

APPENDIX (No. 2).

LIST OF TRAIN ACCIDENTS during the year 1915 which have been reported upon by the Inspecting Officers of the Department; classified according to the Nature of each Accident.

A.—Collisions in which Passenger Trains were concerned.

CALEDONIAN :

May 22nd.—Double collision between passenger trains at Quintinshill, by which 224 passengers and three servants were killed, and 242 passengers and four servants injured.

This collision was found to be due to neglect of rules on the part of two signalmen at the Quintinshill signal-box.

CORK, BANDON AND SOUTH COAST :

January 28th.—Collision between a goods train and a mixed passenger and goods train at Kinsale station, by which two passengers were killed and six injured.

This collision was found to be due either to want of care or want of skill on the part of the driver and fireman of the goods train when approaching Kinsale station.

GLASGOW, BARRHEAD AND KILMARNOCK JOINT :

August 16th.—Collision between two passenger trains at Pollokshaws, by which one passenger was killed and 25 were injured.

This collision was found to be due to an engine-driver being misled by an imperfect signal due to the contraction of the signal-wire through cold.

GREAT EASTERN :

January 1st.—Collision between two passenger trains at Ilford station by which 10 passengers were killed and 507 passengers and two servants injured.

This collision was found to be due to want of care on the part of an engine-driver who failed to notice the position of the signals when approaching Ilford station in time to prevent the collision.

GREAT EASTERN :

January 18th.—Collision between a passenger train and a goods train at County School Station, by which two passengers and one servant were injured.

This collision was found to be due to a mistake on the part of the driver of the goods train.

GREAT EASTERN :

August 6th.—Collision between a passenger train and four vehicles which were being propelled by an engine at Enfield Lock Station, by which 60 passengers were injured.

This collision was found to be due to want of care on the part of the driver of the engine which was propelling the four vehicles.

GREAT NORTHERN :

September 6th.—Collision between a passenger train and an empty wagon at Newark, by which one passenger was killed and 21 passengers and three servants were injured.

This collision was found to be due to the empty wagon having been pushed back foul of a crossing between sidings during shunting operations, and afterwards struck by other wagons which were being shunted, through which it was knocked over foul of the line on which the passenger train was travelling. The shunter in charge failed to satisfy himself in accordance with rules that the crossing was not fouled before the further shunting operations were proceeded with.

LANCASHIRE AND YORKSHIRE :

March 16th.—Collision between a passenger train and an empty passenger stock train at Smithy Bridge, by which three passengers and one servant were killed, and 31 passengers and two servants injured.

This collision was found to be due to the failure of the driver of the passenger train to observe certain signals when proceeding towards Smithy Bridge. Powdered snow was being blown about by strong winds at the time.

LONDON AND SOUTH WESTERN :

August 7th.—Collision between a passenger train and some wagons at Wilton Station, by which five passengers were injured.

This collision was found to be due to three wagons having become uncoupled from others which were being shunted, and which were inadvertently left on the main line without the knowledge of the signalman and shunter. The circumstances were exceptional owing to special traffic, and in their anxiety to continue the shunting operations as long as possible before the line was cleared for the passenger train, the men referred to omitted to carry out Rule 62c by looking to see that none of the vehicles had become detached.

LONDON, BRIGHTON AND SOUTH COAST :

January 23rd.—Collision between a passenger train and a goods train near Streatham Common Station. The wreckage of the goods train which had fouled an adjoining line, was run into by another passenger train. The driver of the goods train was killed and 19 passengers were injured. A fog was prevailing at the time.

The first collision was found to be due to a mistake on the part of the station-master in shifting certain points, so that the goods train which should have gone into the sidings remained on the up line on which the passenger train was approaching. The signals had been lowered for the second passenger train and there was not time to prevent it coming into collision with the wreckage caused by the first collision.

MIDLAND AND GREAT CENTRAL JOINT :

January 14th.—Collision between a passenger train and an engine with van attached at Apethorne Junction, Woodley, by which 17 passengers and two servants were injured.

This collision was found to be due to want of care on the part of a signalman, through which the passenger train was admitted to the section in which the engine and van were standing. The fireman of the latter engine was also in fault for not proceeding to the signal-box in accordance with Rule 55n, when he found that his engine was detained.

NORTH BRITISH :

November 20th.—Collision between passenger train and light engine at Waverley Station, Edinburgh, by which 22 passengers were injured.

This collision which occurred in foggy weather, was due to a mistake on the part of the driver of the light engine. He thought he heard someone shout to him to move his engine out of the bay line in which it was standing, and when he found that the train was approaching he was unable to stop his engine in time to prevent the collision.

NORTH EASTERN :

March 17th.—Collision between engine and vehicles of a passenger train near Scarborough, by which one servant was killed and five passengers and one servant were injured.

This collision was found to be due to a mistake on the part of a signal box lad, for which the responsibility rested with the signalman in charge, who should not have allowed the lad to manipulate the signal-levers.

NORTH-EASTERN :

December 17th.—Collision between a passenger train and a light engine and subsequent collision between an empty passenger train and the wreckage caused by the first collision near St. Bede's Junction, by which 18 passengers and one servant were killed and 76 passengers and six servants were injured.

This collision was found to be due to omissions and want of care on the part of signalmen and of the driver of the light engine.

SOUTH EASTERN AND CHATHAM :

December 15th.—Collision between two passenger trains at New Cross station, by which 21 passengers were injured.

This collision was due to one of two causes, viz., either an intermittent fault in a block instrument or the improper use of a release key in connection with that instrument, but the evidence was not sufficient to prove which was the real cause.

CALEDONIAN RAILWAY.

Railway Department, Board of Trade,

8, Richmond Terrace, Whitehall, London, S.W.,

17th June, 1915.

SIR,

I have the honour to report for the information of the Board of Trade, in compliance with your Order of the 22nd May, the result of my Inquiry into the causes of the double collision which occurred on the 22nd May, between passenger trains at Quintinshill on the Caledonian Railway.

In this case a special troop train from Larbert to the south collided with the 6.10 a.m.* local train from Carlisle to the north, which had been crossed over from the down to the up line opposite Quintinshill Signal-box, and shortly afterwards the wreckage was run into by the 6.5 a.m. express passenger train from Carlisle to the north.

The 6.10 a.m. local train was composed of a six-wheels-coupled bogie passenger engine No. 907, with a bogie tender, fitted with the Westinghouse Automatic brake on the coupled wheels and the tender-wheels, and of the following vehicles:—

	No.	No. of wheels.	Brake.	Lighting.
C. R. Composite	425	8	Westinghouse	Electric
C. R. Third	1191	8	Westinghouse	Gas
C. R. Brake-Van	34	8	Dual	Electric
C. R. Milk-Van.. .. .	181	6	Dual	Electric

This train was fitted with the Westinghouse Automatic brake on all the wheels with the exception of the centre pair of the six-wheeled milk-van.

The special troop train consisted of a four-wheels-coupled bogie passenger engine, No. 121, with a bogie tender, fitted with the Westinghouse Automatic brake on the four coupled wheels of the engine and the eight tender-wheels, and of the following vehicles:—

	No.	No. of wheels.	Brake.	Lighting.
G.C.R. Brake Composite '	699	8	Dual	Electric
G.C.R. Third	388	6	Vacuum	Gas
G.C.R. Third	466	6	Vacuum	Gas
G.C.R. Third	283	6	Vacuum	Gas
G.C.R. Third	955	6	Vacuum	Gas
G.C.R. Composite	740	6	Vacuum, WH. pipe	Gas
G.C.R. Composite	203A	6	Vacuum	Gas
G.C.R. Third	1834	6	Vacuum	Gas
G.C.R. Third	414	6	Vacuum, WH. pipe	Gas
G.C.R. Third	1056	6	Vacuum	Gas
G.C.R. Brake Composite	1595	8	Dual	Electric
G.C.R. Third	1343	6	Dual	Gas
G.C.R. Third	1469	6	Dual	Gas
G.C.R. Composite	1239	8	Dual	Gas
G.C.R. Composite	104	8	Dual	Electric
C.R. Caravan Truck	176	6	Dual	—
C.R. Caravan Truck	155	6	Dual	—
C.R. Open Scenery Truck	161	8	Dual	—
C.R. Fish Van	77	6	Dual	—
C.R. Fish Van	86	6	Dual	—
C.R. Brake-Van	15	6	Dual	Gas

*This train is generally called the 6.17 a.m. train by the Company's men, as that is the time of departure from Carlisle laid down in the Working Timetable.

The carriages were fitted with the Automatic Vacuum brake, on all wheels with the exception of the centre pair of the six-wheeled coaches, the engine being dual fitted, the continuous vacuum brakes on the coaches being applied by the same handle as the Westinghouse brakes on the engine and tender.

The 6.5 a.m. express passenger train from Carlisle consisted of two four-wheels-coupled bogie passenger engines, Nos. 140 and 48, each with an eight-wheeled tender, fitted with the Westinghouse brake on the four coupled wheels and tender-wheels of each engine, and of the following vehicles fitted throughout with the Westinghouse Automatic brake, with the exception of the centre pair of wheels of the bogies of the three 12-wheeled sleeping saloons :—

	No.	No. of wheels.	Brake.	Lighting.
W.C. Brake Van	213	8	Dual	Gas
W.C. Composite	58	8	Dual	Electric
L. & N.W. Sleeping Saloon	5132	12	Dual	Electric
W.C. Sleeping Saloon	451	12	Dual	Electric
W.C. Sleeping Saloon	450	12	Dual	Electric
W.C. Sleeping Composite	119	8	Dual	Electric
W.C. Sleeping Composite	37	8	Dual	Electric
L. & N.W. Third	1399	8	Dual	Gas
W.C. Third	313	8	Dual	Electric
W.C. Third	515	8	Dual	Gas
W.C. Third	509	8	Dual	Gas
W.C. Brake Third	72	8	Dual	Electric
W.C. Brake Composite	588	8	Dual	Electric

Each collision was of a very severe nature, and I regret to say that the driver, F. Scott, the fireman, J. Hannah, and a large number of the officers and men of the 1/7th Royal Scots, who were travelling by the troop train were killed, and five officers in the 6.5 a.m. express also lost their lives. The details of those killed and injured in each train as far as can be ascertained are given in Appendix I. Details of damage to Rolling-Stock and Permanent-Way are given in Appendix II.

Description.

Quintinshill Signal-box, the scene of this disaster, lies 10 m. 10 chs. to the north of Carlisle, a short distance over the Scotch border. The next block post to the south is Gretna Junction, distant 1 m. 31 chs., and the next block post to the north is Kirkpatrick, distant 2 m. 68 chs. The railway at Quintinshill runs approximately north and south, the up line being on the east side of the down line. There are also up and down loop lines, signalled and equipped for passenger trains, and a main cross-over road between the up and down main lines.

The signal-box is on the east side of the up loop line, and there is no obstacle whatever to the view of the signalman of all the lines in the immediate vicinity of the signal-box, these being carried on a low embankment. Measured from the centre of the signal-box, the distance to the various signals, etc., are as follows :—

- Up distant signal, 1,010 yards north ;
- Up main home, and up main to up loop signals, 204 yards north ;
- Up advanced home, and up loop to up main signals, 172 yards south ;
- Up starting signal, 504 yards south ;
- Down distant signal, 1,029 yards south ;
- Down home, and down main to down loop signals, 207 yards south ;
- Down advanced home, and down loop to down main signals, 178 yards north ;
- Down starting signal, 467 yards north ;
- Trailing points of main cross-over road in up line, 55 yards south ;
- Trailing points of main cross-over road in down line, 14 yards north.

Both lines on either side of the signal-box for some little distance are on a curve of a radius of 80 chains, for up line trains bearing to the right and down line trains to the left.

Approaching Quintinshill from the north, an up train is on a falling gradient of 1 in 200 for a distance of over 4 miles, and for a down train approaching Quintinshill from the south, for the first $7\frac{1}{4}$ miles out of Carlisle the gradients are unimportant, then the gradient becomes a rising one of 1 in 193 for a distance of 2 m. 17 chs., and then a rising one of 1 in 200 for the last half mile.

230 yards north of the up main line home signal there is an overbridge, and for the next 100 yards to the south of the bridge the line is in a cutting, about 15 feet in depth, and this combined with the slight curvature of the line, would have hidden the standing local train from the view of the driver of the troop train until he had nearly reached the up main line home signal.

210 yards south of the down main inner signal is an underbridge, and the buffer stops at the south end of the down loop line are 116 yards north of this signal.

The weights and lengths of the various trains concerned in this case were as follows:—

6.10 a.m. local train: total length, 261 ft. 10 ins.; total weight, when empty, 218 tons 17 cwt.; weight of engine and tender, 131 tons 5 cwt.

Troop Train: total length, 858 ft. 10 ins.; total weight, when empty, 433 tons 19 cwt.; weight of engine and tender, 115 tons.

6.5 a.m. Express: total length, 843 ft. 10 ins.; total weight, empty, 608 tons; weight of leading engine and tender, 107 tons 7 cwt.; weight of second engine and tender, 115 tons.

The carriages of the 6.5 a.m. express, with the exception of the rear brake composite had underframes composed entirely of steel; the rear brake had Channel steel sole bars and headstocks, but oak longitudinals, diagonals, etc. The G.C. carriages of the troop train had oak underframes, with steel sole plates, excepting the 1st, 8th, 11th and 15th, which had steel underframes.

The method by which each carriage of these trains was lighted is given above.

The tools carried on the 6.5 a.m. express were as follows:—

	No. 213.	No. 588.	No. 72.	Total.
Fire Extinguishers	1	1	1	3
Ambulance Boxes	1	1	1	3
Hammers	—	1	—	1
Saws	1	1	—	2
Axes	1	1	—	2
Crow Bars	2	1	—	3
Buffers	—	1	—	1
Acetylene Lamps	—	1	—	1
Ladders	—	1	—	1

There were also five Fire Extinguishers in Sleeping Saloons and Sleeping Composites (one in each). There were no fire buckets in the emergency equipment in this train, but it is now the practice of the London and North Western Railway Company, who maintain the West Coast Joint Stock, to supply two fire buckets in all the main line open vans and larger brake ends as the vehicles pass through the works.

The tools in the Troop Train consisted of:—2 extinguishers, 2 refills for same, 2 axes, 2 saws, 2 long pinch-bars, 2 small pinch-bars, 2 water buckets (*i.e.*, one of each of the articles mentioned in each of the two brake compartments).

The brake-van of the local train was also equipped with:—1 fire extinguisher, 1 hand-saw, 1 fore-hammer, 1 chisel, 1 hand lamp, 1 hand hammer, 1 pinch-bar, 1 fire bucket, 1 collapsible ladder.

The following is a description of the Block Instruments in use in the signal-boxes concerned in this collision :—

Description of Block Instruments.

(a) These Instruments are furnished with two miniature Semaphore Arms, one for Up trains, the other for Down trains—the Upper coloured Red and the Lower coloured White. The Upper or Red Arm shows the signal last received, the Lower or White Arm shows the signal last sent—the Semaphore Arms working up and down after the manner of Outdoor Signals. The position of the White Arm indicates the position of the Red Arm in the signal-box in the rear. Each Instrument is also furnished with a Bell or Gong, which rings with every movement of the Semaphore Arm.

(b) Two Keys are attached to each Instrument for working the Semaphore Arms, the one placed above the other. Signals given on the Upper Key raise the Arm, and Block the Section in the rear ; signals given on the Lower Key lower the Arm, and clear the Section in the rear.

(c) A Ringing Key is also attached to each Instrument, by which the Signalman is enabled to give all Call Signals on the Bell or Gong without interfering with the Semaphore Arms.

(d) An Indicator is provided at the left hand side of the lower part of each Instrument, and whenever the White Arm is raised to Danger the Indicator shows the word " On " (Train on Line). The Indicator must not be altered until after the train or engine has passed off the Section carrying the Last Vehicle Indicator, and the signalman is in a position to give the " Line Clear," or the " Section Clear but Station or Junction Blocked " signal, where such is authorised, for a following train. Immediately thereafter it must be reversed to show the word " Off " (Train off Line). This is accomplished by pressing in the small button placed on the left side of the Instrument.

The following Block Telegraph Regulations are specially concerned in this collision :—

13. *Blocking Back.*—(a) When it is necessary, after the passing of one train, and before permission is given for another to leave the Signal-box in the rear, to obstruct the Line inside the Home Signal by allowing vehicles or a train to be crossed from one Line to another, or to leave a Loop Line or Siding for the Main Line for shunting purposes, or before the Line Clear Signal is received from the Signal-box in advance, the Blocking Back Signal (2- 4) must, unless instructions are issued to the contrary, be given to the Signal-box or boxes in the rear on the key which raises the Block Semaphore Arm to danger, and the same must be acknowledged by repetition on the Ringing Key.

(c) The Block Indicator must be maintained at the " On " position until the Line or Lines are again clear.

Regulations for use of Lever Collars.

The following are the regulations as regards the use of the Lever Collars specially issued by the Caledonian Railway :—

Lever Collars are supplied to every Signal-box on the Line with the exception of those working Single Line Sections only. They must be used by the Signalman as a reminder that the Line is blocked, under any of the following circumstances :—

When a Train has been shunted on to the opposite Running Line.

For each of the operations mentioned above, or in any other case of the Line being blocked, the Signalman must place the Lever Collar over the handle of the Lever working the Signal which protects the Line upon which the obstruction exists, and so prevent the Signal from being lowered until the Collar is removed.

When a " Lever Collar " has been used for the protection of a Train in accordance with the foregoing, the Signalman must not remove it from the handle of the Lever until he is personally aware that the Train has been shunted clear of the Line on which it had been standing, or he has been informed by the Shunter or Guard that this has been done.

When the Guard, Shunter, or Fireman has satisfied himself, in accordance with the provisions of Rule 55, that his Train has been protected by the use of a Lever Collar or other appliance provided in the Signal-box for this purpose, he may return to his Train.

N.B.—The Lever Collars when not in use must, where practicable, be placed on the spare Levers, but, where this cannot be done, they must be hung up in a convenient place in the Signal-box.

GLASGOW, April, 1912.

T. W. PETTIGREW,

General Superintendent.

The parts of Rule 55 referred to in this case are as follows:—

(b) When a train or vehicles have passed a Home Signal, and are waiting to be crossed to another Line, or to be let into a Siding, or have been shunted on to the opposite Running Line, or placed on either a Main or Branch Line at a Junction, or when a train or vehicles have been shunted from a Siding on to a Running Line and are 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 Signaller of the position of the train or vehicles, and, except as provided for in clause (f), remain in the Box until the Signaller can give permission for them to proceed or to be shunted clear of the Running Lines.

(c) The duty of going to the Signal-box must (except in the case of Rail Motor Cars and Motor Trains) be performed by the Guard, Shunter, or Fireman who is nearest to the Signal-box.

(f) Where mechanical or other appliances are provided to serve as a reminder to the Signaller that certain Signals must not be lowered or turned off, he must make prompt use of such appliances; and the Guard, Shunter, or Fireman who has gone to the Signal-box in accordance with clauses (a) and (b) must return to the train after receiving an assurance that the Signaller has protected it by such appliances.

Evidence.

George Meakin states:—I am 31 years of age, and have been in the service for 17 years—as signaller for about 10 years. For the last 3 or 4 years I have been at Quintinshill. Prior to that about 2½ years ago I was between 2 and 3 years in the same box. I came on duty on Friday, the 21st May, at 8 p.m., to work till 6 o'clock next morning. I had been on the same duty the previous night. The hours of my box are as follows: Day shift from 6 a.m. till 4 p.m.; from 4 p.m. till 8 p.m. the duty is taken by relief signaller; the night shift is from 8 p.m. till 6 a.m. For two or three years back my mate and I have changed duty between night and day shift at 6.30 a.m., and it has been our habit when on night duty to make notes in pencil of the signalling of all trains after 6 a.m. until the change in the shift is made and the signaller taking duty entered in the information in the train book. We both signed our names in the train book as leaving and taking duty at 6 a.m., and that was done following upon the last entry previous to 6 a.m. We did this without authority and unknown either to the Inspector of the District or the District Superintendent. On Saturday morning, 22nd May, my mate did not turn out at 6 a.m., but arrived with the 6.17 a.m. local passenger train from Carlisle. This local train was belled to me at 6.20, accepted 6.20, and arrived 6.30, and knowing by wire information that the 5.50 and the 6.5 a.m. express trains from Carlisle were running late, I considered it would be necessary to shunt the local train at Quintinshill, and this to the up main line, because of the down loop being occupied by the 4.50 a.m. goods train from

Carlisle. As the 6.17 a.m. train from Carlisle was approaching I pulled my home signal and exhibited a green flag. At this time the 4.50 a.m. goods train from Carlisle was standing in the down loop line, and a special train of empty coal wagons was standing at the up main line home signal. After the 6.17 a.m. from Carlisle was shunted through the road to the up line I allowed the empty wagon train to draw into the up loop. At 6.34 I replaced the loop points and signal. The local passenger train arrived at 6.30, and my mate arrived by that train and would reach the signal-box a minute or two afterwards. I made my mate aware of the position of the trains at and approaching my box, and he took charge of the work from that time. After my mate entered the cabin the fireman of the 6.17 a.m. train from Carlisle arrived at my box to carry out Rule 55, and he signed the register book in the ordinary course. The time of the fireman doing this is not shown in the book. I cannot say how long the fireman remained in the box. When relieved by my mate I told him that Kingmoor near Carlisle was unable to take in the empty wagon train, and that I had shunted it into the loop for the troop train which was following to pass. I set the points for the empty wagon train to enter the loop. This would be about 6.38 a.m., and I made my mate aware why this was being done. I was aware that the expresses from Carlisle were running late, and that the one for Edinburgh (5.50 a.m.) was leaving Carlisle about 6.27 or 6.28, and knowing that there would not be sufficient margin to run the local passenger train to Kirkpatrick,

I decided to shunt the latter to allow the expresses to pass. Occasionally my mate travelled by the 6.17 a.m. local train if he got to know that that train was to be shunted at Quintinshill to allow the expresses from the south to pass, otherwise he travelled by road to take duty. I live at Springfield, 12 minutes' walk from the signal-box, and always walk to duty. The arrival time at Carlisle of down expresses is transmitted to me by No. 3 Signal-box at Carlisle. The troop train was telephoned to me as passing Lockerbie at 6.32 a.m., and I made my mate aware of this, and, as he had then taken over the work from me, I sat down in the corner to read the newspaper, which had come by the local passenger train from Carlisle. I had some conversation with my mate as to the running of the expresses from Carlisle, and he was well aware of how all trains up and down were running and the condition of things at Quintinshill. I delayed the empty wagon train at the up home signal perhaps 2 or 3 minutes, as about 6.22 a.m. Kingmoor had wired to me that he had no accommodation for the train, and I kept it the time stated to allow of the 6.17 a.m. being crossed from the down to the up line, and when this had been done I opened the points for the loop for the empty wagon train. I remained about 20 minutes in the signal-box reading the paper after my mate took charge, but did not interfere with the working of the signal-box nor did I pay any particular attention to the details of my mate's signalling during that time. The newspaper I was reading is addressed to my mate, and as a rule it is thrown off when the train does not call. I may have made those in the box aware of interesting war news. The 4.50 a.m. goods train, ex Carlisle, arrived at my box and was shunted into the down loop line at 6.14 a.m. About 5 or 10 minutes after this the brakesman came to my box, and he remained in it until about 6.32 so far as my memory serves me. I am sure he left the box almost immediately after my mate arrived. He put no questions to me as to when his train was to get forward or as to why he had been shunted at my box. The object as a rule of brakemen coming to my box when shunted is to ascertain when they are likely to get away, or to ask me to wire for relief; the same applies to the drivers and firemen. Neither the driver nor the fireman of the 4.50 a.m. goods train came to my signal-box. A few minutes after the empty wagon train came to a stand in the up loop the brakesman of that train came into the signal-box and odd remarks were passed between us without any particular reference to the working of his train. This brakesman remained in the signal-box until the accident happened. He did not sign the train register book in accordance with the regulations. The only men that have signed the register book have been those that came under Rule 55. The brakesman's van was about 10 or 20 yards north of the signal-box so far as I could judge. When I was leaving the signal-box the troop train was approaching at a speed of about 40 miles an hour, and immediately afterwards the collision occurred. I turned back and shouted to my mate, "Where is the 6.5?" and he ran to the signal levers. I ran down the stairs to ascertain what had happened, but seeing that a serious collision had occurred, I returned to the box and told my mate to send the distraction danger signal to the signal-boxes at each side. I wired for assistance to Mr. Blackstock, the District Superintendent, and to Inspector McAlpine, and also made the station masters at Gretna Junction and Kirkpatrick aware of the serious nature of the accident. The 6.5 a.m. express from Carlisle ran into the wreckage within half a minute of the first collision occurring. I did not go near to the wrecked trains, but employed my time in assisting in the signal-box. There is only telephone communication on the

telephone circuit, which is between Carlisle and Kirtlebridge, with the intermediate signal-boxes on it. The last signals that I sent prior to my mate taking charge was the "Train out of section" signal for the 6.17 a.m. local train ex Carlisle, and I accepted the 6.5 a.m. train. I did not give the "Train out of section" signal for the empty wagon train, although I had set the points for the entrance into the loop of that train. I cannot say whether my mate gave the "Train out of section" signal for the empties or not, as I took no particular notice, nor can I say if he released the indicator lock. I did not give the "Blocking Back" signal prior to crossing the 6.17 a.m. local train from the up to the down line, because the Welsh empty train was still at the home signal, and the "Train out of section" signal for that train had not been given. I did not hear my mate give the "Blocking Back" signal for the local passenger train, and I expected he would send the "Train out of section" signal for the empty train. It did not occur to me to remind my mate that it was necessary to send the "Blocking Back" signal for the local passenger train. The local passenger train was crossed to the up line by my operation, but after the arrival of that train on the up line I did not put the lever collar on the up home signal. I did not consider it necessary so long as I had charge of the box to put on the lever collar. I gave not the slightest attention to the working of the signal-box after I had handed it over to my mate, being engrossed in the reading of the newspaper. When it is necessary to shunt a down local train to the up line the loop is always blocked by another down train, otherwise the train is shunted into the loop. It is not the practice for my mate to telephone from Gretna Junction to me to ascertain whether the 6.17 a.m. local train is going to call or not. I have more than once advised Gretna Junction to let my mate know that the passenger train had to be shunted, but this does not happen often. Tinsley arrived in the signal-box at 6.32, and after he did so I gave him to understand about the empty wagon train coming in to the loop, that Kingmoor was blocked up, and that the troop train had passed Beattock at 6.17. I had received that on the telephone from Kirtlebridge. Shortly after that we got the troop train wired from Lockerbie about 6.34, the train having passed that place at 6.32. I also told him where the 5.50 and 6.5 trains were and about the local train being put through the crossover to the up line. I handed over the work in the signal-box to my mate about 6.35 or 6.36. At that time there was a train in each of the loops and the slow passenger train had been passed from the down to the up line. I made my mate acquainted with all that was done. I then sat down to read the paper in the cabin and a few remarks passed. I do not think I read the paper out. Brakesman Young of the empty wagon train was in the box at this time, and he was still there when the collision occurred. I do not know for what reason he came to the signal-box, and I did not hear him say. It is usual for men on standing trains to come to the cabin. Brakesman Young came to the box a minute or two after his train got into the loop. The fireman of the 6.17 a.m. train also entered the cabin to carry out Rule 55, and he signed the train book. He came to the box as soon as his train came to a stand on the up line and would be about 4 or 5 minutes in the box. Brakesman Young did not sign his name in the book. The brakesman of the goods train also came to the box and sat about 10 minutes, but no other driver or fireman came to the box. I paid no attention to what my mate was doing after I left off work. The first warning I had of something being wrong was when I saw the troop train coming past the box. I was then just in the act of leaving

the box to go home. I should say the troop train went past at a speed of about 40 miles an hour, and I turned round and asked my mate what he had done and where the 6.5 a.m. express was, and the second collision then happened. I then ran down the stairs and saw a lot of soldiers running back. I returned up the stairs immediately and started to write telegrams for assistance. Before I handed the work to my mate the last bell signal I gave on the block instruments was accepting the 5.50 a.m. train from Carlisle at 6.33 from Gretna Junction. I gave "Train out of section" for the local train. I did not give "Train out of section" for the empty coal train or release the indicator lock after it had passed to the up loop at 6.34, although I replaced the points and put the signal to danger. I did not complete the movement, and my mate was standing at the block at the time. I did not give the "Blocking Back" signal to Kirkpatrick after I crossed the local passenger train from the down to the up main line, as the empty wagon train was still standing at my home signal and was starting to move into the loop. I would have given the "Blocking Back" signal when I replaced the points and have given the "Train out of section" signal for the empty wagon train had I been in charge. My mate having started work at the block, I did not complete the operation in connection with the coal train. I think my mate would have understood to send the "Blocking Back" immediately the empty wagon train was in the loop. I did not use the lever collar when I shunted the local train to the up line. It is seldom we use the lever collar, and I thought that the "Blocking Back" signal would do, but I did not give it on this occasion. We put the slow train into the loop in the event of our having to shunt such for the express when the loop is empty. I live in Springfield, about 12 or 13 minutes' walk from the box. When I am on the same shift as Tinsley was I come on duty between 6 and 6.30 a.m.

By Mr. Lightfoot :—I had been very busy all night. Tinsley got off the engine of the local passenger train before it arrived on the up line, and he knew it was going to that line, as he would see it passing through the road. The lever collar is used to insure the safety of a train left in the loop, its function being to indicate its presence and protect it. I had every reason to believe that Tinsley himself, having got off the engine of the local train, knew perfectly well where it was. Fireman Hutchinson of the 6.17 a.m. local train came to the box, and also Brakesman Young of the empty wagon train in the up loop. It is usual for men to go to the signal-box to make enquiries as to how long they are to be delayed. I suppose Young came for this purpose on this occasion and this was quite legitimate. The brakesman of the 4.50 a.m. goods, which was in the down loop, was also in the box. I do not think he mentioned anything about how long he was to be kept. There was no nonsense going on in the box.

George Meakin recalled :—I put the down distant signal to danger and the second collision just then occurred. Perhaps I put the down home signal to danger, but I cannot remember. I am quite certain I did not give the "Train out of section" signal for the empty wagon train.

By Mr. Pettigrew :—Q. Did you hear the "Train out of section" signal given?—Your attention would surely have been drawn to that as a signalman?—A. I never heard it. Q. Did you release the lock?—A. I never touched it. Q. It was at 6.34 when the "Train out of section" signal was given. That must have been given by a signalman, and according to your evidence the other man did not take charge till 6.36?—A. He was in the box about 6.32. Q. When

did the fireman of the local train come to the box?—A. As soon as the train got through the road, and that was at 6.35. My mate was at the train hook then, as he asked the fireman to sign.

James Tinsley states :—I am 32 years of age and have been over 8 years in the service—as signalman for 7½ years, and for the last 5½ years signalman in Quintinshill Box. On the morning of Saturday, 22nd May, I came on duty at 6.32 a.m., but signed the register book as taking duty at 6 a.m. This had been the practice at Quintinshill between my mate and myself to avoid getting up so early in the morning. This was done without the knowledge of the District Inspector or of the District Superintendent, and to keep our action from their knowledge the night signalman kept a note in pencil of the train signals from 6 a.m. until the change in shift was made at 6.30 a.m., and the day shift signalman entered the times in the train register book after signing his name and recording the time as 6 a.m. The irregular changing of the shifts was only done in connection with the 8 p.m. to 6 a.m. and 6 a.m. to 4 p.m. shift. On a very occasional morning I arrived at the signal-box by 6.15 a.m., but mostly it was 6.30 before I reached the box. I slept longer than usual on this particular morning, otherwise I would not have had to travel by the 6.17 a.m. local passenger train from Carlisle, which I did on this occasion. The signalman at Gretna Junction occasionally made me aware that the local passenger train required to shunt at Quintinshill. He signalled to me on this day what was to be done. On arrival of the local train at Quintinshill I found from the condition of the loops, that it would require to be shunted across the road, and I saw this done and reached the box after the train had stopped on the up line. I travelled on the engine of the local passenger train from Gretna to Quintinshill and leaped off as the train was being propelled on to the up line, but thereafter all recollection of the local passenger train escaped my memory until the collision occurred by the troop train running into it. On reaching the signal-box my mate told me about the troop train having passed Lockerbie at 6.32, and that the empty wagon train was being shunted into the up loop to allow the troop train to pass. The first signal I dealt with on taking duty was in connection with the 5.50 a.m. down express from Carlisle, in so far as applied to the block section between my box and Kirkpatrick; that is to say, I gave the "Train entering section" signal at 6.33, which was duly acknowledged, and I also gave the "Train out of section" signal to Gretna Junction for the same train at the same time. When I received the "Is line clear?" signal for the up troop train at 6.42, which would be when that train was passing Kirtlebridge, I gave the "Line clear" signal for it, and on receipt of the "Train entering section" signal from Kirkpatrick at 6.46, I belled the train on to Gretna Junction at the same time, and received the "Line clear" signal for it. I thereupon cleared all the up line signals for the troop train, forgetting, as stated before, all about the local passenger train from Carlisle standing on the up main line, and I knew nothing more until the collision occurred. My mate remained in the signal-box from the time of my taking duty at 6.33 until 6.50, and the collision occurred at the latter hour. My mate was seated in the signal-box when the collision occurred, and said to me, "Whatever have you done, Jimmy?" and I said, "Good heavens! What can be wrong? The frame's all right and the signals are all right," and he replied, "You have got the 'Parly' standing there." I received the "Is line clear?" signal for the 6.5 a.m.

express from Carlisle at 6.46 and accepted it, belled it forward to Kirkpatrick at the same time, and received the "Line clear" signal, thereafter lowering the signals for it. The "Train entering section" signal for this train was received from Gretna Junction at 6.48, and the train approached my box just after the collision on the up line occurred. I gave the "Obstruction danger" signal at once to the box on each side. I cannot say anything about the condition or the position of the trains after the collision occurred. The brakeman of the 4.50 a.m. goods train from Carlisle may have been in the box when I arrived to take up duty, but he certainly was shortly afterwards, and he remained in the box for some time, but was not in it when the collision occurred. The fireman of the local passenger train after it was shunted to the up line, came into the box and signed his name in the train register book. When the fireman signed the book I had not commenced to enter the times of the train signals handed to me by my mate. The fireman did not wait any time in the box. I signed the book myself and gave the time of taking duty as 6 a.m., and my mate signed off at the same time. In the interval the brakeman of the empty wagon train also turned up at the box, and at one time there were the two brakemen, myself, and my mate in the box. When I was entering up my times in the book little or no conversation took place, and none of these men interfered in the slightest degree with me in the working of the box. My mate, who was reading the newspaper, which comes by the 6.17 local train from Carlisle, remarked that there was little or no war news that morning, but otherwise he did not enter into the conversation at all, but continued reading the paper. The only thing that I can account for my forgetting about the local passenger from Carlisle standing on the up line, was my mind being occupied in entering up the times of the trains between 6 and the hour that I took duty—viz., 6.33 a.m. I did not give the "Train out of section" signal to Kirkpatrick for the empties nor remove the indicator lock, nor did I put a lever collar on my up home signal lever to protect the local passenger train on the up line. I am aware of the regulations for the use of the lever collars, but have only used them for the protection of vehicles left off trains and stored in the loop, and this was done to prevent me from making a mistake in running a train into the loop when it was blocked. I did not use the lever collars for the main line, because when the main line was blocked I had obtained the "Blocking Back" authority from the signal-box in the rear, and my instrument at that time would be locked; and in my opinion there was not the same necessity for the use of the lever collars. I repeat that I did not give the "Train out of section" signal for the empty train, and that I did not release the Indicator lock after that signal must have been given. The "Train out of section" signal was given to Gretna Junction at 6.31 for the local passenger train, and that must have been done before I reached the cabin. I am certain that I did not take charge of any of the block signalling until 6.36, and the first train to be dealt with after that was the 5.50 a.m. ex Carlisle passing the box, the "Train entering section" signal for which I sent to Kirkpatrick. My mate not only gave the "Train out of section" signal for the local passenger train, but he also acknowledged the "Train entering section" signal from Gretna Junction for the 5.50 a.m. express at 6.36 a.m. On reaching Quintinshill I got off the engine as it was passing through the road, so that I knew the train was to be crossed to the up line, and the train was standing on that line when I got to the box. On getting to the box my mate told me the 5.50 a.m.

from Carlisle was signalled and that the troop train had passed Lockerbie at 6.32. He also told me that Kingmoor was blocked and that the empty wagon train would have to go into the up loop. The first block signal I gave was the "Train entering section" signal to Kirkpatrick at 6.38 for the 5.50 a.m. train from Carlisle. The first signal I gave on the up line was the "Line clear" signal to Kirkpatrick for the troop train at 6.42. I did not give the "Train out of section" signal for the empty wagon train. When I went to the block instrument for the up line from Kirkpatrick the block was in normal position and someone must have cleared the indicator. I am quite certain that I did not do so. The fact of the 6.17 a.m. train being on the up line left my mind entirely until the collision occurred. I did not look out of the window before clearing my signals for the troop train. If I had looked I might have seen the local train. It is not the custom to look if the line is clear before lowering the signals. We can see the signals and the line from the position in which we stand when pulling the levers in the box, and we would not have time to go to the window every time. I was offered the second express—6.5 a.m. from Carlisle—and accepted it at 6.46. I offered it to Kirkpatrick at same time, and it was accepted. I got the "Train entering section" signal at 6.48. When the collision between the troop train and the local passenger train occurred, I knew the 6.5 a.m. express would be at the back of it, but I could not say where. All my down line signals were put to danger when the collision occurred, but by whom I cannot now say. I cannot say whether I did so or not. When I arrived in the box the brakeman of the 4.50 a.m. goods train was there, and the fireman of the local passenger train followed me up and I gave him the pen to sign the book, and this ought to have reminded me of the train on the up line. The brakeman of the empty wagon train also came to the box. Between the time I arrived and the accident, I said to my mate that there would be another express to come, and he said, "Yes." I called up Carlisle No. 3 Cabin on the telephone and asked where the second express was, and he said it had passed him at 6.40. I went to where the book was, after taking off my jacket, etc., and looked to see what trains were on the slip of paper. The fireman of the local passenger train then came up. I do not use the lever collar when trains are shunted from one line to the other, only in the case of trains left in the loops. I am in the custom of using the "Blocking Back" signal when trains are shunted to the opposite running line, but I did not think of sending it in this case as I had forgotten the local train on the up line. I am certain I did not give "Train out of section" signal for the empty wagon train. The first signal I gave on the block was at 6.38 a.m. My mate gave "Train out of section" for the local passenger and accepted the 5.50 a.m. express from Carlisle.

By Mr. Lightfoot :—I think there would be a minute between the first collision and the second. After the first collision there was nothing I could have done effectively to prevent the second one, there being no time. I was in a fit condition to do anything I could have done and I was all right at the time. I cannot remember whether I put the signals to danger. I only know that they were put to that position. Meakin may have done so, but I cannot say. I jumped off the local train opposite the signal-box door. I did not see the train stationary after it went through the road. Q. Would the fact that the empty train on the up loop line standing immediately in front not rather prevent you seeing the up line?—A. A wee bit. Q. You could have seen the up line if you had looked for it, but the presence of the empty train might prevent you seeing the passenger train?—A. A wee bit. I produced the book for the fireman of the

passenger train to sign. This was the first job I performed, and I then signed on to take control.

By Mr. Pettigrew: I did not interfere with the empty wagon train at all. I did not touch the indicator lock. It was standing off when I got the troop train. Q. Are you quite sure you did not put the signals to danger after the first collision? A. I may have put the up line signals to danger, but I am not sure about the down line signals.

Charles Leggat, brakeman, Larbert, states:— I have been 12½ years in the Company's service, and have been a spare brakeman for nearly five years. I have no regular booked hours. I left off duty at 5 p.m. on the 20th May, and resumed at 2 a.m. on the 22nd. I was guard of the troop train, which consisted of 21, equal to 23½, vehicles as follows:—

Engino 121.		
G.C. Brake Composite 699..		Electric lighting.
G.C. Third 983		Gas lighting.
G.C. Third 466		" "
G.C. Third 283		" "
G.C. Third 955		" "
G.C. Composite 740		" "
G.C. Composite 203A.		" "
G.C. Third 1834		" "
G.C. Third 414		" "
G.C. Third 1056		" "
G.C. Brake Composite 1595		Electric lighting.
G.C. Third 1343		Gas lighting.
G.C. Third 1469		" "
G.C. Composite 1289		" "
G.C. Composite 104		Electric lighting.
Cal. Caravan Truck 176		—
Cal. Caravan Truck 155		—
Cal. Scenery Truck 161		—
Cal. Fish Van 77		—
Cal. Fish Van 86		—
Cal. Brake Van 15		Gas lighting.

The train was fitted for vacuum brake working and the brake was tested before leaving Larbert. There were 20 inches of vacuum on leaving that place, and the train departed at 3.42 a.m. On the journey we were stopped at Abronhill Signal-box for 10 minutes by signals at danger owing to a goods train being in front. The brakes were applied then and acted all right. We had permanent-way slacks at Glenboig and Cloghorn, and stopped at Carstairs at 5.17 and left at 5.27—22 minutes late. The driver applied the brake twice descending Boattock Incline, and it was not again applied. I think the brakes were grinding just before the accident occurred, but I am not sure. When the collision took place I got a blow on the head and I have no definite recollection of what happened thereafter. I think I went to the signal-box at Quintinshill and asked if the signalman had sent the "Obstruction danger" signal. I remember seeing a tongue of fire about 2 yards high, which I think was burning gas on the top of the wreckage just about where my train engine was lying. I remember saying to one of the soldiers, "Look at that now, and there is no water."

David Wallace, engine driver, states:—I am 39 years of age, and have been in the service for 24 years—17 years as engine driver. I came on duty on the 22nd at 6.5 a.m. to work till 4.15 p.m. and finished duty at 5.10 p.m. the previous day. I was driver of the 6.10 a.m. local passenger train from Carlisle on Saturday, 22nd May, and on arrival at Quintinshill was shunted from the down to the up main line, as I understood because the down loop line there was already occupied by a goods train. After the train reached the up line I saw the fireman proceed to the

signal-box to carry out Rule 55. The 5.50 a.m. express from Carlisle passed us after 4 or 5 minutes, and being of the opinion that the 6.5 a.m. express from Carlisle would be allowed through before I could proceed, I remained by my train until the accident happened. The fireman would be away at the signal-box 4 or 5 minutes, and when he returned he informed me that we would remain on the up line until the down 6.5 a.m. express passed. We were being shunted from the down to the up line when I noticed the empty wagon train entering the up loop. Shortly after the return of the fireman to my engine, he got his piece-box and after opening it, he called my attention to the fact that the signals for the up line were standing clear. I looked back the main line and saw the troop train approaching about 200 yards away, but we had not time to get out of the way nor to apply the steam on my engine. I leaped off the engine on the left-hand side and was not hurt. The first and second carriages of my train were slightly damaged, but I cannot say as to any injury to the passengers of my train. My train was composed of two carriages, 1 brake-van and 1 milk truck. After getting off my engine, I ran across the lines and through below the wagons of the goods train standing in the down loop, and while doing so the impact occurred. I realised that the 6.5 express would be coming down just about the time, and immediately bolted back through below the wagons again and saw a large number of soldiers coming out of the wrecked train and running across the down main line and crossing through below the wagons to the down line side. I shouted and warned them to look out as the down train was coming, but almost immediately thereafter the 6.5 crashed into the derailed train. When I got through from below the wagons before the 6.5 came, I observed the carriages of the troop train were badly telescoped and leaning towards the side of the empty wagon train in the up loop, but the tender of the troop train engine was foul of the down line, and I think the engine of the 6.5 struck the tender near the footplate and twisted it round and pulled some of the derailed vehicles back over. Shortly after this I observed fire among the wreckage near the front of the train engine, and as the roof of a large carriage had been thrown on the top of my engine (the roof was upside down) I went round by the south end of the express and got extinguishers from that train and one from the van of my train. I got four or five extinguishers and mounted this roof, and from that position discharged the extinguishers on to the fire, one after the other, but they did not seem to make much impression. Some persons, I think they were soldiers, had got a hand-cart and force-pump about this time, and a line of hose was laid from the ditch on the up side, and from about 8 a.m. water was played on the fire until after the fire brigade arrived. While I was engaged trying to extinguish the fire there was an explosion or two, and bits of metal about the size of my hand rose out of the wreckage, which I ascertained came from the gas tanks, so that it would appear they had exploded. Not more than 15 minutes elapsed from the time the accident happened until I had the extinguishers out, but the fire had got such a hold that these had little effect. A small hand-pump was brought out from somewhere, and we had this in operation in about 40 minutes. The fire brigade arrived about 11 o'clock. All the tools and crowbars that could be got were brought from the salvage cases in the brake-vans and there were a number of naval men at work, who used the tools to great purpose. They worked under the direction of a naval officer, who was standing amongst the wreckage, and did great work. The soldiers also were using tools and worked for all they were worth, and about 50 persons were removed from the wreckage

while I was there. I think there would be about 20 or 30 soldiers giving assistance in the release of passengers. There were wagons on the troop train, and hatchets, saws, etc., were secured from these wagons. I do not think more tools would have had any effect on the number of passengers rescued. The difficulty was the want of water. I think a number of men were killed by the 6.5 a.m. express, the soldiers having got out of the troop train on the six-foot side and been caught when the second collision occurred. When I went through below the wagons after jumping off my engine, the soldiers were making an effort to get clear, and there was little more than a minute between the collisions, if that.

George Hutchinson, fireman, states:—I am 30 years of age, and have been in the service for 13 years—4 years as fireman. I worked the same hours as driver Wallace on the 21st and 22nd May. I was fireman on the 6.17 a.m. local passenger train from Carlisle on the 22nd instant, and after being shunted from the main down line to the main up line at Quintinshill, I almost immediately proceeded to the signal-box. When I arrived there the brakeman of the 4.50 a.m. goods train from Carlisle and the two signalmen were in the signal-box. My intention was to carry out Rule 55, and I signed my name in the train register book, but did not put down the time. This would be about 6.38 a.m. About 2 minutes after my reaching the signal-box, the brakeman of the Welsh empty wagon train came into the box, which made five men in the box altogether—namely, the two signalmen, myself, and the two brakemen. We would all be in the box for about 4 minutes when I left, after receiving word from signalman Tinsley that he was going to keep us on the up line until the 6.5 a.m. express passed. When I left the signal-box the two brakemen remained in it, and neither of them accompanied me. I proceeded direct to my engine through below the empty coal train, and told the driver what the signalman had said. I opened my piece-box, and, glancing forward, I observed the up main line signals to be standing clear. I at once informed my driver, but there was no time to reverse and put on steam before the collision occurred. I jumped off my engine on the right-hand side (looking north) and got under the empty truck train, and was not injured. Two of the carriages of our train were damaged, but I cannot say as to any injury to the passengers in the train. After the collision the end of one of the sleeping cars on the 6.5 train was leaning against our engine, but I cannot say whether this was the first or the second sleeping car. When I entered the signal-box Tinsley was at the train book, and when I went to sign my name he pointed to the line on which I was to do so. I took Tinsley to be the signalman in charge at that time, which would be about 6.40 a.m. I am aware that it is my duty, when carrying out Rule 55, to see that my train is protected and thereafter to return to my engine, but I did not carry out this rule in its entirety as I remained some time in the signal-box. When I left the signal-box I did not see that the lever collar was placed on the up home signal lever, but simply took the signalman's word for it that he knew we were on the up line. After the collision I came back to the scene of the accident to see whether I could get water, but the back end of the tank of my engine was knocked in, and after that I assisted with the injured. I tried to get extinguishers, but I could get none, and I think my mate had got all that were in our train. The fire I saw was at the leading engine of the express train. I heard two or three explosions amongst the debris near the engine of my train. The noise sounded something like that of a gun going off. I wrote my name in the train book and I ought to have seen that the lever collar was put on the lever

before I left the box, but I did not see that this was done. I would be about 5 or 6 minutes in the box.

By Mr. Lightfoot:—Tinsley knew that I had come from my train, and I assumed that he was aware that it was standing on the up line, as he had left it while it was passing through the road to the up line, and that is the reason I did not see that the collar was put on the lever.

Douglas Dobie Graham, guard, states:—I am 46 years of age, and have been 33 years in the service—26 years as guard. I came on duty on the 22nd May at 5.55 a.m. for 11 hours, having left duty at 8 p.m. on the 21st. I worked the 6.17 a.m. local passenger train from Carlisle on the morning of the 22nd May, and on arrival at Quintinshill was shunted from the down to the up main line, as the down refuge loop at Quintinshill was already occupied by the 4.50 a.m. goods train from Carlisle. I came to a stand at 6.34 a.m. After the train was shunted through the road I saw the fireman go to the signal-box to carry out Rule 55. The 5.50 a.m. express passed us at 6.39 by my time, then I thought we were safe until the 6.5 a.m. train had passed and went back into the van and commenced to work. The next thing that I knew was that the troop train had run into us. I was thrown to the far end of the van by the impact. I was stunned for a second, and after pulling myself together, I remembered that the down 6.5 a.m. express would be at hand, and I rushed back to the line to stop it, but it was then too near. I held up my hands and whistled as loud as I could to draw the driver's attention. I had not time to get my red flag or detonators. I am confident someone on the engines saw me, as the brakes went on with some force. This happened about 6.49 or 6.50 a.m. I went right away back to Gretna and told the signalman there. The guard of the 6.5 a.m. followed me to protect his train. I informed the station-master what had happened, and asked him to get every assistance and to wire the officers, etc., as I knew they would all be wanted. I returned to the wreckage in about half-an-hour and assisted to get out the injured, and remained at the rescue work until about 4 p.m.—as long as I could bear it. I would be about 15 or 20 yards past the down home signal, which was off when I passed it, when the 6.5 a.m. express passed me, and the brakes were applied hard then. I went right away back to Gretna and informed the signalman there of what had occurred. I also told the station-master, and asked him to advise the company's officers, etc. I got back to the scene of the accident about half-an-hour afterwards, when I found the fire burning fiercely all round about the engines, which were covered up with debris. The fire was confined to the lower parts of the wreckage. The fire extinguisher had been taken from my van during my absence, but the tools—saw, axe and crowbar—were still there, and I handed these out to people engaged in rescuing work. There was a large number of men working with tools. There would be about 2 minutes between the two collisions. My train consisted of 4, equal to 5½, vehicles, and was worked by the Westinghouse brake on all wheels except centre wheels of the fish van. I did not see anything like fire from escaping gas.

Andrew Johnstone, driver, states:—I am 46 years of age, and have been in the service for 25 years—an engine-driver for 15 years. I came on duty at 4.55 a.m. on the 22nd for 10 hours, having left duty at 2 a.m. on the 20th. I was not on duty on the 21st. On the date in question I was train driver of the 6.5 a.m. express from Carlisle, and had 13, equal to 21, vehicles on my train. We left Carlisle at 6.37—

32 minutes late—and on approaching Quintinshill all the signals were standing clear. On nearing the home signal I observed a guard signalling to me by his arms that there was something wrong, and I immediately shut off steam and put my brake to zero and attempted to reverse the engine, but before the last could be done my train had collided with the wreckage. I remained on my engine until we came to a stand, and at once went to relieve my pilot driver, who was fixed against the boiler by coal from the tender. The fireman of the pilot engine was free and assisted me to relieve his driver. I at once proceeded to the signal-box to get the signalman to wire for tool vans and assistance. On my return from the signal-box fire was all round the two engines of my train. I got on to the footplate of my engine to get the hose-pipe to play on the fire, but was blown off by some explosion. I went on to the tender and used water in a bucket from my tank until the flames compelled me to give way. There were the usual tools on both engines, but these could not be got at owing to the fire. It was impossible for anyone to stand the heat in any endeavour to put out the fire. I heard several explosions take place, but cannot say how they originated, whether from the gas tanks or the ammunition in the troop train. There was a large quantity of woodwork all round about my engine. The two vehicles next my engine were telescoped, and the end of the sleeping saloon—the third in the train—was knocked in. So far as I could judge, two of the sleeping saloons were destroyed by fire. I did not see any shoots of flame, but I heard several explosions after the one which blew me off the footplate, but I cannot say where these occurred or what caused them. My engine was partly under the pilot engine tender, and the rear of it was raised up. No burning coal came out of the fire-box. I saw many people working about the place later on, but I was rather done up myself. I cannot say how far I was from the obstruction when I applied the brakes, and I cannot estimate the speed at which we were travelling at the time. At the speed at which my train was travelling I could have stopped it nicely in about 110 yards. My engine and tender were off the rails on all wheels. I did not see the down home signal for Quintinshill as I was engaged applying the brake on account of my fireman having told me there was something wrong. I tried to reverse the engine, but before I got the lever back the collision occurred.

Lieut. J. C. Bell, 1-7th Royal Scots, states:— I travelled in the third or fourth compartment of the first carriage from the engine of the troop train, and the first I knew of anything being wrong was when awakened by the shock of the collision, and I found myself falling down with glass and water falling about me. There was a short space and then a second shock. After that I saw a man getting out of the carriage, I think on the right-hand side, and I followed him. I did not notice fire at first, and I think I went to the rear end of the train without noticing much. I stayed there for some time, and I then saw an engine and two or three carriages piled up, and fire was rising from them. The battalion tool coach was on the train and the tools were got out of it and employed on, I think, the roof of a sleeping saloon car. One lady was got out after the roof was cut off. So far as I saw there were more tools than men using them. The tools I speak of were the battalion tools—not railway company's tools—picks, shovels, axes, crow-bars, etc. I felt two shocks, and I think I got out of the train after the second collision. There were five officers in my compartment, three of whom were injured, and three in the next compartment ahead,

who were killed. The other officers were in the rear of the train, and escaped injury. I was cut in the head and wrist by broken glass, I think. There was no loose ammunition in the train as far as I know, but I think some of the boxes must have got broken, as I saw some lying about afterwards.

David Todhunter states:— I am 30 years of age, and have been 11 years in the service—a fireman for four years. I came on duty at 5.10 a.m. on the 22nd May, to work to 4 p.m. I left duty the previous day at 8.10 p.m. On the date in question I was fireman on the front engine of the 6.5 a.m. express from Carlisle, and on approaching Quintinshill the signals were all clear for us. The first notice of anything being wrong was when approaching the home signal, when I observed a guard waving his arms as if something was the matter. I shouted to my driver to stop, as I saw there was something in front. He came from his side of the engine to my side and immediately applied the brakes, shut off steam, and endeavoured to stop as hard as he could. After the train came to a stop I found myself up to the chest by the coal having been forced forward, and the driver was in a worse position. With the assistance of the train driver and fireman, so far as the driver was concerned, we got him out. I assisted my driver off the engine to a place of safety, as he was cut on the neck and feeling weak. I then went back to my engine and shut off the injector. We were using the Westinghouse brake on the train. The two first vehicles of my train were telescoped, and the leading end of the first sleeping car was knocked in. Alongside my engine I observed fire in the troop train as if it had started there first, but I did not observe fire on my own train until some time after. I gave all the assistance I could. The available appliances on my engine were given out for use in rescuing the passengers. My driver was caught between the lever and the fire-box, and, after removing him to a place of safety and shutting the injector, I rendered assistance in rescuing passengers. I waited a long time at the leading sleeping saloon, where men were working with tools. I first noticed fire amongst the wreckage of the troop train between the engine and tender. I did not notice any fire in the carriages on my train, and I do not know whether anybody got water from my tank to put the fire out. I think it would be less than half-an-hour before the carriages of my train caught fire. I heard some explosions—loud bangs—in the fires on both trains, sending the debris into the air.

John Graham, fireman, states:— I am 29 years of age, and have been 14 years in the service—8 years a fireman. I worked the same hours as driver Johnstone on the 22nd May. I was not on duty on the 21st. I was fireman on the train engine which worked the 6.5 a.m. express from Carlisle on the 22nd May, and corroborate the evidence of the fireman of the front engine, which I have heard. My driver immediately shut off steam, applied the brake, and attempted to reverse his engine, but before he could stop, his train had run into the other trains. On coming to a stand I assisted my driver to release the men on the front engine. I was slightly cut about the eye, and had my leg slightly bruised by the coal. The appliances on my engine were taken out and used for the rescue of passengers. I also assisted to put out the fire until we could remain no longer. The damage was as stated by my own driver. I noticed fire on the right-hand side of my engine shortly after driver Cowper was released. The fire appeared to come from the troop train, the wreckage of which was lying about in all directions. I did the best I could to put out the fire with water carried in a bucket from my tank.

Philip Thomas states:—I am 60 years of age, and have been in the railway service for 37 years—33 years as guard and 4 on West Coast trains between London and Glasgow. I took duty as guard at 11.30 p.m. at Euston on Friday, 21st May, to act as guard on the 12 midnight sleeping car express from London to Glasgow. I was off duty from the previous Tuesday. On leaving Carlisle—32 minutes late—my train consisted of 13, equal to 21, vehicles, as follows:—

Pilot Engine, No. 140.

Train Engine, No. 48.

West Coast Brake-van, No. 213, 8-wheeled.

West Coast Composite, No. 58, 8-wheeled.

L. & N.W. Sleeping Saloon, No. 5,132, 12-wheeled.

West Coast Sleeping Saloon, No. 451, 12-wheeled.

West Coast Sleeping Saloon, No. 450, 12-wheeled.

West Coast Sleeping Composite, No. 119, 8-wheeled.

West Coast Sleeping Composite, No. 37, 8-wheeled.

L. & N.W. Third, No. 1,399, 8-wheeled.

West Coast Third, No. 313, 8-wheeled.

West Coast Third, No. 515, 8-wheeled.

West Coast Third, No. 509, 8-wheeled.

West Coast Brako Third, No. 72, 8-wheeled.

West Coast Brake Composite, No. 588, 8-wheeled.

As near as I can remember we reached Quintinshill at 6.50 a.m. I felt a shock, and the train came to a sudden stop. I did not hear any whistling. Approaching Quintinshill I felt the brakes suddenly applied, and almost immediately afterwards the collision occurred. The shock did not feel to me very violent, but I knew from it that we had collided with something on the line. I was in the act of allowing a gentleman through the corridor to go for a cup of tea, and was in the centre of the corridor of the vehicle next to the brake-van, third vehicle from the rear. Neither of us was thrown off our feet by the shock. I immediately looked out of the window on the six-foot side and saw a lot of wreckage in front, and it was apparent to me then that my train had run into an obstruction. I looked on the other side and saw that the wreckage was on both sides of my train. There was a number of soldiers and sailors in my train, and I called to them to assist as there had been an accident. I got them to collect cushions from third-class carriages and to take them to the front of the train at once. I got two or three to come back to my brake-van for the wreckage tools, ambulance boxes and fire extinguishers, and gave them to a man, and I went back to Gretna. I was not aware that the guard of the local train had gone back. I met the station-master coming out of the G. & S.W. Junction Signal-box with the guard of the local train. I asked him if he was aware what had happened, and he said, "Yes," and I told him all I knew, and asked if he had wired to Carlisle and Glasgow for assistance, and he answered that he had. He accompanied me back to Quintinshill along with the guard of the local train. About 2 minutes after my train collided with the debris a soldier called my attention to smoke coming from the vehicles. I was handing out cushions at the time, and I immediately passed out three fire extinguishers belonging to brake-vans in rear and one from the sleeping composite, and the soldiers took them forward to play on the fire. A large number of soldiers and sailors engaged in the work of rescue until all the injured were got out. In the three leading compartments of the composite nearest the engine, one of the third-class compartments—the centre one—was labelled "Ladies Only." There were also three first-class compartments behind, in which seven military officers travelled, and all escaped. Sleeping car attendant Dyer, in charge of No. 5,132, was killed in the collision. I was shaken a little bit by the sudden stop of the train. As I returned

from Gretna I could see the fire blazing when I got in sight of Quintinshill. When I arrived at the scene of the accident a large number of people were working with tools—soldiers and sailors. There were soldiers and sailors in my train. I saw no water put on the fire before the arrival of the fire-engine. I saw that all the passengers in my train had been got out when I got back from Gretna. I do not think there were many persons injured in the rear part of my train. There were seven first-class passengers in the leading composite, and an officer told me that they all got out with slight injuries.

Richard Lewonski, sleeping-car attendant, states:—I am 64 years of age. I have been in the L. & N.W. Company's service since 1871, and have been sleeping car attendant since 1881. I was in charge of cars 450 and 451 on the 12 midnight train from Euston on Friday, the 21st May. I had 19 passengers in the cars. Everything went all right until approaching Quintinshill about 6.50 a.m., when I felt the brakes go on, and immediately afterwards the shock of a collision. At that time I was standing close to the geyser, which was at the rear end of the compartment, and the shock threw me across the pantry against the front. I was not thrown down, and I realised at once that there had been a collision. I went into the corridor to see what had happened, and found that the front end of the saloon (451) was crushed in, and that a gentleman was wedged in. This was a young officer out of saloon 5,132, the saloon in front of mine, and he had been forced back with some wreckage through the leading end of my saloon. I told him we would get him out directly, and with the assistance of some soldiers we succeeded in rescuing him in about 40 minutes. We also found a lady and gentleman under him, and they were removed as well. We had to get part of the roof cut off to release them. After getting these passengers out, I then saw that the wreckage was on fire, and when I went to get the extinguishers out of the vans they had been taken away. Somebody had removed them during my absence. No. 5,132 was very badly damaged; the body of it, apparently completely smashed, telescoped into the front end of my saloon. I saw no other passengers imprisoned by the wreckage, and I employed myself in getting water, cushions, sheets, etc., for the injured. The wreckage tools seem to have been taken possession of just at once by the soldiers and sailors who were assisting, and they made very good use of them. So far as I could see, there were no injured passengers imprisoned in the wreckage of the front part of my saloon. There were seven officers in the first-class compartments of the composite, second vehicle from engine, and they all escaped, apparently not much injured. I did not see these officers, but two of the officers told guard Thomas and me that the others had got out of the carriage safely. There was a large number of soldiers working at the front part of the train amongst the wreckage doing their best to rescue everybody, and two naval officers were taking a prominent part in directing the operations. A Mr. Connil, railway official, and a sleeping passenger in my car also assisted. The sleeping car attendant in charge of 5,132 was Samuel Dyer, and he was afterwards found to be killed.

Robert Kirkpatrick, signalman, Gretna, G. & S. W. Junction, states:—I am 38 years of age, and have been in the service for 13 years—as signalman for 11 years. I have been in Gretna Junction Signal-box for 12 months. Nothing unusual occurred in the signalling between Quintinshill and my box on the morning of the 22nd May. About 6.26 a.m. I received a telephone call from the signalman on

duty at Quintinshill to the effect that the "Boy would get a ride to-day," meaning that his mate would be able to go forward by the 6.17 a.m. train. I told him that I did not see him, and that the train was coming into the station. On looking out, however, I saw signalman Tinsley coming down the road, and I drew his attention to the passenger train, which would mean to him that he could travel by it. I signalled the 5.50 a.m. express from Carlisle to Quintinshill at 6.33, and my signal was accepted at 6.33. The train passed my box at 6.36. The "Train entering section" signal was sent at the same time, and the "Train out of section" signal was received at 6.38. The "Line clear" signal for the 6.5 a.m. express from Carlisle was received from Quintinshill at 6.47 a.m., the train passed my box at 6.49, and the "Train entering section" signal was forwarded at the same time. The up troop train was signalled and accepted at 6.47. At 6.53 I gave one beat on the block instrument to call the attention of the signalman at Quintinshill, as I was wondering what had become of the troop train, and immediately after I had done so I received the "Obstruction Danger" signal from Quintinshill, and I at once put my signals to danger. I have noticed frequently that signalman Tinsley, when on the morning shift, passed my box later than 6 a.m., but I had no knowledge of any arrangement as to an alteration in the hours of changing duty. I advised the station-master at once of the accident, and also the platelayers who were passing my box at the time. The 6.17 a.m. local passenger train from Carlisle passed me at 6.28, and I received "Train out of section" signal for it at 6.33. I came on duty at 10 p.m. on the 21st to work till 8 a.m. on the 22nd. I worked the same hours all the week.

Thomas Sawyers, signalman, Kirkpatrick, states:—I am 35 years of age, and have been in the service for about 8 years—about 3 years in the superintendent's department as a signalman, all that time at Kirkpatrick. Prior to that I was in the Permanent-Way Department. My hours were 10 p.m. till 8 a.m. I got the "Is line clear?" signal for the 5.50 a.m. express from Carlisle at 6.33, and accepted it at the same time. The "Train entering section" signal was received at 6.38, and the train passed my box at 6.42. The "Is line clear?" signal for the 6.5 a.m. express from Carlisle was received at 6.47. The "Train entering section" signal was received at 6.53, and the "Obstruction danger" signal was received immediately before. I gave the "Is line clear?" signal to Quintinshill for the empty wagon train at 6.17, and it was accepted at that time. The "Train entering section" signal was sent at 6.25, and the "Train out of section" signal was received at 6.34. The "Is line clear?" signal for the troop train was sent to Quintinshill at 6.43, and that train was accepted at the same time. The "Train entering section" signal was sent at 6.47, and the "Obstruction danger" signal was received at 6.53. I did not receive any "Blocking back" signal from Quintinshill that morning. I received the "Obstruction danger" signal at 6.53. I got this signal before I got the "Train entering section" signal for the 6.5 a.m. train. I am certain of this. The troop train was running fast when passing my box and all my signals were clear for it. I did not receive "Train out of section" signal for the troop train, and I got the "Obstruction danger" signal at 6.53 a.m.

Richard Moss, engine-driver, states:—I was driver of the 4.50 a.m. goods train from Carlisle, which was composed of 45 loaded wagons. My engine was a six-wheels-coupled tender-engine, with steam brake on all engine and tender wheels. My train left Carlisle

at 5.50 a.m. The signals at Quintinshill were at danger when we approached, and, after being slowed at the home signal, the signal for the loop line was cleared for my train, and I understood that it was to be shunted for following trains to pass. We drew into the loop about 6.15 a.m. and pushed the train back into the dead end of the loop and clear of the facing points to the main line, finally coming to a stand at 6.20. After we had stood for a good bit the 6.17 train from Carlisle came along, and it was shunted through the cross-over from the down to the up line. I also observed an empty wagon train arrive on the up road, and it was put into the loop at the opposite side from us. About 7 or 8 minutes would elapse from the time the empty wagon train was put into the loop and the arrival of the troop train. I remained on my engine all the time, and both my fireman and myself were on it when the collision occurred. I did not notice the up main line signals at all before the accident, but after the troop train passed I looked at them and they were lying off. I did not notice the approach of the troop train until I heard it coming round by the bridge. There would be an interval of half a minute between the first and second collisions. There were five wagons on my train burned. One of the tenders of a locomotive came on top of them, but the engines were so mixed up I cannot say which came against my train. The one collision pushed debris to one side and the other collision brought it back to my side. I did not see what was on the other side from me. We felt nothing of the first collision, but we felt the second one. When the first collision occurred I got off the engine to see what was wrong, and my train got a knock from the back end when the second collision occurred. It knocked my engine forward for 4 or 5 yards. My mate then went back and uncoupled the wagons as near the wreckage as he could. We then drew out the wagons—33 of them—and after clearing the points leading from the loop to the down main line at the north end, we shunted the wagons to that line. We then went back into the loop by the way we came out, and proceeded to the scene of the accident to see whether the water we had in the tank would be of any service. Seven wagons were left in the dead end, these having evidently broken away in the collision. I first noticed fire about 2 minutes after the second collision at the leading engine, No. 140, of the 6.5 a.m. express. This engine was sitting up in the air. I could not say exactly what was on fire, but everything was burning together. The engine of the express had covered itself with debris as it came through, and this caught fire. There was a fire amongst the carriages on the other side as well. The first engine of the express was on top of wagons of my train and the tender of the troop train was against my train. I do not think the fire was caused by the rearing of the engine, but it might have been brought about by hot ashes from the ash-pan. Six wagons of my train were burnt. My engine was a six-wheels-coupled goods-engine with a six-wheeled tender fitted with the steam brake on all wheels of engine and tender.

John Watson, fireman, states:—I am 26 years of age, and have been in the service for 8 years—a fireman for six years. I was fireman of the 4.50 a.m. goods train ex Carlisle on the 22nd May. The statement of the driver, Richard Moss, has been read over to me, and I corroborate it generally. I noticed the signals for the troop train after it passed, when they were lying clear. From the first collision to the second about 1 minute would elapse. After the second collision occurred I noticed that fire had broken out, and I went back with the bucket from my engine. It was too far to carry water, and we took as many wagons as we could from our train

and shunted them on to the down line. After doing so, we ran the engine back into the loop and brought it as near the fire as possible, but our water was of no use. The fire broke out about where the engines were lying against our wagons. The fire spread rapidly. That was the only place where I saw fire. I then went to assist in rescuing passengers from the express train, and I saw soldiers come out of it also.

Thomas Ingram, brakesman, states:—I am 50 years of age, and have been in the service for about 30 years—a brakesman for 18 years. I was brakesman of the 4.50 a.m. goods train from Carlisle on the 22nd May, and on arrival at Quintinshill my train was shunted to the down loop. My train consisted of 45 four-wheeled loaded wagons and a 14-ton brake-van. After we were pushed back to the dead end about 6.15 a.m., I made my way to the signal-box to enquire how the expresses were running. I went to the box when the 6.17 a.m. train was shunting through the road, and I was in the box when Tinsley arrived. I arrived in the box about a quarter-past six and remained some time. I heard remarks exchanged between the two signalmen as to how the trains were running, but I did not observe any signals received or given on the block while I was there. I left the box with the fireman of the local passenger train and met the brakesman of the empty wagon train. I was up past the engine of my own train, between the two starting signals when the first collision occurred. After the second collision happened I went to get my train uncoupled so that part of it might be drawn out on to the main line to permit of the engine being got back to the loop to be nearer at hand for water. The fireman, however, had uncoupled the train before I got forward, and I then assisted in supplying water to passengers and threw water on to the wreckage. I noticed fire just immediately after the second collision and it spread very rapidly. The wagons on my train burned very quickly. They were loaded with barrels, but I do not know what was in these. There was a large amount of debris all round the engine of the express train. I did not see any signs of "shoots" of flame. I helped to carry water and I did something in the way of getting passengers out, and soldiers were busily engaged at rescue work with tools which they had evidently got from the troop train. I came on duty on the 22nd at 4.20 a.m. for about 11 hours. I had left duty the previous day at 4.40 p.m. I saw another fire, but I was mostly on the down side.

James Benson, driver, states:—I am 38 years of age, and have been 20 years in the service—a driver for 12 years. On the date in question I was driver of the up empty wagon train. When I approached Quintinshill the signals were standing at danger, but on nearing the home signal the loop signal was cleared for me, and I drew into the loop. My fireman and I remained on the engine. I observed the 6.17 a.m. local passenger train being shunted from the down line to the up line and that when the troop train approached the signals were standing clear for it. After we were inside the loop I heard the noise of an engine and looked to see whether it was the express from Carlisle, and just then the accident occurred. Immediately the collision took place I saw the guard of the local passenger train running back, and I and my fireman ran southwards along the main line to try and stop the approaching express, but we were not in time to do so before the second collision occurred. The driver of the express observed the three of us and applied the brakes, and the driver of the pilot engine reversed just as he passed the spot where I was standing. Some of the vehicles of the troop train came in contact with my train, which

was knocked forward a little bit, but I cannot say how far. I afterwards assisted in taking injured persons out of some of the vehicles. After the second collision I saw fire round the derailed engines, and I heard one or two explosions which I think came from right on top of the wreckage. One was a very severe explosion and some material was thrown into the field. I did not see anything in the nature of a "shoot" of flame as if gas was on fire. I came on duty at 10.15 p.m. on the 21st for 11 hours. I had left duty at 9.20 a.m. previously.

John Grierson, fireman, states:—I am 27 years of age, and have been in the service for 14 years—a fireman for 8 years. I was fireman of the special empty wagon train, and on arrival at Quintinshill was shunted into the up loop about 6.40 a.m. We were almost stopped at the up home signal when the loop signal was cleared for us. I did not hear the troop train approaching, but I heard an engine which I thought was that of a train from Carlisle. The up line signals, I noticed, were clear when the troop train came forward, and I think the carriages of this train came in contact with the wagons on my train as it moved forward, this having been caused by the body of one of the carriages almost going over the wagons. When the collision occurred my driver and I jumped off the footplate and, along with the guard of the local passenger train, we ran along the line to try and stop the express approaching on the down line, but we were not sufficiently far forward. We then returned to our engine and remained there for a little time. I noticed that fire broke out about the centre of the wreckage—that is, where the engines were—and when I went forward it was blazing. That would be about half-an-hour after the collision. I gave assistance in the way of carrying cushions, etc., to the injured people, who were taken into the adjoining field. I came on duty at 10.15 p.m. on the 21st for 11 hours, having previously left duty at 10.15 a.m.

William Young, brakesman, states:—I am 27 years of age and have been in the service for 5 years—4½ years as brakesman. I came on duty at 10.45 p.m. on the 21st for 12 hours. I left duty 10 a.m. on the 21st. I was brakesman of the empty wagon train, and when approaching Quintinshill on the morning in question we were almost brought to a stand at the home signal, but the loop signal was cleared for us, and on coming to a stand we were backed towards the dead end. After coming to a stand I wrote up a portion of my journal and proceeded to the signal-box, as I was anxious to ascertain how long we would be kept. My day's hours were about up. I remained in the signal-box until the accident occurred. The signalman could not tell when I would get away, but I remained in the box. I did not sign the book, although intending to do so. The signalman was busy continuously at the train book, and Meakin, the signalman who had been on duty during the night, was reading a newspaper. He was not reading aloud. When I entered the signal-box the fireman of the local passenger train and the brakesman of the down goods train, were just leaving the box. I was aware that the local passenger train from Carlisle was standing on the up main line, but I did not pay any notice as to the action of signalman Tinsley as far as the working of the block instruments and clearing the signals for the troop train was concerned, and I was not aware of anything wrong in his actions until the collision occurred. Immediately after the collision I assisted the guard of the troop train out of his van, and to prevent some of the vehicles from running back and into the debris of the collision I went into the van, and after a little brought them to a

stand by means of the hand-brake. I then proceeded to protect my train, and then returned. When I got back there was a pretty big fire at the scene of the accident.

Alexander Thorburn states:—I am 42 years of age, and have been 25 years in the service—11½ years as a station-master, and of this 15 months as station-master at Gretna. On the morning of the 22nd May I was called out at 7 a.m. by Richard Broach, platelayer, who informed me that there had been a bad smash at Quintinshill. I concluded it was the passenger trains which just passed Gretna shortly before that were involved, and I immediately hurried to Quintinshill, but as I passed the Gretna Junction Box I told the signalman to 'phone to the Border Union Box and ask him to 'phone to Longtown to send doctors and all the assistance they could. I arrived at Quintinshill about 7.35 a.m. I found the three trains in collision and that fire had broken out on the north side of the debris near to where the engine of the troop train was lying. Several people with extinguishers were applying them on the fire. The fire had begun about the bottom of the debris, but when I saw it the flames were as high as the engine chimney, and the extinguishers did not seem to be taking much effect on it. I heard no explosion. I went to the signal-box to ascertain what had been done in the way of getting assistance, and found that most of the station-masters near at hand had been advised to send assistance, doctors, ambulance men, and materials. At this time there were a great many people assisting. These were soldiers from the troop train and soldiers and sailors who had been travelling by the 12 midnight from Euston, and as everything possible was being done in the way of rendering assistance, I took the engine of the 4.50 a.m. goods train and went to Kirkpatrick to open single line working up to the point of obstruction in order to be in a position to bring the trains with assistance from that end as soon as they arrived. Having opened single line working I returned to Quintinshill with the engine, and Mr. Blackstock had by this time arrived, and with his concurrence I removed all the wagons of the 4.50 a.m. goods train which could be moved, and also those of the empty coal train which could be moved, to Kirkpatrick, and after combining them there sent them to Kirtlebridge in order to give as much room as possible at the scene of the accident for rescue work. After doing this I took forward the carriages of the Beattock local train to the scene of the accident to take away all the passengers going north who were fit to travel. I also attached the five vehicles off the rear of the troop train, which consisted of vehicles containing machine guns, ammunition vans, and the brake-vans, and these were also sent to Kirtlebridge and then forwarded to Glasgow. I remained in this section working single line and bringing forward relief trains, etc., until relieved about mid-day on Saturday by reliefman Scott. I understand that single line working between Gretna and the point of obstruction was in charge of Mr. Richardson, station-master, Kirkpatrick, from the time I opened single line working from the north end. I was not aware that the signalmen at Quintinshill were changing shifts about 6.30 a.m. in the morning, as the porter usually passes the 6.17 a.m. local train from Carlisle unless when I have cash to send to Lockerbie Bank by it, and I had not much opportunity of finding this out. One of the signalmen lives at Springfield and the other lives in the Station Cottages, Gretna, but I understand he took care to keep out of my way when he was late in coming out. I am on duty at night until 7.45 p.m., and I made a point of visiting Quintinshill Signal-box in turn with the other signal-boxes as frequently as my duties would

permit, sometimes twice per week, but not less than once per week, and have always found things in very good order. I have also visited the signal cabins occasionally at night, the last time about 10 p.m. about two months ago. There would be about 100 soldiers and other persons working with tools when I got to the scene of the accident. I last visited Quintinshill Signal-box on the 18th May, four days prior to the date of the accident. When I arrived at 7.35 a.m. on the 22nd all the signals were at danger.

Mr. Robert Killin states:—I am assistant superintendent of the line for the Caledonian Railway Company. I have been assistant superintendent of the line for 4 years. I made enquiry into the circumstances connected with this accident. It has come to the knowledge of the Company, as the result of enquiries following the happening of the accident, that the signalmen at Quintinshill Signal-box had been in the habit of exchanging duty at about 6.30 a.m. instead of 6 a.m. Six a.m. is the hour laid down by the Company as the proper time for signalmen changing duty in this box on the shift in question. The station-master at Gretna, under whose direct supervision the signalmen are, was not aware of this practice, and the higher officials were necessarily ignorant of it. The position, therefore, was that the men had no authority to depart from the specific instructions of the company as to change of shift. The two signalmen, Meakin and Tinsley, lived in the vicinity of the signal-box. Tinsley lived at Gretna, about 1½ miles from the signal-box, and Meakin lived at Springfield, about 1 mile distant from the signal-box. In terms of No. 69 of the Company's Rules and Regulations, signalmen are not permitted to change the hours of duty unless at authorised times. The company and other railway companies have a system of supervising the working of signal-boxes. The station-master, under whose direct supervision a particular signal-box is, is required to visit it as frequently as his other duties permit, and he records his visits in the train register book. I find on referring to the train register book in question that the station-master visited the signal-box at 1 p.m. on Tuesday, 18th May—4 days before the accident. There is also a district inspector for the southern district of the railway, who has a staff of assistants called reliefmen under him, and the inspector personally or one of his assistants visits the signal-boxes in his district at irregular times without notice to the signalmen, the object of these visits being to see that the Company's regulations are obeyed and that there are no irregularities of any kind. Prior to the accident the signal-box was last visited by reliefman Graham on the 19th May, and on that date he visited it twice—viz., at 3.12 a.m. and 9.20 a.m. Examination of the train-register-book discloses that within a month prior to that date he made three visits at varying hours. The district inspector made a personal visitation of the signal-box on the 18th January last. With regard to the signalling on the morning in question, when the local passenger train from Carlisle was being shunted through the road, the signalman who authorised that movement should have placed a lever collar on the lever of the up main line home signal, and the collar should not have been removed until the local passenger train had been cleared off the up main line. This is referred to in a special circular issued to the staff signed by Mr. Pettigrew, superintendent of line, dated April, 1912, and in a special instruction in the Appendix to the Working Time Table at page 63. The signalman who signalled the Welsh coal empty train should have given the "Train out of section" signal for that

train when he had the train safe inside the loop and he had reversed the points for the up main line. The indicator lock on the block instrument should not have been released, but immediately the "Train out of section" signal was acknowledged he should have given the "Blocking back" signal to Kirkpatrick, and the indicator lock should have been kept on all the time. He should have given these signals personally, or if his mate was taking part in the work, he should have seen these signals were given by his mate.

Henry Douglas Earl, superintendent of the carriage department, London and North Western Company states:—I produce a diagram of the 6.5 a.m. express passenger train from Carlisle of the 22nd May. The train was marshalled from the engine as follows:—

218.	W.C.J.S. Brake-van	..	Gas lighting.
58.	W.C.J.S. Composite	..	Electric lighting.
5192.	L. & N.W. Sleeping Saloon	..	" "
451.	W.C.J.S. Sleeping Saloon	..	" "
450.	W.C.J.S. Sleeping Saloon	..	" "
119.	W.C.J.S. Sleeping Composite	..	" "
87.	W.C.J.S. Sleeping Composite	..	" "
1999.	L. & N.W. Third-class	..	Gas lighting.
319.	W.C.J.S. Third Class	..	Electric lighting.
515.	W.C.J.S. Third-class	..	Gas lighting.
509.	W.C.J.S. Third-class	..	" "
72.	W.C.J.S. Third Brake	..	Electric lighting.
588.	W.C.J.S. Composite Brake	..	" "

Statement made to the Caledonian Railway Co.

W. H. Blackstock, district traffic superintendent, Carlisle, states:—The first intimation I had of the accident at Quintinshill was by telephone message at 7.14 a.m. I reached Citadel Station at 7.32 a.m. A special train was ready, and a number of doctors had been called, and ambulance men with stretchers, appliances, etc., were being got together. Drs. Crawford-Aitken and Lediard were present when I arrived, and in a few minutes Drs. Balfour-Paul and Helm appeared. The train left at 7.43 a.m. with the four doctors, Mr. Campbell, superintendent of the Citadel Station, 15 ambulance men with 12 stretchers, 12 fire extinguishers, 12 fire buckets, ambulance boxes, and two 50-ft. lengths of fire hose-pipe. Instructions were left to have motor-cars in readiness to take forward the other doctors without delay, and also to advise the infirmary to be prepared. On arrival at Quintinshill at 8.10 a.m. I observed large numbers of injured in the fields adjoining both sides of the railway. I did not see any who were not receiving attention. I left Mr. Campbell at the south end of the accident to give attention to the injured and to keep me advised of what was required there, and at once made my way to the signal-box. The wreckage, of which the engines were the centre, was burning fiercely. On arrival at the signal-box I got into immediate telephone communication, and after forwarding what information I could obtain to Carlisle for transmission to the principal officers of the Company, and sending calls in both directions for further assistance, I gave the instructions necessary to enable assistance to come from the north. At the same time I was arranging as to ambulance trains to, and further assistance and appliances required from, Carlisle. A large number of doctors, nurses and others, promptly answered the call, and many of the injured were early removed by motor-car to Carlisle. Three ambulance trains were despatched and reached Carlisle at 10.42, 11.12 and 11.51 a.m. respectively. The effort that was being made to deal with the fire was by means of a hand-pump taking water from a very small stream on the up line side, and immediately I had dealt

with the arrangements for the injured I made enquiry as to the Carlisle Fire brigade, and was informed that it had been called out, and shortly afterwards it arrived on the scene. There was no lack of professional and other assistance. I found it necessary to keep in close touch with the telephone in the signal-box all the morning.

Eric Herbert de Schmid states:—I am chief constable of Carlisle and director of the fire brigade. At 8.40 a.m. on Saturday, the 22nd May, I received a telephone message at my house from the inspector on duty at the Central Police Office to the effect that a sailor had just arrived stating there had been a serious railway accident near Gretna, that many were killed and injured, that the trains were also on fire, and that motor-cars and assistance were required. I told my inspector that I could not send the fire brigade without further details, but that I would ring up the Citadel Station immediately, and that in the meanwhile he was to warn the brigade to be in readiness in case they would be required. I then rang up Mr. Campbell's office, and got into communication with his chief clerk. I told him what I had heard, and asked if they required the fire engine. He replied, "We know very little about it at present, Mr. Chief, but I understand the fire is out, and we may want the ambulance. I will ring you up again in about 10 minutes." A few minutes later I received a further message from the Central Office to the effect that someone else had called, and said that fire was raging at the scene of the accident, and I immediately went to the fire station and ordered out the brigade, who left at 8.55 a.m. I then telephoned to the railway station to say that I had despatched the brigade, and followed myself in a motor-car about 20 minutes later. On my arrival I found that the engine had taken up its position near the River Sark, at a point nearly half-a-mile from the burning trains. A length of hose was run out to which three jets were connected, and these were used practically continuously from 10 a.m. to 12 midnight, after which they were used intermittently for the remainder of the night. The brigade returned to head quarters at 9 a.m., on Sunday, the 23rd instant. I left the scene of the accident shortly after 5 p.m. on Sunday.

John Cowper, No. 1, driver, Carlisle, states:—I have been in the Company's service for 47 years, and an engine-driver for 34 years. On the 22nd May I took duty at 5.10 a.m. after being off duty for 9 hours' rest, and was instructed to assist the 6.5 a.m. passenger train ex Carlisle to Summit, a distance of 50 miles. I am a regular main line passenger driver, but on this date, owing to the train working, I was not on my own job, but doing spare work for the day. The 6.5 a.m. express from Carlisle consisted of 13, equal to 21, vehicles, and was worked by engine No. 48, Andrew Johnston, driver, and I had engine No. 140 to assist it. Both these engines are of the same class, being four-coupled bogie passenger engines with bogie tenders. They are fitted with brake-blocks on the two pairs of coupled wheels on the engine, and on all the four pairs of wheels of the tender. We were working Westinghouse brake on the engine and the train. The train left Carlisle about 32 minutes late and had a clear road and a good run to Quintinshill. Approaching Quintinshill, I saw the distant signal clear, and the home signal, when I came in sight of it, was also clear. I was on the right side of my engine when we were travelling between the distant and home signals, and just shortly after coming out of the cutting my fireman gave me a shout, and I knew something was wrong. I immediately crossed to the left side of the

engine and applied the Westinghouse brake with full force, and at this time I noticed we had just passed the guard of the local train. This would be at a point somewhere between the underbridge and the buffer-stops of the down loop. There were two other men running towards the train close to where the guard was. On looking up I saw the wreckage in front of me, and in a few seconds we struck it. The first collision was *not very hard, and there was a great sound of splintering wood and breaking glass followed by a very hard blow which almost brought us to a stand.* I was buried up to the neck in the left-hand corner of my engine cab by the coals from the tender, with my back to the fire-box. I was assisted out by driver Johnston and my own fireman, and was considerably bruised and somewhat burned about the neck. I was also somewhat stunned, but had my wounds dressed on the field, and was able to assist some of the wounded.

After the collision from where I was fixed on the engine I could see the home signal, and it was standing clear. I think I was fixed in the cab for about half-an-hour. There was a part of a Great Central carriage lying on the top of my engine cab and tender, and it was on fire by the time I realised it was there. The fire spread very quickly, and I heard repeated explosions. My engine-tank was full of water when we left Carlisle, but I do not think from its position it would have been possible to get water from it to quench the fire. I think the brake on my train was taking effect by the time we passed the home signal, and it had considerably reduced the speed before the actual collision, but probably the speed at the time of the first collision was 40 to 50 miles an hour. I saw and recognized the guard of the local train, whom I know personally. I cannot say where the fire first started.

Conclusion.

The circumstances attending this disastrous collision were as follows:—

As the 11.45 p.m. and 12 midnight sleeping-car express trains ex Euston were running late, the 6.10 a.m. local train ex Carlisle was sent on ahead of them, the rule being that when the 12 midnight train cannot leave Carlisle by 6.20 a.m. the local train leaves at 6.10 a.m., as was the case on the morning of the accident. This is to allow the local train to get as far on its journey as possible, ahead of the midnight express, in order to form a connection at Beattock, 39 miles from Carlisle, with the 7.42 a.m. express passenger train from Moffat to Glasgow and Edinburgh, and to afford extra time for work at intermediate stations between Carlisle and Beattock, such as loading the milk traffic. If such an arrangement were not in operation, the local train (when the midnight express was running late) would be kept back, when necessary, until after the departure of the 6.30 a.m. Glasgow and South Western express from Carlisle to Glasgow, and of the 6.35 a.m. North British express from Carlisle to Edinburgh, thereby disorganizing the working of the local train throughout to Glasgow, as well as the residential service to Edinburgh and Glasgow.

On the morning of the accident, both express trains left Carlisle more than half-an-hour later than the booked times, which are 5.50 a.m. and 6.5 a.m. respectively, and the local train left at 6.10 a.m., ahead of them. It reached Quintinshill Signal-box at 6.30 a.m., where signalman G. Meakin, knowing that the 5.50 a.m. express was leaving Carlisle at about 6.27 a.m., decided to shunt the 6.10 a.m. train, as there would not be sufficient margin to send it on to Kirkpatrick without probably delaying the expresses.

As the down loop line was already occupied by the 4.50 a.m. goods train from Carlisle, which had arrived at about 6.14 a.m., the local train was shunted on to the up line, and Meakin made the necessary lever movements for putting the train through the cross-over road, which is just opposite the signal-box. When this was done he also set the road and lowered the up loop line home signal for an empty coal wagon train to draw into the up loop, and when it was inside, at 6.34 a.m., Meakin replaced the points and signal arm in their normal positions.

Just before this, about 6.33 a.m., signalman J. Tinsley arrived to take over the duty at the signal-box from G. Meakin, who states that he made Tinsley aware of the positions of the trains at and approaching the signal-box, viz., that the empty wagon train was coming into the up loop, as Kingmoor, near Carlisle, could not deal with it and so it could not go forward; that the troop train had passed Beattock at 6.17—a message coming through while they were speaking to say that the latter train had passed Lockerbie, 15 miles 19 chains from Quintinshill, at 6.32 a.m. Meakin states that he also told Tinsley the position of the 5.50 a.m. and 6.5 a.m. expresses, and that the 6.10 a.m. local train had been crossed to the up main line. He states that he handed over the working of the signal-box at about 6.35 or 6.36, and that he then sat down at the far end of the signal-box to read a newspaper that had come by the 6.10 local train. Tinsley should have taken over

duty at 6.0 a.m., but for the last two years or so the two men, by a private and unauthorised agreement between themselves in order to avoid getting up so early in the morning, have changed duty later; and when the local train has had to stop and shunt at Quintinshill, then Tinsley, who lives at Gretna, has sometimes travelled by that train, the signalman at Gretna giving him a sign when the train had to shunt at Quintinshill. This occurred on the morning of the collision, and Tinsley got off the engine of the local train as it was backing through the cross-over road to the up line, when just opposite the signal-box. In order that this irregularity should not be discovered, the two signalmen used to sign the Train Register Book as having changed duty at 6.0 a.m., and the man on night duty used to keep a record of the times of the block signals sent and received on a separate piece of paper, so that the man who should have made them in the book could copy them out in the right hand-writing. On the morning of the collision there were 15 entries, regarding 1 up and 2 down trains to be made, 5 for each train, and Tinsley, as soon as he arrived, appears to have occupied himself in making these entries, thus distracting his mind from his proper work. Shortly after he reached the signal-box, G. Hutchinson, the fireman of the local train, came into the signal-box to carry out Rule 55, and Tinsley, who was then at the Train Book, gave him his pen to sign his name in the book, which he did. Hutchinson did not enter the time, as he should have done, but he states it was about 6.38 a.m.

When Tinsley took over the work in the signal-box, the 5.50 a.m. express had already been accepted from Gretna Junction by Meakin, at 6.33, which he states was the last bell signal he gave on the block instruments before handing over the working. Meakin declares that he did not give the "Out of section" signal for the empty wagon train to Kirkpatrick although he worked the points and semaphore signal for that train to enter the up loop, and also replaced them in the normal position. But this block signal was received at Kirkpatrick at 6.34 a.m., so must have been sent either by Meakin or Tinsley, and one of these two men must also have released the indicator lock, the result being that the block of the up line was cleared between the two places, leaving the block instrument in a condition in which another train could be accepted from Kirkpatrick. Neither Meakin nor Tinsley gave the "Blocking back" signal to Kirkpatrick, which should have been given, on account of the local train being crossed to the up line, in accordance with Block Telegraph Regulation No. 13 (a) and (c); nor was a lever collar placed on the up home signal, to prevent this signal and the up distant signal being lowered, in accordance with the Company's Regulations on the subject.

Tinsley's account is that he got off the engine of the local train as it was passing through the cross-over road to the up line, and that the train was standing on the up line when he got to the signal-box. Meakin then told him the position of the various trains, but he states that the first block signal on the down line sent by him was the "Train entering section" signal to Kirkpatrick for the 5.50 a.m. express, at 6.38 a.m.; and the first on the up line was the "Line Clear" signal to Kirkpatrick, accepting the Troop Train at 6.42 a.m. Tinsley is positive that he did not give the "Out of Section" signal for the empty wagon train, nor release the indicator lock, and he says that when he went to the Block Instrument for the up line from Kirkpatrick, the arm was in the normal condition, and there was nothing to remind him that the local train was standing on the up line which, he says, entirely escaped his memory, and so he accepted the Troop Train at 6.42 a.m. He received the "Train entering section" signal for it at 6.46 a.m., and then offered it forward to Gretna Junction, where it was accepted at once; so Tinsley lowered all his signals for the Troop Train, which accordingly came into collision with the local train at 6.50 a.m. The Troop Train was running very fast, as it had been on a falling gradient of 1 in 200 for the last four miles, so the collision was a very violent one, the Troop Train being wrecked and many carriages broken up.

The 6.5 a.m. express was offered to Quintinshill at 6.46 from Gretna Junction, and was accepted at once, and as it was accepted by Kirkpatrick Signal-box, Tinsley lowered all the signals for it. Tinsley got the "Train entering section" signal for it at 6.48, and as it could not be stopped in time, after the first collision occurred, it came into violent collision with the wreckage caused by the first collision, which at once caught fire, with disastrous results.

Just before the second collision occurred a number of uninjured men from the Troop Train got out of their carriages on to the down line, and were unfortunately run down by the engine of the express, but it is not possible to say how many were killed in this way.

As soon as the first collision occurred, efforts were made by Driver Benson and Fireman Grierson of the empty wagon train in the up loop and by Guard D. Graham of the 6.10 a.m. local train, to stop the 6.5 a.m. express, which they knew was approaching with the signals "off" for it. They ran back and when it reached them they managed to attract the attention of the enginemmen, who shut off steam and applied the brake fully, but though speed was somewhat reduced the collision with the wreckage of the troop train was also very severe. Thus there was a short interval before the 6.5 a.m. express ran into the wreckage caused by the first collision. Witnesses naturally varied in their estimate of the interval, but several thought about one minute, but in order to try and get this as accurately as possible the Caledonian Railway Company, a week after the collision, arranged for the men who were on the spot at the time, and some of whom ran back to try and warn the 6.5 a.m. express, to repeat as nearly as possible their movements, as on the morning of the accident, and these were timed by a stop watch. The times recorded varied a good deal, but as Benson and Grierson (the driver and fireman of the empty wagon train) and D. Graham (guard of the 6.10 local train) were the only men who ran back, and as driver Johnstone of the train engine corroborates the positions they said they had reached, their times are probably the most reliable. It was found that Benson and his fireman were 132 and 147 yards respectively from their engine, and Graham 167 yards from where he left his van, when the 6.5 a.m. express passed them, and the time taken was 31 seconds for Benson and 40 seconds for Graham. Grierson agreed as to Benson's movements. Graham got the furthest and was 278 yards from the point of the second collision or about 170 yards outside the home signal.

Driver Cowper of the leading engine of the 6.5 a.m. express says both distant and home signals were off for him, and that his fireman shouted to him that something was wrong, so he crossed over to the left side of his engine and applied the brake with full force. He saw at the same time that he had just passed the guard of the local train. He places this point as between the underbridge south of the signal-box and the buffer-stops of the down loop. Half way between these two points is 163 yards outside the down home signal, or only 7 yards from where Guard Graham says he got to.

The down distant signal is 822 yards outside the home signal, and the point of the second collision was 108 yards inside the home signal, so if the express was running at 50 miles an hour between the distant signal and a point 170 yards outside the home signal, it would cover this distance of 652 yards in 27 seconds, and if its average speed, owing to the brakes being applied, between this point and the point of the second collision was 45 miles per hour, it would cover this distance of 278 yards in 13 seconds, or a total of 40 seconds to run from the distant signal to the point of the second collision.

If Graham's time is correct then there was an interval of 53 seconds between the time he left his van after being knocked down by the first collision, and the second collision, and so it is quite possible that had the down distant signal been thrown to danger at once when the first collision occurred, it would have been against the 6.5 a.m. express before the latter reached it. But, of course, with such a narrow margin of seconds and the uncertainty of the actual times of the men's movements, it is impossible to be positive. It is certain, however, that the down signals were not thrown to danger immediately the first collision occurred. Tinsley says he cannot remember touching the down signals at all. Meakin says he was leaving the signal-box just as the first collision occurred, and that he turned back and shouted to Tinsley: "Where is the 6.5?" and then he ran down stairs to see what had happened, and seeing that a serious collision had occurred he returned to the signal-box and told his mate to send the "Obstruction danger" signal, and that he wired to Carlisle for assistance. Meakin further states that he put the down distant signal to danger just before the second collision occurred, and that he may have put the down home to danger as well, but cannot remember. Driver Cowper says he saw the down home signal still "off" after the collision, but it was at danger when Mr. Thorburn, the Stationmaster at Gretna, arrived at 7.35 a.m., and when the signal superintendent, Mr. W. Stevens, went to the signal-box on arrival about 10.30 a.m. the levers in the

signal-box could not be moved owing to debris being on top of the wires. Thus it is doubtful when the home signal was actually put to danger, but I consider it was certainly "off" when the 6.5 a.m. express passed it.

The responsibility for the collision lies entirely with the two signalmen, G. Meakin and J. Tinsley, as all signals were lowered for the troop train at the time of the first collision, and for the express. Meakin crossed the 6.10 a.m. local train from the down to the up line, and it was unquestionably his duty to have protected it, both by sending the "Blocking Back" signal to Kirkpatrick and also by placing a clip on the up home signal lever, before handing over his duties to Tinsley. He also should have given the "Out of Section" bell signal to Kirkpatrick for the empty wagon train, which he had placed in the up loop line (as he had done all other signalling in connection with it), as soon as he replaced the points and the up loop home signal. This bell signal on the Block Instrument was received at Kirkpatrick at 6.34 a.m. and both Meakin and Tinsley deny having sent it. The clocks in the two signal-boxes were in agreement, as both Train Registers give the time of the 5.50 a.m. express being offered to and accepted by Kirkpatrick as 6.33 a.m., and the time of the "Train entering section" signal being sent as 6.38 a.m., and the time of sending the "Out of section" signal from Kirkpatrick as 6.42 a.m. So I think there is little doubt but that 6.34 a.m. was the actual time at which the "Out of section" signal was sent from Quintinshill to Kirkpatrick for the empty wagon train. Both signalmen deny having sent this signal, and also having released the Indicator Lock of the Block Instrument, which should have been kept on all the time. Had it been kept on, this would have rendered it impossible for Tinsley to have accepted the special troop train on the block instrument when it was offered to him from Kirkpatrick, as the lower of the two keys of the block instrument would have been locked. This Indicator Lock is automatically applied when the upper of the two keys is used to acknowledge the "Train Entering Section" signal, or to send the "Blocking Back" signal, and can only be released by pressing the button on the left side of the Block Instrument.

Tinsley should also have seen that the 6.10 a.m. local train was properly protected, as he was fully aware that it was standing on the up line, but his attention was probably taken up by making the numerous entries in the Register, and also in dealing with the signalling of the two expresses; so when he was offered the troop train at 6.42, he at once accepted it on the block instrument, which was in the normal position, and not locked as it should have been. Having got the troop train accepted by Gretna Junction at 6.46, he lowered all his signals for it, forgetting all about the 6.10 a.m. local train, which was standing only 62 yards away from the centre of the signal-box.

It will be seen, too, from the evidence, that G. Hutchinson, the fireman of the 6.10 local train, came to the signal-box to carry out Rule 55, and signed his name in the Register in accordance with the instructions. Tinsley saw him do this, but although Hutchinson remained in the cabin some four minutes before returning to his engine he neglected to get an assurance from Tinsley that his train was protected by a collar being placed on the lever of the up home signal, as he should have done.

There were other men in the signal-box between 6.15 and 6.50 a.m., who should not have remained there so long, viz., T. Ingram, the brakesman of the 4.50 goods train from Carlisle, who, when his train was put into the down loop at 6.14, went to the signal-box and remained there until about 6.42, when he left with G. Hutchinson. Just before they left, W. Young, the brakesman of the empty wagon train came in and remained until the collision occurred. These brakesmen should not have remained so long; they might go to carry out Rule 55, or to ascertain how long their trains would be kept waiting, or to ask for relief to be arranged for them, if necessary, but, having given or received the necessary information, they should have left the signal-box, after signing the Register Book, if carrying out Rule 55.

Also, Signalman Meakin should have completed his duties and then left the signal-box, whereas he remained reading a newspaper; and although he says he did not read from it aloud, he admits that he may have made the other men in the box aware of interesting pieces of news, and there was some general conversation going on.

This disastrous collision was thus due to want of discipline on the part of the signalmen, first by changing duty at an unauthorised hour, which caused Tinsley to be occupied in writing up the Train Register Book, and so diverted his attention from his proper work; secondly by Meakin handing over the duty in a very lax manner; and, thirdly, by both signalmen neglecting to carry out various rules specially framed for preventing accidents due to forgetfulness on the part of signalmen.

Men engaged in routine work, where the conditions may easily become dangerous either to themselves or others, sometimes get into a loose way of working, and habitually neglect regulations which have been laid down for their own or others' protection. I have noticed in other cases that the use of the lever collar has been neglected, and both Meakin and Tinsley admitted that they did not think it necessary to use one to protect a train crossed over from one line to another, and that it was seldom used. With regard to the irregular hour of changing duty, it is hard to understand how it had not come to the knowledge of the Station-master at Gretna during the 15 months he had been stationed there, as Tinsley lived in the station cottages there.

This class of accident, viz., collisions due to signalmen overlooking light engines or vehicles standing on a line within their control, has in the last few years led to the instalment of "Track circuiting" at a large number of signal-boxes, especially where there is interruption in the view of a signalman of the lines near his box, and it is true to say that, if the up line had been track circuited between the home and starting signals, the up home signal lever would have been locked, and so Tinsley would have been unable to lower that signal or the up distant signal. But if a place like Quintinshill is to be fitted with track circuit, it means that every signal-box on a main line is to be fully provided with this device on both lines between the home and starting signals. This is not practicable at the present time, nor will be for a great many years, as the device can only be introduced gradually, as the necessary apparatus and funds for their instalment can be provided. Quintinshill would be one of the last places to be so fitted, as far as the lines between the home and starting signals are concerned, as it is little more than a block post, and all the lines are in full view of the signalman. The means provided at the present time by the Company for reminding signalmen of any vehicles standing within their control at such a place as Quintinshill should have been sufficient, if the signalmen concerned had only carried out the ordinary simple rules of Block Working and Regulations laid down for the purpose, and paid proper attention to their duties. Also, it is much to be regretted that some signalmen do not look out of their signal-boxes to see if the line over which an approaching train is to run is clear of any obstacle before lowering the signals. It takes only a brief interval to do so, and many collisions could be prevented if this simple precaution was always taken. Had Tinsley looked along the up line on this occasion, he could not have helped seeing the 6.10 local train standing only a short distance away.

During the six months preceding the 22nd May, the 6.10 a.m. local train had been shunted at Quintinshill on 21 occasions, and on 17 of these it was put into the down loop line; on the other 4, viz., January 15th, March 11th and 12th, and April 1st, it had to be crossed to the up line, on account of the down loop being occupied, and in each case the "Blocking Back" signal is shewn in the Kirkpatrick register book as having been given by Quintinshill, and so the working was quite in order. I am informed that the traffic on the Caledonian Railway into and out of Carlisle has lately been 40 per cent. greater in each direction than it was 10 months ago, so that the traffic conditions have been quite exceptional.

The point of collision between the troop train and the local train was 62 yards south of the centre of the signal-box just beyond the points of the crossover road in the up line. When this collision occurred the engine of the local train was driven back for about 42 yards, and the four coaches of this train were driven back for a distance of about 136 yards, the couplings between the tender and the leading coach being broken. The tender of this engine was on the up line, but the engine itself was derailed in the six-foot way. The engine of the troop train turned over on to its right side and lay across the up line touching the engine of the local train with its front against the empty wagons in the up loop line, and its tender lay across the down line. Some of the carriages of the troop

train shot right over their engine, and the foremost of them was about opposite the tender of the local train, and to the south of the point of collision; the wagons in the up loop line were also covered with debris of the carriages of the troop train. All the carriages of the troop train were derailed with the exception of the six Caledonian Railway vehicles in the rear. The couplings between the last Great Central vehicle and the Caledonian vehicles must have been broken by either the rebound in the first collision or to a blow from the second, as these six vehicles ran back up a gradient of 1 in 200 for some distance and were brought to a stand a little to the north of the signal-box by the brakes being applied in the rear van by W. Young, the brakesman of the empty wagon train, and so they escaped the subsequent fire, as did the carriages of the 6.10 a.m. local train.

The force of this collision was such that the length occupied by the engine and fifteen coaches of the troop train after the collision was only about 67 yards, while its length when running was 213 yards.

When the express arrived it ran through some of the wreckage ahead of the engine of the troop train, and then its leading engine came into violent collision with the tender of the troop train, which was lying across the down line. This was driven back and to the left for about 30 yards, right through the wagons of the 4.50 goods train in the down loop line, on to the embankment, the leading engine of the express coming to rest partially across the wreckage of these wagons and partially in the space between the down main and down loop lines. The tender of this engine was also inclined to the left, behind its engine, and its rear end was sitting on the frame in front of the smoke box of the second engine of the express, which was also derailed. The tender of this engine was against the leading end of the engine of the 6.10 local train.

The three leading coaches of the 6.5 express were telescoped into each other, the brake van (213) and composite (58) were squeezed out between the engine and sleeping car (5132), and No. 58 was thrown on to its side and jammed between No. 5132 and the tender of the local train.

The result of these collisions was a mass of wreckage heaped all round and on top of the engines of the local and troop trains and the second engine of the express.

The damage to the troop train was very excessive, due to its high speed, and perhaps owing to some of the six-wheeled coaches being old, and to 11 of the 15 vehicles having oak underframes. The ashpan of its engine, which lay on its side, was forced in and the firebars were displaced, leaving a clear opening at both ends of the ashpan. This would allow live coal from the fire to have free access to the wreckage lying all round about, and the coal of the overturned tender was thrown amongst the debris. The violence of the collision is borne out by the buckling up of the underframes and bodies of the troop train carriages, and a large number of the gas cylinders in the vehicles were very badly damaged, several of them being torn open, while others bore traces of having been ruptured by the excessive pressure of gas caused by intense heat. The force of the first collision also threw a large quantity of coal off the tender on to the footplate of the engine of the local train, and the same thing happened in the case of the two engines of the express in the second collision. A fire under such conditions was inevitable, and I consider that the cause of the outbreak in the main part of the wreckage was due to the live coals from the overturned engine of the troop train; and this was afterwards intensified by the escape of gas from the cylinders as they burst. These were already charged on arrival at Larbert to the extent of 5 to 6 atmospheres of gas, sufficient to take them back to their destination without being recharged by the Caledonian Railway Company.

But I consider that a fire would have occurred even if all the vehicles had been fitted for electric lighting, as a separate fire immediately broke out among the wagons of the 4.50 a.m. goods train in the down loop, caused by ashes from the leading engine of the express which ran into them while they were covered with wreckage from the troop train.

As soon as the second collision occurred, steps were taken at once to rescue the injured passengers in the troop train and the express. The uninjured officers and men of the Royal Scots did all in their power to help their comrades, and a good supply of tools

was available from the regimental tool wagon, which was in one of the rear vehicles of the troop train. Also a number of naval men worked under the direction of a Naval Officer, and did great work in rescuing the passengers from the wrecked carriages of the express, using the tools from the vans of that train. There appears to have been plenty of tools available for all who could use them, but the fire among the wreckage, which broke out at once, could not be subdued, owing to the want of any water supply. A small pump and a line of hose were obtained in about 40 minutes from a farm near by, but water could only be obtained from a ditch, and this was used until the arrival of the Carlisle Fire Brigade, about 10 a.m., though it had small effect on the fire. A number of extinguishers were used, of which there were 8 in the 6.5 express, 1 in the van of the 6.10 local train, and 2 in the troop train. Those in the leading van and sleeping saloon of the express and in the troop train were not available, owing to the telescoping of the vehicles, but those in the rear vans were used by driver Wallace of the 6.10 local train, who says he got 3 from the express and 1 from the van of his own train; he got on the top of his engine and discharged them on the fire, but they had little effect. They beat down the flames on the surface of the wreckage, but had no effect on the body of the fire underneath, where the contents of the fire-box of the troop train engine and coal from the tenders was burning. This he says was about fifteen minutes after the collision occurred. Efforts were made by some of the enginemen to pour water from their tenders on to the fire, but not much could be done for the following reasons:—Driver Johnstone, of the second engine of the express No. 48, went back to his engine, after helping to release driver Cowper, of the leading engine, and got on to the foot-plate to get the hose to play on the fire, but he was blown off by an explosion. He then went to his tender and used water in a bucket from his tank until driven off by the flames. He was assisted by his fireman, J. Graham. Driver Moss, of the 4.50 a.m. goods train standing in the down loop line, also tried to get water on to the fire from his tender. He had first to draw the 33 wagons ahead of those set on fire by the leading engine of the express out on to the down main line, and set them back on the down main line clear of the loop points, and then get his engine back into the down loop, before he could get it near the fire. By this time the fire had got such a hold that the water poured on it by him and his fireman (J. Watson) had little or no effect.

The tender of engine 121 of the troop train was overturned, and the side knocked out of it, so that the water would all escape at once. The rear end of the tender of engine 907 on the local train was also completely knocked in and the water from it would escape at once. The tender of engine 140, which was the front engine on the express, was found to be empty when lifted, and the water probably escaped from it gradually owing to the damage to the pipe connections underneath it, and driver Cowper says that the fire would have prevented this water being used by hand buckets. The tender of engine 681, which was on the empty wagon train, in the up loop, was in the ordinary course nearly empty, and there appears to have been only about six inches of water in the bottom of it. Driver Benson, of this engine, states that he filled one bucket of water and took it up to the conflagration, handing it over to some soldiers who were working on the wreck, but his attention was afterwards taken up in freeing the injured, and he did not get the bucket back and does not know if more water was drawn. In any case, there was so little in the tank that it would have been difficult to fill buckets from it.

The fire spread rapidly and was soon burning fiercely, and in spite of the efforts of those on the spot spread to the whole of the troop train, with the exception of the six detached rear vehicles, and all the 15 coaches were entirely destroyed. The front coaches of the 6.5 express also became involved after about half an hour, and the four leading coaches were also destroyed by the fire. All four engines and tenders were also generally damaged by fire, and all the coal left in the tenders after the collision was consumed. Seven wagons of the goods train in the down loop were also destroyed and one had the upper body partly burned. Five wagons of the empty wagon train in the up loop were destroyed, two were partially burnt, and two damaged.

The Carlisle Fire Brigade was sent for and arrived about 10 a.m. and poured water on the blazing wreckage, and gradually subdued the fire. I attach a statement from the Director of it. Mr. Blackstock, the District Superintendent at Carlisle, left that place in a special train at 7.43 a.m. with four doctors and 15 ambulance men, bringing 12 stretchers, ambulance boxes, a supply of fire extinguishers and buckets. They arrived

at Quintinshill at 8.10 a.m., when the wreckage was burning fiercely. Everything possible was done for the injured under most distressing circumstances, and a large number of injured soldiers were removed from the troop train, and as soon as possible sent to Carlisle, where also everything possible was done for them by the doctors and staff of the hospitals, etc. The wreckage of the troop train was so excessive that probably all those not rescued before the fire reached the coaches in which they lay were dead, or at any rate insensible, so it may be confidently hoped that few, if any, were conscious when the fire reached them. I was informed by more than one person that they were struck by the absence of cries for help from the wrecked coaches of the troop train, and by the great fortitude of the injured.

The number of injured soldiers attended to at Carlisle and Penrith was 155, and of these 26 were recorded as suffering from burns; and of the 40 admitted to Moor Park Hospital, Preston, three were suffering from burns.

The circumstances attending this disastrous collision, as far as the troop train is concerned, were altogether exceptional, so with regard to suggestions for preventing the terrible results arising from fire breaking out in wreckage after a bad collision I need only refer to the recommendations already made in previous Accident Reports. The principal of these for coaching stock on main lines and for express trains are:—

(1) The construction of the coaches to be of steel as far as possible, with shock-absorbing buffers, and any timber or other combustible material used to be rendered non-inflammable. Special attention to be paid to the construction of the doorways, so that the doors shall not jam when a collision occurs. Bars across windows to be easily removable, and windows to be capable of being opened to their fullest extent.

(2) The provision of electric lighting in all new stock, and gas lighting in existing stock to be abolished and electric lighting to be provided as opportunity admits.

(3) The provision of tools and appliances for extinguishing fires, in all brake vans, sleeping saloons, etc.

With regard to the action taken by Railway Companies in these matters:—

(1) I understand that some of the principal Companies are carrying out the recommendation as to rendering timber used in carriage construction non-inflammable.

(2) Most of the principal Companies are providing electric light in all new carriage stock, and some are arranging to convert existing gas-lit stock as opportunity occurs, but this must necessarily be a slow process spread over many years.

(3) All express trains are I believe now provided with tools and appliances for extinguishing fires.

I have the honour, etc.,

E. DRUITT,

Lieut.-Col.

The Assistant Secretary,

Railway Department,

Board of Trade.

APPENDIX I.

CASUALTIES AS ASCERTAINED UP TO THE 3RD JULY, 1915.

FATAL.

	In Troop Train.	Non-Commissioned Officers and men killed and identified	57		
		Non-Commissioned Officers and men since dead	26		
			—	83	
	In Troop Train.	Other bodies recovered but not recognisable	82		
		Reported missing in addition by Military Authorities who cannot say definitely that figures are absolutely correct, Battalion Roll having been lost in accident. Figures were compiled from Roll Call made from information available at Scottish Command and may be regarded as very nearly accurate	Officers ..	3	
			Other ranks ..	47	
			—	50	
	In 6.5. a.m. Express.	Passengers killed	5		
		Passengers since dead	2		
			—	7	
	In 6.17 a.m. local train.	Passengers killed	2		
	Railway Servants killed.	On Troop train	2		
		On 6.5. a.m. Express	1		
			—	3	
				—	
		Total	227		

INJURED.

Passengers in Troop train injured	{	Officers ..	2	
		Other ranks ..	189	
			—	191
Passengers in 6.5 a.m. Express injured				51
Passengers in 6.17 a.m. Local train injured				0
Railway Servants injured	{	On 6.5 a.m. Express	3	
		On Troop train	1	
			—	4
		Total	246	

APPENDIX II.

DAMAGE TO ROLLING-STOCK AND PERMANENT-WAY.

Rolling-Stock.

Engine No. 121 (of Troop Train).—Engine framing broken and bent; buffer-beam knocked off; bogie displaced and destroyed; driving wheels bent; engine cylinders broken; engine motion-plate bent; connecting rods bent; eccentric rods bent; engine coupling-rods bent; smoke-box knocked inwards and wrecked; brake gearing broken off; cab framing wrecked; ashpan-casting broken off; firebars displaced. Tender wrecked.

Engine No. 907 (of 6.10 Local Train) —Main frame bent and broken; smoke-box knocked in; buffer beam knocked off; cylinders broken; piston and spindle rods bent; boiler plates sprung; motion plate displaced and bent; connecting rods bent; engine bogie displaced and wrecked; bogie pivot broken off; splashers and footplate twisted and broken; brake gearing broken; cab framing bent. Tender: both bogies displaced; tank knocked in at back; framing bent.

Engine No. 140 (Leading of 6.5 a.m. Express).—Smoke-box knocked in and wrecked; front buffer beam and framing broken; engine bogie broken and displaced; engine framings bent; cab framing bent. Tender: Trailing bogie displaced and wrecked; back buffer-beam bent; both sides of framing bent; brake gearing broken off.

Engine No. 48 (Second of 6.5 a.m. Express).—Front buffer-beam broken; engine framing bent on right side; cab framing bent.

All the engines were also generally damaged by fire.

Damage to Vehicles on Goods Train.

L. & N.W. Wagon No. 2609.—Destroyed.

L. & N.W. Wagon No. 49482.—Destroyed.

L. & Y. Wagon No. 10260.—Destroyed.

L. & Y. Van No. 19195.—Destroyed.

G.C.R. Wagon No. 39814.—Upper body partly burned.

C.R. Wagon No. 4587.—Destroyed.

C.R. Goods Van No. 4376.—Destroyed.

M.R. Van No. 45637.—Destroyed.

Damage to Vehicles on Empty Wagon Train.

H. G. Lewis Wagon No. 1389.—Both ends, one side, 2 headstocks, 1 diagonal, and end standard burned; axle-box broken.

H. G. Lewis Wagon No. 6006.—Destroyed.

H. G. Lewis Wagon No. 7565.—Brake gearing damaged.

Kestell Bros.' Wagon No. 454.—Underframe burned.

Kestell Bros.' Wagon No. 496.—Coupling, side rail, 2 side planks and end door cleading damaged.

Kestell Bros.' Wagon No. 560.—Destroyed.

Kestell Bros.' Wagon No. not known.—Destroyed.

Kestell Bros.' Wagon No. not known.—Destroyed.

Kestell Bros.' Wagon No. not known.—Destroyed.

Damage to Coaching Stock.

On 6.10 a.m. Local Train ex Carlisle :—

C.R. Bogie Composite No. 425.—Ends damaged and bogie displaced.

C.R. Bogie Third No. 1191.—End damaged and bogie displaced.

On Special Troop Train :—

G.C. Brake Composites Nos. 699, 1595.—Destroyed.

G.C. Thirds Nos. 383, 466, 283, 955, 1834, 1056, 414, 1469, 1343.—Destroyed.

G.C. Composites Nos. 740, 1239, 104, 203A.—Destroyed.

On 6.5 a.m. Express ex Carlisle :—

W.C.J.S. Van No. 213.—Destroyed.

W.C.J.S. Composite No. 58.—Destroyed.

L. & N.W. Sleeping Saloon No. 5192.—Destroyed.

W.C.J.S. Sleeping Saloon No. 451.—Destroyed.

Permanent-Way, &c.

	32-in. Rails.	Chairs.	Fish Plates.	
	80-lbs.	90-lbs.	46-lbs. Sleepers.	22-lbs. Keys.
Up Main Line	—	12	229	87
Up Loop Line	4	—	30	15
Down Main Line	—	12	148	76
Down Loop Line	6	—	50	22
Total ..	10	24	457	200

Out of the 34 rails returned as damaged, three of them were broken, and of the remainder some were bent as the result of the collision and some bent by the fire.

Out of the 200 sleepers damaged, 35 were totally destroyed

APPENDIX II.—*Permanent-Way, &c.—continued.*

50 point-rods, 15 ft. long; 3 compensating crank-tops, No. 6; 3 compensating crank-tops, No. 7; 1 crank-top, No. 2; 90 roller box cheeks, No. 285; 80 bottom rollers, No. 286; 80 top rollers, No. 286A; 46-feet creosoted red pine, 6 in. by 2½ in.; 14-feet creosoted red pine, 6 in. by 1½ in.; 36-feet creosoted red pine, 3 in. by 1½ in.; 2 angle brackets and pulleys; 6 side brackets and pulleys; 1 coil signal wire; 150-feet red pine, 9 in. by 1½ in.; all damaged.

Copies of the above Report were sent to the Company on the 17th September, 1915.
