hourly, a mean of the observations will not give the true daily mean, and certain corrections must be applied to the individual observations, deduced from the known diurnal march of the temperature on that day: to effect this the observations at each hour for a series of years are separately collected into monthly averages, and the means thus obtained are used to furnish by interpolation the normal diurnal march on each day. In this way the normal diurnal curves being constructed for a sufficient number of places on each parallel of latitude, the mean curve for that latitude is found by graphical interpolation, and from the curves of all the latitudes, that for the whole surface of the earth is determined. It is thus that Professor Dove has been enabled to construct his well known isothermal maps, and to announce those striking results which have astonished and delighted all engaged in the pursuit of meteorology: I may refer the reader for information to Humboldt's *Cosmos*, to *Views of Nature*, and to Dove's *Verbreitung der Wärme*, and *Brit. Ass. Reports* for 1847-8.

This principle then of separating the changes of value of the meteorological elements into two classes—periodic—or those which recur in a determinate order,—and non-periodic—or those which may be considered accidental at the period of occurrence, and whose effect is to be eliminated from the mean result—so fertile in results and powerful in analysis, was first brought prominently into notice by Bessel and Gauss, and has since been applied with eminent success by those distinguished philosophers, Dove and Col. Sabine. . . The non-periodic variations are those to which the attention of meteorologists will in future be mainly directed in connection with the whole subject of the windrose, which Dove has shewn to be the key of the great problem of climatology.

To proceed now to the paper which is the subject of this letter.

The first table given by Colonel Sabine, contains the temperature of each hour of the day, arranged in monthly means on the average of six years, from 1842 to 1848, and from this by Bessel's formula, he has calculated another table giving the corrections to be applied to the observed temperature at each hour of the day, for every five days throughout the year in order to deduce the mean temperature of the day, thus forming the normal diurnal march. His interesting remarks upon this table I give in full, but the limits of this note compel me to omit his novel and ingenious idea of chrono-iso-thermal curves.

"From the temperatures computed from the six years of observation we learn many facts regarding the temperature at Toronto which are interesting in themselves and may become particularly so in their comparison with the phenomena in other parts of the Globe.

"Amongst these may be noticed the following:—The mean annual range, or the difference between the mean temperatures of the coldest and the hottest month, (February and July) is 42°.7. The warmest day of the year is July 28, being thirty-seven days after the summer solstice, the coldest day is February 14, being fifty-five days after the winter solstice. The mean temperature of the year is passed through on April 19th and October 15th. The warmest and coldest days, and the days on which the mean temperature is passed through, deduced by a similar process at Konigsberg by Bessel, at Paris, Turin, and Padua by Kamtz, at Berlin by Mädler, and at Prague by Fritsch and Jelinek, are collected by the last named meteorologist in his memoir,—*On the daily march of the principal Meteorological elements, deduced from hourly observations at the Prague Observatory*, published in the Transactions of the Imperial Academy of Sciences at Vienna in 1850, and are as follows:—

	Maximum.	Minimum.	Days on which the mean temperature of the year is passed through.
Konigsberg	August 1	January 9	April 21...October 20.
Berlin (18 years)	July 18	January 19	April 19...October 21.
Berlin (92 years)	July 22	January 12	April 17...October 16.
Prague (8 to 9 years)	July 24	January 26	April 16...October 20.
Prague (76 years)	July 23	January 19	April 15...October 18.
Paris	July 28	January 15	April 18...October 19.
Turin	July 27	January 3	April 18...October 26.
Padua	July 26	Jafiuary 15	April 20...October 15.

These may be compared with the corresponding epochs at Toronto as derived respectively from the six-years and the twelve-years series discussed in this paper.

Toronto (1842.5 to 1848.5)	July 28	Feb'y. 14	April 19..October 15.
Toronto (1841 to 1852,)	July 28	Feb'y. 12	April 25..October 17.

The anomalous character of the North American Winter, so visible in the Chrono-iso-thermal Plate is also marked by the very late occurrence of the epoch of the *minimum* temperature, and the great dissimilarity in that respect from all other stations. The systematic character of this anomaly is further shown by the fact that every hour in the twenty-four has its minimum temperature between the 7th and 17th of February; the minimum occurs earliest, viz., on the 7th of February, at the hour of 2 P. M.; the minima of the hours of the night, or from 9 P. M. to 7. A. M. inclusive, fall the latest, viz., on the 15th, 16th and 17th of February; those of the intermediate hours on the intermediate days and in regular progression. The hours from 6 A. M. to 9 P. M. inclusive, or those of the *day*, have their maximum temperature between the 20th and 30th of July; those of the *night* or from 11 P. M. to 5. A. M. inclusive, from the 3rd to the 12th of August. The portion of the twenty-four hours which is warmer than the mean temperature of the day varies considerably at different seasons; in part of November there are fourteen of the observation hours colder, and only ten warmer than the mean temperature of the day; in the greater part of July twelve of the observation hours are colder and twelve warmer; and in all the rest of the year thirteen hours are colder and eleven warmer. On the average of the whole year the mean temperature is passed through about 8h. 31m. A.M., and 7h. 44m. P.M., making intervals of 11h. 13m. and 12h. 47m. The hours from 9 P. M. to 7. A. M. inclusive, are throughout the year colder than the mean temperature of the day; those from 10 A. M. to 7 P. M. are throughout the year warmer than the mean temperature of the day; 8 and 9 A. M., and 8 P. M., are sometimes warmer and sometimes colder than the mean temperature: 8 A. M. is colder except for about three weeks in July, and 9 A. M. is warmer except from November 20 to March 11; 8 P. M. is colder from the middle of March till late in November, and either coincides with the mean temperature, or is slightly warmer during the remainder of the year.

The hours of the highest and lowest temperature on every fifth day of the year, and the amount by which the temperature at those hours exceeds or falls short of the mean temperature of the day may be examined in detail in the Table. From the third week of September until April, 2 P. M. is the warmest hour, with the exception of some days in January and February, when 3 P. M. is warmer: from April to the middle of May, and again from the end of July to the middle of September 3 P. M. is the warmest hour; and from the middle of May to the middle of July, 4 P. M. The coldest hour from the latter part of April to the end of June, and again from the end of October to late in November is 4 A. M.; from the middle of July to the middle of October, in January, and for a short time in the middle April it is 5 A. M.; from the latter end of February to early in April it is 6 A. M.; and generally in December and February 7