

phery of the wheel, there is the opportunity, with larger wheels, of getting a greater inward projection of the lip, and consequently a deeper clench.

The original section was arranged for our carriage wheels, which are 4 ft. in diameter, and is in practice made a little less for 3½ ft. and 3 ft. wheels.

I am not aware that any special specification was given for these wheels, so far as regards my fastenings. I rather think it was assumed that the makers should follow the usual mode. Neither is there any reason, so far as I know, that could make it the interest of the manufacturers to deviate from the original section. It may probably have been done with a view to facilitate repairs, and the consequent and necessary alteration in the annular key was overlooked.

I am very glad the defect was so soon discovered, and the proper remedy applied.

The same firm made the wheels that you saw that had been running for six years with a broken tire, and no manufacturers have given me so much satisfaction in the making of my wheels. They very promptly made arrangements that will ensure in future a full clench on the annular key, whatever may be the amount of projection given to the back lip A.

I am very pleased to inform you that the Directors and Officers of the London and North-Western Railway have resolved to persevere in using my patent fastenings, the instance of the failure being found to be due to the deviation I have herein explained, and which will be guarded against in future.

Thanking you for the kindness and courtesy of giving me this opportunity of explanation,

I remain,

Yours very truly,

J. GIBSON.

Col. Yolland.

LONDON AND SOUTH-WESTERN RAILWAY

*Railway Department, Board of Trade,
Whitehall, 11th April 1861.*

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, for the careful consideration of the Directors of the London and South-Western Railway Company, the enclosed copy of the report made by Col. Yolland, R.E., the Officer appointed by my Lords to inquire into the circumstances which attended the accident that occurred to a passenger train on the 28th January last at the Epsom Branch Junction of the London and South-Western Railway.

I am, &c.

JAMES BOOTH.

*The Secretary of the
London and South Western
Railway Company.*

*Railway Department, Board of Trade,
Whitehall, 3d April, 1861.*

SIR,

I HAVE the honour to report for the information of the Lords of the Committee of Privy Council for Trade, in obedience to your minute of the 29th January, the result of my inquiry into the circumstances which attended the lamentable accident that occurred on the 28th January, near the junction of the Epsom branch with the main line of the London and South Western Railway, 1½ miles west of Wimbledon station, which is 7½ miles from the Waterloo Road Station, when one passenger, Dr. Baly, was instantaneously killed, and about 19 others were injured, several of them very seriously.

At this junction the lines of the London and South Western Railway are raised on an embankment of about 20 feet in height, and the main line east of the junction is on an easy curve of 100 chains radius inclining to the right, and the curve extends a very short distance beyond the junction. The line is practically level, and the Epsom branch curves off to the left from the junction.

The junction is protected by the usual junction signals generally employed on the London and South Western Railway, and by distant signals in each direction on the main line, and by an up distant signal on the branch. Two distant signals are in work between the junction and Wimbledon station, one of which repeats, at a greater distance, the indications of the other. The up-distant signal on the main line between the junction and Kingston is 770 yards from the junction.

The general character of the accident was as follows:—

The 5h. 10m. p.m. down direct express train to Portsmouth consisted of

Engine and tender,
1 second-class carriage,
2 first " "

1 guards' break van,
1 first class carriage,
2 second " "
2 first " "
1 second " "

making up a total of 10 vehicles, besides the engine and tender, arranged in the order in which they are here written, left the Waterloo Road Station at 5h. 11m. p.m., and as it was about to pass the Epsom Junction at 5h. 30m. p.m., one of the vehicles got wholly or partly off the rails, and after running a short distance beyond the facing points at the junction, the tender and the next four vehicles got off the rails, and then ran down the embankment on the left of the line in succession, and some of them fell over against the embankment of the Epsom Branch line. The next two carriages in the train, a first and a second class carriage, also got off the line to the left, but after passing the place at which the last of the four leading vehicles (the guards' break-van) had got down the embankment, the leading first-class carriage diverged to the right, possibly being deflected by coming in contact with the guards' break-van, or by the right wheel striking against the transoms; and passed across the down-line of rails on which it should have been running, and turned over on its side in the six feet space intermediate between the down and up line, and fouled the up-train line. As this carriage fell over on its side, it fell on Dr. Baly, who had been riding with two other gentlemen in the centre compartment, and who in some unaccountable manner fell through the doorway just before the carriage tumbled over on to its side, and was instantaneously killed. The last four carriages of the train remained on the rails coupled to the two preceding carriages, which had ultimately diverged to the right.

The position of the tender and the leading four vehicles was completely reversed. The tender remained nearest to London, and the guards' break-van furthest from it. The tender having apparently come violently into contact with the east end of the coping wall of an under bridge, fell directly over into the public road below, the tank separating entirely from the framing, which lay on its side, partly resting against the western abutment of the corresponding under bridge on the Epsom Branch.

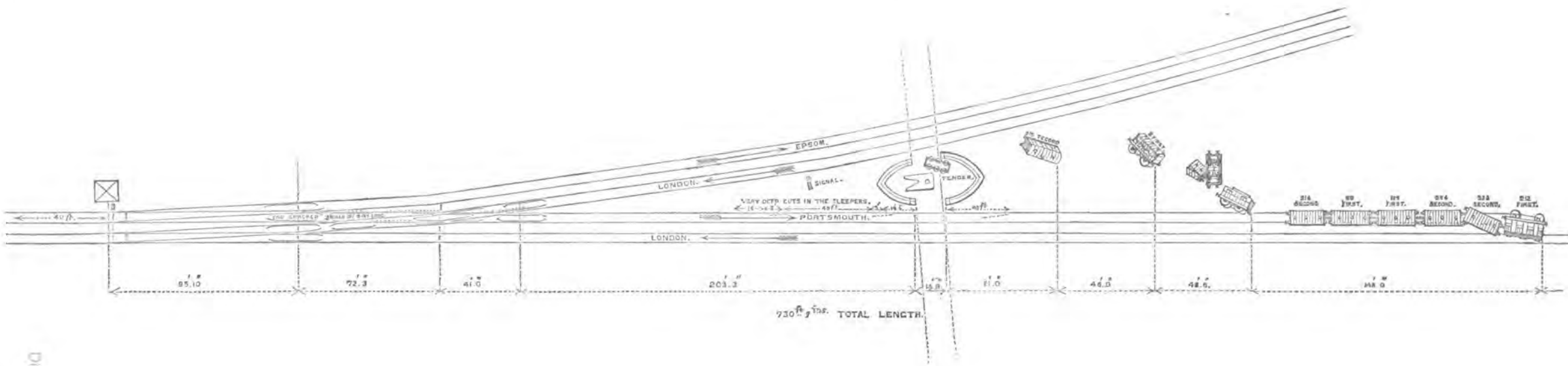
The next vehicle to the tender, a second-class carriage, seems to have struck the western end of the coping stone of the under bridge on the main line, and was thus deflected forwards before it ran down the embankment, and rested in a reversed position on the embankment of the Epsom Branch; otherwise the consequences would in all probability have been very much worse, and as I have already stated, two other carriages and the break-van got wholly or partly down this embankment on the left side. The tender was greatly damaged, and so also was the first-class

To accompany Report of Colonel Yolland, R.E., of 3d April 1861.

LONDON AND SOUTH WESTERN RAILWAY.

PLAN OF EPSOM JUNCTION.

Note.—The dotted lines denote the positions and directions of marks on sleepers and rails.



carriage, No. 30, immediately preceding the guards' break-van; the body was terribly shattered, and torn from its framing, and it is a matter of great surprise that some of the passengers riding in it were not killed on the spot. Three other carriages and the van were also damaged.

The driver of the train, Elijah Cooke, stated before the coroner, that "all went right with this train till after passing the pointsman at the junction, and that he was about to cross the up Epsom line, as near as he could judge, when he felt a sudden jerk from the train, at the same time the engine whistle blew twice, but not clear: that he was standing on the right side looking towards Kingston, and he looked back and saw apparently all the front part of the train off the line. The tender appeared to bound off almost at the same time, and after making a few bounds on the ballast, she broke away from the engine, but he did not notice which side the tender got off; that after the tender broke away, he sounded the whistle several times as he became aware that something was wrong; it was done almost momentarily; that he then saw the tender turn over the wall, and go down into the road below; that he saw the carriages apparently pass the tender and run down the embankment, and two of the other carriages apparently ran foul of the up main line; that he knew the up express was due, as he generally met it at that place, and he ran on with the engine for the purpose of stopping her, and his fireman changed his head lights on the engine from green and white to red; that when he had got 100 or 200 yards from the place he saw the lights of the express train a long way down the line, perhaps two miles, and in addition to his red head-lights, he waved a hand lamp with a red light, and the express train was stopped by these means at Malden Station, and he sent his fireman to tell the driver of the express. He also stated that the average speed at which he usually passed the junction was about 24 or 25 miles an hour, and that he passed Wimbledon at about 33 to 35 miles an hour, and shut off the steam just after passing the second distant signal, and kept it off while passing the junction; he thought the carriages were off the rails before the tender, but the tender went off almost at the same time: he had not occasion to find fault with the road, though it was worse than usual on account of the frost."

But in a report made on the night of the accident, and written by J. Hopkinson at E. Cooke's dictation, he said, "while passing Epsom Junction, he found that something was wrong in the train by the steam whistle being pulled slightly open, and on looking back saw the carriages in front part of the train off the road, and at the same time, he saw the tender, No. 121, jump off, and before he could do anything the tender broke loose from the engine; the tender and four carriages ran down the embankment doing serious damage to several passengers, &c. &c."

The fireman of the train, John Robinson, says, that after passing the pointsman at the junction, and to the best of his judgment, the engine had got to the crossing of the up Epsom line, when he felt a sudden jerk from the train, which might have been caused by the application of the guard's break, or by some carriages off the line, and at the same time, he heard two half-smothered whistles from the engine, not perfect, which might have been caused by the communicating cord being pulled, or by the carriages going off the line; that he does not know what caused the smothered sound, and on looking round he saw two carriages next to the tender off the line; at the same time that he looked round the tender jumped off the line, as he was stepping on to it to apply the break; it was not off before; and he was going to put his hand on the break when the engine and tender separated; that he had hold of the handrail of the engine, and held on to it to save himself from going on to the tender, and the engine ran ahead."

He also states that "nothing had occurred and nothing was felt until they had passed the junction, and he does not think the tender could have jumped without his being aware of it; that the carriages did not appear to be detached from the tender when he looked round; that between the time of his feeling the jerk, and the tender breaking away, one, two, or three seconds might have elapsed; that he was looking ahead when he felt the jerk, and the carriages were off when he looked round, and that the jerk and the smothered sound of the whistle were simultaneous."

The guard of the train, Matthew Matthews, riding in the van, the fourth vehicle from the tender, states, that nothing occurred until they had passed Wimbledon Station, and that they were travelling at 25 or 26 miles an hour; that he was standing looking forward, with his hands on the wheel of the break, and just as he was passing the Epsom Junction points, he saw a carriage in front, either that next to the tender, or the next in rear of that carriage, oscillate, and it seemed to jump and to rise and turn; that he then applied his break, and he was holding on to his break, when he was thrown from the wheel of the break, and found himself partly at the side and roof of the van, which had been turned over on the left side; that he got up as soon as he was able, and at once proceeded to take the necessary measures," (which I need not describe,) "for protecting the tail of his train; that his van had passed the junction signal a yard but not more, when he saw the carriage jump, and it might have jumped 3 or 4 inches; that it was not the tender that jumped as it is lower than the carriages, so that he could not see it; that he did not hear the driver whistle for the breaks; that he had to look to all the couplings and side chains; that he believes he locked all the doors on the off side of the carriages; that sometimes there is a break van behind the carriages, but on this occasion there was none." The preceding is the whole of the evidence of the servants of the company travelling with the train that is material to the question of where any part of the train got off the line.

The pointsman on duty at the Epsom Junction, Wm. Martin, states "that the 5h. 0m. down train passed at 5h. 18m., and the next train that was due was the 5h. 10m. p.m. down direct Portsmouth train at 5h. 30m. p.m.: that he noticed the 5h. 10m. train coming when it was at the auxiliary signal, 800 yards east of the junction, and he had no signal on at that time, which meant 'all right' for the train to pass: that at that time the facing points were set right for the main line, and there was no obstruction at them: that he was standing against the points, and showed the train the 'all right' signal, or white light, with his hand lamp: Mr. George Dixon stood there also close behind him, and the train passed precisely at 5h. 30m., its proper time, and he thinks it was going at the rate of 35 miles an hour: that the whole train passed him, and when it arrived at the facing points, some part of it struck the points violently: he could not say whether it was the engine or tender, or some part of the front of the train; he knew it by a sudden jerk on the lever, and he felt the blow from having his hand on the lever which worked the points: the points were fully open to the main line at that moment, and after the train passed he saw that an accident had happened." He also stated subsequently, "that there was one sudden jerk, very heavy, he had never felt such a jerk before, then there were several others in rapid succession but less violent. After the train had passed he examined the points, in less than five minutes, and found the northern point of the switch broken, and bent in towards the right rail of the down line, but not broken off; that was done by the inspector one half or three quarters of an hour after the accident occurred, to allow the points to be opened to the Epsom Branch."

He also states "that he examined the line within 10 or 15 minutes after the accident occurred with a light; and he went up the line towards Wimbledon as far as the under bridge over the public road, and from the junction eastwards he noticed that something had been off the road; such marks as a flange of a wheel would make inside the right or north rail of the down line on the longitudinal sleepers, and on the fang bolt heads, and on the iron plate near the end of the point rail: the marks on the longitudinal sleepers were perhaps from 50 to 60 feet from the junction: he found no disturbance of the permanent way: there is a mark on a bolt head on the outside of the left or south rail of the down line, close to the switch, but he did not find marks corresponding to those on the longitudinal sleepers.

A careful examination of the line was made by the resident engineer, Mr. Strapp, the same night, and I examined it two days after the accident occurred. I also looked at the damaged vehicles which remained on the sides of the embankments and in the public road below; and since that time I have attended at the coroner's inquest held at the White Hart Inn at Merton on nine separate days, and have had many opportunities of looking to the state of the rolling stock, and the line of railway; and have also had the benefit of hearing the opinions which have been given as to the causes which probably produced this sad accident.

This part of the line is laid with longitudinal sleepers and bridge rails, and the first marks which could be traced of a vehicle being off the line, walking towards the junction from London, were found on the longitudinal sleeper inside the right hand or north rail of the down line, about $5\frac{1}{2}$ inches from the rail, and about 40 feet from the tongue of the facing points or switches at the junction—40 feet east of the junction. This mark seems to have been made by the flange of a wheel running on the wooden sleeper, and there was also somewhat of the same kind of mark a few feet nearer to the junction, but I was told that this last was not a new mark. There was also an abrasion on the outside, at the top of the left hand or south rail, opposite to the first mark on the longitudinal sleeper, apparently made by the rubbing or grinding of the inside of the tire and rim of a left wheel against the top of the rail—and this abrasion could be traced further west, and the heads of sundry fang or screw bolts were also bruised or notched by the flange or tread of a wheel. Again, at 2 feet 11 inches east of the facing points, an iron plate fixed on the longitudinal sleeper inside the north rail and the head of a bolt on the outside of the south rail of the down line, immediately opposite to each other, were both notched by the flanges of a wheel, and the right hand or north facing point which was about $4\frac{1}{2}$ inches from the rail was struck, cracked, and bent down towards the north rail by the wheel or wheels of the vehicle which was off the rail, from the mark 40 feet east of the facing points, and which wheel must also have made the mark on the iron plate—while the opposite wheel on the same axle notched the head of the bolt outside the south rail. The blow on the facing point is a distinct confirmation of the pointsman's evidence.

I was also told that there was a distinct mark of a wheel having mounted over the south rail of the down Epsom line close to the points, but I did not myself notice it. However, there can be no doubt that the wheel or wheels of the vehicle which was off the rails from the mark 40 feet east of the facing points, inside the north and outside the south rail of the down main line, must have mounted the rail at the junction, otherwise it would have gone off to the Epsom Branch.

About 30 yards west of the facing points, a check or guard rail inside the north rail of the down line was struck by the wheel of some vehicle—and a short distance farther on, and inside the same rail, the wing rail of the crossing of the north rail of the down main line with the south rail of the up Epsom line, had about 11 inches broken off its end—and the detached piece appears also to have been struck after it became

detached. Other marks inside the north and outside the south rail of the down main line, keeping nearly at the same distance from the rails, could be traced to the crossing of the down main line with the up Epsom line, about 56 yards west of the facing points, and still farther down, there were distinct marks of more than a pair of wheels having been off the rails, and the transoms were cut, and the permanent way was much more injured.

The tender, separated from the tank, lay in the public road below, about 140 yards west of the Epsom Junction; the guard's van lay on its side, partly down the embankment, 178 yards west of the Epsom Junction, holding up by one of the side coupling chains the frame of the first-class carriage, No. 30, of which the body was greatly shattered, twisted round and separated from the frame. Two other carriages rested on the sides of the embankments between the public road where the tender lay and the guard's break-van and No. 30 carriage. The last of the four carriages that remained on the down main line, and therefore the last of the train, stopped some short distance west and beyond the place where the guards' break-van lay, while the carriage in which Dr. Baly rode, that fell over on its right side, lay 244 yards west of the facing points at the junction.

The door of the centre compartment of this carriage was torn off its hinges, but there is no proof that this door, which was on the off-side of the carriage, was locked when the train left Waterloo Road Station in accordance with the usual practice; the guard "believes he locked it;" neither is there any evidence to show that the door was wrenched or shook open before the carriage fell over. One witness expressed a decided opinion that Dr. Baly did not himself open the door. The handle is flattened down, but I am aware of a case in which the doors of the several compartments of a first-class carriage, on one side, were forced open by the shock of a collision without damaging the doors or door posts. This carriage was not much damaged.

The frame of the tender was found considerably bent, but the corresponding part of the under side of the tank was not at all bent, and the tire of the right hand centre wheel had shifted outwards on the rim of the wheel about $\frac{3}{8}$ inch on one side and $2\frac{1}{2}$ inches on the other. This tire was subsequently removed from the rim of the wheel at the company's workshops at Nine Elms, and it was then clearly ascertained that the tyre had been loose on the rim, as the four new studs inserted in the rim of the wheel on the 20th December last, in consequence of a report made by the engine driver Cooke, that the bolts which were then in the wheel were loose, had either worked out of the holes in the inside of the tire, or, which is much more probable, that they had never been thoroughly screwed home to the bottoms of the holes; and thus, if the tire had broken, an accident would, in all probability, have been occasioned, as there was nothing to retain the tire on the rim of the wheel.

From the nature of the construction of this wheel, the shift of the tire could only take place outwards on the rim. The leading wheels of the tender were very slightly out of gauge; the centre and trailing wheels were very nearly true to gauge, irrespective of the shift of the tire on the right centre wheel.

The axles of the wheels of the break-van were slightly bent, and so also, but to a much greater extent, was one of the axles of the carriage next in front of it, No. 30, and the flange of the right-hand trailing wheel of this carriage was deeply indented. The flanges of the leading and right centre wheel of the tender had also received rough treatment, but there was nothing in the damaged state of the rolling stock which might not have fairly resulted from the rough usage the vehicles met with after they got off the rails, with the exception of the unsafe condition of the tire of the right centre wheel of the tender, and attention was, in consequence, especially directed to that wheel.

A shift of the tire on the rim of the wheel outwards, to the extent which I have already detailed, or even to that of an inch or less, taken in connection with the state of the line, which I shall have to describe, would have certainly sufficed to throw the middle wheels of the tender off the line, and the bent condition of the frame of the tender, in the same direction as the curve of the line, favoured this supposition; and strong and confirmatory scientific evidence was given to prove that the accident had been occasioned in this manner. But this scientific evidence was met by the Railway Company by certain tangible evidence which it was impossible to resist.

There is a difference in the gauge of the carriage and tender wheels to the extent of about a quarter of an inch—the tender wheels being the widest; and there is also a sensible difference in the forms of the flanges of the two kinds of wheels, those on the carriage wheels being sharper and thinner than those on the tender wheels. On applying the templates made to correspond with the forms and gauges of the carriage and tender wheels, it was manifest that the carriage wheel templates fitted into and corresponded with the two notches at 2 ft. 11 in. east from the facing points—on the iron plate and iron bolt—while the tender wheel templates would not do so, either as regards the gauge or the form of the flanges; and if the carriage wheel templates were fitted to the mark on the longitudinal sleeper inside the north rail, 40 feet east of the facing points—the opposite wheel would abrade against the outside of the top of the south rail—the tender wheel templates similarly fitted to the mark on the sleeper on the one side, would not have the left wheel touching the rail on the opposite side. Again, if it had been the centre pair of wheels of the tender which were off the rails at this spot, and which had abraded the outside of the south rail, the paint on the inner side of the flange and rim of the left centre wheel, would surely have been removed while grinding the outside of the rail, whereas it remains undisturbed; and lastly, if the shift of the tire on the right centre wheel of the tender had thrown those wheels off the rails, from the gauge being too wide, the left wheel could not by any possibility have abraded the south rail. These facts are quite conclusive to my mind, that the accident was not occasioned by the centre wheels of the tender.

The permanent way was not in good condition at this part of the line, and the platelayers had been engaged on the Tuesday preceding the Monday on which the accident occurred, in raising and packing the south rail on the outside of the curve, between the junction and an under bridge rather more than 40 yards east of the junction, and at the time of the accident between 64 yards east of the junction and the junction itself the super-elevation of the outer rail above the other varied, in 35 yards, from $\frac{3}{4}$ of an inch to $2\frac{1}{4}$ inches, and in the next 20 yards to the junction itself, it was gradually done away with altogether, while the gauge of the rails varied from $\frac{3}{4}$ of an inch wide to $\frac{1}{4}$ of an inch narrow in a distance of less than 50 yards. A piece of the rail had laminated and bulged out from the north rail, and projected inwards, but still adhered at each end where the gauge was most narrow. That the line was not considered by the Company's executive to be in good condition may be inferred from the fact that a notice had been issued on the 16th January to the engine drivers "to reduce their speed to a safe rate" in running over the line from Wimbledon to Weybridge, in consequence of a report of the state of the road having been made by a driver. This express train is timed to run at about an average rate of speed of 42 miles an hour, and the proper super-elevation of the outer rail on this curve for that speed would be about 1.2 inch—for a less rate of speed a less amount would be required; the actual super-elevation exceeded the proper amount by about one inch, and the actual super-elevation was entirely done away with in the next 29 yards. The locomotive superintendent thought that 35 miles an hour (the rate named by the pointsman) would be too

great a rate of speed over the Epsom Junction, but the servants of the Company travelling with the train speak to the rate as being 24, 25, or 26 miles an hour. Looking at the rate at which the train must travel to keep its time, to the actual average rate between Waterloo Road Station and Wimbledon Station, assuming the clocks at the two stations to agree (30 miles an hour); and to the position and state of the carriages after the accident, I have not the least doubt that the train was travelling at least at the speed named by the pointsman; and I regard it as absolutely certain that the vehicle which got off the rails east of the junction, did so between the under bridge and the mark 40 feet east of the junction. The manner in which the north facing point was cracked and bent, and the evidence of the pointsman would lead to the inference that more than a pair of wheels were off the rails before the junction was reached, but there are no marks to corroborate this inference.

With reference to the causes which induced the vehicle to get off the rails, in the absence of any obstruction, or of something defective in the state of the rolling stock, exclusive of the right centre wheel of the tender, which I put altogether aside as out of the question, I think it must be attributed to the state of the line, which was sufficiently out of order to cause the vehicles to oscillate. I noticed this oscillation on other passing trains, when examining the line; and this oscillation, combined with the tightness of the gauge while travelling round a curve, the bulging out of the north rail, and the subsequent rapid diminution of the super-elevation of the south rail, probably caused the left wheel to mount and drop outside the south and inside the north rail. A large amount of evidence was given before the Coroner to prove that the accident could not have been occasioned in this manner, but the witnesses declined to assign a probable cause for the vehicle leaving the rails. Now, railway vehicles will only quit the rails from some one cause, or the combination of several. It is a difficult thing to throw a train off the rails even by placing an obstruction on them—in proof of this I may mention the number of cattle which are run over, while the trains remain on the line. The breaking down or derangement of the rolling stock and the defective state of the permanent way, which in many cases is ill adapted for the speed at which trains travel over it, still usually permits trains to reach their destination without their getting off the rails; and there are many cases where trains have left the rails, in which it has been impossible to detect any thing wrong with the rolling stock, or to find fault with the state of the permanent way, and in which the oscillation which often attends high speed, is the only assignable cause for such trains leaving the rails. In this case we have a defective state of the permanent way, which might produce oscillation, but with out excessive high speed.

The railway company's management is, however, much more open to censure as regards the manner in which the train was made up, than for the condition of the permanent way. There had been a frost of great severity and length, following after a great deal of wet weather, and all embankments that retained the water in them would be liable to suffer materially from the severity of this weather, and it was impossible to attend to them while the frost continued; but no excuse save that of convenience was offered for sending out a train, consisting of engine and tender and ten vehicles, appointed to travel on the average about 42 miles an hour, with one break-van, (exclusive of the tender,) and that placed near the middle, instead of at the tail of the train, its proper place, in the event of only one being sent with it; and some of the evidence placed before the coroner went so far as to state that breaks were only required for the purpose of stopping at stations. This is, I submit, a very mistaken and mischievous principle for a railway company to act on, if it ever be acted on; and the true principle towards which all efforts should be directed, looking to the very many

ways in which accidents happen to trains, should be to fit up every train, no matter at what speed it is travelling, so that it shall be possible to arrest its progress in the same space, as if it consisted only of a single vehicle, provided with a proper break. Now in this accident, the guard in the fourth vehicle states that he became aware of something being wrong as he passed the Junction, and immediately began to apply his break, and it was found hard on after the accident, and there is no doubt that the first check to the speed must have been experienced when the vehicle off the rails struck the facing points and subsequently the check and wing rails; and the result of so many vehicles being off the line acting much more effectively to stop a train than any break action on the wheels or rails could do, is shewn in the short space in which it was arrested. The reversed position of the various vehicles which got off the line is evidently due to the momentum of the after part of the train running freely on the rails, and pushing off at the side one vehicle after another. Now this, in my opinion, would have been altogether changed if the retarding force of the single break-van had been applied at the tail of the train, so that the carriage in which Dr. Baly rode would, in all probability, not have run more than half the distance it did, (244 yards from the Junction,) and a valuable life would, probably, have been saved, and the character of the accident been materially mitigated.

This probability would have been largely increased if a guard in a van at the tail of the train had had a much larger proportion of break power placed under his control, by means of continuous breaks. The same act of putting on a single break, suffices to put on continuous breaks; and some of these are so constructed that the time of putting the break blocks on the wheels does not exceed a second of time altogether, and in accidents of this kind, seconds of time are of the utmost importance.

The company's management is also open to remark in having fixed the tire on the middle wheel of the

tender in so inefficient a manner, when it was put on new. The locomotive superintendent has long since patented a superior mode of fastening tires on wheels, and he stated that he had full authority from the directors to do what was right in his own department. The blame therefore must certainly rest on him. Attention should also be directed to the practice which appears to prevail in the Company's locomotive workshops of allowing the ends of studs or bolts, having threads cut on them, to project different lengths outside the inner rim of the wheel. These studs should be cut to such a length that the outsides of the thread should not project beyond the holes, into which they are inserted. If this is not done, no engine driver can ever say, with respect to the wheels of the engine, whether the end of the stud is inserted into the hole in the tire, or merely abuts against the tire,—and thus he cannot tell whether the wheel is safe or unsafe to run in the event of the tire breaking.

I should not omit to state that no blame appears to attach to any of the Company's servants travelling with the train or on duty at the junction—and credit is certainly due to the driver and fireman for the steps they took to stop the up express train. Had they not been successful in doing so, it is very likely that the up express train would have run into the carriage which was lying foul of the up line 526 yards east of the up distant signal—because it is not the practice, although it ought to be, for drivers to stop at a distant signal when on at danger, but they continue to whistle and run past it, and then look out for the junction signal, and prepare to obey its indications. I enclose a plan of the line furnished to me by the Railway Company, showing the positions of the various carriages after the accident.

I have, &c.,
W. YOLLAND,
Col., R.E.

The Secretary of the
Railway Department,
Board of Trade.

MANCHESTER, SHEFFIELD, AND LINCOLNSHIRE RAILWAY.

*Railway Department, Board of Trade,
Whitehall, 25th March 1861.*

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to transmit to you, for the information of the Directors of the Manchester, Sheffield, and Lincolnshire Railway Company, the enclosed copy of the report made by Capt. Tyler, R.E., the Officer appointed by my Lords to inquire into the circumstances which attended the collision that occurred on the 6th instant near Dinting.

I have, &c.
JAMES BOOTH.

The Secretary to the
Manchester, Sheffield,
and Lincolnshire Railway
Company.

SIR,

Whitehall, 20th March 1861.

IN compliance with the instructions contained in your minute of the 12th instant, I have the honour to report, for the information of the Lords of the Committee of Privy Council for Trade, the result of my inquiry into the circumstances which attended the accident, that occurred on the 6th instant, near the Dinting Station of the Manchester, Sheffield, and Lincolnshire Railway.

Three quarters of a mile to the west of the Dinting Passenger Station and Junction, there is, at Old Dinting, a goods station, provided with a warehouse and several sidings. It is situated on a nearly level gradient, though the sidings fall towards the eastward, and is protected by signals. It is approached from the west on a curve, and the view in that direction is obstructed by the warehouse.

A porter in the goods department, of the name of Benjamin Thorpe, shunted an empty coal waggon at 6.30 in the morning in question, out of the coal siding into another siding, commonly called the back siding, which was next to the main line from Manchester. He moved it from the coal siding in order to get it out of the way of other waggons; and he placed it in the back siding that it might be ready to be taken away at 10.50, by the pick-up train, to the Dunkirk Colliery. He put down the break of this waggon, but was unable to pin it down, because the pin was broken off.

There was a stop-block near the end of the siding, to prevent waggons from being moved forward nearer to the main line than was safe for the passage of trains; but Thorpe omitted to turn this stop-block into its proper position, and the excuse which he offers for this omission is, that he was engaged at that time in shunting a coal train from the up to the down main line, to allow a passenger train to pass it, and that the performance of this other duty caused him to forget to apply the stop-block as he ought to have done.

He states that he passed the waggon at half past 9 o'clock, on his way to the warehouse, and that it was then "all right," in the place in which he had put it; but that before he had (walking from it) had time to reach the warehouse, it must have been blown forward towards the main line, as the 9.15 a.m. passenger train from Manchester, coming up at that moment, struck it, and turned it over on its side.

The passenger train was composed, in the following order, of an engine and tender, a dummy van, a horse