

GENERAL

A considerable amount of work has been carried out in determining the characteristics of motors, alternators, fluorescent tube ballasts, transmission lines, and I.F. transformers. A distortionless A.C. voltage-stabilizer has been constructed for sub-standard meter testing.

Work was continued on the prevention of frost damage in Auckland orchards by the use of horizontal fans. Without a great deal more meteorological data, little can be said at this stage about the effectiveness and reliability of fans for the prevention of frost damage to crops in Auckland. However, for given meteorological conditions a fair estimate of the performance of this type of fan has been obtained.

Further records have been secured in the investigation into air-conditioning of greenhouses, and it was thought that it would be possible to issue a report on the design requirements from an engineering standpoint. It is evident, however, that plant physiologists must first be able to supply critical and optimum conditions for plant growth before this can be done.

A prototype pulse-rate recorder has been designed and constructed. After slight modifications, some most interesting records were obtained during major operations at the Auckland Public Hospital and Green Lane Hospital. It is hoped to combine this equipment with the blood-pressure-recording equipment at present being developed at the Dominion Physical Laboratory, so as to provide a valuable piece of equipment for the control of anaesthesia and the early indication of dangerous trends in the condition of the patient.

BIOMETRICS SECTION

Officer in Charge: Mr. I. D. Dick

Completed Projects.—The following projects have been completed and are being prepared for publication:—

- (1) The design and analysis of asymmetrical factorial designs suitable for use in animal nutrition.
- (2) The application of confluence analysis to agro-economic surveys.
- (3) The accuracy of reversal trials in dairy experiments.

Other Investigations.—Work has also been done on the analysis of the distribution of yellow-leaf-diseased plants in *Phormium tenax* plantations, but further data are necessary to complete this project.

An attempt has been made to apply the methods of probit analysis to study the growth curves of *Phormium tenax* plants, but this work has been discontinued indefinitely owing to difficulties in interpreting the results.

An investigation has also been made into the accuracy of the point analyser when used to determine secular variations in vegetative cover. Preliminary results have been obtained from data collected in the South Island, and at the moment a theoretical attack is being made that shows considerable promise.

Work in Progress.—This falls into two major categories: (a) the theory of systematic sampling, which is a problem of very real importance in such fields as forest surveys, ecological studies, and kindred fields; and (b) the theory of the statistical analysis of time series—a problem of fundamental importance in numerous geophysical problems.

General.—The advisory duties are still heavy, but the location of assistant biometricians at Auckland and Lincoln is a considerable advantage in this respect.

The development of the section is proceeding satisfactorily. The nucleus of a good library has now been established, staff training both in New Zealand and overseas is under way, and punched-card computing equipment has been ordered and is coming to hand.