No. 65

July 26

A Science Service Feature

? WHY THE WEATHER ?

Dr. Charles F. Brooks,
Secretary, American Meteorological Society,
tells:

WHY STARS TWINKLE

The twinkling of stars, which technically is known as scintillation, is not due, as popularly supposed, to ebulitions of light at its source in a fiery sun, but to conditions in the earth's atmosphere through which the light rays pass. The atmosphere is always far from homogeneous, consisting of pockets and layers of air of very different temperature and moisture content and thus of different densities. These layers and pockets are moved about and mixed by wind. As a result the condition of the air through which rays of starlight come to the eye is different each succeeding moment, and the amount of refraction, which is the bending of the light rays, is constantly changing. This is the chief cause of the small changes in position which we see as twinkling. When a star is viewed through a telescope this change of position is sometimes so marked that the star fairly dances in the field of view, and astronomical observation is impossible.

Similar atmospheric conditions also cause two other components of twinkling, change in brightness and change in color, the latter due to optical interference, which may cause destruction of certain wave lengths or colors. Twinkling is much more violent near the horizon because the thickness of air through which the starlight comes is there much greater. The reason that planets do not twinkle, except sometimes when they are very near the horizon, is that they appear as discs and are not mere points of light like stars. Each point on the disc twinkles but the twinklings do not keep step, so that the average condition of the whole disc is much more nearly constant.

(Tomorrow: Mountain-Top Weather)

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