

Why the weather suddenly becomes colder just before the rising of the sun

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Abstract

It seems there isn't any convincing analysis in the physical literature to answer the above question. We try to find the answer considering that it must be found in the simultaneous appearance of sunshine on the horizon and the sudden fall in the weather temperature.

Analysis:

- The air is considered as an insulator. So, it cannot conduct heat as easily as eg the metals.
- When the sunshine heats up the ground, the hot ground will heat up the air layers adjacent to the ground. This warmth is transferred gradually to the upper layers of air, but since the air is practically an insulator, this heat

transfer does not occur easily, so the upper layers of air practically remains cold always.

- Contrary to warm weather, the phenomenon of gas diffusion does not occur in cold weather. This is because of the smaller fluctuation of the air molecules in the cold weather. This fact causes the exhaust gas of automobiles cannot escape from the air layers near the ground to the upper layers of air in the cold days of winter.
- Just before the rising of the sun, when the sunshine heats only the cold air layers upper than the air layers adjacent to the ground, the possibility of gas diffusion will be increased in these warmed layers of air. So, the lower air layers which, because of their adjacency to the ground, are warmer, and also are naturally gas, will gain more possibility to be diffused through the upper layers which will have become warmer. So, for some minutes the warmth of the air layers near the ground will be diffused through the upper layers lighted by sunshine and then the temperature in the lower layers will fall during these minutes because the warmth of the lower layers of air will be distributed in a larger space. In simpler words the cold layers of air in the above part of the atmosphere act as an insulating cushion over the lower layers causing the warmth near the ground to be conserved, and by radiation of sunshine to this cushion and rarefying it some openings are created in it through which the warmth of the lower layers can escape.