

reach; hence it is necessary to put the manure close to the growing plant, and plenty of it. Compare that now with grass: grass is very nearly a natural plant. It has very large fibrous roots compared with the size of the plant, which can seek for plant-food over a comparatively wide area; and if it is possible to keep a permanent covering of grass you can vary the composition of the different species without breaking the land up; hence, if you once alter the composition of the soil for the better, it must last, as I say, an indefinite period.

97. In farming with sheep a certain quantity of phosphate is carried away with every carcase put into the market?—Yes.

98. Would your phosphates in time not be very much diminished by that process?—They certainly would be diminished, but the rock is continually liberating fresh plant-food through the agencies at work in the soil. In these subtropical and tropical soils by analysis you get comparatively a small amount of the available plant-food. That is the opinion of others. That seems to show that the rate at which the plant-food is made available is quicker in these warmer soils than in the colder soils of the southern parts.

99. *Mr. Russell.*] Have you formed any opinion as to the underground soakage, where there is a good deal of water in the country, taking it right through?—I have not given the matter a thought.

100. Would you express an opinion as to whether, under the treatment you recommend, the better class of this country would grow alfalfa—the pumice country where there is water?—I cannot express an opinion on that point, because there have been no experiments completed in growing lucerne.

101. Assuming the land were cut up into 800-acre sections such as referred to by Dr. Pomare, you would not expect a man to put fertilizers over the whole of his land?—Certainly not.

102. Assuming that a man ploughed and put into cultivation, say, 200 acres of his land in the first place, would not the very stocking of that land provide a large amount of manure, so that he would gradually bring the whole of his farm under cultivation, and there would be no need to re-fertilize all this country?—Certainly that is the obvious method of dealing with this land—to start with a small area, to dress until you get your sward, and then to go on to another part.

103. Have you formed any estimate of the profit a man would get from 200 acres fertilized on your method?—No. As I said before, I am unable to recommend any definite quantity yet. I know that some farmers have obtained good results from a small dressing of slag, but until I can get these results from our own farms I would not like to give any advice at all as to the profit derivable from pumice lands.

104. But you think these lands can be more effectively held in small areas than in large blocks of unimproved country?—Certainly.

JAMES EDWARD FULTON sworn and examined. (No. 16.)

1. *Hon. Sir J. Findlay.*] You are a civil engineer?—Yes.

2. Resident in Wellington?—Yes.

3. What are your qualifications?—I have been all my life engaged in railway-construction.

4. You laid off and supervised the construction of the Manawatu Railway?—Yes, a large portion of it.

5. And after its construction you were the engineer, I think?—Yes, and manager of the traffic.

6. And you have also had many years' experience in this Dominion as a civil engineer in all branches of your profession?—Yes.

7. You laid off and supervised the Taupo Totara Timber Company's Railway from Putaruru?—Yes.

8. What is the weight of the steel rails used on that line?—30 lb. to the yard, steel rails.

9. There is some suggestion as to whether they were new when laid: were they new rails when laid down?—Yes.

10. And of the best quality?—Yes.

11. How does the sleepers in point of heaviness compare with the Government sleepers?—It has much more sleepers than any other line in New Zealand.

12. What is the effect of that?—It is a matter of cost. If you put down more timber you can do with a lighter rail. If the rails were heavier you could, of course, do with fewer sleepers with equal strength.

13. Expressed in another way, with the number of sleepers upon this railway the rails would carry the same weight as a much heavier rail upon a line sleepers as the Government line is?—Yes.

14. You have seen a report made by Mr. Coom?—Yes.

15. Mr. Coom was for many years Chief Government Engineer, I think?—Of the constructed railways.

16. I suppose I may take it that he was one of the leading authorities upon that matter in New Zealand?—Yes.

17. Have you seen the report which was placed before the Taupo Totara Timber Company's Petition Committee last year?—Yes, I saw that.

18. I will put the report in. You have gone through that, I know?—Yes.

19. Have you any criticism to offer on it, or do you agree with it?—I think it is a very fair report.

20. You have made light railways a special study?—Yes.

21. And you share the heterodoxy of believing that they should supersede the more expensive lines for opening up the country?—Most emphatically.

22. They can be constructed for about half what the standard lines cost?—Quite easily.