Underhill, Anne B. Some spectrophotometric observations of the Wolf-Rayet stars HD 192103 and HD 192163.

The following claims regarding Wolf-Rayet stars may be found in the literature: (1) that all Wolf-Rayet stars are binaries, (2) that the color temperatures of Wolf-Rayet stars determined spectrophotometrically over the range $\lambda 3900$ to $\lambda 5000$ are of the order of $12,000^\circ$, and (3) that no *N* lines are to be found in WC spectra and no *O* lines in WN spectra. These conclusions obscure the relationship of the Wolf-Rayet stars to the rest of the stellar population.

Grating spectrograms at $16\text{\AA}/\text{mm}$ have been obtained of HD 192103 and HD 192163 covering the range $\lambda 3100$ to $\lambda 4500$. This material was supplemented by prismatic spectrograms of moderate dispersion ($30\text{\AA}/\text{mm}$ at $H\gamma$) covering the range $\lambda 4000$ to $\lambda 6800$. The following comments may be made:

(1) The radial velocity of each star was obtained on 4 nights in 1957–58, and it does not vary by an amount in excess of 30 km/sec. The scatter among the results can be entirely accounted for by the random errors of measurement. No absorption features attributable to an O or B type companion are visible in the spectrum of HD 192103 or of HD 192163. Thus these stars do not have companions of absolute magnitude brighter than -1 . A fainter companion could not readily be detected.

(2) There are many weak emission features in both spectra in addition to the well-known strong lines. Thus both spectra rarely dip to the continuum. The continuous spectrum that was finally derived after studying tracings from $\lambda 3100$ to $\lambda 6800$ is very like that of an O star. It does not look like that of a star which has a color temperature of $12,000^\circ$ and there is no Balmer jump in absorption or emission. Slitless spectra will be required to obtain meaningful quantitative measurements of the continuous spectrum.

(3) A list of wave lengths has been compiled from measurements made on microphotometer tracings. This list is more comprehensive than previous lists and gives evidence that *N*III, *N*IV and *N*V occur in WC spectra, the clearest nitrogen line being *N*III $\lambda 6455$. The spectra of *O*III, *O*IV and *O*V are present in the WN spectrum, particularly in the ultraviolet. There is an unmistakable *O*V emission occurring as a weak feature between *He*II $\lambda 5411$ and about $\lambda 5470$.

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Weston, Edwin B. The apparent distribution of faint emission-line and variable stars in galactic nebulae.

A comparison of the relative distribution of faint emission-line and variable stars located in galactic nebulae reveals distinct differences from nebula to nebula. This paper deals with the distribution of stars in single interstellar clouds and not in the larger cloud complexes. The two extreme cases observed are (1) an apparent concentration of these stars, in the absence of any very hot, highly luminous star, about the edge of a cloud of high opacity, and (2) an apparent concentration of these stars toward the region of a hot, highly luminous star embedded in a bright nebula. Intermediate situations occur dependent upon the temperature and luminosity of the brightest star involved in the cloud and how long it has been shining with its present characteristics. In case (1) small reflection nebulae (which are small regions in the cloud) may be relatively frequent when seen against the dark cloud, but not as frequent when seen at the edge except when the rim is bright. The small reflection nebulae will be less frequent in case (2).

This effect can be explained in terms of differential dissipation and concentration of interstellar material by radiation pressure and gravitational forces. In the first case we see these faint stars only when they are on the periphery of the interstellar cloud. A star in the near side of the cloud, but seen more or less centrally against it, will frequently show a reflection nebula since its light is scattered by dust behind, to the side, and especially in front of the star, whereas a star appearing on the edge of the cloud will usually be in a region of lower density of interstellar material and in a less favorable geometrical situation for observing a reflection nebula. In the second case the radiation pressure of the very hot, highly luminous star will have blown outward the interstellar dust, which will carry with it a portion of the interstellar gas, thus decreasing the obscuration and revealing the faint stars in the deep interior of the cloud.

T Tauri variables with more extreme characteristics are found only in case (1). Orion variables are present in both cases, but especially in case (2). Neither are found outside of galactic nebulae. This is interpreted to mean that a certain density of interstellar dust is required for T Tauri variables, whereas interstellar gas is sufficient for Orion variables. Probably the Orion variables represent a transition stage in the evo-