

A Science Service Feature

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? WHY THE WEATHER ? Mailed February 14, 1933

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TEMPERATURE "LAPSE-RATE" INDOORS

What meteorologists once called the "vertical temperature gradient" but now generally call, following British usage, the "temperature lapse-rate," or simply the "lapse-rate," is defined as the rate at which the temperature of the air decreases with increasing height above the ground. This definition holds good even when we have what is called a "temperature inversion;" i.e., an increase of temperature with increasing height instead of a decrease. In such a case the lapse-rate is stated as a negative quantity.

Out of doors the lapse-rate is usually positive rather than negative, because the atmosphere is heated mainly from below. Indoors, however, especially in an artificially heated building, the lapse-rate is normally negative. Cold air settles to the floor and warm air rises toward the ceiling.

According to P.J. Marschall, an authority on ventilating and air-conditioning, in a typical heated building the temperature of the air increases at an average rate of about one degree Fahrenheit per foot of elevation, but this lapse-rate is not uniform. The greatest rate of change with height is between the floor and about six feet above it. The matter is of some importance when you decide at what height to install a thermostat for keeping the indoor air at a desired temperature.

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