a small change in the size of the K star between the two eclipses.

4. The observations at egress in 1948 give evidence of variation other than that due to eclipse effects. On the basis of present evidence, this seems to be best interpreted by an intrinsic variation in the light of the K component; similar changes occurring during totality or out of eclipse have been suggested by many earlier observers.

5. Quantitative combination of different sets of observations is difficult because of the great color difference between the two components of the variable and the differences in color sensitivity of the various sets of equipment. However, by taking proper precautions, such sets can be combined quantitatively when the same comparison star has been used and when observations have been made before and after eclipse and during totality as well as during the partial phases.

6. It now seems clear that the general features of the eclipse are in agreement with the idea of an extinction mechanism, but the details call for many refinements of any simple theory.

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Roberts, Walter Orr. Sunspot prominences and the yellow coronal line.

The results are given for part of a research program now in progress. Twenty-five cases of the occurrence of bright emission of the yellow coronal line 5694 Å have been studied thus far. Of these, a preponderance shows the coronal line to be closely associated with sunspot prominences exhibiting unusually high activity and large velocities. Some speculations are given regarding the possible relationship of the yellow coronal line emission to the outbreak of solar flares.

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Routly, Paul McRae and Lyman Spitzer, Jr. A comparison of the interstellar lines and components in neutral sodium and singly ionized calcium.

New measures of the radial velocities and equivalent widths of the interstellar D lines of NaI, including faint components, were obtained

for 17 stars from high dispersion spectrograms taken at the Mount Wilson Observatory. Corresponding measures in CaII were also obtained for four stars.

The new material on NaI, together with additional measures obtained previously by other investigators, was employed in a comparison with CaII. For each line, or component, for which reliable equivalent widths were available in both NaI and CaII, the total number of absorbing atoms (or ions) in the line of sight was computed, N_{NaI} and N_{CaII} , as were also the values of the Doppler constants $b(\text{NaI})$ and $b(\text{CaII})$. For saturated lines, the data verify the result of Wilson's that $b(\text{CaII}) \sim 2$ or $3 \times b(\text{NaI})$. A plot of $N_{\text{NaI}}/N_{\text{CaII}}$ versus the residual radial velocity V of the corresponding cloud producing the line or component shows that on the average a marked decrease occurs in $N_{\text{NaI}}/N_{\text{CaII}}$ as $|V|$ increases; in low velocity clouds NaI tends to be more abundant than CaII, while in high velocity clouds the reverse is true. This result may be used to give a plausible explanation for the fact that the saturated lines of NaI and CaII do not lie on the same curve of growth, $b(\text{CaII}) > b(\text{NaI})$.

The theoretical question of the kinetic temperature prevailing in a high velocity cloud, as a result of the cloud's motion through an intercloud medium, was considered from two points of view. The two methods stand at opposite physical extremes and, except in one case regarded as unrealistic, give discordant values of the temperature. The computations indicate that the kinetic temperature in a cloud possessing a residual radial velocity of 80 km/sec should lie somewhere between 2000° and 13,000°, with the lower value considered more likely.

The level of ionization in low and high velocity clouds was considered next in an effort to explain the observed variation of $N_{\text{NaI}}/N_{\text{CaII}}$ as a function of $|V|$. It is shown that for a high velocity cloud having an internal kinetic temperature in the vicinity of 7000° to 10,000°, collisional ionization of NaI by electrons will be sufficiently effective to reduce the value of $N_{\text{NaI}}/N_{\text{CaII}}$ by a factor of from 50 to 100 times that which it would possess in a low velocity cloud ($\sim 100^\circ$). This theoretical variation is ample to account for the observational data, provided the kinetic temperatures in a high velocity cloud are actually as high as 7000°.

When the kinetic temperature inside a cloud is less than 7000°, the ionization of NaI by electron collisions is insensible; to allow for such cases, several other mechanisms which would affect the