that the diameter of the tremor disc is $2''$, the purity is 10^3 , and faint lines in the photographic region of the spectrum should be resolved if separated by 4 Å. In practice, this resolution is attained with ease on short exposures on IIa-O emulsion. The combined optics (mirror, correcting plate and two prisms) are thus shown to be of excellent quality.

Maximum useful exposure for 103a-O plates is limited by sky fog to about 35 minutes. On 30-minute, 103a-O plates, stars of photographic magnitude 10.3 form spectral images 0.4 mm wide of satisfactory density. The quality of the spectra on the longer exposures is very sensitive to the care used in widening. It is anticipated that rate control of the diurnal drive will ultimately prove satisfactory, but to date the best results have been obtained with manual widening in increments of about $3''$, by means of a standard position micrometer installed on the guiding telescope.

On plates of good quality, exposed for 30 minutes on 103a-O emulsion, and widened as described, luminosity-sensitive lines commonly employed for luminosity classification of late-type stars are well defined. Microdensitometer tracings of spectra on these plates exhibit satisfactory detail, very nearly comparable to that seen on tracings of bright stars photographed with the same prism combination.

In view of the results described briefly above, it may be concluded that the two-prism combination will be an efficient instrument for the purposes for which it was designed.

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Milligan, J. E. and L. H. Aller. The calculation of model atmospheres for hot main-sequence stars.

For an adequate interpretation of the spectra of the stars it is necessary to have some knowledge of the variation of temperature and pressure with depth in the star. The method of model atmospheres, so successful for the sun, may be applied to early-type main sequence stars. Such model atmospheres must be in radiative equilibrium and must have fluxes that are constant with optical depth. Furthermore they must predict color temperatures, Balmer discontinuities, and hydrogen-line profiles in agreement with observations.

The present model applies to an atmosphere of pure hydrogen, stratified in plane parallel layers, and in hydrostatic equilibrium. To start the calcu-

lations we assumed a mean absorption coefficient that approached the modified Chandrasekhar mean near the surface and the Rosseland mean at great depths. A grey body temperature distribution was assumed except near the surface where a correction for the blanketing effect was introduced in accordance with the Chandrasekhar-Hopf theory. With the boundary temperature held constant at $18,000^\circ\text{K}$ three approximations were required before the constancy of flux condition was filled to within two per cent over optical depths from 0 to 2. The best model appears to fall between the second and third approximations.

The following table summarizes the characteristics of the three approximations with respect to temperature distribution, failure of the constancy of flux condition, effective temperature, and total flux.

$\tau(\lambda_{5000})$	I	II	III
0	$18,000^\circ\text{K}$	$18,000^\circ\text{K}$	$18,000^\circ\text{K}$
0.1	21,000	21,300	21,850
0.2	21,500	22,000	22,700
0.4	22,100	22,900	24,000
0.6	22,500	23,600	25,050
0.8	22,900	24,150	25,900
1.0	23,300	24,650	26,600
1.5	24,100	25,800	28,050
2.0	24,800	26,700	29,200
max. $\Delta F/F$	10%	3.9%	1.8%
T_{eff}	$24,200^\circ\text{K}$	$26,400^\circ\text{K}$	$29,500^\circ\text{K}$
Flux	0.62×10^{13}	0.88×10^{13}	1.36×10^{13}
(erg/cm ² /sec)			

Although the flux condition is insensitive to the temperature distribution, as noted by Miss McDonald, the character of the line spectrum is extremely sensitive to the temperature distribution.

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Nail, Virginia McKibben and Harlow Shapley. On colors in five Magellanic Cloud constellations.

With the establishment of photo-electric magnitude sequences in the Large Magellanic Cloud, we have been able to measure the luminosities and colors of several hundred supergiant stars in five large aggregations, which we call constellations because of their resemblance in size and stellar composition to the Orion-like groups of our own galaxy. The absolute magnitudes of the principal blue and red stars that define the constellations average about -6 . The full discussion will appear in the *Proceedings of the National Academy of Sciences*.

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