the larger rays appear to be best explained in terms of splashes, some of the smaller rays may have resulted from extrusive flow of magma through radial cracks. The terrestrial analogues, because of erosion, show up as walls that attain altitudes of 100 feet, in some cases. The paper reports results of a survey of the Spanish Peaks area, from an American Airlines DC3 plane.

*Harvard College Observatory,
Cambridge, Mass.*

Minkowski, R. and L. H. Aller. Spectrophotometry of the planetary nebula NGC 7027.

The bright planetary nebula NGC 7027 shows, in addition to a strong continuous spectrum, the richest line spectrum of any gaseous nebula. Standardized spectrograms of this nebula covering the wave length range from $\lambda\lambda 3300$ –8800 plus similar plates taken of Vega and ϵ Persei but with the aid of a quartz diffuser permit a determination of the energy distribution in the continuous spectrum and the true relative intensities of the emission lines. The observations were obtained at Mt. Wilson with the 100-inch reflector and at the McDonald Observatory with the 82-inch reflector.

The energy distribution in the Balmer continuum fits the hypothesis of a recombination spectrum at an electron temperature of $10,000^\circ$ and is in reasonably good agreement with Page's results. The energy distribution in the visual and infra-red regions does not fit this simple hypothesis and it is possible that other mechanisms are operative here. The photometry of the continuous spectrum is difficult because of the numerous overlapping emission lines.

The intensities of the emission lines range over a factor of five thousand, and it is of interest that Wyse's estimates, made with the aid of a scale plate, show reasonably good agreement with our results over the range $\lambda\lambda 3700$ –5000. In the $\lambda\lambda 5000$ –6800 interval, Wyse's intensities are systematically larger. A comparison of the line intensities in two different parts of the nebula shows that stratification effects are small but noticeable.

*Kirkwood Observatory,
Bloomington, Ind.*

Pierce, A. Keith and Leo Goldberg. The solar curve of growth and the kinetic temperature of the solar reversing layer.

An observational solar curve of growth for iron, titanium, and vanadium was constructed

from the gf values of the Kings and the equivalent widths of Allen. Corrections for the variable continuous opacity and limb darkening coefficient were applied to each line before grouping according to excitation potential. For iron and titanium the displacement of the groups gave a temperature of 4680° K, while for vanadium no proper temperature could be found because of the non-linear relation between excitation potential and the displacements.

The observed curve of growth was fitted to a theoretical curve based on the Milne-Eddington model. The "best" fit corresponds to a most probable Doppler velocity of 2.5 km/sec and values $\Delta\lambda_D/\Delta\lambda_N = a$ (as defined by Mitchell and Zemansky, *Resonance Radiation and Excited Atoms*, Cambridge, 1934) equalling 0.01 for the weaker iron lines and 0.05 for the stronger. The velocity parameter may be interpreted in terms of either a kinetic temperature of 5700° plus a turbulent velocity of 2.0 km/sec or a straight kinetic temperature of $19,500^\circ$ K.

In an attempt to distinguish between the alternatives of thermal or turbulent broadening, the half-widths of faint lines of several elements of different atomic weight, ranging from carbon to nickel, were determined from the Utrecht Atlas. The widths of these lines, after correction for instrumental broadening, show a dependence on atomic weight that accords well with the assumption of thermal widening at a temperature of $16,000^\circ$ K.

*Observatory, University of Michigan,
Ann Arbor, Mich.*

Rottenberg, J. A. On the acceleration of hydrogen atoms at the surface of a high temperature star.

The effect of radiation pressure in producing radial accelerations in the hydrogen atoms of a stellar envelope was investigated for a range of spectral types from A0 to W5. Taking into account absorption processes corresponding both to line absorption and photo-electric ionization it was indicated that hydrogen may be expected to play an insignificant role in the ejection of matter from Wolf-Rayet stars of temperature $60,000^\circ$ to $100,000^\circ$. For the P Cygni stars of temperature $10,000^\circ$ to $30,000^\circ$ the case is quite different and the hydrogen atoms are subject to strong acceleration.

*Dominion Observatory,
Ottawa, Canada.*