

RAINFALL DATA.

The withdrawal of temporary assistance early in the year necessitated the abandonment of the work on the preparation of a new rainfall map of New Zealand. The permanent appointment at the beginning of the current calendar year of Mr. R. G. Simmers, however, enabled the work to be taken up again, and it is now well advanced.

A commencement has been made with the tabulation of the records from the automatic rain-gauge at Kelburn.

A good deal of information regarding heavy rainfalls has been supplied to various engineering bodies, including the Public Works Department. The problem of flooding by rivers has become a serious one in a number of districts.

MISCELLANEOUS.

Experiments in frost protection have been continued in Central Otago, and a number of orchardists have procured heating-apparatus. The meteorological station at Alexandra has been of use in connection with the experiments, and as records accumulate its usefulness should increase. A conference with the Orchard Instructor at Alexandra and representative growers was held early in November and various problems were discussed.

At the request of the Secretary, Department of Scientific and Industrial Research, the relation between wheat-yield at Lincoln College and meteorological factors was investigated during the latter portion of the year. The results are given in a paper which is being printed in the *Journal of Science and Technology*.

Teachers have asked repeatedly for typical weather charts and a simple description of forecasting methods in New Zealand. Since no popular or recent pamphlet on forecasting was available, an article, freely illustrated by charts, was prepared to meet the demand. This article was published by the Education Department in the *Education Gazette*, and has consequently been available to all teachers. Numerous reprints have been distributed also to those interested.

From the 6th to the 9th October, 1928, a remarkable quantity of dust from Australia was deposited over the Dominion, especially in Southland and the ranges of the South Island generally. In March, 1929, enormous areas of snow in the Southern Alps were still deeply discoloured by this deposit, which was of a terra-cotta hue. The latest information available would indicate that the total deposit on New Zealand could not weigh less than 200,000 tons. A paper describing the meteorological conditions leading to the transport of this dust has been published in the *Journal of Science and Technology*.

I have pleasure in acknowledging the loyal and cordial assistance of all members of my staff.

SHORT SUMMARY OF THE WEATHER FOR 1928.

The year was, like its predecessor, remarkable for the comparative absence of westerly winds. The second most important characteristic, which was no doubt associated with the first, was the large number of depressions of cyclonic form which affected the New Zealand area. As a rule, the type of depression most frequently experienced is the southern type in which pressure falls continuously in the southward direction towards higher latitudes than those from which meteorological reports are available. The nature of this common type of depression is determined by the fact that the principal characteristic of the general circulation of the atmosphere in this part of the world is the prevalence of westerly winds and a decrease of pressure from low to high latitudes. These features being very poorly developed this year, the storms were able to form much more symmetrically, and the cyclone was of abnormal frequency. Cyclones cause strong east to north winds during their approach, and south-east to south as they move away eastwards. Owing to the preponderance of easterly winds, eastern districts get heavier rains from cyclones than do western districts, most of the floods in eastern districts arising in this way. The reverse is, of course, the case with the normal westerly depression. The heavy average falls on the west coast of the South Island and about Cape Egmont are due to the prevalence of westerly winds in normal years and the common type of depression.

For the greater part of the Dominion the rainfall for the year was above average. In the North Island there were large areas where the excess was more than 10 in. Deficits were recorded in some districts, of which the principal ones were in Taranaki and the Manawatu, Westland, and the eastern portions of South Canterbury, Otago, and Southland. The deficits were, however, seldom large. The latter part of the year was particularly wet.

There was abundant growth of feed in most districts, and, generally, conditions were favourable for a good yield from the soil. One region where the favourable characteristics of the season were particularly apparent was in the usually rather arid region in Central Otago. The growth of pasture was too rank in some localities to have the most nourishing qualities for stock. In consequence lambs failed to fatten well in those areas. The humid and warm conditions towards the end of the year, also, were favourable to fungus growths, and small crops, such as tomatoes, were affected to some extent in the Nelson and Wellington Districts.

Sunshine was rather below normal for the year in the eastern districts of the North Island and in Canterbury, but in western districts it was above normal. Nelson, with over 2,500 hours, registered the most.

The year was, on the whole, a warm one, the mean temperature being above the average for previous years in all provinces.

The first seven weeks were very dry indeed, and in many parts the driest January on record was experienced. Relief was brought to much of the country in the last week in February, but it was not until Easter-time that the droughty conditions ceased in Taranaki, western Wellington, and Nelson. Good rains followed, and, being accompanied mainly by mild conditions, they soon put the country in good heart generally.