



MINISTRY OF TRANSPORT & CIVIL AVIATION

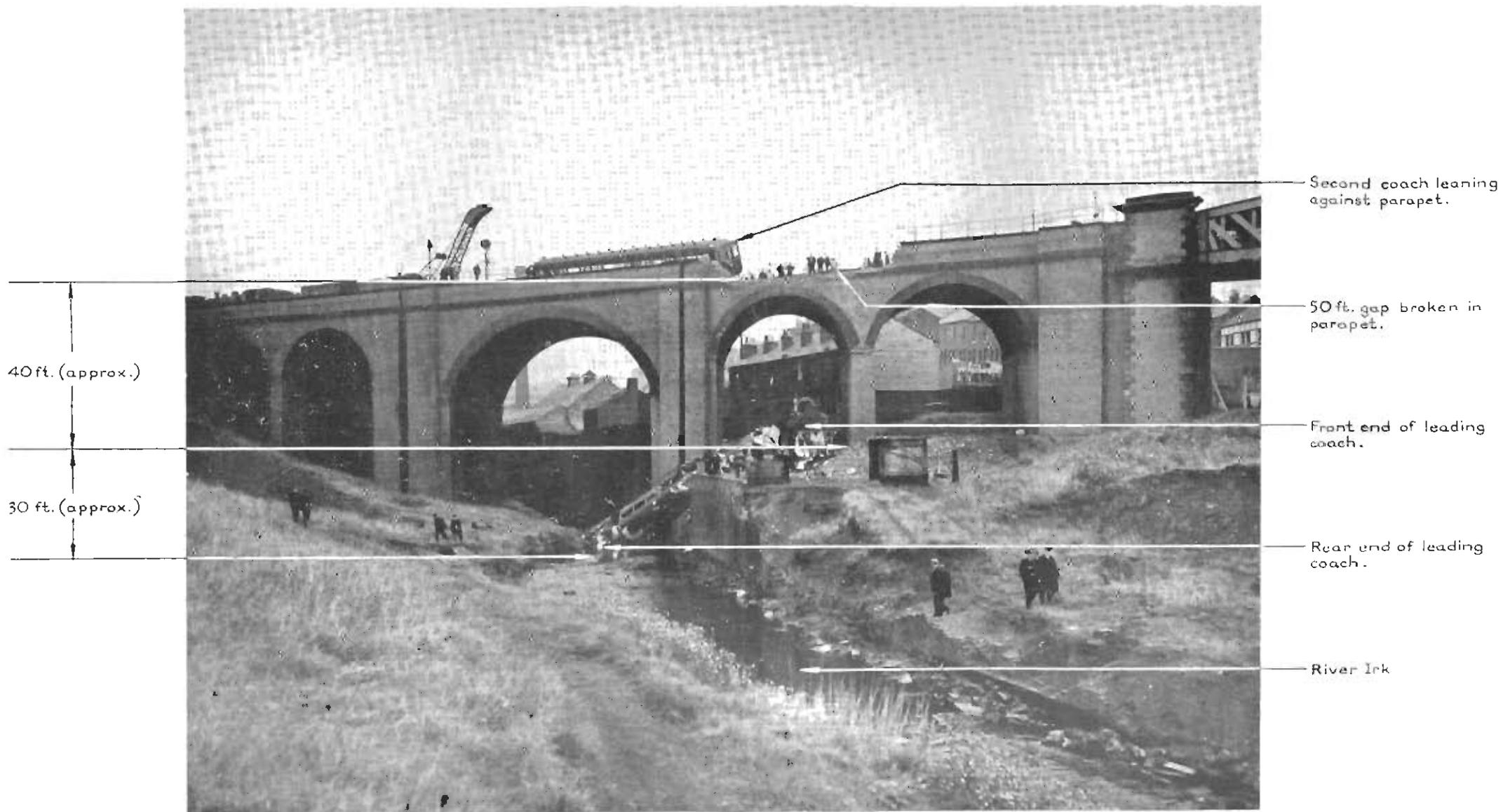
RAILWAY ACCIDENTS

**REPORT ON THE COLLISION**  
which occurred on  
15th August 1953 at  
**IRK VALLEY JUNCTION,**  
near **MANCHESTER (VICTORIA),**  
in the  
**LONDON MIDLAND REGION**  
**BRITISH RAILWAYS**

LONDON : HER MAJESTY'S STATIONERY OFFICE

1953

TWO SHILLINGS NET



GENERAL VIEW FROM THE WEST OF THE WRECKAGE OF THE 7.20 a.m. ELECTRIC TRAIN

SIR,

I have the honour to report for the information of the Minister of Transport and Civil Aviation, in accordance with the Order of the 15th August, 1953, the result of my Inquiry into the collision which occurred at about 7.40 a.m. on that day at Irk Valley Junction. The junction is situated on a viaduct on the electric line between Manchester (Victoria) and Bury in the Central Division of the London Midland Region, British Railways.

An Up electric passenger train collided with a Down steam passenger train on the diamond crossing of the junction. The former was the 7.20 a.m. stopping train from Bury to Manchester (Victoria) and it ran past the Junction home signal at Danger at about 35 m.p.h. The other was the 7.36 a.m. stopping train from Manchester (Victoria) to Bacup, and it was passing under clear signals over the junction to the branch line at about 10 m.p.h. The leading electric coach struck and overturned the steam engine, smashed through the parapet wall of the viaduct, and fell leading end first 40 feet on to the bank of the River Irk below; the rear end came to rest in the shallow river, 30 feet below the front end. A serious irregularity by the signalman in the junction signal box contributed to the accident.

The day was a Saturday and there were about 100 passengers in the electric train, many fewer than on other week days. The leading coach was, however, well filled. The steam train carried about six passengers. I much regret to report that nine passengers and the driver of the electric train were killed. Fifty-eight passengers were injured and were removed to hospital, of whom 34 were allowed to go home after treatment and two were discharged within a week. The injuries to the remaining 22 passengers were more serious and they were detained.

The accident was witnessed by an employee in the Carriage and Wagon Department of the London Midland Region, who at once ran and operated a nearby fire-alarm. The Fire Brigade was on the scene within a few minutes and it was followed closely by ambulances, doctors, nurses and the police. The injured, some of whom had to be released from the end of the coach which was under water, were removed to hospitals in Manchester without delay.

Steam breakdown cranes were ordered from Newton Heath and from Bank Hall, Liverpool, and the line was cleared and normal traffic working resumed at 5.35 a.m. on Monday, 17th August. In the meantime, an emergency service was maintained between Manchester and Crumpsall, firstly by buses and then by steam trains over a diversionary route.

The weather was clear but cloudy.

#### DESCRIPTION.

##### *The Line.*

2. The plan shows the layout of the site and the arrangements at Irk Valley Junction signal box.
3. The line from Manchester to Bury is  $9\frac{3}{4}$  miles long and it was electrified in 1914 on the side contact third rail system at 1,200 volts D.C. After leaving Manchester it passes under the main steam lines in a tunnel and then rises steeply over Collyhurst No. 1 Viaduct and crosses the River Irk and another steam line by Collyhurst No. 2 Viaduct. It then falls at 1 in 44 to Queens Road signal box and thereafter continues to undulate through Woodlands Road and Crumpsall to Bury.
4. Irk Valley Junction lies on Collyhurst No. 2 Viaduct just over one mile from Manchester and it is the point where the steam trains to Bacup branch off the main electric lines, on another viaduct.

It is a simple double line junction and it is controlled from a nearby signal box. It is equipped with a single home signal for each of the three directions and with a starting signal on the Up line to Manchester. The Up Main home signal is 21 yards from the diamond crossing and 122 yards from the box. There are Up Main inner and outer distant signals, worked by separate levers, situated respectively under the Queens Road Up starter and Up home signal, at distances of 283 and 621 yards from the Up home signal protecting the converging junction. The clear sighting distances of the inner and outer distants are 180 yards and 150 yards respectively, but with no train on the Down line, the outer distant can be seen from 391 yards. Again with no train on the Down line, the Up Main home can be seen clearly from the cab of an electric train just before passing through Queens Road overbridge, at a distance of 441 yards.

Irk Valley Junction signal box has a 20 lever frame. Block working in all directions is by 3-position ex Lancashire and Yorkshire instruments. There are no track circuits at the junction and no block controls on any of the signals on the line. The Junction Up Main distant signals cannot be seen from Irk Valley box and repeaters are provided. The junction points lie normally for the main line.

The normal electric service is two trains each way an hour but during peak periods there is a ten minute interval service. On Saturdays, however, some of the trains are not run including the 7.10 a.m. train from Bury, *i.e.* the train which precedes the 7.20 a.m. train on other week days.

#### *The Trains.*

5. The five coaches of the electric train were built in 1914, and were marshalled in the following order—motor coach, trailer, motor coach, trailer, motor coach. This stock is of unusually heavy construction with steel underframes and body framing and aluminium panels, and the total weight of the train was 220 tons. It was equipped with vacuum brakes, the available force of which was 86% of the train weight. A "dead man's handle" was fitted, the release of which caused a full application of the brakes and cut off the supply of current to the traction motors.

The train was driven from a small cab on the left hand side of the front end of the leading coach, opposite to the high tension compartment. Entrance to the cab is from the right by way of a luggage compartment and through a steel door, which is held closed by a ball latch. A seat is provided for the motorman between the controls and a heater. An end window gives the motorman a good view of the line ahead, and there is also a window on the left hand side.

6. The steam train comprised four coaches weighing 116 tons and was hauled by a Class 4P, 2-6-4 type, tank engine which weighed 88 tons in working order. The engine was driven from the left hand side and was travelling chimney leading.

#### *The accident.*

7. The first impact occurred about 2 yards north of the diamond crossing. The electric train struck the engine on its left hand side about 6 feet behind the buffer beam and overturned it. As the engine fell over, the leading electric coach came in contact with the wheels and under gear of the engine. It also struck the leading coach of the steam train, derailing it and forcing it over at an angle of about 45° against the viaduct parapet; it then hit the second coach, and derailed the front bogie. The leading electric coach was diverted to the right across the Down line and struck and smashed through the Down side parapet of the viaduct. After hanging for a matter of seconds the rear end coupling broke, and it fell into the valley below. The second electric coach stopped short of the gap in the parapet against which it was leaning at an angle of about 60°. The leading bogie of the third electric coach was derailed, but the other coaches of that train and the rear two coaches of the steam train remained on the rails.

8. The majority of the casualties occurred in the leading electric coach which was wrecked beyond repair. The second coach was also heavily damaged with severe distortion of the whole underframe.

The main frame of the steam engine was badly buckled and the centre pin of the trailing bogie was fractured. One wheel was torn off its axle. The front ends of the first two coaches on the steam train were heavily damaged.

Generally, the nature and extent of the damage suggested that the combined speed of the two trains at the time of the impact was about 45 m.p.h.

9. The track and the conductor rails were extensively damaged. The current was cut off almost instantaneously by the opening of the substation circuit breakers on short circuit.

The photograph opposite shows the gap in the parapet of the viaduct and the leading coach of the electric train lying in the valley below.

#### RULES

10. The line is worked under the Absolute Block Regulations of the former London, Midland and Scottish Railway. Regulation 4 includes a provision that "Line Clear" for a train shall not be given unless the line is clear for at least  $\frac{1}{4}$  mile beyond the home signal.

Regulation 3(c) reads as follows:—

"Where it is necessary that a Signalman who has acknowledged the 'Is line clear' signal for a train should receive an intimation of its approach before it enters the section, the 'Train Approaching' signal (1-2-1) must, where authorised, be sent in accordance with the special instructions issued".

It should be noted that the signalmen at Woodlands Road signal box are required to use this signal.

Regulation 11 requires a signalman to take certain precautionary action when an unusual time elapses between the receipt of "Train entering Section" and the arrival of the train, unless he is satisfied that the train is approaching.

REPORT AND EVIDENCE

*Train staff.*

11. The 7.20 a.m. Up electric train from Bury was running to time and its last stop before Manchester was at Woodlands Road at 7.38 a.m. The train was manned by Motorman A. Hardman (who was killed) and Guard J. Collinge.

Collinge said that up to the time of the accident there was nothing unusual about the trip. The train stopped at Woodlands Road Halt for the booked period of 20 seconds. It passed Queens Road box without a check and at a normal speed for a clear run through to Manchester, which he estimated at 36-40 m.p.h. The first thing he knew about the accident was the impact, and he was certain that it was not preceded by an emergency brake application.

Collinge stated that the vacuum brake gauge in the rear driving cab of the train, where he was travelling, read 19 inches and that the brakes had worked correctly for all the station stops. He could not see any signals until the train had passed them. Before leaving Bury, he had spoken to Motorman Hardman who appeared quite normal and cheerful.

12. The 7.36 a.m. Down steam train left Manchester on time. It was brought almost to a stand at the Irk Valley Junction branch home signal, which was then lowered. Driver F. Heap said that he opened the regulator and was passing over the junction to the branch line at 5-6 m.p.h. when the engine was struck by the electric train. Neither he nor the fireman saw the electric train before the collision, and they had not seen the Up home signals. Heap said that he saw both signals at Danger soon after the collision.

*The Block Signalling of the Electric Train.*

13. The signal boxes and signalmen concerned were—

|                        |                                     |
|------------------------|-------------------------------------|
| Woodlands Road ..      | Signalman W. H. Upton,              |
| Queens Road ..         | Signalman R. T. Davenport,          |
| Irk Valley Junction .. | Relief Signalman A. Clayton,        |
| Newtown No. 1 ..       | Signalmen E. Smith and G. Robinson. |

The following table shows the times of the block signals for the 7.20 a.m. electric train as recorded in the Train Registers at these boxes and at Crumpsall, the box next beyond Woodlands Road. The figures denote minutes past 7.00 a.m. :-

|                     | Approx.<br>Distance<br>between<br>boxes | Rear Section |                    |                | Advance Section |                |                    | Remarks   |
|---------------------|---|--------------|--------------------|----------------|-----------------|----------------|--------------------|---|
|                     |   | Accepted     | T.E.S.<br>received | T.O.S.<br>sent | Accepted        | T.E.S.<br>sent | T.O.S.<br>received |   |
| Crumpsall ..        |   | 27           | 31                 | 36             | 31              | 36             | 37                 | Train passed<br>36                                      |
| 5 furlongs          |   |              |                    |                |                 |                |                    |   |
| Woodlands Road      |   | 31           | 36                 | 37             | 31              | 37             | 39                 | Train passed<br>37                                      |
| 5 furlongs          |   |              |                    |                |                 |                |                    |   |
| Queens Road ..      |   | 21           | 30                 | 40             | 30              | 40             |                    | Train passed<br>40                                      |
| 2 furlongs          |   |              |                    |                |                 |                |                    |   |
| Irk Valley Junction |   | 29           | 39                 |                | (see Remarks)   |                |                    | Offered<br>forward at<br>29, but not<br>accepted.       |
| 5 furlongs          |   |              |                    |                |                 |                |                    |   |
| Newtown No. 1 ..    |   |              |                    | (see Remarks)  |                 |                |                    | Offered from<br>the rear at<br>29, but not<br>accepted. |

*Note (i)*—On account of the fact that Woodlands Road Halt is between that box and Queens Road and also because of the short distance between Queens Road and Irk Valley Junction boxes, the Woodlands Road signal box instructions require the signalmen (under Regulation 3) to send "Train Approaching", code 1-2-1, to Queens Road as soon as "Train entering Section" is received from Crumpsall. "Train entering Section" also has to be sent. The signalmen are required to enter all block signals, including the 1-2-1 signal, in the Train Registers. (The 1-2-1 signal was, in fact, never sent).

*Note (ii)*—The clock at Queens Road was one minute ahead of the clock at Irk Valley Junction.

14. Signalman Upton had worked at Woodlands Road for two years. He said at first that he signalled the train at the times recorded in his Register, but he admitted later that they were wrong and that the actual times at which he signalled the train forward were those recorded by the signalman at Queens Road box. He cleared all the signals for the train. He did not send the 1-2-1 signal to Queens Road. He said that between 7.38 and 7.39 a.m. he received an enquiry on the telephone from Davenport about the train and replied that it would soon be arriving at his box. At the Departmental Inquiry held previously, he denied having received that enquiry.

15. Signalman Davenport, who had been at Queens Road since April 1953, said that he accepted the train at 7.21 a.m. He received "Train entering Section" at 7.30 a.m., and then offered the train forward to Irk Valley Junction and it was accepted. He then cleared his home, starting, and inner distant signals. It was not his practice to pull the outer distant lever until he saw that the Irk Valley Junction outer distant signal, under his home signal, was at Clear. Davenport stated that he did not clear his outer distant for the train as he saw that the Irk Valley Junction outer distant signal was at Caution. At about 7.39 a.m. Clayton telephoned to him and enquired where the train was, and Davenport replied that he would ask Upton. He then rang Upton and was told that it was just leaving, or about to leave, Woodlands Road Halt. As he took up the other telephone he saw the train coming through Smedley Lane bridge, and he told Clayton that it was about to pass Queens Road box. He gave "Train entering Section" to Irk Valley Junction at 7.40 a.m., on which his forward section block needle went to "Train on Line".

Davenport did not know, when the train was offered to him at 7.21 a.m., which particular train it was. He said that provided the conditions allowed, he accepted trains as they were offered. He did not know which trains were run on Saturdays, and whilst the Working Time Table was available in the box no extract had been taken from it and exhibited.

The booked timing of the train from Woodlands Road Halt to Irk Valley Junction is two minutes, but Davenport was not concerned when the train was not in sight 9 minutes after receiving "Train entering Section" from Woodlands Road box, and he did not apply Regulation 11. He added that such an interval between the bell signal and the arrival of the train was not uncommon.

Davenport said that the 7.20 a.m. train was frequently checked at Queens Road box on account of the branch line train passing over the junction, and then he applied Rule 39(a) at the home signal. Usually, however, he would receive "Line Clear" and lower the starter before the train reached it. On the day of the accident he thought the train was travelling at a normal speed for a clear run through Irk Valley Junction.

Neither Upton nor Davenport saw the motorman of the train.

16. Relief Signalman Clayton had taken over the duties of another signalman at Irk Valley Junction box on the Monday before the accident, having learnt the working, which he did not find difficult, about three weeks previously. His period of duty during the week was from 5.0 a.m. to 1.0 p.m.

Clayton said that as soon as he accepted the 7.20 a.m. train at 7.29 a.m., he offered it to Newtown No. 1 but "Line Clear" was refused. The junction points were normal and he gave "Line Clear" to that box for the 7.36 a.m. steam train at 7.33 a.m.; he offered it to Smedley Viaduct box when he received "Train entering Section" at 7.37 a.m. (*Note:* The steam train was due to pass the junction at 7.39 a.m. and the electric train at 7.40 a.m.).

He had not received "Train entering Section" for the 7.20 a.m. train when the steam train emerged from the tunnel. Consequently when the latter was approaching the home signal he telephoned to Davenport to enquire the position of the electric train, and Davenport replied that he would enquire from Woodlands Road box. Clayton therefore assumed that the train had not yet passed that box and so, in order to avoid delay to the steam train, he reversed the junction and cleared the branch line home signal. The train, which he thought had come to a momentary stop, started at once. He went back to the telephone and heard Davenport say that the electric train was passing Queens Road box. Clayton said that by then the engine had passed his box and he could therefore do nothing. The collision occurred very soon afterwards.

He said that he did not receive "Train entering Section" for the 7.20 a.m. train. He entered the time of the signal in the Register after the accident and turned the instrument commutator to "Train on Line" but the needle remained at "Line Blocked". (*Note:* This was on account of the severing of the block wires.) He stated that all the Up Main signals had been cleared for the previous electric train (7.0 a.m. from Bury) and he had put the levers back to normal after it. He saw from the repeaters that the distants were at Caution before he gave line clear for the 7.20 a.m. train, and he had seen the Up home go back to Danger. He was very definite that he did not at any time lower any of the Up signals for the 7.20 a.m. train, and that he had not offered it to Newtown No. 1 again. There was no train on the Up Branch line and that home signal was also at Danger.

Clayton said that he saw the electric train soon after Davenport had spoken to him. (*Note:* From tests made an Up train can be seen at a distance of about 280 yards from the box.) As soon as he saw it he realised that it could not stop at the home signal, and he thought it was going at a normal speed for a clear run through the junction; the speed did not seem to slacken before the collision. He did not see the motorman but said he did not look.

This was the first Saturday Clayton had worked in the box and he did not know the time table. He was surprised that "Train entering Section" had not been received for a train by about 7.38 a.m. having given "Line Clear" for it at 7.29 a.m., and that was why he telephoned to Queens Road. (It may be noted that "Train entering Section" for the previous three Up trains had been received within two minutes of "Line Clear" being given). He had experienced no difficulty in working with any signalman in an adjacent box. He had previously during the week refused to accept a train from Queens Road box to enable him to make the crossing movement to the branch line.

Clayton was well aware that Regulation 4 did not permit him to foul the junction after giving "Line Clear" to the Up electric train, but he thought that the latter was about a mile away.

Clayton is 35 years of age. He joined British Railways in March 1950 and was trained for two months as a signalman. He was quite confident in himself when working in boxes, and in August 1951 he applied for and obtained an advertised vacancy for a relief signalman Class 2. Up to then he had not worked in any junction box. In July 1953 he was allocated as a Class 1 relief Signalman. He was last examined in the Rules and Regulations in February 1952 by Assistant District Signalman's Inspector Washington. It is not the practice in the Central Division to test a relief signalman's knowledge of a box after he has declared himself acquainted with it and consequently Clayton was not examined in the working of Irk Valley Junction box. Clayton is a married man with a large family, but he said he had no special worries; also that he and his family were all quite fit, and that he was not tired. His home is quite close to the Junction box.

17. Signalmen Smith and Robinson of Newtown No. 1 confirmed that the 7.20 a.m. electric train was offered at 7.29 a.m., but "Line Clear" was refused because it was so much in advance of the train's booked arrival time. It was not offered again. Neither signalman had experienced any difficulty in working with Clayton.

#### *Evidence of other Staff.*

18. Porter H. Knight was on duty at Woodlands Road Halt for the 7.20 a.m. train. As it passed, Motorman Hardman, whom he knew, opened his side window and shouted a greeting. Knight said he looked well and was smiling.

19. Signalman H. B. Burstow, of Smedley Viaduct box, saw the collision, which occurred about 30 seconds after he received "Train entering Section" for the 7.36 a.m. steam train. He thought that the electric train was going to stop at the Junction home signal, which he assumed was at Danger although he did not see it.

20. Ganger J. W. Page was on Queens Road and heard the collision. He looked across the valley and could see the dust and steam which had risen, and he noticed that both the Junction Up home signals were at Danger.

21. Mr. T. H. Bevan, Assistant Station Master, Manchester (Victoria) arrived at Irk Valley Junction at 7.56 a.m. and saw that the Fire Brigade, ambulances and police had arrived, and that some of the injured had already been removed. He noted that all the signals were "ON". After ensuring that all the protective arrangements had been made he proceeded to Queens Road Box.

Mr. Bevan said he spoke to Clayton who gave much the same description of the events as I have recorded above. He asked Clayton whether he had cleared the Up Main signals for the 7.20 a.m. train and the answer was "No".

#### *The Signalling.*

22. I personally checked the signalling equipment during the afternoon after the accident. The locking in the frame was correct and it prevented the lowering of any of the Up Main line approach signals when the junction was set for the branch line. I could not find anything, either on the signal posts or in the run of the wires, that could have caused any one of these signals to stick in the "Off" position. The cables of the distant signals were severed by the collision but the Up Main home signal was working and the arm responded correctly to the lever.

#### *The 7.20 a.m. Train.*

23. The train had received its bi-weekly inspection on the afternoon before the accident and four brake blocks had been changed on a trailing coach; the remainder were serviceable.

I examined the three rear coaches of this train in the Shops at Bury. The brake gear was in good adjustment and the brakes responded correctly to an application from a motor coach which was attached to them. I also examined as much of the smashed equipment from the leading motor coach as had been found. There was no evidence of any electrical burning. Since then the subsidiary circuit switches have been located and I am informed that they also show no signs of any electrical burning. The examination of the equipment indicated that the motorman was not in the cab at the moment of the impact.

The leading motor coach had been overhauled in the Horwich shops in March 1953, and had since run 16,000 miles.

*Tests.*

24. I travelled from Bury to Manchester on a test train which was similar to the 7.20 a.m. on the day of the accident. An emergency brake application, including the release of the "dead man's" handle, was made at the commencement of the 1 in 44 rising gradient just past Queens Road bridge and soon after the home signal came into view. The train was travelling at about 40 m.p.h. and it stopped before reaching the viaduct in a distance of 261 yards.

25. Another test was made by the Divisional Officers in a train running from Woodlands Road to Manchester with all signals "Off," and the following results were obtained :—

| <i>Location</i>   | <i>Distance from point of collision (yards)</i> | <i>Time from location to point of collision (seconds)</i> | <i>Average Speed (in m.p.h.)</i> |
|---|---|---|----------------------------------|
| Earliest sighting point for Irk Valley Junction outer distant .. .. . | 1,031   | 50  | 45                               |
| Clear sighting point for ditto (with train on Down line) .. .. .      | 790   | 40  | 45.2                             |
| Sighting point for Junction inner distant                             | 484   | 25  | 35.9                             |
| Junction inner distant and Queens Road starter (on one post) .. .. .  | 304   | 16  | 38.7                             |
| Point of collision .. .. .  | -   |   |                                  |

26. The following information was also obtained from tests :—

- (i) Time taken to replace all Up Main line signals at Irk Valley junction, to reverse the junction points and to clear the Down Branch home signal .. .. . Minimum 10 secs.
- (ii) Time taken to reverse the junction points and to clear the Down Branch home signal .. .. . Minimum 6 secs.
- (iii) Time taken by a steam train almost at a stand at the Down Branch home signal to reach the point of collision .. .. . Minimum 22.5 secs.
- (iv) Speed attained by a steam train at point of collision .. .. . Maximum 15 m.p.h. (approx.)

*Evidence regarding block signalling generally.*

27. In view of certain information given at my Inquiry I asked for a detailed check on the block working at Woodlands Road, Queens Road and Irk Valley Junction boxes to be made. This was done for a period of two weeks before the accident, and the following irregularities were found :—

- (i) The signalmen at Woodlands Road had regularly failed to send "Train Approaching" to Queens Road as required by the signal box instructions, and the signalmen at Queens Road had not reported the matter.
- (ii) Signalman Upton at Woodlands Road had adopted a practice locally known as "knock for knock", e.g., he asked "Line Clear" for an Up train immediately "Line Clear" was given for a Down train irrespective of whether or not an Up train had been offered by the signalman at Crumpsall. The result of this was a long interval sometimes amounting to 18 minutes between "Line Clear" and "Train entering Section".
- (iii) Incorrect "Train entering Section" signals were sent by Woodlands Road to Queens Road, sometimes long before that signal was received from Crumpsall.
- (iv) The times of the "Line Clear" and "Train entering Section" signals were frequently incorrectly recorded in the Woodlands Road Train Register.
- (v) Signalman Davenport persistently switched out Queens Road box, allegedly for the purposes of going to the lavatory or to get coal, irregularly and without sending any bell signal, in contravention of Regulation 24. When switching out he telephoned to the adjacent boxes but he did not do even that when switching in. It was noted that the box was switched out for periods of up to 47 minutes. He recorded the passage of trains when the box was switched out. During the period of 47 minutes he recorded 6 trains whereas only 5 trains ran ;
- (vi) The switching out of Queens Road box was not recorded in the Train Register at that box, nor at Woodlands Road box, nor again at Irk Valley Junction box before Clayton's arrival.

28. I also asked for a detailed check to be made at signal boxes at which Clayton had worked previously, and this was done. According to the block times recorded, there were four cases of seriously irregular junction block working similar to that which he committed at Irk Valley Junction. In two of these cases, a passenger train was concerned.

Clayton was questioned closely on these irregularities. He admitted that each case appeared to be a "breach of block", but he was certain that he had never knowingly taken such a risk before the occasion which caused the accident.

*Evidence of Supervisory Staff.*

29. Mr. W. E. Farnell was District Signalman's Inspector, Bury, up to 1951, and Signalman Clayton was trained at Ilex Hall Carriage box, Rawtenstall, under him in 1950. The procedure then was for an applicant to be interviewed by the Station Master or the Inspector and, if considered suitable, to be placed under the tuition of an experienced signalman who took a particular interest in training men. The normal training period was about 2 months. During that time the trainee was interviewed about **once a fortnight** by the Inspector who assessed his progress. In some cases men were found unsuitable and **their training** was stopped. At the end of the period the Inspector examined the trainee. If the result was **satisfactory** he was then interviewed by the Staff Assistant to the Divisional Operating Superintendent before being posted to take charge of a box.

Mr. Farnell could not remember Clayton during his training period nor could he recollect examining him, but he remembered clearly seeing him later in boxes. He formed the impression that Clayton was capable, **keen** and intelligent, and said that he was interested in the discussion of block working. Mr. Farnell **again** interviewed Clayton in connection with his application for the post of Relief Signalman **Class 2**, and reported on him favourably. He agreed that up to that time Clayton had not worked in any Junction box. He had not seen him since leaving the District.

Mr. Farnell said that when **visiting** a signal box the usual irregularities he looked for were omissions in the Train Register, the failure **by** enginemmen to carry out Rule 55 and incorrect **signing on** and off by the signalmen. Only when **investigating some incident did he ever** compare the Train Register of one box with that of an adjacent box, but he **agreed that it was only by doing so** that breaches of the Block Regulations would come to light. He checked the times recorded in the Register only in connection with Rule 55.

30. Mr. J. Washington was Assistant District Signalman's Inspector, Manchester (Victoria) for about two years up to 27th June, 1953. He thought that during the three months before he left the District he had visited Woodlands Road, Queens Road and Irk Valley boxes twice each. On one occasion, during April, it was to introduce Inspector Kelly, who had taken over the District. He had also been to Woodlands Road and Irk Valley boxes to pass out new signalmen. He stated that it was unusual to go into a box "**unless you happen to be passing or you have something definite to investigate**". He said that about half his time was taken up with **new entrants** and that he had no opportunity for **routine inspections**. A special Inspector had, however, been appointed for training new men a few weeks before he left the Manchester District.

Except when investigating some particular case, his normal visit to a box would last about 5 minutes. When asked what form of **checking** he would do on such an occasion he answered "Sign the book, ask the signalman is everything all **right**, **look through** the last two pages of the book and see that Rule 55 is properly observed". He did not know that "knock for knock" was being practised at Woodlands Road box, but agreed that an examination of the Registers would have revealed it. He was also unaware that "Train Approaching" was not being sent by that box. He thought it was not usual to record that signal. (*Note:* It was found that Woodlands Road box was the only one out of 21 boxes on the District which did not record the signal.)

Mr. Washington said that the block times recorded in adjacent boxes were checked only in the Special Train Registers kept for the three monthly train census. **These are used during the period of census recording (one week) in place of the ordinary Registers. They are then sent to the inspector's office and the number of trains run are extracted for statistical purposes.** He said "if there is anything which leads us to think **there is any irregularity when going through the book** we check it with the books of the adjoining boxes"; **otherwise no checking is done** which would reveal block irregularities, except by observing the working when in a box. He personally had never found a case of a "breach of block" except possibly when investigating a particular case.

He remembered taking Upton for his last annual examination and was satisfied with him although it was necessary to put him right on one or two Regulations. He considered Upton was "average". Mr. Washington **had not** personally examined Davenport but said that he was particularly intelligent and good on the Rules and Regulations. He had taken Clayton for his last annual examination in February, 1952, and had found his knowledge of the Rules and Regulations satisfactory.

Mr. Washington was shown the cases referred to in paragraph 28, all of which took place in his District, although **three occurred after he had left**. He agreed that they all appeared to be cases of a "breach of block" and **reiterated that the only way to discover such irregularities was to check carefully the Train Registers of adjacent boxes.**

He did not know that Davenport was in the habit of switching out Queens Road box for going to the toilet, nor that he was doing it irregularly. There was no need for it as the lavatory is attached to the box.

31. Mr. L. W. Kelly had been the Signalman's Inspector of the District since 4th May, 1953, having previously worked on the Western Division. There are 64 boxes in the District. He said that apart from an introductory visit he had been in Queens Road box three times and Woodlands Road box once. He had also visited Irk Valley Junction box, but there was no signalman on duty at the time. All the visits were for a specific purpose and he had done no detailed checking. He said he was concentrating on a scrutiny of the working of the more important boxes first. When doing that he would study the Instructions and then check the Train Register for about the previous two days. He would compare the Registers of adjacent boxes only when looking into some special irregularity, and never as a matter of routine.

Mr. Kelly said that he personally had discovered the block irregularities committed by Clayton (see paragraph 28) when checking the Registers. He had never before experienced such "breaches of block". He said that these irregularities were noted from the examination of the particular junction box Register, and confirmed by reference to the Registers of the adjacent boxes.

He also discovered the irregular working in Woodlands Road and Queens Road boxes (see paragraph 27) when checking the Registers after the accident. He agreed that they should have been noticed during the thrice weekly inspections required to be made by the station master, Crumpsall. The irregular switching "out" and "in" by Davenport at Queens Road, which he described as a dangerous practice, came to light only as a result of Clayton having recorded it in the Irk Valley box Train Register.

32. Mr. J. Johnson who had been the station master at Crumpsall since September 1951, was in charge of Woodlands Road box and had visited it thrice weekly as laid down. He was unaware that the "Train Approaching" signal had to be sent by the signalmen, although it was clearly included in the box Instructions.

33. Four relieving station masters had worked at Crumpsall shortly before the accident, for periods of from 9 to 21 days. Three of them admitted that they had not read the Woodlands Road box Instructions, and the fourth agreed that he had not noticed that signalmen were not complying with them. Neither Mr. Johnson nor any of the relieving station masters were aware of the other irregularities practised at Woodlands Road box.

#### CONCLUSIONS

34. The reasons for this accident were two-fold—firstly, Hardman, who was driving the 7.20 a.m. electric train, ran past the Irk Valley Junction Up Main home signal at Danger; and secondly, Signalman Clayton committed a serious irregularity by permitting the steam train to pass over the junction to the branch line after he had given "Line Clear" for the electric train, in contravention of Regulation 4.

35. I have no doubt whatever that the Junction Up Main outer and inner distant signals were at Caution and that the home signal was at Danger when the train passed them. The interlocking prevented the levers of these signals being pulled when the junction was set for the branch line. There was no defect in the distant signals and the Up Main home signal arm was working freely, and none of them could have remained "off" with the lever normal in the frame. Furthermore, Ganger Page saw the Up Main home signal was "On" immediately after he heard the collision.

The Up Main outer and inner distant and home signals are well sited and could be seen without difficulty from distances of 391 yards, 180 yards and 441 yards respectively, as there was no train on the Down line. The Up Branch home signal could be seen from the main line but there was no train on the branch line at the time and that signal also was "On".

36. I have considered whether the Irk Valley Junction Up Main signals could have been cleared for the electric train, and then returned to Danger.

Simple time distance calculations based on the information given in paragraphs 25 and 26 are, however, sufficient to prove that Hardman could not have seen either the home or the inner distant at Clear.

On the other hand, if the outer distant had been cleared it could have been in Hardman's view for about 17 seconds; but it must have been returned to Caution at least 32.5 seconds before the collision when the train was still some 100 yards from it.

I do not, however, believe that it ever had been at Clear for the train. Clayton had offered the train once to Newtown No. 1 box, but it had been refused and I do not think that he would have cleared the starter which was necessary before the distants could be cleared. As mentioned earlier, there are no block controls. Furthermore, Davenport said that he saw the Junction outer distant at Caution, and Clayton was very definite that he had at no time cleared any of the signals for the electric train.

37. The reason for Hardman's failure to obey the signals will never be known for he was killed. An analysis of the running of the 7.20 a.m. train may, however, provide the explanation. From 30th March to 14th August, 1953, the train was run 110 times. On 101 occasions the train was checked at Queens Road home signal and it was stopped at the starter 29 times. On 9 occasions it had a clear run through due to the late running of one of the two trains; it was on these occasions only that the Junction distant signals could have been cleared, but the margin in some of them was probably not sufficient for this to be done. It was therefore only on rare occasions that the Junction distants were ever at Clear for the train. During the period the train was not once stopped at the Junction home signal.

On the day of the accident, Davenport had cleared all the signals for the train, except the outer distant, when he received "Train entering Section" from Woodlands Road and "Line Clear" from Irk Valley Junction, both at 7.30 a.m.; there was nothing to prevent him doing so. When Hardman saw the home signal at Clear, he probably assumed the starter would also be "Off" (as it was), and he may have taken it for granted that, as usual, the train would then be given a clear run through the junction. Although this may well be the explanation for his action, it is no excuse whatever for his failure to act on the information given by the Junction distant signals.

38. Even if that was the reason for not reducing speed on seeing the distants at Caution, it does not explain why Hardman did not apply the brake when the home signal came into view at Danger at a distance in which the train could easily have been stopped. In fact, it is clear that no brake application at all was made before the collision.

I have considered the possibility of Hardman having fainted or become unconscious for some reason. A post-mortem examination was not possible but his medical history was satisfactory with no indication of any disease or disorder. He was absent on account of sickness for only 5 days during the past year. Furthermore, as mentioned earlier, he was probably not in the driving cab at the moment of the impact. It seems likely, therefore, that he realised that there would be a collision only just before it happened. Presumably he then applied the brakes fully, released the "dead man's handle" and pushed open the cab door to get into the luggage compartment. The brake application probably took effect at the same time as the collision.

39. I am satisfied that the brakes of the train were in working order. As mentioned before, they are vacuum brakes and they are therefore self checking. There was evidence that the train pipe was connected up correctly and any defect other than a blockage in the pipe would have caused the brakes to be applied or prevented their release. Any such blockage is most unlikely as the train had not been uncoupled that morning, and, if it had occurred, it would not necessarily have prevented all the brakes in the train from working. Lack of evidence of electrical burning on any of the cab equipment also rules out the possibility of serious arcing which might have distracted his attention.

40. I can conclude, therefore, only that Hardman, having assumed that the train would get a clear run through the Junction, relaxed his attention and did not look at the home signal.

He was 64 years of age and was due to retire in November this year. He was a man of slight build and of simple and abstemious habits, and was a well-known and respected public figure, being an Alderman and having been Mayor of Bury; he was a member of some local public Boards. He joined railway service in 1907 and became a driver in 1920. The same year he was appointed spare motorman. In 1940 he was appointed motorman and had worked in that capacity ever since. His sight was last tested on 7th December, 1951, and was good. He had an excellent record. Motorman Instructor J. Clingo spoke of him as a "first class driver and rather a stickler for rules".

41. Signalman Clayton was little, if any, less responsible for the accident than Hardman, for he should not have allowed the electric train to approach the Junction home signal and the steam train to cross over to the branch line simultaneously. The Block Regulations specifically forbid such a practice unless an outer home is provided at an adequate distance from the home signal. There is no such outer home at Irk Valley Junction.

Clayton was observing the Regulations when he accepted the two trains with the junction points set normally for the main electric lines. Then, however, he should have held the steam train at the Down home until the electric train had passed. Alternatively, if he wished to give preference to the steam train, he should have made certain that the electric train had stopped at the Up Main home signal at Danger before reversing the junction and clearing the signal for the steam train to proceed to the branch line. But Clayton did neither. Instead, he rang up Davenport at Queens Road to find out the position of the electric train, which he had accepted some ten minutes earlier. From Davenport's answer (that he would enquire from Woodlands Road) Clayton assumed that the train was at least a mile away. Without waiting to get a firm reply from Davenport he reversed the junction points and allowed the steam train to start. When Davenport told him that the electric train was so close, it was too late for the steam train to be stopped.

Clayton was undoubtedly somewhat misled regarding the position of the electric train, but that excuses him in no way whatever. He fully realised that his action was irregular. The only reason he gave for it was that he was trying to save delay to the steam train.

His personal particulars are given in paragraph 16. During his three years service he had a clear record. He gave his evidence in a most straightforward manner.

42. The various irregularities committed by other signalmen (see paragraph 27) had no direct bearing on the accident, which would not have occurred if Hardman had stopped the train at the Up Main home signal or if Clayton had obeyed the Regulations. Nevertheless they indicate that slipshod methods of working have existed in these boxes and that these were largely the result of ineffective supervision. Upton was responsible for a number of these irregularities. He was an unsatisfactory witness and was, I think, deliberately untruthful in his statements to the Departmental officers and to me. Davenport's action in closing Queens Road box irregularly was unpardonable. He was also dishonest for he did not record the fact and entered in the Train Register block signals which were neither sent nor received. He was straightforward in most of his statements to me, but I find it difficult to accept the fact that the switching out of the box was entirely connected with visits to the lavatory.

In my view, the subsequent inquiries indicate that neither Upton nor Davenport is the type of man who is suitable for the respected and responsible position of a signalman. I refer to these matters and to Clayton's other block irregularities later.

#### REMARKS AND RECOMMENDATIONS

43. This tragic accident resulted from the coincidence of two entirely separate failures of the human element. A motorman ran past a home signal at Danger at speed after having been warned of its aspect by two distant signals at Caution, and a signalman knowingly committed a serious breach of the Block Regulations. I consider that the signalling arrangements are adequate.

The Regulations require the line to be clear for  $\frac{1}{4}$  mile beyond the home signal before giving "Line Clear", to allow for misjudgment in stopping a train. This was, however, no case of misjudgment for the brakes of the electric train were not applied until just before the collision. As mentioned earlier, the true facts will never be known. If the explanation given for the motorman's action is correct, as I believe it to be, it emphasises how wrong and how dangerous it is for a driver to assume that he will *never* be stopped at a signal which is *usually* seen at Clear.

It has been mentioned that the motorman must have relaxed his attention. I have also said that he held positions on local public boards, and I understand that these formed his main interests. Other drivers have different outside interests which nowadays are more varied than heretofore, and it is right that they should have interests outside their work. But is it fundamental that when at work they must give the whole of their attention to it to the exclusion of other matters. This means that a driver must never relax his concentration on the observance of and obedience to signals, on which depends the safety of his and other trains.

I do not consider that Automatic Train Control of the Warning type which reminds a driver of the conditions ahead, would have prevented this accident. In any case, the electric lines between Manchester and Bury will not rank high in priority for the provision of this equipment.

44. As far as the signalman is concerned, there is little to be said. The safety of trains depends very largely on such men obeying the Block Regulations, and the comparatively small number of accidents that occur as a result of their failure in this respect is an indication of their integrity generally.

Block controls and track circuits are provided at many places to assist signalmen and to prevent an accident if they unwittingly make errors or omissions of certain types. No such equipment is provided at Irk Valley Junction and it would not have prevented this accident, nor would it prevent an accident of the same nature at any other similar junction.

It has been mentioned that on account of the narrow margin between the passage of the two trains concerned over the junction, the electric train is almost invariably checked at Queens Road box signals. This had no bearing on the accident, but it is an undesirable feature at such a junction and I am glad to report that endeavours are being made to eliminate it.

45. As already mentioned, Clayton had committed the same type of block irregularity on four previous occasions at other junctions. When he joined the service he had no railway background, but I think that his initial training as a signalman was adequate. He was, however, promoted to relief signalman very early, in fact within 15 months, and before he had worked at any junction. I consider that whenever possible a man should have more experience than this, including at least a reasonable experience of junction working if he is likely to work in such a box, before being selected for such a post. I consider also that relief signalmen should be tested in their knowledge of the working of all boxes to which they may be sent. I understand that this is the practice in some of the Regions.

46. Clayton's earlier irregularities did not come to light until investigations were made as a result of this accident: in two of them passenger trains were concerned. If they had been discovered sooner he would have been relieved of his post or at least relegated to an unimportant box. In the normal course of inspection, however, such "breaches of block" would not be noticed unless a signalman committed the offence when a supervisor was present, which is unlikely. It is only when a Train Register is checked with care, and the Register of one box is compared with that of an adjacent box, that such irregularities can be found.

47. As recorded in paragraph 27, subsequent investigations also disclosed certain irregularities in two other signal boxes, which had no direct bearing on the accident.

The "Train Approaching" signal is used for operating purposes only and it is not a "safety" Regulation. Nevertheless it was not sent as was required, and the fact that it was neither sent nor recorded was not noticed.

The method of asking "Line Clear" for a train long before it had been "offered" was irregular as also were the premature "Train entering Section" signals and the incorrect booking of bell signal times. All these malpractices can engender doubt in the mind of a signaller on the true state of the block sections. Again, none had been noticed.

The irregular "switching out" of a box, and the "switching in" without any information or bell signal to the signaller on either side undoubtedly presented an element of danger, even though the signaller concerned said that he took precautions. No mere casual inspection of the box concerned would have laid the practice bare and it was discovered only when the relief signaller, who was partly responsible for the accident, recorded in his Register the information that the adjacent box had been switched out.

48. The above irregularities cumulatively indicate a very unsatisfactory state of affairs. The Rules and Regulations have been designed as a result of experience over many years to prevent accidents, and they are there to be obeyed and not disregarded. Signallers who get into the habit of displaying contempt for the Regulations or who think they can do things in a better or easier way are certain sooner or later to make a serious mistake which may cause an accident, more usually when someone else makes a mistake at the same time.

49. These facts recall the necessity for effective supervision at all levels to ensure that train working is in accordance with the Rules and Regulations. I am sorry to say that it was lacking as far as these boxes were concerned. Indiscipline as disclosed in this and in some other accidents in recent years will invariably result from lax supervision.

50. I do not, however, believe that supervision generally is ineffective nor that signallers generally are undisciplined. But it would not be reasonable to assume that the cases which come to light when an accident occurs are isolated.

There are now a larger number of young signallers and of signallers without long experience or any railway background, working in signal boxes than heretofore, particularly in some localities. I believe that the great majority of such men are completely dependable, but Clayton, Davenport and Upton, all of whom fell in one or other of these categories were not so.

51. It is satisfactory to note that immediately after this accident the Railway Executive Headquarters inaugurated a campaign against irregular working in signal boxes, and I am sure that this will have good results. I do, however, consider that arrangements should be made for a closer scrutiny of Train Registers than I am informed has been possible in the past, and I recommend that this should be applied particularly at junctions and to signallers whose experience is limited.

I have the honour to be,

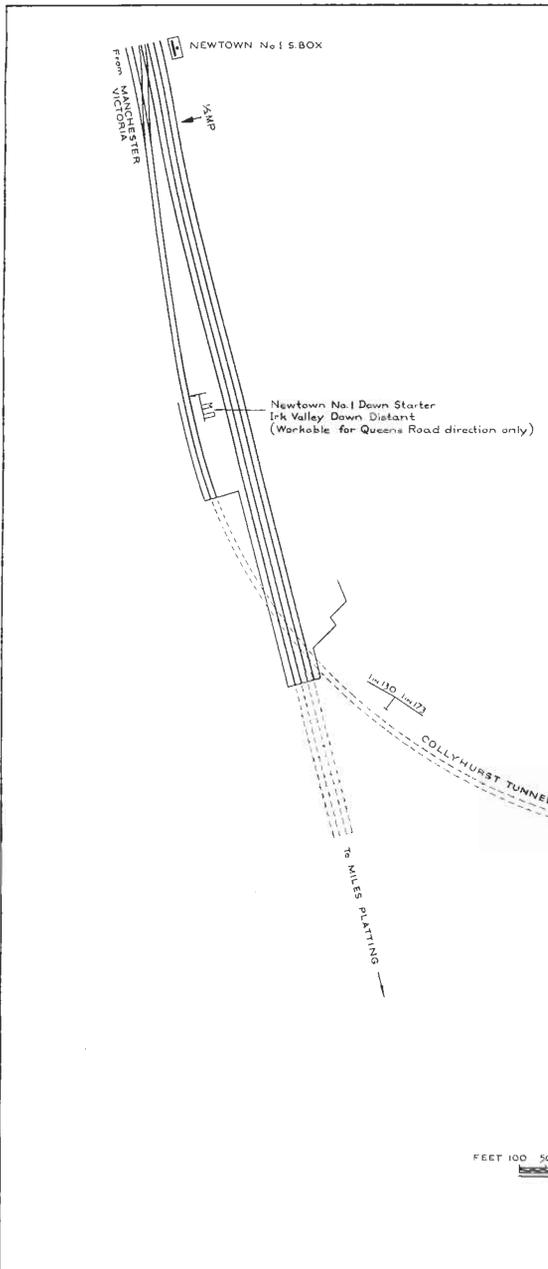
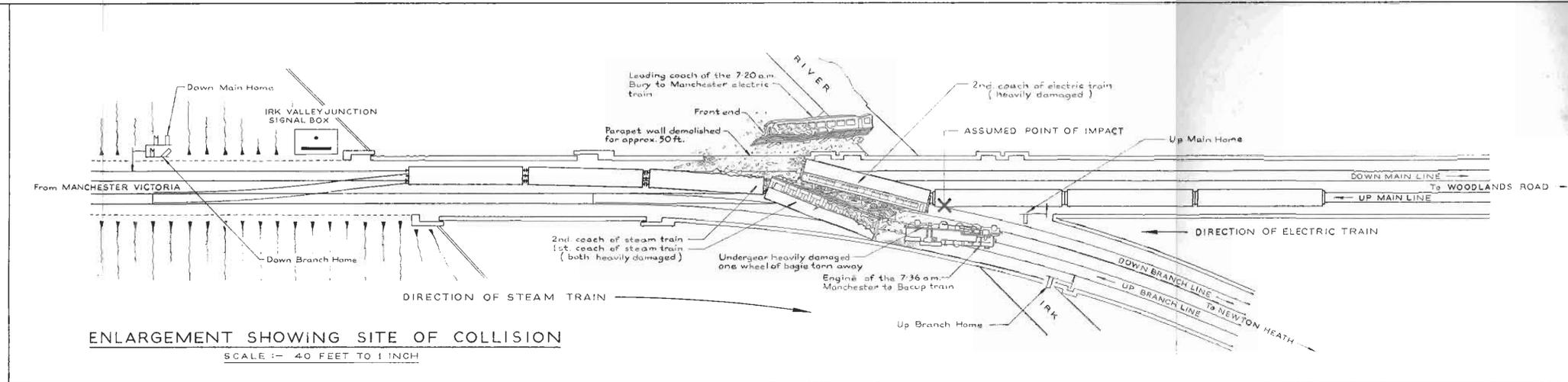
Sir,

Your obedient Servant,

D. McMULLEN,

*Colonel.*

The Secretary,  
Ministry of Transport and Civil Aviation.



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MANCHESTER**  
**15th. AUGUST, 1953**

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