recent high-dispersion observations by Struve and Sahade. One of these difficulties consists in the large masses which are attributed to the components; another arises from the fact that the rotation of the primary component seems to be smaller than required by synchronization.

Now, the broad emissions which are displayed by the spectrum of β Lyrae oscillate in wave length opposite in phase with respect to the lines of the B8 component. This was already reported by Belopolsky (1893) and by Curtiss (1911), who found that the amplitude of the broad $H\beta$ emissions is about 75 km/sec as against about 185 km/sec for the B8 component. Furthermore, the broad emissions in HeI and in H seem to have a relatively stronger, narrower emission superimposed upon them. This narrow feature also oscillates opposite in phase with respect to the B8 component but the amplitude is smaller than that derived by Belopolsky and Curtiss for the broad $H\beta$ emissions and the value of γ is about 130 km/sec more positive.

It seems that the emissions displayed by β Lyrae arise at least partly from matter which surrounds and moves with the secondary component. If the motion suggested by the emissions is indicative of the motion of the secondary component, it would imply that the secondary star is more massive than the primary; at the same time, it must be smaller in size than the latter, as suggested by the spectrographic observations.

The fact that there is streaming of matter from each of the components towards the other star suggests that the lobe of the inner contact surface must be filled; therefore, the secondary component must have a large gaseous envelope. Moreover, the difficulty of the rotational velocity of the B8 component could be removed if one assumes that the star has expanded from its original size.

Therefore, if we further assume that the secondary component has been the more massive since the binary system was born, we can advance tentatively the hypothesis that the system of β Lyrae is formed by a primary B8 star in a late stage of its evolution, having expanded from its original size and filling now its lobe of the inner contact surface, and by a smaller, more massive secondary which has evolved faster and is already past the stage at which we are observing the B8 component, being now underluminous for its mass. The streaming of matter from each star toward the other

component and the expanding shell which surrounds the entire system are features of β Lyrae which do not require modification.

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Santirocco, R. and Savedoff, M. P. Chemical abundances in the atmospheres of RR Lyrae and certain F stars.

Spectrophotometric analysis by curve of growth techniques has been applied to the cluster variable RR Lyrae and the early F stars 20 CVn, γ Vir N, γ Vir S, HD 2454. *UBV* photometric results have been used to obtain P_{∞} , T_{∞} for computing opacities. Preliminary results show concordant results for γ Vir N, γ Vir S, and HD 2454. Iron is apparently overabundant in 20 CVn by a factor of ten and underabundant by factor of two or three in RR Lyrae. Results for other elements will be reported. At present the deduced iron abundance in RR Lyrae shows some unexplained phase dependence which must be understood before final acceptance of these results.

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Sears, R. L. An evolutionary sequence of solar models.

A set of models of solar mass has been integrated using the IBM 650 computer at the Research Computing Center of Indiana University. A convective envelope in adiabatic equilibrium and a radiative interior have been assumed, following Schwarzschild, Howard, and Härm (1957). The variables, equations, and method of fitting are those of Haselgrove and Hoyle (1956). An opacity formula, developed Mr. Jon A. Stewart, was used which represents the tables of Keller and Meyerott (1955), extended for the relevant compositions, to within five per cent accuracy. An energy-generation formula, also derived by Mr. Stewart, was used which represents the rate for the proton-proton reaction, as given by Burbidge, Burbidge, Fowler, and Hoyle (1957), to within one per cent accuracy. The initial composition chosen was $X = 0.75$, $Y = 0.235$, and $Z = 0.015$.

The results comprise a chemically homogeneous model and three inhomogeneous models