impression is that the changes of pressure at Oxford were followed by similar changes at Kew, only nearly an hour later.

It is premature (until we obtain more information) to enter into a discussion of the rate of progress of storms; but we are quite justified in considering the barograph an instrument extremely well adapted to extend our knowledge of atmospheric disturbances.

We see that on those very occasions when this knowledge is most interesting the barograph comes forward to our assistance, and presents us with results which could not possibly be obtained otherwise than by a system of continuous registration. It does not, however, follow that, while a continuous record is by far the best, other records are of no value; for should an observer be placed beside an ordinary barometer during the crisis of a storm, observations made in rapid succession and accurately timed would be of very great assistance. Such an observer would in fact produce approximately a record similar in kind to that of a barograph, although inferior in value.

It ought here to be noticed that two stations are not enough to enable us to determine either the direction in which an atmospheric disturbance is propagated or the rate of propagation. It is only on the improbable supposition that all such disturbances travel in a direct line from Oxford to Kew that barographs at these two places might be deemed enough. In order to obtain the greatest amount of information which such instruments are capable of affording, it is evidently necessary to multiply our stations and to distribute them judiciously over the surface of the country. Nor is it desirable to confine ourselves to one meteorological element, but the barograph should be accompanied by a thermograph and a self-registering anemometer. As this is the system about to be pursued by the Board of Trade in their chief meteorological stations in the British Isles, we may reasonably hope that before long we may by this means receive a large accession to our knowledge of the laws which regulate atmospheric disturbances.

II. "On the Lunar-diurnal Variation of the Magnetic Declination, with special regard to the Moon's Declination." By G. Neumayer. Communicated by the President. Received March 11, 1867.

(Abstract.)

The hourly records of the magnetic declination systematically kept at the Flagstaff Observatory at Melbourne, Victoria, during the period from the 1st of May 1858 to the 28th of February 1863, have been discussed by the author, with a view to determine the lunar-diurnal variation to which that magnetic element is subject. The results arrived at in the course of this discussion elicit, he believes, facts hitherto unnoticed, to which it seems desirable that the attention of scientific men should be directed.

The process employed in reducing the observations was identical with that generally adopted in such cases. The disturbed observations were first eliminated, by rejecting all that differed from the final normal belonging to the same solar hour by more than a certain separating value, which was taken at 3·61 minutes of arc. The elimination of the larger disturbances having been thus effected, from every remaining reading (R) of the magnet's direction the final normal (N) belonging to that solar hour was subtracted, so that the residue R—N is devoid of the influence of the solar-diurnal variation. This residue is positive when the north end of the needle is to the east of its mean position, and negative in the contrary case. The number of observations at command amounted to 38,194, of which 4178 single observations were excluded from the discussion as being beyond the assumed limit used for separating the greater magnetic disturbances, leaving 34,016 available for the purpose of determining the lunar-diurnal variation.

The treatment of the residues with a view to classification according to lunar hours presented no particular novelty. It may be mentioned, however, that before entering on any general discussion, every month's result was calculated separately. The values for the various months were afterwards arranged, irrespectively of the year, in two groups, viz. Sun South (October to March) and Sun North (April to September). Thus the mean lunar-diurnal variation was obtained separately for each half of the year, as well as for the whole year. On examining the results, irregularities in the lunar-diurnal variation presented themselves which seemed to show that that variation depended in some degree on the moon's position with reference to the equator, on the circumstance whether her declination were north or south.

Accordingly the whole series of observations were rearranged in groups, "Declination of the Moon South" and "Declination of the Moon North," so as to cause her declination to be divided between the hours of the day, all those days being rejected on which the moon was close to the equator. The 118 groups of lunar-diurnal variation thus formed were subsequently classified according to whether the sun's declination was south or north.

A Table was thus formed giving for each lunar hour the lunar-diurnal variation of the magnetic declination separately under each of nine conditions formed by combining each of the three conditions, Sun South and North, Sun South, Sun North, with each of the three Moon South and North, Moon South, Moon North. The results given numerically in the Table were also laid down graphically in curves.

A glance at the curves shows that the lunar-diurnal variation must be regarded as being influenced by both the sun and the moon; for it is seen that in case the declinations of the two bodies are of the same name, the curves show greater regularity than in the contrary case.

The question whether during the winter season any lunar-diurnal variation can be traced at all can, the author conceives, no longer be entertained

if we pay due attention to the facts which may be gleaned from the Table. Indeed it is afterwards shown, in discussing the individual years of observation, that in some cases the lunar-diurnal variation manifests itself in a very striking manner during the winter months.

On examining the results of the inquiry for the several years of observation, obvious differences are recognized on comparison. This was especially remarkable as regards the year 1861, which was the more striking as the year 1860 did not exhibit any such extraordinary deviations from the mean values. At first some error was suspected in the deduction of the results; but a perfectly independent and fresh discussion gave results agreeing in the main points with those previously arrived at.

In the course of the year 1861 the instruments previously in use were replaced by fresh ones obtained from Munich, which came into use for regular registration at the beginning of June. Though every care was taken to ensure uniformity of registration, it was deemed satisfactory to repeat the discussion, including that part only of 1861 in which the old instruments were employed; and accordingly the lunar-diurnal variation was discussed, with special regard to the moon's declination, for the year May 1860 to April 1861, and likewise for the year May 1858 to April 1859; but it was still found that towards the latter part of the former period the anomalies above pointed out made themselves clearly felt.

The results for the years 1860 and 1861 were given numerically in a special Table, and delineated in curves.

In conclusion, the author expressed a hope that the few facts he had brought forward might operate as an inducement to those who are engaged in similar pursuits, to enter upon such a laborious task as that of classifying magnetic observations for the purpose of examining into the law and nature of the lunar-diurnal variation, according to the moon's position north or south of the equator.