

A Science Service Feature

Released on receipt
but intended for use
August 11, 1926

! WHY THE WEATHER !

Mailed August 4, 1926

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INVISIBLE LIDS

Some days begin cool and bright and sunny but soon the promise of a fine day is thrown into doubt by the quick clouding over of the sky. After a little while more, the sun may shine through some gaps temporarily, or the sky may partly clear, then cloud over again, perhaps several times before it clears finally toward sunset.

When the wind shifts from south to northwest the change during the first day or two affects only the lower mile or so of air. Higher up, the wind continues from nearly a westerly direction. The cooler wind coming in below is in stable equilibrium with the warmer immediately above. That is, the air below is heavier than that above, and, therefore, will not be forced up into the warmer air. Because of this stability and the tendency of the two currents not to mix, the bounding surface forms the upper limit or invisible lid for most of the vertical motion in the cool wind.

In this cool wind blowing over the heated earth on a clear morning the warmed air masses, rapidly displaced upward, form cumulus clouds that have sharp outlines and seem to promise unlimited upward motion, perhaps leading to showers. But after rising about a mile their heads bump the invisible lid and flatten against it. By inertia they may dent the lid, but since the air above the surface is appreciably warmer and less dense than the colder air of the cloud, the cloud can be pushed up no higher. The cloud material, therefore spreads over the sky, shutting off the sunlight till evaporation lets it through again, when the process can be rejuvenated.

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21st and B Sts.,
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