REPORT OF THE DIRECTOR OF THE BUREAU OF SAFETY IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE PHILADELPHIA & READING RAILWAY AT HERSHEY, PA., ON OCTOBER 11, 1923.

December 17, 1923.

To the Commission:

On October 11, 1923, there was a derailment of a freight train on the Philadelphia & Reading Railway at Hershey, Pa., which resulted in the death of one employee and the injury of three employees.

Location and method of operation.

This accident occurred on the Lebanon Valley Branch of the Harrisburg Division, which extends between Harrisburg and Reading, Pa., a distance of 55.4 miles, in the vicinity of the point of accident this is a three-track line over which trains are operated by time-table, train orders, and an automatic block-signal system. The derailment occurred at a point 575 feet east of the passenger station at Hershey; approaching this point from the east the track is tangent for a distance of 1,400 feet, followed by a 2-degree curve to the right 3,000 feet in length, the accident occurring on the curve at a point about 500 feet from its receiving end. The grade is 0.36 per cent descending for a distance of 3,800 feet, and is then 0.32 per cent ascending to the point of accident, 300 feet distant. The track is laid with 100-pound rails, 33 feet in length, with 18 oak ties to the rail length, triple-spiked, tie-plated, and ballasted with from 9 to 12 inches of crushed stone, it is well maintained.

The weather was partly cloudy at the time of the accident, which occurred at 3.35 a. m.

Description.

Westbound freight train extra 1710 consisted of 39 cars and a caboose, hauled by engine 1710, and was in charge of Conductor Feltour and Engineman Arm. This train passed Palmyra, the last open telegraph office, 3.4 miles east of Hershey, at 3.31 a. m., according to the train sheet, and was derailed while traveling at a speed estimated to have been about 50 miles an hour.

The engine and first 23 cars were derailed to the right, the majority of the cars going down a 40-foot embankment. The engine came to rest on its right side, with the pilot fouling the westbound track and the rear end down the embankment. The employee killed was the engineman

Summary of evidence.

Conductor Seymour, who rode on the engine from Reading to the point of derailment, said the first warning he had was when he heard the exhaust of the air brakes applying in emergency, immediately following which the engine went down the embankment. At the time the brakes were applied he was standing in the gangway, but although he had been looking back over the train, he was unable to estimate the speed at the time of the accident. He was unable to say whether or not the engineman had applied the brakes, or what part of the engine was the first to be derailed.

Fireman Warwick said he had worked with Engineman Ann since March, 1923, and considered him the most careful engineman with whom he had ever worked, not only in the matter of signals but in the details around the engine and its general operation. On this occasion the usual run was made, the speed was the same as usual, 40 or 45 miles an hour, with steam nearly shut off, and nothing wrong was noticed until the engine lurched, there was a shout, and the air brakes applied in emergency; he thought the trailer truck was the first part to be derailed. It was Fireman Warwick's opinion that the lurch of the engine, coupled with the weight and speed of the train, overturned a rail.

The statements of Head Brakeman Yeager, who was riding on the left side of the engine, practically corroborated those of the conductor and firemen, except that he estimated the speed at about 30 miles an hour and said that he saw the engineman make an emergency application of the air brakes at the time of the derailment. He was unable to say what part of the engine was the first to be derailed.

Brakeman Daub, who was riding in the caboose, said that when passing a water spout which is 1 mile east of Palmyra the speed of the train was about 50 miles an hour; the first intimation he had of anything wrong was on feeling several short jerks, with an air-brake application at about the same time, following which the train came to a sudden stop. He said the accident occurred at 3.25 a.m., and that the water spout east of Palmyra, nearly ½ miles from Hershey, was passed at 3.20 a.m. Flagman Fretz was also riding in the caboose and practically corroborated the statements of Brakeman Daub, except that he estimated the speed passing Palmyra, at 30 or 35 miles an hour. After the train had come to a stop Flagman Fretz went back to flag, but before leaving the caboose he said he looked at his watch and noted that it was then 3.25 a.m. On his way back to flag he did not see any marks indicating that there had been any dragging equipment.

Examination of the track for some distance east of the point of derailment failed to disclose any marks on the ties or rails, or evidence that the train had been derailed, before it reached the point where the track was torn up and partly carried down the embankment, with the exception of three marks on the outside of the left rail and two marks on the inside of the right rail, found by Section Foreman Stuckey; he did not think these marks were made by the engine, but thought they might have been caused either by the tender or some of the cars after the derailment. Many of the rails were bent, the track was torn up and practically destroyed for about three rail lengths, and about 100 feet of the embankment was carried away, the damage being such that it was necessary to rebuild a portion of the embankment and to renew 21 rails. All of the rails were accounted for except one that the section foreman thought was buried when rebuilding the embankment, and for this reason it could not be definitely determined whether or not a broken rail was involved, although nothing was discovered to indicate that such was the case.

Section Foreman Stuckey said that on October 1, 2 and 3, of this year, he had raised the track and renewed 282 pine ties with oak ties, within a distance of 31 rail lengths, it being difficult to maintain the gauge with pine ties; these new ties were put in both preceding and following the point of derailment, the work being completed about noon of the third day. At the end of each of these days the track was lined and surfaced, but it had not been resurfaced since the work was completed, the elevation maintained was 3 1/8 inches. After having raised track, it was his custom to allow several days to pass before completing the surfacing and ballasting, and he said a request had already been made for the stone to be used in filling in and dressing the track, this work not having been done at the time of this accident. Prior to the accident there had been ballast at the ends of the ties on the outside of the curve, extending about 2 inches above the bottoms of the ties, this also had not been replaced at the time of the accident. Section Foreman Stuckey, however, said that in his opinion there was sufficient ballast in the track to hold it properly for trains moving at scheduled speed, and that it had not been necessary to place any speed restrictions covering this section of track between the time the work was completed on October 3 and the time of the accident. It also appeared that within the 24-hour period preceding the time of the accident approximately 30 trains had passed over this section of track at scheduled speed. Notwithstanding these facts, however, the section foreman's examination of the track shortly after the occurrence of the accident showed that it had been

moved out of line from where the track was torn up back to the caboose, the movement being toward the inside of the curve, while at one point the distance the track had moved measured 6 inches. The gauge was practically intact, and all that the section foreman had to do to repair this part of the track was to move it back into line; he expressed the opinion that this condition might have been caused by the sudden stopping of the train. His examination of the ties at the point of derailment did not show anything to indicate that the spikes had been drawn, as would have been the case had a rail been forced outward or overturned. It further appeared from the section foreman's statements that he had often seen engines of the type here involved rounding this curve at a good rate of speed and had noticed them swinging, and he said that with pine ties it had been difficult to keep the track in gauge. Section Foreman Stuckey was unable to assign any definite cause for the occurrence of the accident.

Division Engineer Dunn said that while the speed limit for passenger trains on this branch is 60 miles an hour, they would not be moving at this rate of speed on this particular curve on account of the fact that all of them have a station stop to make at Hershey. He considered the elevation of 3 1/3 inches to be safe for a speed of 53 miles an hour; when trains moving at that rate of speed, track which is open would have to be watched, but he thought it would be knocked out of line before it would result in the derailment of a train. In this particular case, considering the manner in which the track was ballasted, he thought it safe for a speed of 52 miles an hour, and said that in his opinion the sudden stopping of the train was what threw the track out of line east of the actual point of derailment.

Engine 1 10 is of the 2-8-0 type, and has a total weight, engine and tender loaded, of 496,425 pounds. Examination of this engine showed that the tires of the forward driving wheels and of the right intermediate driving wheel were bright, indicating that they had been derailed to the left and while in that position had rubbed against the rails; there were no marks of derailment on the trailer and engine truck wheels. The yoke of the pony truck was broken near the center pin, but the break was new and evidenced no defects in the metal. Measurements of the gauge and lateral motion of the engine wheels, and of the tire wear, both tread and flange, on the engine and tender wheels, showed that they were in good condition, and nothing defective about the engine was discovered which could have contributed to the occurrence of this accident.

The distance from Palmyra, the last open office, to the point of derailment is approximately 3.3 miles. The train sheet shows that extra 1710 passed Palmyra at 3 21 a.m., and the time of the derailment, according to the statements of Brakeman Daub and Flagman Fretz, was 3 35 a.m., from these figures it would appear that the time consumed by extra 1710 in traveling this distance was four minutes, or at an average rate of speed of 49 1/2 miles an hour.

Conclusions.

The cause of this accident was not definitely ascertained.

The evidence developed as a result of this investigation shows that the forward and intermediate driving wheels of the engine were derailed to the left while the engine finally came to rest to the right of the track, that there were no marks on the ties east of where the track was entirely torn up, although about 150 feet east of this point there were a few marks on the left sides of the rails, that the track was moved out of line as far back as the caboose, a distance of approximately 500 feet, this movement being toward the inside of the curve; that one rail which had been in the track could not be located, making it impossible to determine definitely whether or not there had been a broken rail; that the track was open to some extent after having been raised 8 or 10 days previously, although it had been passed over in safety within the preceding 24 hours by approximately 50 trains moving at scheduled speed; that the speed of the derailed train undoubtedly was higher than that permitted under the time-table rules, and that there was nothing about the engine which could have contributed to the occurrence of this accident.

The employees involved were experienced men; at the time of the accident they had been on duty less than 6 hours, after having been off duty approximately 24 hours

Respectfully submitted,

W. P. BORLAND.

Director.