NORTH-EASTERN RAILWAY.

Railway Department, Board of Trade,
8, Richmond Terrace, Whitehall, London, S.W.,
April 21st, 1909.

SIR,

I HAVE the honour to report, for the information of the Board of Trade, in compliance with the Order of the 10th April, the result of my inquiry into the causes of the accident which occurred on the 9th April, to an express passenger train, a portion of which left the rails at Ouston Junction, near Birtley, on the North-Eastern Railway.

In this case as the 11.30 p.m. express from King's Cross to Edinburgh was passing Ouston Junction signal-box, the eight rear vehicles were derailed at a V crossing of a cross-over road with the down fast line. The derailed carriages kept in line. Two passengers complained of shock, and one attendant was shaken and bruised.

The engine of the train was a four-wheels-coupled bogie engine with a trailing axle, with a six-wheeled tender, fitted with the Westinghouse automatic brake working blocks on the four coupled-wheels and two trailing wheels of the engine, and on the six tender wheels, and with a hand-brake working the blocks on the tender wheels.

The train consisted of nine vehicles in the following order behind the engine, viz. :—

	Wheels.
East Coast bogie brake third	12
East Coast bogie sleeping car	12
East Coast bogie sleeping car	8
East Coast bogie sleeping car	8
East Coast bogie sleeping car	12
East Coast bogie composite	8
East Coast bogie third	8
East Coast bogie third	8
East Coast bogie van	8

The first coach was not derailed. The second had the rear bogie partially derailed, and the remaining coaches were derailed all wheels.

The total length of the train was about 194 yards, and the rear of it came to a stand about 32 yards ahead of the V crossing.

The derailment occurred at about 4.58 a.m.

Details of damage to permanent way and rolling stock are given in the Appendix.

Description.

At Ouston Junction there are two pairs of lines (fast and slow) running approximately north and south, the fast lines being to the east of the slow lines, and the down lines on the west of their respective up lines.

Just south of the signal-box the slow lines branch off to the south-west to Annfield Plain, and just to the north of the box there is a double junction between the up main and up slow, and between the down slow and down main lines.

Just north of the junction points in the fast lines is a cross-over road between the up and down fast line, the V crossing in the right hand rail of the down fast line being 44 yards north of the junction points and 167 yards north of the signal-box.

It was at this V that the derailment occurred.

The permanent way consists of 90 lb. rails, with 40 lb. chairs, fastened to the sleepers by two bolts placed diagonally, and of ash ballast.

The weights of the crossing chairs were as follows :—

No. 1 > chair, 110 lbs.
No. 2 crossing chair behind No. 1, 111 lbs.
No. 3 crossing chair behind No. 2, 129 lbs.
No. 4 chair behind No. 3, 95 lbs.
No. 5 chair, the one ahead of No. 1, 88 lbs.
No. 6 chair, the one ahead of No. 5, 101 lbs.

The length of the right-hand wing rail was 13 feet 6 inches, and it was held in position

by six chairs, viz. : No. 1 > chair and the two chairs behind it, Nos. 2 and 3, and by Nos. 5 and 6 and an ordinary 40 lb. chair ahead of No. 1.

The rails at the crossing were laid on ordinary sleepers, and no special crossing timbers of larger dimensions were employed as is usually the custom at such crossings.

The gradient of the down fast line at the spot is 1 in 220 falling, and the line is quite straight for a considerable distance on each side of Ouston box.

At the time of the derailment Ouston signal-box was switched out, and the next box open to the south was Chester-le-Street, about two miles away, and to the north, Birtley, about one mile distant.

There is a special restriction of 30 miles an hour for all trains between Ouston signal-box and Ouston down advance signal (fast lines) owing to pitfalls under the line.

Evidence.

Charles Edward Gill states : I have been 24 years in the North-Eastern Railway Company's service and 12 years a driver. I came on duty at 10.5 p.m. on the 8th April at Gateshead and expected to work until 8.5 a.m. on the 9th. I was driver of the first portion of the 3.19 a.m. express from York to Newcastle. On passing Chester-le-Street the signals were all off for me, but the distant at Ouston Junction was on on account of the speed restriction over the portion of line between Ouston signal-box and Ouston down advance signal, where the speed is limited to 30 miles per hour. I don't think I was running more than 25 miles an hour when I passed Ouston Junction signal-box. The first I knew of the derailment was a slight application of the brakes, and then I applied the Westinghouse brake fully and brought the train to a stand. Just as we were coming to a stand I felt a jerk which broke the coupling between the engine and the first carriage. The train came to a stand a few yards inside the down advance fast line signal. I got off the engine and shut the taps of the brake-pipe, and just then the front guard came to me, and seeing the train was off the line, he came on to the engine and we ran forward to Birtley as fast as possible so as to warn the signalman. I afterwards returned on the wrong line to the derailed carriages. I felt nothing unusual when going over the crossing where I found afterwards the carriages had been derailed. My engine was a ten-wheeled one of the Atlantic type, with leading bogie, four coupled wheels, and two trailing wheels, and six-wheeled tender working with blocks on the four coupled wheels and six tender wheels actuated by the Westinghouse Automatic brake. The trailing wheels of the engine were also fitted with blocks worked by the Westinghouse brake. I had 65 lbs. pressure in the train pipe.

Andrew Blythe states : I have been 16 years in the Company's service and about 12 years a fireman. I worked the same hours as driver Gill on the date in question. I left duty on the previous shift at 8.5 a.m. on the 8th and worked with the same driver. On approaching Ouston Junction the distant signal was at danger. We were running about 25 miles an hour on passing Ouston Junction. The first I knew of anything being wrong was feeling the brakes going on. The driver immediately applied the brake fully. We came to a stand just a few yards short of the Ouston Junction fast line down advance signal.

Robert Wills states : I have been in the service about 40 years and 25 years a conductor. I was in charge of the 11.30 p.m. sleeping car train from King's Cross on the 8th April. I had nine bogie vehicles on. We left York seven minutes late and are due into Newcastle at 4.52 a.m. I was riding in the front van, next the engine. The train slackened as usual at Ouston Junction. The first I knew of anything being wrong was the van jerking and then it came to a stand. I got out of the van on the six-foot side and turning round I saw the train was off the road and the up line blocked. I said to the driver "We will get off to the next cabin as quickly as possible," and we came to Birtley and informed the signalman that the line was blocked. I called the station master and then returned with the engine to the train. There were eight vehicles off the rails. The engine and leading van were not off. No passengers complained although I went amongst them for the purpose of noting any complaints that might be made.

Daniel Morfoot states : I have been 27 years in the North-Eastern Company's service and have been guard about 12 years. I was riding in the rear van of the 3.19 a.m. from York on April 9th. The first I felt of anything being wrong with the train was apparently the brakes going on and then my van came off the road all wheels. I then went to the front of the train and seeing the engine was going forward I returned to Chester-le-Street to protect my train and stop all traffic. I put detonators down as I went back. The second portion of the express was at Chester-le-Street, about two miles away, when I got there. I then returned to my train. On approaching Ouston Junction I noticed the train slacken considerably as usual.

John Barry states : I am chargeman of the length from Ouston Junction to a little south of Birtley Station, about three-quarters of a mile, and four lines of rails. I have two men to help me. I have been in charge of this length five years last October. I have had a great deal of trouble with this length since I took charge owing to pitfalls and slips. I arrived at the scene of derailment about 5.45 a.m. I found the right hand wing rail was just turned out of the chairs into the six foot. The point chair was broken just under the right hand wing rail and the spikes were laid over out of the sleeper. No. 2 chair behind the point chair was undamaged. No. 3, the second back from the point chair was broken under the V and also under the right hand wing rail. No. 5 chair, the first ahead of the point chair had the centre glut broken off. Ahead of these the chairs were all broken. I go round my length every morning and I took notice as I always do of this crossing. I don't remember whether there were any keys out the previous morning, but sometimes I find them out. I knew that there were old fractures in Nos. 1 and 3 chairs. There was an old fracture in No. 1 about

the centre of the chair and in No. 3 there was an old fracture in the centre of the chair under the V. I don't remember how long these chairs had been broken but possibly two or three months. I informed Inspector Wilkinson that these chairs were broken, but I don't remember the date. I always report broken chairs as soon as I find them. There has been a considerable subsidence of the line just at this crossing and the abutment of the bridge just behind the crossing has cracked. This particular crossing has not been packed since the end of last year when the road was lowered in order to make sufficient headway under the bridge which was sinking. I have been working at a slip on the slow lines nearer Birtley and could not be in both places at once.

Thomas Wilkinson states: I have been 34 years in the service and 10 years an Inspector of the Permanent Way. I am Inspector in charge of the Team Valley District. My district extends from south of Durham to Low Fell on the main line. I looked at the crossing where the derailment occurred about a week previously. I was aware that No. 1 point chair and No. 3 chair, the second chair behind the point chair, were broken. I do not remember how long previously I noticed these chairs broken, but I sent down two to replace them either the first week in March or the week following, and it is the duty of the ordinary gang to replace them. Although I knew these chairs were broken I did not think there was any danger. I had had some conversation with Barry and Chargeman Riley of the spare gang about replacing these broken chairs, as Barry told me he could not do it himself, and it was arranged that it should be done at the same time as another V crossing further south. The crossing where the derailment occurred was put in on the 1st October, 1893, composed of 90 lbs. rails, and the crossing chairs are of the standard pattern. We had put in extra spikes to keep the broken chairs from slewing. As a rule we only have two spikes diagonally in a chair. The chairs sent down at the beginning of March were not put in before the accident.

John Barry, recalled, states: No chairs to replace the broken ones, Nos. 1 and 3, were sent to me at the beginning of March, but some were sent for another crossing further south. If they had been sent to me I could not have put them in with only two men to help me as one man has to flag. We had put in extra spikes to keep the broken chairs from slewing, and I had plugged one of the spike holes and re-drilled it on the outside portion of the chair, which had been forced outwards, leaving a gap between the two portions. As a rule we only have two spikes diagonally in a chair. The chairs sent down in the first week in March for the other crossing were not put in before the accident. The right-hand wing rail of the crossing was renewed about three years ago. I do not remember any of the crossing chairs being broken previously during my 5 years on the length.

Henry Marshall states: I have been 5 years in the Company's service and work under Chargeman Barry. I go over my length of line every morning and evening. I went over the length on the evening of the 8th April and found the outside key of No. 1 chair under the right-hand wing rail was out, and that in No. 3 chair was hanging out. I drove them home. I knew that Nos. 1 and 3 chairs had been broken for two or three months. Both broken chairs had been double spiked as is the custom if we cannot replace them. The crossing has not been packed since the road was lowered at the end of last year. I find keys out of this crossing nearly every night when I go round. On account of the chairs being broken I had to put the keys in sideways so as to get them to hold, as the space was too wide. I have had many more keys to replace at this crossing than at any other crossing on account of the broken chairs.

Richard Wright states: I have been 25 years in the Company's service and about 10 years a carriage examiner. I examined the carriages of the 3.19 a.m. from York on the 9th April in the York Station before leaving, and as far as I could see all was in order.

Conclusion.

The evidence in this case leaves no doubt as to the cause of this derailment, which took place at an ordinary V crossing in the right-hand rail of the down fast line, 167 yards north of Ouston Junction signal-box, where there is a cross-over road between the up and down fast line.

Very shortly after the derailment the condition of the crossing, as noted by the Divisional Engineer, was as follows, viz. :—

All the keys were out on the outside of the right-hand wing rail, which was still in the chairs but was lying canted over, the space between the point of the crossing > and the inside of the head of the wing rail being $4\frac{1}{2}$ inches.

No. 1 chair, which carries the point of the V and the two wing chairs, was broken under the inside edge of the right-hand wing rail, and there was a gap of $\frac{3}{4}$-inch between the two portions of the chair.

No. 2 crossing chair, which is the one carrying the V and wing rails behind No. 1, was undamaged.

No. 3 chair, which is the back chair (behind No. 2) holding the V and the wing rails, was also broken under the inside edge of the right-hand wing rail.

No. 4 chair behind No. 3 was undamaged.

No. 5 chair, the one at the crossing knuckle next in front of the V point chair (No. 1), had the glut or filling piece between the two wing rails broken out, and No. 6 chair, the one ahead of No. 5, was broken in two places under the inside edges of the two wing rails.

There was a mark on the inside of the head of the right-hand wing rail about 8 inches behind the knuckle as if something had been rubbing against it, and there was also a wheel mark on the top surface of the foot or bottom flange of the right-hand wing rail, which was lying in a canted position.

The permanent way ahead of the crossing was considerably damaged for a distance of 150 yards, the sleepers and chairs being broken by the derailed coaches.

The engine and leading vehicle were on the rails, but the remaining eight coaches were derailed.

When I visited the spot the V and wing rails had been replaced in the crossing, and although the V was considerably worn, having been laid in on the 1st October, 1893, it was in a serviceable condition ; the right-hand wing rail was not so much worn, having been renewed about three years ago. On inspecting the broken crossing chairs, it was evident that the fracture in No. 1 > chair was an old one. No. 3 chair, the back one holding the V and wing rails, was broken in two places, under the V, and also under the right-hand wing rail ; the former was evidently an old fracture, and the latter a new one. The fractures in the other crossing chairs as described above were all new.

The evidence of J. Barry, the chargeman of the length of line between Ouston Junction and a point ¾ mile north of it, was that he had a great deal of trouble with his length of line owing to pit falls and slips, and that since the end of last year nothing had been done to the crossing in question, as he was working on a slip nearer Birtley. He was aware that Nos. 1 > chair and No. 3 crossing chair were broken and had been for two or three months, and he had reported this to Inspector Wilkinson, who was in charge of the district. He states he had double-spiked the broken chairs, and previously, when he noticed the spikes were slightly drawn, he had plugged a spike hole and driven the spike afresh, and he was aware that there was a gap between the two portions of No. 1 chair. Although the chairs had been reported broken for so long a time, Barry states that no chairs had been sent to replace the broken ones at this crossing, but in the first week of March two had been sent to replace some in another crossing near this one, but these had not been put in at the time of the accident, as he with his two men could not do so unaided, as one of them had to act as flagman to protect the other two.

One of Barry's men, H. Marshall, who went over his length of line on the previous evening, stated he found the outside key of No. 1 chair out, and that of No. 3 chair hanging out, and replaced them, and he further stated he found the keys of these chairs out nearly every night when he went round, and that owing to the space between the two parts of the broken chairs he had to put the keys in sideways instead of vertically to get them to hold.

The permanent-way inspector, T. Wilkinson, stated he was aware that the two chairs had been broken for some time, and that Barry had told him he could not replace them with the two men at his disposal, so he had arranged with the chargeman of the spare gang to help to replace them when replacing others at another crossing just south of this one, and that he had examined the crossing where the derailment occurred about a week previously, and did not think it was in a dangerous condition.

The driver of the train, C. E. Gill, stated he felt nothing going over the V crossing. He had reduced speed in accordance with the regulation, and was running at about 25 miles an hour. He felt a slight application of the brake, so he at once applied it fully and brought his train to a stand. Just as he did so he felt some jerks and the coupling of the engine broke. As the rear of the train came to a stand only 32 yards ahead of the point of derailment, it is evident that the speed was very moderate, and not at all in excess of that permitted by the restriction in force.

From the above evidence and description of the state of the crossing after the derailment, it is evident that the cause of it was the very weak condition of the permanent way at the crossing, due to the want of proper maintenance.

In all probability the preceding trains had loosened the keys in the chairs, some of which had probably fallen out, and possibly slightly spread the right-hand wing rail, and the remaining keys holding the wing rail in position probably fell out as the engine of the 11.30 p.m. train went over the crossing, allowing the wing rail to cant over in the chairs, and so the remaining coaches were all derailed in succession. Although the leading coach was on the rails when it came to a stand, there were cuts on the tyres showing that it had been derailed or struck something at the V crossing.

As mentioned above there has been a big subsidence of the line at this place, the abutments of an overbridge alongside it having sunk about two feet, and at a place

further north there is a bad slip in the embankment at the side of the slow lines, and this latter appears to have taken up the time of the regular surfacemen of the length of line in question.

Chargeman Barry had informed Inspector Wilkinson of the state of the crossing, who had also inspected it himself, and the latter was responsible that it was left so long in what was a dangerously weak condition.

It would appear desirable in consequence of the unusual difficulty of keeping this length of line in a satisfactory condition, that the regular gang employed on it should, for the present, be increased in number.

After the derailment the men in charge of the train acted with promptitude to protect the train, the engine at once running forward to Birtley signal-box to warn the signalman of the accident and that the up line was fouled, and the rear guard going back to Chester-le-Street, the signal-box in rear.

I have, &c.,
E. DRUITT,
Lt.-Col., R.E.

The Assistant Secretary,
Railway Department, Board of Trade.

APPENDIX.

List of Damage to Rolling Stock.

East Coast Joint Stock, No. 266.—Not derailed. Undamaged.

East Coast Joint Stock, No. 104.—*Derailed.* One footboard damaged; three door mouldings and cornice damaged; bogie frame bent; truss rod bent; one axle box broken; one axle $\frac{1}{4}$ inch out of gauge.

East Coast Joint Stock, No. 237.—*Derailed.* Two headstocks damaged; footboard damaged; two door facings damaged; two axle boxes broken; one door handle damaged; one drop shelf broken off (No. 4 berth); vestibule cover damaged; bogie hornplate bent; dynamo sheave axle broken; one cell box broken; two cradles bent; vacuum reservoir damaged.

East Coast Joint Stock, No. 235.—*Derailed.* Cell box damaged; vacuum and Westinghouse reservoir damaged; dynamo damaged; two dynamo sheaves broken; five single eyes bent; six step irons damaged; four footboards damaged; seven door facings damaged; corner pillar damaged; one headstock damaged; commode handle bent; leather in vestibule damaged; cornice damaged; pipe connection between Westinghouse cylinder and reservoir damaged.

East Coast Joint Stock, No. 186.—*Derailed.* Two truss rods bent; one truss rod broken; one brake block broken; dynamo middle sheave broken; cell box broken; vacuum reservoir damaged; seven door facings damaged; three step irons broken; two headstocks damaged; cornice damaged; five footboards damaged.

East Coast Joint Stock, No. 28.—*Derailed.* Lavatory pipe damaged; four wheel bolts broken; dynamo damaged; cell box damaged; vacuum reservoir damaged; hanger bent; five step irons bent; nine single eyes bent; cornice damaged; three footboards damaged; one footboard minus; two door facings damaged.

East Coast Joint Stock, No. 338.—*Derailed.* Three truss rod hangers bent; four footboards damaged; six single eyes bent; seven step irons bent; two cornices damaged; one end light broken; four facings damaged.

East Coast Joint Stock, No. 207.—*Derailed.* Three safety hangers damaged; one brake block broken; dynamo damaged; dynamo belt minus; vacuum reservoir damaged; Westinghouse reservoir hanger bent; cell box damaged; three facings damaged; four step irons bent; three footboards damaged; corner pillar damaged; cornices at both ends damaged.

East Coast Joint Stock, No. 46.—*Derailed.* Pull rod bent; four footboards damaged; two headstocks damaged; one single eye bent; cornice damaged; footboard and step irons minus.

Damage to Permanent Way.

188 sleepers broken; 332 common chairs broken; 15 P. and C. chairs broken; 20 fishplates broken; 40 fishbolts broken; 124 keys broken; eight switch bolts broken; 500 spikes damaged; one pair of points and rods damaged; 20 yards of steel rail bent.

Printed copies of the above Report were sent to the Company on the 20th May.