

8. What other tunnels have you been connected with?—The tunnels all through the Gorge contract—five in number. Also three of the tunnels between Hunterville and Taranaki.

9. So you have had considerable experience in tunnels?—Ten tunnels altogether.

10. You were in charge of the Makarau Tunnel for the department after what is termed the breakdown?—Yes.

11. You were appointed then as Inspector, were you not?—I was.

12. Will you describe the order that we were carrying on the work by?—I took charge of the draining of it.

13. Well, of course, that was preparatory to the experimental work on our own part; and, as an inspector, you thought you had nothing to do with that, I suppose?—Well, what I saw at the time I approved of.

14. I mean that after the drainage was completed and we had diverted the water off the line of tunnel, then we proceeded with the work. In your opinion, was the method by which we proceeded with the work a proper one—the way that an expert would carry on the work?—With the heavy ground you had to contend with, the principle you adopted was, in my opinion, a correct one.

15. Did we as contractors understand the carrying-out of works of that kind?—When I was there you overcame all the difficulties you had to contend with.

16. In a systematic and workmanlike manner?—Yes.

17. Now, in these tunnels that you have constructed—we will say the Gorge tunnels, as they are the most recent—I suppose there was some heavy ground?—Particularly heavy in portions.

18. In those cases when you were lining up with brickwork were the sills or the ends of the sills removed from the brickwork?—In my case we took out the sills, but where the ground was particularly heavy they were left in.

19. And the sills themselves, what about them?—They were heavy sills, and were left in until the brick length was completed. The difference between the centres was 2 ft. less than usual—viz., 9 ft. The average in the Gorge would be 12 ft.; in bad ground, 9 ft.

20. In bad ground the sills were left in the brickwork?—Yes; but it was concrete-work, not brickwork.

21. In carrying out this contract of the Makarau Tunnel there were something like 6 chains to complete after you came?—Well, I think it was more.

22. About 6½?—I suppose that would be it; I am not sure.

23. In the whole of that distance was there a sill taken out of the work before the brickwork was put in?—No.

24. The sill was left in in every case?—Every case that I can remember.

25. Did you have any instructions from Mr. Vickerman to remove the sills or to leave them in?—In general conversation it was understood they were to be left in. Had Mr. Vickerman instructed me to take them out they would have been taken out.

26. In general conversation it was understood they were to be left in?—Yes.

27. And they were left in?—They were.

28. Immediately, of course, the length was put in and everything was secured?—Yes.

29. [Referring to cross- and longitudinal-sectional drawings pinned up on the wall] Is that a correct idea of the method of carrying on the work?—That fairly represents the whole scheme.

30. In your opinion, in that ground was it absolutely necessary to have a sole-plate or bottom sill in?—Where it was not on rock.

31. In this particular ground?—It was absolutely necessary there.

32. It would never have done to have had that sill out and depended on these legs simply standing on the ground?—Certainly not; they would have disappeared.

33. The whole thing would have crushed down?—Yes. I have seen them have to go back and take up the whole because they had gone down too far.

34. *The Chairman.*] Having superintended the building of about ten tunnels, you claim to be a good judge of the way in which tunnels should be constructed?—Yes; for, beside the work of some ten tunnels, I have had fully thirty years' experience as a miner off and on.

35. But you claim to be an adequate judge of whether the work is done in a workmanlike way by expert men?—Yes.

36. And, in your opinion, does that description apply to the way in which this tunnel was made?—To the latter portions of it.

37. That is, of course, with the portions with which you were connected?—Yes.

38. Can you tell us what object was to be gained by removing the sills in the tunnel in advance of the brickwork, or when the brickwork reached the sills?—What object would be gained?

39. Yes. What advantage?—It would tend to weaken the tunnel. The brickwork would not be strong enough to carry the poles and the bars on the top had the sills been taken away in the first case.

40. You have taken the question the other way about. What advantage would there be in removing the sills? Do you not build the sills in first till the brickwork has dried and afterwards remove them?—That is what was done when I was there.

41. Then, you are not in a position to say whether they were removed or not when the slip took place?—No; I was not there then.

42. *Mr. Morrison.*] There is one expression that you have used that I should like to have explained. What do you mean by the phrase "heavy ground"? You stated, in reply to a question, that, in connection with some of these tunnels you superintended, parts of some of them were through heavy ground?—Yes; portions of them. The entrance of one of the tunnels near the Palmerston end was particularly heavy ground. We went back and put in extra timber, extra concrete, and an extra ring of concrete blocks. Also at the far end—the Woodville end—of the tunnel portions of the ground were very heavy,