Royal Meteorological Society

WINTER TEMPERATURES
in
TORONTO

by
M.K. Thomas

CANADIAN
BRANCH

25¢

VOL. 4 NO. 3

Published by

ROYAL METEOROLOGICAL SOCIETY, CANADIAN BRANCH

Copies of this publication at 25¢ each are obtainable by writing to:

The Secretary,
Royal Meteorological Society, Canadian Branch,
315 Bloor Street West,
Toronto 5, Ontario.

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Presented at the regular monthly meeting of
the Royal Meteorological Society, Canadian
Branch, Toronto, Thursday, March 26, 1953.

ERRATA

Page 9: References No. 3: for "100 Years Ago" read "110 Years Ago"

Page 10: No. 6: for "from 1814 to 1852" read "from 1841 to 1852"
No. 9: for "1834" read "1884"

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ABSTRACT

A continuous record of daily temperature is available for Toronto since 1841. The averages, extremes, and the frequency of extremes for the winter months are listed and discussed. The significance of the position of Toronto in the zone of the westerlies and in the Great Lakes region is noted and comparisons are made with stations of similar latitude. Long term temperature trends and the differences between downtown and suburban temperatures are considered.

INTRODUCTION

The urban area of Greater Toronto extends some 25 miles in a NE-SW line along the northern shore of Lake Ontario. The breadth of the urban development increases from a mile at the eastern and western fringes to about 15 miles in the central portion. In general, the region is a plain which slopes towards the lake and is cut by several southward-flowing streams. The two largest of these, the Don and the Humber rivers, lie in well-marked valleys and ravines. Elevations above sea level (Fig. 1) increase from the mean lake level at 245 ft. to above 700 ft. which is reached some 15 miles north of the lake.

Temperatures were first observed and recorded in Toronto during the early 1830's, but the official continuous record begins with the founding of the Magnetic and Meteorological Observatory late in 1840 (1, 2, 3). The location of the Observatory has changed only slightly over the years, the original site being within a mile of the present Observatory which was established in 1909 at 315 Bloor Street West. Temperatures have always been taken at a level of four feet above the ground, at first from a north-wall screen exposure and now from a standard Stevenson screen.

While the Observatory site has remained quite constant geographically over the 112 years, the environment has changed considerably. Originally, in the early 1840's, the Observatory was on the northern outskirts of a small military and commercial town of about 20,000 persons. By 1880 the Observatory had been enveloped by a city of 100,000 inhabitants. Industrial and residential growth became more rapid until at present the urban population is well over a million people.

Except for purposes of comparison, all temperatures shown in this paper have been taken from the records of the Toronto Observatory, although there have been several climatological stations where extremes of temperature are recorded daily. Three of these stations have continuous records of more than 20 years although two of them, Wexford (1912-29) and Toronto Island (1905-27), are now closed. Agincourt, with a continuous record since 1911, and Brampton (starting in 1943), Clarkson (1949), East York (1952), Islington (1952), Admiral Road (1949), South Leaside (1951) and Woodbridge (1948), constitute the list of climatological stations now in operation.

A station called East Toronto was in operation from 1907-11 and again in the late 1940's and temperatures were recorded in 1906-07 at Scarborough. The tenth temperature reporting station now in operation in the Greater Toronto area is at Malton Airport where a complete meteorological observing and forecasting station was established in the late 1930's. Two additional stations, Toronto Island and Unionville, have been authorized and are expected to start observing in the spring of 1953.

In this study, the term "winter" will imply the winter season of December, January and February. Any average winter temperature shown will be the mean temperature for these three months. However, since sub-zero temperatures have been experienced in November and March and as there have been as many as 15 degrees of frost in October and April, these months will be included in many of the charts and tables. This seven-month period might be considered the "winter period" as compared to the three-month "winter season". The units of temperature used throughout the paper are degrees Fahrenheit.

AVERAGE AND EXTREME TEMPERATURES

At Toronto, the coldest days of the winter are on the average during the first week of February when the average daily temperature is 21°F. However, there is great variability from year to year and the coldest portion of a winter may occur any time from early December to early March. Nor do the daily temperatures slowly decrease day after day to the minimum and then gradually rise again in spring. Fig. 2 shows the daily mean temperatures for the winter of 1950-51. In that winter, the coldest days were February 8th and 9th, although these days were flanked by days well above normal temperature. In the winter of 1951-52 the coldest day was January 29th, while in 1952-53 it was December 28th. For comparison the daily normal temperatures are shown by the smooth curve. These normal temperatures were derived by smoothing a curve through the long-term averages for each day.

The lowest official temperature in Toronto since 1841 is -26.5°, which was reported on January 10th, 1859. December and February have also experienced temperatures below -20°. The lowest in these months is -26° on February 5th and 6th, 1882, and -22° on December 29th, 1933. Since 1841, there has been a total of 16 months during which temperatures of lower than -20° have been reported on at least one day. It must be remembered though that these are the extremes. In fact, the average annual minimum temperature is only -11°. Taking a day over the 24-hour period, February 8, 1934, has the dubious distinction of being the coldest day on record at Toronto--the average temperature for the day was -16°. Considering periods less than a month, one of the coldest periods in Toronto was Feb 6-15, 1875, when 8 days out of 10 had mean temperatures less than zero.

Recently in the United States, Court (5) has used the Theory of Extreme Values to derive a method for obtaining the lowest temperature to be expected in one hundred years through the use of only thirty years of data. Use of the equation with Toronto minimum temperature data for the period 1921-50 gives an expected minimum of -34°. Used with 1851-80 data the expected minimum is -35°. These values are almost identical and are several degrees lower than the 112-year record low of -26.5° at Toronto. Court points out that there are similar situations in the United States and that in some localities local influences restrict temperatures so that the annual minimums do not follow the theory of extreme values. The moderating influence of the Great Lakes is believed to be the factor which restricts Toronto's annual minimum temperatures.

On considering extreme temperatures in the winter season, it is always interesting to examine the frequency of days below certain critical temperatures. Tables 1 (A) and 1 (B) are based on minimum and maximum temperatures for the 1941-50 period and show the average number of days when temperatures remained below 30°, 20°, 10° and zero, respectively. These tables are self-explanatory and point out the extreme severity of February followed by the rapid warm-up in March. These tables may also be considered as probability charts for future winter months.

The results of this examination are used in the construction of Fig. 3 where the probable number of days with maximum and minimum temperatures below certain values can be found. Assuming a uniform distribution of temperatures, it is easy to read off the approximate annual number of days with extreme values below any temperature between 30° and zero.

Table 2 shows the average and extreme conditions in Toronto for the 112 years of record on a monthly basis*. It at once shows the average conditions in any month and the wide range of temperature which has taken place. The extremes of monthly mean temperatures are shown in Fig. 4

* In order to discuss average temperature adequately, the days must be grouped together into units such as weeks or months. Since monthly statistics are readily available, these are used here. Unfortunately this may obscure the temperature regime of a month. A winter month may have temperatures above average during the first half and below during the second half but the monthly figure would show only a normal month. Also there are undoubtedly some 30-day periods, part in one month and part in the following month which, if the days were entirely in one calendar month, would increase the range of average monthly temperatures somewhat. However, the present monthly system is convenient and the longer the period of observations, the better the system becomes.

along with the year of their occurrence. January, the most variable, has averaged as low as 10° in 1857 and as high as 35° in 1932. It is also interesting to note that there has been an April colder than some Decembers or Januarys. Of the 112 winters on record, February was the coldest 54 times, January 49, December 6 and March 3 times.

Toronto mean temperatures have been calculated by different methods over the years, but have since been standardized to the system currently in use. In the early years, the mean daily temperatures published were the average of combinations of hourly temperatures with certain corrections applied for the diurnal variation. Diurnal and other variations in temperature at Toronto were the subject of a paper given by Sabine (6) at a meeting of the Royal Society in London one hundred years ago (February 10, 1853). This paper was reviewed and commented on by Professor Cherriman (7) before the Canadian Institute in Toronto later that spring.

From 1880 to 1940 the mean was the average of the 24-hourly observations taken by photographic methods and since 1935 the average of 24-hourly observations on the mercury-in-steel thermograph. Values obtained by these methods are regularly checked against mercury thermometers.

All monthly mean temperatures, as they appear in the Monthly Meteorological Summary of Toronto and this paper, have been adjusted to the present basis. This was done by Monsinger and Connor several years ago, utilizing the mean daily maximum and minimum temperatures. The magnitude of the difference between the mean of the 24-hourly observations of the calendar day and the standard Canadian climatological method, i.e., the mean of the maximum (day ending at 0730 E. the next day) and the minimum (day ending at 1930E.) is not great. Between 1941 and 1950 winter temperatures would have averaged 0.1° lower at Toronto using the climatological station method instead of the present 24-hourly method.

In an attempt to find if the distribution of mean winter temperatures at Toronto was normal, the frequency that each mean winter temperature occurred was obtained. Grouped in three-degree intervals these are plotted as a frequency histogram in Fig. 5. The mean and standard deviation were calculated and the theoretical normal curve drawn. If the distribution of the 112 temperatures had been normal there would have been 75 winters with mean temperatures in the interval 27.7° to 21.1° (i.e. $M_x \pm \sigma_x$). There were actually 78 which indicates that the distribution of mean winter temperatures in Toronto is near normal.

In dealing with arithmetic means of temperatures, it is quite easy to assume that there are equal numbers of very warm and very cold days in any month. In a study of abnormally high and low daily mean temperatures at Toronto, Longley (8) classified each day as warm, cold, very warm or very cold. Percentage frequencies of the very cold (15° or more below the average temperature for each day) and very warm (15° or more above) have been computed and are shown in Fig. 6. Here it can be seen that although there is about a 12% probability of a very cold day in winter, the probability of a very warm day is only about 4%. Accordingly, there will be a much greater probability of a day with a slightly above normal temperature than slightly below normal. It can also be seen that this is a particular winter situation as in the months of April and October the trend is reversing and in the summer months, there is a greater probability of very warm days compared to very cold days.

As might be expected from a short glance at Fig. 2, it is difficult to find a winter day in Toronto when the temperatures are what might be called "typical". Even if the mean daily temperature is near the normal value, the trend throughout the day may be completely abnormal. In fact, a brief survey of recent Januarys shows that at least a third of the days exhibit abnormal trends. Fig. 7 shows the average hourly temperatures for January (curve A) as compared to some individual days. Usually, minimum temperatures are reached just after dawn and maximum temperatures in the early afternoon, and most days exhibit this trend. There are three main types of abnormal days shown by curves B, C, and D. Curve B shows an isothermal day when there is little change in temperature over the 24-hour period while C shows a day with almost-continuous falling temperatures, and D is a day with rising temperatures.

FACTORS INFLUENCING WINTER TEMPERATURES

The position of Toronto places it well within the latitudes which are known as the "westerlies". The general circulation of the upper atmosphere is practically always from west to east with the different air masses usually moving over the region from the northwest, west, or southwest. The surface winds are much more variable, although westerly and southwesterly winds predominate. This variability of winds at the surface is caused by the cyclonic and anticyclonic circulation around the migrant pressure systems while they move across the region from west to east. When these systems are moving rapidly, the Toronto region is treated to frequent changes of air mass and sometimes to pronounced changes of air temperature. On the other hand, when the pressure systems are relatively static in their movement, Toronto has several days with almost uniform temperatures. When there are many days or weeks at a time with a relatively constant pressure pattern, large departures from the normal temperature may occur.

A measure of the variability of winters can be shown by examining an average temperature map and finding the latitudinal variation of Toronto's winter temperature. The warmest winter on record at Toronto was experienced in 1931-32 when the average temperature in December, January and February was 33°. This is the average for much of the State of Maryland, 375 miles to the south. On the other hand, the coldest winter was that of 1874-75 when the average temperature was 17°, the average condition in the Muskoka area some 100 miles north of Toronto. Thus Toronto's winter temperatures have varied by an amount equal to that ordinarily obtained by travelling 500 miles latitudinally. It also shows that the average temperature gradient is much greater north of the city than to the south. Fig. 8 is a map showing average winter temperatures over an area within 500 miles of Toronto.

Second only to the influence exerted by the general circulation on winter temperature is that of the Great Lakes. Cold air arriving at Toronto from any direction other than directly from the northeast has already passed over a portion of these water surfaces, which remain open for most if not all of the winter. In December and January, after an influx of fresh cold air, temperatures in the lee of the lakes are sometimes 20° to 30° above those reported from stations to the west of the lakes. Because of this the average coldest period of the winter is delayed until the first week of February, some five to six weeks after the winter solstice.

This early winter temperature lag is illustrated by comparing Toronto average monthly temperatures with similar months at La Crosse, Wisc. (500 miles west) and St. Johnsbury, Vt. (450 miles east) both at about the same latitude as Toronto. The comparison (Table 3) shows that late in October, temperatures at the three localities all average about 45°, but during the next three months, temperatures at Toronto fall much more slowly than at La Crosse and St. Johnsbury. By January, Toronto averages 23° and the other two 16°. In February, Toronto continues to drop a little while the two more continental locations begin to show a rising temperature trend. Over the three-month winter season, Toronto averages about 6° higher than it would, were it not for the Great Lakes. By mid-April, La Crosse is up to 47° while Toronto and St. Johnsbury are only 42° illustrating again the lag produced by the lakes at Toronto and to an extent, the more northwesterly circulation at both eastern stations in the spring. Since Toronto is about 300 ft. lower than the other two stations, a difference of about 1° might be expected by topographical control alone; so it is evident that the 6° winter difference expresses a truly significant lake control factor. A very good discussion of the effect of the Great Lakes on temperatures at Toronto and throughout Southern Ontario was written by Mouat (9) and published in 1884.

The third factor influencing Toronto winter temperatures is the "Föhn" effect due to topographical control. Air arriving in Toronto from the west-through-northeast must descend at least 300 ft. in the last 15 to 20 miles. This factor is frequently obscured in discussing Toronto temperatures since attention is usually focussed on the lake and city control. However, this control probably increases Toronto's temperatures in winter by at least a degree when the air movement is from the west and north sectors. The fourth control factor is the influence of the large urban area of the city and this will be discussed in the section on temperature trends.

LONG TERM TEMPERATURE TRENDS

As already shown, Toronto's wintertime temperatures can vary widely from day to day, from month to month and from year to year. It then becomes interesting to examine the records to see if any long-term temperature trend is in evidence. For this purpose, Fig. 9 has been made. This figure shows the ten-year moving-average temperatures which are plotted on the final year of each period.

The first years of record averaged slightly above 24° but the winters became colder reaching a minimum in the winters of the early 1860's of just a little above 22°. For the following 30 years, there was little change with the moving mean fluctuating about 23.5°, but a rising trend began in the 1890's. This period was followed by somewhat lower temperatures and led Stupart (10) to conclude in 1917 that any upward winter tendency is not very noticeable in the past twenty years. But beginning about 1920, a spectacular rising trend began which almost reached 27° in the decade 1924-33, and then levelled out to average 26.5° until 1941. In the 1940's, the winter temperatures were definitely lower, averaging about 25°. The trend line based on 110 winters is also shown. This has been calculated by the Method of Least Squares and indicates an increase of approximately 3° per century.

Thus, after 110 years of observations, the temperatures in winter have been averaging much the same as they did in the 1840's (e.g.: 1842-51, 25.0°; 1942-51, 25.7°), although the ten-year mean has varied from 22.4° to 26.8°. The two most recent winters, though, have ranked as the 14th and second warmest on record and the trend has again been sharply upward. The ten-year moving mean now stands at 26.7° and the mean is second only to that at the end of the winter of 1932-33, when the ten-year moving mean was 26.8°. With the growth of the city from some 20,000 persons in the early 1840's, to a metropolitan area of nearly 1,200,000 inhabitants today, one might expect a considerable increase in winter temperatures due to the increased artificial heat and to the blanket effect of atmospheric pollution. This city-effect is shown to a degree by comparing the trend at Toronto with a long-term rural station in Ontario which dates back to 1876. Fig. 10 shows the winter trend line at Toronto compared to such a station--Beatrice--and indicates that in the past 70 years, the "city effect" has added perhaps less than one degree to average winter temperatures in Toronto. As supporting evidence to this surprising fact reference must be made to Thomson (11) who found that in comparing the records for Toronto and Paris (Ontario) for the period 1890-1930, the difference remained almost constant over that period despite the great increase in the population of Toronto.

A more spectacular trend for Toronto winter temperatures is shown in Fig. 11. This figure shows a plot of the five-year averages of winter temperatures and total heating season (September 1st through May 31st) degree-days. A degree-day is defined as the number of Fahrenheit degrees that the mean temperature for any day is numerically less than 65°. The total for any heating season is then the sum of all the individual daily degree-days. Since 1870, winter temperatures have been increasing at the rate of 4.4° per century compared to the rate of 3° per century during the long 1840-1951 period. As seasonal degree-days are based on a nine-month period, it is interesting to note that the warming up trend is just as evident over this nine-month period as it is over the shorter three-month winter season. Based on degree-days since 1870, the rate of warming up is 1300 degree-days per century or 0.2 per cent per year. The equations of the trend lines as computed by the Method of Least Squares are shown in Fig. 11.

Reference to Fig. 4, which shows the highest and lowest monthly mean temperatures, is also indicative of the generally higher temperatures since 1900. The highest monthly temperatures for each winter period month have all occurred since 1920, while the record low months were all prior to 1890.

TORONTO AND SUBURBAN TEMPERATURES

The paper thus far has dealt with temperatures from one location only, at or near 315 Bloor Street West. A study of suburban temperatures clearly shows that winter temperatures in the city and along the lake are higher than those in the inland suburban area and the surrounding country. Fig. 12 shows a map of the Toronto area on which the average and extreme low temperatures for the winter season of 1950-51 are plotted. At the rural or small town locations of Brampton, Malton Airport, Woodbridge and Agincourt, the average temperatures were about 24° and the extreme low between 14 and 16 degrees below zero. In the centre of the urban development at the official Toronto station, the average was 28° and the extreme low 5 degrees below zero. The suburban climatological station in East Toronto was a little colder with an average of 27° and an extreme of 9 degrees below zero, while Clarkson shows the effect of its nearness to the lake with an average of 28° (the same as Toronto) and an extreme low of minus 7°.

An examination of similar maps for the two most recent winters shows the same pattern. The map for 1951-52 is almost identical to that for 1950-51 while temperatures were much higher in 1952-53. In this past winter the contrast was not so great between city and country. Usually extreme minimum temperatures are 10-15° lower in the outlying areas than in mid-Toronto but this year they were only 5-10° lower.

From these examples, it can be seen that winter temperatures in the Toronto area are controlled locally by the proximity to the lake, by the elevation control and by the "city effect". This is shown further by the mean monthly temperatures in Table 4. The averages for these stations have all been standardized to the thirty-year period 1911-40. The climatological station at Lakeside Home on Toronto Island recorded equal or higher temperatures than Toronto in the early winter, but lower in the late winter and early spring. At Agincourt and Wexford, temperatures were lower throughout the whole winter season. The comparison of average daily maximum and average daily minimum temperatures at Malton Airport and Toronto (see Table 5) shows a larger difference in minimum temperatures than in maximum. In February, there was a difference of more than 5° in the minima and only 3° in the maxima. This is characteristic of the whole winter period.

Another interesting comparison between city and rural temperatures has been found in recent studies of design temperatures for the construction and maintenance of buildings and equipment. To obtain winter design temperatures, hourly temperatures in January were studied for the decade 1941-50. A winter design temperature -1% basis is the temperature at or below which occur 1% of the January hourly outdoor temperatures. At each of the 1, $2\frac{1}{2}$, 5 and 10% levels, the Malton design temperatures are about 4° lower than the corresponding ones for Toronto. The temperatures are as follows: -1% level Malton -9°, Toronto -4°, $2\frac{1}{2}$% level -4° and 0°, 5% level 1° and 5° and 10% level 6° and 10°.

An interesting investigation regarding the distribution of air temperature in Toronto was carried out some years ago by Middleton and Millar (12). They attached an electrical resistance thermometer to an automobile and in different seasons and under different meteorological conditions made several trips from the lakefront directly to a point 8 miles north. The results of one trip on a clear, almost calm, night in winter were most spectacular. Although the temperature only dropped from 16° to 8° in the first 7 miles, it then dropped to -17° in a valley bottom. This 25° difference in temperature between the bottom of the valley and its crest was the result of excellent meteorological conditions for radiative cooling and good air drainage. It is by no means representative of the average wintertime conditions but, undoubtedly, average minimum temperatures are lower in the ravines and valleys of the Toronto area than on the hills and plains.

ACKNOWLEDGEMENTS

A study such as this is made possible only by the existence of a complete and well-kept set of records. Such records are available for the Toronto Meteorological Observatory and their excellence reflects much credit on the observers, past and present. The help of the present observer Mr. J. McGowan is gratefully acknowledged. Appreciation is also expressed to Mr. A. Thomson, Controller, and to Mr. C.C. Boughner, Mr. R.W. Longley, and other members of the Climatological Section, for their suggestions and help.

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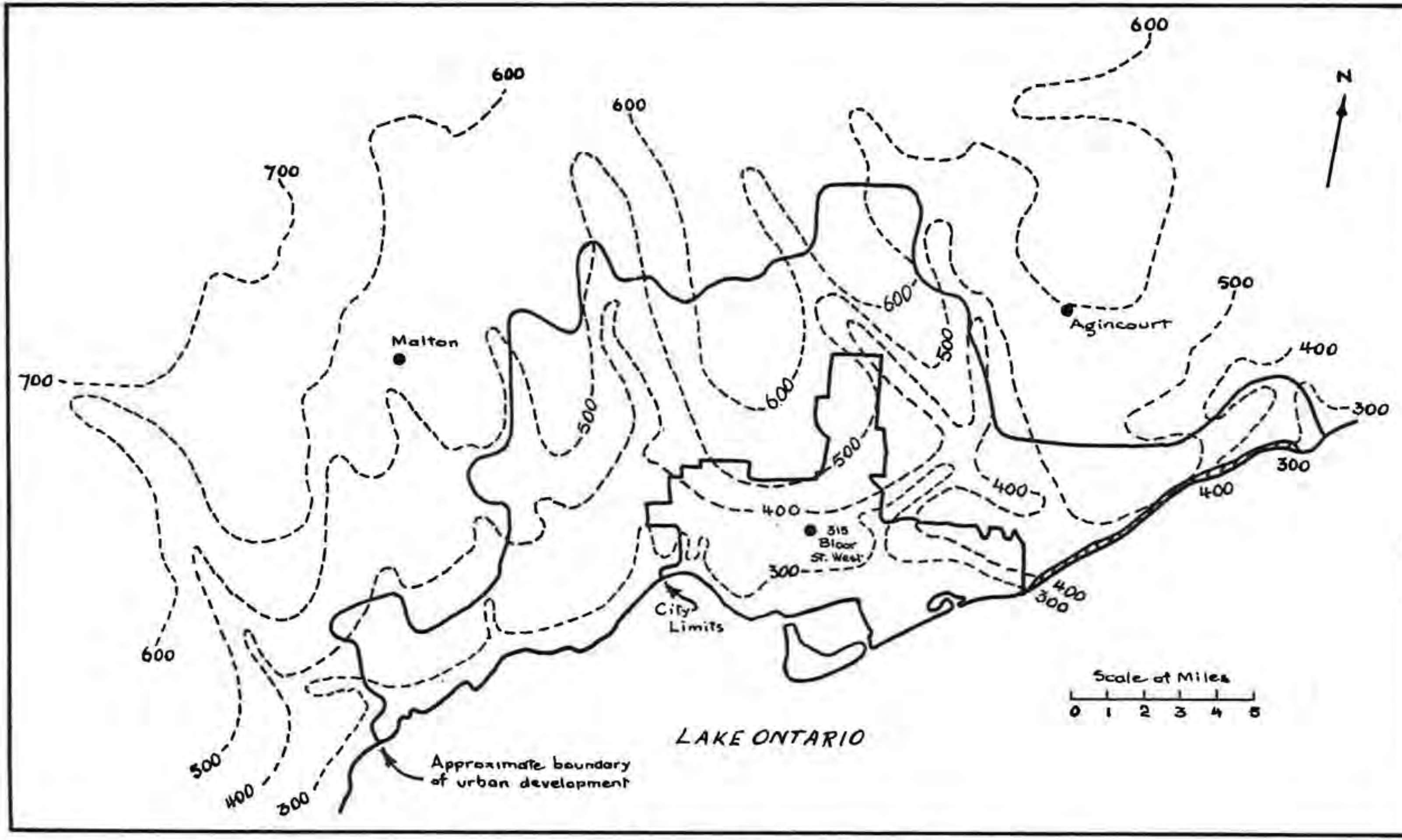

Fig. 1 - Contour Map of Toronto Area

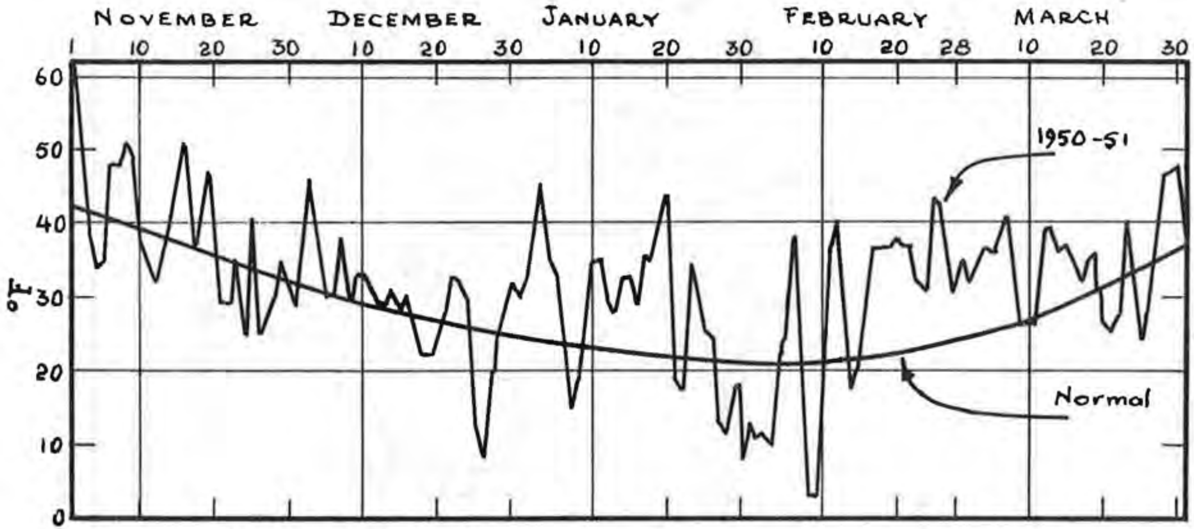

Fig. 2 - Average Daily Temperature during the winter of 1950-1951 as contrasted to the Normal Daily Temperature.

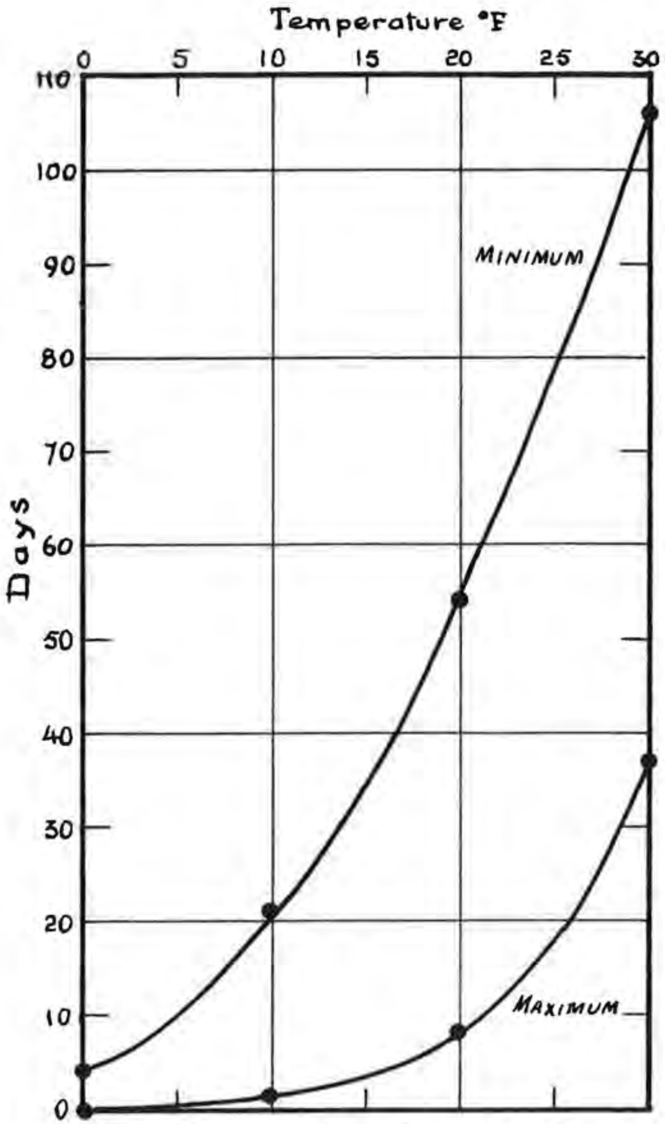

Fig. 3 – Average annual number of days with extreme temperatures less than any value between 0° and 30° (based on 1941-50 data).

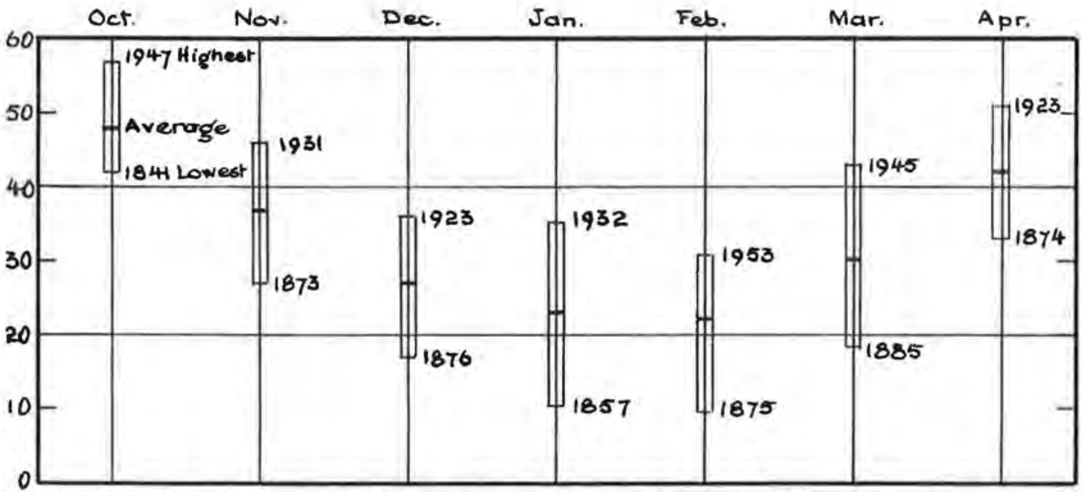

Fig. 4 – Average monthly temperatures (1841-1950) compared to the highest and lowest monthly means. The years of the warmest and coldest months are shown.

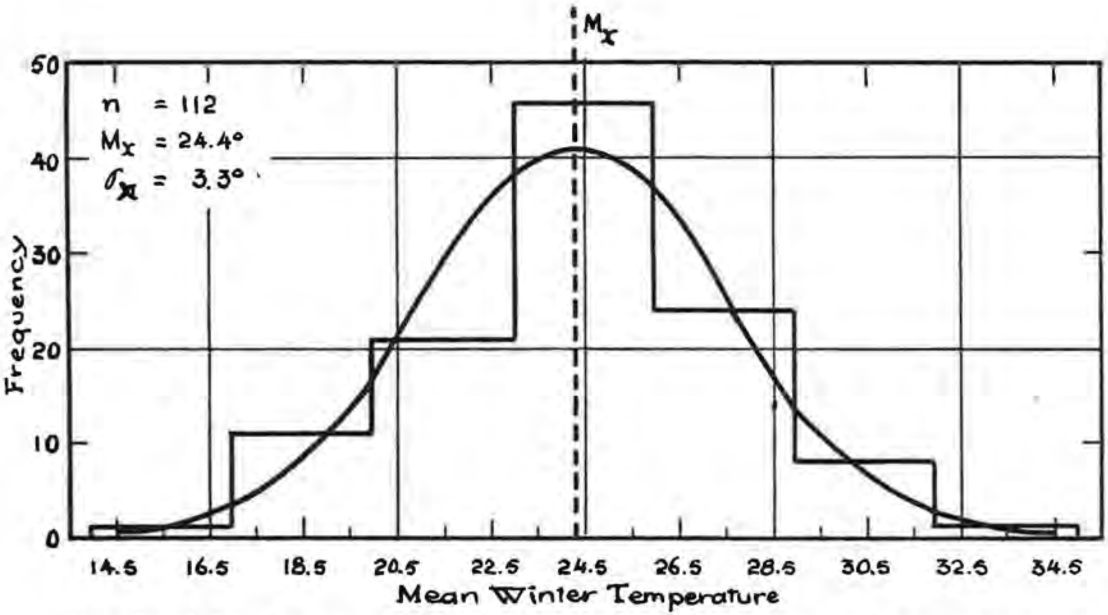

Fig. 5 - The frequency distribution of mean winter temperatures at Toronto, 1841 - 1953. The histogram shows the actual frequency in each temperature interval and the theoretical curve is based on the mean and standard deviation.

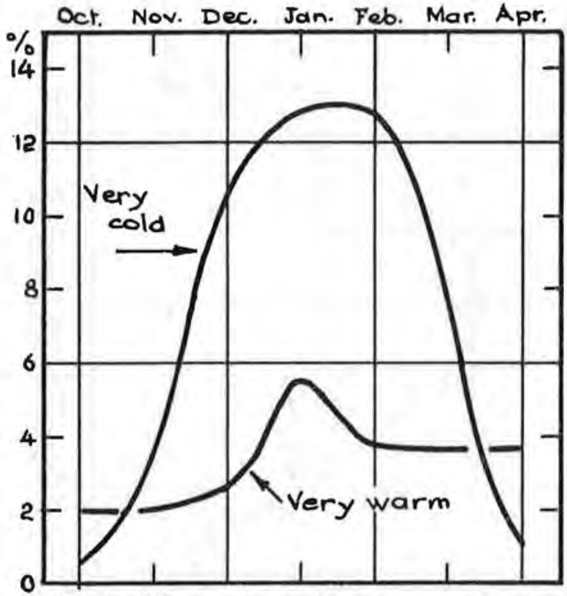

Fig. 6 - Percentage frequency of very cold and very warm days at Toronto, 1841-1940. (Adapted from Longley)

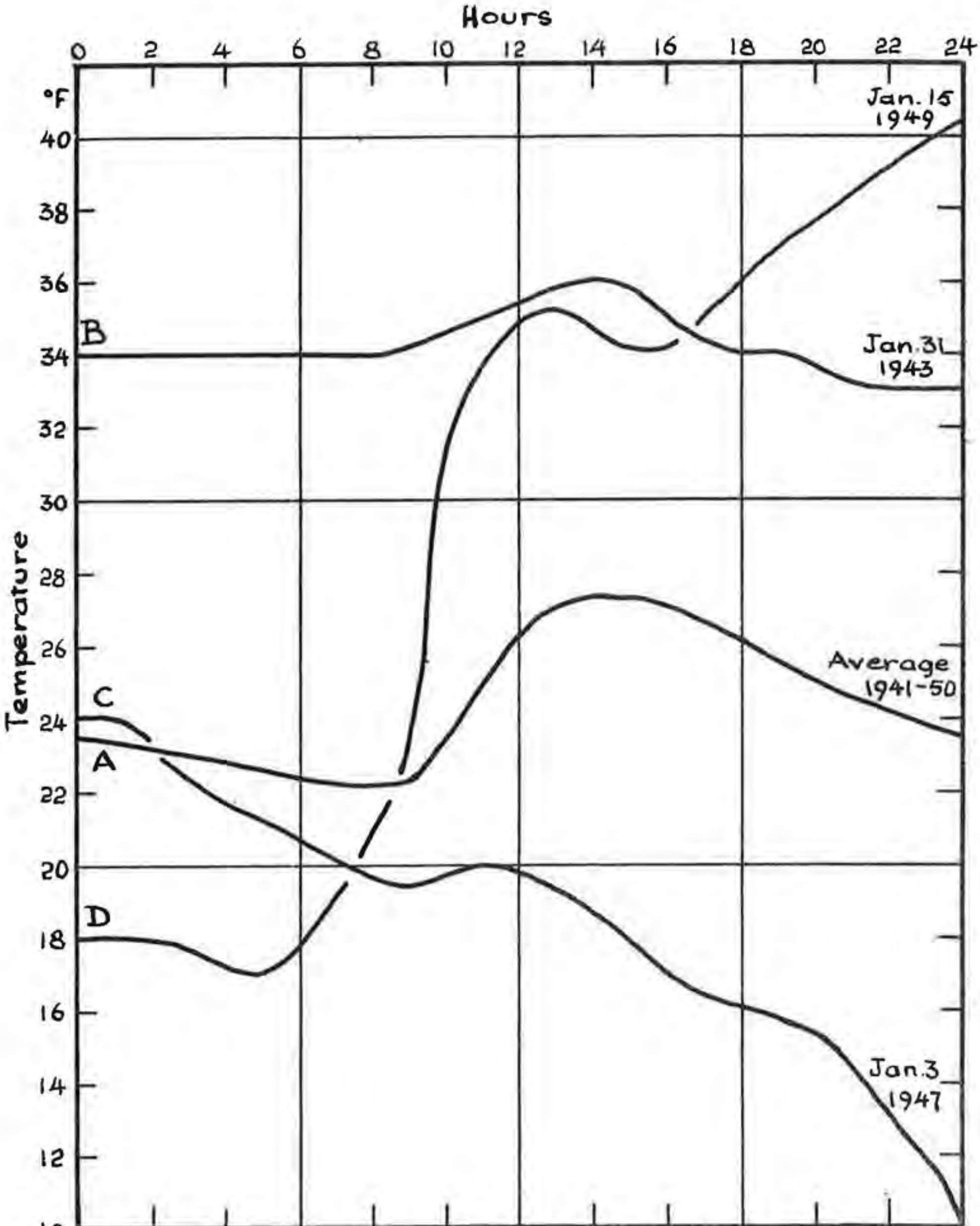

Fig. 7 - Average hourly temperatures in January as compared with three individual days.

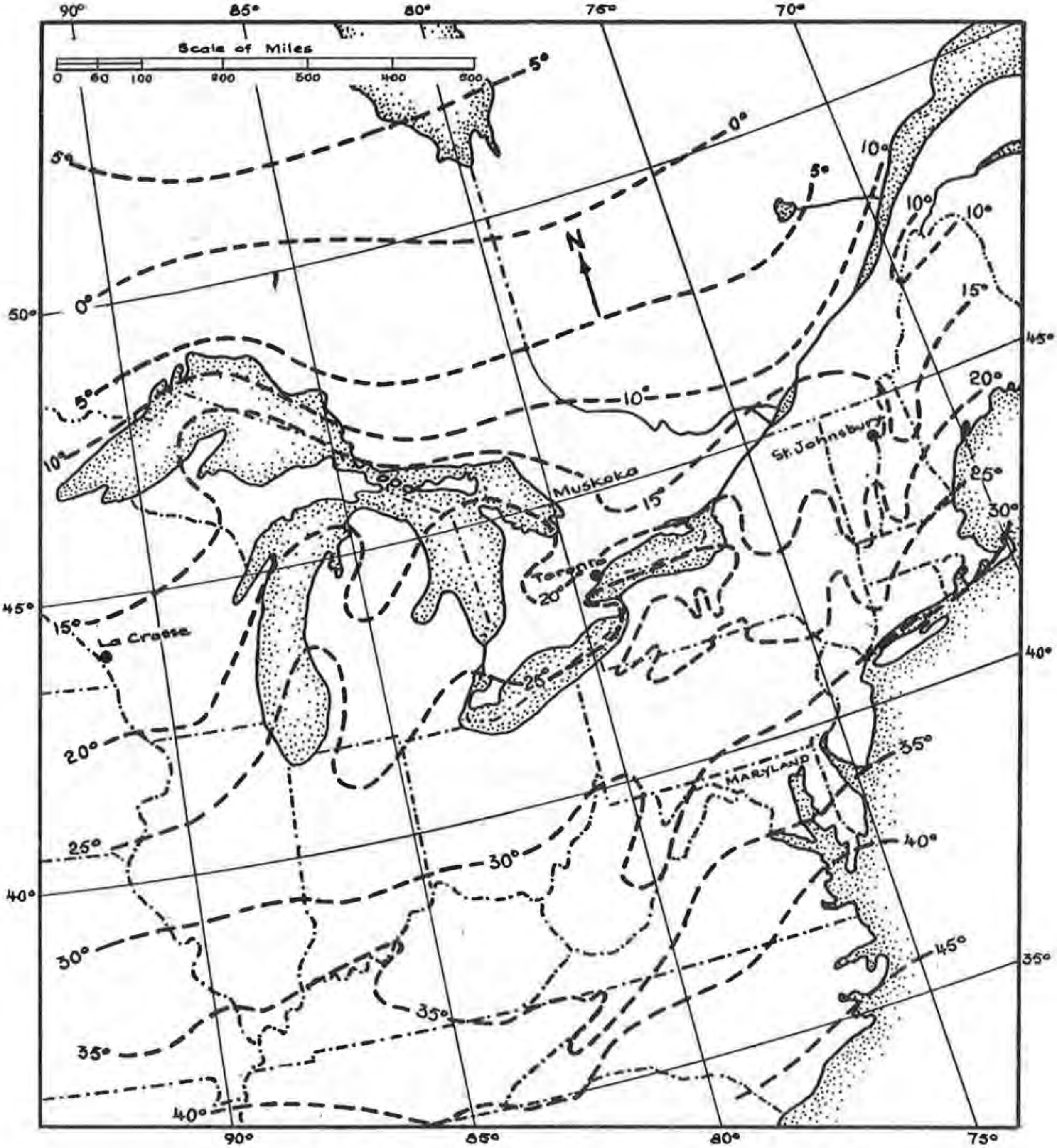

Fig. 8 - Average Winter Temperatures (Dec., Jan., Feb.)

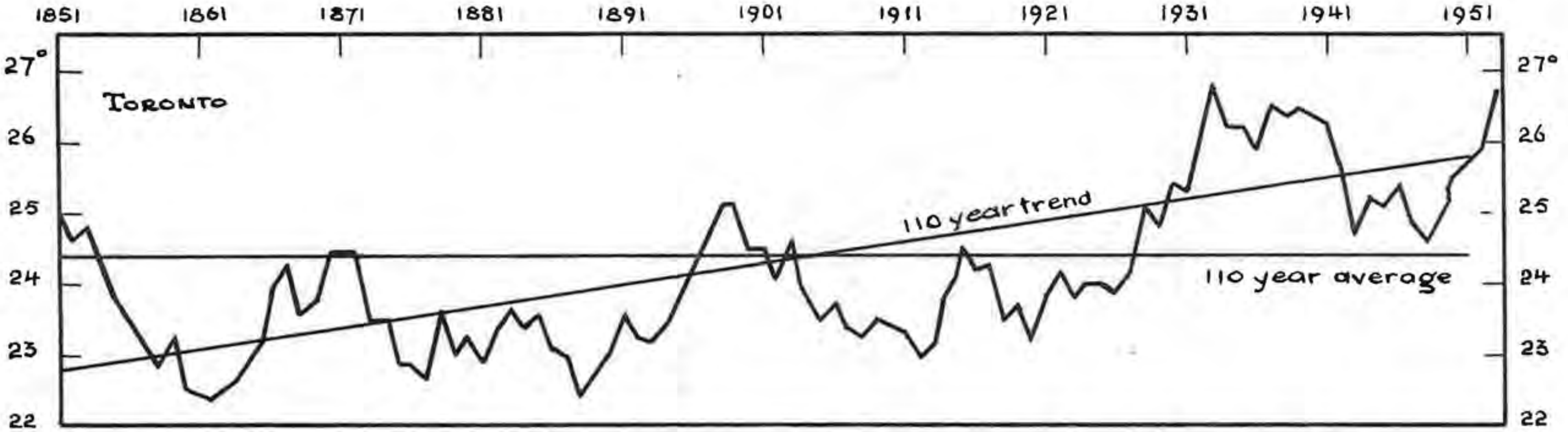

Fig. 9 - Ten year moving average of winter temperatures plotted on final year of each period. The 110 year trend line is also shown.

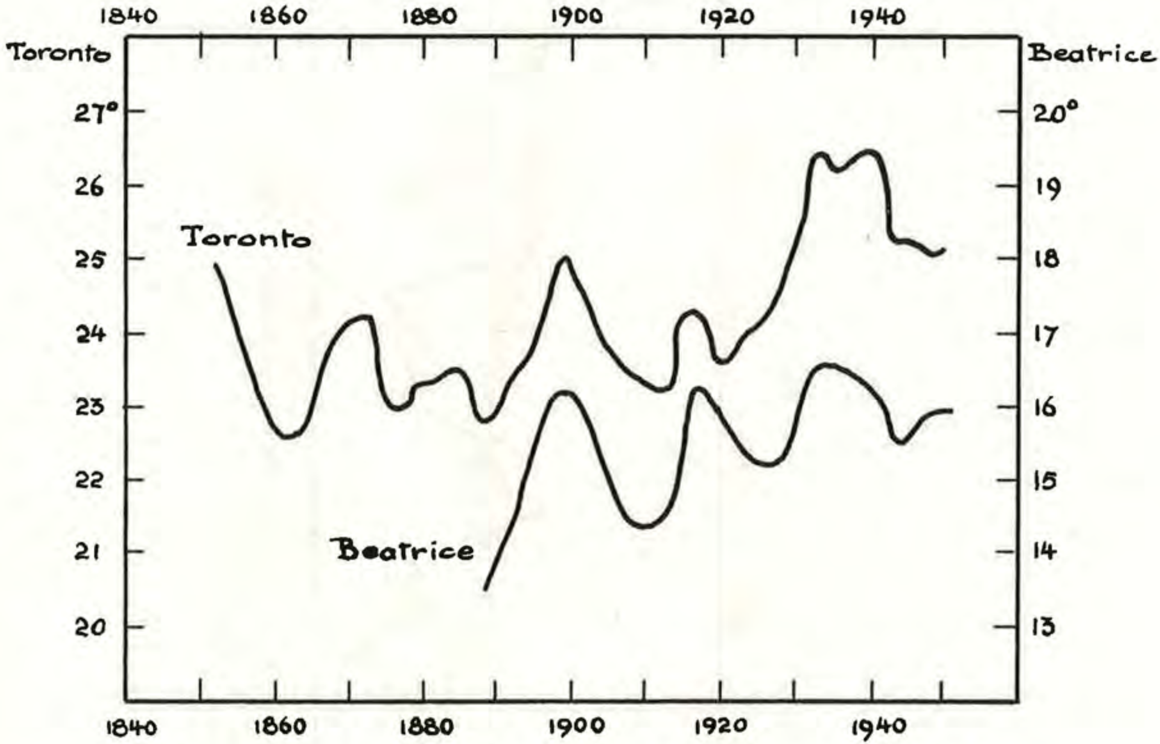

Fig. 10 - Smoothed ten-year moving averages of winter temperatures at Toronto and Beatrice.

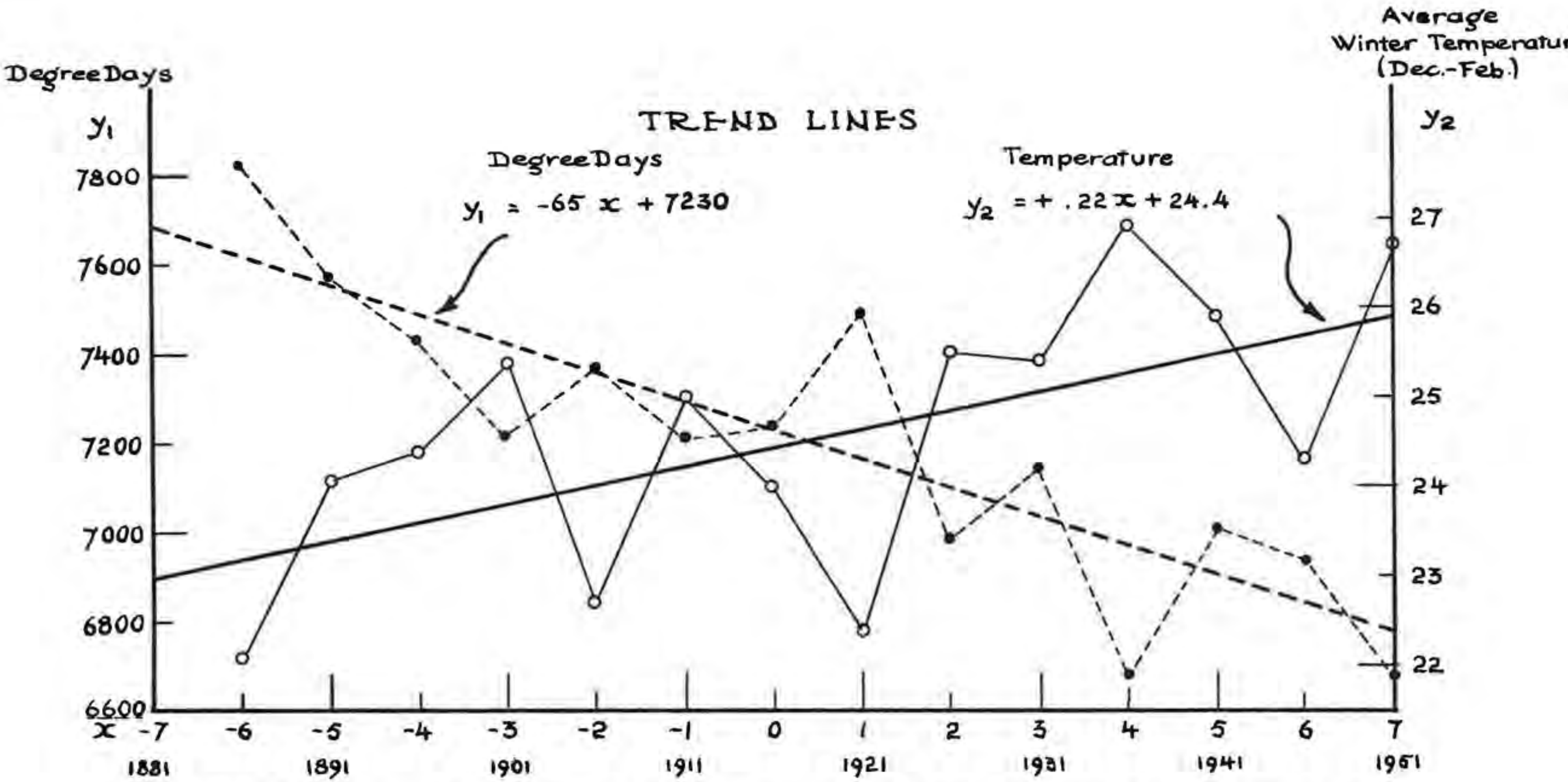

Fig. 11 - Five-Year Averages of Winter Temperature and Seasonal Degree Days at Toronto from 1880-81 to 1950-51. The seventy-year trend lines are shown by heavy lines.

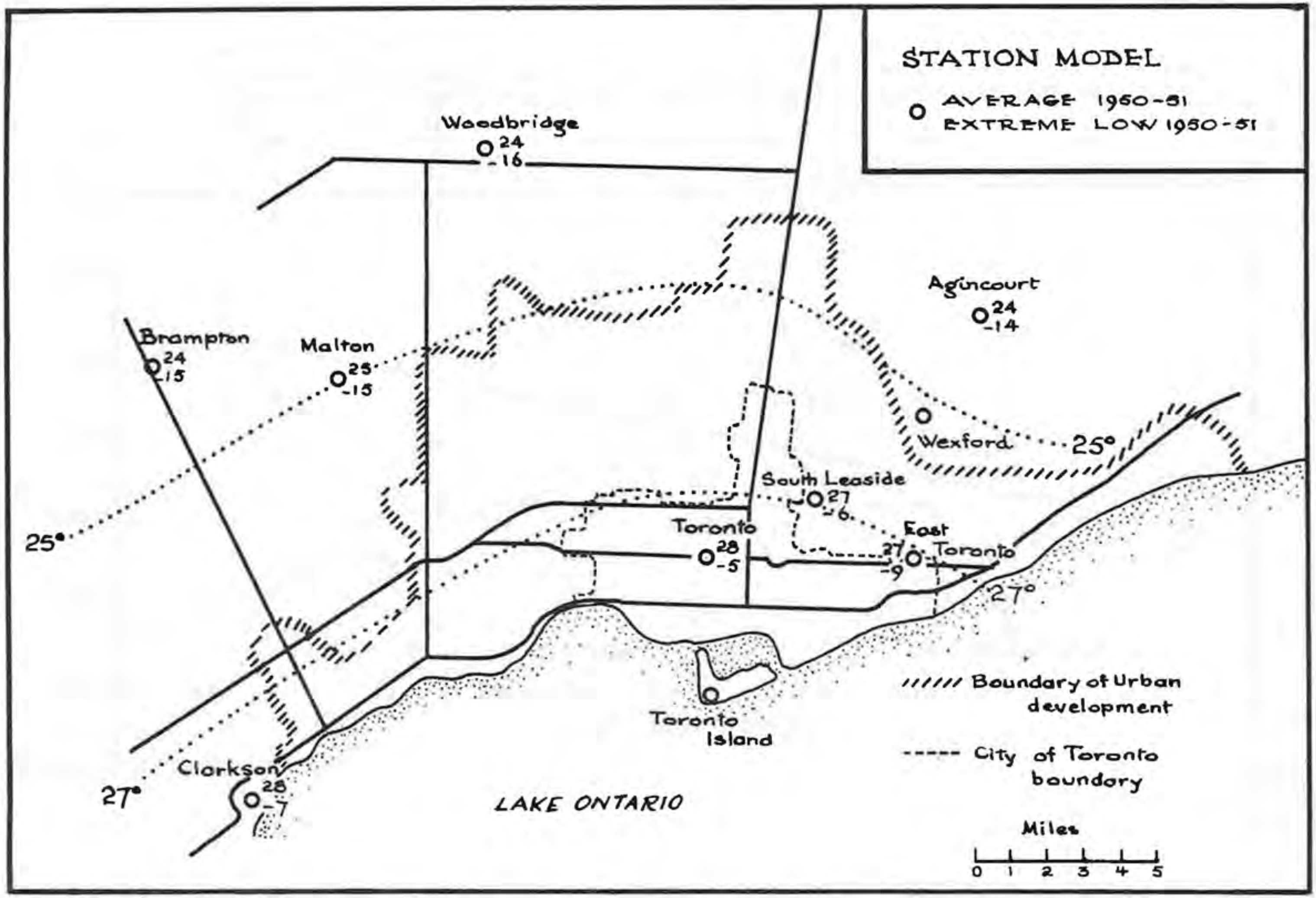

Fig. 12 - Average and Extreme Low Temperatures in the Toronto Area during the Winter of 1950-51

T A B L E 1 (A)

AVERAGE NUMBER OF DAYS WITH MINIMUM TEMPERATURES LESS THAN SPECIFIED VALUES. PERIOD 1941 - 50

DAYS	OCT. 31	NOV. 30	DEC. 31	JAN. 31	FEB. 28	MAR. 31	APR. 30	ANNUAL --
Days Less Than 30°	*	8	23	26	25	19	5	106
" " " 20°	0	1	11	17	16	9	*	54
" " " 10°	0	*	5	7	6	3	0	21
" " " 0°	0	0	1	2	1	*	0	4

T A B L E 1 (B)

AVERAGE NUMBER OF DAYS WITH MAXIMUM TEMPERATURES LESS THAN SPECIFIED VALUES. PERIOD 1941 - 50

DAYS	OCT. 31	NOV. 30	DEC. 31	JAN. 31	FEB. 28	MAR. 31	APR. 30	ANNUAL --
Days Less Than 30°	0	1	9	12	11	4	0	37
" " " 20°	0	*	2	3	2	*	0	8
" " " 10°	0	0	*	1	*	0	0	1
" " " 0°	0	0	0	0	0	0	0	0

* = Less than 1 day

T A B L E 2

AVERAGE AND EXTREME WINTER TEMPERATURES AT TORONTO 1841 - 1950

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	WINTER DEC. - FEB.
Absolute Maximum	85	75	61	60	55	80	90	61
Average Monthly Maximum	72	60	48	45	45	55	70	--
Average Daily Maximum	56	43	33	30	30	37	50	31
Average	48	37	27	23	22	30	42	24
Average Daily Minimum	40	31	21	16	15	23	34	17
Average Monthly Minimum	27	10	-1	-6	-6	4	21	--
Absolute Minimum	16	-5	-22	-26	-25	-16	5	-26

T A B L E 3

AVERAGE MONTHLY TEMPERATURES AT TORONTO COMPARED TO LACROSSE, WISC. AND ST. JOHNSBURY, VT.

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
Lacrosse	50	35	22	16	19	32	47
Toronto	48	37	28	23	22	30	42
St. Johnsbury	47	34	21	16	17	29	42

Elevation Above M.S.L. Lacrosse 672 ft., Toronto 379 ft., St. Johnsbury 711 ft.

T A B L E 4

AVERAGE TEMPERATURES IN THE TORONTO AREA
PERIOD 1911 - 1940

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
Toronto	50	39	28	24	23	32	43
Toronto Island	51	39	29	24	23	31	42
Agincourt	49	37	25	21	20	29	42
Wexford	49	36	27	21	20	31	42

T A B L E 5

AVERAGE DAILY MAXIMUM AND MINIMUM TEMPERATURES AT TORONTO AND MALTON AIRPORT
PERIOD 1941 - 1950

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.
Average Maximum							
Toronto	60	46	34	31	31	40	53
Malton	60	45	32	29	28	39	53
Average Minimum							
Toronto	45	35	23	18	18	26	37
Malton	40	31	18	13	13	22	33