

LONDON MIDLAND AND SCOTTISH RAILWAY.

MINISTRY OF TRANSPORT,
Metropole Buildings,
Northumberland Avenue,
London, W.C.2.

20th December, 1939.

SIR,

I have the honour to report, for the information of the Minister of Transport, in accordance with the Order dated 16th October, 1939, the result of my Inquiry, at which I was assisted by the Hon. H. T. de B. Bingham, into the accident which occurred at about 8.53 p.m. on Friday, the 13th October, at Bletchley on the London Midland and Scottish Railway.

The 7.37 p.m. down express passenger train, Euston to Inverness, had been standing at the down fast platform for about 9 minutes, and a shunting engine was in the act of attaching a van on to the rear, when this engine was run into by the following 7.50 p.m. express passenger train, Euston to Stranraer, which was also due to stop at Bletchley.

I regret to report that four persons lost their lives, namely a Royal Air Force passenger and the driver of the shunting engine, whose bodies could not be released till the following afternoon; also a postman and a porter who were working at the rear of the Inverness train. Five other Passengers and one Company Servant were seriously injured, while 27 Passengers and 7 Servants sustained minor injuries and shock.

Everything possible was done for the injured; five doctors, two ambulances of the Bletchley Urban District Council, one ambulance from a R.A.F. depot, and the Company's ambulance from Wolverhampton were soon in attendance, together with many willing helpers, including members of the Bletchley local Ambulance Brigade.

The Inverness train, comprising engine and 12 bogie vehicles, weighed 488½ tons, and the brakes were fully applied; the shunting engine, No. 9169, was of 0-8-0 type with a 6-wheeled tender, and weighed 99½ tons. The van which was being shunted was of 4-wheeled type, and weighed about 11 tons including its load.

The Stranraer express comprised 11 bogie coaches, weighing 338 tons; it was drawn by two engines, namely the pilot, No. 5025, Class 5P. 5F., type 4-6-0, with 6-wheeled tender, weighing 125½ tons, and the train engine, No. 6130, Class 6P, Royal Scot, type 4-6-0, with 6-wheeled tender, weighing 139½ tons. The total weight of the train was, therefore, 602½ tons, and its length 786 feet; the brake power was 89 per cent. of the total weight.

The collision took place at considerable speed, chimney to chimney, the impact causing the shunting engine (which was also stationary with the brakes applied) to destroy the van and the two rear coaches (brake vans) of the Inverness train; in doing so, this heavy engine mounted the down fast line platform, and demolished the Refreshment and Waiting Rooms, where some of the casualties occurred. A large portion of the station roof was also destroyed or had to be taken down in clearing the wreckage. The two engines hauling the Stranraer train were derailed and the pilot mounted the wreckage; the leading vehicle of this train was also derailed and damaged. A length of about 75 yards of the down fast track was badly damaged and had to be replaced. The debris blocked the up and down fast lines, which were not restored to traffic till about 9 a.m. on Sunday, the 15th October.

The weather conditions at the time were bad, and there was driving rain with an East wind. It was also very dark, and no landmarks could be seen on account of the black-out and absence of moonlight.

The accident was attributable to failure on the part of the two drivers of the Stranraer express to observe the last six signal indications, covering a distance of over 2 miles, before this train reached the obstruction.

Description.

The Company's quadruple main line through Bletchley lies in a north and south direction, and the four tracks are designated, from west to east, as down fast, up fast, down slow, and up slow. The station is on the level, but is

approached from the south over the down fast line on almost continuously falling gradients for 15 miles from Tring, including 6 miles at 1 in 333 through Cheddington, and 5 miles at 1 in 1683 and 1 in 660 after leaving Leighton Buzzard, through Stoke Hammond. The site of the collision was about 7 yards north of the south end of No. 3 platform, and the following are the approximate distances therefrom to the relevant down fast signals and other locations concerned:—

Stoke Hammond Distant	2 miles 1385 yards South.
(colour-light)	
Lamb's Siding Distant {	
Stoke Hammond Home }	2 " 35 " "
Overbridge No. 148	1 mile 1166 " "
Chelmscote overbridge, No. 149	1 " 776 " "
Lamb's Siding Home	1 " 732 " "
Lamb's Siding Starter	1 " 174 " "
Bletchley No. 1 Distant (96) }	
Lamb's Siding Advance Starter }	1513 " "
Bletchley No. 1 Outer Home (95) *	750 " "
Bletchley No. 1 Inner Home (94) with detonators in conjunction	310 " "
Bletchley No. 1 Signal Box	200 " "

The Company's latest C type block equipment is installed, the boxes concerned being provided with 3-position 3-wire block instruments. Occupation of the track circuit on No. 3 platform line holds the inner home signal, No. 94, at danger through the block instrument; the outer home, No. 95, cannot be lowered in such circumstances until the track circuit in rear of it for 200 yards (and extending up to the inner home) is occupied. The control on the advance starter at Lamb's Siding by this track circuit, for one release only, is extended to Stoke Hammond home when the former box is out of circuit, as on the night in question.

There is also sequential locking between Nos. 94 and 95 signals, and the latter's arm and lever must be normal before *line-clear* can be given. The arms and lights of Nos. 95 and 96 are repeated in No. 1 box, where two signalmen were on duty. In addition, a warning red light appears on the down fast block instrument should No. 96 arm remain off when the lever is replaced normal.

The signals concerned are situated to the left, or west side, of the down fast line, and all are fitted with long-burning oil lamps, except the Stoke Hammond distant which is a colour-light, over 2½ miles from the scene of the collision. Bletchley No. 1 distant is 35 ft. above rail level.

The down fast line approaching Bletchley is straight and in open country. Observation in daylight from the footplate of a Class 5P. 5F. engine on the day of my Inquiry, 18th October, showed that a good view is obtainable, in clear weather, of all the above-mentioned signals; but there appeared to be some interference of Bletchley down fast distant by Chelmscote overbridge (44 yards to the south of Lamb's Siding double-armed down fast home) and by Lamb's Siding down fast starter.

A sighting inspection was also made on the night of the 19th October, with the following results:—Bletchley down fast distant could be seen at a range of only 836 yards, owing to obscuration by Lamb's Siding down fast starter. The outer home was sighted from the distant signal location at a range of 763 yards; but it appeared to mingle with the cluster of inner homes ahead of it.

Report and Evidence.

1. Permissible speed was limited to a maximum of 60 m.p.h., and the following instructions applied:—

"Until further notice no train must exceed a speed of 60 m.p.h. on any line.

Drivers must continue to observe carefully all laid down speed restrictions of less than 60 m.p.h.

When passenger trains are running late, in clear weather and when no air raid warning is in force, drivers must endeavour to make up time provided all speed restrictions are strictly complied with and the maximum speed of 60 m.p.h. is not exceeded."

2. The Inverness train had arrived at Bletchley at 8.44 p.m., four minutes late; after station duties had been completed, it was drawn forward to allow the shunting engine to attach the van on to the rear via a trailing connection, No. 46, leading from the Oxford branch and situated between No. 1 box and the south end of the platform. The movement had just been completed, and the van was being coupled up, when the collision occurred; points No. 46 had remained set for the withdrawal of the shunting engine, and they were run through.

According to the Train Registers and the Guard's journal, the Stranraer train passed Tring at 8.40 p.m., six minutes late, and arrived at Bletchley at 8.53 p.m., three minutes before time. In thus making up nine minutes, a distance of 15 miles had been covered in 13 minutes, and the last $6\frac{1}{4}$ miles from Leighton Buzzard in about five minutes. Clearly, an average speed of about 70 m.p.h. must have been maintained after passing Tring to the site of the collision.

3. Signaller G. J. Campbell, who had had 30 years' service in No. 1 box, said that, after the arrival of the Inverness train at 8.44 p.m., he accepted the Stranraer train from Stoke Hammond at 8.47 p.m. and proceeded to make the shunt of the van from the Oxford branch. The shunting engine propelled the van tender first, and Campbell observed a tail lamp at the trailing (chimney) end. At 8.50 p.m. he received the *Entering-section* signal for the Stranraer train and waited for it to occupy the track circuit in rear of the outer home, to enable him to pull that signal lever.

When the *train-waiting* buzzer sounded he went to the end of the frame to pull the lever, anticipating that the train would come to a stand at the signal as usual; but, on looking out, he realised that it was passing the inner home and the box, and he had no time to take any action. Campbell's account was that the train "*was going faster than the ordinary expresses when stopping at Bletchley and would have over-shot the platform in any case*". The repeaters (which he said he observed after replacing the levers to normal behind the Inverness train) were showing that the distant and outer home signals were on, while the back light of the inner home could be seen distinctly.

While Campbell had had no time to operate his independent detonator placers, or to display his hand lamp, the detonators at the inner home, which normally remain in position when the signal is at danger, were exploded. Relief Signaller E. Wells was working at the other end of the frame and confirmed Campbell's evidence. Having just seen the engine headlights when he heard the detonators explode, he also had no time even to pick up a lamp; he estimated that the train passed "*a lot faster than 20 m.p.h.*". Neither signaller had received any complaints regarding the fast line signals, nor had they experienced any trouble with them.

4. Telegraph Inspector Sambrook arrived on the scene at about 10.0 p.m. and found all the electrical repeater and block instrument equipment in order, with normal tolerance in the setting of the signal arms. He had been at Bletchley for 13 months, and had experienced no trouble with these signals. Signal Inspector Hobley arrived at 11.0 p.m., and also found the signalling apparatus in order. The distant and outer home signals were provided with Adlake oil lamps, which were properly fitted on the lamp brackets, and had been trimmed on the 7th and 12th October respectively. The down fast inner home and the other stop and distant signals on the bracketed post at that location were trimmed on the 7th October.

Mr. Mottram, with the two Inspectors, examined the lights of these signals at 11.30 p.m., by going back as far as Lamb's Siding box; they found, according to Mr. Mottram, that "*the lamps of the down fast distant and down fast outer home were burning and showing fairly good lights, but not as brilliant as the cluster of lights we saw for the down fast inner homes and distant signals*". Mr. Shoppee also noted the down fast line signals; he arrived on the scene at 10.45 p.m., having travelled over the down slow line on the footplate of a tank engine (chimney first). He said they were clearly visible when observed through the spectacle glass, and, though it was raining with an East wind, "*the view did not seem materially affected, and I observed the distant signal for Bletchley No. 1 just after passing Chelmscote Bridge. I think I was able to see that signal as quickly as it was possible to do so, having regard to the situation of the bridge*".

Confirmation of the foregoing evidence was also afforded by Driver W. T. Freestone of the Inverness express; he said that when he approached Bletchley at 8.44 p.m. there was rain and mist blowing across the line, but his view of

signals "*was fairly good*", though later he also remarked that he "*could not see a signal until close on top of it*". He had 20 years' driving experience, however, and knew the line well; he referred to the down fast distant as "*the worst on the road*", due to the interference in view already mentioned, but he sighted it "*after passing Lamb's Siding bridge (the second)*". His fireman, J. Robertson, also stated that "*all distant and home signals were showing good lights, with the exception of one at Bletchley which was just slightly dim*".

5. Shunter J. Leadbetter was in charge of the shunting movement and, having screwed up the van coupling, was about to attach the brake pipe when he heard Inspector W. Nursaw shout; from between the vehicles, he managed to jump up on to the platform, by which time the leading engine of the Stranraer train had apparently passed the box. The warning undoubtedly saved the lives of other men who were working in the rear vehicles of the Inverness train; also of Fireman S. White, who, on observing the headlights of the express, jumped from the footplate of the shunting engine and reached a point on the platform only some eight yards away when the collision took place. His mate, Driver W. Butler, had no chance of getting clear and was killed at his post.

Nursaw said that he was supervising the attaching operation when Carriage Cleaner (Acting Examiner) A. J. Underwood drew his attention to the headlights of the approaching express. Nursaw could neither judge its speed nor whether the engine was steaming; but he saw sparks coming from the wheels, as the result of brake application. On the other hand, Underwood, who deserves credit for having been the first to realise the situation and to give warning, appears to have seen the headlights as the leading engine passed the box, and judged that the speed of the collision was 30 to 40 m.p.h.

Guard A. Downes, of the Stranraer train, was unable to attend my Inquiry. His statement referred to the testing of the brake at Euston and to the fact that the train left two minutes late; he was unaware that it was double-headed until the Inspector on the platform handed him a note to this effect as the train was drawing out. After being diverted to the slow line at Willesden and returned to the fast at Bourne End, he noted that Tring was passed at 8.40 p.m., namely six minutes late; on looking at his watch again 12 minutes later, he thought that Bletchley was being approached, but he evidently had not realised that it was so near. He sat down and looked through the observation side window, but it was so dark that he could see nothing and he failed to observe the colour-light distant for Stoke Hammond; nor did he notice the overbridge near Lamb's Siding, though he knew it. Downes' impression was that speed had considerably slackened when the collision occurred, and that the train would otherwise have been brought to a stand normally at the platform.

6. Driver J. E. Copperwheat was in charge of the train engine of the Stranraer express. He is 59 years of age, with 41 years' service; he has acted in his present capacity for 26 years, and has driven the Coronation Scot since it commenced running. He stated that the pilot engine, in charge of Passed Fireman C. W. E. Haynes, did not arrive till three or four minutes before the train departed; he gave Haynes particulars of the stops, and his fireman, M. Coventry, helped in coupling up, which he was satisfied was properly carried out so far as the brakes were concerned. He felt their application, and observed the gauge, when Haynes had to reduce speed on leaving the fast line for the slow, and on returning, at Willesden and Bourne End respectively; Haynes had obeyed the low speed restrictions over the crossovers at each place.

Copperwheat was driving from the left-hand side of the footplate and did not use the seat; he stated that he observed the Stoke Hammond colour-light distant at clear, and that it was passed at about 50 m.p.h., his regulator then being shut. This, however, was the last signal he saw until he heard the explosion of the detonators at the Bletchley inner homes, and it appears that he did not even observe this cluster of signal lights. He estimated that speed when passing Bletchley No. 1 box was no more than 20-25 m.p.h. "*The brake was being applied by the leading man (Haynes) right down from Stoke Hammond. The gauge was being worked, and I could see the reduction of the vacuum and we were losing speed.*"

Copperwheat therefore assumed (wrongly) that Haynes was observing the signals which he had missed, and he did not move the brake handle until he heard the detonators. He said that Haynes "*was at the front and I took it for granted that he had seen the signals. . . I was trusting the front man and that the*

platform was clear for us"; according to his account, and that of Haynes, the brake was fully applied by the time the detonators were reached, and he felt that there should otherwise have been no difficulty in bringing the train to a stand at the platform.

In connection with the considerations affecting Copperwheat's failure to observe the six signals in the intervening $2\frac{3}{4}$ miles, he agreed that the anti-glare side sheets, which were in position, had no bearing on this. He said that he *"was looking out all the way down"* through the narrow glass side windscreen, and considered these screens the *"best things we have ever had"*. His account was that *"the smoke from the engine in front, the rain, the very dark night, and the East wind in my face prevented me from seeing anything. . . . We were not in a hurry on this job . . . we were not travelling hard. In fact before the war, the Royal Scot was allowed 1 hour, 17 minutes to do this, whereas now it is 1 hour, 50 minutes, and we hardly know what to do with the time"*.

With regard to the general effect of the black-out, Copperwheat, who of course knew the road very well, did not feel that he had lost location even momentarily, though he pointed out that *"since the black-out, it has been more difficult to find your landmarks and make a judgment regarding your speed within a mile or two"*. He was clearly surprised, however, on hearing that the journey of 15 miles from Tring had been covered in 13 minutes.

Passed Fireman Coventry, who accompanied Copperwheat, also knew the road well, and generally confirmed the latter's evidence. He similarly admitted that, after passing Stoke Hammond, he *"must have missed some of the signals whilst attending to the damper and injector, and others by temporary blindness after dealing with the fire. It was the darkest night I have been out in. The smoke was blowing away from my side and I had a better view, but the signals are on my driver's side. In the day time, we firemen do see them, but of course on this occasion we had another engine in front and I was attending to several other things"*. He estimated that the collision took place at 15.20 m.p.h.

7. Passed Fireman C. W. E. Haynes is $38\frac{1}{2}$ years of age, and has 22 years' service; he has acted in his present capacity since March, 1938, in which month he passed his test at Liverpool. With regard, however, to his driving experience, he suffered from pneumonia from May until September, 1938, and was not allowed to take up main line duties again until January, 1939, when he was passed as fit. Travelling as third man on the footplate, he refreshed his knowledge of signals during six days in the following May, and signed in June for the route to London. He was thus confident that he knew this road, and he had driven one freight and three passenger trains from London to Liverpool during May (2), June (1) and July (1); since the outbreak of war he had handled the 10.10 p.m. fitted freight train from Camden to Liverpool on the 28th September, and the 12.50 a.m. special empties train from Brent to Crewe on the 30th September, both with Class 5 XP engines of 4-6-0 type.

On the day previous to the accident he had worked the 6.15 p.m. special freight train from Edgehill, and was relieved at King's Langley at 5.25 a.m. on the 13th October, booking off at Willesden at 7.45 a.m. He went to bed at 9.30 a.m. and was called again at 5.15 p.m. after a good sleep. He booked on at 6 p.m., feeling quite fit for duty, and proceeded to Camden Shed, where at 6.30 p.m. he received orders to prepare Engine No. 5025; at 7.15 p.m. he was instructed to act as pilot to the Stranraer train, and was handed the timings and stops on a special sheet. Euston was reached a couple of minutes before departure time, and Haynes spoke to Copperwheat regarding stops while his fireman, R. Lewis, was coupling up. Haynes had no criticism of these arrangements; he was not rushed, and was satisfied with the orders he had received, but he had no time to check his watch. He was fully aware that the train was due to stop at Bletchley, but he did not know that there were two regular trains just ahead of him, namely the 7.30 p.m. and the 7.37 p.m. ex Euston. The first failed, and hence the diversions already mentioned; the second was the Inverness train which was overtaken.

Haynes had apparently been in charge in May last of a pilot engine on one of the trains already mentioned, and was familiar with Rule 135, and with the duties of a pilot driver, as follows:—

"When a train is drawn by two engines the Driver and Fireman of the leading engine are responsible for the observance of signals and the working of the brake; the Driver of the second engine must watch for,

and act upon, signals given by the Driver of the leading engine, but the Driver of the second engine is not relieved from the due observance of all signals affecting the working of the train, and in case of need he must apply the brake."

Haynes said he drove from the left-hand side of the footplate and remained seated. He had the side anti-glare sheets down, and the side window open, but he did not make use of the glass side windscreen "*because you cannot get a proper observation when the rain is beating down on it, as it was on this occasion . . . one would have needed to be continually wiping it down*". In fact, the windscreen was folded back against the cab side, and Haynes maintained his observation of the road over the side of the cab. His account of the journey was that, after the diversions at Willesden and Bourne End, he thought Tring was passed at about 45 m.p.h., five minutes late:—

"After that we may have gathered speed, but very little, for after passing Tring I eased the regulator and it was only a matter of giving the engine a breath of steam, and it was in that position when we passed Leighton Buzzard. Before entering Leighton tunnel I opened the regulator a little wider; this is the practice of all enginemen to avoid back draught and fire coming out on the footplate. . . . On emerging from the tunnel, I reduced the regulator to just a breath of steam and . . . I should say the speed would be about 50 m.p.h., until we got to the colour-light for Stoke Hammond; there I closed it altogether. After that I began to apply the brake to reduce the speed of the train prior to the stop at Bletchley. I did not observe the home signal at Stoke Hammond, or any signals at all after passing the colour-light for Stoke Hammond; this light was green. I did not think that this was the distant for Bletchley. I should say that the distance from Stoke Hammond to Bletchley No. 1 is about a mile. I could see nothing after passing the colour light; neither did I see any obstruction. My first intimation that I was at Bletchley No. 1 was the detonators exploding. I did not see the inner home signal or the tail lamp. My brakes were already on. I had gradually reduced the vacuum, and when the detonators exploded the brake was fully applied. . . . I do not think the train was travelling at more than 30 m.p.h. when the detonators exploded."

Haynes said that he was looking out all the time, and that there was "*nothing to take my attention off my work. I am positive that if it had been a colour-light signal at Bletchley I should have seen it*". He added that it was raining very hard, and he could not remember passing under a bridge; so far as he could recollect there was only one after passing Stoke Hammond, but there are in fact two. He apparently saw the box there, which is very near the line. Generally, he said that he "*had great difficulty in observing the signals all the way*", on account of the rain blowing in his face; steam was shut off and the engine was not blowing off.

Questioned with regard to the approach to Bletchley, Haynes said that "*the explosion of the detonators told me I was at Bletchley. Had I been in a position to observe signals I should have known where I was. I was not waiting to see the station before coming to a stand. Whilst applying the brake I was watching for signals, and I was not doing anything else. . . . This was because I knew I was approaching Bletchley. I knew I must be very near to the signals at Bletchley No. 1*".

Haynes went on to explain that he had made this full brake application before reaching the detonators "*to further reduce the speed of the train. Having seen those signals (Stoke Hammond), I was reducing the speed of the train all the time, and as I reduced, my power of observation would become greater. I had not seen any signals. I do not say I was going so fast that I could not see signals. If I had realised that I had passed signals at danger I should have applied the brake fully earlier*". Haynes was not drowsy and he did not feel that it was excessively hot with the anti-glare sheets down. His eyesight had not been affected by his illness, and examination by a specialist proved that he had fully recovered: further examination in November, 1939, subsequent to the accident, also proved that Haynes was fit in every respect. The engine was in good order, and there was no steam escaping which was likely to obscure vision.

With regard to the general question of operation under black-out conditions, Haynes explained that *"it is much more difficult to judge the speed at which you are travelling. . . . I knew I must be close to signals. If there had been anything to have told me, or any object which I could have seen, even with the absence of any signal, I could have stopped. I knew the signals were there, but I had no idea I had passed them. . . . I would like to try and point out that any light near signals, or the least bit of light alongside, in the dark, shows up objects which assist a driver in knowing where he is within a few yards. On this night, if I could have seen anything—I was actually brought up at Bletchley—I would go so far as to say that this unfortunate accident would not have occurred"*.

Haynes went on to say that he *"could not see as much as a telegraph pole. If I could, I should have seen the signals. Even if it had been moonlight, or as we were before the war, I could have seen it a long way off. . . . When you have two engines coupled together, coasting, you have so much noise that it cuts out the noise of crossings, bridges, etc. . . . We drivers must not do more than 60 m.p.h. You can, however, make up time provided you do not exceed that limit. The last time I looked at my watch was at Tring and we were five minutes down. My watch was showing 8.39 p.m. I did not look at my watch when the collision happened, and I did not know I was making up time. I did not attempt to do so. The slip of paper handed to me gave me the passing times. . . . I was running the train in a normal manner, namely in accordance with the present timings, not pre-war timings."*

Acting Fireman R. Lewis generally confirmed Haynes' evidence; he had never worked with him before. He has 19 years' service, of which four have been spent in his present position. He stated that he was not a Passed Fireman; he knew the road *"fairly well"*, but the signals *"not too well"*. He was in the extra link and had not worked up to London since August. He knew that the train was to stop at Bletchley. After observing the Stoke Hammond colour-light distant, the regulator was closed, and Lewis opened the injector; he then noticed that his anti-glare side sheet had become loose, and he secured it again in position. Lewis referred to the *"heavy wet mist"*, and said he saw no other signals; but he observed the tail light ahead, and shouted before the detonators were exploded. With regard to speed, his account was that at Stoke Hammond *"we were certainly moving pretty fast. It is very difficult now as we cannot see the mileposts. The train does not light up anything, but we were reducing speed I am sure. I cannot say anything about the brake"*. He estimated that the collision took place at 20-25 m.p.h.

Conclusion.

8. This unfortunate train accident is noteworthy as being the first under war-time black-out conditions to result in serious consequences; such conditions were also intensified by bad weather, rain with an easterly wind, and a moonless night, factors which made the task of observing signals still more difficult.

The accident was clearly attributable to the failure of Driver C. W. E. Haynes to observe and act upon the warning indication of the Bletchley distant signal and the danger indications of the outer and inner home signals. He frankly admitted his failure, and Driver J. E. Copperwheat of the train engine can hardly accept less responsibility, since he admitted with equal frankness that he failed in the same way; Copperwheat was *"trusting"* Haynes, and *"took it for granted that he had seen the signals"*. Nor did the two firemen render any assistance in this respect, except that, according to his own account, Lewis saw the tail light on the shunting engine and was perhaps responsible for Haynes' full brake application just before the detonators were reached at the inner home signal, 310 yards from the site of the collision.

The statements of the signalmen, and of other reliable observers (Enginemmen Freestone and Robertson, Inspectors Sambrook and Hobley, and Messrs. Mottram and Shoppee), before and after the accident, show that the three Bletchley signals concerned were at danger and were showing effective lights; the timings of trains on other lines preclude the possibility that the view of those signals was affected by steam and smoke. Sequential locking was in operation, which prevented the acceptance of a train from Stoke Hammond if any of the stop signals had been displaying a clear indication. Further, all four enginemmen admitted that they failed to observe, not only the signals at Bletchley, but those at Lamb's Siding, and the home at Stoke Hammond. I am satisfied that Haynes and Copperwheat were not misled in any way by false-clear or defective indications, and it remains to consider the circumstances in which these two drivers, one a man of long experience, came to pass six successive locations without observing a single light after passing the colour-light distant at Stoke Hammond.

9. From this location, the successive signals which they failed to see, and the distances run, are as follows:—

	Yards.
To Stoke Hammond home and distant for Lamb's Siding	1,350
To Lamb's Siding home	1,063
To Lamb's Siding starter	558
To Lamb's Siding advanced starter and distant for Bletchley No. 1	421
To Bletchley No. 1 outer home	763
To Bletchley No. 1 inner homes	440

Taking into account the additional 110 yards to the signal box, the distance between the colour-light distant at Stoke Hammond and the box at Bletchley is 2 miles 1,185 yards, which Haynes estimated as only a mile; further, it did not appear that he had accurate knowledge of the intervening signals, particularly regarding the existence of the advanced starter for Lamb's Siding above Bletchley No. 1 distant, and he could remember only one overbridge instead of two after passing Stoke Hammond.

Haynes gave his evidence in a very straightforward manner, but he appeared to lack imagination and alertness of mind; his evidence regarding the use of the narrow glass windscreen was surprising. I think that over-confidence and lack of experience and knowledge of the road were probably the underlying causes of his failure, coupled with serious underestimation of speed and consequent misjudgment of distance under black-out conditions. Indeed, both men suggested that maximum speed could not have been more than 50 m.p.h., and that Bletchley No. 1 box was passed at 20 to 30 m.p.h. under a full brake application; they were both obviously surprised to hear that the former speed must have been at least 70 m.p.h. according to the timings, and, had the latter estimate been correct, the train, so braked, would certainly not have reached the obstruction.

It seems more likely that, while travelling at the higher speed, Haynes made a full brake application when he heard Lewis shout on viewing the tail light on the shunting engine, just before reaching the detonators at the inner home location, with the result that, fortunately, speed was reduced to about 45 m.p.h. by the time the collision took place. The damage appeared to be more consistent with speed of this order, notwithstanding the weight and double heading of the Stranraer train. For instance, the heavy shunting engine was thrown forward bodily on to the platform, the front end of the pilot engine was wrecked, and a leading bogie wheel was torn off its axle, while the shunted van and the two coaches in rear of the standing train were destroyed.

It is a significant fact that at 70 m.p.h. it would have taken only two minutes to cover the distance of 2 miles 1,385 yards from the Stoke Hammond distant to the point of collision; on the other hand, had the train been running at 50 m.p.h., as Haynes and Copperwheat suggested, it would have reached a point, in two minutes, only about 390 yards on the approach side of Bletchley No. 1 distant, namely just where they would have been expecting to sight it under the prevailing conditions.

It should also be borne in mind that their view of the Stoke Hammond colour-light distant at green indicated that they probably had a clear run to Bletchley, as they were aware that Lamb's Siding box is invariably switched out at night; in consequence, their attention might well have become relaxed until they expected to reach the vicinity of the Bletchley distant. Further, the following factors undoubtedly tended towards inadvertent increase of speed, namely, a constantly falling gradient of 1 in 660; double heading by two powerful, well balanced, high speed engines; a comparatively light train of only 338 tons; the absence of speedometers; and the black-out.

10. I fear that these drivers thus seriously misjudged their speed to the extent of 20 m.p.h., and I can only suggest that, acting on the assumption that it was about 50 m.p.h., Haynes must have omitted to keep a sufficiently keen look-out after passing Stoke Hammond distant until such time as he thought he was nearing the Bletchley distant. Unfortunately, and notwithstanding his under-estimate of distance, he was then too late in commencing the full brake application which he said he made when he felt he "*must be somewhere near the signals for Bletchley*".

I feel, however, that although his conduct cannot be excused, his failure merits consideration on account of the difficult prevailing conditions, which called for clear thinking and more intimate knowledge of the road than he possessed. Moreover, he received no help from Copperwheat, and it is a matter for regret that the latter, a man of such wide experience, should have failed to rise to the occasion and appreciate his responsibilities; he must have permitted a serious infringement of the speed restriction of 60 m.p.h. to continue for an extended distance, and he was content, in such adverse circumstances, to leave the entire control of the train to Haynes, a driver unknown to him and obviously much his junior.

Remarks and Recommendations.

11. It is only fair to say that had Copperwheat been in sole charge of the train, it seems unlikely that the accident would have happened; indeed, it really resulted from double-heading, with a man in charge of the pilot engine who lacked a sufficiently intimate knowledge of the road. There is much to be said for the more experienced man being transferred to the leading engine, or for the engines themselves to be interchanged. Under modern conditions of operation, the tendency may be to expect drivers to memorise an increasingly widespread mileage, and I feel that consideration might well be given to the use of cinema-films, even though this would not directly afford a means of viewing the "pattern" of lights as seen by night. I suggest that, as in other activities, the cinema would create interest and render considerable assistance to enginemen and supervisors in refreshing and verifying knowledge of a route.

12. Whether Copperwheat lost his location or not while approaching Bletchley on this occasion—and he would not admit that he did—it seems certain that Haynes must have done so; presumably hesitation also played its part in delaying action so far as the latter was concerned. It is for consideration whether, and to what extent, black-out conditions on very dark nights affect the normal efficiency of enginemen in this respect. I have heard it stated that such conditions actually make the driver's task easier, and it is true that the "pattern" of lights to-day, as compared with the maze of different lights which may be observed in peace-time on the approach to a big station or town, is generally confined to a few signals relating only to the line on which the train is running, and perhaps to a parallel line as at Bletchley.

On the other hand, experience shows that however desirable it may be to eliminate extraneous lights, especially signs and lighting on adjacent highways, the clarifying of the resulting signal "pattern" has not the safety value it otherwise would have, as the landmarks, by which a driver instinctively locates himself, are also eliminated under black-out conditions. If locating objects, even signal boxes, are no longer visible, a driver, although not realising it, may well lose his whereabouts temporarily, and for sufficient time to permit of speed in excess of that corresponding to signal indications.

Such temporary loss of location and speed-sense calls for increased vigilance on the part of enginemen, particularly in bad weather at night when the task of observing signals is made so much more difficult. Under such conditions observation of the line-side is entirely negative, and familiar landmarks which are sub-consciously noted are invisible. It may be said that in open country similar conditions prevail in peace-time; but it must be remembered that the train itself is now blacked out, and therefore the driver loses the helpful illumination given by the light from the engine fire as well as from the leading carriages, which normally serves to throw into relief various unlighted objects on the line-side. In fact, on moonless or cloudy nights, such as that in question, a driver in the black-out speeds through almost impenetrable darkness, relieved only by the lights of signals as they come into view.

As the evidence in this case also showed, the assessment of distances between signals is uncertain, and there is the fact that, in the case of oil-lit semaphore signals, one green light is identical with the next, so that location may well be mistaken unless there is some variation in "pattern", or the combination of bridge or tunnel closely adjacent, by which a signal may be identified. It therefore appears that, under black-out conditions, drivers may be at considerable disadvantage in assessing their speed and location, particularly after years of operation at 70-80 m.p.h., and it is not inconceivable that, without a speedometer, speed may unconsciously be allowed to rise considerably in excess of what it is thought to be, especially with modern engines over an easy road and under favourable conditions of power.

Such considerations apparently contributed to this accident, and the best illustration of the extent of the misjudgment on this occasion is the fact that, although both drivers knew that the train was booked to stop at Bletchley, the speed at which the collision probably took place, namely 40 to 50 m.p.h., indicates that the platform would have been over-run. It seems clear that neither of them realised until too late that the distant and outer home signals had been passed without being observed, and that speed must have been much in excess of that which was appropriate.

13. It is hardly necessary to say that a colour-light distant might have had preventive effect, while Automatic Train Control of Warning type, such as has already been installed by the Company between London and Southend, would certainly have been the means of ensuring obedience to signals on this occasion. I understand that both these important adjuncts to safety were being introduced on this main line when war was declared, but work on the latter (which was of an experimental nature for test purposes at high speeds) has been suspended, having regard to the reduction in maximum speed to 60 m.p.h.

I feel, however, that the driver's difficulties may be so much enhanced under black-out conditions, and the integrity of operation is so important on a main line such as this, that the extension of Automatic Train Control equipment should now be actively pursued again, so far as labour and materials permit. It consists of an inductor to give a location warning before reaching every colour-light distant, and a number of such signals and Pacific Class engines were in process of equipment when war was declared.

14. The introduction of an isolated colour-light down fast distant at Bletchley No. 1 presents difficulties; but I understand that it had already been decided to provide another semaphore oil lighted distant under the starter for Lamb's Siding. At present the interval of 763 yards to the outer home is inadequate for the fast line, and I recommend that this work be undertaken without further delay.

15. I would also draw the attention of all concerned to the importance of ensuring under black-out conditions that signal lights are maintained in the best possible condition and focus. Though the evidence shows that effective lights were burning in the distant and outer home signals at Bletchley No. 1, I noted on the evening of my Inquiry, between Bletchley and London, that while the majority of oil lights were excellent, there was a definite inferiority at one or two locations. Drivers might well be encouraged to report on this point, particularly during the winter months.

16. Finally, I would refer to the war-time speed of operation. The schedule point to point speed of 45 m.p.h. is being raised to 50 m.p.h., while the permitted maximum is being retained at 60 m.p.h., to reduce wear and tear of the track; but, unfortunately, there are still few engines fitted with speedometers. Having regard, therefore, to the instruction regarding making up time, I recommend that consideration be given to the adoption of minimum timings, and to the scrutiny of Guards' journals in this respect, over sections such as the 15 miles between Tring and Bletchley in the down direction. By such means, any running in excess of the permitted maximum should be detected and suitable action taken.

I have the honour to be,

Sir,

Your obedient Servant,

A. H. L. MOUNT,

Lieut.-Colonel.

The Secretary,
Ministry of Transport.

NOTE.—Driver Haynes was tried at the Buckinghamshire Assizes on the 12th January, 1940, on a charge of Manslaughter. At the conclusion of the evidence, Counsel for the Defence submitted that there was no evidence of Manslaughter. After the Judge had directed the Jury on this submission, Haynes was found Not Guilty and was discharged.