irreconcilable with the observations. Hence some one of the assumptions (origin in a single comet, low ejection speed, only gravitational perturbations) must be false for Perseids. Moreover, the stream cannot be more than 6000 years old, and is probably much younger.

The observed distribution of Perseids can be approximately reproduced on the hypothesis of an explosion. On this supposition, the meteors were ejected at a mean speed of 2.6 km/sec from a point in the comet orbit 75 deg in true anomaly before perihelion passage, 1.5 a.u. from the sun, and 1.3 a.u. north of the ecliptic plane, about a thousand years ago.

Experiments with High-Sensitivity Image Orthicons I. JOHN SPALDING, JOHN F. DUGAN and CURTIS L. HEMENWAY, *General Electric Company, Schenectady, New York, and Dudley Observatory.*—We are continuing to explore the various characteristics of high-sensitivity image orthicons coupled to several different kinds of telescopes.

Preliminary experiments with our system coupled to a 12-inch refractor indicate that useful studies concerning seeing can be made since the high sensitivity allows short exposures to be made and the electronic image processing permits exposures to be made in rapid sequence. The short-exposure technique appears to be useful for photographs of planetary detail formerly available only to visual observers.

The equipment was coupled to an 8-inch meridian circle, and transits were observed and recorded. These experiments suggest that the taking of meridian data could be fully automated with the aid of modern electronic data-processing techniques. Observer errors could be eliminated by such techniques. The observer would also be freed from much dull repetitive work.

Movies of typical exposures have been made.

Stellar Spectrophotometry below 3000 Angstroms. THEODORE P. STECHER and J. E. MILLIGAN, *Astrophysics Branch, Goddard Space Flight Center, National Aeronautics and Space Administration.*—Four objective grating spectrophotometers were flown in an Aerobee rocket from Wallops Island, Virginia at 0342 EST on November 22, 1960. They were mounted in such a fashion that the rotation of the rocket accomplished the spectral scanning of the stars.

The flight occurred a few days after the November solar event and encountered a bright uv aurora. This background radiation limited the number of stellar spectra to a fraction of what had been expected.

Satisfactory spectra were obtained for 10 stars between 1600 and 4000 Å. Among those observed were α Carinae F0Ib, α Leonis B8V, ϵ Canis

Majoris B2II, β Canis Majoris B1III, ι Orionis O9V, γ Orionis B2IV, and γ Velorum WC7. On these stars the mean error from photon statistics for the 50 Å bandpass was less than 6%.

The observed energy distribution for α Carinae is in good agreement with that predicted by Canavaggia and Pecker (*Ann. d'Astrophys.* **16**, 47, 1953). For the stars of earlier spectral type there is good agreement between theoretical models and observation down to $\lambda 2600$. At this point the observations depart slightly from theory. This is probably caused by continuous absorption in the stellar chromospheres from the 2^3S metastable level of HeI. At $\lambda 2400$ a departure in the observed flux begins which results in an order of magnitude discrepancy between theory and observation at $\lambda 2000$. It appears that neither atomic absorption in the stellar atmosphere nor interstellar absorption can provide an explanation. The authors would like to suggest that quasi-molecules, such as HeH^{++} and HeH^+ , resulting from interactions of hydrogen and helium atoms and ions might be responsible for the increased opacity.

The reduced stellar fluxes will considerably change the ultraviolet interstellar radiation field. Attention is drawn to the effect of this change on the discrepancy between the observed and predicted interstellar calcium-sodium ratio.

Radio Pictures of the Sun at a Wavelength of 9.1 cm. G. SWARUP, *Radio Astronomy Institute, Stanford University.*—Daily spectroheliograms are being obtained at Stanford at a wavelength of 9.1 cm using a high-resolution antenna which provides pencil beams which are only 1/100th of the size of the solar disk. During the last two years observations have been made on more than 200 days and show that the quiet-sun component has shown a steady decrease during the period. The brightness temperature near the center of the disk was about 35 000°K during October 1959, 30 000°K during July 1960, and 23 000°K during February 1961. The quiet sun at 9.1 cm shows a marked deviation from circular symmetry, and shows the presence of limb brightening only in the equatorial regions. Combining radio observations made at various centimeter wavelengths, it is shown that the electron density in the inner corona of the equatorial regions was about 1.4 times van de Hulst's model for a typical solar maximum near 1958–59 and decreased to values close to his model for sunspot minimum by 1961 February.

Microwave spectroheliograms obtained during 1960 are also used to estimate electron densities in the solar active regions which give rise to a slowly varying component of solar emission. For very active regions, associated with type E or F sunspot groups, the electron densities increase to more than