

service might have been ready to take charge of it. The importance of telegraphic communication between all stations is here once more shown. Had it existed in the present instance, there might very probably have been time to have informed Dewsbury, and

collision occurred.

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

I have, &c.,
C. S. HUTCHINSON,
Lieut.-Col., R.E.

Printed copies of this report were sent to the company on the 21st September.

LONDON AND NORTH-WESTERN RAILWAY.

Tamworth,
15th Sept. 1870.

SIR,
IN compliance with the instructions contained in your minute of yesterday, 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 accident that occurred on that morning to the Irish mail train at the Tamworth station of the London and North-western Railway.

There are at Tamworth, as will be seen by the accompanying diagram, four lines of rails running through the station between the passenger platforms. Two of these lines are centrally situated, are separated from the platforms by the lines on either side of them, and are used exclusively for through trains not stopping at the station, and not requiring, therefore, to draw up at the platforms. The two outer lines are used for all stopping, both goods and passenger trains; and are loop lines, having connections with the through (centre) lines north and south of the station. The connection of the up through line with the up platform line is formed, on the north of the loop, by a pair of facing points (marked A in the diagram) 95 yards north of the north end of the up platform; and 236 yards to the south of these points (A) there are, 35 yards on the south of the south end of the platform, a pair of points (B) connecting the platform line with a siding. This siding, which is about 150 yards long from points to buffer stop, acts, when properly used, as a safety siding, to protect the through line from any engine or train moving out of the platform line, and is employed for waggons conveying fuel to a stationary engine there situated, which pumps up water to supply the locomotive engines, and for other purposes. At the end of this siding, about 150 yards from the points (B.) above referred to, which connect it with the platform line, there was a rough buffer stop (C), formed of earth and lined inside with timber; and beyond the site of this buffer stop, the river Auker, a tributary of the Tame, runs under a bridge which carries the two main lines of the railway towards London. On the north side of the river, and on the east of a line prolonged from the siding, there is a reservoir (D) for collecting and depositing the mud from the water pumped up by the stationary engine. This reservoir measures 40 feet long by 31 feet wide, and is 13 feet deep.

The Tamworth station is approached from the north on a falling gradient of 1 in 660, which commences at 267 yards north of the points (A) connecting the up through and platform lines; and on the north of this falling gradient there is a gradient of 1 in 330, rising towards the station. The portion from the siding points (B) to the end of the siding (C) is level. The view of an approaching engine-driver is much obstructed by two bridges over the line, named, respectively, the Gungate bridge (E) and Mace's bridge, and by a curve which runs through a deep cutting. The radius of the curve, from the bridge known as Mace's bridge to and through the station, is 160 chains.

For the protection of the station from the north, there are a distant signal post, a "stop" or intermediate signal post, and a home signal post. The distant signal post is provided with two arms working together—a high arm, forty feet from the ground, for the signalman to see over the Gungate bridge, and a low

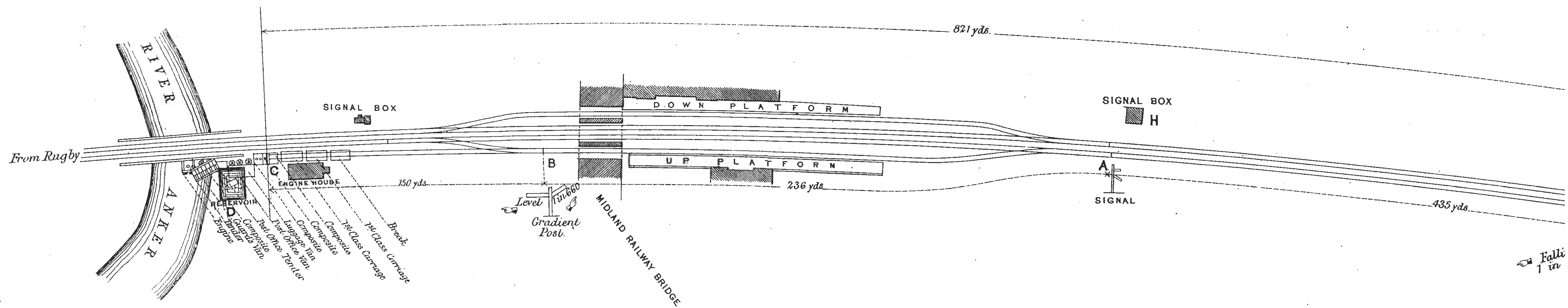
arm to be seen with it in clear, or without it in foggy weather by the engine-drivers. It is 976 yards from the points (A), between the through and platform up lines, and is visible for upwards of half a mile to the northward. The intermediate signal is 356 yards north of the points (A), 24 yards south of the Gungate bridge, and 620 yards south of the distant signal. It appears to have been originally worked from a cabin below it, which has now become disused; and it is now connected with the principal cabin (H), from which it is worked by a wire. It is used to indicate to the engine-drivers when the station is clear on the through as well as on the platform line; and it is lowered when either of these lines is clear for the passage of an engine or train. The home signalpost is close to the points of connection (A) between the through and platform up lines, and carries two arms, which are lowered one at a time for the admission or passage of a train when either of those lines is unobstructed.

Within the last four months, and in anticipation of the extension to this part of the line of the train-telegraph system, a new signal cabin, with locking apparatus, and containing 23 levers for working the points and signals, has been provided at (H.) The locking system has been so arranged that the home signals interlock with the facing points (A) which connect the through and platform up lines,—so that, on the one hand, when the through line signal is lowered, the points, which must first be set right, are locked for the through line, and the platform line signal is then locked at danger; while, on the other hand, the points must be set right for the platform-line signal before that signal can be lowered, and they are locked for the platform line, at the same time that the through line signal is locked at danger, when the platform line signal is lowered for the admission of a train. But the "intermediate" and "distant" signals are not interlocked with the points or with any other signals.

There is a signal station to the south of Tamworth, from which points and signals are worked somewhat similarly to those above described for the north cabin; but there is no "intermediate" signal on the south, the view in that direction being much better than on the north. There is a means of intercommunication between the north and south signalmen by gong and disc, the north signalman ringing at the south signal station, once for a through line train, and twice for a platform line train, and receiving replies in the former case on a disc. In the latter case a disc has been provided, but has not been connected with any lever. Similar gong signals are made in the opposite direction between the south and the north signal stations, and two discs are working at the south station. The south signalman has a lever for working the points (B) previously referred to, leading from the platform line to the fuel siding, and these points are interlocked with his lever which works the through line disc in the north cabin. When that disc is worked to allow a main line train to pass through the station, the siding points are locked for the siding, to prevent any engine or train from leaving the platform line unless signalled to do so, and to provide that they shall not come in the way of a train passing along the through line. When the disc in the north cabin is set to prohibit the

To accompany Captain Tyler's Report of the 15th Sept^r 1870.

LONDON AND NORTH WESTERN RAILWAY.
SKETCH OF TAMWORTH STATION SHewing SITE OF ACCIDENT TO IRISH MAIL.



use of the through line, then the points of the siding are free to be moved in either direction. There is a ground signal, with a disc and lamp, working with these siding points (B), to indicate their position to the engine-drivers; a red light or red disc being exhibited when the points are open for the siding and closed for the main line, and a white light without a disc when they are in the contrary position.

The following notice was issued by the Superintendent of the Southern Division of the London and North-western Railway on the 9th of November, 1869, in regard to the working of these siding points:—

“MEMORANDUM TO TAMWORTH UP AND DOWN
“ SIGNALMEN.”

“On receiving two beats of gong, to indicate a train approaching that is to stop at station, let the policeman on duty at the other end at once set his loop points for main line, so that, should the train overshoot the platform, it will run out upon the main line, and not risk running into any waggons that may be standing in the siding.”

The Irish mail train left Holyhead at 12.13 a.m. on the 14th (yesterday), 18 minutes late, the mail-boat from Kingstown having arrived late at Holyhead, and the train having been consequently detained to that extent. It reached Chester at 2.16 a.m., 13 minutes late, and left that station at 2.29, after having been kept waiting three minutes more than the 10 minutes allowed in the time-bill, by extra luggage, and in detaching a carriage from the front of the train. It passed Crewe at 3 o'clock, 15 minutes late, without stopping; and reached Stafford at 3.33, 13 minutes late. After changing engines, and thus losing one minute extra at Stafford, it left that station at 3.37, 14 minutes late, composed of an engine and tender, a break-van, a composite carriage, a post-office, a post-office tender, a luggage-van, three composite carriages, two first-class carriages, and a break-van. The leading van was worked with an ordinary break, and the hind van was coupled up with the two first class carriages in front of it with continuous breaks, on Mr. Fay's principle. There was one guard in the front, and one in the hind break.

The following were the weights, when empty, of these vehicles:—

	No.	Tons, cwt. qrs.
1st. Guard's break van -	430	7 18 0
2nd. Composite carriage	54	8 5 0
3rd. } Post office and	21	{ 6 10 0
4th. } tender - - }		
5th. Luggage van	59	7 8 0
6th. Composite carriage	992	8 5 0
7th. " "	966	8 5 0
8th. " "	1020	8 5 0
9th. 1st class "	435	7 2 1
10th. " "	436	7 2 1
11th. Guard's break van	198	7 18 0
		83 8 2

Adding 27 tons for the engine, 17 tons 8 cwt. 2 qrs. for the tender, and say 5 tons for passengers, luggage, and mails, &c., the total weight of the train would have been less than 133 tons.

Thus composed, the train approached Tamworth about 4.9, thirteen minutes late; and the rear guard observed that the distant-signal and the intermediate signal were both at all right, showing white lights. The guard heard the engine-driver whistle, a series of sharp whistles, which he calls “the alarm whistle,” as soon as he had passed under the Gungate bridge; and he applied his continuous breaks without loss of time. He estimates the speed of the train, when he heard this whistle sounded, at 45 miles an hour; and believes it was the usual travelling speed of the train in approaching and passing through the Tamworth station. He noticed that the upper lamp on the home signal post, which applied to the through line, showed a red light, but he did not notice the condition of the lower lamp, which applied to the platform line. His

breaks were fully on before he passed that post. He felt a lurch in passing it from which he was aware that the train was running up the platform line in place of passing along the through line. He saw, after he had applied his own break, sparks flying from break-blocks in front of the train, and he believes that the speed was reduced from 45 to 15 miles an hour before the engine struck the buffer-stop at the end of the fuel siding.

The engine mounted the buffer-stop, and ran over it, falling 24 yards beyond it, on its wheels, but at right angles to the line of its path, in the middle of the river. The tender fell on its side, with its wheels to the rear, and lay also at right angles to the line, but with its leading end in the opposite direction, partly on the engine. The body of the guard's van next behind the tender was completely broken up. The composite carriage next to it was thrown on its side, on the framing of the van—both being over the tender—and its leading end was knocked to pieces and its body separated from its framing. The two post office vehicles fell over the reservoir, and the post office was broken to pieces. The luggage van lay lengthways, leaning against the bridge, and much damaged. Of the three composite carriages, two passed over the buffer stop, and one was tilted up, with its trailing end against the buffer stop. Two of them were much broken, but the third was only slightly damaged at the end. The two first-class carriages and the rear break-van remained on the rails of the siding, and were not damaged. Comparatively little shock appears to have been felt in these last vehicles. The guard in the rear van was not thrown down or injured in any way.

The engine-driver appears to have fallen on or against the piling round the head of a pier of the bridge. He was brought alive to the railway embankment, but died shortly afterwards. The fireman was found dead in the water, with his right leg broken, and other injuries; and one passenger was taken out from near the engine, with his head injured, and both his thighs broken, and was found to be dead. Most fortunately the greater number of the passengers were riding in the rear portion of the train, but ten passengers, besides two officers of the Post Office,—one of whom was immersed for a considerable length of time in the reservoir,—have up to the present time been ascertained to be injured. The guard, also, who rode in the leading break-van, was cut on the head, and bruised over nearly the whole of his body.

The latter guard was looking out for the signals as he approached Tamworth; and he believes that he saw the home signals as soon as the train came in sight of them. He noticed that the upper light on the post showed red, and was quite aware that it was the danger signal for the through line; and he applied his break as soon as he saw it. He was under the impression that the lower lamp on the same post did not show the danger signal, and he believed that the engine driver whistled for the breaks as soon as he came in sight of the home signal post. This man was in bed, and was suffering from the effects of his injuries when I examined him.

The signalman, Evans, who was on duty at the north cabin, has been for 14 years in the service of the company, and for six years at this particular post. He declined in the first instance to make any statement to me without taking the advice of his solicitor. But later in the day he made, in the presence of his solicitor, a statement to the following effect:—He came on duty at 6.30 p.m. on the previous evening. He expected the Manchester goods train, due to reach Tamworth at 3 a.m. from that hour; and as soon as the platform line had been cleared for a previous train, he lowered his signal about 3 o'clock, his points having previously been set for the platform line, to allow the Manchester goods train to run into that line. As soon as he lowered this platform-line signal, three pairs of points connected with the safety of the platform line were locked, and they could not, therefore, again be moved, until the signal was raised to danger. The signal and

points remained thus ready for the Manchester goods train until half-past three o'clock, when the signalman, looking at his watch, and considering to himself that the goods train might still come before the mail train, determined to leave them in that position. At 3.50 (by his watch) he again looked at his watch, and he thought that as the Irish mail was within seven minutes of being due, he would change his signals and points, and prepare the through line for the mail, in place of the platform line for the goods train. In walking towards his levers he saw a white light coming from under the bridge on the north of him, and, hearing no whistle for the through line, he concluded that it must be a light engine, which would require to be turned into the platform line. He knew it could not be the Manchester goods train, because that train would have carried a green light on the buffer of its engine. He therefore left the signal and points right for the platform line, turned the distant and intermediate signal to danger as the Irish mail train passed them, and pulled his lever twice to give two beats on the gong at the south signal station, and thus to intimate to the south signalman that he should expect some train or engine on the platform line. After sounding the gong, he walked back to be ready to put up his platform-line signal; and he then saw that it was the Irish mail train, and not a light engine, which was running into the station. His first thought was to alter his points, but the mail engine was already on them, and he could do nothing further. He then gave two more beats on the gong to the south signalman. He next looked at his watch, and found that it had deceived him, and had stopped at 3.50, and had thus led him to believe that the Irish mail train was not due as it was approaching his cabin. The watch was a small silver Geneva watch, which had gone well since it was repaired, nearly a year previously. The engine-driver did not whistle until he arrived opposite the cabin, and the guards' breaks did not show sparks until they were on the three-throw switches near the north end of the up platform. The platform-line signal was down, and the through-line signal was at "danger," when the engine-driver of the mail train came in sight, in passing under the Gungate bridge, of the home signal post; and the platform-line signal remained down until after the engine had passed it.

This man is stated to have borne hitherto an excellent character, and to have been previously careful and attentive in the discharge of his duties.

The signalman who was on duty at the south signal station, James Higgins, also came to work at 6.30 the previous evening. He had been 6 months at that post, and altogether 24 years in the company's service, of which he had served 5 years at the Tamworth station. He received notice by telegraph at 4.5 of the approach of a goods train from Polesworth, $3\frac{1}{2}$ miles south of Tamworth; and he signalled to the north cabin with one beat of the gong, to intimate to the north signalman that this goods train was coming, to pass along the through line. The north signalman upon this turned his disc off, and the south signalman lowered his home signal and distant signal to allow it to pass. The south signalman was watching this goods train approach him when he heard one beat on his gong from the north cabin; and, on looking round, he saw the Irish mail train coming up, as it appeared to him, at the side of the platform. He saw that this train was running along the wrong line, but the siding points which he worked, as above explained, were locked for the siding by the lever of the disc (working in the north cabin), which he had turned over about 16 minutes previously, to give notice to the north signalman that the through line was clear for its passage. He states that he had not had time to move back the disc lever and the two point levers, and that he was not able, for this reason, to prevent the mail train from running into the fuel siding.

The yard foreman at Tamworth, who was then on night duty, was standing on the down platform, opposite the booking office, at 4.9, expecting the

Irish mail train, when he saw the mail train engine emerge from the Gungate bridge, and heard the engine-driver at the same time whistle as if in alarm. He watched the train till he saw it, much to his surprise, take a turn into the platform siding instead of running along the through line. He could not see the condition of the home signals, because there are white lights only at the backs of the lamps, without any glasses (as in more modern lamps) to alter the colours behind when they are altered in front. Noticing that the train was going at great speed, and foreseeing what was likely to happen, inasmuch as the ground signal showed a red light, and the siding points were therefore open for the fuel siding, he ran towards the south signal station as fast as he could, in order to call the signalman's attention to the danger. But he kicked against a brick, and fell. As he rose again from the ground, the mail train passed him; and just before it passed him, he heard a gong sounded *once* at the south signal station. As far as he could see, the driver and guard appeared to be doing their best to stop the mail train. The goods train did not, he thinks, pass the south signal station until 2 or 3 minutes after the accident.

The immediate causes of this accident were, (1) the mistake of the signalman at the north cabin, in setting his points in the wrong direction, and turning the Irish mail train into the platform line in place of the through line, (2), the want of sufficient warning to the engine-driver of the mail train to enable him to stop short of those points when they were set in the wrong direction, and (3) the want of extra locking mechanically between the south and north signalman, to prevent the possibility of the fatal mistake which was made by the latter.

In regard to the first cause there is little evidence, except that of the signalman himself, upon which to form any conclusion. I see no reason to doubt his statement that he had opened the points for the goods train, which he expected, and which was overdue; and it is quite possible that his watch may have stopped, as he says, at 3.50 a.m., and that he may thus have been misled, and have supposed that the Irish mail train was not due. But it seems strange, to say the least, that when he saw the lights of an approaching engine or train,—and when he saw that those lights were not the lights of the goods train, but were lights, such as might be carried by the Irish mail train,—and when he must have heard the train approaching him at high speed, and, if the other evidence is to be believed, a good deal of "alarm" whistling,—he should have contented himself, until it was too late to move his points, with the idea that a light engine was approaching him, which he might safely allow to run through the platform line. His statement that he sounded the gong twice, is not confirmed either by the south signalman or by the yard foreman.

That this man made the mistake is too evident; that he was bound to work carefully with the means at his disposal is not to be disputed; but human nature is and always will be fallible. It is at least some excuse for him that he was not provided, as he might have been, with apparatus which would have prevented the mistake, and which would, even if it could have been made, have deprived it of the risk so constantly incurred.

In regard to the second cause, neither the engine-driver nor the fireman can now, unfortunately, speak for themselves. But they appear to have been on the look-out, to have foreseen their danger as soon as they realized the fact that the wrong signal was lowered on the home signal post, and to have done their best to stop the train. In approaching Tamworth they found, it must be remembered, both the distant signal and the intermediate signal inviting them to proceed;—may more, it may almost be said, luring them on to their destruction; and it was only as they reached the Gungate bridge, and when they were within little more than 400 yards from the facing

points, that they were able to see, while travelling at, say 45 miles an hour, the only signal which afforded to them any warning of their danger. The facing points were, as already explained, so interlocked with the home signals that they must have been set right for the through line before the through line signal could be lowered, and for the platform line before the platform line signal could be lowered, and that the lowering of either of these signals would lock them for those lines respectively. But, unfortunately, the signals so interlocked with the points were visible for little more than 400 yards; and what was required, in this respect, in order to prevent an accident from occurring in consequence of a mistake of the signalman, was that the facing points should be interlocked with signals visible for such a distance as would give the engine-driver the opportunity, in the event of such a mistake, of bringing his train to a stand short of the facing points. This may be done, if it is considered necessary to retain the facing points, either by interlocking the points with two arms and lamps on the intermediate post, which might also be moved still further from them, and which, as worked, was worse than useless; or by interlocking them with a double set of arms and lamps on the distant signal post.

The third cause has reference to the incompleteness of the locking arrangements, with regard to the plan of the station and the conditions of the traffic. It will be remembered that the south signalman, working a lever at his own station, turned over a disc in the north cabin to show that the through line was clear for the Irish mail train, before the arrival of that train, and that the disc lever so worked at his own station locked the siding points for the siding. He thus, in making it safe for a train to pass the station on the through line, made it dangerous for a train to pass through on the platform line; and in so doing he acted independently of the signalman in the north cabin, as far as locking was concerned; and he moved the north cabin disc for the through line, not when the Irish mail train was approaching, but 16 minutes previously, when it might have been expected. For the whole of those 16 minutes, therefore, the points (A) lay open for the platform line, while the points (B), lay at the same time open for the siding, and the two signalmen combined, in this manner, acting independently of each other, to cause the accident, and to wait in this joint position of imminent danger for 16 minutes until it occurred. If, on the other hand, the south signalman had been provided with the means of locking the points (A) for the through line while the points (B) were thus locked for the siding, and while he turned on the disc to show "all right" for the through line, and if he had been unable to show all right for the through line except by working the points against the platform line, or if, in other words, the north signalman had been prevented from admitting a train to the platform line unless the points (B) had been locked for the through line in place of for the siding, the accident could not then have occurred.

But, in considering the way in which this accident was brought about, there are other points which deserve discussion, involving either subsidiary causes, or remedies by the application of which such an accident might be prevented. The north signalman describes his attitude for an hour before the arrival of the Irish mail train as one of expectation. He waited for the goods train, which sometimes preceded and sometimes followed the Irish mail train, with his distant and intermediate signals at all right, and his home signal and points set for the goods train to run along the platform line. This was not a desirable mode of working, and the nearer the time for the Irish mail to approach the less satisfactory did it become. But it appears to have been his practice to keep his distant-signal and intermediate-signal as a rule at all right as long as there was no actual obstruction requiring that they should be turned to danger, and irrespective of the condition of the home-signals, which could not both be turned off at the

same time. It would in any case have been better to work these signals as junction signals, rather than as station signals, that is to say, that they should be kept at danger, excepting when they are lowered for the approach of a train, rather than that they should be kept at all right, and only raised to danger for an actual obstruction. And it would certainly be safer to keep the facing points right as a rule for the through line, and only to alter them for the platform line on the actual approach of a stopping train intended for that line. Under such a system of working, combined with the interlocking of the points with signals at a greater distance from the facing points, the engine-driver would have timely warning of such a mistake on the part of the signalman as occurred in the present case; and still more, the interlocking above referred to between the two signalmen, would entirely obviate the risk of such an accident, even in the case of an engine-driver disobeying the signals.

There is another accessory to safety that should be referred to, namely, the use of the electric telegraph in affording ample warning to the signalman of the approach of the different trains, and informing him of the nature of each train when it is still several miles or minutes from him. It was in the absence of such information that the signalman had been for more than an hour expecting the goods train, and prepared for that train only, before the approach of the Irish mail train. There were telegraph instruments, as already stated, in the cabin, but they had only been used for practising by day, preparatory to the introduction of the train telegraph system; and as they were not regularly worked, there was no other signalman on the north of Tamworth in communication by night with the north Tamworth cabin. Notice by telegraph was, indeed, received at the Tamworth station of the approach of the Irish mail train in advance of the goods train; but this notice was not communicated to the signalman, to whom it was, in the interest of public safety, of most importance that it should be made known. If it had been communicated to him he would naturally have altered his points, and his home signal, and the accident would not have occurred.

A good clock or time piece is also of great importance in every signalman's cabin, and care should be taken to ensure its keeping right time. Watches provided by signalmen, who can afford neither to purchase them nor to pay for their repairs, must always be unsatisfactory and untrustworthy, and are too liable to be out of order when they are most wanted. Without the means of ascertaining the correct time, the signalmen must always be more or less in a state of uncertainty as to what trains they are to expect or when they should look out for them. It is also impossible for them to carry out the regulations of the company as to the prescribed intervals between trains, the detention of trains when others are due, and the exhibition of their signals. Without good clocks, also, they are unable to keep correct records of the passage of the trains,—which are important as conducing to regularity of working, and are valuable, when properly kept up, in tracing out irregularities, and the causes of accidents. No record of this description has yet been kept in the Tamworth cabin; and this system, so rigidly enforced on some lines, does not yet appear to be appreciated at its proper value on parts of the London and North-western Railway.

It is hardly necessary to say that these questions are, all of them, of the greater interest and importance in the case of a station which is passed daily and nightly by non-stopping trains travelling at the highest rates of speed, and on the main north and south line of the London and North-western Railway. At such a station, and on such a railway, facing points should only be allowed in connection with the main line in cases where it is impossible to avoid them, or where the avoidance of them would lead to greater risk than the employment of them. When they are admitted, it is not too much to ask that they should be inter-

enable an engine-driver to bring his engine or train to a stand, when from a mistake of the signalman or from any other cause they are not set right for him; that the interlocking should be carried out on a complete system, so as to avoid conflict of points and signals between two signalmen at the same station; that the signalmen should be amply warned by telegraph of the approach of non-stopping and indeed of all trains; and that they should be provided with the means of ascertaining in their cabins the correct time.

Unpunctuality is frequently cited as a fruitful source of railway accidents, and in this case the mistake of the signalman arose partly from the lateness of the goods train, which ought to have preceded the Irish mail train. If the goods train had reached Tamworth at the time when it was due, it would have been disposed of, and the signalman would, no doubt, have afterwards set his points and signals right for the Irish mail train before that train arrived, and the accident would not have happened. But perfect punctuality is impossible in any railway working, and especially on a line having long mileage and numerous junctions, and above all connexions with steam-boats; and the best chance of safety cannot be obtained by arranging that a railway shall be worked for punctual trains only, and that there shall be liability to accident in the case of any alterations in their order of running or variations from the time-tables. It is necessary, on the contrary, that ample provision should be made and sufficient margin allowed for the irregular as well as for the punctual running of trains, and that unpunctuality shall be neither a cause of nor an excuse for accident.

In the case of this train there was a larger amount of break-power than is frequently provided on the fast trains of the London and North-western Company, and to this circumstance it is due that there was not a greater loss of life from an accident of so fright-

ful a character. It is a question whether, if the rails had been in good condition, the train might not have been brought to a stand before it reached the end of the siding. In my opinion it might have been so brought to a stand. But unfortunately the rails were in a greasy condition, and the train retained its speed much longer on that account than it would have done if they had been in good order. The continuous breaks at the tail of the train were, however, of great use, not only in checking its speed, but also in lessening the actual shock to the passengers in the rear carriages, and in protecting them from the effects which they would otherwise have experienced from the rebound of the buffers. The secondary jars so occasioned are in some cases of collision more hurtful than the primary shock.

I ought not to omit, in conclusion, to draw attention to the fact that if the signalman at the south of the station had been a more active and intelligent man, he might, even after the mistake of his colleague, and without the other aids to safety to which I have alluded, have prevented the accident from occurring, by turning the train through the siding points from the platform line to the through line. At the same time it must be admitted that vigorous action of this nature, at such a moment would have required an amount of presence of mind which all men do not possess, and that his attention was partly occupied by a train approaching him from the opposite direction. In now completing the interlocking and the intercommunication between the signalmen, the company should construct a suitable raised cabin from which this south signalman may be better able to perform his important duties.

I have, &c.,
H. W. TYLER.

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

Printed copies of this report were sent to the company on the 17th October.

LONDON AND NORTH-WESTERN RAILWAY.

*Queen's Hotel, Chester,
27th October 1870.*

SIR,

In compliance with the instructions contained in your minute of the 26th ultimo, I have the honour to report, for the information of the Board of Trade, the result of my enquiry into the circumstances which attended the accident that occurred on the 21st September near Trefnant station, on the Vale of Clwyd branch of the London and North-western Railway. The line is single with sidings.

On the day in question, a train, which consisted of an engine and tender, 13 loaded waggons, and a break van, left Trefnant station for Rhyl, at the proper time, 6.36 a.m.

When this train had got about 500 yards to the north of Trefnant station, one of the wheels of a waggon of coal (belonging to the Copper Colliery), which was about the centre of the train, got off the rails. The train was ascending an incline of 1 in 264 at the time. The driver and breaksman of the goods train noticed the waggon off the rails at the same moment; but as soon as the breaksman got his break on, the waggon that was off, got back on to the rails. The train was stopped, and the breaksman went back to see what had caused the accident. He found that the near rail had been forced about 2 ins. out of gauge. The off wheel of the waggon had run for about 330 yards close inside of the off rail, and forced it out. The chairs were slightly marked for the whole distance.

The goods train proceeded to St. Asaph, and pulled up at that station. The breaksman saw the foreman of platelayers, who is in charge of the line between Trefnant and St. Asaph, at the latter station, and told him what had happened. He also told the engine-

driver of the down passenger train due to leave Rhyl at 8.2 a.m., whom he saw when the goods train arrived at Rhyl.

The foreman of platelayers obtained the assistance of the gang of platelayers who have charge of a portion of the railway to the north of St. Asaph, as well as the assistance of his own gang, and proceeded at once to the spot. He found that the railway had been pushed 1 to 2 ins. out of gauge for about 330 yards adjacent to the Trefnant down distant signal. He sent out a man at once with a red flag, 700 or 800 yards to the north of the place, and proceeded with the remainder of the two gangs to put the railway to-rights. When they had put to-rights about 270 yards of the displaced rail, the foreman sent the son of the second foreman of platelayers (a boy about 14 years of age), who had brought his father's breakfast, to call the flag-man nearer to the working gang. The boy only went half way, and recalled the man by waving his cap.

The down passenger train from Rhyl arrived at this time, and was checked by the flag-man.

The flag-man then furled his flag, and signalled to the driver to go on, believing that the boy was calling him away from his post, in consequence of the road having been completely put to-rights. The engine-driver put on steam again, and proceeded on his journey, believing that the road had been mended. He also saw the boy waving his cap, but could not see the men who were at work on the railway, owing to the line being in cutting and on a curve. The station down distant signal was also at all-right for the train to proceed. As soon as the platelayers noticed that the train which they expected to have been stopped by the flagman was approaching at a speed of 10 or 12 miles