PLANETARY NEBULAE AND WHITE DWARFS

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The present-day birth rate of planetary nebulae, $5 \cdot 10^{-12}$ PN/pc^{3}yr according to Cahn and Wyatt (1976), seems somewhat high compared to white dwarfs, for which a redetermination, including the statistics of Sion and Liebert (1977), yields $2 \cdot 10^{-12}$ WD/pc^{3}yr to within a factor of two. However, an increase of the distance scale for PN by a factor of 1.3 compared to Seaton (1968) - necessary in order to shift the extremum of PN radial velocities to the distance of the galactic center (9 kpc), and to increase the luminosities of the central stars from the position given by Pottasch et al. (1977) to a minimum value compatible with evolutionary constraints (Weidemann, 1977a) - brings birth rates of PN and WD into almost complete agreements.

Calculated mass distribution functions for WD (and PN nuclei) are presented for several evolutionary schemes with mass loss (Weidemann, 1977b). It is possible not only to reproduce the observed narrow mass range for WD (50% within $\pm$ 0.1 $M_\odot$) but also to rule out several models which predict too wide a mass distribution or - with no more than 50% of WD or PN belonging to the younger population I - too many high mass progenitors. (To be published, in co-authorship with D. Koester, in Astronomy and Astrophysics.) Cahn, J.H. and Wyatt, S.P. 1976, Ap.J. 210, 508. Pottasch, S.R., Wu, C.C., Wesselius, P.R. and Van Duinen, R.J., 1977, preprint (submitted A.and A.). Seaton, M.J. 1968, Ap.Letters 2, 55. Sion, E.M. and Liebert, J. 1977, Ap.J. 213, 468. Weidemann, V. 1977a, submitted to A. and A. Weidemann, V. 1977b, A. and A., in print.

DISCUSSION

Tinsley: Is there still any discrepancy between the observed and pre-dicted luminosity functions of white dwarfs at the faint end of the sequence?

Weidemann: No, there is no discrepancy any more; no red deficit. Al-though we just observe a couple of 'red' white dwarfs, if you account for the probability of detection of these very faint objects, there is no deficiency.