that of a very elongated ellipse, in fact the most elongated nebular form that we have yet observed, it is not surprising that its angular velocity of rotation is the greatest that we have thus far observed in planetary nebulæ.

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ON THE ROTATION OF THE NEBULA JONCKHEERE 320.

The small planetary announced by Jonckheere in March, 1916, number 320, has recently been tested for spectrographic evidence of rotation. The form of this nebula is shown in Dr. Curtis's drawing, and briefly described in his paper in this number.

Our spectrographic observations indicate that this nebula is rotating about an axis coinciding approximately with the shorter axis of the bright central oval, in the sense that a point on the major axis of the oval 3 seconds of arc south-east of the center, has a velocity of approach of about $10^{km/sec}$ relative to that of the corresponding point northwest of the center. When the slit was placed along the major axis of the fainter outer ring, a slightly smaller rotational effect was observed for the brighter oval. The spectrum of the faint ring was not recorded.

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THE SPECTROSCOPIC BINARY h 4 CENTAURI.*

h *Centauri*, a *helium* star of Class B 5, was observed by the D. O. Mills Expedition at Santiago, Chile, in the years 1908 to 1911 and announced as a spectroscopic binary in the *Lick Observatory Bulletin* **6**, 56, 1910. The 36 two-prism plates taken show twenty or more lines between 3900A and 5000A, of which eighteen are well identified and two probably are enhanced "metallic" lines. Only the four lines Hγ 4340A, He 4388A, He 4471A, Mg 4481A, were found uniformly sufficiently good for velocity measurement and these were weighted 1, 2, 4, 3, respectively. A period of 6.927 days best satisfying the observation was derived from a plotting of the observed velocities. The Lehmann-Filhé method and plani-

* *Lick Observatory Bulletin.*

meter gave the preliminary elements, and Schlesinger's method of least squares solution gives the definitive elements which are, together with the period mentioned above: a recession of 5.2^{km} of the center of mass of the system; semi-amplitude of oscillation in the line-of-sight, 21.4^{km}; eccentricity 0.23; angle of periastron from the node 147°.23; epoch of periastron passage, Julian Day 2418733.25; projected semi-major axis, 1984000^{km}; a value of the mass-function, 0.0065; probable error of a single observed velocity, $\pm 2.5^{km}$.

From the small value of the mass-function, it is found that the secondary mass must be small, but at the same time it is possible that the probable difference of magnitude between the components is not too great for the spectrum lines of the secondary to affect those of the primary. Altho suspicions of the secondary spectrum may be raised, it remains to be found with certainty. The velocity of h *Centauri* has been shown by H. C. Plummer to satisfy the hypothesis of motion parallel to the Galactic Plane, with a resulting parallax of 0″.0078. Revision of the computation, using the new value of the velocity of the center of mass of the binary system, gives a component zero normal to the Galactic Plane and a parallax of 0″.0095, which corresponds to a distance of 343 light-years. Kapteyn has obtained a parallax value of 0″.0073 based upon the theory of stream-motion among the Class B stars. Charlier also derived the value 0″.0071 by assuming similar luminosities to pertain to Class B stars. The three values show remarkable agreement but cannot as yet be freed from the qualification hypothetical.

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