never heard of such a thing as the sills being removed. They ought to be kept in till the very last —till the brickwork is in. They are made so that they are movable after that, and the holes in the brickwork are filled up after they are moved. The old-fashioned way of scarfing is useless, but they should be butted up underneath.

6. And these sills are put in in two so that they can be removed when the ground is heavy? —Yes; otherwise they would have to be cut out, and would be useless for anything else.

7. Our schedule price was 6s. 6d. In addition to that we claim from the department 6s. Do you consider 12s. 6d. per cubic yard a high or low price for excavating a tunnel consisting of material such as this tunnel was?—Well, it would depend on the sort of material the tunnel was in. I am not quite sure, seeing I only saw part of it; but I may say that in soft ground—that is, with moderately good clay—10s. to 12s. 6d. per cubic yard would be a fair price for taking out the tunnel. That includes all the timber necessary, of course.

8. It would not be a high price?—No.

9. There has been reference made in the report from the department as to the fact of Sims's work on tunnelling being an obsolete work. Would you state to the Committee what you consider about that work?—For such tunnelling—that is, brick-lined—there is no other way of working than that mentioned in Sims's book. It has remained the standard; but very soft-ground tunnelling is generally done now by means of cast-iron lining and air-pressure.

10. That is very soft ground?—Yes, and in any sort of clay. I may say it is only in very soft ground that that has been used, such as the tunnels under the Severn and Thames, and various other places.

11. But you consider that in that class of tunnel Sims is right up to date?—Yes; it is not obsolete. There is no way of doing it unless you simply duplicated with timber.

12. You have read clause 8 of the specification. Would you consider the contractor should be paid for slips under that clause?—It is very difficult for me to answer that.

13. This is the clause: "All cuttings shall have a width of base at formation-level as shown on the drawings, according to the material through which they are made. Slopes shall be ¼ to 1 in solid rock, 1½ to 1 in sand, and 1 to 1 in all other material; but, should the Resident Engineer require any other slopes, the difference in cost, estimated at schedule rates, shall be added to or deducted from the contract sum. The Resident Engineer shall be sole judge as to what class the material in the cuttings belongs. Any alteration in the slopes of cuttings will be ordered in writing. No slips will be paid for under this clause except those that are in the opinion of the Resident Engineer due to steepness of slope, and for which an order has been given beforehand." Now, I will put it in this way: If you were tendering for a contract would you consider that that clause covered the question of slips? That is, if slips occurred through no fault of the contractor—slips not brought down for any ulterior purpose, but genuine slips—would you consider the contractor would be justified in considering that they would be paid for?—Yes, I think that is very clear. If the ground is so soft and mucky that it will not stand, say, 1 to 1, there is no use in the Resident Engineer not ordering a flatter slope. Otherwise they could not open the railway; it would just continue to run in. The natural slope is the one the engineer should set all his cuttings by. If it will not stand at 1 to 1 there is no use an engineer not doing it, because it will take its own slope. I think it would be a monstrous thing that any individual of the community should have to pay for that which is inevitable, and for which the whole community gets the benefit. I may say that that was always my own practice when in the department. When a slope would not stand at a certain angle, I, either with or without authority, increased the slope until it would stand.

14. Is it customary to put borings down to ascertain the nature of the country that a tunnel should go through as a guide to contractors tendering?—Well, I have never known a tunnel put into ground that was not carefully examined—certainly none that I had anything to do with—without examining it, not every yard, but certainly in two or three places every chain, and cross-examining it too. I have generally put down at least three borings every chain.

15. In the Auckland District the strata below the clay is usually sand, is it not?—I could hardly answer that question.

16. At any rate, the clay in the Auckland District is greatly underlaid with sand-rock?—Yes. The only tunnel I have had north of Auckland is the Waitakere Tunnel, and it was through ground of that character.

17. That material is very easily excavated?—Very easily.

18. You know of no material that is cheaper to excavate than sand-rock?—That is the cheapest for a tunnel that I know.

19. In calling for tenders for a tunnel that is to be through sand-rock under clay, would you, as an engineer, have the site of the tunnel bored?—Yes, as I have said before; but I would not guarantee anything to the contractors.

20. As a matter of fact, you had all the cuttings bored on the Rotorua Railway?—All without exception—every heavy cutting. I had borings put down every chain, sometimes nearer and more frequently—as a rule three of them to the chain—so as to give the nature of the cross-section. Similar cuttings on the level ground I did not bore at all.

21. No, it would not be necessary where the ground was shallow?—It was easily seen what they were in that case.

22. But, at any rate, in driving almost any length or kind of a tunnel, unless the ground were very shallow you would have it bored?—For my part I could not go on without.

23. There has been some kind of a reflection placed on us as contractors for this work, you know. As a contractor for a considerable number of years, I would just like to ask you to state to the Committee your opinion of us as contractors. That is rather personal, but as it has been brought up as a reflection against us I would just like them to have your opinion?—I should have no hesitation, and never would have any hesitation, in accepting you as contractors for engineering,