for different chemical compositions are thus well defined at the upper end (larger mass) of our model range but are not well defined at the lower end.

The zero-age lines at the upper end of these models are of constant slope and parallel to each other for different chemical compositions, in agreement with similar results obtained by I. Iben (*Astrophys. J.* **138**, 452, 1963). The zero-age line is displaced vertically upward as the Z value of the model is increased. At the lower-mass end of these models there is, at present, no way of deciding where the zero-age line should lie. By varying the carbon cycle p-p ratio we can obtain a family of main sequence lines which can be made to coincide with the lower end of the Sandage "zero-age" line.

A Search for a CO_2 Mercury Atmosphere. JAY T. BERGSTRALH AND HARLAN J. SMITH, *The University of Texas.*—Spectra of Mercury in the 10 500, 12 050, and 12 200 Å regions were obtained on 30 March through 3 April 1967 using an image tube with an S-1 photocathode at the coude spectrograph (1200 line/mm grating in first order) of the 82-in. Struve reflector at the McDonald Observatory. These spectra were recorded on baked IIa-O emulsions at dispersions of 3.2 Å/mm, with effective exposures of about 4 h.

First analysis of two of the plates, respectively of the strong 12 030 and 12 177 Å CO_2 bands, indicates nearly two orders of magnitude reduction in the upper limit on the abundance of CO_2 from that given by Moroz for Mercury's atmosphere. Measurements of the plates in the regions of the strongest hypothetical Mercury CO_2 lines and band heads, confirmed by measures at the positions of the corresponding terrestrial CO_2 features, show that at the time of these observations assuming a temperature of 450°K the amount of CO_2 above the observed portion of the surface of Mercury was less than 0.5 m-atm (less than 0.04 mbar CO_2 surface partial pressure).

Characteristics of Inner Coronal Structures from Optical Spectroscopy. DONALD E. BILLINGS AND JO ANN JOSELYN, *University of Colorado.*—We have carried out a detailed study of the green-line emission in two coronal features, using both linewidth and line intensity jointly. We explore the hypothesis that the linewidths measure temperature, from which we deduce plausible information concerning the magnetic field configuration in the regions. From the hypothesis that the emission gradients indicate temperature, on the other hand, we draw conclusions concerning the kinematics of of the gas in the features. Finally, through hydrodynamic considerations, we attempt to bring the two interpretations together.

Spectrum Variations in the Peculiar A Star 73 Draconis. WALTER K. BONSACK (present address: the Hawaii Institute of Geophysics, University of Hawaii) AND ALLAN H. MARKOWITZ, *Perkins Observatory.*—Variations in equivalent width and wavelength have been measured for a selection of lines. The equivalent widths of lines of Eu II, Ca II, Sr II, and Ti II are found to vary synchronously with a period of 20.276 days, in agreement with results reported by Morgan in 1933 and Durham in 1943. We find no evidence for the change in period suggested by Rakos. The wavelengths vary with the same period, but the phase relationship between the intensity and wavelength variation is different for different elements. Rapid deviations from the systematic variations occur in both intensity and wavelength. Rapid changes in the wings of the hydrogen lines discovered photoelectrically by Wood are confirmed, and it is found that the metallic lines blended in the wings do not participate significantly in the variation.

Photoelectric Spectrophotometry of Individual Martian Features by Means of Area Scanning. PETER B. BOYCE, *Lowell Observatory.*—During the recent opposition of Mars the Lowell Observatory area-scanning spectrometer has been used to obtain monochromatic intensity profiles across the Martian disk at 10 or more selected wavelengths. These observations were made using the 72-in. reflector of the Ohio Wesleyan and Ohio State Universities at the Lowell Observatory and also the 61-in. reflector at the Flagstaff Station of the U. S. Naval Observatory. On nights of good seeing, these profiles show surface features such as the Elysium and Syrtis Major. In addition, "white" clouds have been observed on most nights near either, and sometimes both, limbs at the equator.

In practice an analyzing aperture usually 1.8 sec of arc square is repeatedly driven across the planet's image taking about 1/5 sec to traverse the entire disk followed by a rapid return to the initial position. The scan repetition rate is 2.5 sweeps per second. For every second scan the data are accumulated into a multiscaler, which is synchronized with the mechanical sweep. After the completion of the desired number of sweeps (usually 40), the contents of the multiscaler are punched on paper tape and plotted on the IBM 1130 computer at Lowell Observatory.

The "white" clouds show most contrast with the disk in the violet, becoming undetectable at wavelengths longer than 5800 Å. These clouds also be-