

The Spectrohelioscope.

GENTLEMEN,—

I am much interested in the letters of Mr. Porthouse and Mr. Buss in the July and October numbers of *The Observatory*, and wish to assure them that I am anxious to give full credit to Mr. Thorp for his spectrohelioscope. He wrote me many years ago that he was designing such an instrument, but I cannot find his letter and I have never learned what success he attained. Mr. Buss has been kind enough to send me a drawing of the instrument, and I have suggested that he publish this together with a description of the spectrohelioscope and a detailed statement regarding its performance, preferably when used on a rigid support in conjunction with a cœlostast telescope. It should show prominences at the limb very well, but I am not sure whether the linear dispersion will prove great enough to reveal satisfactorily the remarkable variations with wave-length of the form and intensity of the flocculi which have given me the radial velocity of the hydrogen descending into the vortices surrounding sun-spots (see *Nature*, September 18, 1926).

Mr. Thorp's design is an attractive one, but I prefer a single pair of slits at the opposite ends of an oscillating bar to a large number of slits on the circumference of a disc because of simplicity and cheapness, precision in isolating any part of the H α line or its wings, and ease of adjusting the slits and varying their width. The second slit should be narrower than the dark H α line; and as very narrow slits often give trouble from dust lines, this is a reason for considerable linear dispersion. I have obtained excellent observations of the flocculi with the bright second-order spectrum of a 4-inch plane Rowland grating (used in 1891-1896 in my first spectroheliograph at the Kenwood Observatory), mounted with a pair of 2-inch concave (spherical) mirrors of 60 inches focal length. This is employed with a small cœlostast, driven by a cheap clock movement costing two dollars. The cœlostast mirror, 5½ inches in diameter, is merely a piece of selected plate-glass, not re-figured. The second mirror, 4½ inches in diameter, is of the same material, while a lens of 4 inches aperture and 18 feet focal length forms the 2-inch solar image on the first slit. With this arrangement the illuminated grating surface is 2 inches long and 1¾ inches high, thus permitting a grating of moderate size to be employed. The slits oscillate through an amplitude of ⅛ inch, and the observing eyepiece magnifies two diameters. I have obtained less satisfactory results with prisms, but my experiments with prisms and grating replicas are not yet completed. My object is to develop an efficient solar telescope and spectrohelioscope, of cost sufficiently low to render them widely available.

I am, Gentlemen,

Yours faithfully,

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GEORGE E. HALE.

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