and Development Command expedition to the Canary Islands made measurements of the magnitude and direction of the polarization of the coronal light. The observations presented in this report were made from an F-101B airplane, flying at 45 000 ft, well above the scattering influences of the earth's atmosphere. By flying at supersonic speeds, the airplane was able to remain in the umbral cone for $7.6^{\text{m}}51^{\text{s}}$. An RB-47 from the 16th Air Force, flying along the path of totality at 30 000 ft, furnished the navigational assistance to set the F-101B on the desired course at the correct time.

A Millikan DMB III 16-mm movie camera was used for the photography. This camera was equipped with a disk of Polaroid HN-32 mounted in front of the optical system. The disk was rotated 60° between each successive frame of film. A total of 178 frames of film have been analyzed in a microdensitometer built specially for this purpose.

The magnitudes of the percent polarization in the region $2.5R_\odot < R < 5.5R_\odot$ are in fair agreement with the results from previous eclipses. The deviations in the direction of the magnetic vector from the radial direction are significantly larger, particularly in the equatorial region. The familiar, but unexplained phenomenon of greater light intensities across the lunar disk than in the outer corona ($R > 3R_\odot$) was observed on all frames of film.

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21-cm Continuum Observations of Discrete Sources. S. J. GOLDSTEIN, JR., *Harvard College Observatory, Agassiz Station, Harvard, Massachusetts*.—The switched maser radiometer mounted on the 60-foot reflector at Harvard College Observatory has been used at 1422.4 Mc to observe continuum sources, selected from the survey at 85.7 Mc by Mills, Slee, and Hill. This paper is a report on 18 of the sources at galactic latitudes greater than 9° for which positive results have been obtained in good positional agreement with those reported at 85.7 Mc. The observations at 1422.4 Mc, made with 1 Mc bandwidth, and beamwidths of $55'$ in both declination and right ascension, consist of two or more drift curves and two or more scans in declination across each source. The weakest of these sources at 1422.4 Mc produces deflections of several times the rms fluctuations on single records with an integration time of ten seconds.

One hopes to obtain accurate average spectral indices from these observations, and those of Mills, Slee, and Hill because (1) the sources are strong at both frequencies, (2) neither instrument is affected by angular size of the source, (3) the beamwidths of the two instruments are nearly equal, and (4) the large ratio, 16.6, of the two frequencies of ob-

servation reduces the effect of errors in flux density on the value of the spectral index.

The spectral indices range from 0.56 to 1.10 with an average of 0.85. There is no clear-cut evidence of grouping. This is a much narrower range of indices than that obtained at lower frequencies by Whitfield.

The three sources which are extended at 85.7 Mc have smaller indices than the three which are possibly extended, the latter sources having about average spectral indices. Thus, for some of the sources there may be an inverse correlation between angular size and spectral index.

Polarization and Extinction by Models of Interstellar Dust Clouds. J. MAYO GREENBERG, *Rensselaer Polytechnic Institute*.—Calculations have been made on the wavelength dependence of polarization and extinction by models of interstellar dust clouds consisting of refracting spheroidal particles. The calculations are based on scattering data obtained by the microwave analogue method for particles with an index of refraction of 1.3.

Some Fluctuations in the Interplanetary Magnetic Field and their Relationship to Solar Activity. E. W. GREENSTADT, *Space Technology Laboratories, Inc., Los Angeles, California*, AND G. E. MORETON, *Lockheed Solar Observatory, Lockheed Aircraft Corporation, Burbank, California*.—The American solar satellite 1960 α (Pioneer V) was launched into orbit toward the trajectory of Venus on March 11, 1960. Among the instruments contained in the vehicle was a magnetometer sensitive to field values greater than 0.1 gamma. With the exception of a brief period following the launching, all the data transmitted by the vehicle, which delivered information to the earth well into June 1960, represent samplings of the interplanetary region inside the earth's orbit.

The orientation of the vehicle and the operation of the search coil magnetometer were such that the measured values of the field represent a magnetic component essentially perpendicular to the plane of the ecliptic. Two outstanding characteristics are in evidence upon examination of the average field values during successive payload transmission periods. First, the occurrence of frequent and sometimes extensive variations in the measured field component, and second, the consistent return of the field to a base value of 2.5 gamma over the entire period of recorded data, despite the great distance traveled by the payload.

As has long been observed at magnetic observatories on the earth, strong flare activity on the sun is often followed by magnetic storms at the earth's surface. Corresponding severe deviations in the field