

A Science Service Feature

Released upon receipt
but intended for use
July 2, 1931

? WHY THE WEATHER ?

Mailed July 25, 1931

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VERTICAL AIR CURRENTS

The fact that winds can blow up and down as well as more or less horizontally is of much practical interest to the aeronaut. Instruments, known as vertical anemometers, have been constructed for measuring these up-and-down air currents, but the great majority of measurements have been made by sending up a pilot-balloon, which has a known and constant rate of ascent in still air, and observing its actual rate of ascent by means of theodolite measurements on the ground. A typical series of observations made during one year in England showed that of 305 upward currents, 45 per cent. were less than five feet a second, 42 per cent. were from five to ten feet a second, and 13 per cent. were greater than ten feet a second. Of the descending currents observed, 62 per cent. were less than five feet a second, and only four per cent. were greater than ten feet a second.

The strongest vertical currents are those that occur in thunderstorms and line-squalls. The experience of an air mail pilot who was caught in the updraft of a thunderstorm over Oklahoma and driven rapidly aloft, although his plane was headed earthward and the engine was going full speed, indicated a vertical wind velocity of at least 133 feet a second. Even greater velocities are inferred from the maximum sizes attained by hailstones. Dr. W.J. Humphreys has computed that a blast of from 185 to 250 miles an hour, or approximately 270 to 370 feet a second, is required to permit a spherical hailstone to attain a diameter of five inches before falling to earth; the figures varying with the density of the ice.

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