

### PHOTOGRAPHING THE CORONA WITH- OUT AN ECLIPSE.

PERHAPS the most important observation since the discovery by Jannsen and Lockyer that the solar chromosphere could be studied without an eclipse, has recently been made by Mr. Huggins,<sup>1</sup> the well-known English astronomer.

When the spectroscope had been found capable of bringing this important region into daily view, there still remained the corona, whose feeble light and nearly continuous spectrum defied all attempts to see it through the overpowering glare of our own atmosphere; which, even in the purest sky, acts as a luminous veil between us and the object. It is very easy at all times to cut off the sun's direct light by a screen: unless the screen be at an enormous distance from the eye, however, this glare is not diminished by its use. Mr. Huggins's method is founded principally on two considerations.

The first is, that the principal coronal radiation (as found in Egypt by Dr. Schuster in the late eclipse) occupies a narrow part of the spectrum between G and H, while the atmospheric glare consists of light of all refrangibilities. As this coronal radiation, though occupying narrow limits of wavelength, is not monochromatic in the sense in which that of the chromosphere is, he has not employed the prism to disperse the atmospheric glare, but certain absorbent media to shut it out; choosing those, of course, most transparent to this violet light alone. The best isolating medium has been thus far found to be potassic permanganate.

The second consideration is, that since the G—H region is near the limit of vision, where, though the retina responds but feebly, the photographic plate is active; and since the latter is sensitive to feeble distinctions of light, and preserves a permanent record of them, it is best to use it, rather than the eye. Dr. Huggins has worked with a Newtonian telescope having a mirror of six inches aperture and three and one-half feet focus. By selecting fine days, he has obtained, between last June and September, twenty plates, showing what appear to be the rays and streamers of the sun's inner corona.

As at least one European observer of distinction deceived himself by the supposition that he had obtained a naked-eye view of the corona without an eclipse, and as the appearances about the sun caused by inequalities in

<sup>1</sup> On a method of photographing the solar corona without an eclipse. Paper read at the Royal society by William Huggins, D.C.L., LL.D., F.R.S., Dec. 21.

our own atmosphere are most perplexing, and so corona-like as almost to 'deceive the very elect,' the reader will be interested in perusing the following letter to Mr. Huggins from Captain Abney, the eminent photographer:—

"A careful examination of your series of sun-photographs, taken with absorbing media, convinces me that your claim to having secured photographs of the corona with an uneclipsed sun is fully established. A comparison of your photographs with those obtained during the eclipse which took place in May last shows not only that the general features are the same, but also that details, such as rifts and streamers, have the same position and form. If in your case the coronal appearances be due to instrumental causes, I take it that the eclipse photographs are equally untrustworthy, and that my lens and your reflector have the same optical defects. I think that evidence by means of photography, of the existence of a corona at all, is as clearly shown in the one case as in the other."

This is a clear opinion from a master of the subject; but Dr. Huggins's own caution in statement, as well as skill in research, are, without it, sufficient to predispose us to believe, that, in spite of its difficulties, the problem of securing the forms of the inner corona without an eclipse has been, in principle, solved. What these difficulties are, only those few who have experimented in this particular direction know. As one of this number, the writer can only express his sense of the great consequence of the result reached, and his admiration of the skill employed in obtaining it. It is given to few to crown such a scientific life as that of Dr. Huggins, by a discovery of such importance.

S. P. LANGLEY.

### A SINGULAR METEORIC PHENOMENON.

WE are indebted to the favor of the Bureau of Navigation, for the privilege of publishing the following very interesting letter of Captain Belknap, addressed to Commodore John G. Walker, United-States Navy, Chief of Bureau of Navigation, Navy Department, Washington.

U. S. S. ALASKA, AT SEA,  
lat. 37° 54' N., long. 124° 25' W.  
Dec. 15, 1882.

SIR, — I beg to report, that on the evening of the 12th inst., a few minutes after sunset, and in lat. 38° 21' N., long. 134° 07' W., a remarkable phenomenon was witnessed in the western horizon from the deck of this ship.