tain absorption line spectra of the low surface brightness bars with exposure times of the order of 1 h.

Several important generalizations are possible on the basis of these spectra. First, the absorption line spectra are similar to the spectra of the nuclei suggesting that the main contributor to the light in the bar is from stars similar to those found in the nuclear region. Secondly, the bar usually displays throughout 3727[O II] emission from a relatively uniform distribution of low-density gas. The velocity dispersion of the gas is much smaller than that of the stars. The ionization and excitation of this gas present an interesting problem.

Finally, the differential velocities of the gas emission lines and the stellar absorption lines display significant differences. The gas appears to rotate more like a rigid body while the stellar components show a velocity field similar to that which would be exhibited by a contraction or expansion of the system.

Effect of Axial Rotation upon the Strength of Weak Stellar Lines. GEROME W. COLLINS, II, *Perkins Observatory*.—In this paper we endeavor to estimate the effects of axial rotation upon the formation of weak scattering and absorption lines in the spectrum of a star. Included in the study are some of the processes, resulting from stellar rotation, which influence the equivalent width of the line: shape distortion, gravity darkening, limb darkening, aspect effects, and the variation of the line absorption coefficient over the surface of the star due to varying surface temperature and pressure. In addition, an attempt was made to include effects of the variation of the interior structure with increasing angular velocity.

The atmosphere of the star was approximated by a Milne-Eddington type model with the local value for the effective temperature and surface gravity. An expression for the specific intensity at the surface in both line and continuum was thus obtained from the general solution for the Milne-Eddington model and the resultant profile was numerically integrated over the visible surface of the model.

Results are presented which indicate the variation of weak absorption and scattering lines with changing angular velocity and angle of inclination. It is demonstrated that one of the most important effects governing the strength of the line is the amount of distortion experienced by the star. However, unless the variation of line absorption coefficient with temperature and pressure is extremely large, little change in the equivalent width of the line will be experienced. This leads one to suggest that the variation of the spectral type of a star of given mass is almost totally insensitive to axial

rotation. Since the *UBV* colors are affected by rotation, one would then expect a systematic scatter in the spectral type- $(B-V)_0$ relationship of about 0.04 mag at B3.

Change of Li/Be Ratio in Main Sequence Stars.

PETER S. CONTI, *Lick Observatory*.—A spectroscopic study of the Li and Be content of some bright F and G stars has been completed. The analysis was made with newly measured equivalent widths, a curve of growth, and line strengths predicted from a grid of model atmospheres. The data are combined with previously published results. Under the logical assumption that stars start with a common value for the ratio Li/Be, as evidenced by spallation experiments, it is possible to trace out the pattern of Li destruction.

The change of Li/Be among main sequence stars can be interpreted as an age effect. It is found that the F stars deplete Li on a time scale longer than the age of the Hyades. Since G stars deplete Li on a time scale shorter than this, there must be an inverse relation between the Li destruction rate and spectral type. This is probably related to the deeper convective zone in cooler stars.

The variation in Be abundance of these stars presumably represents a different initial light element content. Several F stars contain no detectable Be (nor Li). Unless they destroyed both elements subsequent to arrival on the main sequence, these stars must have had no initial light-element content.

Abundances Analysis of the A Stars in the Pleiades.

PETER S. CONTI, *Lick Observatory*, AND STEPHEN E. STROM, *Smithsonian Astrophysical Observatory and Harvard College Observatory*.—A model-atmosphere abundance analysis has been made for eight A stars in the Pleiades cluster. The results of this analysis have been compared with those obtained from curve-of-growth techniques, and, with few exceptions, the disagreements are minor. We find that the A stars chosen by Conti (*Astrophys. J.* **142**, 1965) as metallic line A stars on the basis of the Sc II/Sr II line strengths exhibit other abundance anomalies characteristic of this class of stars. The values of microturbulent velocities obtained for these stars are large (in the range 4–6 km/sec), in agreement with previously reported analyses of metallic-line stars. The possibility that the anomalous abundances deduced for these stars are caused by incorrect choice of atmospheric structures was ruled out by computing abundance ratios for a very wide range of atmospheric conditions and finding no conditions that produced normal ratios.