

Retford to Great Grimsby, and consisting of engine and tender, 24 waggons, and one goods break van, had three passenger carriages attached to it, behind the goods break van, for the convenience of some persons proceeding to a coursing meeting at Elsham, near Brigg, the number of passenger carriages usually attached to this train being only one, for the accommodation of the local passenger traffic of the district. This train left Retford at 1h. 50m. p.m., or 20 minutes late; it stopped at Sturton and Gainsborough stations; and just after it had passed Northorpe station, when travelling at the rate of 23 or 24 miles an hour, the driver felt a jerk, and, on looking round, he saw a number of waggons leave the rails and fall over the low parapet of the viaduct. He stopped his train as quickly as he could, and then went back to the scene of the accident. He found that eight waggons were still attached to the engine and on the rails; the 9th waggon was also attached to the 8th, but the trailing wheels of this waggon were off the rails; the 10th, 11th, and 12th waggons, still coupled together, were all off the rails; and the remaining 12 waggons had all run off the rails, and had fallen over the low parapet wall of the viaduct, carrying the line over the river Eau, on the northern side of the line. The goods break van was off the rails, and hanging over the edge of the viaduct; the three carriages remained coupled together, and to the goods break van; the leading carriage was entirely off the rails; that next to it had a pair of wheels off the rails; and the last carriage remained on the rails.

On examining the permanent way after the accident happened, the eastern end of the second rail east of the easternmost pair of falling points, by which the sidings lying north of the main line were connected with it, was found to have been forced outwards, and the two chairs under this left rail, next to the joint, were broken; the fished joint adjacent was also broken, and the third rail had been forced outwards, and broken into three parts, (the central piece of this rail was not forthcoming,) and from this rail right across the viaduct the left line of rail was broken up, and several rails had been forced over the side of the viaduct; and the left parapet wall of the viaduct was carried away by the waggons as they ran over the top of the viaduct, and fell over its side into the field below, a height of about 14 feet. I am informed that no trace of any wheels being off the rails could be traced further west than the eastern end of the second rail before referred to, and the line is described as being in good order prior to the accident.

According to the evidence of the company's servants, the accident appears to have been caused either

by the ninth or tenth waggon from the tender; both of these waggons belonged to the Kiveton Park Company. An inspector of permanent way, who was riding on the engine, says that, on feeling the jerk, he looked round and saw the ninth waggon off the rails, and that it was the first off the rails. It was an old waggon, and the left leading axle-box was broken, and the outside of the tire of the left leading wheel was marked as if it had been rubbing against the inside of the rail. Another inspector, who saw this waggon some hours after the accident, told me that the fracture of the axle box was partly old, but the carriage inspector who saw it on the following morning said the fracture was a new one. I am unable to state positively which is correct, as no precautions were taken to cover up the fractured parts so as to prevent oxidation from taking place.

The 10th waggon was found to have the three top plates of the left leading spring broken, one of which is said to have been missing by most of the witnesses, while another, the driver, says they were broken, but were all there. I could not see this waggon, as it had been removed by the Kiveton Park Company.

The carriage inspector states that the plates were newly fractured.

I saw some of the sleepers which had been taken out of the line when it was repaired after the accident, but the greater portion of those taken out were burnt in keeping up fires during the night, while the line was being restored. Some of those which I saw were not in good condition, but I think there is little doubt that the accident was caused by the 9th or 10th coal waggon, and not by the condition of the permanent way.

These coal waggons were examined at Retford before the train left, and are said to have been in good order.

Six of the passengers were either cut, bruised, or contused, and five of the waggons that ran over the side of the viaduct were broken up, and three others were damaged.

The passengers were injured in consequence of the railway company having most improperly attached three railway carriages to a heavy coal train, which got off the rails in running, the waggons in such trains belonging mostly to private companies that do not usually take the same care in keeping them in good condition as railway companies do their own rolling stock.

*The Secretary*  
(*Railway Department*),  
*Board of Trade.*

I have, &c.  
W. YOLLAND.  
Colonel.

A copy of the above report was sent to the company on the 18th February 1870.

## MIDLAND RAILWAY.

*Board of Trade*  
(*Railway Department*),  
18th December 1869.

SIR,

I AM directed by the Board of Trade to transmit to you, for the careful consideration of the Directors of the Midland Railway Company, the enclosed printed copies (six) of the Report made by Colonel Hutchinson, R.E., the officer appointed by the Board of Trade to inquire into the circumstances connected with the collision which occurred on the Midland Railway, near Long Eaton junction, on the 9th October last.

I am, &c.,  
R. G. W. HERBERT.

*The Secretary*  
*of the Midland*  
*Railway Company.*

*Board of Trade*  
(*Railway Department*),

SIR,

1, Whitehall, S.W., 16th Nov. 1869.  
IN compliance with the instructions contained in your minute of the 12th ult., I have the honour to report, for the information of the Board of Trade, the result of my inquiry into the circumstances attending the collision which occurred on the Midland Railway, near Long Eaton junction, about midnight on the 9th ult., between an excursion train and a mail train. This collision has been unhappily attended by most serious results; seven passengers in the excursion train having been killed on the spot; four having had their legs broken, one her spine injured, and six others having been shaken, bruised, and slightly injured. One of the guards of the excursion train received also a severe blow in the chest. No passengers or

servants of the company in the mail train appear to have been injured.

The collision having (as stated above) occurred late on Saturday night, and the coroner's inquest having been held and the verdict returned on the following Monday, the Board of Trade had no time to send down one of their inspecting officers to be present at the inquest. On Saturday the 16th I held an inquiry which lasted over nine hours; on the following Monday I visited Mansfield junction, Nottingham, and examined the signalman there, and on Wednesday the 3d inst. I took the evidence of the injured guard, and that of some other additional witnesses, having examined in all 21 persons. I have thought it right to state these facts in order to show that the inquiry was not of the brief character that has been represented.

Long Eaton junction is situated between Nottingham and Trent, being  $6\frac{1}{8}$  miles from the former and 1 mile from the latter. Between Nottingham passenger platform and it there occur, 1st, Mansfield junction,  $\frac{3}{4}$  of a mile from the platform, 2d, Beeston station,  $3\frac{1}{4}$  miles from the same point, and 3d, Attenborough station (not used at night)  $1\frac{1}{2}$  miles from Beeston; the distance from Beeston to Long Eaton junction being thus  $2\frac{1}{4}$  miles.

The gradients are easy; there is a mile of level on the Nottingham side of Beeston, and  $1\frac{1}{2}$  miles on the Long Eaton side of it; thence there is nearly a mile of ascending gradients of 1 in 1060 and 1 in 660, and then  $\frac{3}{4}$  of a mile of level up to the junction, whence to Trent the line rises at 1 in 386.

Long Eaton junction is the eastern point of a triangle of which Trent north junction and North Erewash junction form the western and northern points. It is provided with locking apparatus and with the usual home and distant signals. The distant signal towards Nottingham is 634 yards off, towards Trent north junction 362 yards, and towards the North Erewash junction 316 yards.

The Trent north junction distant signal towards Long Eaton junction is 270 yards off, and the two distant signals between these two junctions are close together. The North Erewash junction distant signal towards Long Eaton is 288 yards off, and the distant signals between these two junctions are some distance apart. These junctions are all under the charge of the Trent station-master. The signal cabins are provided with telegraphic bells, but not with block or speaking instruments. Thus Long Eaton cabin is in communication with Mansfield junction, Nottingham, Trent north junction, and North Erewash junction, the three cabins adjacent to it, and similarly with the others. The bells are used only for the purpose of signalling forward to the cabin in advance the approach of all trains and engines running between the cabins.

In the event of fog coming on the practice has been for certain appointed platelayers to repair to the several signal cabins, and put themselves under the orders of the signalmen. Thus to Long Eaton junction cabin, two were in the habit of proceeding, and to North Erewash junction, three. The duty of these men is for each to provide himself with fog signals and lamp or flag, and to station himself near the distant signal, placing two fog signals on the rails about a yard apart at double the distance beyond the distant signal at which the fog permits it to be seen, and himself remaining half-way between the distant signal and the fog signals; if, then, the distant signal is taken off in answer to the whistle of an approaching train, the platelayer removes, if possible, the fog signal, or at any rate shows the driver a green lamp signal or green flag; if the signal remains at danger, he shows him a red lamp signal or red flag; the theory being that the driver may receive two cautions of the road not being clear in addition to the distant signal. As soon as the train has passed the distant signal, fog signals are again to be placed on the rail, remaining there as long as necessary. As stated above, the Long Eaton junction signalman was usually

attended by only two platelayers (it was so on the night of the accident), one being stationed at the distant signal towards Trent, and the other, for the most part, at that towards Nottingham, the latter being recalled by the signalman (by means of moving up and down the distant signal), when wanted by him in the North Erewash junction direction, this man in fact having double duty as long as any trains were coming from the Erewash Valley line.

Saturday the 9th October having been Nottingham goose fair, a great festival for the Midland Counties, a number of special excursion trains had been put on for the occasion, viz., five from the Erewash Valley (returning as two trains), three to and from Leicester, one to and from Lincoln, and two to and from Burton and Derby. Seven of these trains were timed to start from Nottingham on their return journeys at 9, 9.40, 9.50, 10, 10.10, 10.20, and 10.45; the eighth, which was an additional train to and from Leicester, had no time affixed to it. Omitting, therefore, the Lincoln special train, due to leave Nottingham at 10 p.m., there were six special trains timed to leave it, running through Long Eaton junction to Trent, &c., between 9 and 10.45 p.m. In addition to these there were the regular passenger trains due to leave Nottingham for Trent, Derby, &c. at 9.50, 10.20, and 11.30, the additional special train to Leicester, and goods trains at 9.45, 9.55, and 10. These trains after leaving the station were all liable to be detained at Mansfield junction ( $\frac{3}{4}$  of a mile from the platform), if the signalman there found it necessary.

Joseph Barker, pointsman and signalman for about 14 years, 7 years at Long Eaton junction, took up the duty there at 5 p.m. on the 9th inst. A fog was then coming on, and between 6 and 7 o'clock became so thick that a lamp could not be seen (according to Barker) more than 20 or 30 yards off; and with regard to this I may at once say that the evidence all goes to show that the fog remained dense the whole evening, commencing between Mansfield junction and Beeston, and continuing up to and beyond Trent, though at Nottingham and Mansfield junction the weather was comparatively clear. Soon after 6 o'clock, two platelayers (Horobin and Marshall) arrived at the cabin to act as fog signalmen. Both having been provided with lamps and fog signals, Marshall was despatched to the distant signal towards Trent, but in consequence of there being only one platelayer left for the remaining two distant signals towards Nottingham and North Erewash junction, Barker stated that he detained Horobin till near 9 to assist him with the passage of trains in both directions, when, there being only one more train due from the North Erewash junction, he despatched him to the Nottingham distant signal with his lamp and about 18 fog signals, to remain there till he was called back, and that after this he saw him no more until about  $\frac{1}{4}$  to 12, when he returned for a further supply of fog signals. As the two distant signals are 950 yards apart, and trains passed the junction (by Barker's register) from North Erewash at 6.54, 7.10, and 7.22, and from Nottingham at 6.56 and 7.29, it is impossible that Horobin can have been at the proper distant signal as each of these trains passed it; nor, if Barker's statement is correct, can he have been at the North Erewash distant signal on the passing of a passenger train, which arrived at the junction at 10.20, crossed there, and backed into Trent. Horobin's own statement about what he did up to this time (10.20), is very confused, and he contradicted himself so much that I can place but little dependence on his evidence.

The first return special train reached Long Eaton junction for the Erewash Valley at 9.23, the next for Leicester at 10.1, then followed another for Leicester at 10.17, a passenger train for Leicester at 10.23, next a goods train for Trent at 10.37; following this was a special train for Burton at 10.50, a regular passenger train for Trent at 11.6, then an Erewash Valley special train at 11.35, and next a goods train for Derby at 11.50. These are the times entered in the signalman's book, but the time the goods train

reached Long Eaton junction is made 11.40 by the guard of the goods train and driver of the following train which ran into it. Up to this point all had gone smoothly, and though the appointed times of departure from Nottingham were gradually getting less and less observed, a fair margin of time had hitherto been preserved between the starting of the trains.

The goods train, which reached Long Eaton junction at 11.40 or 11.50, consisted of engine and tender, 42 loaded and empty waggons, and a break van; it had started from Lincoln at 7 p.m., and had reached Nottingham goods yard at its appointed time. Its proper time for leaving Nottingham was 9.45 p.m., but in consequence of the number of passenger trains leaving about this time the Mansfield junction signalman stated that he would not give it its signal till 11.17, and that it passed his cabin at 11.20. As this signalman keeps no register of passing trains, there is not much dependence to be placed upon the times he quotes, and from the evidence of the guard of the goods train (as well as other incidental evidence), I think the time of this train passing Mansfield junction must have been nearer 11.25 than 11.20. The distance from one junction to the other being  $5\frac{1}{2}$  miles, and the time occupied in running it, according to the guard, being 17 minutes, the speed must have been on an average 19 miles an hour. On approaching Long Eaton junction, the distant signal was found to be at all right, and the train had got about three parts through the junction, when the van was bumped by the engine of a following train, which the goods guard had heard whistle for the junction signal, and caught sight of just in time to enable him to jump from his van. The effect of the bump was to uncouple the waggons in three places, viz., the eighth waggon from the van, and two others nearer to it. The engine of the passenger train came to a stand in about 30 yards. The driver of the goods train felt that something had gone wrong, and pulled up at Trent station.

The passenger train which overtook the goods train consisted of engine, tender, and 25 coaches, including three break vans. Its proper time out of Nottingham was 10.20, but it actually started, according to the station-master, at 11.20, or, according to the driver and head guard, at 11.25. It passed Mansfield junction, where it received a green hand lamp signal (implying train ahead between 5 and 10 minutes), at 11.30, according to the signalman there, who stated that the goods train had been gone about 7 or 8 minutes. At Beeston the semaphore signal was found at danger, but the driver got a green hand lamp signal, the porter here stating that the goods train had passed about 7 minutes. The driver stated that he proceeded cautiously, and approached Long Eaton junction distant signal at a speed of 12 to 15 miles an hour, that he found it off (the signalman explains this by stating that he had taken the signal off for the goods train, and had not put it again to danger, not being sure whether the engine of the goods train had passed it), and concluding all was right went on and caught sight of the tail lights of the goods train when close to the junction, the fog being so thick that it was impossible to see more than 10 to 12 yards ahead; that he then immediately reversed his engine and got his breaks applied, and had a slight collision which merely broke a piece off one of his buffers, his engine coming to a stand about two carriage lengths over the junction. After remaining there three or four minutes he went on to Trent, pushing before him the detached portion of the goods train. This driver makes the time of his collision at 11.40, and supposing this to be correct, his average speed must have been about 30 miles an hour, certainly too high a speed for so foggy a night, with a heavy train a short distance in front of him. The rear guard of this train states that immediately upon his train stopping suddenly near Long Eaton junction, he got out of his van and went back with fog signals and hand lamp to protect it; that he put down one fog signal at about 400 yards, another at 600 yards, and two others about 1,200 yards from the van, then coming back and placing himself 20 yards

from the last two; (Rule 21 of the company's regulations states that one fog signal is to be put down at 400 yards, and two others at 800 yards from the tail of the train; the guard therefore went 400 yards beyond the prescribed distance); that while standing here the fog signalman Horobin came up to him and told him he was to go back to his train; that he asked him if the road was clear, to which Horobin replied that it was; that he then asked him a second time, upon which he replied he was not sure, but would go and see if the distant signal was off; that he then remained where he was until the next special train (one for Leicester) came up, giving its driver a red lamp signal; that the driver pulled up so sharp on passing over the fog signals that he was able to get on the step of the tender, and said to the driver, "There is something in front, go up cautiously;" that the latter replied, "Go back as quick as you can, and give four more fog signals, as the mail is behind us;" that he then went back as fast as he could, and had reached the tail of the Leicester train when he heard the mail-engine whistle; that he had but time to put down one fog signal and show his red light, when the engine passed him and ran into the van. He estimates the speed of the special train at 6 to 7, and that of the mail train at 17 to 18 miles an hour; and also states that the density of the fog was such that the lights of the mail engine could be seen only 10 or 12 yards off. After the collision he went further back to protect the mail train.

The Leicester special train which was run into by the mail train consisted of a 6-wheeled coupled engine and tender, and 35 vehicles, including 4 breaks with a guard in each (that at the rear of the train being a composite carriage with break compartment); it left Nottingham station for Loughborough and Leicester at 11.35 p.m. by all accounts. It ran at a steady pace up to and through Mansfield junction, where the signals were right for it. There was no fog until near Beeston, where the station signal was at danger, visible about 50 yards off. This signal, upon the driver whistling, was lowered to caution, but about a minute's detention was caused by the driver having shut off steam and reduced his speed. The time of this train passing Beeston was, according to the Beeston station-master, 11.57; making, if the times stated are correct, 22 minutes for running  $3\frac{1}{4}$  miles, or an average speed of only 9 miles an hour. Attenborough signal (lighted but not used at night) was then seen showing a white light, and shortly afterwards, about half a mile from Long Eaton junction distant signal, a fog signal was passed over, and 20 yards further on another. Speed having been immediately reduced from what was stated to have been 15 to 5 or 6 miles an hour, a man, showing a red lamp (the guard of the previous train), jumped on the step of the tender, and told the driver there was a stoppage in front. The driver told the man to go back, or the mail would be into them, and he did so. The driver then went cautiously on towards the junction distant signal, where he saw a man with a white light beckoning him on (this was Horobin, the fog signalman). He at once put on more steam, and had got up a slightly increased speed when the collision occurred. It broke the draw-bar hook of the van next the engine, and the driver let his engine run on till he thought the carriages had stopped, when he pulled up. On the engine the collision had been felt like nothing more than a push; in the rear of the train the consequences had, however, been most disastrous; the rear composite break carriage having been completely smashed by the mail engine, and the hind compartment of the composite next it by (probably) the body of the van having been forced into it. It was in these two coaches that the sad loss of life and injury occurred, the rest of the train having escaped with very trifling damage. The couplings between the rear break carriage and the composite next it gave way, and the train, minus the rear carriage, finally stopped some distance from the engine of the mail train. The rear guard of the train hearing the whistle of the mail

engine, and seeing its light close at hand, jumped on to the bank and escaped with a fall. The head guard, who was riding in a van five carriages from the end of the train, was in the act of dropping off when the collision occurred; he was knocked up against the door frame and severely injured in the chest.

The mail train was due to leave Nottingham for Trent at 11.30, having to stop at Beeston. A consultation took place between the Nottingham station-master and one of the inspectors on special duty there, about the propriety of despatching the Leicester special train or mail train the first, and it was decided that as the special train had to stop neither at Beeston nor Trent, and the mail train at both, the former should be started first, the platform being now crowded with Leicester passengers. Accordingly the mail train, consisting of engine and tender and eleven vehicles, including two break vans (with guards), one in front and the other about three from the end, left Nottingham station at 11.50, 15 minutes after the Leicester train. The driver was an experienced man of 21 years' service with the Midland Company, and in the rear break van there were four inspectors returning from special duty at Nottingham. The driver had seen the special train start, as he thought, about 20 minutes before he did; there was a slight detention at Mansfield junction, where the signalman gave him a green lamp signal, and the train reached Beeston at 12.1, 4 minutes after the Leicester train had passed. The mail train had thus performed this part of its journey in 11 minutes (or just in half the time the special train had taken to perform it), its average speed having been thus about 18 miles an hour. A number of passengers alighted at Beeston, and the train was detained there four minutes, leaving at 12.5, or eight minutes after the Leicester train, the driver being informed by the station-master and porter that it was only five minutes ahead, to induce extra caution on account of the foggy state of the night, and also being cautioned by one of the inspectors. After leaving Beeston the highest speed attained is estimated by one of the inspectors at 25 miles an hour; by the driver and others at 16 to 18 miles an hour. It is also stated that steam had been shut off, and the junction signals whistled for just before the van lights of the train in front were caught sight of. After this the driver had time only to reverse, and his fireman to get three turns on his break, when the engine pitched into the van of the Leicester train; it ran over its framing, knocking its body into the composite carriage in front, and finally stopped (after running about 70 yards from the point at which it first struck), with its leading wheels just dropped off the rails, with the leading axle and wheels of the van between its driving and trailing wheels, the trailing axle and wheels of the van between the leading and centre wheels of the tender and the trailing wheels of the tender, and all the rest of the train on the rails. No passenger or servant of the company in this train is stated to have received any serious injury.

The point of collision was about 480 yards on the Nottingham side of the Long Eaton junction distant signal, and consequently as nearly as possible  $2\frac{1}{4}$  miles from Beeston station; the position of the extreme fog signals put down by the guard of the Burton special train was probably  $\frac{1}{4}$  of a mile further on, or 2 miles from Beeston; supposing, then, the Leicester train to have travelled this last  $\frac{1}{4}$  of a mile, plus its own length (about 300 yards), at the rate of 5 miles an hour, it would have taken about 5 minutes to perform it, and giving it a rate of 12 miles an hour for the previous 2 miles, would make another 10 minutes or 15 minutes after passing Beeston to the time of collision, bringing it to 12.12, nearly agreeing with the time (12.10) at which the Long Eaton junction signalman states that he heard some fog signals exploded, this being the only evidence I could get as to the time of the collision. Assuming, then, 12.12 to have been the time, the average speed of the mail from Beeston would have been about 20 miles an hour, agreeing fairly with the evidence upon that point, though there

is no doubt that the speed at collision must have been considerably more than this average rate, judging from the results. Supposing that the Leicester train had not been checked by fog signals, but had proceeded onwards at its supposed previous rate of 12 miles an hour, followed by the mail train at (say) 30 miles an hour, the latter would not have overtaken the former until long inside the distant signal; and supposing again that a fog signalman had been on duty here, the collision would have been prevented. On any other reasonable suppositions as regards relative speed of the two trains (even a very high one for the mail train), the first would have got well inside the distant signal, *had it not been checked*, before it could have been overtaken by the second.

I have merely made these suppositions to arrive, if possible, at the *immediate* cause of this accident; and this must, I think, be assigned to the absence of the fog signalman from his post when the goods train passed the Long Eaton junction distant signal. Had he been there and protected the goods train with fog signals, the first collision would have been averted; no going back with fog signals would have been necessitated, and consequently no checking of the speed of the Leicester train with its fatal consequences. The fog signalman, Horobin, excuses his absence from his post on the ground that he had just exhausted his supply of fog signals, had gone to the signal box for a fresh supply, and was in the act of returning to his distant signal when the first collision occurred. As I before remarked, I can place but little confidence in the statement of this man, and I think it probable, that owing to the bad practice that prevailed at Long Eaton junction of employing only one fog signalman for two important distant signals, to both of which it was physically impossible he could at certain times attend, the lax habit had been induced of leaving these at other times (the present instance being one) unattended to, and that it was only the occurrence of the first collision which made Horobin hurry, when too late, to his post. Supposing, however, that his statement is correct, and that he had really left his post only for the purpose of obtaining a fresh supply of fog signals, the arrangements of the company are again at fault, for not making provision, especially upon such a night of traffic as the 9th October, for a fog signalman being furnished with a fresh supply without the necessity of his leaving his post for a period of at least 10 minutes, which it would take him to go from his distant signal to the cabin and back. Fog signalmen are entrusted with most important duties, and are as a rule taken from the lowest grade of the company's servants. It seems to me consequently most essential that they should be regularly visited by some superior officer, both to see that they are at their posts and are properly supplied with signals, &c. I can therefore but regard the absence of such a system of supervision as immediately connected with the occurrence of the present accident.

Another cause of the accident was want of due caution on the part of the driver of the mail train. Even assuming his average speed to have been no more than 20 miles an hour, though, as before stated, the actual speed on collision must have been considerably greater, the fact of his having nearly overtaken the Leicester train at Beeston (of which he was duly warned) should have taught him that even this speed was dangerous on such a night, and with so heavily loaded a train in front of him.

As a third cause, may well be reckoned the often reprehended practice of running such large trains as that which was despatched to Leicester in front of the mail, more especially when provided with so small a proportion of break power as 4 break carriages to 35 vehicles. The driver, if cautious (as he seems to have been in the present instance), will hesitate to run at any but a most moderate speed for fear of losing control of his train, and will thus subject himself to the danger of being overtaken and run into. I cannot either think that the despatching of so heavy

a train (though not having to stop) in front of a comparatively light one, was, under existing circumstances, a wise measure.

It was a grave mistake also, on a night when the line was crowded with passenger traffic, to have allowed any goods train to be upon the road between Nottingham and Trent, until such traffic was at an end.

Had some alacrity been shown by the rear guard of the Leicester train in jumping out and running back with fog signals when the speed of his train was first checked, it is very possible that the worst consequences of this collision would have been avoided; that the speed was not too great to have prevented his doing so is shown by the fact of the guard of the Burton train having been able to jump on and off the tender step.

The special time tables appear to have been drawn up in a careless manner, one special train for Leicester having against it the same time of departure from Nottingham as a regular passenger train for the same place, and both only 10 minutes after the previous (9.40) train; and another special train for Derby and Burton the same time (10.20) as a regular train for Derby, and both again only 10 minutes after the previous train; to say nothing of the interpolation of goods trains 5 minutes before and after the 9.40 and 9.50 trains.

Though experience may have shown the impossibility of keeping time in the departure of return excursion trains, there can be no excuse for such mistakes as the above, which can only lead to confusion and irregularity.

While detailing the above as the more or less *immediate* causes of this collision, the *prime* cause is, without doubt, to be attributed to the absence of the means of insuring a proper *space-interval* between following trains. Nothing can more clearly show than the present collision what a completely illusory protection a mere *time-interval* affords. This *space-interval* can be effectually obtained only by means of the electric telegraph; and I am informed that in June last the Directors of the Midland Railway gave orders for the completion of the block telegraph system of working on their main lines from Bradford to London, and from Chesterfield to Bristol, including Nottingham and Trent. It is only to be regretted that this decision had not been come to at an earlier period; the occurrence of the present and of many other serious accidents would then, in all human probability, have been prevented.

I am, &c.,

The Secretary  
(Railway Department),  
Board of Trade.

C. S. HUTCHINSON,  
Lieut.-Col. R.E.

Midland Railway,  
General Manager's Office,  
Derby, January 5th, 1870.

SIR,

YOUR letter of the 18th ultimo, enclosing six copies of Colonel Hutchinson's report upon the collision which occurred at Long Eaton junction on the 9th of October last, has been laid before the directors; and I am instructed to submit the following observations, in reply to Colonel Hutchinson's remarks, upon the case:—

Colonel Hutchinson is under a misapprehension when he says that the "practice prevailed at Long Eaton junction of employing only one fog signalman for two important distant signals," the fact being that the only distant signal the man Horrobin had to attend to was the distant signal working from the Long Eaton junction towards Nottingham; and when he was employed upon any other duty than attending to this signal by the Long Eaton junction signalman it was in the immediate neighbourhood of the junction, to assist in passing trains, or to go and tell drivers of trains that had stopped at the junction, in obedience to the signals, when to come forward; and he was only employed in this way at times when the junction signalman did not consider it necessary to have him

at the distant signal. It never has been the practice to employ a fog signalman at the distant signal worked from Long Eaton junction towards Mansfield (which is the other signal referred to by Colonel Hutchinson), as that signal is so short a distance from the North Erewash junction signal box that it is a rare occurrence for the fog to be so dense as to prevent the pointsman on duty there from seeing it, and, if at any time he were unable to see it, he would pull up and caution the driver of any train running through his junction in the direction of Long Eaton junction. The Long Eaton junction signalman said that he never sent Horrobin to this signal, and there is no doubt that Horrobin's statement as to his having been there is incorrect. He was not seen by the North Erewash junction signalman, which must have been the case if he had gone there, and it certainly had never been his practice to go to that signal on previous occasions.

This is fully proved by signalman J. Day, who has been at the North Erewash junction 14 years, and says that it has never been customary for the Long Eaton junction fog signalmen to signal for the distant signal working from Long Eaton junction towards his junction. There is no doubt that the man Horrobin, when giving his evidence, was very much confused by the position in which he was placed, and, indeed, it will be in the recollection of Colonel Hutchinson that, upon the discrepancies in his statements being pointed out to him, he said he had never previously given evidence before his superiors, and that he had been confused and fluttered by his unwonted position.

With respect to Colonel Hutchinson's remarks as to the class of servants from whom the fog signalmen are drawn, and his suggestion that they should be regularly visited by some superior officer to see that they are at their posts and properly supplied with signals, it is necessary to have experienced men for the duty of fog signalling; and it is the practice of this and of many other companies to employ the most trustworthy of the platelayers for the purpose. These men are continually at work on the line, are well acquainted with the company's regulations, are easily available in case of emergency, are in the habit of seeing the traffic work under all circumstances, and appear to be in every way eligible for the duties. The signalmen under whose direction they act are fully conversant with all matters connected with the working of their respective posts, and it is much safer to leave these men to act under the instructions of the signalmen than to introduce other authority, which might, by clashing with the understanding the men had with each other, lead to increased danger rather than to safety; besides, fog signalmen are, as a rule, employed at such a distance from each other that an inspection of the kind suggested by Colonel Hutchinson to be effective must practically resolve itself into an inspector for every one or two fog signalmen. It is of course the duty of the station masters having the supervision of posts where fog signalmen are employed to satisfy themselves that the men are on duty when necessity arises for their being so. Fog signalmen know the precise nature of their duties, and the number of signals they are likely to require; and these signals are so light and easy of carriage that no difficulty can be experienced by the men taking with them a sufficient quantity for any length of time they are likely to remain on duty. Horrobin left Long Eaton junction for the distant signal towards Nottingham at about nine o'clock, taking with him 18 fog signals. The mode of using these signals is as described by Colonel Hutchinson. Two of them are kept on the rails outside the distant signal, and when a train whistles for the junction, if the junction is clear, the distant signal is turned off for the train to pass, and the fog signals are taken up, and replaced after the train has gone by; the only deviation from this arrangement being in cases where the distant signal is not turned off when the train whistles, the fog signal being then left on the line for the train to explode. The trains running through the Long Eaton junction, from Nottingham towards Trent, do not, in

passing the junction, foul any other line except the one on which they are running; occasions for slackening them would consequently be of rare occurrence, and, in the majority of cases, there is no doubt that both the fog signals would be recovered. Eighteen fog signals would thus suffice for signalling a great many trains.

The system of fog signalling in operation at the Long Eaton junction has sufficed for the safe working of that junction for the last ten years, the man Horrobin having been employed on fog signal duty for five years; and during the whole of the ten years no occurrence has taken place to show that the arrangements are in any way faulty, or that they are not perfectly efficient for the safe working of the junction.

Colonel Hutchinson says "another cause of the accident was want of due caution on the part of the driver of the mail train." Upon this point it must be remarked that the driver of this train knew when at Beeston that the special train had passed that station without stopping at least five minutes before he left it, and the special had only  $2\frac{1}{2}$  miles to run before reaching the Long Eaton junction signals; and it does not appear that a speed of 20 miles an hour was, under these circumstances, a rash one.

There is nothing to show that the speed of the mail must have been more than 20 miles an hour when it struck the excursion train, and considering the slow rate at which the excursion train would be moving, a speed of 20 miles an hour with the mail train would be quite sufficient to account for all that occurred. With respect to the opinions expressed by Colonel Hutchinson as to the impropriety of starting the Leicester excursion train in front of the mail, and as to the break power of the excursion train being insufficient, I may remark that the excursion train, which had not to stop at either Beeston or Trent, or indeed before arriving at Loughboro', and was drawn by one of our most powerful six-wheel coupled goods engines, which was fully master of the load, was started from Nottingham 15 minutes before the mail, which had to stop at Beeston to set down a large number of passengers returning from the fair, and had only to run to the Trent station, where its passengers and mails would be transferred to the down mail train from London; under these circumstances the servants of the company exercised a wise discretion, and the course they adopted was calculated to conduce to the safe working of the trains.

With respect to the break power of the excursion train, this train was supplied with four breaks, each of which was manned, thus giving one break for every eight vehicles, and this is certainly above rather than below the break power it is customary to supply.

Colonel Hutchinson says: "It was a grave mistake also, on a night when the line was crowded with passenger traffic, to have allowed any goods train to be on the road between Nottingham and Trent, until such traffic was at an end." It is exceedingly objectionable to detain goods trains in the way suggested by Colonel Hutchinson on one portion of the line, so as to throw them very much out of course on other portions of the line, where such irregularity might, to say the least of it, be very inconvenient; and looking at all the circumstances of the case, and bearing in mind the very important fact, which should not for a moment be lost sight of, that the weather at Nottingham was clear, and the people there did not know of the existence of a dense fog in the neighbourhood of Long Eaton Junction, there was nothing in the despatch of the goods trains which was, so far as the parties concerned in their despatch knew, calculated to interfere in any way with the safe working of the line.

Colonel Hutchinson says: "Had some alacrity been shown by the rear guard of the Leicester train in jumping out and running back with fog signals when the speed of his train was first checked, it is very possible that the worst consequences of the collision would have been prevented." If the guard in the last van had known what was

about to happen he would no doubt have acted as Colonel Hutchinson suggests, but, without such knowledge, the fact of his driver reducing the speed of his train when approaching the junction signals on a foggy night would appear to him so ordinary and natural an occurrence as not to require any special action on his part. If his train had come to a stand and he had failed to go back, the case would have been very different, but if he had left his van, and the line had been clear, the train would have run away without him, for it must not be forgotten that at the moment of collision the excursion train was running at a speed of about six miles an hour. The rear van would thus have been without a guard until the train stopped at Loughboro', and it is very possible that his absence from the train might have been the cause of mishap somewhere else.

As regards the drawing up of the special time tables, it is impossible to estimate beforehand the number of people who will avail themselves of special facilities on occasions like Nottingham goose fair, so much depending on the state of the weather, &c. Two special trains were announced to leave Leicester and two to return, one of these and one of the Burton trains being set down in the table at the same time as ordinary trains; and by detaining the first train and running it in the time of the second, if the passengers had not been numerous, would have enabled us to have conveyed them by one train from Leicester and Burton respectively to Nottingham and back, any few stragglers who might have depended upon the later train being conveyed by the ordinary train, instead of its being necessary to run specials uselessly; but in case of the additional specials being required the proper interval of time between them would of course be secured. And upon this subject, I would call attention to the following announcement which appears in the weekly programme for the working of the special and excursion trains run by the company: "The necessary trains to be signalled, and if the passengers are numerous, it may be necessary to divide the trains. A good look out must therefore be kept for the red board or extra tail lamp, which will be attached behind the last vehicle of the first train should there be another train following. Station masters at terminal stations, are requested to provide a sufficient supply of roof lamps, to ensure all the trains (whether ordinary or special) being properly lighted."

In Colonel Hutchinson's concluding remarks, my directors are glad to be able to say they entirely concur; in fact, after a very careful consideration of all the surroundings of the occurrence, they cannot regard the matter in any other light than as a most deplorable accident, arising from a combination of circumstances which it was impossible to foresee, and for which, as stated by Colonel Hutchinson, the block telegraph system of working, which ensures an actual space-interval between the trains, is the only effectual remedy.

My directors have, as remarked by Colonel Hutchinson, given instructions for the establishment of the block system over the whole of their main lines, and are proceeding with its construction as rapidly as possible. It must not, however, be forgotten that the "block," like every other system must be worked by human agency, and as all men, however carefully they may be selected for the duties they have to perform, are liable to mistakes and errors, it is by no means impossible for collisions to occur where it is in full operation; and in the event of any such mistake or error leading to an accident the consequences will be in all probability far more serious than they would be without the "block." The reasons for this opinion will be obvious to all persons practically engaged in the working of railways.

To the Secretary,  
Railway Department  
of the Board of Trade,  
Whitehall, London.

I have, &c.,  
JAMES ALLPORT.

*Board of Trade*  
(*Railway Department*),  
2nd February, 1870.

SIR,

I AM directed by the Board of Trade to transmit to you the enclosed copy of a memorandum by Colonel Hutchinson, R.E., upon your communication of the 5th ultimo with respect to the collision which occurred at Long Eaton junction on the Midland Railway on the 9th October last.

I am, &amp;c.

W. R. MALCOLM.

*The General Manager,*  
*Midland Railway Company.*

MEMO.—I have read over the remarks of the General Manager of the Midland Railway Company on my report of the accident at Long Eaton junction on the 9th October last, and see no reason to depart from the conclusions as to its causes I therein arrived at after mature consideration.

The distant signal worked from Long Eaton junction towards Mansfield alluded to by the general manager as being at "so short a distance from the "North Erewash junction signal box that it is a rare occurrence for the fog to be so dense as to prevent the pointsman on duty there from seeing it," is, I find, 188 yards from that box; and though the fog

signalman Horrobin was not specially told off to attend to it as well as to the one towards Nottingham, yet practically he was, when called up to the Long Eaton box to assist in crossing trains, doing duty which should have devolved upon a fog signalman at the former post, and was for the time being leaving his own signal unattended to.

As to fog signalmen being visited on their posts by some superior officer, the practice exists on certain lines of railway, and the wisdom of the practice is in my opinion signally exemplified by the occurrence of this accident.

The fact of the existence of the dense fog in the neighbourhood of Trent being unknown at Nottingham appears to me simply to indicate on the part of the Trent station master a want of judgment in not informing the Nottingham station master, by telegraph or otherwise, of a state of things which would be almost certain to retard the trains on their journey from Nottingham to Trent, and possibly influence the Nottingham station master in regulating the despatch of these trains. But whether or no, I still repeat that the despatch of any goods trains in the midst of the dense passenger traffic was in my opinion a grave mistake.

C. S. HUTCHINSON, Lieut.-Col., R.E.

31/1/70.

### MIDLAND RAILWAY.

SIR,

Derby, 30th Nov. 1869.

IN compliance with the instructions contained in your minute of the 25th instant, I have the honour to report, for the information of the Board of Trade, the result of my inquiry into the circumstances which attended the collision that occurred on the 17th instant, near the Sawley junction on the Midland Railway.

At the Sawley junction, which is a mile and a quarter to the east of the Sawley station, and eight miles from Derby, the Midland Railway diverges to Trent and Nottingham on the east, and Leicester and London on the south. On the south of the junction, and adjacent to the up line towards Leicester and London, there are several sidings in connexion with extensive buildings which are used for the manufacture of tarpaulin sheets, as covers to waggons for the Midland system generally; and these sidings join the main line by means of leading points only, about 500 yards south of the junction. The Sawley junction has not yet been fitted up with locking apparatus, but is supplied with the usual home and distant signals in each direction, the distant signal towards Derby being about 520 yards from the junction cabin. There are telegraph bells communicating with Spondon junction, which is about six and a half miles towards Derby on the west, and with Sheetstores junction, which is upwards of half a mile distant on the south, but there is no telegraph communication in the direction of Trent on the east. There are a block instrument and a speaking instrument in the cabin, which are not at present in use.

The 5.15 p.m. express passenger train from Derby to London left Derby punctually on the day in question, consisting of an engine and tender, four composite carriages, one third-class carriage, and two break-vans, one behind the tender, and the other at the tail of the train. This train ran towards the Sawley station, seven miles from Derby, at its usual speed, but the engine-driver shut off his steam in approaching the distant signal from that station, because it was very foggy, and with the intention of running cautiously forward towards the Sawley junction. He saw a fogman with a hand-lamp, showing a red light, about 20 yards, as he believes, west of the Sawley station distant signal. He also ran over a detonating

signal before he reached that distant signal, and a second detonating signal, which appeared to him to be very near the distant signal. He reversed his engine, turned on his steam, and whistled for the breaks, while the fireman applied the tender break; and he then sanded the rails. About 75 yards inside the distant signal, as nearly as he could judge, he met a second man with a hand lamp, showing red, but he did not pass over any more detonating signals. The guard in the leading van heard two fog-signals explode, one indistinctly, and the other unmistakably, but it was only on hearing the second that he came to the conclusion that the first had been a detonating signal. He does not remember having heard any break-whistle from the engine, but he applied his break immediately after the explosion of the second detonating signal. The head guard, who rode in the hind van, heard neither the break whistle from the engine nor any detonating signal; but on observing that the train was slackening speed he applied his break some time after passing, though he cannot say exactly how far from, the Sawley station.

This train appears to have approached the distant signal from Sawley station at a speed of 30 to 35 miles an hour, and it came into collision with the van of a ballast train, according to measurements taken by Inspector Goodman on the same night, 146 yards inside the Sawley junction distant signal, and 380 yards from the Sawley junction cabin, at a speed which is variously stated by the engine-driver and guards at from 20 to 25 miles an hour.

Neither the engine nor any of the carriages of the passenger train left the rails. There was one buffer broken on the engine, but no damage was done to any of the carriages, and the whole train went forward, after a delay of 56 minutes, to London. Three passengers have, up to the present time, complained of injury, out of about 20 who were riding in the train.

The ballast train which was thus in the way of the passenger train on the main line, left Peterborough in the morning, and started from Derby on its return journey at 4.50 p.m. It came to a stand at Sawley station at 5.14, in obedience to the signals. After a delay of two minutes, in proceeding forward towards the Sawley junction, it was checked by a fog signalman near the Sawley junction distant signal. The