and absolute magnitude of a star. The effects on the temperature and surface gravity have been investigated in the $U-B/B-V$ diagram. A weak correlation of ultraviolet excess with departure from mean rotation (at a given color) is obtained, although rather less pronounced than that found earlier in the Hyades (Kraft, R., and Wrubel, M., *Astrophys. J.* **142**, 703, 1965).

The effect of rotation on absolute magnitude has been investigated in the color-magnitude diagram, in a manner similar to that followed by P. Strittmatter (*Astrophys. J.* **144**, 430, 1966), who analyzed the same cluster but used less accurate rotations by Tremain and included fewer stars in the analysis. A much weaker correlation of magnitude excess with rotation excess (from the mean at a given color) is found using the new data. This result is more nearly in accord with the smaller effects predicted by models in uniform rotation than those in nonuniform rotation.

Radio Recombination Lines from H II Regions.

JOHN E. DYSON, *Washburn Observatory*.—The temperatures of various H II regions are derived from the total energy in a recombination line of hydrogen and the brightness temperature in the adjacent continuum. The shape of the line is immaterial. The temperatures are compared with those calculated assuming a Gaussian profile. L. Goldberg (*Astrophys. J.* **144**, 1225, 1966) has proposed that partial maser action may occur. The electron temperature may be derived from the total energies in an α and corresponding β transition allowing for this possibility. This method is applied to M17. Inconsistencies in the results are attributed to the complicated nebular structure. The possibility of maser action depends on the variation of b_n and $d \ln b_n / dn$ with n . Values are calculated for these quantities taking into account the local radio frequency radiation field. The results are applied to various observed nebulae.

Near Infrared Measurements of Coronal Polarization in Line and Continuum.

JOHN A. EDDY, JOHN W. FIROR, AND ROBERT H. LEE, *High Altitude Observatory*.—Filtergrams of the solar corona in the near infrared were obtained during the eclipse of 12 November 1966 using an airborne telescope of 8 in. aperture and a two-stage image tube. Interference filters isolated coronal radiation from two spectral regions: a 14 Å band centered on the [Fe XIII] $\lambda 10747$ Å emission line and a 100 Å band of the continuum at $\lambda 10625$ Å. Coronal polarization in line and continuum was measured using a stepped polaroid. Coronal images obtained are of good detail and extend to about 8' above the limb. Ana-

lysis indicates that the emission line polarization varies in amount and direction through the corona but can be described as having electric vector perpendicular to the limb, as expected from resonance polarization theory. Continuum polarization is completely described as having electric vector tangent to the limb. The line polarization measurements extend and confirm the results obtained by Eddy and Malville at the previous eclipse (*Astrophys. J.*, to be published).

Contribution Curves in the Fine Analysis of Stellar Spectral Lines.

FRANK N. EDMONDS, JR., *The University of Texas, Austin*.—Three methods for the fine analysis of spectral lines are: (1) a straightforward combination of formulas arising from pertinent formal solutions to the equation of radiative transfer; (2) the Planckian-gradient method developed by Mugglestone; (3) the weight-saturation method developed by Pecker and others. These three methods are equivalent in that the formulas for one method can be obtained from those of another by simple integration by parts. In each of the three cases the formulas allow the computing of contribution curves which presumably show the relative contribution to line formation of the different layers of the model atmosphere used in the fine analysis.

Computer programs have been developed for the three methods which compute the equivalent width and profiles of spectral lines under the assumption of formation by pure absorption. These programs have been designed to give contribution curves as well. The contribution curves for the same line abundance-model atmosphere situation are quite different for the three methods, and many of the properties of contribution curves which have been determined previously, using the weight saturation method, are not found in those for the formal solution or Planckian-gradient methods. These results lead to the conclusion that contribution curves are critically method dependent and do not provide information about the depth dependence of line formation. Previous determinations of effective depths of line formation based on or related to contribution curves are therefore suspect.

The differences in the contribution curves of the three methods are such that the weight-saturation method weights more heavily the contribution from the upper layers of the atmosphere, while the Planckian-gradient method gives the least weight to these layers. One might expect, therefore, differences in equivalent widths and profiles computed by the different methods because of this difference in weighting. In particular, a method which weighted the most reliably determined layers of a model atmosphere would be preferable. Calculations test-