

pointing in declination, except when the observer was at the eye-piece. This want, combined with the great force necessary to move the telescope in declination, makes its pointing a difficult and troublesome operation. The observer must first set the telescope by pure guess-work. He has then to mount to the eye-piece, wherever it may be, look into the microscope, and note the reading of the circle. He has then to withdraw his eye, and by considerable muscular exertion to make another guess, which he again tests by reading the circle. Thus the pointing is to be made by a series of trials which are so troublesome that I found the observers were in the habit of mounting to the top of the cylinder of the dome and finding the pointing in declination by moving the telescope around the horizon.

I remark, in this connection, that the Washington telescope has a coarse setting which the observer can read from any point below the telescope with the aid of an opera-glass. This setting is sufficiently accurate to bring any object whose position is known into the field of view of the finder, and near its center.

*Objective.*—The proper figuring of an objective so as to give the best possible image, is justly considered the most difficult task in the construction of a large telescope. Especial interest, therefore, attaches to Mr. Grubb's success with the objective. The atmospheric conditions during my visit were unfavorable to the finest tests, but I succeeded in making such examination as the circumstances admitted of on three evenings. On the first trial, the image was found to be defective, owing to a want of adjustment of the glass itself. This was corrected next day by Director Weiss. On the second trial I found a well-marked spherical aberration, which seemed, however, to be very regular from center to circumference. But there had been a fall of temperature and the dome had been opened only a short time; circumstances under which the Washington telescope always exhibited the same phenomena. On the third evening, the dome had been opened long enough to nearly equalize the internal and external temperatures. So far as I could judge the character of the image was perfect, there being no appearance of those rings of different focal length, which are so often found in large objectives. As I had not used a large telescope for some eight years, I could not feel that my judgment was of the most critical kind, but I am persuaded that if any defects exist, they are so minute as not to interfere in any important degree with the finest performance of the instrument.

The color correction is less than in the Washington telescope. The result is that the blue areole around brilliant objects is much less striking.