at Columbus, Ohio,² was given by Goldberg, McMath, Mohler and Pierce¹ who assumed a variation of the carbon monoxide content of the earth's atmosphere with geographical location. To investigate this problem further, tracings of both the fundamental and first overtone regions, 4.7μ and 2.3μ , respectively, were taken within a short time interval with the newly installed solar spectrometer of the Dominion Observatory at Ottawa. The fundamental band was obtained with about the same intensity as at Columbus. The terrestrial lines in the overtone band were barely observable, their intensity being comparable to the upper limit estimated for the intensities at Lake Angelus and Mt. Wilson.

The observations at Ottawa lead therefore to the same atmospheric concentration of carbon monoxide as at Columbus and show that the same concentration could also be present at Lake Angelus and Mt. Wilson. Moreover we find that the observed high intensity ratio of the fundamental and first overtone bands is quite expected from the laboratory absorption coefficients given by Penner and Weber.³ We conclude, therefore, that there is at present no reason to assume a geographical variation of atmospheric carbon monoxide.

Using the laboratory values of the absorption coefficients we compute the abundance of carbon monoxide in the atmosphere to be 0.06 cm. atmos. The calculated abundance of carbon monoxide in the atmosphere and the intensity ratio of the two bands were confirmed by laboratory tracings taken with the same instrument using an absorption cell filled with air at pressure 0.5 atmos. and an amount of carbon monoxide equivalent to that calculated for the atmosphere.

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3. S. S. Penner and D. Weber, *J. Chem. Phys.* **19**, 807, 1951.

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McDonald, J. K. Hydrogen absorption lines in the spectra of B-type stars.

This investigation is an attempt to use the characteristic difference in the shapes and intensities of the hydrogen lines in the spectra of B-type stars as a criterion of the distances of the stars, by predicting theoretically from model-atmosphere computations the profiles of the hydrogen lines as a function of surface gravity and

temperature, and then relating these results to the observed profiles in the spectra of B-type stars of known distance.

A model stellar atmosphere was computed for an assumed effective temperature, $20,700^\circ\text{K}$; assumed gravity, $\log g = 3.80$; and assumed abundances of the elements by weight, hydrogen:helium:heavier elements = 1000:800:50. The condition of radiative equilibrium was found to be well satisfied for the model. The computed flux was constant within ± 4 per cent, for optical depths from 0.00 to 2.00, and this constancy of flux was found to be relatively insensitive to alterations in the assumed grey-body temperature distribution. The energy distribution in the continuous spectrum of the model indicated a Balmer discontinuity of 0.105, a bolometric correction of -2.63 , and a colour temperature on the Greenwich scale of $35,000^\circ\text{K}$. The value of Balmer discontinuity and the computed number of observable hydrogen lines, when compared with observations, supported the assumption that the model approximates a main-sequence B2 star. The profile of the $H\gamma$ line was computed for the model, assuming two different re-emission processes to be operating, monochromatic radiative equilibrium (pure scattering) and local thermodynamic equilibrium (pure absorption). The computed profiles were compared with the observed profiles of $H\gamma$ in the spectra of four stars in the range B1-B3, III or IV. It appears that the contour of the wings of the lines, computed by either of the assumed processes, represents rather well the observed profile for a star of type B2.5 IV, but neither process yields a good representation of the line centre.

The conclusion is that the currently used model-atmosphere method of computing the $H\gamma$ line profile will not provide a sufficiently discriminating criterion of the absolute magnitudes of the B-type stars, but an extension of the investigation to additional models may possibly modify this conclusion.

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McLaughlin, Dean B. The variable profiles of emission bands of Nova Aquilae 1918.

During secondary oscillations of light, novae show higher excitation at minima than at maxima. This is attributed to variation of temperature of the effective photosphere of the central star. Several novae have had smooth emission bands at maxima of light, and a pattern of