on the declining branch of cycle 20. Flare frequency dropped markedly in mid 1970 and early 1971, many moonspot areas in the northern hemisphere also fell to relatively low levels in 1971, but a similar decline in southern sunspot areas did not occur until 1973. Additionally, during the last six months of 1973 and the first six months of 1974, the hemisphere of the sun centered approximately on Carrington solar position 10°-20° was significantly deficient in centers of activity in comparison to the opposite hemisphere. This weak chromospheric hemisphere included the location of regions of conspicuous coronal weakness as observed by Skylab and OSO-7. As of November 1, 1974 the first spot group of cycle 21 has not yet appeared.

28 The Case of the Missing Sunspots, JOHN A. EMERY, High Altitude Observatory. - Late in the last century Sporer and Maunier called attention to a curious anomaly in historical solar records: the sun, they claimed, was almost totally devoid of spots for a seventy-year period between about 1645 and 1715 AD. During this time the sun was under daily watch by respected astronomers with fair telescopes, yet there were continuous periods of up to 10 years length when no spot was seen. At the most active times the sun appeared almost as spotless as it does at solar minimum in the present era. During the same period the observers noted aurora in the British Isles, and in Scandinavia they became rare enough to be considered portentous, according to other summaries. Maunier’s "prolonged solar minimum" has recently been pointed out by R. N. Parker, who has asked that it be re-examined. In the light of present emphasis on possible solar-induced terrestrial changes, it seems important to clear the case. Many climatologists accept the Maunier Minimum as evidence of a sunspot-climate relationship, and physicists, by custom and inclination, are largely unaware of it.

I have begun a study of the original historical data which Sporer and Maunier used. In addition I have looked at subsequently-compiled orbital records, at the tree-ring evidence, and at accounts of the eclipsed sun during the period of interest, when the sun might have appeared as one big coronal hole. Solar records from the time are dim today, yet, in sum they seem to confirm the prolonged minimum which Maunier described.

The importance of the Maunier Minimum to our understanding of solar activity cannot be exaggerated. If it really happened it was surely the most significant event in the history of solar observation. It tells us that major solar change in the historical time frame, and reveals a phase of solar behavior grossly different from the routine cycle we now accept as normal. It may represent a deep valley in a recurrent envelope of solar activity of period 500 years or more which deserves examination as a fundamental or beat frequency. And it offers a good test case for solar influence on climate.

51 Time variations in the EUV line emission from the chromosphere and corona. J. E. Varnazza, Center for Astrophysics, Harvard College Observatory, and Smithsonian Astrophysical Observatory. - We have analysed Solar EUV observations of quiet regions from ATM. We found that EUV emission lines have rapid time variations. These variations are superimposed into a slowly varying DC level. The brightening seems to be random and occurs over a large range of atmospheric heights. We classified the quiet region data in two areas: center of the network cells and boundaries. Power spectrum analysis of the time series shows no dominant period in the network boundaries. The only periodic variation occurs in the line at around 500 s only but only in the cell centers. The intensity amplitude of this oscillation in the Lyman line is of the order of 0.1% of the DC level.

52 High-resolution Solar Spectra in the 2900 A and the 1700 A Range. HOWARD C. MCLURKIN, Department of Physics and Astronomy, University of Washington, W.帳H. SMITH & JOHN T. JEFFERIES, Institute for Astronomy, University of Hawaii. High-resolution photographic spectra were obtained by a rocket-borne spectrometer on June 14, 1974. The instrument was pointed to selected portions of the sun, including active regions, quiet sun, and limb. Spectral resolution approximates 0.02000 and spatial resolution 7.5 seconds of arc. We present preliminary results from these data, including comparison of profiles of the Mg II h and k lines in filaments, quiet sun, plage regions, and in the vicinity of the solar limb. Center-to-limb variation of the profiles, along with the effect of, networks and cell boundaries, are shown. Also to be discussed are profiles of other prominent features in the regions covered by the spectra, such as the Mg II resonance line at 2852 A. the C I multiple near 1657 A, and the He II triplet at 1640 A.

53 Cinematography of the Five Minute Oscillations: A New Aspect of the Heliospheric Propagation. DAVID K. LYNCH, The San Fernando Observatory, The Aerospace Corp. and The McDonald Observatory, The University of Texas at Austin. A 2.5-hour 30-s interval velocity movie at quiet disk center of just the oscillations was obtained in Fe I 6495 with Seeley and Bhattacharyya's separation technique. During this movie one sees many 4-5 arc sec elements crawling away, apparently independent of one another. This squirming and writhing goes on continuously and shows the five minute oscillation in the velocity amplitudes. The strong impression one has of horizontal motion is at variance with the results of stop-frame projection which reveals no horizontal motion whatever. This paradox is resolved by the well-known psycho-physiological effect known as "apparent motion" in which stationary objects which appear and disappear are observed to translate if they come together quickly enough. The conclusion is that no horizontal propagation takes place. Full disk velocitygrams are used to support this idea which leads to the conclusion that the only sort of wave mode which agrees with the observations is vertically propagating acoustic waves.

54 A Nonlinear, Time-dependent Theory of the Type III Burst Exciter. R. A. SMITH, M. L. GOLDSMITH, NASA - Goddard Space Flight Center and E. R. BUCHHOLZ, Naval Research Laboratory. - In situ satellite observations of type III burst excitors at 1 AU show that the beam does not evolve as a plateau in velocity space, contrary to the prediction of quasi-linear theory. The observations can be explained by a theory that includes coupling excitation due to excitation of the parametric oscillating two-stream instability and its saturation by anomalous resistivity. The time evolution of the beam velocity distribution is included in the analysis.

*NAS/NRC Postdoctoral Resident Research Associate.

55 The Work of the Diode Array. D. M. Rust, American Science and Engineering & C.A. Bridges, Sacramento Peak Observatory. - Chromospheric observations made between September, 1971 and May, 1974 with the 512-diode array described by Dunn et al. (Proc. SPIE 4, 109 (1974)) are described. Spectroheliograms of active regions and of the quiet chromosphere at a resolution of one arc sec show structure everywhere in the 1020-30 K line of He II. The