We have analyzed critically the following aspects of Hoyle-Wickramasinghe theory:

(1) The carbon partial pressure in the photosphere is overestimated, because their calculation is implicitly based [Hoyle and Wickramasinghe, Eq. (18)] on the assumption of total veiling of radiation by photospheric grains at the lowest temperature of the cycle, which lacks observational basis. The average variation of the apparent magnitude of class N stars catalogued by Kukarkin and Parenago (*General Catalogue of Variable Stars*, Academy of Sciences of the USSR, 1958) does not support in any way the above-mentioned implicit hypothesis. This variation is explained by changes of the surface temperature during the cycle assumed by Hoyle and Wickramasinghe.

(2) A direct estimation of the evaporation rate of the grains, during the first stage of their outward journey, shows that the grains eventually formed in the photosphere are totally evaporated before they can reach an altitude of about 0.2 the star radius.

(3) Hoyle and Wickramasinghe have calculated the total of carbon to the interstellar space supposing that 10^4 class N stars in our Galaxy have been working cyclically, in the same way already mentioned, during 10^9 yr. In that way, they obtained a suitable fit to the average number of cosmic grains per cm^3 . But (even assuming that mixing processes over the entire volume of the star are extremely efficient, which is a very doubtful hypothesis) the admitted rate of carbon supply is so high that every star would have expelled all its carbon atoms in 10^6 yr.

The assumption that graphite is an important constituent of cosmic grains is very plausible, but a theory would be necessary which avoided the contradictions pointed out above. This might be provided by adapting for the formation of carbon grains the theory developed by Cernuschi *et al.* (*Ann. Astrophys.* **28**, 860, 1965).

A Comparison of Photometric Observations with Theoretical Predictions for Rotating Stellar Atmospheres. G. A. CLAPP AND J. S. NEFF, *University of Iowa*.—A preliminary comparison of photometric observations on the Chi system (Neff, J. S., and Travis, L. D., *Astron. J.* **72**, 48, 1967) and β observations with the rotating model atmospheres of Collins and Harrington (Collins, G. W., and Harrington, J. P., *Astrophys. J.* **146**, 152, 1966) is described. A systematic correction of 0^m07 was applied to the theoretical flux ratios to bring them into agreement with observation. This is within the estimated uncertainty of the absolute calibration. The theoretical β 's were increased by 0^m07 to bring them into agreement with observation.

Theory and observation were compared on the $\Delta(0.33) - \log[F(0.33)/F(0.55)]$ relation, the $\beta - \Delta(0.33)$ relation, and the $M_v - \Delta(0.33)$ relation. The absolute magnitudes were calculated with trigonometric or cluster parallaxes. It was found that theory and observation were consistent.

For six stars it was possible to estimate V_e and i with large estimated errors, M_v being the most uncertain quantity. The photometric value of $V_e \sin i$ was calculated and compared with the spectroscopic value. The results were consistent within the estimated error although there was a tendency for the photometric values to be 20–50% larger than the observed values.

A more accurate comparison between theory and observation can be made for stars with smaller masses than used above. This is because there are more nearby stars of this type and the photometric effects due to rotation appeared to be larger.

Chromospheric Magnetic Field Changes Associated with Photospheric Motions. ALFRED CLARK, JR., *University of Rochester*.—A theoretical analysis is given of the effect of horizontal photospheric motions on magnetic fields which extend upward into the chromosphere. A method based on "integrals of the motion" allows the calculation of a final static state in terms of an initial static state and the over-all horizontal displacements at the photospheric level. In particular, the method successfully avoids consideration of the dynamics of the transition between the two states; it is restricted to a perfectly conducting fluid, however. Detailed results are presented for the case of small displacements and an initially uniform vertical magnetic field. The dependence of the solution on the initial field strength and atmospheric scale height is investigated. The theory is applied to the problem of the accumulation of magnetic fields by solar supergranulation. The results indicate that the field-channeling role assigned to the supergranulation in current theories of the chromospheric network should be examined more critically.

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Spectrum of the Bars in Barred Spirals. ARTHUR D. CODE, *University of Wisconsin*.—In general, the colors of the bars in barred spiral galaxies are similar to the colors of the nuclei. In order to obtain a clearer understanding of the constitution of the bar, slit spectra have been obtained of a number of barred spirals using the Kitt Peak 84-in. reflector. The spectra were obtained using a Carnegie image tube and linear dispersions of 120 or 60 Å/mm. The use of the image tube makes it possible to ob-