THE DWELLINGUP STORM - JUNE 1954

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A storm struck the jarrah forest at the top of the Darling Scarp on the night of 16th June 1954, passing within half a mile of the residence of the only eye witness at 10 p.m. It moved in a slight curve - almost a straight line - from northwest to southeast, leaving a trail of destruction from one to two hundred yards wide for about five miles through the forest.

Trees of up to four (4) feet in diameter were uprooted and left piled one upon another. The trunks of others were left standing with the limbs torn off them, while others again were snapped off at heights of from six feet to about thirty feet above the ground.

The destruction was not of the same intensity throughout the storm track, and appeared to be most severe near its beginning. In some parts only about 10% of the timber was damaged, while in others almost everything was down.

It was apparent that most of the damage was done by winds in front of the storm centre, as a large proportion of the trees were lying at right angles to the storm track with their crowns to the right and butts not far from the stumps from which they were broken. A surprising feature was the number of trees left lying parallel to each other but in the same relative position as when they were growing. Apparently they were smashed down to the ground and then left there undisturbed.

There was evidently a very strong vertical wind gradient, as little damage was done below six feet from the ground. Practically all trees snapped off were broken above this level, and the lower saplings and scrub appeared completely undamaged.

This same feature was noticed by a bushman who cleared up the damage caused by a similar storm in the Dwellingup district about ten years ago. It was rather more intense than the recent one, and levelled practically everything in its path above a height of six feet. Below this height, blackboys (a brittle type of grass tree) were left standing, and furthermore dead leaves were left attached to the branches of a tree which had fallen at some earlier date, in the path of the storm.

The recent storm traversed very broken country, but was undeflected by the ridges and gullies. In one place it travelled for some distance along a railway line, and looking down from a nearby hillside it appeared as if a maintenance gang had been through, felling all the timber within a certain distance of the line.

In some places the damage faded out more or less gradually into the surrounding forest, but in others there was a well defined line of demarcation between the fallen and broken timber along the storm track and the undamaged forest.

The damage ceased on the highest ridge in the district, the last tree down being about 100 yards from the main Pinjarrah - Dwellingup road, and about half a mile from a house in a clearing towards which the storm had been moving.

The eye witness of the storm stated that he could hear it for " a long while - about half an hour", as it came towards his residence. He was inside when it was first heard and came out to see what was happening. He said that the forest was "all lit up" as the storm passed through, and described the noise as "a roar with thunder and lightning, and trees going down". In the circumstances it is probable that the time which seemed like half an hour was in fact considerably less.

It is interesting to compare the damage done by this storm with that caused by recent gales in Perth. On the night of 18th-19th July, gusts exceeded 50 miles per hour frequently for a period of eleven hours, during which time they exceeded 60 miles per hour on five (5) occasions and reached almost 80 miles per hour at their peak. The Bureau is situated in approximately 10 acres of park land carrying trees of all sizes. A few small trees which were riddled with white ants were blown down. No large trees were uprooted, none were stripped of their branches and none were snapped off. The only damage sustained by a sound tree was the removal of a small branch from a Kurrajong. This provides some basis for the estimation of the wind speed in the Dwellingup storm.

The synoptic situation at the time of the occurrence showed a depression with a centre below 1,000 mb. about 250 miles southsouthwest of Cape Leeuwin, and a front approximately 150 miles west of Dwellingup. Isobars over the Southwest Division were approximately westnorthwest/east-southeast, the surface wind at the nearest reporting station (Perth) was northnorthwest 11 knots, and the upper wind at 1000 feet 19 knots from 340°. Figure 1 shows the chart for 0001 17th June, 1954, two hours after the blow.

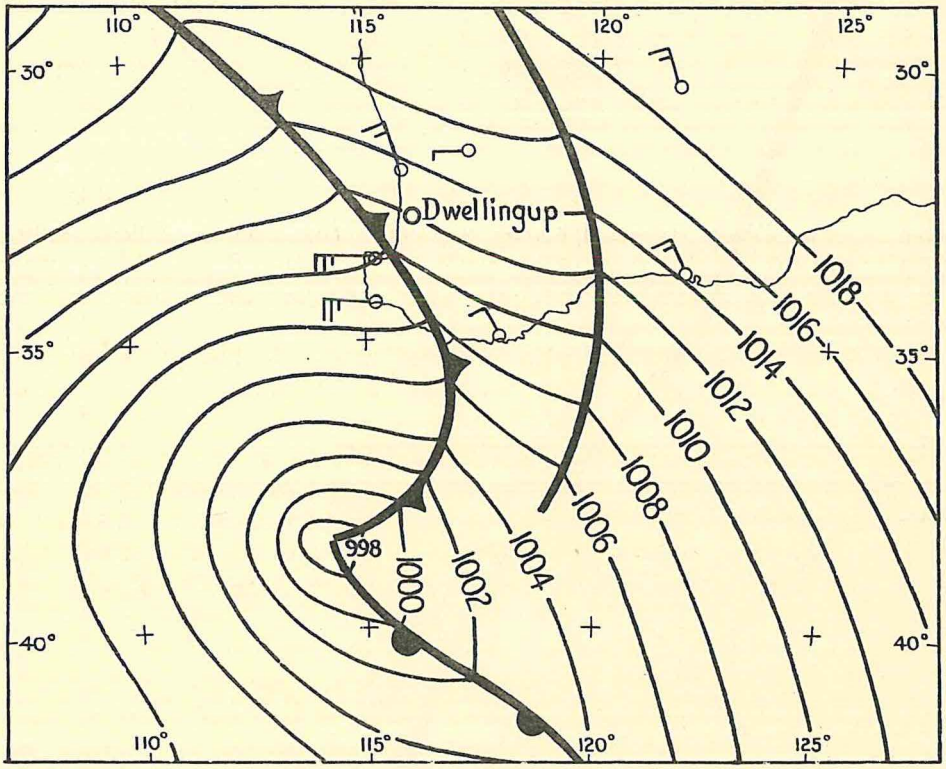

FIGURE 1. SYNOPTIC SITUATION AT 0001 Hrs (W.S.T.) 17·6·54

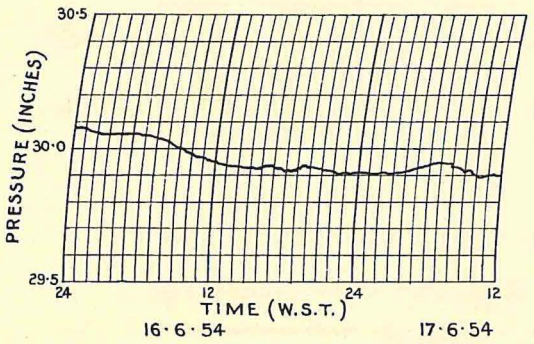

FIGURE 2. Barograph Trace DWELLINGUP

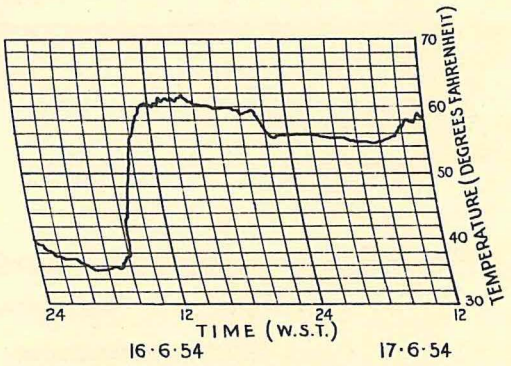

FIGURE 3. Thermograph Trace DWELLINGUP

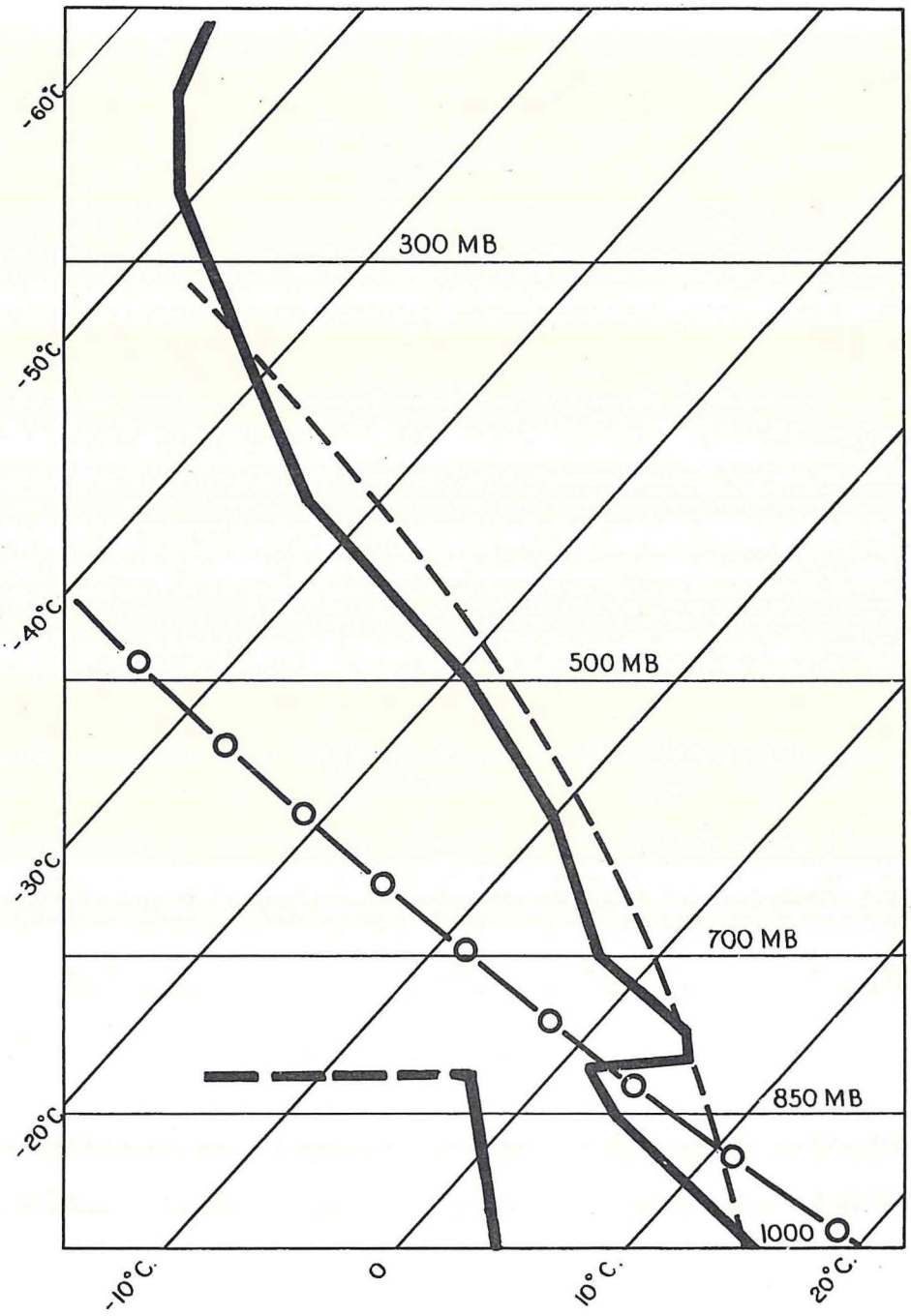

FIGURE 4. Aerological sounding at GUILDFORD 1200 W.S.T. 16·6·54. Temperature and Dew point heavy full lines ——— SALR - - - - - - DALR —O—O—

Throughout the whole of its course the storm was within six miles of the meteorological station at the Forests Office, Dwellingup, and approached within 1½ miles at its nearest point. The barograph trace from this office (figure 2) shows no sign of any pressure disturbance during the life of the storm. There were minor fluctuations about 8.30 p.m. and 6 p.m., but they were much smaller than those which occurred a few days later with normal winter storm conditions. The thermograph record (figure 3) shows a gradual and continuous fall of approximately 2 degrees per hour from 9 p.m. to 11 p.m.

The rainfall record is not available, but it is known that the heaviest rain during the night fell about 11.20 p.m. when 25 points were recorded in 15 minutes.

The Guildford aerological diagram for the 16th (figure 4) shows a super adiabatic lapse rate for the first 450 feet, but as the observations were made at midday this would not persist until 10 p.m. However, neglecting the significant point at 1000 feet the existing lapse rate approximated to the D.A.L.R. to the 860 mb. level at which height condensation would produce cloud limited in height by the inversion to a little below the 800 mb. level. During the day there was a general increase in dew point so that the cloud would form at a lower level and tops would rise slightly above the 800 mb. level. At Perth the change in dew point was from 6°C at 0900 to 11°C at 1800 W.S.T.

It appears probable that the uplift due to the Darling Scarp or the foot-hills caused sufficient condensation to enable a rising column to puncture the inversion layer. When this happened the ascending column would be free to rise to approximately 27,000 feet. Elsewhere the inversion would prevent free mixing of the two layers, and as the rising column of air flowed upwards through the puncture, some of the air immediately below the inversion would flow horizontally towards the puncture in a similar manner to water flowing out of a bath.

Except that the vertical movement is upward in one case and downward in the other, the analogy appears to be very close, the whirl developing in the air below the puncture just as a whirlpool forms in the water above the outlet of a bath.

It is thought that a whirl originated over the gradually rising land west of the actual Scarp, but had not developed sufficiently to extend down to the surface in its full force in this area. Evidence of this was found in a belt of trees bordering a road in the lower country, where for about 100 yards many small branches

had been blown down. There was, however, no evidence of any severe damage in this region.

The storm is thought to have been a true tornado for the following reasons:-

(1) It produced winds estimated at well over 100 m.p.h., while winds in neighbouring districts were only light.

(2) It emitted a loud roaring noise as it approached.

(3) It caused severe damage along a narrow track for several miles.

(4) It moved with approximately the same speed and direction as the general wind stream over the district, but caused a large proportion of the damage by winds at right angles to this direction.

(5) There was no sign of it on synoptic charts either before or after the storm.

(6) It caused no fluctuation in barometric pressure $1\frac{1}{2}$ miles from the storm track.