Recently, Corliss and Warner have measured absolute f values for more than 2000 lines of $Fe\ I$, including many very weak lines of high excitation potential. From this list, kindly made available by Dr. Corliss in advance of publication, 254 lines were chosen on the basis of (1) freedom from blends; (2) wavelengths greater than $\lambda 4000$; and (3) values of W/λ smaller than about 10^{-5} . The selected lines have excitation potentials in the range 0–5 eV, and wavelengths between 4000–8600 Å. The iron abundance derived from these weak lines according to the exact method used by Goldberg, Müller, and Aller (*Astrophys. J. Suppl.* **5**, 45, 1960) does not differ significantly from values obtained previously from the stronger Fraunhofer lines.

Preliminary Results from a Rocket Flight of the Harvard OSO-B Spectrometer. LEO GOLDBERG, W. H. PARKINSON, E. M. REEVES, AND R. W. NOYES, *Harvard College Observatory*.—A model of the Harvard OSO-B spectrometer was flown in an Aerobee-Hi rocket from White Sands, New Mexico on 6 September 1963. During the course of the rocket flight, which attained a peak altitude of 221 km, three full scans and part of a fourth were obtained in the spectral region 1350–500 Å. The dimensions of the entrance slit were 1.8 arc minutes wide by 9.0 arc minutes long. Examination of $H\alpha$ and $Ca\ K$ spectroheliograms shows that the entrance aperture was free of plage regions. The purpose of the flight was primarily to check the absolute calibration prior to launch of a similar instrument in OSO-B and also to obtain data on spectral intensities for the center of the quiet sun. Essentially all emission lines found by other experimenters were observed and good records were also obtained of the Lyman continuum. In general, the observed numbers of counts recorded for the emission lines are in satisfactory agreement with those predicted on the basis of published data on photon fluxes and the absolute laboratory calibration, but there are interesting differences which can be attributed at least in part to the fact that the present observations refer to the center of the quiet sun, whereas Hinteregger's observations, for example, apply to the integrated flux from the whole sun, including active regions.

Core-Mantle Grains and Infrared Extinction. J. M. GREENBERG AND A. C. LIND, *Rensselaer Polytechnic Institute*.—It was shown (Greenberg, J. M. and Lichtenstein, P. R., *Astron. J.* **68**, 74, 1963) that *no* distribution of dielectric (dirty ice) grains alone can be made to produce the Whitford extrapolation of the extinction curve into the infrared. Observations by Borgman and Johnson in

the infrared ($\lambda^{-1} < 1$ micron $^{-1}$) indicate that the observational situation may be even worse with respect to dirty ice grains and that, in fact there may, under some conditions, be a knee in the infrared part of the curve with a rather sudden drop in extinction for very long wavelengths. A possible theoretical explanation of this phenomenon is that at least some grains consist of high metallic content cores surrounded by dirty ice mantles. Theoretical calculations on distributions of core-mantle grains exhibit the appropriate qualitative characteristics of the observed extinction curves.

Further Measurements of the Plane-Polarized Component of Radio Sources at 8000 Mc/sec.

F. T. HADDOCK AND R. W. HOBBS, *Radio Astronomy Observatory, University of Michigan*.—Plane-polarized emission of 20 sources has now been measured at 8000 Mc/sec, using a 1000-Mc/sec input band, tunnel-diode preamplifier, and an 85-ft telescope. On clear days the total system noise fluctuation is typically 0.01 °K rms with 100-sec integration, as derived from the IBM 7090 processed data.

The flux density and position angle of the plane-polarized component of the following sources have been measured: 3C10, 3C48, 3C58, 3C111, 3C123, 3C144, 3C196, 3C218, 3C231, 3C270, 3C273, 3C274, 3C286, 3C295, 3C345, 3C348, 3C353, 3C380, 3C405 and CTA 102.

All 17 radio galaxies and point sources studied to date show definite polarization.

Evolution with Neutrino Loss of a Massive Star until the Onset of Carbon Burning.

CHUSHIRO HAYASHI AND ROBERT C. CAMERON, *Kyoto University and Goddard Space Flight Center*.—Previously the authors pointed out [*Astron. J.* **67**, 577, 1962; see also, Hayashi, C., Hoshi, R., and Sugimoto, D. *Progr. Theoret. Phys. Suppl. (Kyoto)*, No. 22, 1, 1962] that, assuming energy loss due to the universal Fermi interaction between electrons and neutrinos, the lifetime of a star of 15.6 solar masses as a red supergiant (post-helium-exhaustion phases) will be too short to account for the observed number of such stars in the cluster η and χ Persei. The neutrino loss effect after the formation of a carbon-oxygen core has now been studied in detail by constructing a contracting-core model sequence. The hydrogen-rich envelope and a helium zone are neglected and the core is treated as a single star of 2.6 solar masses. As the contraction proceeds, a central isothermal core appears; its mass grows because of the rather high temperature dependence of the neutrino-loss rate. In the outer zone of lower temperature, the energy release (radiation loss) is due mainly to gravitational contraction, with the