

Climbing Beyond the Mountain Tops

ON Wednesday, December 29, Philip Wills flew a Weihe type sailplane above Mt. Cook to a height of 30,000 feet, thereby breaking the British altitude record. With better luck (his perspex hood cracked and forced him to descend) Mr. Wills could have climbed still higher, possibly to heights comparable with the world absolute altitude record of nearly 45,000 feet—as high as man can go without pressurised cabins and still live.

Ten days later another Englishman climbed to 30,500 feet over California. This was too small an improvement to satisfy the requirements for a new official record but, in any case, the importance of Mr. Wills's achievement was that it demonstrated the existence in New Zealand of the air conditions necessary for world record performances. What, specifically, are these conditions?

"Mr. Wills's sailplane was launched from Simon's Hill in the Mackenzie Basin," S. H. Georgeson told *The Listener*. Mr. Georgeson is a gliding enthusiast who has done much to establish the sport in New Zealand. "Soon after this he picked up a thermal current which took him up to 6000 feet above take-off point. From this height he was able to pick up a lift produced by a standing wave. Mr. Wills then flew towards Mt. Cook, arriving over the eastern face of the mountain at 14,000 feet. He was then able to use the wave produced by Mt. Cook which he climbed to 30,000 feet."

"Thermal" and "standing wave" were terms about which *The Listener* knew little. But with the help of Mr. Georgeson and Mr. Wills's own book *On Being a Bird*, the following picture emerged.

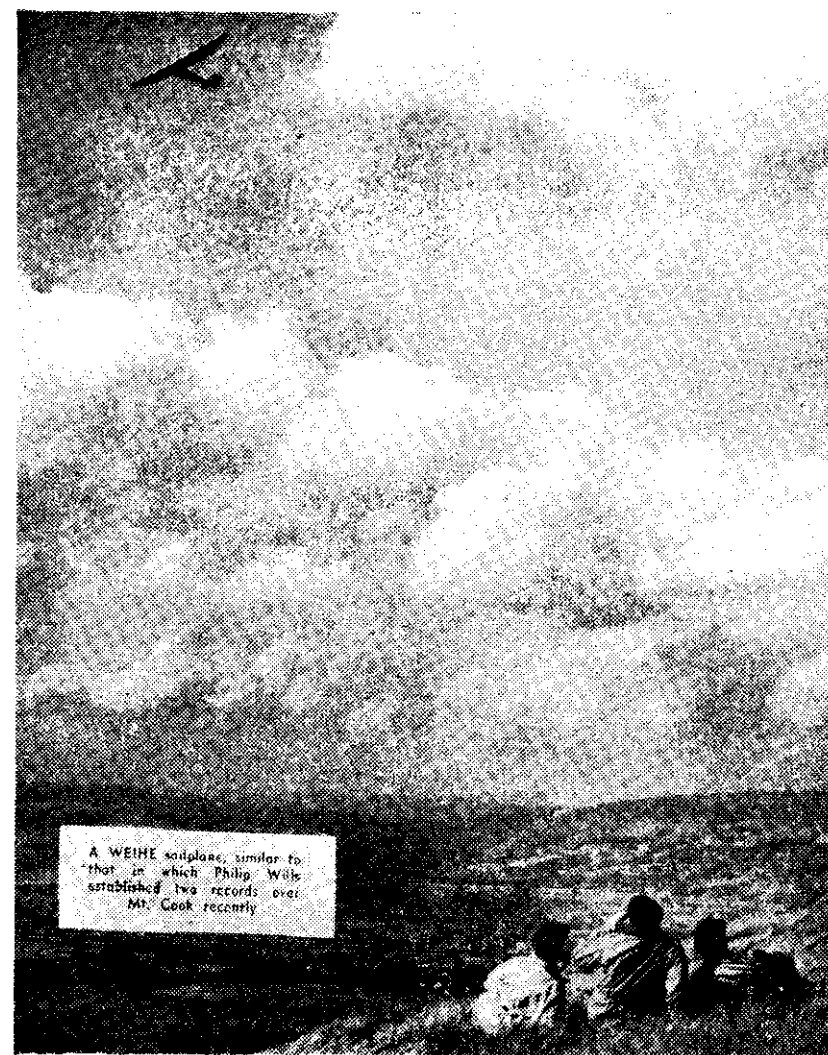
A thermal lift is caused by the sun heating an area of air which expands and thus is forced upwards by the surrounding colder and heavier air. The rotation of the earth makes the thermals spin (the same way it makes the bath-water spin down the plug-hole), and simultaneously the thermal may be moving across country. To find his ther-

mals by which he gains altitude, the pilot must use certain signs like the cumulus cloud which is found at the top of a thermal—"the visible top of an invisible aerial fountain," as Mr. Wills describes it. Once in a thermal, the art of gliding is to keep circling within the rising air, right up into the cumulus—at least, so long as the updraught in the cloud is not too violent and the sailplane is fitted for blind-flying. Rate-of-climb is measured by an instrument based on increasing and decreasing air pressure, which will immediately measure rates of as little as six inches a second to up to 20 feet a second and more. Cumulus clouds generally have a cell of rising air and a turbulent cell of descending air. "It is inadvisable," Mr. Georgeson suggests laconically, "to enter the latter cell."

Standing waves work on a different principle. A boulder totally immersed in water will produce a wave on the surface of the stream in which it lies, with progressively smaller waves at equal distances beyond it. In the same way, stable air flowing down a range of mountains sets up huge waves at the bottom. In New Zealand, the westerlies blowing across the Tasman hit the Southern Alps, rise over the ranges, and descend on the other side, rebounding to great heights (possibly in excess of 60,000 feet), and sometimes extending miles out to sea. These are called "standing waves" because, unlike thermals, the crests do not move in relation to the ground.

It seems probable that a wave stretches from the bottom of the South Island to somewhere about the centre of the North Island. The position of the waves can be seen from the type of clouds, which they sometimes produce, namely, the lenticular cloud (see cover) which is usually long with smooth leading edges. It is possible that the nor-west arch so often seen in Canterbury is the edge of a gigantic lenticular cloud lying between 16,000 and 20,000 feet.

Mr. Georgeson was probably the first glider pilot to explore the nor-west



A WEIHE sailplane, similar to that in which Philip Wills established two records over Mt. Cook recently.

arch. Here is part of his account as printed in the *Civil Aviation Journal*:

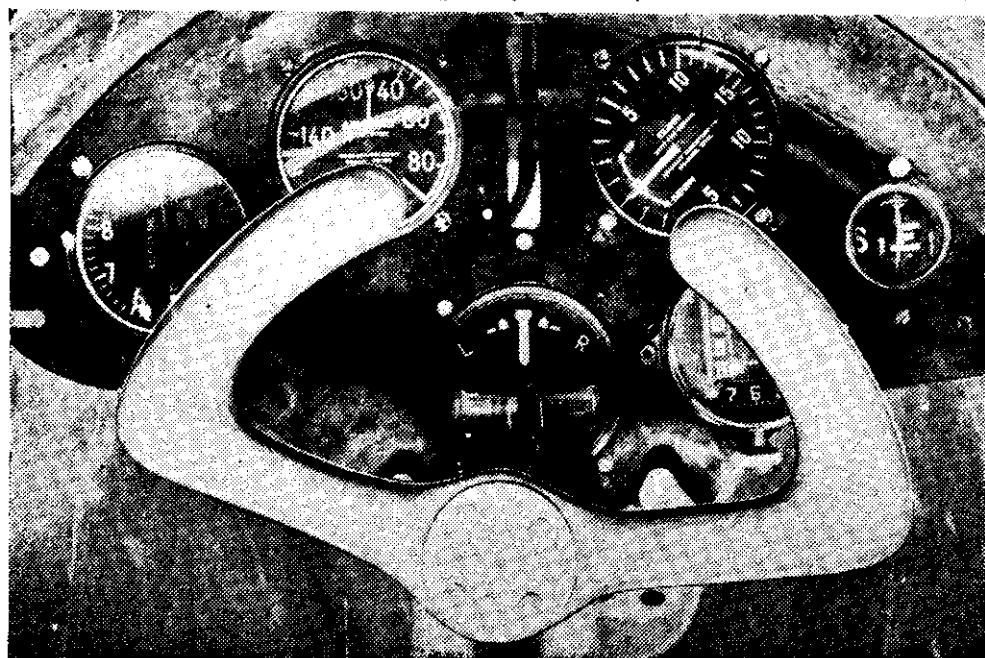
"I thought it well worth a tow (from a powered plane) over to the foothills where westerly conditions prevailed. However, when the time came there always seemed a good excuse for not going—usually that nobody was available with a car and trailer to pick up the sailplane and myself were I forced down. I also realised that this was not the main reason for a flight not being made. It was rather that the tow into the fearsome looking nor-west skies was somewhat awe-inspiring when done in a tiny sailplane. Realising this, I felt better and at the next nor-west arch even I was surprised at the ease with which arrangements were made to retrieve the glider if necessary.

"We eventually took off from Harewood and had a very turbulent ride in the direction of Oxford," continued Mr. Georgeson. "I knew it was necessary to be towed high, and so I

hung on through most uncomfortable conditions until just on 10,000 feet, and nearly over Oxford. Conditions were now so rough I completely lost sight of the Tiger and for safety's sake, let go. I was promptly caught in a very hefty downdraught and in a rather frantic effort to look for Harewood, set off downwind. Miles in the distance I could see Harewood. It was obvious from the rate of downdraught that I would have no chance whatsoever of returning to the field. Although I was still around 9000 feet I turned into wind and frantically started looking for landing paddocks. Away in the distance I saw the Tiger, still climbing, the pilot not realising that I had released. I remember being extremely annoyed, as I was paying for the Tiger. Suddenly the situation struck me as funny, and I felt much better. I started looking for lenticular clouds instead of paddocks."

Later, conditions became smoother and the sailplane was nicely seated on a wave rising at approximately 10 feet a second. (For a normal high-performance sailplane an updraught of two feet a second is enough to keep the craft at a constant height.) "I seemed to be staying stationary over the ground and all I had to do was sit dead into the wind turning neither to the right nor the left. Quite quietly I rose from 8000 feet to a little over 13,000 feet," concluded Mr. Georgeson. "Finally I enjoyed about three hours' flying in the Oxford area

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LEFT: The instrument panel of a typical glider. The dials (left to right at top) are altimeter, airspeed indicator, variometer, compass. The dial between the handles of the stick is the turn-and-bank indicator.