Yerkes Observatory material is $+0''.054 \pm ''0.005$ p. e. This value, combined with trigonometric parallaxes determined at three other observatories, gave a final value for the absolute parallax

$$\pi = +0''.047 \pm ''0.005 \text{ p. e.}$$

The final values for the parallax, the three orbits, and a mass ratio determined in the present study for the A-B system $m_A/(m_A + m_B) = 0.53$, yielded the following masses for the four components:

$$\begin{array}{ll} m_A = 1.0 \odot, & m_C = 0.5 \odot, \\ m_B = 0.9 \odot, & m_D = 0.7 \odot. \end{array}$$

Stars A and B are of approximately normal mass for their luminosities, as judged by the mass-luminosity diagram. Star C is possibly somewhat undermassive for its observed luminosity. The fact that star D is invisible and has a larger value for the mass than has star C indicates that it may be a white dwarf. This possibility was first suggested in 1947 by van de Kamp.

This study was carried out during 1951 and 1952 at the Dearborn Observatory, Northwestern University, Evanston, Illinois, under the direction of Dr. K. Aa. Strand, Director of the observatory.

*Yale University Observatory,
New Haven, Conn.*

Green, Louis C. and Marjorie M. Mulder. **Correlation energy in the ground state of HeI.**

Wave functions of high accuracy are needed for the computation of atomic transition probabilities. It is generally recognized that configuration interaction can play an important role in the determination of both wave functions and energies for the various atomic states. With a view to examining the effects of configuration interaction in a simple case, use has been made of expansions of the three- and six-term expressions, given by Hylleraas, for the ground state wave function of HeI in series of Legendre functions of the cosine of the angle between the two radii vectores. The coefficients in these expansions are functions of r_1 and r_2 , the distances of the two electrons from the nucleus. The contributions of the various components to the total energy are presented. A discussion is given of the method of estimating the magnitude of the correlation, or configuration interaction, energy. Evidence is presented that the total correlation energy is at least $-0.129 R_H hc$ and may be even

more negative. Of this amount $-0.056 R_H hc$ is associated with the radial part of the correlation energy and $-0.073 R_H hc$ with the angular part.

1. L. C. Green et al., *A. J.* **57**, **11**, 1952.

*Strawbridge Observatory,
Haverford College,
Haverford, Pa.*

Hardie, Robert. A six-color photoelectric photometer.

A photoelectric photometer having a spectral range from 3500 to 10,000 Å is described. The cell used is a nineteen-stage multiplier with a silver-caesium-oxide cathode built by Professor A. Lallemand of the Observatoire de Paris. It has a good signal-to-noise ratio when cooled with dry ice and results to date indicate that useful measures may be made to about 11th magnitude in six colors, similar to those of Stebbins and Whitford, with the Perkins 69-inch reflector.

A preliminary color-temperature for the star CY Cyg, 8.8 vis. mag., has been derived. For this purpose only four colors were used since the violet and ultraviolet filters have leaks in the infra-red; these have effective wave lengths of approximately 8700, 7000, 5200, 4500 Å. The apparent color-temperature is $2380^\circ \pm 40^\circ$. If this star is reddened to the same degree as 55 Cyg (which is about $\frac{1}{2}^\circ$ from CY Cyg) and if its visual absolute magnitude is assumed to be around -4 , then the corrected color-temperature turns out to be 3200° ; if, however, it is reddened only to a degree based on the average for the surrounding region, the temperature is then 2950° .

*Perkins Observatory,
Delaware, Ohio.*

Heesch, David S. Calculated line profiles for the 21-cm line of hydrogen.

The line profile of the 21-cm line of hydrogen is determined by the following parameters:

1. The density n , of neutral hydrogen atoms along the line of sight.
2. A parameter which characterizes the population of the energy levels of the hydrogen atom. If the hydrogen is in thermodynamic equilibrium this parameter will be the kinetic temperature T_e .
3. The turbulent velocity, c_0 , of the hydrogen clouds.
4. Galactic rotation.

Observations of the line then, may be expected to yield information about these quantities, if the