

Practical experiments have been made in connection with the wearing of sand and gravel under conditions similar to those of wave-action on beaches. The development of fine detritus by this action has been carefully studied, especially with reference to difficulties in connection with harbour development throughout New Zealand. A large amount of most valuable information has already been obtained and has been embodied in two pamphlets on "The Wearing of Beach Materials" and "Gravel and Sand on Beaches."

METEOROLOGICAL BRANCH.

REPORT BY THE DIRECTOR.

FORECASTING.

PROGRESS has continued to be made along the lines referred to in last year's report. Increasing use is being made by the public and the shipping community of the reports issued by wireless every evening in Morse code by the Wellington Radio Station (ZLW) and by telephone from the stations of the Radio Broadcasting Co. in the four main centres.

Special forecasts giving indications of the conditions anticipated for as far ahead as possible over the wheat-growing areas of Canterbury and Otago during the harvest period from the beginning of February to the middle of March have been issued from the radio broadcasting stations at Christchurch and Dunedin at 12.45 p.m. Appreciation of these forecasts has been expressed by various institutions, and we have been requested to arrange for a repetition of the forecast in the evening during the next harvest season. Since the 2nd December similar forecasts, but of a more general nature, have been issued from the Wellington station (2YA) at 3.30 p.m. mean time each afternoon for the benefit of sheep-farmers, especially in connection with shearing operations. In addition, during the apple-picking season, special warnings of heavy rains or southerly gales were sent to growers in the principal producing districts.

Numbers of farmers have paid to have warnings of severe weather telegraphed to them while their flocks were being shorn. Aviators, also, have asked for forecasts preparatory to undertaking various flights. Very many other forecasts have been given either by telephone or telegraph to people in all parts of the country for special occasions of many kinds.

The number of reports received daily from ships at sea continues to increase. These reports are of very great value, and our thanks are due to the captains and officers who co-operate with us by sending them.

I desire also to acknowledge the continuous, regular, and prompt assistance given by the Post and Telegraph Department, on which our success is entirely dependent.

OBSERVING-STATIONS.

New climatological stations have been established during the year at Queenstown, Kapiti Island, the Chateau Tongariro in the National Park, and the Milford Sound Hostel. Owing to the sale of the farm, the station at the Weraroa State Farm has been abandoned. That at Matamata also was discontinued. Twenty-two new rainfall stations have been established, and five have ceased reporting.

Assistance has been given to the Cook Islands Department in the establishment of stations in some of the islands, and the records have been supervised.

The quality of the observations at climatological stations still continues to give concern, very few being thoroughly reliable. As much inspection as possible has been done, and some improvement has been made. It is clear, however, that repeated visits are necessary. There is no doubt that the outstanding need in the meteorological service in New Zealand is for improved observations. Forecasting is liable to eclipse the other activities of this Branch in the eyes of the public, but its most important duty is the collection of the statistics which are required for the advancement of agriculture, engineering, and other pursuits. We are very grateful to those observers who send us complete and accurate returns.

RAINFALL DATA.

During the year a bulletin has been completed giving a new annual rainfall chart for New Zealand. Another chart shows also the average number of rain days per annum. The rainfall data given are for the epoch from 1891 to 1925. The relation of the rainfall to the topography of the country and to the principal storm systems was described.

Hourly rainfalls for Kelburn have been tabulated regularly from the records of the automatic gauge.

Much information regarding heavy rainfalls has been collected and tabulated at various times and distributed to engineers.

AVIATION METEOROLOGY.

Observations of winds in the upper air have been made daily at Wellington, and monthly summaries have been prepared. A comparison is being made of the relative accuracy of the range-finder and "tail" methods of determining the height of the balloon.

At Auckland Mr. F. H. Sagar has made balloon ascents on most days, and presented a discussion of them for his thesis for the M.Sc. degree.

This Branch has co-operated with the Christchurch Magnetic Observatory in the inauguration of pilot-balloon ascents there daily. Results are now telegraphed each morning to Wellington.