

MINOR CONTRIBUTIONS AND NOTES.

THE HYDROGEN ATMOSPHERE SURROUNDING THE WOLF-RAYET STAR D. M. $+30^{\circ}3639$.

WHILE examining various star spectra with the 36-inch refractor on the night of June 28, I was much interested in confirming Professor Campbell's discovery of a hydrogen envelope around the Wolf-Rayet star *DM. $+30^{\circ}3639$* .¹ With the collimator adjusted so that the spectrum was linear at $H\beta$, and with the slit wide, the $H\beta$ line appeared as a circular, fairly well defined disk, which narrowed to a fine line crossing the linear star spectrum when the slit was closed up.

That this appearance is not an illusion of any kind produced, for example, by irradiation, is proved by the following experiments. (1) When the the spectrum is made linear at the blue band $\lambda 4652$, which is nearly as bright as $H\beta$, no such appearance as that described above is observed. The band is reduced to a mere line coincident with the star spectrum. This band is not much narrowed by closing the slit. (2) With the collimator adjusted so as to make the spectrum linear at $H\beta$ and with the slit narrow, the star can be thrown off the slit by slightly displacing the telescope in declination, so that the continuous spectrum disappears. The short and narrow $H\beta$ line remains visible, however, until the slit is displaced by more than the radius of the hydrogen envelope. This latter experiment, in particular, seems to be conclusive as to the reality of the observed phenomenon.

With a large reflector I think that this hydrogen envelope could be observed visually without a spectroscope, perhaps with the aid of a piece of blue glass. With a refractor the small disk is confused with the circles of chromatic aberration when the focus is adjusted for $H\beta$.

The existence of such an extensive hydrogen envelope around a Wolf-Rayet star has an important bearing on theories of bright-line stars, as Mr. Campbell has already pointed out.

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LICK OBSERVATORY,
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¹ *A. and A.*, 12, 913, 1893; *A. N.*, 3200.