km/sec. Assuming a random orientation of the axes of rotation we find an average rotational velocity $\langle v \rangle = 126$ km/sec for the Orion stars compared with $\langle v \rangle = 200$ km/sec for the general field stars.

Preliminary Spectrophotometric Observations of Nova Herculis, 1960. ADEN B. MEINEL, *Kitt Peak National Observatory*.—The scanning ratio spectrometer has been used with the 16-inch and 36-inch telescopes to observe the spectrum of Nova Herculis 1960. Daily observations were started on March 10, and continued on an intermittent basis since May, when changes became less frequent. Complex changes within the spectrum will be described.

A by-product of these observations has been the determination of the extinction curve as a function of wavelength for Kitt Peak.

A Relationship between Flares and Loop Prominences. DONALD H. MENZEL, *Harvard College Observatory*.—Carrington's famous observation of a white-light solar flare is reviewed. It is suggested that Carrington's observation can best be interpreted as an extremely brilliant loop prominence, developing out of coronal material under the action of electric currents and associated magnetic fields, from the top downward in the manner characteristic of loop prominences. Enhanced convection around the edges of sunspots tends to raise the residual magnetic and electric currents there to higher levels, where the repulsion of the magnetic fields tends to form the current into a loop. The coronal material, caught within the current loop, is squeezed by the well-known pinch effect to a density so high that recombination of ions and electrons suddenly occurs, rapidly cooling the material so that it becomes luminous in $H\alpha$ and lines of similar high excitation. If sufficient material is caught and compressed within the loop, it will attain the brilliance of an $H\alpha$ flare; if still more is caught, sufficient to make the pinched loop optically thick in white light, we may expect a white-light flare, such as Carrington saw.

This suggestion, that certain flares can be identified with loop prominences, does not intend to imply that all or even most flares are so associated. It is finally, however, suggested that a more intensive search should be made for flares in white light, particularly in the vicinity of large active spot groups with loop prominence activity.

A Goniometric Measuring Engine for Curved Film. G. R. MICZAIKA, *Aeronutronic, a Division of Ford Motor Company, Newport Beach, California*, AND J. NUNN, *Joseph Nunn and Associates, Pasadena, California*.—An instrument for measuring relative positions of objects on curved films (Schmidt camera image fields) has been developed. Its prin-

ciples of operation and dimensional reliability are discussed with particular reference to the elimination of systemic errors and speedy reduction of data to catalogue information.

The Distribution of C_2 in the Heads of Comets. FREEMAN D. MILLER, *The Observatory, University of Michigan*.—Nine comets of sufficient angular size to permit study of the light distribution in the projected images have been observed at the University of Michigan in the last 12 years. Prior to 1957 conventional filters were used to effect some separation of radiations from different constituents. In 1957 an interference filter designed to isolate the 5165 Å band of C_2 was used to photograph comets Arend-Roland, Encke and Mrkos, and in 1960 for Comet Burnham. In four of the nine comets the dust component which contributes to the coma and type-III tail was weak. Isophote configurations of these comets can be attributed primarily to neutral molecules. The form of the isophotes suggests that these molecules are either ionized or dissociated before reaching the classical Eddington parabolic envelope. This, together with the variation in projected intensity as a function of distance from the nucleus, demonstrates that an appropriate half-life of the molecules must be included in models of the coma. The problem is currently being programmed for the IBM 704. Isophotes of Comet Burnham are oval, with the long axis perpendicular to the projected radius vector. Ejection of the neutral molecules predominantly into the sunward hemisphere is the most probable interpretation, but a dispersion in the ejection velocities may play a role.

$H\alpha$ Observations of Flare-Initiated Disturbances with Velocities ~ 1000 km/sec. G. E. MORETON, *Lockheed Solar Observatory, Lockheed Aircraft Corporation, Burbank, California*.—During 1959 a program of six frame per minute $H\alpha$ cinematography revealed four events where a flare unambiguously resulted in abrupt activation of one or more absorption filaments, situated in preferred directions, at distances of 150 000 to 700 000 km from the flare. The flares have a distinct premaximum intensity "explosive" phase, at which time the luminous borders appear to suddenly expand at rates of several hundred km/sec. It was inferred that the filament activations resulted from a disturbance initiated at the explosive phase and propagated through the solar atmosphere to the filaments. The four cases indicated assignment of a velocity of ~ 1000 km/sec to the disturbance. Since January 1960 observations have been conducted with the 0.5 Å birefringent filter bandpass displaced 0.5 Å to the blue wing of $H\alpha$ resulting in greater sensitivity to Doppler-shifted absorption features; four additional such events have been detected.