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EARTHQUAKES OF EASTERN CANADA AND ADJACENT AREAS

1954 - 1959

W. E. T. Smith

OTTAWA, CANADA

Department of Mines and Technical Surveys

DOMINION OBSERVATORIES

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EARTHQUAKES OF EASTERN CANADA AND ADJACENT AREAS

1954 - 1959

W. E. T. Smith

INTRODUCTION

The general program of the Seismological Service of Canada, to catalogue all Canadian earthquakes, was outlined in a paper by Milne and Smith*. For the purpose of describing Canadian seismicity, Canada was divided into four separate regions having arbitrarily defined boundaries. Of these, only one - the Eastern Region - is pertinent here. It consists of that portion of Canada and adjacent areas lying east of the 85th (western) meridian and south of the 60th (northern) parallel.

The paper cited above was the first of a series, to be issued annually, dealing with all the regions. The series will permit interested persons to receive currently available data without waiting for the completion of the whole project. As a similar service, the present work is being published at this time. The shocks herein are listed without serial numbers pending their publication in the more formal papers of the Publications of the Dominion Observatory. An earthquake catalogue**, with map, for the Eastern Region prior to 1928, based on historical records, was published in 1962. A study is now in progress to provide similar data for the period from 1928 to 1953 based on seismograms from stations in and around the area.

Data in the present list differ considerably from material published earlier in the Seismological Bulletin. Many disturbances previously listed as earthquakes have been omitted. This is because recent research has shown that whole series of these events were caused by mining activity. A few were from rockbursts but the vast majority were from blasts - for example, about twenty per year from a single mine in northern New York state. Few additions have been made but there are a large number of revisions. These were occasioned by the use of improved techniques.

One hundred and twenty three disturbances are listed in Table I. Of these 112 are plotted as circles on the map in the pocket. There is a diagram in the map legend relating the magnitude of each earthquake to the size of the symbol representing it. In the past it has been the practise to indicate the precision of the epicentral determination by letters defined in terms of the quantity of available data. More recently, as in this list, each coordinate is followed by stipulated uncertainties. It should be clearly understood that these are not "probable errors" or any other statistical evaluations. They were assigned by the writer after consideration of the number and quality of seismic traces, the position of the epicentre relative to the seismograph stations, etc., and are an indication of his confidence in the precision of the solution. When both un-

*Milne, W.G. and Smith, W.E.T., 1961. Canadian earthquakes - 1960: Dom. Obs., Seismol. Ser., Ottawa, no. 1960 - 2, 1-23.

**Smith, W.E.T., 1962. Earthquakes of eastern Canada and adjacent areas, 1534 - 1927: Dom. Obs., Pub., Ottawa, v. 26, no. 5, 269-301.

certainties in the coordinates are adjudged to amount to less than 20' of arc, the epicentre is plotted as a filled circle; otherwise the circle is left open.

Ten of the shocks are in northeastern United States. Their epicentres were found from Canadian Seismograms and may not be published elsewhere. Complete coverage of United States territory was not attempted.

ACKNOWLEDGEMENT

The cooperation of Rev. M. Buist, S.J., of Jean-de-Brébeuf College, in supplying records from the Montreal station, since its inception, is gratefully acknowledged.

EARTHQUAKES OF EASTERN CANADA AND ADJACENT AREAS 1954-59

(Universal time is used throughout)

(M = magnitude)

1954

- p>
January 10 21:04:30. 49°10'N ± 15', 68°14'W ± 20'. M = 3.9. In the St. Lawrence River about five miles south of Baie-Comeau, Que.
January 27 03:55:10. M = 2.4. About 67 miles from Ottawa, possibly in the Cornwall, Ont. - Malone, N.Y. area.
February 1 00:37:50. 43°02'N ± 15', 76°39'W ± 15'. M = 3.3. About three miles northeast of Montezuma, N.Y.
February 7 20:24:16. 47°42'N ± 20', 70°15'W ± 20'. Near Pointe-au-Pic, Que.
- or
- 47°00'N ± 20', 69°50'W ± 20'. Between Ste-Félicité and St-Omer, Que. M = 3.8.
February 21 09:00:37. 47°40'N ± 5', 70°37'W ± 10'. Nine miles north-northwest of St-Urbain, Que.
- or
- 46°53'N ± 10', 70°08' ± 10'. Near St-Marcel, Que. M = 3.5.
March 28 00:58:04. M = 1.9. About 44 miles from Seven Falls.
April 12 21:22:01. 46°54'N ± 15', 76°03'W ± 18'. M = 4.3. At the northwest corner of Baskatong Reservoir, Que.
April 27 02:14:08. 43.1°N, 79.2°W. M = 4.1. A few miles north of Welland, Ont.
May 20 22:01:18. 44°58'N ± 5', 74°12'W ± 10'. Depth 20 km (?). M = 2.7. About 10 miles northeast of Malone, N.Y., where it was felt.
June 26 07:44:47. 46°42'N ± 10', 74°58'W ± 10'. About 12 miles north of Ste-Veronique, Que.
- or
- 45°07'N ± 10', 73°47'N ± 10'. Near St-Chrysostome, Que. M = 2.4.
June 30 07:41:07. 47°00'N ± 15', 70°07'W ± 10'. M = 3.7. Between St-Cyrille and Ste-Félicité, Que.
July 22 07:34:37. M 2.1. 56 miles from Seven Falls, possibly on the Quebec - Maine border.
July 29 19:56:54. 42°40'N ± 15', 70°45'W ± 18'. M = 4.0. 45 miles west by north of Harvard seismograph station.
August 28 15:23:01. 45°10'N ± 18', 56°52'W ± 12'. M = 5.2. In the Atlantic Ocean, 140 miles south-southwest of Grand Bank, Nfld. and 170 miles southeast of Glace Bay, N.S.
September 8 01:29:53. 49°02'N ± 15', 68°22'W ± 17'. Depth 18 km. M = 4.3. In the St. Lawrence River about 15 miles southwest of Baie-Comeau, Que.
September 11 18:55:52. 47°20'N ± 18', 75°38'W ± 15'. Depth 18 km. M = 4.6. In the Gatineau River Valley about 30 miles north of the northern arm of Baskatong Reservoir, Que.
September 26 00:59:12. M = 3.6. 366 miles from Halifax, N.S.

- October 16 06:45:00. $44^{\circ}50'N \pm 18'$, $56^{\circ}48'W \pm 10'$. $M = 5.3$. In the Atlantic Ocean, 170 miles south-southwest of Grand Bank, Nfld. and 185 miles southeast of Glace Bay, N.S.
- December 13 03:53:52. $44^{\circ}36'N \pm 10'$, $74^{\circ}36'W \pm 10'$. Depth 12 km. $M = 3.6$. About 25 miles southwest of Malone, N.Y.

1955

- January 24 01:22:29. $45^{\circ}04'N \pm 25'$, $59^{\circ}02'W \pm 20'$. Depth 11 km. $M = 3.6$. In the Atlantic Ocean about 90 miles southeast of Glace Bay, N.S.
- February 1 12:40:27. $47^{\circ}40'N \pm 12'$, $70^{\circ}30'W \pm 15'$. $M = 4.0$. About 20 miles north of Baie-St-Paul, Que.
- February 1 12:45:02. $47^{\circ}40'N \pm 12'$, $70^{\circ}30'W \pm 15'$. $M = 2.7$. After-shock of the earthquake at 12:40:27 above.
- February 1 20:48:48. $47^{\circ}40'N \pm 12'$, $70^{\circ}30'W \pm 15'$. $M = 3.2$. After-shock of the earthquake at 12:40:27, February 1.
- March 3 21:03:51. $45^{\circ}48'N \pm 17'$, $74^{\circ}43'W \pm 15'$. $M = 2.0$. About 25 miles southwest of Ste-Agathe, Que.
- April 3 06:14:09. $45^{\circ}48'N \pm 18'$, $74^{\circ}34'W \pm 14'$. $M = 2.0$. About 22 miles southwest of Ste-Agathe, Que.
- April 4 03:17:07. $51^{\circ}35'N \pm 30'$, $79^{\circ}18'W \pm 30'$. $M = 3.6$. About 25 miles west of Rupert House, Que.
- April 15 01:45:10. $M = 1.8$. About 44 miles from Seven Falls, Que.
- June 29 01:17:40. $43^{\circ}46'N \pm 20'$, $79^{\circ}38'W \pm 20'$. $M = 3.0$. About 15 miles northwest of Toronto, Ont.
- July 1 01:37:39. $M = 3.1$. About 25 miles from Kirkland Lake, Ont.
- October 7 18:09:52. $45^{\circ}13'N \pm 10'$, $73^{\circ}54'W \pm 12'$. Depth 0 km (?). $M = 3.5$. About 24 miles southwest of Montreal, Que.
- October 20 20:58:32. $48^{\circ}56'N \pm 18'$, $70^{\circ}12'W \pm 15'$. Depth 29 km. $M = 3.2$. On the Portneuf River, 55 miles northeast of Chicoutimi, Que. Foreshock of the earthquake at 21:31:06, October 20.
- October 20 21:16:24. $48^{\circ}56'N \pm 18'$, $70^{\circ}12'W \pm 15'$. Depth 27 km. $M = 3.3$. A second foreshock of the earthquake at 21:31:06, October 20.
- October 20 21:31:06. $48^{\circ}56'N \pm 18'$, $70^{\circ}12'W \pm 15'$. Depth 24 km. $M = 3.4$. On the Portneuf River, 55 miles northeast of Chicoutimi, Que. There were two foreshocks during the preceding 35 minutes.
- November 1 07:45:52. $46^{\circ}30'N \pm 10'$, $75^{\circ}52'W \pm 10'$. $M = 3.5$. About eight miles northeast of Maniwaki, Que., where it was felt.
- November 21 16:10:41. $50^{\circ}35'N \pm 19'$, $63^{\circ}30'W \pm 19'$. $M = 4.9$. About 25 miles north of Havre-St-Pierre, Que.
- November 26 06:50:09. $46^{\circ}20'N \pm 15'$, $73^{\circ}23'W \pm 18'$. $M = 2.0$. Close to St-Gabriel, Que.
- December 3 11:38:18. $45^{\circ}40'N \pm 18'$, $75^{\circ}03'W \pm 18'$. $M = 2.4$. About 20 miles northeast of Buckingham, Que.

1956

- January 10 12:08:18. $45^{\circ}40'N \pm 7'$, $75^{\circ}28'W \pm 7'$. M = 3.3. About 22 miles northeast of Ottawa, Ont.
- January 27 11:03:27. $40.5^{\circ}N \pm 1.0^{\circ}$, $84.0^{\circ}W \pm 1.8^{\circ}$. M = 4.4. South of Lima, Ohio, where it was felt in the southern part of the city.
- January 30 09:43:13. $47^{\circ}03'N \pm 15'$, $71^{\circ}10'W \pm 15'$. M = 3.7. About 15 miles north of Quebec City, Que., where it was felt.
- February 2 19:24:16. $45^{\circ}27'N \pm 10'$, $74^{\circ}49'W \pm 10'$. M = 3.1. About 10 miles north of Maxville, Ont.
- February 11 10:29:55. $46.0^{\circ}N \pm 0.2^{\circ}$, $75.3^{\circ}W \pm 0.3^{\circ}$. 47 miles northeast of Ottawa, Ont., or $44.8^{\circ}N \pm 0.2^{\circ}$, $75.1^{\circ}W \pm 0.3^{\circ}$. Just to the southeast of Morrisburg, Ont.
- February 16 10:29:31. $45^{\circ}52'N \pm 7'$, $74^{\circ}58'W \pm 7'$. M = 2.0. Five miles southwest of Namur, Que.
- March 6 23:38:10. $44^{\circ}51'N \pm 10'$, $75^{\circ}23'W \pm 10'$. M = 3.1. About four miles north of Cardinal, Ont.
- April 6 04:51:37. $59.4^{\circ}N \pm 0.5^{\circ}$, $74.1^{\circ}W \pm 1.2^{\circ}$. M = 4.9. At Payne Lake, Que., about 150 miles northeast of Port Harrison, Que.
- May 12 00:39:46. $47^{\circ}51'N \pm 12'$, $72^{\circ}22'W \pm 15'$. M = 2.6. About ten miles southwest of Kiskisink, Que.
- May 26 00:44:17. $45^{\circ}31'N$, $73^{\circ}34'W$. M = 1.6. Recorded only at Montreal and reported as an "underground rumble."
- June 1 10:30. $45^{\circ}16'N$, $66^{\circ}03'W$. M = 1.7. Felt by employees of Irving Pulp and Paper Ltd. at a plant near the Reversing Falls in St. John, N.B. First of two shocks on June 1.
- June 1 11:40. $45^{\circ}16'N$, $66^{\circ}03'W$. M = 1.9. Felt, over the noise and vibration of heavy machinery in operation, at the plant of Irving Pulp and Paper Ltd. near the Reversing Falls in St. John, N.B. There was one foreshock.
- June 5 07:45:16. $56.8^{\circ}N \pm 0.5^{\circ}$, $58.9^{\circ}W \pm 1.0^{\circ}$. M = 5.1. About 100 miles off the coast of Labrador, Nfld.
- June 15 00:53:37. $47^{\circ}06'N \pm 7'$, $76^{\circ}26'W \pm 10'$. Depth 18 km. M = 3.9. At the Cabonga Reservoir about 55 miles northwest of Maniwaki, Que.
- July 27 01:34:44. $44^{\circ}42'N \pm 10'$, $73^{\circ}47'W \pm 12'$. M = 3.4. About 30 miles south-southeast of Malone, N.Y.
- August 3 12:51:39. $49^{\circ}25'N \pm 12'$, $66^{\circ}10'W \pm 18'$. M = 4.1. In the St. Lawrence River about 55 miles south of Sept-Îles, Que. This is the first of at least two and possibly four shocks which occurred in a span of about 40 seconds.
- August 3 12:52:09. $49^{\circ}25'N \pm 12'$, $66^{\circ}10'W \pm 18'$. M = 4.3. In the St. Lawrence River about 55 miles south of Sept-Îles, Que. This is the second or main shock of a pair, or possibly it is the third of a series of four shocks, which occurred in a span of about 40 seconds.
- August 3 22:11:06. $44^{\circ}56'N \pm 10'$, $74^{\circ}41'W \pm 10'$. M = 2.3. About 10 miles east of Massena, N.Y.

August 22	16:38:12. $45^{\circ}24'N \pm 4'$, $75^{\circ}38'W \pm 4'$. $M = 2.4$. Five miles east of Ottawa seismograph station. Felt with intensity II at Eastview, Ont., and in Ottawa South and Ottawa East.
October 10	05:51:20. $47^{\circ}18'N \pm 12'$, $70^{\circ}20'W \pm 10'$. $M = 2.7$. In the St. Lawrence River south of Ile-aux-Coudres, Que.
October 27	14:40:06. $48^{\circ}15'N \pm 20'$, $69^{\circ}00'W \pm 25'$. $M = 3.4$. Near the south shore of the St. Lawrence River about 15 miles down stream from Trois-Pistoles, Que. There was one aftershock at 15:03:53, October 27.
October 27	15:03:53. $48^{\circ}15'N \pm 20'$, $69^{\circ}00'W \pm 25'$. $M = 3.4$. Near the south shore of the St. Lawrence River about 15 miles down stream from Trois-Pistoles, Que. Aftershock of the earthquake at 14:40:06, October 27.
November 4	11:53:24. $46^{\circ}13'N \pm 8'$, $75^{\circ}44'W \pm 8'$. $M = 4.0$. About 16 miles southeast of Maniwaki, Que.
November 16	07:17:55. $46^{\circ}12'N \pm 6'$, $74^{\circ}46'W \pm 6'$. $M = 2.9$. About 26 miles northwest of Ste-Agathe, Que.
December 1	14:00:00. $49^{\circ}25'N$, $82^{\circ}26'W$. $M = 2.3$. Felt within a ten mile radius of Kapuskasing, Ont. The reports were furnished by the Kapuskasing Tribune. The maximum intensity was II. Not recorded at Kirkland Lake.
December 28	01:41:25. $45^{\circ}10'N \pm 7'$, $74^{\circ}16'W \pm 7'$. $M = 2.7$. In the St. Lawrence River south of Rivière Beaudette, Que.

1957

January 21	22:19:01. $48^{\circ}09'N$, $80^{\circ}02'W$ (Kirkland Lake, Ont.). A rock-burst in a mine released more seismic energy than an earthquake of magnitude 4.
February 19	05:18:33. $48^{\circ}24'N \pm 25'$, $69^{\circ}56'W \pm 25'$. $M = 3.5$. About 25 miles northwest of Tadoussac, Que.
March 23	19:02:05. $41^{\circ}37'N \pm 15'$, $74^{\circ}50'W \pm 15'$. $M = 3.5$. In New York State near the Pennsylvania border.
April 26	11:40:10. $43^{\circ}33'N \pm 20'$, $70^{\circ}12'W \pm 20'$. $M = 4.7$. About 15 miles south of Portland, Me. Felt in the New England States.
May 13	08:07:36. $46^{\circ}36'N \pm 7'$, $74^{\circ}04'W \pm 7'$. $M = 2.8$. About 15 miles west of St-Zenon, Que.
May 25	12:27:49. $45^{\circ}58'N \pm 7'$, $74^{\circ}20'W \pm 7'$. Depth 4 (?) km. $M = 2.8$. About 10 miles west of Ste-Adele, Que. Felt at St-Agathe, Lac St. Denis, Lac Louisa and Ste-Adele, Que.
June 29	11:25:09. $42^{\circ}55'N \pm 18'$, $81^{\circ}19'W \pm 18'$. Depth 26 km. $M = 4.2$. About 9 miles south southeast of London, Ont. Felt at London, Ont.
August 4	12:40:58. $46^{\circ}35'N \pm 15'$, $67^{\circ}05'W \pm 15'$. Depth 19 km. $M = 3.7$. About 8 miles east of Juniper, N.B.
August 6	23:50:38. $47^{\circ}29'N \pm 18'$, $70^{\circ}25'W \pm 18'$. Depth 19 km. $M = 4.0$. Between Baie-St-Paul and Les Eboulements, Que.
August 17	01:30:07. $46^{\circ}44'N \pm 12'$, $70^{\circ}07'W \pm 12'$. Depth 25 km. $M = 3.3$. About 7 miles northwest of Lac-Frontière, Que.

- August 21 02:40:33. $44^{\circ}48'N \pm 10'$, $76^{\circ}10'W \pm 10'$. $M = 3.0$. About 10 miles south-southwest of Smiths Falls, Ont. Felt at Smiths Falls.
- October 4 00:15:26. $45^{\circ}19'N \pm 5'$, $75^{\circ}12'W \pm 5'$. $M = 2.1$. About 25 miles east of Ottawa, Ont.
- October 9 14:16:58. $48^{\circ}25'N \pm 15'$, $69^{\circ}54'W \pm 15'$. Depth 20 km. $M = 3.1$. About 20 miles northwest of Tadoussac, Que.
- October 16 19:13:27. $50^{\circ}30'N \pm 19'$, $64^{\circ}52'W \pm 19'$. $M = 4.8$. About 20 miles north of Sheldrake, Que.
- October 27 08:48:27. $46^{\circ}23'N \pm 15'$, $78^{\circ}45'W \pm 15'$. $M = 3.2$. About 6 miles northwest of Mattawa, Ont., where it was felt.
- November 2 04:00:16. $46^{\circ}12'N \pm 10'$, $74^{\circ}57'W \pm 10'$. $M = 2.6$. About 10 miles southwest of Labelle, Que.
- November 13 20:45:38. $48^{\circ}40'N \pm 25'$, $69^{\circ}33'W \pm 30'$. $M = 3.3$. About 20 miles northwest of Sault-au-Mouton, Que. Foreshock of the following earthquake.
- November 13 20:49:19. $48^{\circ}40'N \pm 25'$, $69^{\circ}33'W \pm 30'$. $M = 3.5$. About 20 miles northwest of Sault-au-Mouton, Que., with one foreshock and one aftershock all within a nine minute time interval.
- November 13 20:54:17. $48^{\circ}40'N \pm 25'$, $69^{\circ}33'W \pm 30'$. $M = 3.3$. Aftershock of the previous earthquake.
- November 30: 06:27:51. $45^{\circ}01'N \pm 5'$, $74^{\circ}46'W \pm 5'$. $M = 2.5$. In the St. Lawrence River, about 5 miles west of Cornwall, Ont., where it was felt.

1958

- January 24 "Shortly after noon E.S.T." $44^{\circ}59'N$, $81^{\circ}15'W$. (Lions Head, Ont.). Magnitude estimated as 3.5. Reports of the shock being felt in the Bruce Peninsula from Wiarton North, were forwarded by Mr. D.R. McIvor of Lions Head, Ont.
- February 2 01:54:44. $46^{\circ}38'N \pm 7'$, $75^{\circ}26'W \pm 15'$. $M = 2.8$. About seven miles northeast of Mont Laurier, Que.
- February 4 08:06:43. $57.9^{\circ}N \pm 1.0^{\circ}$, $53.5^{\circ}W \pm 1.5^{\circ}$. $M = 5.1$. In the Labrador Sea.
- February 12 13:29:54. $44^{\circ}50'N \pm 7'$, $75^{\circ}18'W \pm 7'$. $M = 2.6$. At Iroquois, Ont.
- March 1 17:41:49. $46^{\circ}54'N \pm 7'$, $76^{\circ}02'W \pm 7'$. Depth 9 km. $M = 3.9$. Near Baskatong Reservoir, about 40 miles north of Maniwaki, Que.
- March 19 06:39:25. $46^{\circ}00'N \pm 10'$, $77^{\circ}08'W \pm 10'$. $M = 3.1$. About 15 miles north of Pembroke, Ont.
- March 23 22:04:17. $45^{\circ}33'N \pm 20'$, $67^{\circ}07'W \pm 20'$. $M = 3.4$. About 10 miles southeast of McAdam, N.B.
- April 7 07:42:05. $46^{\circ}10'N \pm 7'$, $75^{\circ}12'W \pm 12'$. $M = 2.7$. About 20 miles north of Cheneville, Que.
- May 6 16:02:49. $48^{\circ}34'N \pm 15'$, $70^{\circ}19'W \pm 15'$. $M = 3.7$. About 35 miles northeast of Chicoutimi, Que. This shock was followed by two aftershocks.

- May 6 16:11:09. $48^{\circ}34'N \pm 15'$, $70^{\circ}19'W \pm 15'$. $M = 3.5$. About 35 miles northeast of Chicoutimi, Que. Aftershock of the earthquake about eight minutes earlier.
- May 6 16:31:38. $48^{\circ}34'N \pm 15'$, $70^{\circ}19'W \pm 15'$. $M = 3.4$. About 35 miles northeast of Chicoutimi, Que. Aftershock of the earthquake about 29 minutes earlier.
- May 14 17:41:21. $46^{\circ}58'N \pm 10'$, $76^{\circ}33'W \pm 10'$. Depth 9 km. $M = 5.4$. Near Bark Lake, Quebec. Felt at Lac des Loups, 115 miles northwest of Ottawa, by a motorist on the highway between Mont Laurier and Val d'Or, Que. It was also felt at Bracebridge and Lanark in Ontario and startled many persons at Ottawa.
- July 13 21:32:49. $46^{\circ}10'N \pm 5'$, $76^{\circ}23'W \pm 10'$. $M = 2.4$. About 10 miles north of Lake Dumont, Que.
- July 18 23:56:27. $46^{\circ}42'N \pm 5'$, $71^{\circ}24'W \pm 5'$. Depth 3 km. $M = 3.2$. In the St. Lawrence River about 15 miles above Quebec City, Que.
- July 22 01:46:40. $43^{\circ}00'N \pm 25'$, $79^{\circ}30'W \pm 25'$. Depth 5 km. $M = 4.3$. About 15 miles west of Welland, Ont. Felt in St. Catharines and vicinity.
- July 25 03:45:11. $46^{\circ}34'N \pm 5'$, $75^{\circ}48'W \pm 5'$. Depth 15 km. $M = 3.8$. In the Gatineau River Valley about 15 miles north of Maniwaki, Que.
- July 27 08:58:00. $47^{\circ}19'N \pm 15'$, $70^{\circ}18'W \pm 20'$. $M = 3.0$. In the St. Lawrence River south of Île-aux-Coudres, Que.
- August 4 20:25:58. $43^{\circ}08'N \pm 20'$, $80^{\circ}00'W \pm 20'$. Depth 0 km. $M = 3.9$. Near Caledonia, Ont.
- August 8 22:15:03. $47^{\circ}56'N \pm 5'$, $70^{\circ}23'W \pm 5'$. Depth 0 km. $M = 4.0$. In an uninhabited area about 30 miles up Rivière Malbaie, Que.
- August 12 03:22:12. $48^{\circ}36'N \pm 12'$, $69^{\circ}23'W \pm 12'$. Depth 5 km. $M = 3.9$. About 10 miles northwest of Sault-au-Mouton, Que. On September 11, two smaller disturbances and one of equal magnitude occurred, all within a quarter of an hour, at the above location within the stipulated uncertainties.
- August 22 14:25:05. $43^{\circ}00'N \pm 1.0^{\circ}$, $79^{\circ}00'W \pm 1.0^{\circ}$. Depth 5 km. $M = 3.6$. On the Niagara Peninsula, Ont.
- September 11 17:34:44. $48^{\circ}32'N \pm 15'$, $69^{\circ}44'W \pm 15'$. $M = 3.5$. About 20 miles west of Sault-au-Mouton, Que. Foreshock of the earthquake 15 minutes later.
- September 11 17:41:17. $48^{\circ}32'N \pm 15'$, $69^{\circ}44'W \pm 15'$. $M = 3.5$. About 20 miles west of Sault-au-Mouton, Que. Foreshock of the earthquake about eight minutes later.
- September 11 17:49:56. $48^{\circ}32'N \pm 15'$, $69^{\circ}44'W \pm 15'$. $M = 3.9$. About 20 miles west of Sault-au-Mouton, Que. This earthquake was preceded by two foreshocks within a quarter of an hour of the main disturbance.
- September 29 10:45:29. $48^{\circ}23'N \pm 15'$, $69^{\circ}16'W \pm 15'$. $M = 3.8$. In the St. Lawrence River about 20 miles north of Trois-Pistoles, Que.

- September 30 00:13:58. $45^{\circ}11'N \pm 5'$, $73^{\circ}44'W \pm 5'$. Depth 21 km. $M = 3.7$. About 10 miles southeast of Beauharnois, Que. Felt at Montreal and north to Ste-Julienne, Que. This shock, though small, is important because it indicates seismic activity deep in the crust of the earth within 22 miles of the city of Montreal.
- October 21 09:32:51. $49.6^{\circ}N \pm 0.5^{\circ}$, $68.0^{\circ}W \pm 0.5^{\circ}$. Depth 14 km. $M = 4.1$. About 30 miles north-northeast of Baie-Comeau, Que. A report was received that a "fire ball" was seen at about the origin time of this disturbance.
- October 22 08:34:33. $45^{\circ}52'N \pm 5'$, $74^{\circ}28'W \pm 5'$. $M = 2.4$. About 15 miles southwest of Ste-Agathe, Que.
- December 23 23:14:16. $46^{\circ}59'N \pm 7'$, $69^{\circ}49'W \pm 7'$. $M = 3.7$. About five miles northeast of Ste-Félicité, Que.

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- February 9 Between 2:00 and 3:30. $43^{\circ}N \pm ?$, $81^{\circ}W \pm ?$. $M = 2.4$. East of London, Ont. This shock was not recorded. The epicentre and magnitude were estimated from reports supplied through the courtesy of the London Free Press. The earthquake was felt by a few persons in London and in Charlotteville Township, and by one person on a farm at Walsingham, Norfolk county, all in Ontario.
- April 13 21:20:19. $41^{\circ}55'N \pm 25'$, $73^{\circ}16'W \pm 25'$. $M = 3.4$. Near Pine Mountain, Conn., U.S.A. Possibly a large blast.
- April 16 16:36:25. $47^{\circ}07'N \pm 7'$, $70^{\circ}20'W \pm 7'$. $M = 3.5$. About 10 miles southeast of Bonsecours, Que.
- May 14 14:23:40. $47^{\circ}00'N \pm 7'$, $70^{\circ}19'W \pm 7'$. $M = 2.5$. About nine miles south of Bonsecours, Que.
- May 21 09:38:51. $46^{\circ}33'N \pm 3'$, $76^{\circ}27'W \pm 3'$. $M = 3.9$. About 30 miles northwest of Maniwaki, Que.
- May 24 10:52:03. $48^{\circ}48'N \pm ?$, $79^{\circ}12'W \pm ?$. $M = 3.5$. The co-ordinates are those of La Sarre, Que., where the shock was reported to have been felt. The magnitude was derived from the Ottawa seismogram which also indicated that the epicentral distance was about the same as that from Ottawa to La Sarre. It was not recorded elsewhere.
- May 29 02:16:49. $46^{\circ}32'N \pm 7'$, $76^{\circ}43'W \pm 7'$. $M = 3.0$. About 40 miles northwest of Maniwaki, Que.
- August 1 13:52:49. $48^{\circ}25'N \pm 12'$, $68^{\circ}19'W \pm 12'$. $M = 4.1$. About 10 miles east of Rimouski, Que.
- August 22 03:52:30. $46^{\circ}57'N \pm 5'$, $70^{\circ}47'W \pm 5'$. $M = 3.2$. In the St. Lawrence River just east of the Island of Orleans, Que.
- September 25 01:36:30. $50^{\circ}11'N \pm 35'$, $68^{\circ}12'W \pm 35'$. $M = 3.9$. Between the Manicouagan and Toulouste Rivers, about 40 miles above their junction, in the Province of Quebec.
- October 18 07:47:22. $45^{\circ}54'N \pm 7'$, $75^{\circ}07'W \pm 7'$. $M = 2.6$. Near Cheneville, Que.

ROGER DUHAMEL, F.R.S.C.
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