## THE ROYAL SOCIETY OF CANADA

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The lines in the yellow green region were selected to include as many elements as possible among the limited number of measurable lines in the region. Some, such as the lines of Mn, Ti, Si, are not of very good quality for measurement, but were included in order to give evidence in regard to question c., Section 3 above. In the violet region No. 4 to No. 13 inclusive, are the ten lines selected to be measured by all observatories co-operating in this work and the other five are lines which Adams and Lasby\* found gave systematically higher or lower values of the rotation than the general reversing layer. The column "Velocity Constant" gives the half value of the multiplier required to reduce the millimetre displacement to kilometres per second, and will evidently give the observed velocity of the sun's limb. These multipliers are readily determined, in the well known way, when the linear dispersion at the region is known. As the grating gives practically a normal spectrum over the narrow limits used, it is sufficient to determine this dispersion, which is about  $0.70^{\circ}$  Å, per millimetre at  $\lambda 5600$  and 0.75 Å at  $\lambda$ 4250, for five or six lines over the region used. When these values and the multipliers are plotted on cross section paper they are found to lie within the errors of observation on a straight line, and the constants for all the lines measured can be at once read off.

## REDUCTION OF MEASURES.

10. The observed or measured velocities are the radial components of the actual velocities at certain points on the sun's disc whose latitudes can be readily computed, and it is hence necessary to know the angle of inclination between the radius vector and the direction of motion at the point in order to apply the necessary corrections, the further correction for the motion of the earth in its orbit being made to obtain the sidereal rate. In the early observations, by Dunér and Halm, of the rotation of the sun by the spectroscopic method, the measurements were made at the limb and the computations and corrections were straightforward. When, however, as in Adams' work and our own the observed points are some distance within the limb, the matter is not quite so simple. Adams' method of reduction\*\* depends upon projecting the observed points radially to the limb and obtaining the corrections by Dunér's methods and tables, but this assumes the rotation of the sun to be that of a solid body, which is of course not the case. A further correction is therefore necessary for the difference in angular velocity at the observed and computed points. [PLASKETT

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<sup>\*</sup> Adams and Lasby—An investigation of the Rotation Period of the Sun by Spectroscopic Methods, p. 119.

<sup>\*\*</sup> Adams and Lasby, p. 13.