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Letter to the Editor

TO THE EDITOR:

Perusal of a regression study carried out during a Canadian winter brought to mind the frequent inappropriate use of relative humidity when examining physiological phenomena occurring at widely different temperatures. The purpose of this note is to suggest that absolute humidity should be more generally used.

The water content of the atmosphere can be expressed either as absolute or as relative humidity.

- Absolute humidity is the amount of water vapor in unit volume of air and is given, for example, in gm per m^3.
- Relative humidity is the ratio of the actual vapor pressure of the water in the air to its saturated vapor pressure at the same temperature. This ratio is readily measured by simple devices such as the hair hygrometer and the psycho-meter, which doubtless accounts for its frequent use.

The saturation vapor pressure of air is a function of temperature. Thus at $-10°C$, it takes 2.83 gm of water vapor to saturate 1 m^3 of air, while at 40°C this takes 51.27 gm of water vapor.

Consequently, a sample of air containing 2.83 gm per m^3 of water vapor will have a relative humidity (RH) of 100 percent at $-10°$, but its RH at 40°C will only be 21.5 percent.

The rate of evaporation is inversely proportional to the water content or absolute humidity of the air. The higher the humidity, the lower the evaporation rate.

When the temperature is constant, the RH is directly related to the absolute humidity. This is clearly not the case when the temperatures at which comparisons are made are not the same. The greater the temperature difference, the more important this divergence becomes.

Since the human body, including the skin, is generally not at the same temperature as its environment, the use of relative humidity is, strictly speaking, meaningless and should be replaced by absolute humidity.

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