ening we find a kinetic temperature of approximately $30,000^\circ$.

Variation of the profile with height in the chromosphere has thus far only been studied for $H\alpha$. Here it is clearly seen that the profile decreases in half-width and indicates diminishing optical depth with increasing height. Structure within the emission lines becomes more pronounced with increasing height in the chromosphere. The emission features are presumably spicules or groups of spicules. Some of the spicules exhibit marked radial velocities and some have large wings to the blue or the red. The profiles of different spicules at a given cross-section differ somewhat, but this does not necessarily imply that conditions differ in various spicules. Spicule profiles are, however, decidedly wider than prominence lines.

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Athay, R. G. and Thomas, R. N. Some comments on photospheric models.

Models for the upper photospheric layers are usually derived by assuming that the excitation temperature, T_{ex} , in the cores of the early Balmer lines is the same as the kinetic temperature, T_e . From the observed center-to-limb variations in the line intensities, one then obtains a photospheric model with T_e decreasing monotonically with height. From eclipse data, however, we find that the central parts of these early Balmer lines are formed at heights of 2000 to 4000 km above the base of the chromosphere, and, in addition, that T_e is either constant or increasing with height. In this paper we attempt to integrate eclipse observations with disk observations in order to join the photospheric model to the low chromospheric model.

The data indicate that T_{ex} for $H\alpha$ decreases across the disk, then remains constant for the first 4000 km in the chromosphere before it decreases further. For $H\beta$, $H\gamma$ and $H\delta$, however, the drop in T_{ex} across the disk is followed by a sharp rise in T_{ex} at the limb, which, in turn, is followed by a rather rapid decrease in T_{ex} with height. We interpret this behavior in terms of the differences in the optical depths in the lines and in terms of the non-uniformities arising from spicule structure. In all cases T_e obtained from

other chromospheric data exceeds T_{ex} in the early Balmer lines.

In order to check the validity of identifying T_{ex} with T_e , we use the line profiles on the disk to obtain an empirical relation between T_{ex} and the Doppler widths of the lines. If we ignore mass motions, the profiles show clearly that $T_e > T_{\text{ex}}$. If the observed effects are attributed to mass motions, random velocity fields of the order of 13 km/sec are required. Such velocity fields could, conceivably, arise from spicule motions, but it seems unlikely. Furthermore, we find that the individual curves of T_{ex} versus height for the early Balmer lines do not join smoothly, again indicating that $T_e \neq T_{\text{ex}}$. Thus, we conclude that T_{ex} in the early Balmer lines does not serve as a sound basis for deriving photospheric models.

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Barnhart, Philip. The photoelectric determination of the direction and velocity of motion of the scintillation layer.

By simultaneous recording of the scintillation of a single star at two telescopes having a known horizontal separation and lying on a horizontal line having a known azimuth, it is possible to determine the azimuth and velocity of the shadow pattern of the star. Some details of the method are described in a letter by Barnhart, Protheroe and Galli (*J. Opt. Soc. Amer.*, in press). Using this procedure, observations of the pattern motion have been analyzed for seven nights in May and June, 1956.

These observations were compared with Rawinsonde balloon observations of the atmospheric wind directions and velocities at various heights. The assumption was then made that the observed motion of the shadow pattern is caused by the translational motion of the atmospheric scintillation layer responsible for the formation of the pattern. On the basis of this assumption, possible heights of the layer were determined by looking for those heights at which the wind velocity and direction agreed with the pattern velocity and direction.

On three nights there was only one altitude below 50,000 feet at which agreement between