The analyses of the samples of rye-grass are proceeding, and results to date indicate no marked differences in the carbohydrate or nitrogenous fractions studied. But as has been pointed out above, the fractions for which analytical methods are available are not those which would be suspected of causing a pathological condition. When adequate methods for determining the components of the rest-nitrogen fraction are worked out, the material from these experiments will prove of value in determining the effect of at least one environmental factor on this interesting fraction.

Phytohormones.

Extension of the work on the rooting of cuttings through the use of phytohormones has been in the direction of determining the effect of various nitrogenous materials used in conjunction with naphthaleneacetic acid. Cuttings of *Rhododendron maddenii* var. *jenkinsii* were chosen for the investigation, since difficulties have been experienced in promoting rooting in this species. Some thirty nitrogenous compounds of varying degrees of complexity and markedly different chemical constitution were used, and considerable variations occurred in the rooting response. Thus, betaine, alloxan, and tyrosine, when applied to the cuttings after a preliminary treatment with naphthaleneacetic acid, gave 100 per cent. rooting in two months, naphthaleneacetic acid alone giving virtually no rooting over the same period. Other materials did not give so marked a response, although all the materials tried, including ammonium and nitrate salts, produced some effect. It is noteworthy that concentrations of these chemicals as low as one part in twenty millions exerted as great an effect as concentrations four hundred times as great and that at the lowest concentration of 0·05 mg. per litre each cutting would take up no more than 0·025 γ of the substance. No satisfactory explanation can be put forward as to the action of these nitrogenous materials, since such infinitesimal quantities can hardly be acting as plant nutrients.

Other Investigations.

The analyses of the rations fed to milking cows in stalls have been carried out for the Dairy Research Institute in connection with their nutritional investigations.

The soil and pasture studies on the Marton area, which have been in progress for a number of years, will come to an end in 1941, when a full report of the whole investigation will be submitted. Meanwhile current analyses are going forward satisfactorily.

Publications.

The following papers have been published in the *New Zealand Journal of Science and Technology* during the year:—

"A New Method for Clarification of Plant Extracts for the Determination of Reducing Sugars," by B. W. Doak.

"The Effect of various Nitrogenous Compounds on the Rooting of Cuttings treated with Naphthaleneacetic Acid," by B. W. Doak.

"Nitrate Nitrogen in Plant Material: I—A Micro-method for the Determination of Nitrate; II—A Micro-method for the Determination of Total Nitrogen in the Presence of Nitrate," by I. Reifer.

"The Estimation of Nitrogen by the Hypobromite Method, using Copper as Catalyst," by I. Reifer.

"The Micro-estimation of Adenine, Guanine, Xanthine, and Hypoxanthine in the Presence of Uric Acid," by I. Reifer.

ANIMAL RESEARCH.

The Animal Research Management Committee held no meetings during the year, owing to the fact that it was deemed necessary by the Government to review the policy and departmental organization concerned with the administration of animal research.

Reports on researches relating to animal problems are included in the sections of this report referring to the work in progress at the Agricultural Colleges and Cawthron Institute.

SOIL SURVEY.

Land Utilization Committee.—Sir Theodore Rigg, Director, Cawthron Institute (Chairman); Mr. A. H. Cockayne, Director-General, Department of Agriculture; Mr. E. J. Fawcett, Assistant Director-General, Department of Agriculture; Mr. R. B. Tennent, Director, Fields Division, Department of Agriculture; Mr. R. P. Connell, Land Utilization Officer, Department of Agriculture; Professor W. Riddet, Massey Agricultural College; Mr. G. A. Pascoe, Factory Controller, Department of Industries and Commerce; Dr. L. I. Grange, Director, Soil Survey Division, Department of Scientific and Industrial Research; Mr. R. G. McMorran, Under-Secretary, Lands and Survey Department; Mr. F. R. Callaghan, Chief Executive Officer, Plant Research Bureau, Department of Scientific and Industrial Research; Dr. I. W. Weston, Agricultural Economist, Canterbury Agricultural College; Mr. F. J. A. Brogan, Assistant Secretary, Department of Scientific and Industrial Research (Secretary).