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INVISIBLE STARLIGHT¹

By Dr. PAUL W. MERRILL

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INVISIBLE radiation was first observed when Sir William Herschel, in 1800, found a blackened thermometer bulb to be warmed when placed beyond the red end of the sun's visible spectrum. The following year, J. W. Ritter noted the darkening of silver chloride caused by light beyond the violet end of the solar spectrum. Three quarters of a century elapsed before the study of invisible starlight was begun by Sir William Huggins, who, in 1876, photographed both visible and ultra-violet stellar spectra. Although of obvious interest, the investigation of invisible starlight has developed slowly, not only because of serious practical difficulties but because it was natural and proper to exploit first the more readily observed visible portion of the spectrum. The time has now come, however, when astronomers can perhaps afford to de-

vote more attention to ultra-violet and infra-red light. Hence it may be worth while to outline the general importance of invisible starlight in astrophysical investigations and to review the present observational status of the problem.

To obtain a general view of the situation let us consider first radiation as it leaves the star; then what happens to it in interstellar space and in the earth's atmosphere; and finally what can be done with it when it arrives at the focus of a telescope. The original investigators had, of course, to work the sequence in the opposite direction.

The most important property of the light emitted by any incandescent object is the manner in which the energy is distributed among various wave-lengths—briefly, its spectral intensity curve. Laboratory investigations have shown that for most solid or liquid bodies the curve has a definite relationship to the

¹ Address of the retiring vice-president and chairman of the Section of Astronomy, American Association for the Advancement of Science, Boston, December, 1933.

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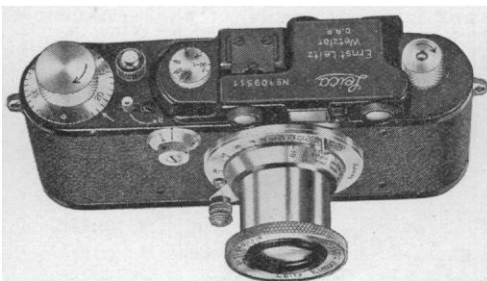
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