

connected together by a screw and block. The whole instrument with these additions seemed now very rigid, and a test showed that the displacement of the lines due to flexure was now reduced, at the most, to an amount equivalent to from 1 to 2 kms. per second for two hours movement while in some declinations of the telescope the flexure was hardly appreciable. This amount of flexure would not affect the final result by half the velocity mentioned, owing to the displacement being compensated to a considerable extent by a similar displacement of the comparison lines which are exposed for half the time before, and half after the exposure on the star. As I could contrive no further means of stiffening the instrument without rebuilding, it seemed preferable to keep it intact for work on other parts of the spectrum and to make all velocity determinations with an instrument of more modern type, designed expressly for line-of-sight work, and now nearing completion in our workshop.

*The Temperature Case.*—It was realized from the first that it would be necessary to provide some means of keeping the instrument at constant temperature during an exposure, for not only does the deviation and dispersion of the prisms change with change of temperature but the expansion of the metal parts would also be liable to introduce differential displacements of the star and comparison lines. The errors thereby introduced in velocity determinations might be comparatively large owing to the small displacements measured, one millimetre being equivalent to about 1300 kms. per sec.

A light wooden case enclosing the whole spectrograph was constructed and supplied with coils of German Silver wire for heating. The heat was at the beginning automatically regulated by a makeshift thermostat arrangement but this was finally abandoned for simple hand control by turning current on and off the coils. In the new spectrograph an automatic arrangement modelled after that by Hartmann will be employed.

*The Correcting Lens.*—After the thorough tests and the modifications and additions just described, I expected to get results