the individual stars is presented. The published data on luminosity functions and star counts do not indicate enough faint stars to account for the observed mean sky background. On the other hand, the additional observational data related to the geometric fine structure are not adequate to permit inferences about luminosity functions and star counts, as might be hoped. The geometric fine structure is estimated to have a standard deviation equivalent to a star of mag. 23–24 when working through a diaphragm whose solid angle corresponds to one square second of arc, on the basis of observational data presented here. The standard deviation is proportional to the square root of the solid angle. The geometric fine structure establishes a limit to all photometric methods in the measurement of faint objects.

Some Structural Properties of Galactic and Globular Clusters. I. RICHARD W. MICHIE AND T. D. KINMAN, *University of California, Berkeley*.—As reported elsewhere (*Astron. J.* **67**, 582, 1962), theoretical models have been constructed using the Boltzmann equation with encounters. The velocity space distribution is not restricted to complete isotropy everywhere, and the potential is obtained from Poisson's equation. A further property is that some models include an approximation to the effects of the tidal force by requiring the escape velocity to go to zero at finite distance from the center. In dimensionless variables, the model is specified by one parameter C for any given strength of the tidal force. When C is zero, the velocity distribution is isotropic, while large positive C produces the elongated orbits. The calculations indicate the tidal force determines the structure of the outermost parts of the system, but it is the anisotropy of velocities which determine the structure of the inner regions.

Models have been obtained for 12 galactic clusters using star counts to faint magnitudes. The model parameter has a wide range, but generally $C \approx 10^{-2.5}$, which implies quite elongated orbits. Models for 35 globular clusters have been obtained from the Kron and Mayall data (*Astron. J.* **65**, 581, 1960) and for seven of these, models were also obtained by using surface density data. For this overlap of seven, the two methods agree very well. Again, the model parameter for the globular clusters is generally large, implying elongated orbits.

Among the galactic clusters, there is no evidence of any correlation of the model parameter with the strength of the tidal force. The tidal force is not of importance in determining the major part of the system, but completely determines the outermost regions. The intrinsic structural properties of the

young clusters then reflect conditions in the gas cloud out of which the system formed. The highly elongated orbits in some systems must be due to a more rapid rate of collapse of the original cloud of gas, the rate being determined in part by the turbulent pressure and also possibly by the strength of the magnetic field.

Generation and Propagation of Waves in the Solar Atmosphere. D. W. MOORE AND E. A. SPIEGEL, *Bristol University and New York University*.—We have studied the propagation of compressible waves of small amplitude from a fluctuating point source in an isothermal atmosphere. Using Lighthill's method of stationary phase, we have computed surfaces of constant phase, group velocities, and amplitude distributions in the radiation field. The existence of a trapped band of frequencies at the resonance frequency of the atmosphere suggests a mechanism for the observed oscillations.

The trapping of waves in an atmosphere of variable temperature has also been treated and discussed in relation to the observed oscillations. Certain qualitative features of the observations seem to be explainable in terms of these results.

The waves and oscillations may be generated by turbulence resulting from shear instabilities in the large horizontal flows (supergranulation). This is one possible explanation of the observed temperature–velocity correlation. Analogies to experimental convection are noted.

This work was supported by the Air Force Office of Scientific Research under Contract No. AF 49(638)1065.

Photometry of Some Cataclysmic Variables. GEORGE S. MUMFORD, *Tufts University*.—During the fall and early winter of 1962–63, the 36-inch, Cassegrain reflector at Kitt Peak was used to monitor photoelectrically a number of cataclysmic variables. A major aim of this program was to establish whether there are additional eclipsing binaries among the brighter objects of this type. The data obtained are summarized in the table.

Star	Nights	Total hours	Color	Type
SS Aur	1	2.8	B	U Gem
Z Cam	4	24.0	B	Z Cam
EM Cyg	9	21.5	B, V	Nova?
U Gem	1	5.0	U, B, V	U Gem
CN Ori	1	2.3	V	U Gem
TZ Per	11	42.3	B	Z Cam
GK Per	1	6.0	U, B, V	Nova
SU UMa	6	33.2	B	U Gem