II.—A total eclipse of the Moon, June 22, 1880. Visible as a partial eclipse in British Columbia.

III.—An annular eclipse of the Sun, July 7, 1880. Invisible in Canada.

IV.—A partial eclipse of the Sun, December 1, 1880. Invisible in Canada.

V.—A total eclipse of the Moon, December 16, 1880. Visible as a partial eclipse in the N. W. Territories and British Columbia.

	h	m	
First contact with the penumbra, December 16.....	0	31·5	Mean time at Greenwich.
First contact with the shadow.....	1	44·5	" "
Beginning of total phase.....	2	54·0	" "

VI.—A partial eclipse of the Sun, December 31, 1880. Visible in the eastern portions of the Dominion of Canada.

At Toronto the magnitude of the eclipse at Sunrise (Sun's diameter=1) is 0.427.

The last contact is at 8h. 30·7m. a.m. Angle of contact from the North Pole 50° towards the east.

The Greenwich mean time of last contact for places near Toronto may be found from the following formulæ:

* cos ω=2·14358—[0·23330] sin l—[9·85065] cos l sin (130° 44′ 21″—λ)
t=1h. 55m. 11s.+[3·62351] sin ω+[2·84315] sin l—[3·88964] cos l cos (118° 31′ 50″—λ).

Contact on the Sun's limb, ω—5° 32′ from the north towards the east.

At Quebec the eclipse has begun before Sunrise.

The greatest phase is at 8h. 18·7m. Magnitude of eclipse (Sun's diameter=1) is 0·535.

The last contact is at 9h. 20·4m. a.m. Angle of contact from the North Pole 55° towards the east.

The Greenwich mean time of last contact for places near Quebec may be found from the following formulæ:

cos ω=2·15789—[0·23193] sin l—[9·85960] cos l sin (139° 38′ 8″—λ)
t=1h. 45m. 5s.+[3·64239] sin ω+[2·98992] sin l—[3·90726] cos l cos (123° 18′ 44″—λ).

Contact on the Sun's limb, ω—7° 20′ from the north towards the east.

At Halifax the first contact is at 7h. 52·0m. a.m. Angle of contact from the North Pole 68° towards the west.

The greatest phase is at 8h. 53·5m. a.m. Magnitude of eclipse (Sun's diameter=1) is 0·549.

The last contact is at 9h. 59·0m. a.m. Angle of contact from the North Pole 55° towards the east.

The Greenwich mean times of first and last contacts for places near Halifax may be found from the following formulæ:

First contact—

* cos ω=1·97483—[0·23293] sin l—[9·85019] cos l sin (104° 17′ 33″—λ)
t=2h. 15m. 48s.—[3·60227] sin ω+[2·74977] sin l—[3·86850] cos l cos (94° 3′ 5″—λ).

Contact on the Sun's limb, ω+4° 42′ from the north towards the west.

Last contact—

* cos ω=2·15135—[0·23082] sin l—[9·86819] cos l sin (145° 1′ 8″—λ)
t=1h. 36m. 58s.+[3·06882] sin ω+[3·08754] sin l—[3·92779] cos l cos (125° 45′ 56″—λ).

Contact on the Sun's limb, ω—8° 52′ from the north towards the east.

TABLE SHOWING THE AVERAGES OF CERTAIN METEOROLOGICAL QUANTITIES.

[From observations at the Toronto Observatory.]

	Barometer, average of 38 years.	Temperature, average of 39 years.	Resultant direction of Wind 30 years.	Resultant velocity of Wind av of 30 years.	Mean velocity of Wind, average of 31 years.	Clouded Sky, average of 26 years.	Amount of Rain, average of 38.9 years.	Days of Rain, average of 39 years.	Amount of Snow, average of 36 years.	Days of Snow average of 39 years.	Total Rain and Snow.	Days of Rain and Snow.
	in.	°		*miles.*	*miles.*		in.		in.		in.	
January	29.6482	22.84	N. 80 W.	3.29	8.55	0.74	1.215	4.90	16.82	14.10	2.897	19.00
February	.6270	22.85	N. 67 W.	3.30	8.98	.70	0.881	4.00	17.89	12.26	2.670	16.26
March	.6005	29.17	N. 51 W.	3.50	9.31	.63	1.632	6.10	15.69	10.57	3.001	16.67
April	.5866	40.92	N. 24 W.	2.26	8.42	.60	2.474	9.94	2.33	3.65	2.707	13.59
May	.5728	51.77	N. 17 W.	1.63	7.05	.55	3.075	11.92	0.15	0.36	3.090	12.28
June	.5720	61.87	N. 64 W.	0.82	5.45	.52	2.747	11.56	...	...	2.747	11.56
July	.5916	67.61	N. 78 W.	0.90	5.21	.50	3.204	10.77	...	...	3.204	10.77
August	.6197	66.43	N. 62 W.	0.89	5.41	.48	2.956	10.85	...	...	2.956	10.85
September	.6636	58.26	N. 55 W.	1.20	5.81	.51	3.667	11.41	...	...	3.667	11.41
October	.6398	45.94	N. 60 W.	1.96	6.55	.62	2.451	12.69	0.81	1.85	2.532	14.54
November	.6116	36.00	N. 77 W.	2.74	7.88	.75	2.885	9.93	4.21	7.00	3.306	16.93
December	.6466	25.75	N. 77 W.	3.53	8.89	.76	1.517	5.80	15.32	14.00	3.049	19.80
Year	29.6150	44.12	N. 61 W.	1.99	7.29	0.61	28.704	109.87	71.22	63.79	35.826	173.66

Magnetic Observatory, Toronto.

Latitude, 43°.39′.4 North. Longitude, 79°.23′.2 West, or 5 hours, 17 minutes, 33 seconds slow of Greenwich Time. Elevation above Lake Ontario, 108 feet. Approximate Elevation above the Sea, 350 feet.

* In the above formulæ the co-efficients of the various terms are the numbers whose logarithms are the numbers within the brackets [ ]; also, l denotes the *geocentric* latitude, and λ the longitude west of Greenwich.