case there was a subsequent decision of the Court of Appeal, dated 11th October, 1892, in favour of the tramway company. (See p. 198, June number of Law Reports referred to.) This disposes of the only remaining authority cited in favour of the Telephone Department's contentions.

I was unable to make this statement when I appeared before the Committee, as the June number of the Law Reports has only come from England since that date.

The Chairman, A to L Petitions Committee, House of Representatives, Wellington.

I have, &c.,
J. H. Hosking.

Friday, 25th August, 1893.

Dr. Lemon examined.

The Chairman: We understand, Dr. Lemon, that you will be able to give us some information in reference to the subject of this petition?

Witness: As far as the Department (Telegraph and Telephone) is concerned I can. I do not suppose any of you gentlemen have seen the report of Lord Kelvin's evidence before the Committee of the House of Commons and House of Lords on this question. It is contained in the *Electrical Review* for June 23rd, 1893. In that evidence Lord Kelvin, examined by Mr. Pember, said: "The escaping currents from electric-light lines affected telephones perceptibly at a distance of five miles, and considerably at many hundreds of yards. He had examined the Blackpool Tramway very carefully, and the generating station. The return circuit was through the wheels and by the rails. The potential was 300 volts, and there was very great disturbance. It was almost impossible to speak over the telephones at certain times during the running of the trams. He attributed it partly to induction. Two or three trollies instead of one would diminish the disturbance very much, and probably something in the way of brush contact would have the same effect; but the best method of preventing the disturbance would be a properly insulated return-wire. There would be no practical difficulty in laying this, whether the wires were overhead or underground. Two insulated conductors would allow a much higher working electric pressure to be used, and would diminish very much the quantity of metal used in the conductors. Accumulators were to be preferred in some respects; but there was the difficulty of weight, and expense, and no one could say whether they would or would not be used in the future. It would be a very great evil to the public if the number of overhead wires were doubled. If the tramway used the earth for the return circuit, it would be rendered unavailable to every one else." He did not think the use of the earth by the telephone companies should be interfered with, it was so valuable. The public required protection to prevent the gas- and water-pipes being utilised for powerful currents, such as those of the electric-lighting companies. He thought there was a prospect of accumulators. The cost was too great at present, but he thought it worthy of consideration. [Photographs showing the effects of electricity on water- and gas-pipes were put in by witness.] The evidence taken before the Committee of the House of Commons does not go into the effects of wandering currents upon telephones underground. That matter was not before the Committee then; in fact, it has only cropped up since 1st July, 1893. Before this inquiry was started, each time that an electric tramway company started they found that it would be an interference with the telephone system, and they had to fight out each case by itself. After about fifty cases had been heard, some of which had been decided in favour of the tramway companies and others in favor of the telephone companies, the matter was taken to the Board of Trade, and they were asked to do something to define the position once for all. The Board of Trade would not take it upon their shoulders, but referred the matter to the House of Commons. The whole of the evidence taken before the Committee, and also the summing up of the lawyers, is contained in the journals I have handed in. The decision of the Committee has not arrived here yet. I could have telegraphed to London for information, but I could only have got a few words of reply back, which would not be satisfactory. A mail is due in Auckland to-morrow, and will doubtless bring news of the report of the Committee. I have no interest in the matter under your consideration, save the protecting of the public property. The proposed electric tramway system will interfere with our telephone system to a large extent.

1. *Mr. Earnshaw.*] You will look upon the decision of the House of Commons as a final decision?—No; I do not think so. They have not seen this paper (*Western Electrician*, 1st July, 1893). It puts another phase on the thing. In the report of the evidence before the joint Houses, there is evidence by one Mr. Langdon. He pooh-poohs the idea of electric action of currents on wires underground, and on water- and gas-pipes. I shall be most happy to let you have the Committee's report, if I get it in time. I think it would be better to postpone coming to a decision on this question until you see what decision the House of Lords and House of Commons have come to. Since these papers from which I have quoted have come out, I have received a paper containing the report of Professor Barrett, Electrician to the Corporation of Chicago, on the effects of wandering electric currents on water- and gas-pipes. It shows conclusively the destructive action of the wandering currents from the electric tram-service on the water- and gas-pipes in that city. I do not believe the London people had that report in their possession before I had. There is no doubt that, apart from interference, wandering currents will have a destructive action on underground cables. Some of the cables in Chicago, which had only been down four months, were destroyed. [Dr. Lemon here produced photographs of single-trolly and double-trolly tramways.]

2. Do I understand, with regard to this destroying of electrical cables, that the electricity that is discharged from the tram-service permanently remains in the ground?—No. That has never been made clear to you, and I will explain it. Say, you have a battery (there is a great misunderstanding as regards the terms "positive" and "negative"): the copper pole inside the battery is called the "negative," and the zinc pole the "positive." The electricity deposited on the copper by the chemical action on the zinc, when it reaches the copper pole, and when it is discharged