . By this time the fire had got to the top of the carriage and the passengers began to shout. The fire after beginning at the bottom of the carriage spread to the top. 1 do not know what started the gas flame underneath the carriage. I do not think it could have been ashes from the engine. The passengers in the compartment thead of mine were all smoking and it may have been a match or light from one of their pipes. I then got a third extincteur and went on the top of the carriage and played right down on to the fire, but that had no success. at all. I stopped on the top until my face was hunt and the roof began to go in. I then got down off the carriage. I again went back to the leading compartment and tried to liberate the men and with the assistance of driver Rowe we managed to get one of the passengers out. I found that he had a compound fracture of the left leg and was terribly burned, and I then gave orders for him to be carried away. There were then two other passengers left in the leading compartment and I went back to that compartment again, but the heat was too great and it was impossible to rescue any passengers from that compartment. I then went back and searched the other compartments of the train, and I saw that there were some dead bodies. I am certain that the brake-van in front of my carriage caught fire from my carriage, and that the fire spread very rapidly. I did not know at that time that there were passengers in it. I was not able to take any steps to rescue passengers from the brake-van. I think I may have seen one passenger get out of the brake-van when the collision first occurred. I did not see any passengers alive in the

brake-van after the collision, and my impression is that if there were any passengers in the brake-van they were killed by the collision. I had noticed at Tyne Dock Station that the three compartments of the brake-van were all crowded. I then attended to the injured people to see what I could do for them. The fire brigado arrived on the scene about one hour The superintendent then arrived with an later. engine to take the rear carriages away. The two front carriages were still burning. I do not think the fire spread to the rear carriage. I cannot say whother the gas in any of the other cylinders on the two leading carriages of the train contributed to the fire. I saw the fire burning in the fire-box of the engine, and the canopy over the cab was also on fire. I did not see any fire underneath the engine. It was the engine of the empty stock train on which I saw the fire. I did not see any fire at all on the engine of my train. I left the scene of the accident at ten minutes past ten. When the fire brigsde arrived the two carriages were still burning. I cannot say whother they put out the fire, but I think they did; but I left before the fire was extinguished. The doctors took care of me and told me to get away home. The light did not go out in the compartment in which I was travelling when the collision occurred. I am almost certain that there was a S.W. wind at the time, but there was not a great lot of wind. When I was rescuing people from the second carriage I did not hear any people shouting for rescue from the brake third. I had a number of people helping me and they all worked quite willingly.

Mr. A. C. Stamer states :-- I am acting as chief mechanical engineer to the Company, and for the present I am responsible for the construction of the railway stock. The two leading vehicles of the 7.5 a.m. train were 13 years old, each 49 feet in length over the headstocks, and the underframes are constructed of two main steel channels on the outside. These are braced by transverse members constructed of steel angles and plates, and by two oak headstocks. There are also two oak inside longitudinal members. I submit herewith a plan showing their construction. The steel channels are also braced together by diagonal strips, and the headstocks are further stiffened by angle-irons running at right angles to the headstocks. The vehicles were coupled together by ordinary screw couplings. The lighting arrangement of the two vehicles was by flat flame gas carried in three cylinders in the case of the leading vehicle, and by four gas cylinders in the case of the second vehicle, which was partially burnt. The vehicle on the down train which was destroyed was of similar construction, but 52 feet in length, and that also was provided with three gas cylinders. The cylinders were housed underneath the vehicles well up into the frame. One of the gas cylinders of the leading vehicle of the 7.5 a.m. train was found to be knocked off the coach and lying near the rear of the engine which was down the embankment; it was the gas cylinder fixed at the leading end of the first vehicle. This cylinder was, on examination, found to be burst at both ends. The back of the bunker of the engine was badly scorched immediately over where that cylinder was found, but I think that this was due to the close proximity of the burning coach and not necessarily to gas from that cylinder, as owing to the cylinder being burst I consider that the gas would all have very quickly escaped. With regard to the other two cylinders on that vehicle they were found to be in position on the coach and one was delved in at the bottom, but I do not think it was split. The other one was burst away at both ends. All the pipe connections were broken away from all the cylinders. The gas cylinders on the second vehicle were all in

their right position, and there was only one connection broken ; that was the leading right-hand cylinder of the four ; that was the only damage which could be found that was done to this cylinder. All the low pressure pipes were, however, severed in the case of all the cylinders. As regards the leading vehicle of the down train, two of the cylinders were in good order and in position on the underframe. The other one was in position, but was burst at one end ; this was the rear left-hand cylinder. The connections of the cylinders were also broken off. These cylinders were not fitted with safety valves of any description. My Company has made a trial with two different sorts of automatic valves. The object of these valves was to prevent the rush of gas out of the cylinders if any of the pipe connections were severed. Whenever the pressure became too great the valve closed automatically. The result of the experiments with these valves was found unsatisfactory as they were found to be unreliable, and in some tests which I personally made I found this to be the case. They did not shut off when they were supposed to. My Company is still experimenting with safety valves, but for the present we are not fitting any to any of our stock ; it is no use doing so until we find something reliable. My Company has within the last few years gone into the question of precautions to be taken to prevent fires on trains. We have fitted 770 vans with rescue appliances and fire appliances. That is out of a total of 836 vans which we propose to fit up. We have also fitted 924 vehicles with a lead pipe on the low pressure side of the gas regulator. That is the pipe which runs up outside the end of the vehicle to feed the lamps. The object of this lead pipe is that if there were a rupture of the pipe it could be readily closed by means of a hammer. This could not be done in the case of the old steel pipe. Then, again, since we introduced incandescent gas wo have found that we can reduce 'the number of cylinders in each vehicle, and in order to obtain 24 hours' light we found that we could reduce the number of cylinders on most of our vehicles to one, thus doing away with sometimes two, and sometimes three, cylinders. We have altered 334 vehicles in this respect. We have also taken steps to strengthen up the headstocks and leading ends of our vehicles; this is in order to prevent telescoping as far as possible. This strengthening is being done on all new vehicles. None of the vehicles on the 7.5 a.m. train had, however, been strengthened in this way. We have also made the This is in order buffer-face flat instead of convex. to try to prevent one vehicle mounting the next. With regard to the last two items, we have not earried them out in regard to many vehicles. From what I have heard. I believe there were safety appliances carried in all the brake-vans on both the up and down trains. My own opinion is that in the condition in which the gas cylinders were found after the accident they would not take long to be emplied. In fact, on the first coach, which was burned out, there was only one cylinder which was not ripped open and from which the gas would have to escape by means of the connections on the cylinder.

William Rowe, driver, states:—I have been 42 years in the service of the Company and have been au eugine-driver over 23 years. I was on duty in the St. Bede's sidings at the time that this accident occurred. The engine I was in charge of was on the independent line to the Dock Bottom on the down side of St. Bede's Junction. I had brought may engine 'from Jarrow on the down main line. I had passed the 6.50 a.m. goods train near the farm bridge on the up side of St. Bede's Junction. I afterwards passed the light engine standing on the up main line which was standing just over the points of the cross over road. There was a red light on the front of the engine, but I could not see what light there was on the rear end of it. I remember heating a crash, but I did not at that time know that it was a collision. At that time I was standing on the down independent line. About eight minutes after hearing the crash I went to the scene of the accident. I had been told by the shunter that the up train had run off the road. When proceeding to the scene of the accident and when about 50 yards from the point of collision I saw a fire break out. I could not say for certain that the fire had not started before I saw it. I proceeded right up to the fire and found that the brake third of the up train, that was the leading vehicle on it, was on fire. This vehicle was standing upright on the line. The engine of the train was down the embankment, but the leading vehicle which was on fire was close to the end of the engine at that time. The second vehicle of the train was not on fire. At that time driver Tolliday was on top of the leading carriage using one of the extincteurs. I then commenced opening the carriage doors of the second vehicle; one or two of them were difficult to get open, but by foreibly pulling them I succeeded in getting them open. There were no passengers in any of the carriages which I forced open. All this time I had been on the north side of the burning train. I then went round to the other side of the train; I did all I could to release passengers who were in the train. The last one I released was in the last compartment of the leading vehicle; that was the only one I released from the leading vehicle, and I did not release any from the second vehicle. By this time the fire had spread to the second vehicle. I thought we bad rescued all the people that were possible from the up train so I then went round and turned my attention to the down train. The first vehicle of the down train was on fire. That vehicle was just about touching the burning vehicle of the up train. I cannot say, however, how the fire on the down train started. I found that there were no passengers in the down passenger train. Guard Dunlop and I uncoupled the vehicles on the down train and pushed them back clear of the burning vehicle. I think that when I left the up train there was one passenger penned in one of the compart-ments, but I think he was dead. The fires were eventually extinguished by the fire brigade. I did not myself use any tools to force open the doors, and I was able to force open all the doors that I tried to, but I helieve some other men had used tools to force the doors open. It appeared to me that the fires on the up and down trains were all one fire.

William Dunlop, guard, states :-- I have been 21½ years in the service of the Company and have been guard 15 years. I was acting as guard of the down train of which driver Rowe was in charge of the engine. I remember passing the 6.50 a.m. up goods train between Jarrow and St. Bede's. I do not, however, remember seeing the light engine standing on the up line at St. Bede's Junction. was riding in a side ducket van and was on the opposite side of it. I did not hear the noise of the collision at all, but the fireman of my train told me about it. I at once went to the scene of the accident. I went right up to the front part of the up train. At that time none of the train was on fire. I had gone up there before my driver went, and I am quite sure that nono of the vehicles of the train were on fire when I got there. I had walked up the six-foot way between the up and down lines. I at once helped two passengers out of the wreckage and handed them over to the bystanders. They were taken out of the first carriage of the train-the brake-van. Just after I had brought the second one out the leading

brake-van burst into flames. The fire broke out in the front portion of the leading carriage and seemed to originate from the bottom of the carriage. I rannot say what caused the fire at the bottom of the carriage. I went back to the van of the up train to get the fire appliances and found that they had alroady been taken away. I then went up the other side of the train, that is on the south side of the line and saw the appliances were in use, one by driver Tolliday and the other by a passenger. I then tried by means of a crowbar to release some of the passengers on that side from the leading carriage. I required the crowbar to remove some of the heavy wreekage. It was not to force open doors which had jammed. I succeeded in rescuing oue passenger from the wreckage of the first carriage, and then with the help of driver Tolliday I succeeded in getting another passenger out of the first carriage. By this time the fire was very intense, but it had not spread to any of the other vehicles. Everything seemed to be beyond help then, and I went to the other side of the wreckage and found the leading vehicle of the down train on fire. I sought for passengers in that train but found that there were none and was informed that it was an empty train. I then began to uncouple each vehicle of the down train and got. assistance to push them back singly. I am quite. certain that it was the leading carriage of the up train that was on fire. I never saw any vehicle of the up train except the leading brake van on fire. The two ends of the first and second vehicles were telescoped together. With the fire travelling the leading end of the second vehicle was also on fire. The burning vehicle of the up train was so close to the burning vchicle of the down train that I could not pass between them.

John Thomas Walker, shunter, states :-- I have been nearly two years in the service of the Company and have been a shunter about 17 months. I am now employed in St. Bede's sidings, and I was employed there on the 17th December. I had just gone into the shunters' cabin when I heard the crash of the collision and went to the cabin door and then the telephone went. I answered the telephone and it was signalman Hodgson ringing and he told me to come to the box and that there had been a train smash. I proceeded to the scene of the accident and found a young man lying by the side of the line and I took him to the signal-box. I then saw driver Taylor of the down train. I returned from the signalbox to my cabin and telephoned to the Dock Bottom for doctors to be sent. I then went back to the scene of the accident and I met guard Taylor and asked him if I should take away the five carriages which were standing on the up road, and he asked me if I had an engine in the yard. I said : "Yes," and I went and got it and brought it up to take away the five carriages and made them secure on the Independent. When I first reached the scene of the accident I did not notice any of the vehicles were on fire, but when I returned with my engine to take the five carriages away one vehicle of the up train and one on the down train were on fire. They and one on the down train were on fire. They appeared to be touching each other. It was the leading vehicle of the up train and the leading vehicle of the down train. I did not deal with the fire at all myself as I was attending to the telephone. After that I was not able to assist in any way in getting the passengers out of the train or in extinguishing the fire,

James Redican, brake-examiner, states :--I have been 23 years in the service of the Company, and have been a brake-examiner for 19 years. I myself was travelling in the 7.5 a.m. train from South Shields; I

was travelling in the rear but one carrisge of the train. The first I knew of the accident was hearing a loud noise; then the train appeared to rock a little and then rebound a little, and then it stopped all at once. I cannot say that the train was actually checked before it came to a stand. I was a little shaken, but I was not thrown about in the carriage. I think there were nine passengers altogether in my curriage. After the train came to a stand I waited until all the other passengers in the compartment had got out, and then I got out myself. I went up the line along the side of my train, on the south side of the line. I saw the guard and asked him if I could do anything. He asked me to take the names of the injured and also to attend to them if possible. I went into the van and opened the ambulance box, but I did not take anything out of it; I just left it ready for use. I then proceeded to the front of the train; it was very dark at the time and there was much steam about. I assisted in taking passengers out of the compartments. I think the carriage out of which I assisted to take passengers was the second one. It was not on fire at the time. I cannot remember seeing the leading vehicle at all, and it was not on fire at that time. I then went to the other side of the train, and that was the first intimation I had that the empty train had run into the wreckage. I assisted two passengers out of two vehicles of the up train, and we took them down the side of the embankment. At the time I took these two passengers out the second vehicle was not on fire, and I do not remember seeing any vehicle on the down train on fire at that time. I then heard a woman say, "The train's on fire," and I looked round and saw that the train was on fire, but I cannot say which vehicle it was. I was then towards the back of the up train. I then went to the front of the train and then back to the rear van, and I got the tools out with the assistance of some -six gentlemen and also two extinguishers. I took the tools, and driver Tolliday took one of the extinguishers and some gentlemen took the other, and we all went to the front of the train. When we got there, as far as I remember, the front vehicle was not on fire at that time. I cannot say whether any of the vehicles of the down train were on fire at that time. I then endeavoured to get passengers out of the second vehicle, and I succeeded in getting one out after much trouble. I cannot say whether there were at that time any passengers in the first vehicle. We then tried to get another man out, but could not manage it. I do not remember clearly what I did after that. At this time the fire was raging. As far as I can remember, it was only the second vehicle which was then on fire. I never saw any of the vehicles of the down train on fire. I cannot say in what portion of the second vehicle the fire first started. I do not remember seeing any fire at the time on the engine of the up train.

Mr. H. H. Carrick states :- I am superintendent of the Sunderland district, which includes the scene of this accident. 1 arrived on the scene of the accident at ten minutes to nine. I then found the engine of the 7.5 a.m. train and the light engine in precisely the same position as they were yesterday when you visited the scene of the accident. When I arrived on the scene the front coach of each train was practically consumed and the fire was then burning in the telescoped portion of the two first vehicles of the 7.5 a.m. train. I observed that the fire brigade had only one hose-pipe, and as there were several reels of hose lying about, I suggested that they should get another line of hose out to a hydrant. situated at some distance off in a timber yard. This was done, and the fire was subsequently extinguished about 10 o'clock. The underirames of the leading

carriage of the 7.5 a.m. and of the leading carriage of the empty train were overlapping to the extent of three compartments, and were lying close together. They were not completely locked because when the tool vans arrived from Gateshead on the down line the first operation which was performed was to draw the front of the empty train clear of the front underframe of the 7.5 a.m. The front vehicle of the 7.5 a.m. up passenger train had run past its engine, and the underframe was lying against the bunker end of the engine of that train. It was detailed to the left of its line. It was uncoupled from its engine, and the rear end of the first and the leading end of the second coach were telescoped. The second vehicle was immediately in the rear of the first. I think that the rear bogie of this vehicle was, however, on the rails. Most of the dead bodies appeared to be in the telescoped portion of the two vehicles. At the time I arrived the front vehicle of each train was nearly entirely consumed except the underframes, and the leading portion of the second vehicle was still hurning. I cannot say whether the 6.50 a.m. up train always has a pilot-engine assisting it. I have no reason for thinking that the statement which has been made, that as often as not it has a pilot, is not correct. I am aware that there is no signal in the code for working between Dock Bottom and St. Bede's for a train that is assisted by a light engine.

Oswald Hutchinson, locomotive foreman, states :-I am locomotive foreman at Tyne Dock, and I have held that position for 41 years. I arrived on the scene of this accident on the 17th December at about 8.15 a.m. I found the three engines all lying in the position in which they are now. The leading vehicle of the up train was wedged between the engine of the up train and the leading vehicle of the down train. These two vehicles were overlapping, as far as I could see. The leading vehicle of the up train was derailed. It was badly on fire at the time. It appeared to be standing upright, but was very badly damaged. The rear end of it was where the damage had chiefly taken place. I cannot say whether it was still coupled to its engine, but I do not think it was. I think that the end of it was too far from the engine to be coupled. It was still standing fairly parallel to the line. The second vehicle of the train was also standing upright, the leading bogie being derailed, and one pair of wheels of the second bogie. It was still coupled to the leading vehicle. The rear portion of the leading vehicle had telescoped with the leading portion of the second vehicle. The leading end of the second vehicle was also on fire at the time, two compartments. At the time I arrived the fire was very severe in the iront vehicle. It was also severe at the leading end of the second, but only to the second compartment. We managed to check the fire in this vehicle, i.e. we managed to check it extending. We checked it by throwing ballast over it. I should say the fire brigade arrived about 10 minutes to nine or nine o'clock, and they succeeded in subduing the flames, The three carriages were still burning when the fire brigade arrived. The leading carriage of the down train was derailed with both bogies. It was standing nearly parallel to the line, but derailed towards the north side. About the leading half of the first vehicle of the down train was in confact with the leading vehicle of the up train, and that vehicle was also on fire when I arrived on the scene. This fire was also extinguished by the fire brigade, and it was the last vehicle on which it was extinguished. I cannot form any opinion myself as to where the fire originated. There was not any fire on any of the engines at the time that I arrived. I myself saw five bodies taken out of the wreckage; three of them were taken out of the leading vehicle and two of them out of the

second vehicle. No bodies had been removed before I came on the scene, and none of the vehicles, the position of which I have described, had been moved before I arrived. I cannot say whether there were any burnt ashes or enders under the carriages which had been burnt.

William Hunter, driver, states :- I have been 23 years in the service of the Company, and I have been a driver for about one year and eight months. came on duty at 1.45 a.m. on the 17th December to work till 10.45 a.m. I think I came off duty the previous day about 3 p.m. My engine was a sixwheels-coupled tank shunting engine. It was fitted with a steam brake, working blocks on all six wheels. My brakes were in good order. I joined the goods train to which this accident occurred between 6 and 6.30 a.m. that morning, and I started with that train from Tyne Dock Bottom. I was assisting that train from the rear. It is customary when the train. is above its load for it to be assisted up to St. Bede's Junction by an engine in the rear. When we began to run up to St. Bede's Junction the engine was not coupled up to the train and it is customary for engines not to be coupled up to the train when running up that line. When we were running up to St. Bede's Junction we were running chimney first, and there was a red light on the chimney end of the engine. There was a green light at the rear end of the engine. Those are not the correct lights for an engine in the position mine was. My explanation is that it has been the custom for a considerable time to use those lights when assisting a train up to St. Bede's Junction or when working anywhere in the Dock Bottom. Nothing unusual happened whilst we were running up to St. Bede's Junction. I remember passing St. Bede's Junction signal-box. When we passed St. Bede's Junction signal-box my engine was close up to the rear of the goods train. We dropped off the goods train when running through the Junction. We were just beyond the bridge carrying the bracketed signals when we dropped off the train. My engine was just past the bracket of signals when the van of the goods train left my engine. I myself have several times assisted a goods train up this line before and it has always been ny custom to bring my engine to a stand when past that bridge of signals. When I had brought my engine to a stand beyond the hracketed signals I was then clear of the cross-over road points. I sounded my whistle as an inducation to the signaluan that I was over the points and wanted to use them. I did not get the points and signals immediately. I looked up and I saw the board was off for a train to run on the down line into the Independent. When I found that that was the case 1 turned round and asked my mate what light he had on the back end of the engine. He told me it was a green light and I told him to put a red light on. He did so. I told my mate that in all probability we would be getting into the Dock Bottom when this goods train got in clear of the points. I waited until I thought this goods train was in clear and I then sounded my whistle again. I heard the board working. Instead of the signalman pulling the points over and my signal off he pulled the board off for the down main line. I saw then that we would be standing another minute or two. I turned to my mate and told him that he would have to go to the signal-box in accordance with Rule 55. He asked me what Rule 55 was and I had to explain the Rule to him. Between the lime that the goods train could get in clear and the main line board came off a very thick fog had come on. I was rather doubtful about sending the young lad away in such a fog as he had never carried out the rule before, and he had

never travelled over that portion of the line before to my knowledge, and I thought that if I sent him away when there was something coming on the down line that I should be placing him in a position of danger, so I told him to wait until the train on the down line was past. He waited accordingly. I was looking out of my side and saw the down train pass. When it had passed I looked round at my mate to see where he was and I found that he was already off. I then kept a good look-out and I thought I heard something like a train coming in the distance. I was not quite sure about this, owing to an engine which was shunting in some neighbouring sidings. It is particularly difficult to hear at this point as one can hear engines moving in several different places. Before the fog came down I could see the advance board quite clearly at danger, but when the fog came down I lost sight of that board. When I heard the rumbling in the distance, being rather in doubt, I thought that I would just move my engine forward in the direction of the advance signal to see whether it was still at danger or not. I had just got my engine into slight motion, and whilst I was still looking back, I caught the head lights of a Newcastle passenger train approaching on the up line. I concluded that there was going to be an accident, and I thought the best thing I could do under the circumstances was to try and get as much movement on the engine as possible. When I applied my steam, instead of the engine getting pure steam it got the water out of the boiler and thus hampered the movement of the engine. However, I continued to do my best, and in the meantime I was sounding my whistle continuously to endeavour to attract the attention of the driver of the approaching train. I failed to do so, and the consequence was that the train ran into my engine. I felt my engine leave the rails. I knew no more until I recovered consciousness, and I was then standing in the field at the bottom of the embankment. I think that my engine may have been moving at five or six miles an hour at the time of the collision. I should estimate the speed of the up train at the time at about 35 miles an hour. I have a very clear conception that steam was turned on the engine of the up train at the time, at least until he was very close to me. I cannot say anything about the brakes of the up train. I never saw the down empty passenger train at all. I am myself acquainted with Rule 55. I am acquainted with the rule which says that when a train or vehicles has passed the home signal and is waiting to be crossed to another line the guard, shunter or fireman must, when the train or vehicles come to a stand, proceed immediately to the signal-box, and remind the signalman of the train or vehicles. I admit that this rule was not carried out to the letter, but my reasons for not doing so are as follows :-- When I looked up and saw the board was off for the goods train to go into the down Independent I knew that the signalman could not get me into the Dock Bottom until the train was in clear of the points, and, therefore, I thought it would be unnecessary to send the fireman away immediately, being under the impression that the signalman was eware of my presence there. As soon as I saw that the hoard was lowered for the second train on the down main line I acted on Rule 55. As far as I could judge it was about five minutes after my engine came to a stand that the fireman left my engine. Fireman Jewett has often worked with There has never been an occasion before me before. when Jewett was with me that he has had to carry out Rule 55, I myself saw the fireman shift the lights on the engine. I expected that I should be signalied from the Dock Bottom as assisting the goods. I have always been under the impression when working on the Dock Bottom branch that engines were

signalled as assisting in the rear of goods trains. Other trains besides the 6.50 a.u. are assisted by an engine in the rear.

William James Smith, driver, states :- I have been 30 years in the service of the Company and have been for 18 years a driver. I came on duty on the 17th December at 3.45 a.m. to come off duty at 12.45 p.m. I finished duty on the day previous to the accident at 12.45 p.m. I was in charge of the engine of the 7.5 a.m. passenger train from South Shields to Newcastle. My engine was a four-wheels coupled tank engine with a trailing bogie, and it was running chimney first at the time of the accident. It was fitted with the Westinghouse brake working blocks on the four coupled wheels, and with a hand-brake working the same blocks. My brakes were in quite good order. We left South Shields punctually at 7.5 a.m., and the last station we stopped at before the accident occurred was Tyne Dock. I had made use of my brakes in stopping at that station and they had acted quite well. I am very well nequainted with St. Bede's Junction. When approaching St. Bede's Junction the up distant signal was off for me. I saw the up home signal and that also was off for me. It was a shifty morning, by which I mean that it was foggy in places. I had to be about an engine length from the home signal before I could see it, but I was quite confident that it was off for me. I estimate my speed when I passed the home signal at about 30 miles an hour. Steam was already on when I passed the home signal and none of my brakes were applied. I remember passing the St. Bcde's Junction signal-box. I did not see anything unusual there. I did not see the signalman. I did not see any red light showing at the box. I was looking out and attending to my own signals at the time I passed the The first thing I knew of there being anything box. on the line in front of me was seeing something in front of me which I took to be the trailing end of a tender, and it was just about the length of an engine from me. When I first saw it stenm was still on at I at once turned off steam and my hand the time. went back to apply the brakes, but whether I had done so before the collision occurred or not I could not say. If the brakes went on at all it was only just as the collision occurred. I do not know whether the engine in front of me was moving or stationary. As soon as the collision occurred I got knocked about in the cab, and the engine began to oscillate, and I remember that just as the engine was coming to rest there was another reaction. I remember that when the engine was just coming to rest it seemed to hegin to move again. I never saw any light on the rear of the engine we ran into. I had never seen my advance signal before the collision occurred. I had been unable to see it on account of the fog and the engine in front before the accident occurred. 1 was looking out for my advance signal. I was dazed by the accident. I knew nothing about the train on the down main line.

George William Taylor, driver, states :--I have been 26 years in the service of the Company and have been a driver nearly five years. I came on duty on the 17th December at six o'clock to work till 4.25 p.m. I had come off duty at 4.25 p.m. on the previous day. I was in charge of the engine of the empty passenger train from Hebburn to High Shields. My engine was a four-wheels-coupled tank engine with a pair of leading and trailing wheels, and it was travelling bunker first at the time of the accident. It was fitted with the Westinghouse automatic brake working blocks on the four coupled wheels, and with a hand-brake working the same blocks. My brakes were in good order. I am acquainted with the

signals at St. Bodo's Junction. When I reached the distant signal for St. Bode's Junction I found it at At the time I passed that distant signal I danger. was running about 30 miles an hour. After passing that signal 1 shut off steam and applied the brakes to reduce speed. As I was approaching St. Bede's home signal I had the train under proper control to stop at the home stop signal, and just before coming to the home signal I saw a flash of fire and steam and knew nothing more after that. I estimate our speed at the time I first saw the flash at about 10 miles an hour. Before that happened I had not seen the position of my home signal. It was, however, a thick morning. I had been able to see my distant signal clearly. I could see the signal when about 25 yards distant from it. It seemed to me that my engine had run into another engine, and that that engine was travelling in the opposite direction to what we were. I thought that the engine we ran into had been derailed from the other road. When I came to my senses I found I was lying on the embankment. I cannot say whether there was any fire burning anywhere when I came to my senses.

Samson Tolliday, driver, recalled, states :--When I first saw the fire underneath the carriage I am quite certain it was solely a jet of gas. It was after I had used the first extincteur that I saw that the woodwork of the carriage was on fire.

Mr. A. C. Stamer, recalled, states :-- The cubica capacity of the gas cylinders at atmospheric pressure on the two leading vehicles of the up train was 10 cubic feet each, and that on the leading vehicle of the down train was 16 cubic feet each. I estimate that in the two cylinders of the two leading vehicles of the up train the pressure in the cylinders was probably about 75 lbs. per square inch, and on the leading coach of the empty train the pressure was probably from 20 to 25 lbs, on the square inch. The question of strengthening the ends of gas cylinders has been considered, but it was thought that no advantage would be gained thereby. Alterations have, however, been made to house the cylinders more securely by placing them well up into the frame and reducing the diameter of them so as to have them well up behind the main longitudinal members. We have also considered the question of housing the cylinders on the roots of carriages, but we do not consider this desirable; not desirable from a safety point of view. The question of using non-inflammable wood in the construction of carriages has been under consideration before the war started, but owing to the war we have not been able to go further into the matter. At the same time we have experimented with the all-steel carriages. We huilt three kitchen cars of this material, and our electric stock on the Tyneside has had non-inflammable floors from their commencement. We have fitted 344 coaches for electric lighting; that is exclusive of the coaches on the Tyneside electric railway which are also so fitted. During the last three years all onr passenger vehicles which we have built have been fitted with electric light, and the passenger coaches which we shall build this year will be so fitted. The whole question of fitting the electric light to new stock and of converting gas-lit stock was under consideration before the war, but the matter has been shelved for the present. The figures given above are purely N.E. and do not include vehicles of the East Coast Joint Service, a large majority of which The same applies are fitted with electric light. to the N.E. and G.N. Joint Stock. I attribute the failure of the extincteurs on this occasion to the fact that the fire had got a big start before they were brought into use.

### Conclusion.

It appears from the evidence to be customary for goods trains from the Tyne Dock Bottom to be frequently helped up the gradient as far as St. Bede's Junction by an assisting engine in rear, and for that engine to drop off the train at the junction and to return to Tyne Dock Bottom on the down branch line. In accordance with this custom, the 6.50 a.m. up goods train on the 17th December was assisted by an engine in rear; after propelling the train through the junction this engine came to a stand at 6.55 a.m. on the up main line, just ahead of the cross-over road, and it waited there for the cross-over to be set and the signal lowered for it to run back on to the down branch line.

Attention is called to two points connected with this engine :—Firstly, in accordance with the usual custom on the branch line, which is not a passenger line, it was not coupled up to the goods train, so the latter had not to be stopped at the junction; and, secondly, while the light engine was propelling the goods train to the junction, the light at its leading end was a red one, and its tail light was a green one. It is stated that the lights on engines assisting trains up the gradient are frequently arranged in this way in order to save time in changing them before running back to Tyne Dock Bottom.

Signalman Hodgson, who was on duty in the St. Bede's Junction signal-box, states that the goods train from the branch line passed his box at 6.55 a.m.; but, as it is not customary when signalling trains on that line to make use of the Code signal showing that the train is assisted by an engine in rear, he did not know whether it was so assisted or not. He watched the train run through the junction, and he states that he did not see any engine at the rear end of it, but he saw that its rear vehicle had two red side lights and a red tail lamp; these he took to be the lights of the brake-van, and he concluded therefore that the train had run up the branch without any assisting engine; he heard no whistle from it and consequently was completely ignorant of there being a light engine on the up line. A down goods train, running into one of the branch sidings, then passed his box at 7.2 a.m., and a down passenger train passed on the down main line at 7.12 a.m. At 7.8 a.m. the up passenger train was offered to him from the Harton signal-box, and, as he was still in entire ignorance of there being a light engine on the up main line, he accepted it forthwith, and at 7.11 a.m., when he received the "Train out of section" signal from Jarrow for the up goods train, he lowered all his up signals for it. At 7.13 a.m. the fireman of the light engine arrived at the signal-box, and that was the first intimation which Hodgson received of that engine. He at once threw all his up main line signals to danger, but at that time the engine of the up passenger train was passing the up home signal, so the driver had no chance of seeing that it was put to danger, and the train passed the signal-box without checking speed. Hodgson heard the crash of the collision, and then he heard a second crash, which he thinks occurred about a minute after the first. This second crash was clearly caused by the engine of the down passenger train running into the debris caused by the first collision. This down train had been duly accepted by Hodgson at 7.12 a.m., but none of his signals was lowered for it, as the section to Harton was blocked.

Driver Hunter, who was in charge of the engine which assisted the goods train up to St. Bede's Junction, states that when passing through the junction his engine was close up to the rear of the goods train, but that when he was just beyond the signal bridge, he allowed his engine to drop off the train, and he brought it to a stand clear of the cross-over road; that he then sounded his whistle, as an indication to the signalman that he was over the points and wanted to use them; that he then saw the signal lowered for a down goods train to run into the Down Independent, and that when that train was clear be sounded his whistle again; that the signal was then lowered for a down main line train, upon which he told his fireman that he would have to go to the signal-box in accordance with Rule 55, and when the down train had passed, he found that the fireman had already started; that he then heard what he thought might have been the sound of an approaching train, so he moved his engine forward towards the starting signal, and whilst doing so he saw the head lights of an up passenger train; that he applied more steam and sounded his whistle, but his engine was run into, and beyond that it left the rails he remembers nothing more. He estimates the speed of his own engine at the time of the collision at from five to six miles an hour.

Acting-fireman Jewitt, who was on the engine with driver Hunter, confirms the above evidence, but states that it was after the passenger train had passed them on the down main line, and after the signal had been put to danger behind it, that he started for the signal-box. Driver Smith, who was in charge of the engine of the 7.5 a.m. up train, states that when approaching St. Bede's Junction he found both the up distant and up home signals lowered for him, and that he ran past the latter at a speed of about 30 miles an hour; that he saw no red lights or anything unusual when passing the signal-box, but that after passing it he suddenly saw something about an engine's length in front of him, which he took to be the trailing end of a tender; that he at once turned off steam and tried to apply the brakes, but if the latter were applied at all, it was only just as the collision occurred; that all that he can then remember is that his engine began to oscillate, and just as it was coming to rest there seemed to him to be another " reaction " and the engine seemed to move again. This evidence is generally corroborated by the fireman and guard of the train.

Driver Taylor, who was in charge of the engine of the down empty passenger train, states that when he sighted the St. Bede's Junction down distant signal, he found that it was at danger, so he at once shut off steam and applied his brakes, and got his train under proper control so as to be able to stop at the down home signal; that just before reaching that signal he saw a flash of fire and steam, and after that he knows nothing more, but his impression was that his engine had run into another engine, which had been derailed on the up line. He estimates the speed of his train at the time of the collision at 10 miles an hour. The firemau of this train was killed, but driver Taylor's evidence is corroborated by the guard, who however estimates the speed of the train at the time of its derailment at from 12 to 15 miles an hour.

No blame appears to attach to the driver of either the up or down train; each of them was acting rightly in accordance with the signals which he received, and owing to the foggy conditions which obtained at the time, neither of them could have seen the obstruction on the line in front of him in time to prevent the collision.

From the evidence of the witnesses, from the marks on the engines, and from the positions in which they were found lying, I think there can be no doubt that the sequence of events in this collision was as follows :---When the engine of the up train ran into the rear of the light engine, the former was at once derailed, and ran down the embankment on the left or south side of the up line, whilst the light engine was derailed towards the right of the same line, coming to rest in a position in which it was fouling the down line. The light engine when in this position was then run into by the engine of the down train ; the latter became derailed and went down the embankment on the north side of the line, whilst the light engine was driven by the blow across the up line, and went down the embankment on the up or south side, striking the engine of the up train, which was lying there.

Three causes jointly contributed to this accident :----

(1) The omission to make use on the branch line of the usual code signal to notify the signalman that the train approaching his box was assisted by an engine in rear.

Had this signal been made use of, the signalman at St. Bede's Junction would have known that there was a light engine standing on the up line. For this omission the signalmen concerned cannot be held responsible, as the signal is not included in the code specially authorised for this branch line. The non-inclusion of this signal in the code appears to be due to the fact that, though assisting engines have been for some time past in regular use on this branch, their use has never been officially authorised by the Company. If, as appears to be the case, their use is necessary, it should be duly authorised and the corresponding addition should be made in the signal code.

(2) Want of care on the part of signalman Hodgson as regards his watching the goods train run through the junction.

The goods train ran past the front of the signal-box and in close proximity to it. Hodgson knew that this train was frequently assisted up to the junction and that no code signal was ever sent to warn him when that was the case; he should therefore have been keeping a careful look-out, and had he been doing so he should readily have seen that there was an assisting engine at the rear of the goods train; the fact also that the engine was carrying a green tail light, which Hodgson knew that assisting engines frequently carried, should have at once warned him that that was the case.

## (3) The delay in sending the fireman back to the signal-box in accordance with Rule 55.

The portion of the Rule which applied in this instance lays down that the fireman should go to the signal-box immediately on the engine coming to a stand, The light engine in this case came to rest at 6.55 a.m., but it was not until 7.12 a.m. when the down main line train passed it, that fireman Jewitt left the engine, and consequently he did not arrive at the signal-box till 7.13 a.m. The light engine was therefore standing 17 minutes on the line before any steps were taken to carry out this Rule. For this delay driver Hunter must be held mainly responsible. He states that he was well acquainted with the Rule under which his fireman should at once have proceeded to the signal-box ; he admits that he did not at once carry out the Rule, and his explanation for not doing so is that he saw that there was a goods train on the down line, and knowing that consequently the signalman could not at once deal with his engine, he considered that it was unnecessary for him to carry out the Rule. As soon, however, as he saw that there was another train coming on the down main line, he told the fireman that he would have to go to the signal-hox, but fearing that owing to the fog the fireman might be in danger from that train, he told him to wait until it had passed. As a matter of fact, the fireman would not have been exposed to any danger from the train on the down line as, whilst proceeding to the signalbox, he need not have gone near that line, and he could in fact have reached the box without crossing a single line of rails. I cannot therefore accept driver Hunter's explanation as at all satisfactory, and I consider that a very great responsibility in connection with this accident must rest on him on account of his delay in carrying out a definite regulation, with which he himself admits he was well acquainted.

Fireman Jewitt was certainly a young man, being only 18 years of age, but he had been 3½ years in the Company's service, and he had been acting continuously as fireman for seven months, so he also should certainly have been acquainted with Rule 55; he therefore cannot be excused from all responsibility in the matter, though he appears to have acted throughout entirely on instructions given to him by his driver.

This accident is one which the provision of track circuit, which is now being so largely adopted by railway companies, would undoubtedly have prevented, as the signalman would have been unable to lower his up home and distant signals whilst the light engine was standing on the up line. The view of the line from the signal-box is good, and the up starting signal is situated not more than 274 yards from the box, so, as far as view and distance are concerned, it is not a case in which the provision of track circuit is urgently called for; but if, as appears from this instance, light engines are frequently left standing ahead of the cross-over road, its provision would, on that account, appear desirable.

### The Fire.

It is agreed by all the witnesses that the fire did not break out till some few minutes after the collision occurred, and that it broke out on one of the leading vehicles of the up train, but the witnesses disagree as to whether it originated on the first or on the second vehicle of that train; as, however, it was dark at the time, and as those two vehicles were telescoped together, this difference of opinion is not surprising. The most reliable evidence on this point is given by driver Tolliday, who was travelling as a passenger in the up train, and who, being an expert ambulance man, took a leading part in rescuing the passengers. Tolliday had joined the train at Tyne Dock Station, and had tried to enter one of the three compartments of the leading vehicle, but, finding it crowded he took a seat in the second compartment from the front of the second vehicle. After the collision he and the four other passengers in that compartment made their escape through the window, and Tolliday then proceeded to the signal-box in order to see that the roads were blocked and to send off telegrams for assistance; he then returned to the scene of the accident, and endeavoured to release some of the passengers from the compartment ahead of the one in which he had been travelling, that is from the leading compartment of the second vehicle, this compartment having been crushed in by the collision. After obtaining tools from the brake-van he succeeded in rescuing three passengers from that compartment, and while he was working to liberate a fourth, the fire broke out. The first he saw of the fire was a small jet rising from the top of the gas cylinder under the compartment at which he was at work, and he is quite certain that when he first saw it it was solely a jet of gas; at that time, he states, there was no fire burning on the engine of the up train or on the leading vehicle of it. He at once sent for extincteurs and used one of them under the carriage, but though he is well

acquainted with their use, he failed to check the fire thereby, and he then saw that the woodwork of the carriage had also caught fire. He then used a second extincteur from the side of the carriage, but still without effect, and as the fire was now spreading to the top of the carriage, he got on to the roof and used a third extincteur from that position, but still without any success at all. He then succeeded in rescuing one more passenger from the leading compartment, and it is feared that there were still two passengers left in it, but the heat was then too great for him to be able to do anything more. Tolliday is positive that the leading vehicle, the brake third, caught fire from the second vehicle, and was consumed very rapidly, but it is thought that there was no one alive in that vehicle at the time.

The leading vehicle of the down train appears to have caught fire from the vehicles of the up train, though there is no conclusive evidence on this point; the remaining vehicles of both trains were promptly uncoupled and drawn away. It was not until the fire brigade arrived about an hour later that the fire on the three vehicles was finally extinguished.

Another witness, guard Dunlop, who was at the time near the scene of the accident, and who reached the front portion of the train before any of it was on fire, thinks that the fire broke out in the front portion of the leading carriage, and that it seemed to originate from the bottom of it. Guard Taylor, who was in charge of the down train, thought that the fire came from the roof lamps, but as this witness did not see the fire until it was buruing fiercely, his evidence as to its origin is not convincing. Brake-examiner Redican, who was travelling in a rear vehicle of the up train, went to the front of the train after the collision and assisted in rescuing the passengers; at that time none of the vehicles was on fire. He thinks that the fire originated on the second vehicle, but he cannot say on what part of it.

Driver Tolliday showed great resource and energy in taking charge of the operations for the rescue of the injured passengers, and he deserves much credit for the way in which he rose to the oceasion.

The evidence appears therefore to point to the fire in this instance having originated with the ignition of a jet of gas which was escaping from one of the gas cylinders of one of the leading vehicles, that this gas flame then set light to the wooden upper portion of that vehicle, and that that in turn set light to the inflammable portions of the two other vehicles which were lying near it. It is quite possible that the gas may have been ignited in the first instance by some hot cinders or ashes which fell from one of the engines when it was derailed, but it seems certain that it was the gas which was in some way first ignited, and not the inflammable portions of the vehicles.

There have been a large number of railway accidents during recent years which have been accompanied by fires; in some of these, such as those at Witham, Grantham, Hawes Junction, and Ditton, it was found that the fires had originated with escaping gas, whilst in others, such as the Aisgill and Gretna accidents, escaping gas was found to have intensified the fires, which had originated otherwise. In this instance, the evidence that the fire originated with gas is more definite than in any previous case, and it furnishes therefore a very conclusive object lesson as to the additional danger which is caused in the case of an accident by the presence of gas on the train.

The Board of Trade reports on the above-named accidents and on several others have included a recommendation that, on the ground of safety, electricity should be adopted for the lighting of trains in preference to gas, and after each of the Hawes Junction, Ditton, and Aisgill accidents the Board specially addressed all railway companies on the desirability of this being done.

As regards the North Eastern Railway Company's action in this direction, the Company's representatives state that during the last three years all new passenger vehicles which have been built have been fitted with electric light, and that all which will be built this year will also be so fitted. In Appendix II, is shown a return on the subject, furnished by the Company, and from this it appears that, on the 31st December last, out of a total number of 4,241 coaches owned or maintained by them, 626 were lighted by electricity. A certain amount of progress is therefore being made as regards the fitting of new stock, though the Company has not undertaken, as several other Companies have done, that all their new stock shall be so fitted, nor have any steps been taken by them towards the conversion of the existing gas-lit stock. It is hoped that the occurrence of the fire in connection with this accident may at all events lead the Company to the adoption of a definite decision in favour of electric lighting for all new stock and for the gradual conversion of the gas-lit stock.

Certain recommendations were also made in Board of Trade reports with the view of rendering gas-lit coaches less liable to danger from fire pending their conversion, e.g. the provision of safety valves, strengthening gas cylinders and housing them more securely, and the use of non-inflammable material for coaches. The Company states that all these matters have been, and are still, under their consideration; the gas cylinders are now being more securely housed, and on 334 coaches incandescent lighting has been introduced, with the result that one gas cylinder suffices for each carriage in lieu of three or four, but the safety valves which have been tried have not been found reliable, and with the exception of the electrically-propelled stock practically nothing has been done as regards the use of non-inflammable material. This accident shows that pending the conversion of the gaslighted stock further action in these matters is called for. Such expedients can however only be regarded as temporary ones, and not as permanent substitutes for conversion to electricity as recommended above.

It should also be mentioned that in accordance with recommendations previously made by the Board of Trade the Company has fitted 770 brake vans, out of a total of 836, with rescue and fire appliances. These appliances were carried in the brake vans of both the trains concerned in this accident and were promptly made use of; the extincteurs, which seem to be of little value when once a gas fire is fairly started, were not found effective, but the tools provided appear to have been of considerable assistance. The Company has also, with the view to preventing telescoping, arranged for the headstocks and ends of their coaches to be strengthened, and for the buffers to be made flat instead of convex ; this has however only been done as yet in the case of a few vehicles, and none of those concerned in this accident had been so altered.

I have the honour, etc.,

P. G. VON DONOP,

Lieut.-Col., R.E.

The Assistant Secretary, Railway Department, Board of Trade.

#### APPENDIX I.

DAMAGE TO ROLLING-STOCK AND PERMANENT-WAY.

#### Rolling-Stock.

Light Engine, No. 2182. Both frames and back buffer-beam bent; brake-gear broken; guardirons broken off; right leading-spring broken; bolts broken out of right expansion-bracket, and boiler lifted out of position; right side-tank raised off imme; left side of cab broken; both leading splashers broken; smoke-box destroyed; main steam-pipe in smoke-box and blast-pipe broken; front flange of cylinder broken; front buffer-beam broken and footplate bent; chimney destroyed; whistle broken; left hund-rail and right side-rod bent; three buffers broken off; front drawbar bent.

Up Passenger Train. Engine No. 1867. Main frames bent; cab, right side-tank and right footplate angle-iron broken; reversing lever, Westinghouse backe-valve, and connections damaged; coalbucker holed and partially burnt away; front and back buffer-beams bent; main Westinghouse reservoir broken away from fastenings and pipes; front guard-irons missing; brake-guar broken at right side; footplate bent; both leading splashers broken. Brake Third No. 640. Entirely burnt out. Third, No. 1571. Partially burnt out.

Composite, No. 299. One end-bracket broken.

Down Empty Train. Engine No. 671. Back and of coal-bunker and cab destroyed; both main frames badly bent; left back radial-wheel pulled off a kle and bearings tom away; angle-irons canying footplate at back end broken; right buffer massing; Westinghouse main reservoir partially admit and connections broken; back buffer-beam bent; left front footstep damaged; brake-apparatus broken; both side-rods bent; back guard-irons broken off; driving and trailing axles of coupled wheels bent.

Third, No. 3703. Entirely burnt out except part of one compartment.

Third, No. 2802. Headstock damaged.

#### Plemanent-Way.

Twelve 30-feet rails broken or bent; 43 sleepers burnt or damaged; 31 chairs broken; 23 fishbolts broken; 6 fishplates broken.

## APPENDEN 41. . . .

# Lighting of Curching Stock

# North Eastern. East Coast Joint, and Great Northers, and North Eastern Joint Stock, on Sist Decomber, 1915.

	Stock			Lighting.			
UCA.A.			Electric.	Gas.	Tutal.		
	North Eastern	· 	*471	8575	4849		
Maintained	East Coast Joint Service		198	40	178		
N.E. Co.	Great Northern and North Eastern .		19		19		
	Totals		626	8615	4241		

\* includes Tynemouth Electric Stock and Autocars,