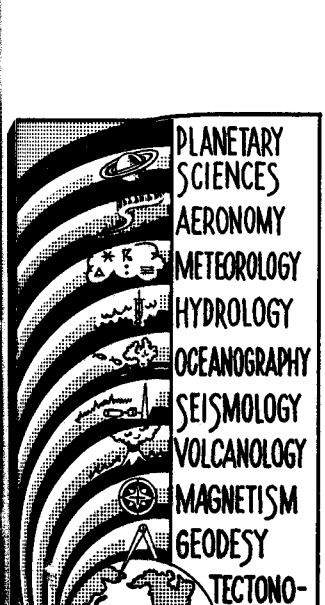
AMERICAN GEOPHYSICAL UNION

Forty-Sixth Annual Meeting Program, 1965

April 19-22, 1965



TRANSACTIONS, AGU
Vol. 46, No. 1, March 1965

(P47) S. YOSHIDA AND S.-I. AKASOFU (Geophysical Institute, University of Alaska, College, Alaska), *A Study of the Propagation of Solar Particles in Interplanetary Space (The center-limb effect of the magnitude of cosmic-ray storms and of geomagnetic storms).* The magnitude of cosmic-ray storms (the Forbush decrease) and of geomagnetic storms (expressed by the K_p and D_{st}) is examined as a function of central meridian distance of the corresponding solar flares. The storms are grouped according to the characteristics of the preceding energetic solar particle events. It is shown that a remarkable 'center-limb' effect in the magnitude of the storms can be recognized only if such a grouping is made. Taking this effect into account, it is demonstrated that solar flares associated with an unusual cosmic-ray increase are the most energetic throughout the entire range of the energy spectrum of solar particles, releasing the largest amount of energy for cosmic-ray storms and magnetic storms. The significance of the results is discussed in detail.

(P48) M. W. HAURWITZ (National Bureau of Standards, Boulder, Colo.), S. YOSHIDA, AND S.-I. AKASOFU (Geophysical Institute, University of Alaska, College, Alaska), *Interplanetary Magnetic Field Asymmetries and Their Effects on Polar Cap Events and Forbush Decreases.* It is shown that, depending on whether the associated flares are east or west, pronounced differences occur in polar cap absorption profiles and in Forbush effects. Both a large increase in absorption at the time of SSC and a large Forbush decrease are caused almost exclusively by eastern and central flares, but not by western flares. Because of these east-west differences, we conclude that a basic and consistent asymmetry must be produced by the flare plasma cloud in the interplanetary magnetic fields, relative to the Sun-Earth line. We show that such an asymmetrical magnetic field configuration is produced by the interaction of the expanding solar plasma region with the quiet-time spiral magnetic field. We propose that this asymmetry is the fundamental cause for the observed east-west differences in polar cap events and Forbush decreases.

(P49) VINCENT J. KISSELBACH (University of Denver, Denver Research Institute, Denver, Colo.), *Cosmic-Ray Nucleonic Component Intensities during Solar Minimum.* An account is given of the variations in the intensity of the cosmic-ray nucleonic component recorded at Denver, Colorado, during the solar quiescent period. The data are analyzed in terms of current findings on the character of the interplanetary medium. Data on the modulation of the nucleonic component-producing primary radiation obtained from synoptic analysis of neutron registrations made at different stations during this period are also reported.

Meteorites, 1

GSA **08h 30m, April 20**

(P50) ELBERT A. KING, JR. (Geology and Geochemistry Section, Manned Spacecraft Center, Houston, Tex.), *A New Meteorite Find near Sweetwater, Texas.* A single stone meteorite weighing 1.76 kg has been recovered from Bernard W. Neeper's farm, Fisher County, Texas (32°33′03″N, 100°25′15″W). The stone was plowed up 200 yards east of the Neeper farmhouse in the autumn of 1961 but was not identified as a meteorite until November 1963, when a small chip from the specimen was received by the writer. A wet chemical analysis by Jun Ito of a 25-gram sample from the most unweathered portion of the meteorite follows: SiO_2, 34.00; Al_2O_3, 2.03; total iron as FeO, 36.26; MgO, 21.68; CaO, 1.36; Na_2O, 0.61; K_2O, 0.07; TiO_2, 0.12; P_2O_5, 0.37; MnO, 0.27; Cr_2O_3, 0.53; Ni, 1.52; Co, 0.06; S, 1.81; C, 0.54; $H_2O(-)$, 0.51; $H_2O(+)$, 1.83. The iron to nickel ratio in the acid soluble metallic phases is 11.15 to 1. The meteorite is an olivine-bronzite chondrite consisting of approximately 50% chondrules contained in a fractured and brecciated matrix. A search of the area around the site of the find failed to produce any additional pieces.

(P51) KURT FREDRIKSSON AND E. P. HENDERSON (Smithsonian Institution, Washington, D. C.), *The Horse Creek, Baca County, Colorado, Iron Meteorite.* The Horse Creek, Baca County, Colorado, iron meteorite, found in 1937, is unique for four reasons: (1) its density is 7.6001, low for iron meteorites; (2) its kamacite contains 2.5% Si, in solid solution, first time reported for iron meteorites; (3) the kamacite contains about 3.9% Ni, low for kamacitic iron; (4) this iron contains about 3% of Perryite, nickel silicide, a new mineral, also present in the metal phase of the St. Mark's South Africa, enstatite chondrite. The approximate chemical composition of Perryite is Ni 81%, Si 12%, Fe 3%, and P 5%. The metallography and chemical composition of the Horse Creek meteorite is discussed, and comparisons are made with other metallic meteorites as well as the metal phase in enstatite chondrites. Electron probe analyses of the different phases present in the Horse Creek iron and the X-ray diffraction data for Perryite are given.

(P52) EDWARD OLSEN (Dept. of Geology, Chicago Natural History Museum, Chicago, Ill.) AND K. FREDRIKSSON (Meteorite Div., U. S. National Mu-