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? WHY THE WEATHER ?

Dr. Charles F. Brooks,
of Clark University,
discusses:

THE HEAT BUDGET OF THE GROUND

The surface of the ground is constantly both receiving and giving off heat. Whether the ground temperature rises or falls depends upon how the budget balances, whether receipts or expenditures are in the excess. The sources of the income, or heat received, are the direct radiation from the sun and also the radiation from the air itself. Under ordinary conditions in summer, the heat received from the atmosphere is easily more than 20 per cent of the heat received directly from the sun. The ground, in return, is constantly expending its heat, largely by radiation into space, but also by conduction both upwards and downwards. That is, the ground surface loses heat by coming in direct contact with cooler air above and cooler, deeper layers of soil or rock below. The ground also expends heat in evaporating moisture. The greatest exchanges of heat occur when we have dry air, bright sunny days, and calm, clear nights, since radiation increases as the fourth power of the absolute temperature. Moisture in the air reduces the ground's net loss of heat by radiation. Clouds at night keep the earth warmer by sending more radiation to the ground, thereby diminishing the relative loss of heat.

(Tomorrow: The Oceans as Regulators of World Weather)

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