Tonantzintla to a blue-star survey partly overlapping the regions included in the present survey, but the results were considered by the Tonantzintla workers to be unsuitable for study of the fine structure of the surface distribution of their blue stars. Moreover, they gave no data for Luyten blue stars in the Coma area beyond noting that some of them do not appear blue on the Tonantzintla plates, while Luyten's stars, which were not considered by him necessarily to be white dwarfs, have been used on occasion to compare predicted numbers of white dwarfs in the Coma cluster with observed numbers. Consequently it was hoped that the new survey would reinforce the Tonantzintla material. Five bright-ultraviolet stars were found within $2\frac{1}{2}^\circ$ of the center of the cluster. Two of these were identified previously at Tonantzintla, two were found by Luyten, and one is new. Fourteen additional such stars, of which six are new, were found in four comparison fields near the cluster. All of the Tonantzintla bright-ultraviolet stars above the magnitude limits of the Case plates were confirmed. The results indicate no pronounced clustering of bright-ultraviolet stars in the direction of the Coma cluster down to photographic magnitude 17.0, which is consistent with the Tonantzintla material. Accordingly, it is concluded that the number of such stars which are members of the Coma cluster is quite uncertain.

Remarks on the Determination of Velocity Gradients in Moving Atmospheres. R. G. TESKE, *Harvard College Observatory*.—Theoretical line profiles and curves of growth have been constructed for atmospheres in uniform and in non-uniform motion; they are based on a pure absorption mechanism in a Milne-Eddington model. The purpose of this study is to describe methods for the detection and measurement of atmospheric velocity gradients such as those which may arise during Cepheid pulsation. The positions of cores of absorption lines which are formed in a *uniformly* expanding (contracting) atmosphere will be a function of the central intensity of the line; the relation is such that strong lines are less displaced by the effects of expansion than are weak lines. This relative position line strength relation depends upon the velocity of expansion and is further complicated by the smearing effect of the spectrographic apparatus. Thus, if one relates measured radial velocity to a parameter which is proportional to line strength, it is possible to infer the presence of velocity gradients where none in fact exist. An analysis of theoretical absorption lines formed in a velocity-gradient atmosphere shows that the relation between the displacement of the line cores and their mean depth of formation τ , measured in the continuum, does not yield the input velocity field. Recourse is had to high-precision spectrophotometry; a spectrophotometric method is described which allows quantitative determination of differential atmospheric motions independent of radial velocity data. The method is limited to a velocity function that is linear with optical depth in the continuum. Some of the calculations upon which this investigation is based were performed with the IBM 704 computer at the Massachusetts Institute of Technology; others were done with the IBM 704 at the Smithsonian Astrophysical Observatory's Computations and Analysis Division.

The Cluster Membership of Objects Lying above the Main Sequence in NGC 6530. PIK SIN THE AND V. M. BLANCO, *Case Institute of Technology*.—NGC 6530 according to Walker (1957) shows a normal main sequence up to visual magnitude 12.0. Fainter stars, presumably contracting objects, fall above the zero-age main sequence as defined by the brighter stars. However, Wallenquist (1940) has found that these faint stars show no clustering, which suggests that they are field stars. To examine this further, colors and magnitudes within 1° of the cluster were determined photographically for 3000 stars. Walker's sequence and one in NGC 6531 were used. Two or three plates were used in each magnitude determination. The probable error of a magnitude is 0.12, which although high does not affect our conclusions.

Checks for systematic errors show these to be negligible. The stars were divided into five groups located in areas near NGC 6530 showing strong absorption and in a nearby clear region. In all cases the diagrams show stars above the main sequence. The numbers of such stars observed/unit area are comparable with Walker's. The surface distributions of stars of different magnitudes near NGC 6530 show a definite clustering only for stars brighter than 12.5, in agreement with Wallenquist's results. Wolf diagrams constructed from the magnitude distributions in the dark cloud that forms a backdrop to M 8 and in a nearby clear region gave an estimate for the cloud's distance of 1.3 kpc. The total absorption of the dark cloud is 1.7 magnitudes. This is sufficiently low to permit the observation of background stars in appreciable numbers. The number of such stars expected to fall above the NGC 6530 main sequence is in rough agreement with observations. It appears from this study that in the case of NGC 6530 at least the majority of Walker's stars are highly reddened background stars of early type.

The 600-Foot Radio Telescope. J. H. TREXLER (introduced by E. Stuart Ferguson), *U.S. Naval Research Laboratory*.—The U.S. Navy is building for the department of Defense and the scientific community, a 600-ft radio telescope at Sugar Grove, West Virginia. When completed in 1962, it will be a significant new tool for astronomical observations at meter and decimeter wavelengths. The radio optics of the instrument will consist of a 600-ft-diam parabolic mirror with a prime focus observing station 240 ft above the surface. The geometry of the optics is maintained through changing environments by a multiplicity of closed loop servo mechanisms which continually refigure the mirror and adjust the focus. The radio optics of the telescope are mounted in an altitude-azimuth configuration providing access to the entire sky. Tracking rates are sufficient to follow celestial objects at distances beyond one earth radius. The 2.6×10^4 m² collecting area of the telescope, effective at wavelengths of low absorption, will provide promising approaches to intergalactic studies as well as more problems. In addition to the classical technique of passive observation, the new field of radar astronomy will be provided with a versatile and powerful tool.

The Extragalactic Distance Scale. SIDNEY VAN DEN BERGH, *David Dunlap Observatory*.—Luminosity classification techniques have been applied to five members of the local group for which distances have recently been given by Sandage. The LMC and SMC were classified on prints kindly made available by Dr. de Vaucouleurs. The absolute magnitude calibration for each luminosity class was obtained from the red shifts and apparent magnitudes of field nebulae by assuming a Hubble constant of 100 km/sec/Mpc. After correcting for the fact that field nebulae were selected for radial velocity observation by apparent magnitude, one obtains the distance moduli given as follows:

Name	Type and class	m-M (DDO)	m-M (Sandage)
M31	Sb I-II	24.1	24.6
M33	Sc II-III	24.9	24.5
LMC	Ir/SBc III-IV	18.6	19.2
SMC	Ir IV/IV-V	19.0	19.2
NGC 6822	Ir IV-V	25.0	24.1

Comparison of Sandage's distance moduli with the DDO distance moduli gives

$$H = 100^{+20}_{-17} \text{ (me) km/sec/Mpc.}$$

(The mean error takes into account the uncertainty in the correction for selection effects.) Two assumptions are involved in this determination of the Hubble constant. (1) The galactic absorption is given by $A_{\text{gal}} = 0.24 \text{ cosec } |b|$. (2) The distances of local group members are those given by Sandage, which are essentially based on the luminosity calibration of novae by T. Schmidt.