

in lat. $48^{\circ} 28' S.$, long. $126^{\circ} 28' E.$, the officers of the relief ship "Morning" noticed an aurora on the evening of the 31st October. Captain Colbeck has described this to me as one of the most brilliant he has seen in southern latitudes. On looking at our curves for the same day I see that they are very much disturbed, probably more so, indeed, than those for any other day of the year, with the exception of the 10th April.

It may be as well, perhaps, to explain these curves a little. The lower pairs of lines, which are straight and broken at regular intervals, are called the "base lines." There are two of these, each corresponding to its irregular line above, because it is customary to use one sheet of paper for two days, moving the position of the recording spots of light on the beginning of the second day, so that the records may be separated from one another. The gaps in these straight base lines are made automatically by the clock every two hours. The break in the line begins at the even hours, and ends four minutes after them, and thus the interval between these gaps is two hours. By this means the time of any magnetic event can be determined to, say, one minute of time. The upper irregular curves represent the movements of the magnets during the day. The spot of light, which acts as a frictionless pencil, is reflected on to the revolving drum carrying the sensitised paper by a mirror attached to the magnet, and therefore the spot moves as the magnet moves, and all its motions are photographed. By making absolute observations, as they are called, with other instruments—that is to say, by determining otherwise, from time to time, the actual value of the magnetic forces—the curves can be standardised, and thus give a continuous record of the actual value of the magnetic forces at any time it may be desired to know them. The absolute observations are made here every fortnight. It is necessary to keep a continual fortnightly check on the self-recording instruments, as, owing to temperature-changes, &c., the two spots—that making the base line and that giving the record—get gradually either nearer or further apart, without at the same time a corresponding alteration in the intensity of the magnetic force. Superposed on this, of course, is the real change. It is usual to determine from these curves the value of the three components of the magnetic force every hour of the night and day, and this is done at magnetic stations all over the world. On ordinary days as distinct from special term days, similar records to these I am now describing have been obtained all over the world, and also by the scientific staffs of the various antarctic and arctic expeditions which are out. On the "calm" days the values obtained will be compared all over the world probably every hour, but on the "rough" ones, such as these reproduced, it is likely that a more exhaustive comparison will be made. Records such as these and their reduction, which, it will be easily understood, is a very laborious process, form the ordinary work of a magnetic observatory at times when no special expeditions are away, and it is from these that knowledge is being collected in various parts of the world of the magnetic changes in progress. Some of the changes are so long-continued that very many years of observation are necessary to determine them, and until they are determined in many parts of the world we cannot hope to ascertain what it is that is producing them.

Apart from these are the special term days, records in which a uniform course of procedure was agreed upon by the International Conference. On these days it was arranged to spread out the record so that the lines of any event could be determined with much greater accuracy. In the magnetographs which the "Discovery" has, the drums carrying the sensitised paper on these occasions have been driven twelve times as fast as on ordinary days. With us it was simpler to alter the clock so that the speed was fifteen times that usually adopted. Probably at other conservatories other alterations have been made; but, whatever has been the speed of rotation of the drum adopted for term-days' work, it has been sufficient to enable it to be said that a magnetic event occurred at any particular station at a given time, which will not be more than five seconds in error, and in the term hours, which are special hours of these term days, results are to be given at every twenty seconds all over the world. Since there are three curves—namely, declination, horizontal, and vertical force—this means nine results to be obtained for each minute, or 540 for each hour. By an arrangement with the officers of the "Discovery," I, in common with several other observers, agreed to adopt high-speed running during the whole twenty-four hours of the term days, and if it finally be decided to take these results out at every twenty seconds also, it means 12,960 results to be obtained for each term day. As in any case there are twenty-four term hours in the year just past, there are nearly 13,000 results to be got out for these hours alone, besides those for other hours of these days and for ordinary days. It is expected that each observatory will do its own reductions, and it is desirable that in an international attack of this kind upon scientific problems of the very highest interest the collection of the results from the various centres should not be delayed. I hear from the "Discovery" that the records have been kept with few breaks, and that the whole of the term days of the year just past have been kept as arranged. Lying as we do almost due north of her winter quarters in McMurdo Straits, there can be no question that a comparison of our records with hers will be of the greatest interest and importance. We shall have for the first time a series of quick- and slow-speed records from stations all round the South Magnetic Pole. It is partly in consequence of the fact that the inaccessibility of the magnetic poles causes a dearth of magnetic information from near them, and partly also owing to the very interesting nature of the rapidity of the changes which take place near the poles, that such great value attaches to these records; and that Mr. Baracchi has, under most trying circumstances—how trying few of us, I expect, realise or appreciate—succeeded in collecting so much information is a matter for great congratulation, and we can only hope that he may be as fortunate during the coming year as he has been during the past.

During the year the Royal Society, as the representative of British science, has appealed for the protection of the Observatory against harm from the stray currents of electric tramways, and has asked, if the present site cannot be kept free from such currents, that the Observatory should be removed to some other. It is proper to say that placing the Observatory where it is was rendered necessary by the "Discovery's" expected visit, so that it might be readily accessible to