information exists other than period and rough photographic light curve. A solar motion solution from the nine having known radial velocities gives a drift of only 66 km/sec, and a weakly determined apex which lies about half-way between those for the local system and the high-velocity stars.

The proper motions for these objects, when reduced to the same apparent magnitude, decrease almost monotonically with increasing period. This strong suggestion of a period-luminosity relation is borne out by statistical parallax solutions, using components respectively parallel and perpendicular to the apparent solar motion, from which are found concordant absolute magnitudes of about +4.4 for the four variables with periods less than .10 day, and +1.6 for those with periods between .075 and .175 day. Trigonometric parallaxes are available only for SX Phe and δ Scu, but these give $M_{pg} = +3.9$ at .056 day and +1.6 at .194 day, respectively.

Light, color and velocity curves were used in the Wesselink-Stebbins method to derive radii for CY Aqr and VZ Cnc. The resulting sizes, 1.4 and 3.8 solar radii, indicate absolute magnitudes +2.5 and +1.0 which agree well with those derived by parallax methods. Such small radii also permit the same $P\sqrt{\rho}$ relation to apply both to the RR Lyrae type a and to the short-period variables, provided the masses of the latter are greater by a factor of about 2. The period-color relation for the galactic RR Lyrae variables alone has the theoretical slope corresponding to a single period-density relation and constant absolute magnitude; for the short-period stars the $P\sqrt{\rho}$ relation coupled with their observed period-luminosity relation can explain fully the much smaller slope of their period-color curve.

Comparison with globular clusters where RR Lyrae stars are so numerous suggests that with a single possible exception variables such as those discussed above having extremely short periods, light curves of substantial amplitude and roughly type a form, and low absolute magnitude, do not occur in globular clusters.

Thus we may conclude either that RR Lyrae stars are, at least in the galaxy, a much less homogeneous group than has previously been supposed; or that we are here dealing with a distinct class of galactic short-period variables characterized by small size and intermediate population, which apart from period resemble RR Lyrae stars in variation, but which trend toward classical cepheids in terms of galactic

distribution and perhaps in mass. The differences from either group are sufficient to suggest that the name "dwarf cepheid" may be appropriate to the class. CY Aqr and AI Vel would then be prototype stars showing respectively extremes of simple and complex variation.

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Smith, Henry J. Southern Wolf-Rayet stars.

Observations of all but three of the W stars south of the equator and brighter than eleventh magnitude have been obtained with the 2-prism spectrograph of the 60" telescope at the Boyden Station. This large sample of stars represents all of the subclasses of the I.A.U. classification system, but discloses numerous objects for which the adopted criteria are inadequate or contradictory. Among the many peculiar stars the following are outstanding.

HD 62910 displays a typical WN6 spectrum, and in addition strong lines of CIII, CIV and Ov. This star is definitely intermediate between the carbon and nitrogen sequences. Most WN6 and WN5+ stars exhibit traces of CIV $\lambda 5810$ emission.

HD 104994, WN5p, is the highest excitation WN star in the southern hemisphere. OVI $\lambda 3811$, $\lambda 3834$ are strong emission lines. This multiplet is strong in WC7 and WC6 stars, but appears in no other WN star.

HD 68273, γ_2 Velorum, has a composite spectrum, O8: + WN7. The star is probably a binary system. Central absorptions of H, HeI and HeII lines shift relative to the overlying emissions. Moreover at one epoch additional violet absorption components of HeI lines appeared, and revealed accelerations from -400 to -1300 km/sec.

HD 66811, ζ Puppis, O5f, exhibits the HeII series $5^2F^\circ - n^2G$ in absorption, and a well developed WN7 spectrum.

RR Telescopii in June 1953 underwent "nitrogen flaring," and developed a complete WN5+ spectrum. The η Carinae sharp emission-line spectrum described by Thackeray persisted during this phenomenon.

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Stock, J. and Wehlau, W. H. Photographic photometry at the galactic pole.

Photographic photometry in the blue and infrared has been carried out for more than 300