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FINAL REPORT

SPECTRAL CLASSIFICATION and SPECTROSCOPIC STUDIES

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During the period of October 1964 to October 1965 spectrograms were obtained for classification purposes of all stars listed in Luyten's Catalogue with proper motions greater than $0''.5$ that are north of $\delta = -21^\circ$ and equal to or brighter than magnitude 9.9. Also, UBV photometry was done on these same stars but a few more must still have third observations for UBV. The classification of the spectrograms are awaiting the new spectral atlas that is now being revised by Mr. Morgan.

Slit spectrograms were obtained of about 110 stars from Bidelman's list of new peculiar objects (ONR Symposium, Flagstaff, 1964). A large number of the stars which he had thought might show peculiarities were found to be normal. The results of this survey are published in PASP 77, 184, 1965 by Anne Pyne Cowley and Charles R. Cowley (~~reprint attached~~). This revision of spectral types should help prevent confusion in the interpretation of peculiar A stars by excluding the normal objects in Bidelman's sample. An interesting sidelight of this program has been the identification of some high excitation lines (previously unobserved in stellar spectra) in one of the peculiar stars observed in this survey. See Anne Pyne Cowley Ap.J. , 141, 1288, 1965.

At this time a spectral survey with the Yerkes classification spectrograph of all stars in the Bright Star Catalogue (to magnitude 6.5), north of -20° and between B8 and F2 is about 80 percent complete. The ultimate goal is a statistical study of the kinematical properties of the A stars. A preliminary investigation has been completed by Mr. B. Schlesinger under the direction of Charles R. Cowley. He finds no detectable differences either in the kinematics or spacial distribution between normal and peculiar A stars. This material is now in press in the PASP.

The title of the paper is "Motions of Normal and Metallic-line A-Stars." His results cannot be considered definitive because of the small sample of stars and inhomogeneity of some of the data. However, if the definitive investigation of the kinematical properties and spacial distribution reveals no differences between the recognized groups of A stars, it will be more difficult to think of spectral anomalies as true abundance differences.

The spectral survey work begun on this program is continuing on to completion.