

was carried. We all hope that Professor Cooke will visit New Zealand again some day.

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On Wednesday, October 5th, at 8 o'clock we enjoyed a most informative lecture from Dr. Frank Newhook, a foundation member of our Society, on Antibiotics and Plant Diseases. As Dr. Newhook has recently carried out research for two years at London University on diseases of lettuce, he dealt with a subject on which he is well qualified to speak with authority. Below we print a summary of his lecture kindly provided by Dr. Newhook.

### ANTIBIOTICS AND PLANT DISEASES

Antibiotics is a branch of science which is very well established in the field of medicine, having received a great impetus from the development of Penicillin and latterly Streptomycin. It is natural to ask whether the same or similar antibiotic substances may have a useful application in the control of plant diseases.

Antibiotic substances are generally regarded as toxins produced by micro-organisms (i.e. by fungi and bacteria and the intermediate group the actinomycetes, and also perhaps by protozoa) which prevent the growth of other micro-organisms. The first record of antibiotic activity was that of Pasteur in 1877, when he found that certain bacteria repressed anthrax in susceptible animals. Further research attracted little attention until after the publication of Sir Alexander Fleming's first paper on Penicillin in 1929. However it is of interest that in 1908 Potter controlled a turnip rot by spraying plants with a toxin produced by the causal bacteria themselves.

Since almost all diseased material sooner or later returns to the soil without the soil becoming increasingly infectious, attention has been directed largely to the soil in the search for useful antibiotic organisms. Several cases are now known where soil-inhabiting micro-organisms destroy plant pathogens, e.g. a green mould Trichoderma parasitises Pythium and Rhizoctonia, the fungi causing damping off of many types of seedlings. Attempts are being made to control soil borne diseases by introducing suitable materials to the soil to encourage the growth of antibiotic organisms. Thus the addition of grass clippings and organic

manures have controlled potato scab and cotton root rot respectively. Such methods are unpredictable, however, and by no means generally effective.

I was fortunate to be able to work for two years in London on another type of disease-producing fungus, one of the group of wound parasites, viz. the grey-mould Botrytis cinerea. It attacks many plants, but only after first starting growth on dead tissue, e.g. old or frost-damaged leaves; spores will germinate on green leaves but will not penetrate and attack. I found that a great number of harmless soil bacteria and fungi which grew saprophytically on dead lettuce leaves in the field prevented attack if inoculated a day or so before Botrytis on wounded leaves. The same result was achieved if a water suspension of seedbed soil was placed on dead leaf tissue a day or more before Botrytis, though if both the soil and the Botrytis were inoculated together the latter attacked the plants. In this way, under natural conditions, providing spores of the disease do not arrive too early, the growth of soil micro-organisms on the old and damaged leaves protect the plants from grey-mould attack by means of antibiotic activity.

There are many reasons why we cannot at present expect any spectacular cures of plant diseases by means of antibiotic substances, e.g. plants have no circulatory system to carry the drugs to all parts in quite the same way as animals and in any case many antibiotic substances are themselves harmful to the plant or are rendered ineffective by the sap.

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On Saturday, October 15th, an excursion was held to Nihotupu Dam. Unfortunately it rained discouragingly during the morning. Notwithstanding, a few brave souls hied themselves forth and their optimism was rewarded and the weather improved and was quite pleasant during the afternoon. Apparently an enjoyable day was spent but further details are lacking as the editor was of those who remained at home.

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If the weather was unkind for Nihotupu nothing could have been better than the conditions for the Goldie's Bush