

At Head Office the results obtained from the frost investigations made during the spring of 1947 in central Otago have been made the subject of preliminary analysis and discussion. Instrumental difficulties are gradually being overcome, but further work is necessary before we shall be in a position to begin detailed forecasts for fruit-farmers.

As a natural extension of the work in Central Otago, a preliminary survey of the frost problem in the Hastings fruit-growing district has been commenced, and further investigations are planned for the coming spring. In connection with these projects the meteorological staff have worked in co-operation with the Auckland Industrial Development Laboratory and the Plants Diseases Division of the Department of Scientific and Industrial Research to test the feasibility of frost-protection methods.

In view of current scientific interest in meteorological processes in the Antarctic and high southern latitudes, and taking into account the increasing amount of information which is now becoming available, some preliminary studies have been made with a view to finding out how this material might best be used in the daily forecast service. These studies are incomplete, but will be pursued as time permits.

At branch offices the following projects are in progress or have already been completed during the year :—

- (a) *General Forecasting Office, Kelburn.*—A study of the meteorological situations associated with daily rainfalls of over fifty points at Waihopi Power-station has been completed and has proved very useful in preparing daily forecasts for transmission to the Engineer in Charge. The use of these forecasts enables a certain saving of fuel and permits more economical operation of the station.
- (b) *Meteorological Office, Auckland.*—In conjunction with the Physics Department of the local University college, an investigation is being made of the distribution of electric potential inside cumulus clouds, utilizing a modified radiosonde technique. A study is also being made of the variation of tropopause heights and high-level winds at Auckland in relation to the movement of pressure systems. In addition, an investigation has been made of weather and flying conditions along overseas air routes, and information is being collected on turbulence in active cumulus clouds.
- (c) *Meteorological Office, Paraparaumu.*—An investigation is being made of local weather conditions at various airfields throughout New Zealand with a view to improving the forecasting of terminal conditions, especially with regard to surface winds and weather minima.
- (d) *Meteorological Office, Taieri.*—This office has been intimately connected with the Central Otago frost investigations and has been specially concerned with the inspection and maintenance of equipment at the meteorological base at Earnscliffe.
- (e) *Meteorological Office, Fiji.*—Work has been continued on the elucidation of certain anomalous features of the diurnal pressure wave in the tropics by using pressure data at Suva and Nandi.

LIBRARY AND PUBLICATIONS

Library.—A specialized library service has been maintained covering all phases of meteorological work both in New Zealand and overseas. This year has seen a continued improvement in the number of publications received from overseas and a widening of our active exchange relations with many countries. In this way a number of important additions have been made to the library and many gaps due to war conditions have been filled.

During the year some progress has been made with the classification of the library and the compilation of the index according to the decimal classification system adopted by the International Meteorological Organization. The completion of this task will