occurs at $\lambda 6374.43$. No other members of this multiplet have been observed with certainty in the solar spectrum, however, and the width of the observed absorption line makes its identification as predicted *Fe I* unlikely, unless it is closely blended with another faint line.

A search has been made for a similar absorption line at the position of the green coronal line 5302.86, identified by Edlen as arising from *Fe XIV*. No such absorption line has been found. It is pointed out that excitation conditions in the chromosphere favorable for the presence of *Fe X* would not necessarily produce *Fe XIV*.

1. *Pub. A. S. P.* 46, 132, 1934.

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MacRae, Donald A. Motions of the seventh magnitude A stars.

David Dunlap Observatory radial velocities for 457 B8 to A3 stars of average photovisual magnitude 6.90 were analysed. The solar motion was found to be $18.4 \text{ km/sec} \pm 1.1 \text{ (m.e.)}$. The root mean square residual velocities along the three axes were 15.6 ± 1.4 , 10.3 ± 1.0 , and $10.6 \pm 2.0 \text{ km/sec}$, the last being the one at right angles to the plane. The longitude of the vertex was $342^\circ \pm 11$. Combined with Oort's $K'(z)$ the value of Z^2 gives the variation of the star density with height above the plane. A value of one-half of the density near the sun is reached at 180 parsecs. Star counts computed with such a density variation agree very well with the McCormick spectral statistics.

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Millman, Peter M. Spectro-photometry of the solar corona, Royal Canadian Air Force Operation "Eclipse," July 9, 1945.

Using specially mounted cameras in a Mitchell and a Spitfire aircraft from No. 7 Photographic Wing of the Royal Canadian Air Force, spectrograms of the totally eclipsed sun were obtained from heights of 26,000 ft. and 33,000 ft. above sea level respectively. Both clouds and excessive absorption in the earth's lower atmosphere were successfully avoided in this way.

In addition to the prominent chromospheric lines both the continuous spectrum and the red and green lines of the corona were photographed. The intensity distribution in the coronal spectrum has been measured and compared with that of the full moon photographed with the

same cameras. From preliminary measures the continuous coronal spectrum from 4000 to 6000 Å has an average intensity roughly $\frac{1}{4}$ that of the full moon and is considerably bluer, having a colour temperature of the order of 6000° or possibly higher. Both continuous and bright line coronal radiation show marked variation in intensity distribution around the solar limb. The intensity distribution of the green line follows that of the continuous spectrum and is dissimilar to that of the chromospheric lines. The effect of the polarization of the corona is evident from a comparison of the intensities in matched pairs of photographs taken through polaroid filters.

It is considered that the above results demonstrate the fact that aircraft can be used with success to carry out a scientific eclipse program.

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Smiley, Charles H. Atmospheric refraction at low altitudes.

Between August 1, 1943 and December 7, 1946, 1105 measures of the vertical diameter of the sun were made with a prismatic reflecting circle constructed by Julius Wanschaff of Berlin. In all cases, the true altitude of the sun was less than 5° . Since the difference between the horizontal and vertical diameters of the sun at any time is equal to the differential refraction between the altitudes of the upper and lower limbs of the sun, a series of observations of the vertical diameter of the sun allows one to start at an altitude at which the refraction is small and relatively well known and integrate downward, obtaining the refraction at intermediate points. Thus it is possible to construct refraction tables for low altitudes without making any assumptions as to the density distribution of the atmosphere.

This observing program has provided information as to the kinds and magnitudes of irregularities in atmospheric refraction and as to the altitudes at which they may be expected. Beside the usual abnormality of refraction due to total reflection at the boundary between two layers of air of different density, other kinds of irregularities were found, mostly at altitudes less than 2° . Proximity of the incoming ray to the earth (in linear distance rather than in angular measure) has a considerable bearing on irregular refraction. Humidity and the rate of change of temperature with time likewise appear to be important factors. It is hoped to extend these