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? WHY THE WEATHER ?

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INSOLATION: HEAT FROM THE SUN

Sunlight is so overwhelmingly our source of energy we are inclined to forget the small amounts of heat that come from the interior of the earth, and from the stars. The heat from the earth itself has been estimated to average but 60 gram calories per square centimeter of surface per year. This amount is equivalent to 1/2500 to 1/3000 of that received from the sun and sky in the northern United States, and is sufficient to keep the earth's surface temperature about a 25th of a degree Fahrenheit higher than if there were no such source. The heat from the stars has been set at the small figure of 1/31,000,000 that from the sun. A small, though measurable amount of heat comes also from the planets and from the moon, mostly as reflected or reradiated solar heat. Moonlight appears to be about a half-millionth as warm as sunlight.

The heat from the sun when appreciably above the horizon amounts on a clear day to slightly over one gram calorie per square centimeter per minute on a surface perpendicular to the rays, or a few hundred gram calories per day. This with sky radiation comes on clear days to about two-thirds of what has been surmised to be the intensity of sunlight outside the atmosphere. The other third has been refracted or absorbed, reflected or scattered by minute particles, or even by the molecules of the air, and absorbed chiefly by ozone high up, and by water vapor, carbon dioxide, and dust or smoke near the earth's surface. The daily totals reaching a horizontal square centimeter on cloudless days in December are about 200 gram calories in the North and 300 in the South. Cloudiness in December cuts this, largely by reflection, to an average of 100 and 200, respectively.

(Tomorrow: Equability of Leeward Shores)
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