

of the camera is, for reasons that will appear later on, by far the most important in radial velocity work.

Collimator Focus.—Three methods of determining the collimator focus were employed, Schuster's^{*}, Lippmann's[†], and Newall's[‡], with fairly accordant results.

Schuster's method consists in placing the observing telescope at a greater deviation than the minimum, and so changing the focus of the collimator and observing telescope that the line at minimum will be in sharp focus in the two positions of the prism that bring it into the field. This gave good values, the mean collimator setting being 15.6 mm., successive determinations differing by 0.2 mm. only. Lippmann's method, depending on the displacement of the two halves of the pencil by two plane parallel plates placed obliquely, and the consequent doubling of the spectral lines when the emergent beam is not parallel, seems by no means so sensitive and accurate as Schuster's. Newall's method, as my experiments have shown, is more applicable to the exact determination of camera focus. Any deviations of the collimator focus to the extent of nearly 2 mm. on either side could be so compensated by changing the camera focus as not to be evident by the displacement of the lines he speaks about.

The only observable change in eight series of test plates at eight collimator settings between 14.0 and 17.5, with six plates in each series at six camera settings near the focus, was in the length of field in good focus, which was the greatest at setting 15.0 and 15.5 with a slight advantage to 15.0. This was taken as showing, not that 15.2 was the focus of the collimator, but that at that focus the curvature of field of the camera lens was reduced to a minimum. I believe that 15.6, the setting determined by Schuster's method, is nearly exact, but that, by moving the slit away from the lens, a greater length of spectrum can be brought into focus. Hence the final setting was fixed at 15.2.

* *Phil. Mag.*, (5), vol. 7, p. 95-99, (1879).

† *C. R.*, vol. 129, p. 569-570, (1899).

‡ *M. N.*, vol. 57, p. 572; also vol. 65, p. 642.