servatory showed a small region of enhanced emission and immediately adjacent to it a small region of greatly reduced emission. Moon profile pictures taken at Khartoum showed that the observed effects could not be attributed to irregularities in the moon's profile. A few degrees away from these regions there was a bright prominence that appeared to be of a surge type.

The region of reduced emission showed mainly in the chromospheric lines. There was also an apparent decrease in the coronal line intensities in the lowest levels of the corona, but there was no marked decrease in the continuum intensity. The decrease in the line intensities apparently resulted from either a cloud of absorbing matter or an actual decrease in chromospheric emission.

The region of enhanced emission showed a maximum in the continuum and all chromospheric and coronal line intensities. The greatest increase in chromospheric lines was in He^+ , $\lambda 4686$. The yellow coronal line, $\lambda 5694$, showed in this region on our spectrograms. It did not show at any other positions, and to our knowledge has not been observed at previous eclipses. Lyot and Dollfus have also reported this coronal line and four new coronal lines from observations at Khartoum.³ All of these lines were found in this region of enhanced emission. The intensities of all of the chromospheric lines decreased much more slowly with height in this region than in an east limb region previously analyzed,⁴ which seemed to represent the undisturbed chromosphere.

It was suggested that the region of enhanced emission was caused by a limb flare. A preliminary interpretation of the data from this region showed that both the electron density and kinetic temperature were greater than in the east limb region, and that the temperature increased less rapidly with height. A more detailed analysis of this region will be published elsewhere.

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Baum, William A. The main sequence in the globular cluster M 13.

Magnitudes and color indices of stars down to $P = 23.8$ in the globular cluster Messier 13 have been measured photoelectrically with the new photon-counting photometer at the 200-inch prime focus. The resulting color-magnitude diagram reveals the so-called main sequence in M 13 to lie more than two magnitudes below the ordinary main sequence for the solar neighborhood, if the absolute magnitude of the RR Lyrae stars is assumed to be 0.0. Alternatively, if the M 13 main sequence is assumed to be coincident with the ordinary main sequence, then the RR Lyrae stars in M 13 would need to have an absolute magnitude brighter than -2 . Since this latter possibility would be difficult to reconcile with other data, the main sequence stars in M 13 are tentatively identified as subdwarfs. The color-magnitude diagrams for M 92 and M 3, although not as yet photoelectrically calibrated in the main sequence region, are believed to have main sequences lying between that for M 13 and that for the solar neighborhood. The general notion of a broad range of possible main sequences is suggested, and attention is called to its many implications.

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Chamberlain, Joseph W. On the presence of oxygen bands in the ultraviolet airglow spectrum.

The identifications of emission features in the ultraviolet airglow spectrum have long been in an unsatisfactory state. Of the many identifications proposed from time to time, the Herzberg ($^3\Sigma_u^+ \rightarrow ^3\Sigma_g^-$) bands of O_2 have been the most generally accepted, although various objections to the presence of this system have appeared. Recent spectra obtained at Yerkes Observatory with a dispersion of 22 Å/mm show fairly good agreement between observed and computed wave lengths for band progressions with $v' \geq 8$. The relative intensities of these features also suggest that the $v' = 2$ and 3 levels are more highly populated than is $v' = 0$; this might occur if the excitation is from the ground state, but would not be expected if the excited molecule is formed by a recombination of oxygen atoms. Furthermore, a number of other ultraviolet features may be attributed to the recently discovered $^1\Sigma_u^- \rightarrow ^3\Sigma_g^-$ bands of O_2 .¹ An increase of one in Herz-

berg's v' numbering would explain two or three additional emissions and would place the $^1\Sigma_u^-$ state slightly below the $^3\Sigma_u^+$ state.¹ The new system also seems to exhibit some preferential excitation to higher vibrational levels, although the exact wave lengths and relative intensities are less certain because of numerous blends and because the new system seems to be intrinsically fainter than the Herzberg bands.

In spite of the above agreement in measured wave lengths, the presence of these O_2 systems in the airglow must still be seriously questioned. Vibrational transition probabilities for the Herzberg bands have been computed by Miss Pillow² and more recently, with improved molecular constants, by Jarman, Fraser, and Nicholls.³ These computations indicate that if the ultraviolet airglow bands are indeed part of the Herzberg O_2 system, then a number of very strong bands should appear in the green and red regions where there are no strong unidentified emissions. More spectra with higher resolution will be obtained in an attempt to separate several blended features and thus render them amenable to accurate wave length and intensity measurements. However, unless the theoretical computations of transition probabilities are considerably in error, which does not now seem likely, it is quite probable that these two O_2 band systems will not adequately explain the strong bands in the ultraviolet airglow.

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Duke, Douglas. Photographic blending of close binaries.

In order to find the individual masses of a visual binary system it is necessary to obtain the mass ratio. This is obtained by observing the fraction of the total relative orbital motion due to the brighter component. However, if the separation is less than $2''$ the stars will normally be blended on the photographic plate, and it is then necessary to correct the position of the blended center to obtain the position of the brighter star.

It has previously been assumed that the position of the blended image will be the mean position of the components weighted for relative brilliance. This gives a blending correction β , which is a function only of the magnitude difference Δm between components:

$$\beta = \frac{1}{1 + 10^{0.4\Delta m}}.$$

It is felt that the above assumption is not valid for two reasons:

1. The response of the photographic plate is not proportional to the exposure received.
2. From personal experience it is believed that the plate measurer makes settings midway between the visible extremities of the image rather than on some interior point of maximum density.

Blending corrections based upon the second of the above objections are not only functions of the magnitude difference, but depend also upon the actual separation between the components, the exposure level of the plate, and probably also on seeing conditions. These other variables enter because, in this assumption, the blending correction is:

$$\beta = \frac{1}{2} - \frac{1}{4d} \Delta D$$

where d is the separation and ΔD is the difference in image diameter between components. Since, on the photographic plate, image diameter is not proportional to magnitude, ΔD will depend upon the exposure level. Any change of shape of the magnitude-diameter relation due to seeing differences or other causes will also be important.

Since it is of interest to compare the results of the two methods an empirical magnitude-diameter relation was chosen at random and the blending corrections computed for different values of separation, exposure level and magnitude difference. Allowance was made for additional outward spread of the images due to the proximity of the components. Significant differences are found. In many cases the difference in the computed values of β for a given Δm vary as much as 0.10 with different separations and exposures. In a few cases the difference approaches 0.20. If this is actually the case, errors of the order of twenty per cent may be introduced in the individual masses by use of the currently used formula for β .

The only experimental work available as a check is that of R. G. Hall;¹ but his work affords only an incomplete comparison since he did not use different exposure levels or obtain results for greatly elongated images. Nevertheless the method here presented calls precisely for the discrepancy he found between observed and computed values of β . If the separation of the