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? WHY THE WEATHER ?

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TEMPERATURES OF THE EARTH'S SURFACE

The heating of the earth's surface is accomplished mostly by the absorption of such sunlight as is not reflected nor used immediately in evaporation. The disposal of the heat absorbed is intricate. Much is given at once to the air by radiation, that is the emission of heat rays, and by conduction, the direct transfer of heat from the surface to the air in contact with it. The remainder is conducted into the ground or carried downward by local currents in the water, later to be released when the surface becomes colder. The movement of heat by conduction in the ground is rather slow, especially in such material as dry sand or snow, in which there is much air. In hard ground, pavements, or solid rock, however, the heat moves much faster. Nevertheless, at moderate depths in the ground the highest and lowest temperatures occur at such absurd times as just the opposite of those at the surface; i.e. the ground only a few feet or a few tens of feet down is warmest in midwinter, and coldest in midsummer.

The movement of heat by convection, or circulation, in bodies of water results in a much more even distribution of heat and greater storage than is possible in the ground. Wind is always an active agent in mixing the warmer surface layers with the colder ones below and in driving the warmer water toward the leeward shore where it must sink. Temperature changes also produce movements when cooling at the top makes the water there denser than that beneath.

(Tomorrow: Air Temperatures Over Land and Water)

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