

stars, the comparison of velocities of stars of different type, and other astrophysical problems; but I shall not discuss these points here. The results are applicable directly to the problem of the determination of the rate of the sun's rotation; in fact the above work was undertaken primarily in the hope that it would offer an explanation of the difference in the rate of the sun's rotation as determined from different spectrum lines (as announced by Adams for his determinations of 1906-1908), and possibly of the greater polar retardation from the spectroscopic observations than from the spots and faculae. Adams' results have recently been verified by himself and St. John at Mt. Wilson in a manner that leaves little room for doubt as to their accuracy, though for the period 1911-1913 several other observers found little or no trace of the effect. The assumption of blended spectra during the time of sun-spots and an absence of the effect when the spots are absent offers an explanation of the above observations, but the point will be discussed soon in a separate paper.

The main conclusions of the above work are:

In the measurements of photographs of blended spectra the stronger spectrum asserts itself out of proportion to the relative intensities of the lines measured, the effect being more pronounced the greater the difference in the intensities of the components of the blends.

When spectra, in which the lines have different character and are displaced by amounts ranging up to half the widths of the lines in question, are blended, the measurements of the resulting lines vary from line to line as the relative intensities vary. In the case of blending the sun's limb (lines displaced by rotation) and centre (lines not displaced) spectra, since the relative intensities of lines progresses fairly regularly with intensity (*i. e.*, level in the sun) the measured displacements of the blends progress regularly. In other words, lines of different intensity show different velocities of rotation, the strong lines showing progressively greater values than the weak lines; and since this very effect has been found by some observers in the determination of the sun's rate of rotation it is suggested that at