DISCUSSION

<u>Seaton</u>:   I would like to congratulate Mme. Acker on her work and on its presentation. I believe that some distances of optically thick nebulae are obtained using a method originally due to Minkowski, which assumes constant stellar luminosity. The nature of the assumption made must not be overlooked.

THE PLANETARY NEBULA IN THE GALACTIC CLUSTER NGC 2818

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The planetary nebula PK 261+8°1 is of special interest due to its apparent physical association with the galactic cluster NGC 2818 (Tiff, Connally, and Webb 1972, <u>M.N.R.A.S.</u>, <u>158</u>, 47). During 1975-76 we obtained spectrophotometric observations (both photographic and photoelectric) and interference filter photographs (Hβ, [OIII], [NII], and [SII]) of this object at Cerro Tololo. The nebula has a rather smooth bilaterally symmetric "hourglass" structure in the Hβ and [OIII] photographs, while several bright filaments appear in [NII] and [SII]. The spectrum of PK 261+8°1 is very rich in lines characteristic of both low ionization ([OI], [OII],[NI], [NII], [SII]) and high ionization (He II, [OIII], [NeV]) regions. Using the photo electric observations, we derive T_e = 14,500 ± 1500°K from the [OIII] lines and T_e = 11,000 ± 1300°K from the [OIII] lines and T_e = 11,000 ± 1300°K from the [NII] lines. The λ6717/λ6730 [SII] ratio suggests that Ne ≤ 800 cm^{-3} in the regions where S^+ exists. Additional information on the density and temperature structure of the nebula derived from the deep photographic spectra will also be presented. Due to the complicated ionization structure, an accurate abundance analysis of PK 261+8°1 is difficult. Consequently, we will present the quantitative results from a variety of abundance calculation techniques. We conclude that He/H = 0.14 ± .01, N is substantially enriched relative to H and O (N/H > O/H = 4 x 10^{-4}), while the abundances of O, Ne, S, Ar, and Cl relative to H are similar to values typical of galactic planetary nebulae. Other characteristics of the nebula derived from its association with the cluster NGC 2818 and its spectral similarity to Henize 97 in the Large Magellanic Cloud will be discussed. This research was supported in part by a grant from the Research Corporation.

DISCUSSION

Aller: NGC 2818 is similar to many galactic planetaries that show
[NII] greater than or comparable with Hα and simultaneous low and high
excitation lines. The most notorious examples are NGC 6302 and NGC 7027.
Dufour: I agree with you, but the percentage of these types among
galactic planetaries seems to be small, only 5 or 10 percent.
Peimbert, M.: To establish that NGC 2818 is a member of the galactic
cluster of the same name, it is very important to derive an accurate
reddening value. Your result of C(Hβ) = 0.065 is smaller than our
result of C(Hβ) = 0.3. What are the errors assinged to your C(Hβ) deter-
mination?
Dufour: Our C(Hβ) value was determined from the Hβ to Hγ ratio which is
rather insensitive to extinction compared with the Hα to Hβ ratio. Our
value is probably not accurate to better than ±.20. We plan to improve
our measurement of C(Hβ) from the Hα to Hβ ratio once we disentangle
the effects of 6548 NII blended with H .
Johnson: Was the upper limit on the stellar mass in the planetary nebu-
la theoretical or observational?
Dufour: The pre-nebular mass of the central star is estimated to be
$\sim 2.5 M_\odot$ from the turnoff of the cluster stars from the main sequence at
A5.
Cudworth: I would strongly encourage someone to get much better radial
velocity measures for both planetary and cluster to address the question
of membership more carefully.