way in which energy is fed into the velocity distribution by processes such as contraction of the cluster.

The Ohio State University 360-Foot Radio Telescope.

JOHN D. KRAUS, *Ohio State University Radio Observatory*.—The telescope consists of a standing parabola 360 ft long by 70 ft high and a tiltable flat reflector of approximately the same dimensions. The parabola is fixed in position, the celestial radio waves being deflected into it by the flat reflector. Electrical tests of the design were begun in 1953 using a scale model. Through a grant from the National Science Foundation construction of the large telescope was begun in 1956. The parabola was completed in 1958 and the tilt flat reflector is now also substantially complete. It is hoped that the remaining construction will be finished late in 1960. A number of the unusual construction features are described. The telescope is being built by the Ohio State University on a site provided by the Ohio Wesleyan University near the Perkins Observatory south of Delaware, Ohio. The telescope is designed to operate at wavelengths between 15 cm and 15 m, a range in wavelength of 100 to 1. A program of sky background mapping, precision position measurement of radio sources and their detailed spectra are planned for the new telescope. Designs are being made to use wide-band feed antennas and tunable receivers so that the spectra of radio sources can be measured rapidly and accurately over the 100 to 1 range in wavelength. The fact that the prime focus is at ground level makes it feasible to employ an elaborate feed antenna and to install low-noise receivers right at the feed point without regard for weight or size. Instrumentation for hydrogen line observations also is to be installed.

The Universality of the Initial Luminosity Function.

D. NELSON LIMBER, *Yerkes Observatory*.—The universality of an initial luminosity function based upon the galactic clusters and the solar vicinity is examined with regard to its implications for the mass-to-light ratios for stellar systems. For this purpose the times that stars spend on and near the main sequence are derived as a function of stellar mass from a discussion of the available data for individual stellar models. These results are then used to calculate upper limits to the mass-to-light ratios for stellar systems as functions of the ages of the systems—on the assumption that an initial luminosity function of the usual form has been operative. The observational data relating to the mass-to-light ratios for galaxies and globular clusters are then analyzed, and the corresponding values for their mass-to-light ratios are obtained. These observational values are compared with the calculated upper limits, and it is found that ages greatly in excess of 12 billion years would be required for many galaxies in order for the data to be consistent with the adopted form of the initial luminosity function. The evidence appears to strongly support the view that the initial luminosity function has at times differed in a very significant way from its assumed form. It follows that the form of the initial luminosity function is sensitive to at least certain of the physical parameters that describe the pre-stellar medium—parameters such as density, temperature, turbulent and magnetic states, and chemical composition.

Evidence of a Solar Corpuscular Influence on Large-Scale Weather Phenomena.

N. J. MACDONALD AND W. O. ROBERTS, *High Altitude Observatory, University of Colorado*.—Statistical evidence from three successive winter half-years strongly indicates that when the earth is bombarded by unusually intense solar corpuscular emission, certain low-pressure troughs in the 300-mb circulation are subsequently amplified. The troughs so affected enter or are formed in the Gulf of Alaska-Aleutian Islands area on the second, third, or fourth days after the start of the corpuscular increases. The trough amplifications maximize a variable number of days later, and in different locations, which may explain why the result was not apparent to earlier workers. The same result has been found independently, at about the same level of significance, in

each of the three winters treated separately. For the three half-years grouped together the probability of so strong a chance association is less than 10^{-6} .

A Direct Determination of Neutral Hydrogen between the Earth and the Sun.

P. MANGE, J. D. PURCELL, AND R. TOUSEY, *U. S. Naval Research Laboratory*.—Profiles of the Solar Lyman-alpha line obtained by means of a rocket-borne spectrograph exhibit a deep narrow absorption line superimposed on a broad shallow central reversal. The observed width of the core at half-maximum, 0.05A, even without correction for instrumental broadening, indicates absorption by hydrogen at a temperature of no more than 3300°K. The absorption core is therefore attributed to hydrogen outside the solar atmosphere. From the observed depth and breadth of the absorption, the total hydrogen between the sun and the E-region of the earth's atmosphere is calculated to be 3×10^{12} atoms/cm² column, with an estimated accuracy factor of 2. The absorption curves are examined for compatibility with suggested distributions of hydrogen in the terrestrial atmosphere, taking into account molecular diffusion and the variation of temperature with altitude.

Possible Absorption Lines in Spectra of Three Supernovae.

DEAN B. McLAUGHLIN, *The Observatory University of Michigan*.—A number of hazy absorption-like minima were measured on two or more Lick Observatory spectrograms of each of the three supernovae: SN (1954) NGC 5668, SN (1956) NGC 3992, and SN (1957) NGC 4374. A Mount Wilson-Palomar plate confirms most of the features in the first- and last-named stars. In general appearance the three spectra are nearly identical and of type I, with the usual pattern of broad diffuse maxima of radiation and no evident deviations from the type. They differ considerably from the peculiar type I object SN (1954) NGC 4214. The patterns of "absorption" differ appreciably, but in all three spectra nearly all "lines" give fairly consistent large negative displacements when identified with lines of HeI, HeII, CII, NII, OII, or other ions found in hot stars. Hydrogen lines are weak or absent. Composition of these "absorption spectra" thus resembles that of SN (1954) NGC 4214 (McLaughlin 1959). In the latter, however, some lines assigned to HeI appear in great strength. These are not outstanding in the three spectra discussed here. However, common to all four was the broad and deep minimum centered about 3820 A, which may be due largely to HeI 3889 whose lower level is metastable. Apparent velocities are in the range -5000 to -7000 km/sec. Identifications appear most satisfactory in SN-NGC 3992, in which nearly every line can be assigned an origin consistent with a hydrogen-poor O-B spectrum. The "absorptions" are fewest, weakest, and least conclusive in SN-NGC 4374 but, so far as they go, they can be interpreted similarly. The author is grateful for the use of spectrograms taken at Lick and Mount Wilson-Palomar Observatories.

On the Fine Structure of Solar Prominences.

D. H. MENZEL AND J. G. WOLBACH, *Harvard College Observatory*.—Solar prominences are not uniform clouds of luminous gas. Observations have clearly shown them to possess filamentary structure. In "hedgerow" prominences these filaments present the appearance of tangled skeins of thread. In various prominences associated with sunspots the filaments assume distinctive forms of which loops are the simplest and the most characteristic. Large scale coronagraph records from Sacramento Peak Observatory have disclosed a still finer structure existing in the filaments themselves. Two types apparently exist. For example a hazy thread, curving gracefully from the upper corona toward the solar surface, is not continuously luminous along its length. High magnification shows that the filament really consists of closely spaced hazy dashes, with the length of the dash roughly perpendicular to the filament. In some complex prominences, the dashes on one filament appear as continuations of those of the adjacent filament. Occasionally the luminous pattern suggests a