landed.) In the turbulent area, the wind would sound strong and whistle, then it would be quiet and calm as I hung from the parachute.

I would estimate that near the center of the valley at about 8 or 9,000 feet (4 or 5,000 above the ground), the oscillations stopped. Now the wind drifted me westward and a little north very smoothly and rapidly. I let go of the shroud lines totally exhausted.

Approaching the ground, I attempted to prepare for the landing. My left hand, arm and shoulder were still numb and useless. I released the safety hasps over the harness quick disconnects as I drifted westward over the highway. I opened the left eye to try to help judge the distance as the ground approached, but I was still not able to focus the eyes together.

I was drifting backwards quite rapidly across the ground, perhaps 20 or 25 miles per hour. I felt I should try to turn around by grasping across the shroud lines but still could not raise my left arm high enough to accomplish this. However, I did grasp the fittings to disconnect the harness from the 'chute but failed to act fast enough. I was stunned by the landing and do not recall being dragged on my face through the gravel.

There were some men working very near to where I landed. I first recall trying to sit up with their assistance and their putting the 'chute around me. It was only minutes before Dr. Kuettner, Harold Klieforth and Betsy Woodward arrived to take me in the car to the hospital. Gee, it was nice to see them although I just sat there stunned and didn't say a word.

When they told me the next day of finding pieces of the glider, it was just unbelievable the condition that it was in. I hope someone can evaluate the forces necessary to break up this rugged ship in the air as it did. Perhaps this can be written up for SOARING later. Between what it did to the ship and me, perhaps some pretty sound conclusions may be drawn.

I just hope that this experience my prevent someone else from encountering such turbulence. If so. perhaps 195 was not lost in vain. Too, I hope that this experience does not dampen anyone's enthusiasm for soaring in the wave. We must let such knowledge gained from this experience help us to understand the medium in which we fly, whether it be motorless or powered aircraft.

# HOW GOOD WILL THE SOARING BE?

John M. Williams
*U. S. Weather Bureau, Rochester, N. Y.*

Of all sports, probably no two are more directly dependent on the weather than sailing and soaring. In other types, such as skating, skiing or bobsledding, weather usually plays a part, but in most cases a rather indirect one, since the motive power comes from other sources.

Many soaring enthusiasts will be out with the gliders and sailplanes whenever time is available and pretty much regardless of the weather, but quite often some previous knowledge of the kind of soaring likely to be encountered is both interesting and helpful. This article is designed to aid the pilot in determining what weather factors are important and the way in which they are interrelated. Having collected the necessary information, he can then put it to use in a logical manner and come up with an answer in terms of soaring quality.

The original data for the study on which this article is based was furnished by members of the Rochester Soaring Club of Rochester, N. Y. For each day on which flights were attempted at the club base at Batavia, N. Y., information was logged as to maximum altitudes attained, the frequently of thermals and their strength, amount of cloud cover, surface wind velocity, and any other details pertinent to soaring on that day. Among the latter was information regarding the arrival or absence of the lake breeze from Lake Ontario to the north. It is an invariable experience that this breeze is quite stable and promptly puts an end to whatever thermals may have existed before its arrival. Some interesting aspects of the lake breeze as related to soaring have yet to be explored.

For the season of 1954, information on 25 flights was sorted as to soaring quality, the flight considered as the best of the season placed at the top of the list, the next best beneath that, etc., with the worst situation at the bottom. During the 1954 season, upper air soundings and wind speed measurements were made at Niagara Falls Airport, a short distance to the northwest of the Batavia airport, during midafternoon at the time of best thermal soaring. This provided an excellent measurement of the condition of the atmosphere.

Having collected the basic material, an effort was made to find certain simple features of the atmosphere that were related to the quality of soaring flight. Elements were sought which are regularly observed or which could be forecast with a minimum of effort. Of those studied, the three that seemed most closely related to soaring quality were: amount of cloudiness; wind speed at the 850-millibar pressure level (about 5000 feet above sea level); the stability of the layer from the surface to the 850-millibar level. To obtain a simple expression for the latter, the principle of potential temperature was used. Since air is cooled or heated when lifted or lowered in the atmosphere, its potential temperature is that temperature, usually expressed in degrees Kelvin, that a parcel of air would have if brought to the 1000-millibar pressure level. For a bubble of dry air, heated at ground level and then rising, the potential temperature would not change but it would cease its upward movement on reaching a level of higher potential temperatures. If, then, the potential temperatures of the air aloft are equal to or less than that of the rising air, it will continue to rise unchecked. As a measure of this ability of air bubbles to rise, the potential temperature of the surface air at 4:30 p.m. was subtracted from the potential temperature of the air at 850 millibars as shown by the Niagara Falls soundings. Large positive values show great stability, negative values instability.

The flights selected, and the three elements selected, are shown in Table 1. An examination of this table shows a relationship between soaring conditions and the change in certain values in the columns, but it also shows that the elements are often present in opposing senses. For example, a low

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