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? WHY THE WEATHER ? Mailed July 23, 1932

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ECLIPSE SHADOW BANDS

Weathermen are looking forward as eagerly as astronomers to observing the total eclipse of the sun next month, since several interesting phenomena of atmospheric origin attend such events. None is more striking than the "shadow bands."

These bands are seen for a few seconds, or at most for a couple of minutes, just before the beginning and just after the end of totality. They consist of dark and light pulsations gliding with a wavy motion over the landscape, their appearance being much like that of ripples of light and shade reflected from moving water. They are best seen on a white or light-colored surface. A common method of observing them for scientific purposes is to fasten a white sheet down smoothly over a level patch of ground, the edges being placed exactly north-south and east-west, as an aid in determining the direction in which the bands move. They travel at right angles to their length, and generally in somewhat different directions before and after totality. Both the width of the bands and their rate of motion are subject to considerable variation. Measurements may be made by means of a board painted in foot-lengths alternately white and black, which should be laid in the direction in which the bands are running.

Shadow bands are due to the same process that causes the twinkling of stars. The beams coming from a source of light are bent successively in various directions in passing through the waves that are nearly always present in the atmosphere, especially near the ground. This gives the light a flickering appearance if the source is a point, as in the case of a star, or a slender band, as in the case of the nearly eclipsed sun. When the whole sun is visible, light coming from different parts of its broad disk combines to produce a uniform illumination, in spite of the bending of the individual rays, and hence the flicker is not seen. Shadow bands can, however, sometimes be observed without an eclipse; viz., at sunrise and sunset, when only a small part of the sun is visible above a sharply defined horizon. They may also be seen quite conspicuously at times on a surface illuminated at night by a distant powerful searchlight.

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