A Science Service Feature

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? WHY THE WEATHER ? Mailed October 11, 1927

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CLOUDS DO NOT FLOAT

Wordsworth's description of the cloud that "floats on high o'er vales and hills" calls for a foot-note; at least in school editions of the poet.

Since water is much heavier than air, scientific men were once at a loss to account for the fact that the drops in clouds apparently float, instead of falling to the ground. In attempting to explain this supposed floating, some authorities assumed that the drops were hollow "vesicles", like little bubbles. This belief was eventually disproved by the optical phenomena exhibited by the drops as well as on other physical grounds.

Moreover, we now know that a cloud never really floats, though the rate at which its particles fall with respect to the air about them is generally very small, on account of the resistance they encounter. Thus a very slight upward current suffices to maintain the altitude of a cloud or even to increase it. The speed with which a drop falls increases with its size. Hence large drops may fall rapidly from great heights all the way to the ground, constituting rain; but in a great many cases such drops evaporate on falling into warmer air below the cloud level, and thus the lower border of the visible cloud remains at about a constant height.

The drops in clouds and fog have been measured, either by noting their optical effects or by microscopic examination. Many are found to be from 0.0006 to 0.0008 inch in diameter. The speed with which such drops fall through still air can be calculated. A drop 0.0008 inch in diameter falls at the rate of about half an inch a second, or 180 feet an hour. Even if a cloud consisting of such drops preserved its integrity for an hour or more while sinking, its descent at this slow rate would hardly be perceptible from the ground.

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