ondary spectrum in the second focal plane is nearly complete, and at $f/15$ within the Rayleigh limit over the spectral range from 4000 to 8500 angstroms. The corrector may be used, then, to bring about color-free star images for even the largest refractors.

*Harvard College Observatory,
Cambridge, Mass.*

Bok, Bart J., and Priscilla F. Bok. A photoelectric sequence of magnitudes and colors for Selected Area 141.

Selected Area 141 at R.A. 1^h , Dec. -30° , is located close to the south galactic pole and not far from the Sculptor cluster. The Linnell-King photoelectric photometer of the Boyden Station has been used for the establishment of a standard sequence of magnitudes and colors for this Area. "Blue" and "yellow" magnitudes in a well-defined color system have been obtained for a skeleton sequence of twenty stars in the magnitude range 9 to 15.5. The internal agreement of our observations indicates that the probable error of a final blue or yellow magnitude of a sequence star of magnitude 14 or brighter is of the order of ± 0.01 mag., and that the corresponding probable error may be as high as ± 0.03 at 15.5 mag.

Observations on six nights relate the zero point of our magnitudes to that of the Whitford-Johnson magnitudes for Selected Area 68 with an error not exceeding ± 0.02 mag.

*Boyden Station,
Harvard College Observatory,
Bloemfontein, South Africa.*

Brouwer, D. Comparison of numerical integration of the motions of Uranus and Neptune with Newcomb's tables.

Positions of Uranus and Neptune were computed from Hill's tables with an interval of 500 days from 1776 to 1950 and for Uranus with an interval of 2000 days backward to 1653 and forward to 2060.

In the case of Neptune, corrections to the elliptic elements combined with the effect of Pluto, included in the integration but not included in Newcomb's tables, account satisfactorily for the difference between numerical integration and tables. Comparison with observations confirms the mass used for Pluto in the numerical integration ($m_p/m_\odot = 1/360,000$).

Uranus shows systematic differences between integration and tables, similar to those found for Saturn. They indicate imperfections in New-

comb's theory. The observations of Uranus since its optical discovery do not yield a significant determination of the mass of Pluto. A new discussion of the pre-discovery observations of Uranus and their direct comparison with the numerical integration is in progress. With the addition of this material a new determination of Pluto's mass from the motion of Uranus will be made.

This investigation was part of research carried out with support from the Office of Naval Research.

*Yale Observatory,
New Haven, Conn.*

Cillié, G. G., and B. J. Bok. The photoelectric light curve of TW Ceti.

An accurate period has been determined for the eclipsing variable TW Ceti and light curves derived in blue and in yellow light with the Boyden station photoelectric photometer attached to the Rockefeller reflector. Two equal maxima and two unequal minima occur in the revised period $0^d.31685260$. The zero point of the elements published earlier by Zessewitsch refer to the secondary eclipse. The form of the light curve and the spectroscopic observations made by O. Struve show that TW Ceti is a normal W Ursae Majoris variable.

*Boyden Station,
Harvard College Observatory,
Bloemfontein, South Africa.*

Clemence, G. M. Comparison of numerical integration of the motion of Saturn with Hill's tables.

The integration by the Selective Sequence Electronic Calculator of the motion of Saturn 1653-2060 has been compared with positions of Saturn taken from Hill's tables, at intervals of 1920 days. The rectangular equatorial coordinates referred to the mean equinox and equator 1950.0, given by the integration, were transformed to heliocentric longitude, latitude, and radius vector, referred to the mean equinox and ecliptic of date.

Errors are indicated in all three of the coordinates extracted from the tables. The salient features of the curve showing the error in the longitude are (1) a term with period the same as that of Saturn's revolution, with a coefficient that increases continuously with the time before and after the epoch of the tables, 1850, reaching $2''$ in 200 years, which is attributed to an error in Hill's secular perturbations, and (2) a term