

to them, the Brashear Company are undertaking to make a new correcting-lens to computations by Professor Hastings, to whom I am very much indebted for criticisms and suggestions on the present paper. I may say that Professor Hastings finds a very marked agreement between his computed data of the objective, color curves, and chromatic differences, and my observations. He explains the failure of the correcting lens to compensate for the chromatic differences of focus, which it was computed to do, by the fact that this lens has to correct the errors of an objective of nearly fifty times the area, that the small departures of the wave-surfaces from a true sphere have grown enormously when these surfaces have contracted to one-fiftieth their original area, and that a very perfect correction by spherical surfaces can hardly be hoped for. He thinks, however, that considerable improvement can be effected, and I have no doubt myself that he and the Brashear Company can do much better than he says when they have quantitative values of the existing aberrations.

The reason for publishing this paper in its present incomplete form, before the new correcting-lens is ready, is to bring before stellar spectroscopists the important matter of the size and character of the star image given by their telescopes. I have gone fully into the details of the investigation and explained the difficulties that arose with the means of overcoming them, in order to smooth the way for similar investigations into the character of the star image given by other systems of objective and correcting-lens. It seems to me extremely probable that, in the major part if not all of the telescopes employed in spectrographic work, aberrations of the same or a similar nature are present. If a correcting-lens computed to compensate for the chromatic difference fails in one case, it is possible, even probable, that it may fail in others. Another basis for this belief is a comparison of the relative exposure times required for different installations taking into account size of object-glass, slit-width, and dispersion of the spectrograph. I am well aware that such a comparison must necessarily be incomplete, and the results reached subject to an uncertainty, say, of 25 per cent., owing to the difficulty of comparing different installations under different conditions of seeing, etc. We have already seen how important a part is played by atmospheric disturbances in enlarging the star image so that the linear