

A Science Service Feature

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? WHY THE WEATHER ? Mailed January 3, 1929

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MEASURING ATMOSPHERIC COOLING

People frequently feel cool when the thermometer says that the weather is warm and warm when the thermometer says it is cool. This is because our sensations of temperature, so far as they are controlled by atmospheric conditions, depend not only upon the temperature of the air but also upon other things that affect the rate at which heat is lost from the human body; viz, atmospheric humidity, air movement and the radiation of heat to and from the body.

In comparing different climates with one another with respect to their effects on human health and comfort it is highly desirable to have information regarding the cooling power of the air in the different regions and the variations it undergoes. Formulas have been proposed for deducing this climatic element from ordinary meteorological statistics and various instruments have been devised for measuring it directly; the most familiar of the latter being Hill's katathermometer, which, used in conjunction with a stop-watch, shows how long a time is required for a previously heated thermometer to fall from 110 to 100 or from 100 to 90 degrees Fahrenheit.

A handier and much more sensitive instrument for the same purpose is Dorno's "frigorimeter". This consists of a small blackened copper sphere, which is kept permanently at 33 degrees Centigrade (91.4 Fahrenheit), the normal temperature of the human skin in an ordinary indoor atmosphere. The sphere is heated electrically and the amount of current required is registered in such a way as to show directly the rate at which the sphere loses heat to the atmosphere in thousandths of a gramme-calorie per square centimeter per second.

During the last three years many series of observations have been made with this instrument in places typical of different climates. The results show that the cooling effect of the air upon the human body undergoes, in many cases, variations differing widely from those of the air temperature.

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