distribution of the comparison stars can be obtained. The spectrum tracings have been handled so that the measurements made refer to the continuum as seen on the tracing. Since the resolution is only 7 Angstroms, it is impossible to correct for faint absorption lines; this correction could be made with the help of high dispersion spectra.

An attempt is being made to compare the theoretical and observed energy distributions at various phases by methods which have in recent years been applied to the six-color photometric results.

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COMMENTS ON THE PRESENT STATUS OF THE PULSATION THEORY

By CHARLES A. WHITNEY

Instability against radial pulsation is discussed briefly from a thermodynamic point of view. Two possible explicit causes are outlined: variations of nuclear generation in the stellar interior; the production of a "heat engine" in the external layers through the action of variable opacity and heat storage.

An encouraging semi-quantitative test of the second alternative is discussed.

A model for the atmospheric motions of W Virginis is presented and observational tests are suggested. Theoretical problems are indicated whose solutions are required for further progress in the interpretation of the spectra of classical Cepheids and W Virginis stars.

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ABSTRACTS

OF PAPERS PRESENTED AT THE NINETY-NINTH MEETING OF THE AMERICAN
ASTRONOMICAL SOCIETY, INDIANAPOLIS, IND., DECEMBER 27-30, 1957

Aller, Lawrence H. Magnetic stellar envelopes and planetary nebulae.

It has been pointed out by Minkowski and others that the structural appearance of many planetary nebulae strongly suggest the presence of magnetic fields. It seems unlikely that such magnetic fields are produced *ab initio* in the nebular shell. Rather, they must have existed in the outer envelope of the parent star. Certain red giant stars with magnetic fields may evolve in such a way that the expansion of the shell is largely governed by the presence of such a field. Magnetic effects may actually be more important than gas pressure differentials and radiation pressure in controlling the evolution of a planetary nebula. The suggestion that combination variables such as AX Persei, BF Cygni, and Z Andromedae may be the immediate parents of the planetary nebulae now appears particularly tempting. Not all such stars necessarily are presumed to evolve into planetary nebulae.

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Baum, W. A.; Ford, W. Kent Jr. and Hall, John S. Recent astronomical tests of thin-film image converters.

During the past three years the astronomical practicability of a special type of electronic image converter tube has been explored. This tube operates essentially by A. Lallemand's method (i.e., electrons ejected from a photocathode are accelerated and focused directly onto a nuclear-track emulsion) but a very thin barrier film or membrane has been added to prevent gas molecules exuded by the emulsion from reaching the photocathode and poisoning it. Electrons of several kilovolts energy can pass through this film but gas molecules cannot. Attention has been confined to designs which are potentially capable of being produced commercially, because the ultimate value of any technique in this field will depend upon its general availability to observatories everywhere.

In August and November, 1957, a number of electron-produced images on Ilford G5 plates were obtained at the 40-inch telescope of the