Letters to the Editor.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, nor to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Atmospheric Pressure and the State of the Earth's Magnetism.

WHILE examining data for atmospheric pressure and terrestrial magnetism at various observatories of the Meteorological Office to discover possible relationships, and after meeting with no clear-cut success so long as attention was confined to daily mean values of pressure, I have now obtained results pointing to a hitherto unsuspected relation between the type of the diurnal variation of pressure and the general state of magnetic conditions, as regards disturbance and quiet, over the earth. As the best available index of the degree of magnetic disturbance

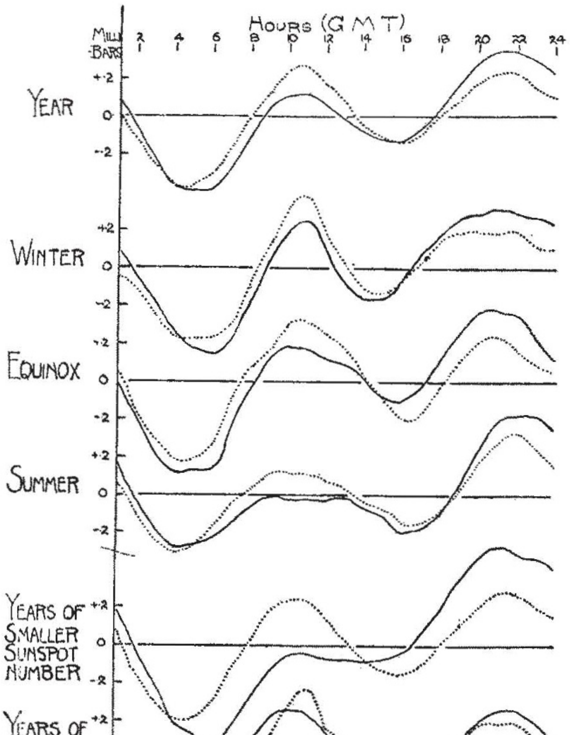

FIG. 1.

on each Greenwich day, the international magnetic character figure was used; the pressure data were those for Aberdeen Observatory as printed in the Observatories' Year Books of the Meteorological Office, Air Ministry. Mean diurnal inequalities of pressure corrected for non-periodic change were computed for the two sets of days, magnetically quiet and magnetically disturbed, on the basis of the five days of each type per month selected at De Bilt over the seven years 1922–28.

By grouping the inequalities according to the season of the year (defining winter as the four months November–February, summer the months May–August, and the remaining four months forming equinox), diurnal variations of pressure representative of the three seasons were constructed. A further re-arrangement of the data gave inequalities illustrating the pressure variations on the two types of days in years of low and high solar activity. The mean sunspot number for the group of years 1922–24 is 12·2; for 1925–28 the mean is 63·5.

The results are shown in the six pairs of curves on Fig. 1. The dotted curve in each pair represents the diurnal variation of pressure on magnetically quiet days and the full curve on magnetically disturbed days. The difference in form clearly shows the change in the pressure variation from one type of magnetic days to the other.

From these it is clear that in all but the last pair the predominant features of the change are the reduced development of the forenoon maximum and enhancement of the evening maximum on disturbed as compared with quiet days. That the effect is consistently present in each of the pairs of curves for the separate seasons as well as for the year as a whole is strong evidence of its reality. The last two pairs of curves illustrating the change of form of the variation in years of relatively low and of relatively high solar activity clearly indicate that, while the change is very marked in feebly active years, it may be masked or even partly reversed in years of frequent and large sunspots.

When the mean inequalities are analysed harmonically, it becomes obvious that change of form of the variation is confined almost entirely to the 24-hour wave; the amplitude and phase are both affected. In each pair of magnetically quiet and disturbed day pressure variations, except that for the group of years 1925–28, the amplitude of the first harmonic on disturbed days exceeds that for quiet days. The ratio of the amplitudes increases from 1·4 for the winter months to 1·7 for equinox and 2·2 in summer; in the group of years of low sunspot development it is 3·3. In all the groupings of the data there is a retardation of the 24-hour wave in passing from quiet to disturbed days; the retardation is a little more than two hours in all groups except that representing high solar activity, when it is about half an hour.

Against these changes in the whole day wave the constancy of the 12-hour component is striking. The ratio of the amplitudes for the two types of days remains steadily about unity in all groups and the changes in phase angle are not significant.

J. M. STAGG.

Lerwick Observatory, Shetland.

The Karoonda (S.A.) Meteorite of Nov. 25, 1930.

AT 10.53 P.M. on the evening of Nov. 25 an extremely brilliant fire-ball was seen by many observers in South Australia. It was observed at Port Lincoln on the west coast, Wirrappa (94 miles north-west of Port Augusta), Mount Gambier in the south-east of South Australia, Murrayville in Victoria, and Broken Hill in New South Wales, the radius of observation being thus well over 250 miles.

When first seen, the meteorite compared in brightness with a star of first or second magnitude, but rapidly (in a few seconds) increased to a brilliancy which gave an illumination comparable to that of daylight, even in Adelaide. An amusing feature of many reports is the illusion of close proximity due to this brightness. It was described by many observers as an immense ball of bluish-white colour, equal in diameter to the full moon, and having a luminous tail several degrees in length. As it approached the earth showers of sparks issued from the main body.