which it reaches its limits. From 8 A.M., to 2 P.M., the return is continuous towards the West. The hours at which the alternate movements terminate, viz., the Westerly at 2 A.M., and 2 P.M., and the Easterly at 10 P.M. and 8 A.M., are indicated also, beyond actual observations, by the means of both the summer and winter half years. There appears less regularity in the periods during the night, than during the day.

The range of diurnal fluctuation appears to be, throughout, greater in the summer than in the winter months. This range is never marked with the Easterly movement, which takes place from 2 to 8 A.M., and the subsequent return. It seems to commence from midwinter, when it is barely perceptible, and daily to increase to midsummer, when the diurnal fluctuation is greatest.

The course of diurnal oscillation at Van Dieman's Land corresponds in all its principal features with that at Toronto, with only one essential distinction, viz., that the hours of Easterly movement at Toronto, are those of *Westerly* movement at Van Dieman's Land, and *vice versa*. The diurnal range is nearly the same at both places, and there is a similar amount of irregularity in summer and winter. The alternate progression and retrogression are as distinctly marked, and the hours indicated by the turning points, or the limit of one movement, and the commencement of the other, are synchronous.

With reference to the diurnal oscillation of the vertical and horizontal forces, the following deductions have been made:—The diurnal oscillation of the latter force, consists in an alternate increase and decrease, forming two maxima and two minima in the twenty-four hours. The principal minimum, or least force, occurs at 10 A.M. in the summer half year, and at noon in the winter half year. The principal maximum is at 4 or 6 P.M., except in midwinter, when the afternoon oscillation is so much reduced in amount, that the other maximum which occurs throughout the year at 6 or 8 A.M., becomes in the months of December and January the principal maximum. The second minimum takes place between 10 P.M., and 4 A.M., during which the force is nearly stationary. The diurnal oscillation of this force appears greater in summer than in winter.

With reference to the former, or the vertical force, the conclusions arrived at are, that the maximum intensity takes place at 6 P.M., and the minimum at 2 or 4 A.M. A second maximum at 8 A.M., and minimum at 10 A.M., are also traceable in some of the months. All variations between the actual position of the bar at any hour, and the normal position at the same hour, (as deduced from the observations made, and recorded, and verified, by monthly means, as to induce these to be regarded as normal positions,) must be set down as the effect of disturbing causes.

*Magnetic Disturbance.* A comparison of the observations at Van Dieman's Land and Toronto, exhibits some connexion between the disturbances of principal magnitude. Generally speaking they are inferior in amount, both in the horizontal force, and in the declination. The fluctuation from one hour of observation to the next, on the average of the whole year, is at Toronto, of the declination, 3.99, and of the horizontal force 000.86. At Van Dieman's Land, they are, respectively, 2.02, and 000.54. The terrestrial magnetic intensity is nearly the same at both stations, the inclination is 70°40 at Van Diemen's Land—75° 10 at Toronto. These assimilations, or, perhaps, more correctly speaking, coincidences, are certainly remarkable, when we reflect on the geographical relations of the two stations of observation, and go to demonstrate that the cause productive of such effects must be uniform in its force and action, and be entirely uninfluenced by any of the ordinary agents which are usually regarded as operating upon, or influencing the climate of a country. Not the least remarkable phenomenon which has received elucidation from these widely dispersed stations of observation, is the great fact, that unusual magnetical disturbances, observed at one station, have also prevailed at, at least, two others; the disturbances being observed, simultaneously, at Prague in the interior of Europe, at Van Dieman's Land, and at Toronto, though modified in intensity, in the particular time in which the action was greatest, and in the element most affected. The connexion, however, appears most distinct between Toronto and Van Dieman's Land. If twenty or thirty of the most disturbed days be selected from both the stations, the days will be found, for the most part, the same at both; and the three days of most remarkable disturbance at Van Dieman's Land, viz., the 2d March, 10th May, and 6th August, were also the most disturbed days at Toronto.

The general prevalence of these magnetic disturbances receives corroboration from the observations made at St. Helena. The mode of manifestation, however, of the magnetic disturbance, being different in low latitudes from that in high, has, probably, been the occasion of a less general notice of them, than if the operation had been uniform. In high latitude great and rapid fluctuation, both in direction and force, appears to be the ordinary and leading characteristic. In the lower latitudes the disturbance partakes of the character of a sustained deviation, either in one direction or the other, from the normal position at the same hours.

As far as regards months of the years, the observations