

P CYGNI: WILL IT EVER BECOME A WOLF-RAYET STAR?

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P Cygni is a B1Ia⁺ hypergiant situated close to the Humphreys–Davidson Limit in the Hertzsprung–Russell diagram. A comparison of its basic physical parameters with computed evolutionary tracks suggests that P Cygni may become a WR star (Lamers *et al.* 1983, *Astron. Astrophys.*, 123, L8).

However, there are problems with such a scenario.

1. WR stars may not be such evolved objects as commonly believed and their spectral characteristics may be explained by an appropriate treatment of radiative–transfer theory (Bhatia and Underhill, 1988, *Ap. J. Suppl.*, 67, 187).

2. The practice of determining the evolutionary status of a single object like P Cygni from its position in the HRD through a comparison with computed evolutionary tracks is fraught with uncertainties and should be handled with great care.

3. Although WNL stars have much in common with P Cygni, similar luminosities, radii (Doom, 1988, *Astron. Astrophys.*, 192, 170), linewidths, etc., and may even have a two-component stellar wind similar to OB supergiants (see, e.g., Zickgraf *et al.* 1985, *Astron. Astrophys.*, 143, 421, and references therein; Bhatia and Underhill, 1986, *Ap. J. Suppl.*, 60, 323; 1988, *Ap. J. Suppl.*, 67, 187; Poe *et al.* 1989, *Ap. J.*, 337, 88), the force driving their winds may be rather different. Whereas in P Cygni the radiation pressure on many lines explains the observed wind phenomena (Lamers, 1986, *Astron. Astrophys.*, 159, 90), the energy present in winds from WR stars is far greater than what can be contributed by radiation pressure alone (Underhill, 1983, *Ap. J.*, 265, 933).

I contend that the conventional picture about the atmospheric parameters and evolutionary status of WR stars has been dictated by the combination of the complexity of their spectra and their, possible, erroneous interpretation in the past, and the plausibility of the arguments brought forward by the modellers of stellar evolution. However, the still existing problems about WR stars, apparent when one considers questions like the one posed in the title of this paper, make it necessary to take a fresh, unbiased look at this whole problem.