

cocks being open, otherwise you cannot have a continuous brake. The engine-driver cannot tell if the whole of the cocks are open without inspecting the whole train. He might guess how far back the cocks are open. He relies on the guards, or shunters, or train-examiners. I have heard the evidence on this inquiry and know the whole circumstances. Assuming the brake was in perfect working-order at Putaruru, and assuming there was a pressure of 70 lb., and that those conditions continued until they stopped on the incline, 1 in 36—a train of twenty-two carriages, weight 226 tons—and a 35 lb. reduction was made, the brakes should have held the train without question for a period of about an hour. It might hold longer. I have had a brake hold for twenty-four hours. The brake is not absolutely airtight, and it is impossible to make it workable and get it absolutely airtight. An hour would be a fair time for an ordinary train. If the leaks were very bad you could not run the train, because the brakes would apply. The success of the brake depends upon its being worked properly. It is worked properly. The guard can only apply or release them. Assuming train fully charged at Putaruru, but on the course of its journey a cock was put up between some of the vehicles underway along the train, the guard could apply the brake from his van. He could not replenish the brake, but it would be perfectly good so long as the pressure lasted. There is not necessarily a leakage from the reservoir. If you cut the train in two you could not tell in which portion the power would die first. If the cocks between passenger-car and trucks had not been turned on, the guard's van and passenger-car would be dead as to Westinghouse brake. If the train was connected right through, the train would never run away. I say there must have been a cock closed or the train would never run away. If the train was properly tested at Putaruru it ought to have been in good working-order on the incline; but the train stopped at Ngatira a considerable time, and it is quite possible the cock was closed then. If that were the case it would explain the whole accident. Of course, if a cock were shut anywhere, at Putaruru or elsewhere, it would account for the whole thing. I could not say at what part of the train the closing of the cock would cause the accident. The cock must have been closed, I think, at head of train or the wheels below that would have shown some sign of skidding. The state of the dial in the guard's van at time of train running back would indicate that the cock must have been closed some time. If the cock was closed at Ngatira a considerable quantity of the air would escape up to the time of the accident. The grade would have nothing to do with the escape. A test on the grade with everything in order would only show that the train would stand about an hour before the brakes would release. The Westinghouse brake is used throughout the world.

*Prendergast:* When the brake is applied the calculated pressure is about 75 per cent. of the empty weight of the vehicle. I cannot say how many vehicles to which the Westinghouse was applied would have held the train. When I say the brake is not absolutely tight I refer to leakage at the couplings. It is practically tight. I do not think the gauge could have showed a reduction from 35 lb. to zero in two or three minutes without the brake going on. If the cocks were open the train would never run away, but if closed in front of train it would run away.

*Court:* The reservoirs are charged in about a minute. The pumps are kept going, in my experience. The pump works automatically. It stops itself when not wanted. It keeps 90 lb. pressure in reservoirs, and when the pressure is below 90 lb. the pump automatically works again.

*Prendergast:* I have travelled from end to end of the colony several times, and the brakes are very well looked after. I never saw a brake-failure. I do not think in any part of the world are they so well looked after as they are here.

*Court:* In my opinion it is important cocks and couplings should be carefully examined, especially at terminal stations. If the connection is not properly made you could not apply the brake-test on the last vehicle. I would rely on the brake-test on the last vehicle without a view of intermediate couplings. An examination of the connections would be only a superficial one. Where the test is made I say each vehicle should be examined. They must look at the brake-pistons. They do so as they run past—as they walk quickly past. At terminal stations a very careful examination must be made. At other stations I would rely on a brake-test from the van. It is quite possible that if a cock was closed in front of the carriage the guard might hear the clatter of the brake along the preceding carriages, and without examination of the wheels of his van assume that the brake was on them. It is essential when a brake-test is made that the guard should see the brakes go off and on the wheels of rear van and carriage. He should see it, and not trust to the clatter or sound of the brake applied or released. The application of the brake is a clap, and the release is a hissing sound. Supposing cock is closed near front end of train at Putaruru, and assuming that before it was closed the whole train had been charged up to 80 lb., and it became necessary to apply the brakes on the vans behind closed cock, I am doubtful if there would be sufficient air left in the reservoirs to apply the brakes—that is, assuming an hour and a half had elapsed from closing of cock. The engine-driver would not know and could not tell. Assuming all the cocks to be open for whole length and the driver charged up to 80 lb. before disconnecting engine, he would close both cocks—that is, that on tender and that on truck—and break the coupling. He would on recoupling release the brakes. The Westinghouse Brake Company supplies all the Westinghouse-brake appliances. The Railway Department does not make them. The appliances are specially tested before being fitted to vehicles, and after being fitted are specially tested again. The very greatest care is taken to see that they are in working-order before they are used. After brakes are put on the Railway Department take charge, and see that they are kept in working-order. Once the Department takes them over the Westinghouse Company has no further responsibility, and no further contract to keep them in order or inspect them. I simply represent the company in New Zealand to give advice and to watch the interests of the company.

*Baume:* I presume the brake-test must have been applied at Putaruru. The brake must have been released there. No doubt a small amount of leakage goes on between each coupling. If it was absolutely tight it would not matter how long the train stood. If the leak is of a rapid character the brake goes on in a moment. Assuming some one interfered with a front cock at