CANADIAN SCENE

by DOUGLAS A. SHENSTONE

Observations On The Behavior Of Stationary Thermals

By J. D. Dure

Some interesting observations were made while flying in a "stationary" type of thermal produced by a barnyard fire near Pendleton, Ont. on May 19th.

Weather conditions were mediocre for soaring, strong small thermals providing fairly good lift up to 3,000. Wind velocity was varying Westerly at 10 m.p.h. and a good lapse rate existed only between 1,000 and 2,000. The sky was clear, and the air was hazy up to 3,500 at which height an inversion existed.

In the mid-afternoon smoke was observed from a barnyard fire about 2 miles upwind of the airport, and it was decided to explore the smoke for thermals in the Olympia. Release was made at 1,800 in the smoke and lift of a maximum of 12 fps was immediately found.

It was found that this thermal existed only in the core or dense part of the smoke, and it was possible at any time to leave and return to the thermal by flying into the smoke.

The most interesting feature of the flight was that at intervals while flying in the thermal, steady lift disappeared and zero or normal sink occurred. After continuing to circle for ½ to 2 minutes, the lift usually re-appeared, and the process would then repeat itself. When the lift disappeared, it was noted that the wind had changed direction or speed and the smoke had veered off to one side or had taken on a different slope. By flying into the smoke again, strong lift was invaribly reencountered, and it was possible to climb to 3,600 enabling the pilot to see over the top of the haze which was stopped by the inversion.

The characteristic of lift disappearing and reappearing would incline one to think that the thermal was of the "bubble" variety; but the position of the smoke showed that the thermal was continuous, the apparent discontinuity being caused by changes in the position of the thermal. This leads to the suspicion that bubble thermals do not exist since their explanation is at the best vague, and that the phenomena is actually due to changes in direction or slope of the thermal. (Ref. 1).

On the day being described, with wind of 10 mph (15 fps) and vertical currents of 10 fps, the thermal should theoretically (neglecting the effects of entrainment of air) take up an angle of 39 degrees. (Ref. 2). This was confirmed by an observed angle of the smoke of approximately 40 degrees. If the wind held steady in direction and velocity, the position of the thermal would be fixed. However, any gusts of variations in the wind velocity would cause the thermal to temporarily move from its normal position. The thermal therefore has a most probable angle and direction, about which random variations occur.

The importance to a sailplane pilot flying in the thermal is that the thermal is not stationary as he might suppose, but has a most probable position about which changes are continually occurring. These changes may be random in direction, frequency of occurrence, amplitude and duration.

Some useful conclusions can be reached regarding the most probable method of regaining a thermal **which has a fixed course:**

(i) Since the thermal has a most probable position, if it moves, there is a good chance that it will return to approximately the same position after say ½ to 2 minutes and it is likely to be regained merely by continuing to circle and penetrating slightly upwind.

(ii) If the wind velocity increases, the thermal will be below the glider and will be regained by continuing to circle.

(iii) If the wind velocity decreases, the thermal is above the glider and can normally be regained by flying upwind.

(iv) Changes of direction cause the thermal to move off to one side, making relocation haphazard.

(v) If not regained by any of the above methods, the most probable way to relocate a thermal is to fly upwind, since the glider will have been sinking, and the thermal is most likely above (and therefore upwind) of the glider.

It should be noted that the above observations apply only to thermals having fixed sources of energy such as wheat fields, gravel pits, etc.

No references to the idea that this type of thermal is subject to movements as described can be found in the literature of gliding, and any further data which readers are able to forward would be appreciated.

Ref. 1 "Observations at a glider School," "Soaring," May-June 1948.

Ref. 2 "Cumulus, Thermals and Wind," "Soaring," Sept.-Oct. 1949.

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GATINEAU GLIDING CLUB

At a recent meeting of the Gatineau Gliding Club of Ottawa, S.A.C. Director LeCheminant produced air maps of an area in the Gatineau Hills, 20 minutes from Ottawa which, it is hoped may become the new home of the Club and eventually the National Soaring Site for the Soaring Association of Canada. Running parallel to Beamich Lake, the area is flat farmland with the thermally active Gatineau Range curving along the northwest side. Through the generosity of the owner, the construction of an airstrip will be provided and hangarage is the only provision lacking.

This is the area in which Johnnie Dure put in his 8 hours in the GB, and landed only because he had to catch a train to Toronto. Here also, during the past winter, the Olympia sailed majestically over the ski-trails and landed on the frozen lake.

It was in this area that gliding had its rebirth in Canada during the war when the upfung flight of hawks caught the eye of men who knew ridge currents when they saw them. No place in Canada presents such unparalleled possibilities for ridge soaring.

CZERWINSKI HONORED

The Soaring Association of Canada recently awarded a very handsomely engraved Certificate of Honor to Waclaw Czerwinski. It reads: This is to certify that Waclaw Czerwinski has been awarded this certificate in recognition of his original work in the design of the Wren, Sparrow, Robin Gliders and the Loudon and Harbinger Sailplanes.