

had less sunshine than they had ever previously had in any month. And there was a tornado in Te Awamutu. This May the tornadoes were at Kaitaia and Lower Hutt.

"Also in contrast to May this year, the southeastern seaboard of Australia last year would have plenty of rain because of a deep depression sitting in the Western Tasman. (See weather maps, page 4).

"So you see," Dr Gabites concluded, "the fluctuations from month to month, and season to season — especially the larger fluctuations — obscure any slow climatic changes that may be going on. It is really these larger fluctuations, and the variability from season to season that impress the man in the street, and that he particularly notices. Put even simpler, it's today's clouds and tomorrow's rain that are important."

Dr de Lisle, contributing to the picture, explained that it was these large fluctuations that had to be taken away and ignored in any research into general trends in our records of rainfall. He had done this recently in a survey of West Coast rainfall, a survey which had some interesting results.

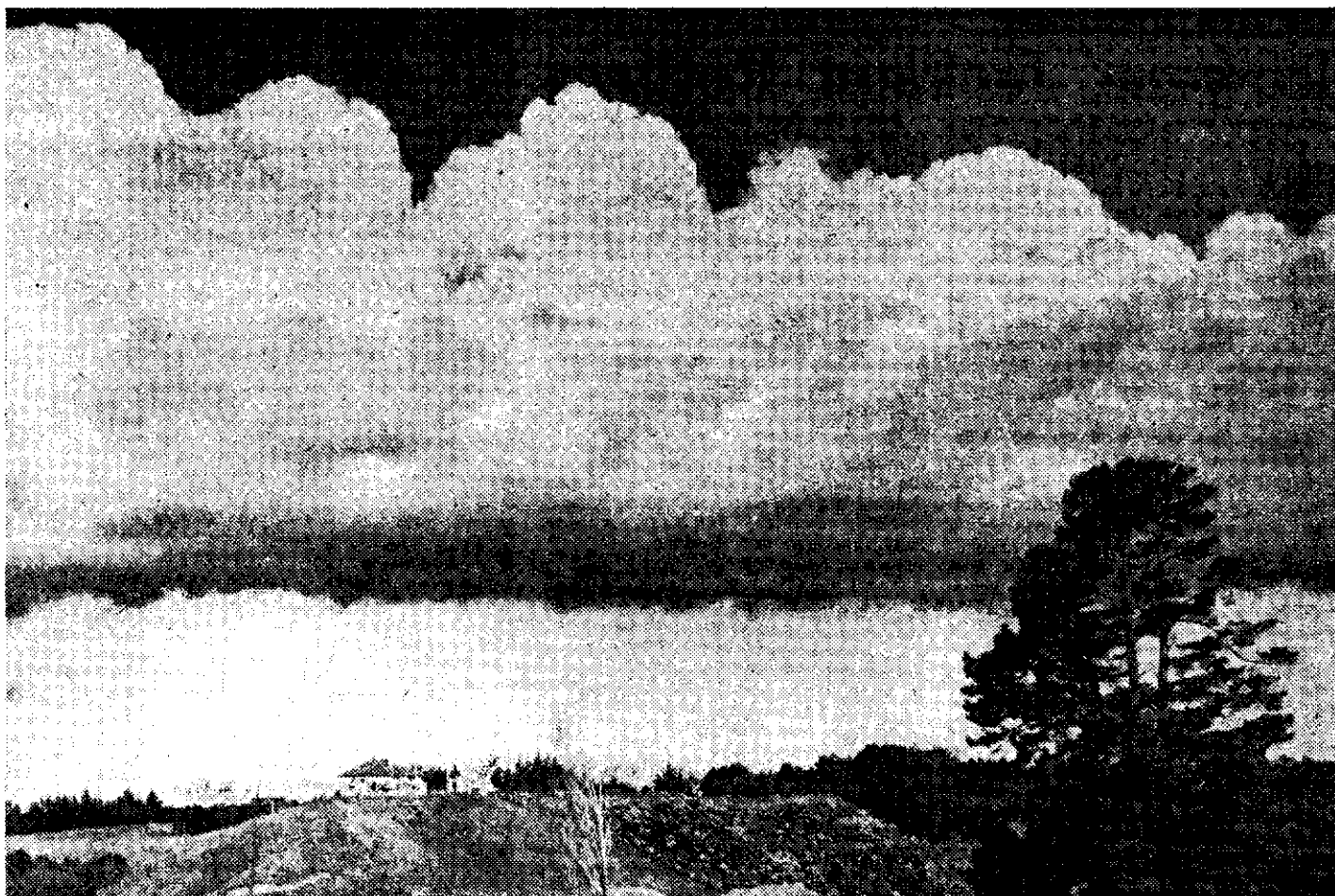
Two research methods were used in this survey, Dr de Lisle explained, both methods being ways of looking at the record through eliminating the "larger fluctuations" mentioned earlier. In the first, by drawing what are called "ten-year moving averages," the year by year changes disappear and only the broad features remain. The second technique is an analysis of frequency. As illustrated in the diagram on this page, the short period waves or oscillations, at the top, show no particular trend, but in the graph at the bottom, where all the short period waves are cut out, a longer wave or trend shows up. Both these methods, said Dr de Lisle, could be compared to picking out the main theme in a piece of music scored for a large orchestra.

"Both methods showed a 20 to 30-year trend in the record of spring rainfall—a general decrease from about 1912. But you must remember this occurred only in a particular place at one particular period. This particular climatic trend is very minor—and completely obscured for the ordinary man by the far larger yearly fluctuations."

One could only guess at the reason for the occurrence of this trend, said Dr de Lisle. There were a number of possible explanations.

"This particular change could be caused by a shifting southward of the westerly wind belt—but why this latter change would occur is another problem again. We have only put the question one stage further forward."

Looking at the charts on Dr Gabites's desk, we wondered what the "stage further forward" meant. The West Coast—even New Zealand—looked very small in half a hemisphere of swirling and waving wind patterns. Was there any other evidence of climatic trends? What about temperatures?



★ ABOVE: Line-squall crossing Taranaki farmland—"It's today's clouds and tomorrow's rain that are important." RIGHT: Graphs, based on Hokitika spring rainfall, show how general trends can be shown by eliminating large annual fluctuations

"In New Zealand we haven't got good enough records of temperature to analyse," said Dr Gabites. "Most records have suffered from the changing of site of the observing station. In Wellington the site has been changed three or four times, being at different times on low or high ground, which in itself is sufficient to vary readings."

"Cities have also grown up around observing sites. If even a tree growing up or being cut down can vary records, you can imagine how a city, with its buildings absorbing and releasing heat in various ways can ruin them."

Though they had no good evidence at present in New Zealand of significant temperature changes, said Dr Gabites, it was always possible that some might be uncovered in the future.

Our last question to Dr Gabites was on the work being done during the International Geophysical Year which, for meteorologists, began on June 20.

"We hope to gain from IGY in two ways," he said. "In the very broad theoretical field, and in the more immediately practical."

During IGY information would be available from areas that were previously blank, and also from areas that would otherwise be supplying only limited observations. Such information would help to give the broader knowledge which was so essential to long-term forecasting.

Dr Gabites touched a chart. "It is not very helpful," he said, "to know that at this point there is a disturbance approaching, if we don't know that there is a big area of anti-cyclonic activity developing here to block its advance. One must have the complete picture if possible."

The benefit in the theoretical field, explained Dr Gabites, could well come from the intensive study of what, in the final analysis, was the beginning and end of all our weather—the sun.

"The sun drives the atmosphere, for the wind systems are ultimately due to the heating from the sun. There have been some investigations in the tropical Pacific which suggest that events on the sun, like solar ares, may have some effect on the temperature conditions in the high atmosphere and ultimately on the wind circulation. Besides investigating this, the IGY scientists will also make a general study of the distribution of the sun's rays and on the fate of the outgoing radiation from the earth and atmosphere."

"Through this work we may learn something fundamental about the nature of weather and climate."

In the meantime, there is apparently little evidence of major changes in New Zealand's climate and the weather seems, to the average man-ingoloshes, as erratic as ever.

