DUBLIN AND SOUTH EASTERN RAILWAY.

Board of Trade (Railway Department),
8, Richmond Terrace, Whitehall, London, S.W.,
10th July, 1912.

SIR,

I HAVE the honour to report for the information of the Board of Trade, in compliance with the Order of the 24th June, the result of my inquiry into the circumstances under which a portion of a passenger train was derailed at about 1.43 p.m. on the 15th June, at Foxrock Station, on the Dublin and South Eastern Railway.

In this case as the 1.28 p.m. special down race train from Dublin to Foxrock, consisting of an engine and 12 vehicles, was approaching Foxrock Station, the engine and three leading vehicles were derailed near the north end of that station. The train was about to stop at Foxrock Station, so its speed at the time was not very great, and the engine was brought to a stand about 74 yards ahead of the point where it is believed that the derailment occurred.

One passenger has notified the Company of personal injuries sustained, but none of the servants of the Company were injured at all, and the damage to rolling stock and to the permanent way, details of which are given in the Appendix, was but slight.

The engine was a four-wheels-coupled tank engine, fitted with a leading and trailing pair of sliding wheels, the side play of the leading pair being $1\frac{1}{8}$ ins. and that of the rear pair $1\frac{3}{8}$ ins.; the engine was running chimney first at the time of the accident. It was fitted with the steam brake and a hand brake, both working blocks on the four coupled wheels, and with the automatic vacuum brake apparatus for working blocks on the wheels of the vehicles of the train.

The train consisted of the following vehicles attached to the engine in the order given :—

	Wheels.
One van	6
Four third class carriages	6
Two first class carriages	6
Three second class carriages...	6
One van	6
One second class carriage	6

These vehicles were all fitted with the vacuum automatic brake, working blocks on four wheels of each vehicle. The brakes are all reported to have been in excellent order.

Description.

Foxrock Station, at which this accident occurred, is situated about $6\frac{3}{4}$ miles from Dublin on the Dublin (Harcourt Street)—Bray Branch of the Dublin and South Eastern Railway, and it is the station for the Leopardstown Race Course, which adjoins the west side of the line. The station is provided with three platforms, *viz.*, the down platform on the east side of the main lines; an island platform, which acts as an up platform, on the west side of the same lines; and a race course platform to the west of the latter, from which it is separated by a single line, which is known as the race course platform line; these platforms are each 150 yards in length. At a point on the down line situated 185 yards to the north of the north end of the down platform, there is a connection, which is facing to down trains; the left-hand road of this connection leads on to the down platform line, whilst the right-hand one crosses the up line, and leads to the race course platform line. The train concerned in this accident was due to run into the race course platform line through this connection, and it was at these facing points that the derailment appears to have taken place. These points, which are provided with a facing point lock and locking bar, are worked from a ground frame situated near the north end of the island platform, and down splitting signals, which are duly interlocked with the points, are erected on the down side of the line adjoining those points.

The main lines from the north approach the station on a gentle right-handed curve of 2,000 feet radius; the left hand connection at the facing point continues on at that same curvature through the station, but the curvature of the right hand connection, which branches off to the race course platform, is, in the vicinity of the facing points, of 475 feet radius.

The gradient for down trains approaching this station is a rising one for the first $4\frac{3}{4}$ miles out of Dublin, it being at parts as steep as 1 in 75; for the remaining 2 miles,

it is either level or on a slightly falling gradient, the last ¾ mile into Foxrock Station being absolutely level.

The positions in which the various vehicles of the train were found after the accident were as follows :—The engine came to rest standing upright, with all its wheels in the six-foot way between the up and down main lines ; its rear end was just 74 yards ahead of the facing points on the down main line described above. The leading vehicle (No. 40 van) was found standing with its leading end close to the trailing end of the engine, to which it was still coupled, whilst its rear end was standing over the rails of the connection leading to the race course platform. The second vehicle was standing over the rails of the same connection, but all its wheels were derailed to the left of the rails on which they should have been running. The third vehicle was standing with its centre and rear pairs of wheels on the rails of the same connection, but its leading pair of wheels were slightly derailed to the left of their proper line. The remaining nine vehicles of the train were not derailed at all ; the leading three of them were standing on the rails of the connection leading to the race course platform, whilst the other six, which had not reached the facing points, were standing on the rails of the down main line. All the vehicles of the train were standing upright, and they were all still coupled together.

No marks connected with this derailment were found on the permanent way up to the facing points where the connection leading to the race course platform branches off from the down main line ; at those points, however, there were undoubted marks of a derailment having taken place. The upper surface of the left hand switch was flattened down at a few inches from its point, and a wheel mark was found on the upper surface of the switch rail ; the heel-chairs were damaged, and one of the cross rods was buckled, the switch rail being forced slightly inwards and its point was not housing close to the stock rail. Ahead of the switch rail chairs were broken and marked on the left hand side of both rails of the race course connection up to the crossings. The crossings were badly damaged, and ahead of them marks continued along the sleepers on each side of the six-foot way between the up and down main lines, up to the point where the engine was found standing. Marks were also found for a short distance ahead of the crossings alongside the rails of the race-course platform connection.

Evidence.

Christopher Everett, driver, states : I have been 33 years in the service of the Company, and I have been a driver for 23 or 24 years. I came on duty on the 15th of June, at 9.30 a.m., to work up to 12.30 at midnight. I should not leave my engine at all during that period of duty. I came off duty at 12.30 midnight the previous day. I was the driver of the engine of the 1.28 p.m. race special from Harcourt Street to Foxrock. My engine was a four-wheels-coupled tank engine with a leading and trailing pair of sliding wheels, and at the time of the derailment it was running chimney first. My engine was fitted with a steam brake working blocks on the four coupled wheels, and with a hand brake working the same blocks. It was also fitted with the vacuum brake apparatus for working blocks on the wheels of the train. My brakes were in good order. We left Harcourt Street at 1.28 p.m., and we did not stop anywhere on the journey. I had not the slightest difficulty with the engine up to the time that the accident occurred. My engine was No. 46. I am acquainted with that engine, having often driven it. I have never experienced any trouble with it. Up to the time of this accident I was very well satisfied with my engine. I remember approaching Foxrock Station. The home signal to lead to the race course siding was lowered for me, and I estimate the speed of my train when passing that signal at between 8 and 10 miles an hour. The first I knew of the accident was that the engine seemed to give a little quiver, and then dropped down off the rail. When I felt this quiver the engine was very near the facing points, but I cannot say for certain whether it had really reached them or if it was past them. I am not exactly sure, but I think my engine wheels dropped off on the right side of the road leading to the race course siding. I cannot say for certain which wheels of my engine were first derailed. I had closed the regulator at Stillorgan Bridge, about half a mile back, so steam was turned off at the time. I had applied my automatic brake before I came to the distant signal, checking the speed there a little bit. I then released the brake a little bit. I then applied my automatic brake again when coming round the curve approaching the home signal. The brake acted so well that I had a difficulty in blowing it off, and at the time that I felt the quiver the automatic brake was not applied at all. As soon as I felt the quiver I at once applied the automatic brake fully. The engine ran along off the rails, and eventually came to a stand. When the engine came to a stand it was in the six-foot between the up and down lines. Neither the fireman nor I was hurt at all. I had not noticed anything wrong with any of the vehicles behind the engine before the engine left the rails, but I cannot say for certain that the engine was the first vehicle derailed. I cannot account in any way for the derailment of the engine. I am well acquainted with the facing points. I have never had any trouble running through those facing points, but there was always a little knock when running through them. I looked round and saw that the leading van of the train was still coupled to my engine, and that it was slewed round, its rear end being over towards the race course platform. I cannot say when that even left the rails, and I did not see what happened to the vehicles behind it at the time of the derailment. I have never had any special instructions as to running through the facing points, but I

always understood that I had to run in easy over these points. The brake of my engine was not damged in any way by the derailment.

George Doyle, fireman, states: I have been between 12 and 18 years in the service of the Company, and I have been employed for nine years as a fireman. I was working with driver Everett on the 15th of June, and I was working the same hours as he did. I was with him on the engine of the 1.28 p.m. train from Harcourt Street to Foxrock. The first I knew of the accident was feeling the engine give a jump. At the time the engine gave a jump we had passed the home signal, but how much I cannot say. I am acquainted with the facing point leading to the race course platform. I do not know on which side of the facing point the engine was when it gave the jump, but the engine could not have been far away from the facing point at the time. I think that the engine may have been travelling at from 7 to 10 miles an hour at the time it gave the jump. Steam was turned off at the time. The automatic brake had been applied previously, but was taken off at the time. After the first jump, the engine ran along still jumping until it came to a full stop. I took no steps myself in the matter. I cannot account in any way for the derailment. The automatic brake had been applied previous to the derailment, and had reduced the speed of the train to such an extent that we could have stopped at the home signal had it been at danger. I am acquainted with engine No. 46, and I have never had any trouble with it before. I have regularly run through the facing points. I have never had any trouble at those facing points. I was not injured at all by the accident.

Christopher Everett, driver, recalled, states: I was still blowing off the brake at the time the derailment took place. I am confident that at the time the derailment took place the brake was entirely removed.

James Traynor, guard, states: I have been 18 years in the service of the Company. I have been a guard for 13 years. I was guard of the 1.28 p.m. race special on the 15th of June from Harcourt Street to Foxrock. I came on duty at 9 a.m. to work as a guard up to 2 p.m. I was then to act as flagman on the level crossing till 4.30 p.m. I was due then to act again as guard back to Harcourt Street, and should have come off duty finally at 12.5 at midnight. My train consisted of the following vehicles attached to the engine in the order given:—

	Wheels.
One van	6
Four third class carriages ...	6
Two first class carriages ...	6
Three second class carriages ...	6
One van	6
One second class carriage ...	6

12 vehicles altogether.

I myself was riding in the rear brake van. All my vehicles were fitted with the vacuum automatic brake working blocks on four wheels of each vehicle. My vacuum brake was in good order. We left Harcourt Street Station at 1.28 p.m. Nothing unusual occurred until we arrived at Foxrock. I knew nothing about this accident until I felt a sudden stop. When the train came to a stop my van had not reached the home signal. I estimate the speed when this sudden stoppage occurred at about 9 miles an hour. I was standing up in my van at the time. I was not thrown down by the shock. Steam was not applied at the time. The train had been previously checked by the use of the vacuum brake, but I cannot say whether it was actually applied at the time of the stoppage. Immediately the train came to a stand I got out, and I found that the passengers were already getting out. None of the passengers were hurt, and none of them made any complaints to me. I found that the engine and leading van were off the rails altogether. They were coupled together, and they were standing upright. The leading pair of wheels of the front third class carriage were also off the rails. Behind that all the vehicles of the train were on the line. I cannot account in any way for this derailment. I was the only guard of the train. There was no one travelling in the leading van.

Mr. Richard Cronin states: I am locomotive superintendent of the Dublin and South-Eastern Railway, and I have held that appointment nearly 16 years. Engine No. 46 was rebuilt in July, 1911, and was converted then from a six-wheeled to an eight-wheeled engine. At that time all the tyres of the wheels were newly turned. The engine was put on the line in July, 1911, and has been running ever since. The engine is stabled at Bray, and is in charge of the Bray foreman. I myself had not examined the wheels of the engine previous to the accident, and I had received no report with reference to the wheels. I examined the wheels of the engine on the afternoon of the aceident shortly after the derailment occurred. I did not form any decided opinion about the wheels. I produce a drawing showing a section of the tyre of the wheel at the present time. I do not consider that it is a bad section. I admit that it is somewhat worn, and that it is worn somewhat straight. I consider, however, that it was in a safe condition to run, and I do not think that it could have got off the road unless there was something to help it to do so. I consider that the driver was driving on this occasion at too high a rate of speed, and that that conduced to cause the derailment. One thing which leads me to form this opinion about speed is that I was standing at Stillorgan Station when the train passed, and I noticed at the time that it was going at a high rate of speed. I also consider that from the distance that the engine travelled after its derailment, the speed must have been far higher than that stated by the driver. I believe myself that it was the leading wheels of the engine that left the road at the facing point.

John Murnane, locomotive inspector, states: I am a travelling locomotive inspector. About a year ago I remember making a verbal report to the locomotive superintendent about the shaking that locomotives sustained in running through the facing points at Foxrock, and I put this in writing subsequently. I told the locomotive superintendent that I was uneasy about the crossing, and previously to doing so I had warned drivers to run cautiously through it, and one driver on his arrival at Foxrock had reported the crossing to me. The locomotive superintendent instructed me to caution all drivers to run slowly through the points, and also to report the matter in writing to him. I cautioned a number of the drivers, but I cannot say that I cautioned all drivers. I cannot remember whether I cautioned driver Everett. I myself have experienced a bad jolt at this crossing on a bogie engine. When I was driving two or three years ago I often got a jolt running through those points. I did not at that time think that the points were not in a fit state to run through. I attributed the jolt to the curve on which the points are situated. I did

not myself communicate in any way with the permanent way department as to the condition of the points.

Mr. Richard Cronin, recalled, states: After receiving the report from inspector Murnane I wrote to the permanent way department on June 20th, 1911. I submit herewith copy of my letter. I submit also a copy of the engineer's letter in reply. I wrote to the engineer again on the 28th of June, copy of which I submit herewith, after which the correspondence ended, and I have had no subsequent communication with the permanent way department on the subject of these points. Since the date of the last letter numbers of trains have run through the points on to the race course platform without any complaints being made.

Mr. P. Hickey states: I am assistant to the traffic manager of the line, and have held that appointment about 21 years. At the time of this accident I was standing about the centre of the race course platform at Foxrock, and I was watching the train coming in at the time that the derailment occurred. The train was coming straight towards me, and I could not judge as to its speed. I did not at the time notice anything unusual about the speed. I could form no opinion as to the speed of the train immediately previous to the derailment. I am nearly positive that it was at the facing points when the derailment really occurred, and it was undoubtedly the engine which was first derailed, and I am positive that it was the leading pair of wheels which were first derailed. Steam was off at the time, but I cannot say anything about the brakes. When I saw the engine approaching the station I saw it give a slight jolt, and it at once went through my mind that there was something wrong. I then saw the left-hand side of the front of the engine go down, and the engine came on pretty strong then on the permanent way. The van was coming in to the race course platform, and the engine pulled its front end across, and the van pulled the third class carriage following off the line. I subsequently found that the leading pair of wheels of the next vehicle were also off the line. Behind that there were three vehicles standing with their wheels on the connection leading to the race course platform, and the remaining vehicles were on the main line outside the facing points. After the derailment I thought the engine was running quicker over the permanent way than she ought to be doing.

Thomas Forde, locomotive foreman, states: I am employed as locomotive foreman at Bray, and have held that appointment for about seven years. Engine No. 46 is in my charge, and has been in my charge since she came out of the shops in July, 1911. I have never had any complaints about this engine from drivers. I myself have recently examined the condition of the wheels. I examined them within a week of the occurrence of this accident. When I last examined the wheels of the engine I saw that the tyres of the wheels were slightly worn, but I considered they were quite safe. She was the next of our engines to be fitted with new tyres. I recognised that the time was coming when she would require to have new tyres, but I was quite sure at the present time she was quite fit to run.

William Wilson, signal fitter, states: I have been employed as signal fitter about 27 years, and am now employed at Bray. I am acquainted with the facing points at which this derailment took place. I examined the points on the morning of the 15th of June. I found them in good condition. I did not detect anything wrong in connection with them. I considered that they were in a perfectly fit condition to run through. I examined them again immediately after the accident. I found that the top of the switch near the point was slightly flattened down, and the switch was not housing quite against the stock rail. I think that before the accident the switch had been housing close to the stock rail. I could form no opinion as to what had been the cause of the derailment. The points had not been altered at all after the derailment before I examined them. The points were still lying for the race course platform and the plunger was still in. I was standing near the ground frame at the time of the accident, and I went up to the points immediately after it occurred. I was sent down specially to examine everything before the race meeting, and I do so on every occasion of a race meeting.

Mr. Edward Moore states: I am assistant Engineer of the Dublin and South-Eastern Railway, and I am in charge of the line at Foxrock. I visited the scene of the accident almost immediately after its occurrence, and I examined the facing points. The points were locked. I believe that the points had not been shifted at all previous to my examining them. I found that the left-hand switch had been damaged. It had evidently been damaged by a wheel having mounted it. There was a very slight gape in the points, the switch rail not housing absolutely close to the stock rail. The third transome bar was slightly buckled. I submit a plan herewith showing the points at which marks were found on the line subsequent to the accident. These points were relaid in May, 1909, and were entirely new points at that time. Since then there has been no trouble with them. I could detect nothing in the condition of the points to account for this derailment. The rail is an 85 lbs. bull head rail fitted with 46 lb. chairs.

Conclusion.

From the above evidence, combined with the marks found on the line and with the positions in which the vehicles of the train were found when they came to rest, there can, I think, be no doubt that this accident originated with the derailment of the leading wheels of the engine at the facing point leading to the race course platform. The left-hand leading wheel of the engine appears to have mounted the left-hand switch rail at these points, and to have run a short distance along the top of the switch rail, and the engine was then completely derailed to the left of its line; it then ran along the permanent way, breaking or marking the chairs on the left side of each rail of the race course connection, until it reached the crossings. Here the engine was deflected by the rails to the left and it ran a short distance along the six-foot way between the up and down lines, where it ultimately came to rest. It seems very doubtful whether any of the vehicles of the train were also derailed at the points, as the 4th, 5th, and 6th vehicles

undoubtedly ran through the points correctly, and were found standing on the rails of the race course connection. It is probable therefore that the three leading vehicles also ran through the points correctly, and that their derailment was caused by their being subsequently pulled off the line by the derailed engine in front of them.

Engine No. 46, to which this accident occurred, was rebuilt by the Company in 1911, and all the tyres of the wheels were at that time newly turned; the engine was put on the line again in July, 1911, since which date it has been in regular use, and has been stabled at Bray. Foreman Forde, who is employed as locomotive foreman at Bray, states that he himself examined the wheels of this engine about a week before the accident. He recognised that the tyres were slightly worn, and that the time was coming when new tyres would be required, but he felt confident that at that time they were in a perfectly fit state for running.

Almost immediately after the accident the wheels of the engine were examined by Mr. Cronin, the locomotive superintendent of the Company. He states that he did not form any decided opinion about them; he admits that the left leading wheel was worn somewhat straight, but he considers that it was in a safe condition for running, and that its condition would not, by itself, account for the derailment.

I examined the tyres of the leading wheels of this engine a few days subsequent to the accident; they were undoubtedly worn somewhat straight, as stated above, and I cannot but regard their condition as one of the factors which contributed to cause this derailment.

The facing points at which this accident occurred were laid in new in May, 1909. The points are only worked on the occasion of a race meeting, and before doing so it is customary for a mechanic to be sent down specially to examine them. In accordance with this custom, signal fitter Wilson specially examined these points on the morning of the accident, and he states that he found them in a perfectly fit condition. Immediately after the accident he examined the points again, and he then found that the left-hand switch rail was not housing close to the stock rail, but he thinks that previous to the accident it had been housing quite close to it.

It should be mentioned that about a year ago there were complaints made by drivers as to their engines experiencing jerks when running through these points at moderate speeds. The points were consequently specially examined at the time by the Permanent Way Department, but no defect was found in them though a slight alteration was made at the crossing. Since that time there have been no further complaints with reference to these points, though numerous trains have run through them on to the race course platform line.

On the day of this accident and previous to its occurrence, three passenger trains had run correctly through these facing points on to the race course platform line, and, as stated above, the vehicles of the derailed train appear to have adhered to their right road when running through them, in spite of the engine having been derailed ahead of them; from this it appears unlikely that there was at the time any serious defect in the condition of those points.

The general speed of the train between Dublin and Foxrock was undoubtedly moderate, as it had taken 15 minutes to run the 6¾ miles; but the first 4¾ miles of this journey were on a rising gradient, over portions of which the speed must have been very low, so no reliable conclusion can be drawn as to the speed over the falling gradient and level, of which the last two miles consisted.

There seems to be no doubt that steam had been turned off at some considerable distance from Foxrock, and that the automatic brake had been applied to check the speed of the train when running round the curve approaching the station, but that at the time that the engine reached the facing points the brakes were not applied at all. The only witnesses who can speak to the speed of the train when running through the points are the driver, fireman, and guard, and they all agree that it did not exceed 10 miles an hour. Mr. Hickey, the assistant traffic manager, was standing near the centre of the race course platform at the time, and he saw the derailment occur; he can express no opinion as to the speed at the time of the derailment, but he was struck by seeing the high speed at which the engine travelled over the permanent way after the derailment. The distance run by this engine over the permanent way points undoubtedly, in my opinion, to a considerably higher speed than that estimated above.

At the same time it must be pointed out that the points at which this derailment occurred are so situated that in running through them a moderate speed is called for. The line approaching the points is on a right hand curve, so that when reaching the points the left hand leading wheel of the engine would be bearing hard against the left hand outer rail; the curve into the race course connection is a very sharp one, and in taking this curve at a

high speed there would be undoubtedly a liability of that wheel mounting the outer switch rail. This is what occurred on this occasion, and I am of opinion that the derailment must be regarded as having been due to a combination of a slightly worn tyre and a speed which was too high for the sharp curve through which the engine had to run.

Unless some alteration can be carried out so as to reduce the curvature at these points, trains should in future be restricted to a very low rate of speed when running through them.

A very similar derailment occurred on the Company's system about a year ago under very nearly the same circumstances, and in that case also the derailment was found to be partly attributable to the worn condition of the tyres of the engine wheels; this matter is one, therefore, which calls for special attention on the part of the Company.

I have, &c.,
P. G. von Donop,
Lt.-Colonel.

The Assistant Secretary,
Railway Department,
Board of Trade.

APPENDIX.

Damage to Rolling Stock.

Some bolts in wheel guards of engine broken; one carriage buffer bent; one panel of carriage injured; corner of van slightly damaged.

Damage to Permanent Way.

Six rails bent; one diamond crossing damaged; 11 crossing chairs broken; seven steel crossing chairs broken; two check chairs broken; four slide chairs broken; 70 ordinary chairs broken; 13 small chairs broken; 28 sleepers damaged; one switch broken.

Printed copies of the above Report were sent to the Company on the 9th August.

GLASGOW DISTRICT SUBWAY.

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

Sir, July 4th, 1912.

I have the honour to report, for the information of the Board of Trade, in compliance with the Order of the 18th June, the result of my inquiry into the causes of the collision which occurred on the 6th June, about 12.21 p.m., between two trains on the Glasgow District Subway, between Buchanan Street and Cowcaddens Stations.

Cable traction is employed on this Subway. A train (No. 1) composed of two eight-wheeled bogie cars—Nos. 29 and 34—was being hauled from Buchanan Street to Cowcaddens, when the apparatus for gripping the cable failed, and the train was brought to a stand by the driver applying his wheel brake. The failure occurred on a rising gradient, and it was necessary to let the train run back down the gradient on to the level, before assistance could be obtained. In the meantime, the following train (No. 2) with cars Nos. 1 and 39 coupled, was permitted to leave Buchanan Street, and a collision between the two trains ensued.

Train No. 2 was practically at a standstill before train No. 1 struck it, and the collision was not a very violent one. There were about 30 passengers in the two trains, and of these 10 complained of bruises, or of the effects of shock, but none were so seriously hurt as to require medical assistance. The vestibule ends of the two trains were crushed in, but no wheels were derailed, and the driver of train No. 2 fortunately escaped injury.

Both trains were fitted with brake-blocks upon all wheels. The blocks could be operated either by air pressure (Westinghouse continuous system) from the driver's