tive temperature correction scheme proposed by Krook and Avrett (Krook, M., *Astrophys. J.* **137**, 863, 1963; Avrett, E. H., and Krook, M., *ibid.* **137**, 874, 1963) is employed in calculating a number of early-type model stellar atmospheres.

We have computed a grid of model atmospheres for which $10\,000^\circ < T_e < 25\,000^\circ\text{K}$, $3 < \log g < 5$ and $X=0.833$, $Y=0.167$. We include in these models the sources of opacity: neutral hydrogen, neutral and singly ionized helium, H_2^+ , H^- , and the effects of electron scattering, Rayleigh scattering, and radiation pressure. The temperature and pressure distributions as well as the emergent fluxes are exhibited for several representative cases.

The accuracy obtainable with this temperature correction scheme used in conjunction with a high-speed computer (the IBM 7090) is shown to be a few parts in 10^4 , with respect to the constancy of net flux, the flux derivative and the temperature. The importance of obtaining such accuracy is illustrated by a case in which a flux, constant to a few percent, requires temperature corrections of several hundred degrees.

Effect of a Magnetic Field on Coronal Heating.

YUTAKA UCHIDA, *Princeton University Observatory* (on leave of absence from the University of Tokyo).—The shock wave heating theory (Schatzman, de Jager-Kuperus, and Osterbrock) of the solar corona is extended to include an effect of the magnetic field, and theoretical models of the solar corona with and without the magnetic field have been investigated in a self-consistent scheme (to be published in *Publ. Astron. Soc. Japan* **15**, 376, 1963).

The solution is obtained numerically under given boundary conditions in the lowest chromosphere by including the heating and the support of the chromosphere in the time average in the same consistent scheme. This is made possible by the comparative smallness of the net radiative loss per mass in the quasi-thermodynamical equilibrium in the lower chromosphere. The presence of an outward-decreasing magnetic field makes the effective sound velocity greater in lower layers, and so makes the strength of the shock waves weaker around there. Accordingly the region of heat liberation is shifted up slightly out of the region of main radiation loss, which lies near the chromosphere-corona transitional region. A greater downward heat flow by conduction is required by this separation, and it in turn requires the presence of a steeper temperature rise to higher values in the model than is the case without the magnetic field. The density in the corona remains higher due to the longer scale height in this case, so that features like coronal condensations in the plage regions around sunspots appear.

Some additional results are given on the paramete-

ter dependence of the model including the dependence on gravity. This may lead to an investigation on the existence of coronas on other types of stars.

Profiles of the Helium Emission Line at $\lambda\,10\,830\,\text{\AA}$ in the Orion Nebula. ARTHUR H. VAUGHAN (introduced by Malcolm P. Savedoff), *University of Rochester*.—The structure of the infrared helium triplet at $\lambda\,10\,830\,\text{\AA}$ in NGC 1976 has been investigated photoelectrically by means of a pressure-scanning Fabry-Perot interferometer constructed at the University of Rochester. With this instrument the intensity of the isotope-shifted emission from He^3 is expected to be measurable if the abundance of this isotope exceeds 1% of the He^4 in the nebula.

The photometer employs an ITT type FW-118 infrared-sensitive photomultiplier tube as a photon counter. The Fabry-Perot achieves a resolving power of 50 000 with a spectral range of 6 $\text{\AA}$. A laboratory helium lamp calibrates the pressure scale in terms of absolute wavelength. Interference filters are used for coarse spectral discrimination.

Regions 3 minutes of arc in diameter centered on and near the Trapezium have been scanned in a preliminary investigation using a 12-inch telescope (near Rochester). The emitting He^4 is found to have an average heliocentric radial velocity of $+28.5 \pm 0.5\,\text{km/sec}$, which is close to the weighted mean radial velocity of the stars in the central cluster (Markowitz, *Astron. J.* **54**, 111, 1949). This velocity is appreciably larger than the usually adopted nebular velocity (Campbell and Moore, *Publ. Lick Obs.* **13**, 96, 1918) ($+17.5\,\text{km/sec}$) determined from N1, N2, and $H\beta$.

In the preliminary investigation the "dark" counting rate ($\sim 40\,\text{counts/min}$) and the sky background ($\sim 50\,\text{counts/min}$) together contribute less than 5% of the signal at the line center.

Detailed profile surveys obtained with the 16- and 36-inch telescopes at Kitt Peak during December (1963) are presented and discussed.

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Formation of Solar Flares without Magnetic Neutral Points.

DONAT G. WENTZEL, *University of Michigan Observatory*.—A flare may be caused by the collapse of an unstable chromospheric region, under the action of magnetic forces, toward a surface of minimum but finite magnetic field strength. The compression of the magnetic field during the collapse results in forces which stop the collapse, in a time comparable to the rise time of flare light curves. Turbulence is likely to occur if the velocities of collapse become comparable to