

## **NIGHT AND DAY**

It is odd that gentle forces, because they do not attract our attention, hold greater surprises than those that are dramatic and familiar. We all know how the sun shines, but few have stopped to consider how our earth shines back. Does cold air cool the ground, the trees, and the grass at night? No, it is the other way around; the air is cooled by contact with the ground, trees, and grass, which first cool themselves by shining heat into space, and then pull the clear atmosphere's temperature down behind them. At night, air only provides second hand cooling, just as it provides second hand heating during a sunny day. Air temperature is vastly over honored and over measured. We tend to accept air temperature as the index of all heating and cooling on earth. Despite our deference to air temperature, we still have the sense to stand in the sun to get warm, but most are surprised to find the advantage of standing in the open and shining back directly into space to cool.

Our eyes work almost exclusively by light reflected from, not emitted by, objects. We owe our ignorance about subtle flows of heat to the dominance of the sun. Although our eyes report what the sun says of everything, reflected sunlight gives limited information; it is faithful to shape, but colors tell us nothing of all important temperature, for colors are only surface décor, not temperature readings. An infrared camera finds objects are already red hot at room temperature. The mysteries of cooling would quickly disappear if our eyes could see in the dark as today's infrared cameras do. Without external light we only see something after it gets "red" hot. The objects we can see by their own radiation are far too hot for us to touch, and the ones we dare to touch are too cold to see.

The student of the night must set out on a path where there is little help. In earlier times, before infrared sensors, he had to literally grope his way in the dark. The sun has been the whole story, because sunlight tells the story. With its warmth and brilliant light, the sun directs all our attention to incoming energy in the daily in-and-out energy tide. This bias is bad enough, but what is worse is that the sun's color language overwhelms the media we might hope would tell us the rest of the story, that of departing energy. What if objects could be revealed by each glowing at its own temperature, as with infrared cameras? Instead our eyes ignore things until the sun rises to repeat its skin deep opinion of everything for yet another day. If we could see by I.R., we would find the night a busy but gentle scene, with softly glowing clouds crossing an icy blue sky, with every object telling its own temperature story in color. The colors would be the indicators of the energy gained during the day as it is shined away at night. Gusts of wind would brighten blades of grass, or leaves of trees, as heat (energy) passed from the atmosphere to them. Massive rocks would glow all night, according to their thickness and previous exposure. The rising sun would cause us to retire, along with other night creatures, for the sunlit scene would bewilder us, as our overheated star revealed the arbitrary nonsense of colors in the brighter world of thermal misinformation.