

19.90 in. (—21 per cent. of mean). In 1916 and 1917, however, the rainfall was about the average, but slightly above it in the latter year. The rainfall returns for Dunedin, which may be taken as representative of the southern districts, in some cases show a fall below the average when that at Auckland in the same year of abnormal anticyclonic movement is above it; but this rule is by no means consistent in the records, and so it would appear that the extreme south is not greatly affected by the variation from the normal of the anticyclonic track in any year.

The excessive rainfall in the northern districts when the high-pressure systems move in higher latitudes is brought about by the greater number of extra-tropical cyclones, which are then able to approach within effective range of the northernmost portion of New Zealand. On the other hand, when the high-pressure areas are in lower latitudes, Antarctic or westerly depressions extend farther north, and the west-coast and southern districts of the South Island receive heavy rains. The conclusion to be drawn is that in years when extra-tropical cyclones are more numerous Antarctic or westerly areas of low pressure are less in evidence, and *vice versa*, and this the records have generally proved.

Since the annual rainfall at Auckland shows a marked relationship to the abnormal positions of these anticyclonic belts, it might be expected to show evidences of any cyclical movement if any such existed, but from records which extend back to 1864 no definite periods in the intervals of maximum or minimum swings of the anticyclonic belts can be deducted. The periods between the years of maximum rainfall, and also between the years of minimum rainfall, appear to be altogether irregular, ranging from one to ten years for the former and one to eight years for the latter. The mean period in both cases is 4.4 years.

(To be continued.)

SUNFLOWER NOTES.

By J. BEVERLEY, Assistant Agriculturist, Central Development Farm, Weraoia.

THE sunflower deserves to be grown more than it is at present in New Zealand, especially on small holdings and in gardens. In the early districts of New Zealand I should advise taking a crop of peas or potatoes first, and letting the sunflower be the second crop off the land in the one season. As regards the cultivation of the crop, sowing in rows 28 in. apart with the plants spaced to about 15 in. apart is recommended. The seed should not be covered with more than 1 in. of soil. When the plants are from 12 in. to 15 in. high they should be earthed up like potatoes, and no more cultivation is necessary. A good average crop will yield 50 bushels to the acre.

In Europe the annual sunflower is cultivated for its oil as well as a food for cattle and poultry. *Helianthus annuus* is, however, not the only variety cultivated, as the dwarf species, *Helianthus indicus*, is preferred by some cultivators in France, who assert that, owing to its dwarf habit of growth admitting of a greater number of plants being grown on a given space, it is not so much inferior to the other variety in quantity of produce as one might be led to expect from its appearance.