δT variation and δH one can observe the following characteristic differences:

a) δH maxima are late compared with δT maxima;

b) after passing the maximum δI rapidly falls to the initial level, while δH returns to the normal level much slower. These facts allow to suggest that between δI and δH there is a functional dependence. The peculiarities mentioned, which differ δH variation from δI variation, indicate the fact that δI is proportional to the speed of ion formation q. δH calculations on δI variation with the account of a wind daily variation for a concrete magnetic storm confirm this suggestion.

Literature

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INTERNATIONAL CONFERENCE ON COSMIC RAYS AND THE EARTH STORM Part I

I-1-PO. Summary of I-1-1 to I-1-10

E. H. VESTINE (at request of S. CHAPMAN)

Professor Chapman yesterday discussed earth storms in retrospect and prospect. With respect to morphology of storms he could hardly have visualized the prospect of the exciting and rewarding afternoon of papers I wish next to discuss. Following a different order than that of presentation, I begin with the paper by Paghis, on magnetic impulses and sun-earth relations. He considered 817 magnetic impulses of the years 1949–59 and looked for numbers of repetitions of these events at daily intervals in time up to $\Delta t=70$ days. It was found that the 27-day recurrence tendency appeared strongly in the data for a set of years of decreasing sunspot activity, and less distinctly in years of rising solar activity. The events in the years declining sequentially in sunspot number, with several repetitions of disturbances gave rise to several sets of sharply marked repetitions at even shorter intervals, which were noted as a feature of the data. It was pointed out that for this reason great care is necessary in statistical analysis of the data which obviously are not necessarily normally distributed.

There was a paper on solar-terrestrial relationships during the IGY and IGC by H. Maeda, K. Sakurai, T. Ondoh and M. Yamamoto of Kyoto University. They began with events on the sun and looked for related events on the earth. They concluded that almost all ssc geomagnetic storms during the period were associated with solar flares accompanied by great type IV continuous radio bursts and type II outbursts. They also found that total flux density of associated radio outbursts was correlated well with magnetic storm intensity. They also found that the magnitude of ionospheric storms is well correlated with the presence of the nonsymmetrical part of the earth storm *DS*. It was brought out that radio emission near the central meridian and possibly in the northern hemisphere of the sun was most important, but that flares near the east limb seldom gave rise to a storm with strong *Dst*, a matter also discussed in connection with data in a following paper by J. Roosen and L. D. de Feiter. This was the paper: The Relations between Solar Flares and Geomagnetic Storms, dealing especially with solar radio bursts in relation to terrestrial events accompanied by solar flares. They found that a magnetic storm with sudden commencement was accompanied by outbursts over a wide range, from measurements at 200, 550 and 3000 Mc/s. Another finding was that a threshold in average energy flux of relative numerical value 150, 10, and 5 was ordinarily necessary at these respective frequencies.

At this stage, I should like to introduce a typical example of a magnetic storm in order to discuss the finding of E. J. Chernosky: Changes in the Geomagnetic Field Associated with Magnetic Disturbance. You will note the initial phase during the first hour or so, and the recovery following the main phase. He emphasized that the time just before a storm merited more study than it ordinarily receive since as a rule the field in *H* increases in magnitude just before a storm. It was agreed that this might not be fully explained by the recovery phase due to previous disturbances.

In the paper V. A. Troitskaya: The Fine Structure of Magnetic Storms in Respect to Pulsations with Periods less than 15 sec., it was indicated that a daytime *SC* shows an oscillatory movement of period 8–15 sec in middle to higher latitudes, with less distinct tendencies of this kind at night. In twenty cases higher frequency and lower amplitude "pearl"-type pulsations were superposed, even at times prior to the initial sudden commencement change. At times of high *K*-index, in 14 cases, the "pearl"-type pulsation was not apparent. *SC* propagation times around the earth was 10–40 sec, and possibly about 10–15 sec at equinox. The *SC* in northern summer appears first in north polar regions, and similarly for southern summer the *SC* appears first in the south polar regions. Propagation was simpler along north-south rather than east-west directions.

In the paper A. Nishida and J. A. Jacobs: World-Wide Simultaneous Changes in the Geomagnetic Field, magnetic impulses resembling sudden commencements but of duration 5 minutes or so were discussed. These were found present on 20 per cent of all hours, at about 37 magnetic stations over the earth. The morphology resembles that of the current-systems for sudden commencements, including preliminary reversed impulses, and enhancement by day at the magnetic equator. Effects were believed related to atmospheric electric currents and possibly solar streams.

The paper E. J. Smith and C. P. Sonett: Satellite Observations of the Distant Field during Magnetic Storms: Explorer VI dealt with magnetic field measurements in the outer radiation belts, near the 21 hour local time meridian. Using a search coil aboard the satellite, ring current fields at four earth radii from August 16 to 19, 1959 were noted to be in phase at both 4 radii and at the earth surface, field changes of *Dst* type being about 320 gammas and 3 times as large in the radiation belt as on the ground. The field, if in the meridian plane, was found to reverse at about 6.2 earth radii, and opposed the dipole field at radial distances just less than this amount. Smaller field irregularities appeared at distances of about 25,000 km out to 50,000 km but were only weakly in evidence on magnetically quiet days.

The paper T. Nagata, S. Kokubun and N. Fukushima: Similarity and Simultaneity of Magnetic Disturbance in the Northern and Southern Hemispheres disclosed that the north and south polar *SD* current-systems are nearly mirror image counterparts. Individual disturbances correspond in small details better by night than by day, in both amplitude and phase, in either hemisphere, at magnetically conjugate points.

V. P. Hessler in a paper: Geoelectric and Geomagnetic Storms on Arctic Drifting Station Arlis I showed that ocean electric currents seemed closely associated with magnetic field disturbances at times of overhead auroral arcs. Some discrepancies between magnetic and earth-current phenomena are to be explored, with the aid of further field work.