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A Science Service Feature

? WHY THE WEATHER ?

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A NICE PROBLEM

By Charles Fitzhugh Talman  
Authority on Meteorology

The United States Weather Bureau in Washington was recently asked the question: How cold must it be to freeze ice two inches thick in a vessel of water overnight? The answer was as follows:

Start with ice cold water and let the night be 14 hours long, and let there be a fair breeze to which the sheet of ice is freely exposed. Calculation shows that under these conditions a steady air temperature of 22 degrees Fahrenheit would produce the two inches of ice. About the same result would follow on a night when the temperature of the air fell from 32 degrees Fahrenheit at dark to 10 degrees Fahrenheit by daylight the next morning.

These calculations are based on the heat conductivity of ice and of a very thin layer of air (1/250 inch thick) next to it. This latter value is an estimate, but probably not far wrong. The conductivity of air is about .01 that of ice.

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21st and Constitution Ave.  
Washington, D.C.