

activity may perhaps be associated with the severe storm of the 18th September.

Characteristics of the storm of September 18, 1941.—The beginning of the present storm of September 18, 1941, was marked by a sudden rise of 26 gammas in horizontal force H , and of 1.3 minutes in Westerly declination D and a fall of 9 gammas in the vertical force Z . H rose gradually till 4^h 48^m G.M.T. and after this the magnet became quite unsteady with low-period oscillations of varying amplitudes. At 5^h 7^m, H shot up rapidly by 141 gammas in barely fourteen minutes. At about 5^h 22^m, the maximum value in H occurred but the position of the light speck was just beyond the recording limit of the photographic paper. The value of H at this time was more than 470 gammas above the baseline value. The vertical force attained its minimum value at about the same time. Westerly D attained its maximum value at 7^h 10^m. A gradual fall in H associated with rapid vibrations commenced at 5^h 26^m and continued till 10^h 36^m when a large decrease of 224 gammas occurred in 52 minutes. At this time the value of H oscillated about this value for about 20 minutes and showed a tendency to fall rapidly from 11^h 50^m onwards. The value of H rapidly decreased and as there was the risk of the light speck going off the recording limit of the photogram,

a deflecting magnet was used at 12^h 6^m and the trace was shifted upwards by 169 gammas. Rapid fluctuations in H were continuing till 15^h 20^m when there was a sudden rise of 144 gammas in about twenty minutes. From 15^h 44^m H began to fall again to attain its minimum at 17^h 50^m. Both the vertical force and westerly D attained their maxima a few minutes after H reached its minimum value. Immediately after attaining the minimum H rose by 149 gammas in twenty-four minutes and thereafter rose and fell at stages with ups and downs such as have been noticed in terrestrial magnetic records associated with Auroral activity. As the need for a deflector magnet disappeared, it was removed from its position at 2^h 16^m on the 19th, resulting in the curve being shifted downwards by 158 gammas. The H , D and Z magnetics continued unsteady till 6^h 44^m on the 19th September, after which H began to rise very gradually with minor fluctuations. The range in horizontal force during the storm exceeded 650 gammas, while the ranges of D and Z were 12.0 minutes and 87 gammas respectively. The storm practically ended at 11.5^h on the 19th although H continued low for a couple of days.

The magnetograms of the day of the storm as recorded at the Alibag Observatory have been reproduced in the figure.

WHISTLING METEORS. A DOPPLER EFFECT PRODUCED BY METEORS ENTERING THE IONOSPHERE

THE Research Department of All-India Radio has recently concluded an investigation of an effect hitherto unobserved. It is reported that the flight of meteors through the upper atmosphere, which results in clouds of ionized gases following the meteors at their tremendously high velocities of several kilometres per second, gives rise under certain conditions to peculiar types of low frequency whistles on the unmodulated carrier waves from nearby shortwave transmitters. The production of these

whistles is explained on the basis of interference between the ground wave and a weak sky wave which has undergone a slight change in its frequency due to 'Doppler Effect', *i.e.*, due to reflection from the head of the rapidly moving ionized cloud caused by the passage of a meteor. This conclusion which is supported by observations and experiments is likely to be of far-reaching importance in the realm of astronomy. A detailed account of the investigation appears elsewhere.
