taminated by distant auroras at high altitude. However, out of fifteen spectrograms, with exposures of four hours or longer during the past year, all show the *Hα* line. Furthermore, Babcock's observations were made at zenith distance 50°, hence the auroras if present should have been detected; during one of his exposures a faint aurora was detected.

Work will continue to verify the identification of the hydrogen line in the airglow spectrum, to determine its absolute intensity, and to determine whether the line is observable in other portions of the sky.

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Naval Ordnance Test Station, Inyokern, Calif.

Greenstein, Jesse L. The spectrum of υ Sagittarii.

High dispersion spectra of the hydrogen-poor supergiant υ Sagittarii have been used (1) to investigate the changes in the spectrum; (2) to identify the elements present in the visual region of the spectrum; and (3) to construct a preliminary curve of growth for determination of empirical line-absorption coefficients for the ionized elements and to determine the abundances of the elements.

(1) Measured equivalent widths during the 138-day spectroscopic period were analyzed for variation of line intensities with position in the orbit. If the invisible component of the system is a hot star, it apparently does not produce large reflection effects. The high-excitation lines show almost no variation; hydrogen and the ionized metals vary in phase except for *Ti* II, which shows a larger variation in opposite phase. The amplitude is 10 per cent or less, in general. One strong P Cygni outburst was visible in the hydrogen lines in the envelope of the system. A double, strong, deep absorption at *Hα* appeared sometime between July 9 and Aug. 11, 1949, at velocities of −285 and −314 km/sec, and was still visible on Sept. 10. No other spectral changes were noted. The outburst was not correlated with the primary eclipse and cannot represent flow of hydrogen from the primary to the secondary.

(2) Lines were measured in the region 4840A to 6600A, on high-dispersion plates. Of the approximately 1000 lines only about 65 per cent have as yet been identified; the laboratory investigations on the singly-ionized elements must be seriously incomplete for the visual region. A total of 2500 lines have now been measured in this star. Elements present in unusual strength include *He* I, *N* I, *N* II, *O* I, *Ne* I, *Mg* II, *Al* III, *Si* II, *P* II, *S* II, *Cl* II and the ionized metals. Lines of these elements are remarkable for high excitation potentials which range up to 21 electron volts; they are important for relative abundance determinations of both light and heavy elements. Stationary emission lines of *Na* I, and *Fe* II, *Ca* II, [*Ca* II] and *Hα* occur in the envelope of the system.

(3) The great strength of highly excited lines suggests that a set of empirical line-absorption coefficients for the ionized elements may be derived from the curve of growth, just as the solar values of X_0 were derived for the neutral elements. Treating υ Sagittarii as an electric furnace requires that we assume the Boltzmann distribution for excited atoms, with a unique excitation temperature. Equivalent widths are being measured from λ3400 to λ4600 for this purpose, and preliminary curves of growth for *He* I, *Ti* II, and other metals have been constructed.

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Haro, Guillermo. Faint stars with strong emission in and around the Orion nebula.

In a previous investigation of the spectra of variable stars in the Orion nebula made by Greenstein and Struve,[1] it has been said that the "lack of emission distinguishes the Orion variables clearly from the T Tauri variables discussed by A. H. Joy."[2] The observed lack of emission previously found in the Orion variables has been interpreted as probably due either to the fact that these stars are not deeply immersed in dark material or because the presence of the very hot, bright stars of the Trapezium may change the character of nebulous material.

In an investigation carried on with the 26-inch prism of the Tonanzintla Schmidt camera many stars with *Hα* in emission fainter than the 10th magnitude and as faint as the 17th magnitude were registered. In an area of about 2.5 square degrees centered on the Trapezium the spectra of 113 stars were recorded with more or less strong emission in *Hα*.

The variables recognized as such in Kukarkin and Parenago's Catalogue, that appear on the Tonanzintla plates with *Hα* in emission are the