on the one hand, and the amount of material above the photosphere on the other, differ by a factor of only 2.5. They differ by a factor of 20 when the Rosseland mean is used. Numerical integrations of the atmosphere, at present in progress, should decide whether any blanketing effect correction is necessary at all.

*Kirkwood Observatory,
Indiana University,
Bloomington, Ind.*

Babcock, Harold D. and Charlotte E. Moore.
The solar spectrum $\lambda 2914$ – $\lambda 3060$.

From spectrograms (1.25 Å/mm) obtained with the second order of a 21-foot concave grating a new description of the spectrum between $\lambda 2914$ and $\lambda 3060$ has been prepared, giving improved wave lengths and intensities for 550 lines. Since most of these are blends, the observational data are subject to greater difficulties of interpretation than in more open regions of the spectrum.

By the method of overlapping orders the wave lengths were referred to adopted solar standards in the blue region. Intensities were obtained by estimation, on a scale intended to correspond to Rowland's intensities in the violet and near ultraviolet.

By comparison with the Revised Multiplet Table¹ and other laboratory data fairly definitive identifications have been found for 380 lines, 200 of which are associated with singly ionized atoms. Among the latter, members of the iron group are especially prominent. Lines of Zr II, Gd II, Sc II, Y II, Cb II, and Eu II are also present.

Our results confirm the reality and the identification of most of the principal features described by Cornu² and by Fabry and Buisson,³ but differ in respect to numerous finer details because of the greater dispersion and resolving power which we have used.

Comparison with Rowland's data⁴ shows that the wave lengths in this part of the Revised Rowland require only small corrections, but we add some weak lines not recorded by him, reject some which he included, and extensively revise the intensities and the identifications.

Intense lines of Fe and Ni which characterize this region of the solar spectrum have extensive wings when observed in the central part of the disk. Rowland described some of these as weak lines, doubtless because, with inadequate filtering, his spectrograms were affected by false light. At the solar limb, and indeed well inside it, we

find these wings suppressed, leaving narrow dark cores. Such effects are more conspicuous in the ultraviolet than elsewhere in the spectrum.

To remove overlapping spectral orders and reduce the scattering of intense radiation in adjacent parts of the order in use, filters were mounted in front of the slit. Best results were obtained with 50 mm of concentrated aqueous solution of NiSO_4 in conjunction with 5 mm of Corning glass number 986. Exposure times extended up to 6 hours.

We are indebted to Dr. J. C. Duncan and to Mrs. H. A. Coffeen for valuable aid in obtaining and reducing the spectrograms.

1. Charlotte E. Moore, A Multiplet Table of Astrophysical Interest. Revised Edition, *Princeton Contr.* No. 20, 1945.
2. *C. R.* **86**, 103, 1878.
3. *J. Phys. Radium*, 6th ser., **2**, 197 and 297, 1921; *Ap. J.* **54**, 297, 1921.
4. St. John and others, Revision of Rowland's Preliminary Table of Solar Spectrum Wave Lengths. *Pub. Carnegie Instn.* No. 396, 1928.

*Mount Wilson Observatory,
Pasadena, Calif.,
and National Bureau of Standards,
Washington, D. C.*

**Beals, C. S. The P Cygni characteristics of
HD 190603.**

Previous studies of the star had indicated anomalous velocities for the lines of hydrogen, and the present investigation has shown that $H\alpha$ and $H\gamma$ are of P Cygni character having an emission line in approximately its normal position with an absorption border on its violet edge. Higher members of the series do not exhibit emission but they are displaced to the violet relative to the stellar velocity. Also in emission appears $\lambda 5875$ of helium while other helium wave-lengths show violet displacements relative to other lines. Velocity and intensity data are given for the lines of hydrogen and helium. The peculiar character of the line profiles is interpreted as due to blending between the absorption lines due to the ordinary reversing layer and the combined absorption and emission due to an outer expanding shell.

*Dominion Astrophysical Observatory,
Victoria, B. C.*

**Bok, Bart J. and Constance B. Sawyer. Red
magnitudes in Harvard Standard Region C5.**

A preliminary study at Tonanzintla of the blue-red color indices for early-type stars suggested the presence of a systematic error of 0.38 mag. in the published photo-red magnitudes for