

SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA

R. Meldrum Stewart, Dominion Astronomer  
Ernest A. Hodgson, Seismologist  
W. W. Doxsee, Assistant Seismologist.



S T A T I O N S

OTTAWA

$\phi = 45^{\circ}23'38''$  N.  $\lambda = 75^{\circ}42'57''$  W.  $h = 83$  m.

Time correction within 0.10 s.

Foundation: boulder clay over limestone

Instruments: Milne-Shaw NS and EW components, designated 23 and 17, respectively, each with photographic registration, magnetic damping, paper speed of 15 mm. per min., mass 1 lb.

Benioff Vertical, short and long period, designated BS and BL, photographic registration, BS a paper speed of 60 mm. per min., BL a paper speed of 30 mm. per min., mass 235 lbs.

HALIFAX

Dalhousie University

$\phi = 44^{\circ}38'$  N.  $\lambda = 63^{\circ}36'$  W.  $h = 46$  m.

Time correction from recorded railroad time signals

Foundation: carbonaceous slate

Instruments: Bosch NS and EW components, designated HN and HE, respectively, each with photographic registration, magnetic damping, paper speed of 15 mm. per min., mass 200 g.

SEVEN FALLS

Quebec Power Company

$\phi = 47^{\circ}07'4''$  N.  $\lambda = 70^{\circ}49'6''$  W.  $h = 232$  m. ca.

Time correction from recorded radio time signals

Foundation: solid granite of Canadian Shield

Instruments: Wood-Anderson and Milne-Shaw, both EW component, designated SF and SM, respectively, each with photographic registration, magnetic damping, SF a paper speed of 60 mm. per min. and mass 15 g., SM a paper speed of 6 mm. per min. and mass 1 lb.

VICTORIA

$\phi = 48^{\circ}24'49''$  N.  $\lambda = 123^{\circ}19'26''$  W.  $h = 67$  m.

Time correction from radio time signals

Foundation: rock

Instruments: Milne-Shaw NS and EW components, designated 21 and 20, respectively, each with photographic registration, magnetic damping, paper speed of 8 mm. per min., mass 1 lb.

Wiechert Vertical, designated WV - not operating.



S T A T I O N S (Cont'd)



SHAWINIGAN FALLS

Shawinigan Water and Power Company

$\phi = 46^{\circ}33'1''$  N.     $\lambda = 72^{\circ}45'8''$  W.     $h = 60$  m. ca.  
 Time correction from recorded radio time signals  
 Foundation: solid granite of Canadian Shield  
 Instruments: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15 g.

SASKATOON

University of Saskatchewan

$\phi = 52^{\circ}08'$  N.     $\lambda = 106^{\circ}38'$  W.     $h = 515$  m.  
 Time correction from radio time signals  
 Foundation: clay and sand  
 Instruments: Mainka NS and EW components, designated SN and SE, respectively, each with smoked sheet registration, air damping, paper speed of 15 mm. per min., mass 139 kg.

DETERMINED CONSTANTS  
 ~~~~~

| INSTRUMENT | $T_0$ | V    | $\epsilon$ | DISPLACEMENT FOR 1" ARC TILT | DISPLACEMENT FOR $10^{-5}$ g. |
|------------|-------|------|------------|------------------------------|-------------------------------|
| 17         | 12.0  | 250  | 20:1       | 44 mm.                       | 7.0 mm.<br>55.0 mm.           |
| 23         | 12.0  | 250  | 20:1       | 44 mm.                       |                               |
| BS         |       |      |            |                              |                               |
| BL         |       |      |            |                              |                               |
| HN         |       |      |            |                              |                               |
| HE         |       |      |            |                              |                               |
| SA         | 1.0   | 1800 |            |                              |                               |
| 20         | 12.0  | 250  | 20:1       |                              |                               |
| 21         | 12.0  | 250  | 20:1       |                              |                               |
| WV         |       |      |            |                              |                               |
| SF         | 1.0   | 1800 |            |                              |                               |
| SM         | 12.0  | 250  | 20:1       | 43 mm.                       |                               |
| SN         | 9.3   | 58   | Aper.      |                              |                               |
| SE         | 9.1   | 56   | "          |                              |                               |

NOTE: Universal Time used throughout.



CORRELATION OF EARTHQUAKES

December, 1938.

NOTES

=====

|   |                                                            |                         |                                               |
|---|------------------------------------------------------------|-------------------------|-----------------------------------------------|
| A | : Ottawa                                                   | $\Delta = 240$ km.      | H = 23 <sup>h</sup> 29 <sup>m</sup> .3 U.T.   |
| B | : Ottawa                                                   | $\Delta = 9800$ km.     | H = 12 <sup>h</sup> 11 <sup>m</sup> .9 U.T.   |
| C | : Victoria                                                 | $\Delta = 5600$ km.     | H = 15 <sup>h</sup> 38 <sup>m</sup> .9 U.T.   |
| E | : Victoria                                                 | $\Delta = 9470$ km.     | H = 13 <sup>h</sup> 24 <sup>m</sup> .0 U.T.   |
| F | : Ottawa                                                   | $\Delta = 5150$ km.     | H = 3 <sup>h</sup> 55 <sup>m</sup> .5 U.T.    |
|   | Victoria                                                   | $\Delta = 2300$ km.     | H = 3 55.2 U.T.                               |
|   | Seven Falls                                                | $\Delta = 5280$ km.     | H = 3 55.6 U.T.                               |
|   | Shawinigan Falls                                           | $\Delta = 5250$ km.     | H = 3 55.5 U.T.                               |
| G | : Ottawa                                                   | $\Delta = 3460$ km.     | H = 9 <sup>h</sup> 10 <sup>m</sup> .8 U.T.    |
|   | Shawinigan Falls                                           | $\Delta = 3180$ km.     | H = 9 11.0 U.T.                               |
| J | : Ottawa                                                   | $\Delta = 15500$ km.ca. | H = 17 <sup>h</sup> 21 <sup>m</sup> .ca. U.T. |
|   | Victoria                                                   | $\Delta = 12500$ km.ca. | H = 17 21 ca. U.T.                            |
| K | : Epicentre probably within 100 km. of the Ottawa station. |                         |                                               |
| N | : Victoria                                                 | $\Delta = 2500$ km.     | H = 18 <sup>h</sup> 14 <sup>m</sup> .5 U.T.   |
| S | : Shawinigan Falls                                         | $\Delta = 215$ km.      | H = 7 <sup>h</sup> 46 <sup>m</sup> .4 U.T.    |
| W | : Ottawa                                                   | $\Delta = 415$ km.      | H = 4 <sup>h</sup> 49 <sup>m</sup> .9 U.T.    |

Rock burst at Lake Shore Mine, Kirkland Lake, Ontario.

Dominion Observatory,  
Ottawa, Canada,  
March 30, 1939.



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA

R. Meldrum Stewart, Dominion Astronomer  
Ernest A. Hodgson, Seismologist  
W. W. Doxsee, Assistant Seismologist.



S T A T I O N S

OTTAWA

$\phi = 45^{\circ}23'38''$  N.  $\lambda = 75^{\circ}42'57''$  W.  $h = 83$  m.  
Time correction within 0.10 s,  
Foundation: boulder clay over limestone  
Instruments: Milne-Shaw NS and EW components,  
designated 23 and 17, respectively, each with  
photographic registration, magnetic damping,  
paper speed of 15 mm. per min., mass 1 lb.  
Benioff Vertical, short and long  
period, designated BS and BL, photographic  
registration, BS a paper speed of 60 mm. per  
min., BL a paper speed of 30 mm. per min.,  
mass 235 lbs.

HALIFAX

Dalhousie University

$\phi = 44^{\circ}38'$  N.  $\lambda = 63^{\circ}36'$  W.  $h = 46$  m.  
Time correction from recorded railroad time signals  
Foundation: carbonaceous slate  
Instruments: Bosch NS and EW components, designated  
HN and HE, respectively, each with photographic  
registration, magnetic damping, paper speed of  
15 mm. per min., mass 200 g.

SEVEN FALLS

Quebec Power Company

$\phi = 47^{\circ}07'4''$  N.  $\lambda = 70^{\circ}49'6''$  W.  $h = 232$  m. ca.  
Time correction from recorded radio time signals  
Foundation: solid granite of Canadian Shield  
Instruments: Wood-Anderson and Milne-Shaw, both  
EW component, designated SF and SM, respectively,  
each with photographic registration, magnetic  
damping, SF a paper speed of 60 mm. per min.  
and mass 15 g., SM a paper speed of 6 mm. per  
min. and mass 1 lb.

VICTORIA

$\phi = 48^{\circ}24'49''$  N.  $\lambda = 123^{\circ}19'26''$  W.  $h = 67$  m.  
Time correction from radio time signals  
Foundation: rock  
Instruments: Milne-Shaw NS and EW components,  
designated 21 and 20, respectively, each with  
photographic registration, magnetic damping,  
paper speed of 8 mm. per min., mass 1 lb.  
Wiechert Vertical, designated WV -  
not operating.



S T A T I O N S (Cont'd)



SHAWINIGAN FALLS

Shawinigan Water and Power Company

$\phi = 46^{\circ}33'.1$  N.     $\lambda = 72^{\circ}45'.8$  W.     $h = 60$  m. ca.  
 Time correction from recorded radio time signals  
 Foundation: solid granite of Canadian Shield  
 Instruments: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15 g.

SASKATOON

University of Saskatchewan

$\phi = 52^{\circ}08'$  N.     $\lambda = 106^{\circ}38'$  W.     $h = 515$  m.  
 Time correction from radio time signals  
 Foundation: clay and sand.  
 Instruments: Mainka NS and EW components, designated SN and SE, respectively, each with smoked sheet registration, air damping, paper speed of 15 mm. per min., mass 139 kg.

TORONTO

$\phi = 43^{\circ}40'$  N.     $\lambda = 79^{\circ}24'$  W.     $h = 111$  m.  
 Time correction from radio time signals  
 Foundation: sand and clay  
 Instruments: Milne-Shaw NS and EW components, designated 18 and 22, respectively, each with photographic registration, magnetic damping, paper speed of 8 mm. per min., mass 1 lb.

DETERMINED CONSTANTS

| INSTRUMENT | $T_0$ | V    | $\epsilon$ | DISPLACEMENT FOR 1" ARC TILT | DISPLACEMENT FOR $10^{-5}$ g. |
|------------|-------|------|------------|------------------------------|-------------------------------|
| 17         | 12.0  | 250  | 20:1       | 44 mm.                       | 7.0 mm.<br>55.0 mm.           |
| 23         | 12.0  | 250  | 20:1       | 44 mm.                       |                               |
| BS         |       |      |            |                              |                               |
| BL         |       |      |            |                              |                               |
| HN         |       |      |            |                              |                               |
| HE         |       |      |            |                              |                               |
| SA         | 1.0   | 1800 |            |                              |                               |
| 18         | 12.0  | 150  | 20:1       |                              |                               |
| 22         | 12.0  | 150  | 20:1       |                              |                               |
| 20         | 12.0  | 250  | 20:1       |                              |                               |
| 21         | 12.0  | 250  | 20:1       |                              |                               |
| WV         |       |      |            |                              |                               |
| SF         | 1.0   | 1800 |            |                              |                               |
| SM         | 12.0  | 250  | 20:1       | 43 mm.                       |                               |
| SN         | 9.3   | 58   | Aper.      |                              |                               |
| SE         | 9.1   | 56   | "          |                              |                               |

NOTE: Universal Time used throughout.



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA



FROM December 1, 1938 to December 6, 1938 No. 70

| NO.<br>AND<br>DATE | PHASE                                                              | TIME        | AMP.      | DISTANCE | REMARKS                                                                 |
|--------------------|--------------------------------------------------------------------|-------------|-----------|----------|-------------------------------------------------------------------------|
|                    |                                                                    | h m s       | $\mu$     | km.      |                                                                         |
| 449<br>Dec.<br>1   | e<br>e <sup>N</sup><br>eL<br>F                                     | Ottawa      |           |          |                                                                         |
|                    |                                                                    | 2 37.1      |           |          |                                                                         |
|                    |                                                                    | 2 50        |           |          |                                                                         |
|                    |                                                                    |             | 2 59      |          |                                                                         |
|                    |                                                                    |             | 4 26      |          |                                                                         |
|                    |                                                                    |             | Victoria  |          |                                                                         |
|                    |                                                                    | e           | 2 33 52   |          |                                                                         |
|                    |                                                                    | e           | 2 43 27   |          |                                                                         |
|                    |                                                                    | L           | 2 48      |          |                                                                         |
|                    |                                                                    | F           | 4 00      |          |                                                                         |
|                    |                                                                    |             | Saskatoon |          |                                                                         |
|                    |                                                                    | e           | 2 25 00   |          |                                                                         |
|                    |                                                                    | e           | 2 35 20   |          |                                                                         |
|                    |                                                                    | eL          | 2 51      |          |                                                                         |
|                    |                                                                    | F           | 3 26      |          |                                                                         |
|                    |                                                                    | Seven Falls |           |          |                                                                         |
|                    | e                                                                  | 2 37.3      |           |          |                                                                         |
|                    | e                                                                  | 2 46.4      |           |          |                                                                         |
|                    | eL                                                                 | 2 59        |           |          |                                                                         |
|                    | F                                                                  | 4 31        |           |          |                                                                         |
| 450<br>Dec.<br>1   | H<br>P<br>S<br>L<br>F                                              | Ottawa      |           | 240      | $\Delta$ and H based on Joliat's<br>Tables for Nearby Earth-<br>quakes. |
|                    |                                                                    | 23 29.3     |           |          |                                                                         |
|                    |                                                                    | 23 29 56    |           |          |                                                                         |
|                    |                                                                    | 23 30 23    |           |          |                                                                         |
|                    |                                                                    | 23 30 51    |           |          |                                                                         |
| 453<br>Dec.<br>3   | H<br>P <sub>Z</sub><br>S <sub>E</sub><br>e <sub>E</sub><br>eL<br>F | Ottawa      |           | 9,800    |                                                                         |
|                    |                                                                    | 12 11.9     |           |          |                                                                         |
|                    |                                                                    | 12 24 46    |           |          |                                                                         |
|                    |                                                                    | 12 35 36    |           |          |                                                                         |
|                    |                                                                    | 12 48.3     |           |          |                                                                         |
|                    |                                                                    | 12 56       |           |          |                                                                         |
| 454<br>Dec.<br>4   | H<br>P<br>S<br>L<br>F                                              | Victoria    |           | 5,600    |                                                                         |
|                    |                                                                    | 15 38.9     |           |          |                                                                         |
|                    |                                                                    | 15 46 55    |           |          |                                                                         |
|                    |                                                                    | 15 54 13    |           |          |                                                                         |
|                    |                                                                    | 16 00       |           |          |                                                                         |
| 457<br>Dec.<br>6   | e<br>L<br>F                                                        | Ottawa      |           |          |                                                                         |
|                    |                                                                    | 23 29.4     |           |          |                                                                         |
|                    |                                                                    | 23 52       |           |          |                                                                         |
|                    |                                                                    | 0 28        |           |          |                                                                         |



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA



FROM December 6, 1938 to December 9, 1938 No. 71

| NO.<br>AND<br>DATE           | PHASE           | TIME        | AMP.<br>$\mu$ | DISTANCE<br>km. | REMARKS |
|------------------------------|-----------------|-------------|---------------|-----------------|---------|
|                              |                 | h m s       |               |                 |         |
| 457<br>Dec.<br>6<br>(Cont'd) |                 | Victoria    |               |                 |         |
|                              | e               | 23 13.6     |               |                 |         |
|                              | e               | 23 24.4     |               |                 |         |
|                              | L               | 23 46       |               |                 |         |
|                              | F               | 1 00        |               |                 |         |
|                              |                 | Toronto     |               |                 |         |
|                              | e <sup>N</sup>  | 23 21       |               |                 |         |
|                              | e <sup>N</sup>  | 23 28.7     |               |                 |         |
|                              | L               | 23 54       |               |                 |         |
|                              | F               | 1 00        |               |                 |         |
|                              |                 | Seven Falls |               |                 |         |
|                              | e               | 23 27.9     |               |                 |         |
| e                            | 23 37 30        |             |               |                 |         |
| eL                           | 23 48           |             |               |                 |         |
| F                            | 1 18            |             |               |                 |         |
| 458<br>Dec.<br>7             |                 | Ottawa      |               |                 |         |
|                              | e               | 13 44       |               |                 |         |
|                              | eL              | 14 21.3     |               |                 |         |
|                              | F               | 15 28       |               |                 |         |
|                              |                 | Victoria    |               | 9,470           |         |
|                              | H               | 13 24.0     |               |                 |         |
|                              | eP <sub>E</sub> | 13 36 35    |               |                 |         |
|                              | eS              | 13 47 07    |               |                 |         |
|                              | PPS             | 13 48.7     |               |                 |         |
|                              | SS <sub>E</sub> | 13 53.8     |               |                 |         |
|                              | eL              | 14 02       |               |                 |         |
|                              | F               | 16 05       |               |                 |         |
|                              |                 | Toronto     |               |                 |         |
|                              | e               | 14 03.1     |               |                 |         |
|                              | L               | 14 23       |               |                 |         |
|                              | F               | 15 42       |               |                 |         |
|                              |                 | Seven Falls |               |                 |         |
|                              | e               | 13 44.4     |               |                 |         |
| e                            | 13 49           |             |               |                 |         |
| e                            | 13 54           |             |               |                 |         |
| e                            | 14 01           |             |               |                 |         |
| eL                           | 14 13           |             |               |                 |         |
| F                            | 16 02           |             |               |                 |         |
| 459<br>Dec.<br>9             |                 | Ottawa      |               | 5,150           |         |
|                              | H               | 3 55.5      |               |                 |         |
|                              | eP <sub>Z</sub> | 4 04 00     |               |                 |         |
|                              | eS              | 4 10 53     |               |                 |         |
|                              | SS              | 4 13.8      |               |                 |         |
|                              | L               | 4 18        |               |                 |         |
| F                            | 5 10            |             |               |                 |         |



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA



FROM December 9, 1938 to December 13, 1938 No. 72

| NO.<br>AND<br>DATE           | PHASE            | TIME      | AMP.<br>$\mu$ | DISTANCE<br>km. | REMARKS |
|------------------------------|------------------|-----------|---------------|-----------------|---------|
|                              |                  | h m s     |               |                 |         |
| 459<br>Dec.<br>9<br>(Cont'd) |                  | Victoria  |               | 2,300           |         |
|                              | H                | 3 55.2    |               |                 |         |
|                              | iP               | 3 59 53   |               |                 |         |
|                              | eN               | 4 01.0    |               |                 |         |
|                              | iS               | 4 03 42   |               |                 |         |
|                              | SS               | 4 04.5    |               |                 |         |
|                              | L                | 4 05.4    |               |                 |         |
|                              | F                | 5 30      |               |                 |         |
|                              |                  | Toronto   |               |                 |         |
|                              | e                | 4 13 04   |               |                 |         |
|                              | e                | 4 16 08   |               |                 |         |
|                              | L                | 4 21      |               |                 |         |
|                              | F                | 5 10      |               |                 |         |
|                              |                  | Saskatoon |               |                 |         |
|                              | eE               | 3 58.2    |               |                 |         |
| eE                           | 4 01.2           |           |               |                 |         |
| eL                           | 4 06             |           |               |                 |         |
| F                            | 4 32             |           |               |                 |         |
|                              | Seven Falls      |           |               |                 |         |
| H                            | 3 55.6           |           | 5,280         |                 |         |
| P                            | 4 04 09          |           |               |                 |         |
| S                            | 4 11 09          |           |               |                 |         |
| SS                           | 4 14 02          |           |               |                 |         |
| SSS                          | 4 14.9           |           |               |                 |         |
| L                            | 4 18             |           |               |                 |         |
| F                            | 5 14             |           |               |                 |         |
|                              | Shawinigan Falls |           |               |                 |         |
| H                            | 3 55.5           |           | 5,250         |                 |         |
| eP                           | 4 04 04          |           |               |                 |         |
| eS                           | 4 11 03          |           |               |                 |         |
| L                            | 4 19             |           |               |                 |         |
| F                            | 4 37             |           |               |                 |         |
|                              | Ottawa           |           |               |                 |         |
| H                            | 9 10.8           |           | 3,460         |                 |         |
| ePz                          | 9 17 11          |           |               |                 |         |
| eSz                          | 9 22 24          |           |               |                 |         |
| L                            | 9 26             |           |               |                 |         |
| F                            | 9 35             |           |               |                 |         |
|                              | Seven Falls      |           |               |                 |         |
| e                            | 9 21 38          |           |               |                 |         |
| L                            | 9 25             |           |               |                 |         |
| F                            | 9 31             |           |               |                 |         |
|                              | Shawinigan Falls |           |               |                 |         |
| H                            | 9 11.0           |           | 3,180         |                 |         |
| P                            | 9 17 02          |           |               |                 |         |
| S                            | 9 21 57          |           |               |                 |         |
| L                            | 9 25             |           |               |                 |         |
| F                            | 9 32             |           |               |                 |         |



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA



FROM December 13, 1938 to December 16, 1938 No. 73

| NO.<br>AND<br>DATE | PHASE           | TIME                  | AMP.  | DISTANCE | REMARKS |
|--------------------|-----------------|-----------------------|-------|----------|---------|
|                    |                 | h m s                 | $\mu$ | km.      |         |
| 465<br>Dec.<br>13  | e               | 17 49.4               |       |          |         |
|                    | L               | 18 11                 |       |          |         |
|                    | F               | 19 19                 |       |          |         |
| Ottawa             |                 |                       |       |          |         |
| 466<br>Dec.<br>16  | H               | 17 21 ca.             |       | 140° ca. |         |
|                    | eP'z            | 17 40 45              |       |          |         |
|                    | PP              | 17 43.5               |       |          |         |
|                    | SKP             | 17 44 20              |       |          |         |
|                    | PPS             | 17 56.1               |       |          |         |
|                    | eL              | 18 18                 |       |          |         |
|                    | F               | Lost in next<br>quake |       |          |         |
| Victoria           |                 |                       |       |          |         |
|                    | H               | 17 21 ca.             |       | 112° ca. |         |
|                    | PP <sub>E</sub> | 17 40.4               |       |          |         |
|                    | PPS             | 17 50.8               |       |          |         |
|                    | SS              | 17 56                 |       |          |         |
|                    | L               | 18 14                 |       |          |         |
|                    | F               | Lost in next<br>quake |       |          |         |
|                    | Toronto         |                       |       |          |         |
|                    | e               | 17 43                 |       |          |         |
|                    | e               | 17 53                 |       |          |         |
|                    | eL              | 18 18                 |       |          |         |
|                    | F               | 20 20                 |       |          |         |
| Seven Falls        |                 |                       |       |          |         |
|                    | e               | 17 44 33              |       |          |         |
|                    | e               | 17 54.0               |       |          |         |
|                    | e               | 17 58.0               |       |          |         |
|                    | e               | 18 03.6               |       |          |         |
|                    | eL              | 18 19                 |       |          |         |
|                    | F               | 20 32                 |       |          |         |
| Ottawa             |                 |                       |       |          |         |
| 467<br>Dec.<br>16  | eZ              | 19 04 31              |       |          |         |
|                    | L               | 19 24                 |       |          |         |
|                    | F               | 20 15                 |       |          |         |
| Victoria           |                 |                       |       |          |         |
|                    | e               | 18 52                 |       |          |         |
|                    | e               | 19 02                 |       |          |         |
|                    | L               | 19 22                 |       |          |         |
|                    | F               | 20 50                 |       |          |         |



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA



FROM December 16, 1938 to December 19, 1938 No. 74

| NO.<br>AND<br>DATE             | PHASE       | TIME        | AMP.<br>$\mu$ | DISTANCE | REMARKS       |
|--------------------------------|-------------|-------------|---------------|----------|---------------|
|                                |             | h m s       |               |          |               |
| 468<br>Dec.<br>16<br>and<br>17 | eZ          | 23 34 15    |               |          |               |
|                                | eL          | 0 13        |               |          |               |
|                                | F           | 1 30        |               |          |               |
|                                |             | Victoria    |               |          |               |
|                                | e           | 23 41       |               |          |               |
|                                | e           | 0 01        |               |          |               |
|                                | L           | 0 13        |               |          |               |
|                                | F           | 2 10        |               |          |               |
|                                |             | Toronto     |               |          |               |
|                                | e           | 23 36       |               |          |               |
|                                | L           | 0 11        |               |          |               |
|                                | F           | 1 35        |               |          |               |
|                                | Seven Falls |             |               |          |               |
|                                | e           | 23 38.6     |               |          |               |
|                                | e           | 23 57       |               |          |               |
|                                | L           | 0 23        |               |          |               |
|                                | F           | 1 39        |               |          |               |
|                                |             | Ottawa      |               |          |               |
| 470<br>Dec.<br>17              | iZ          | 15 48 30    |               |          | Nearby quake. |
|                                | iZ          | 15 48 31    |               |          |               |
|                                | F           | 15 48.6     |               |          |               |
|                                |             | Ottawa      |               |          |               |
| 471<br>Dec.<br>17              | eZ          | 16 48 11    |               |          |               |
|                                | L           | 17 16       |               |          |               |
|                                | F           | 17 46       |               |          |               |
|                                |             | Seven Falls |               |          |               |
|                                | e           | 16 48 03    |               |          |               |
|                                | e           | 16 58.4     |               |          |               |
| L                              | 17 14       |             |               |          |               |
| F                              | 18 13       |             |               |          |               |
|                                |             | Ottawa      |               |          |               |
| 472<br>Dec.<br>17              | iZ          | 18 42 56    |               |          | Nearby quake. |
|                                | iZ          | 18 42 57    |               |          |               |
|                                | F           | 18 43.5     |               |          |               |
|                                |             | Seven Falls |               |          |               |
| 475<br>Dec.<br>18              | e           | 22 09.5     |               |          |               |
|                                | L           | 22 29       |               |          |               |
|                                | F           | 23 03       |               |          |               |
|                                |             | Ottawa      |               |          |               |
| 476<br>Dec.<br>19              | iZ          | 18 13 55    |               |          |               |
|                                | L           | 18 32       |               |          |               |
|                                | F           | 19 00       |               |          |               |



SEISMOLOGICAL SERVICE OF CANADA  
DOMINION OBSERVATORY, OTTAWA



FROM December 19, 1938 to December 31, 1938 No. 75

| NO. AND DATE                  | PHASE                                                  | TIME             |      |    | AMP. $\mu$ | DISTANCE km. | REMARKS                                                                                                                  |
|-------------------------------|--------------------------------------------------------|------------------|------|----|------------|--------------|--------------------------------------------------------------------------------------------------------------------------|
|                               |                                                        | h                | m    | s  |            |              |                                                                                                                          |
| 476<br>Dec.<br>19<br>(Cont'd) | e<br>L<br>F                                            | Seven Falls      |      |    |            |              |                                                                                                                          |
|                               |                                                        | 18               | 16.0 |    |            |              |                                                                                                                          |
|                               |                                                        | 18               | 33   |    |            |              |                                                                                                                          |
| 477<br>Dec.<br>19             | iZ<br>L<br>F                                           | Ottawa           |      |    |            |              |                                                                                                                          |
|                               |                                                        | 18               | 36   | 06 |            |              |                                                                                                                          |
|                               |                                                        | 19               | 02   |    |            |              |                                                                                                                          |
| 478<br>Dec.<br>21             | e<br>L<br>F                                            | Seven Falls      |      |    |            |              |                                                                                                                          |
|                               |                                                        | 18               | 46   | 25 |            |              |                                                                                                                          |
|                               |                                                        | 19               | 05   |    |            |              |                                                                                                                          |
| 480<br>Dec.<br>23             | H<br>eP<br>eS<br>eL<br>F                               | Seven Falls      |      |    |            | 2,500        |                                                                                                                          |
|                               |                                                        | 13               | 12   | 12 |            |              |                                                                                                                          |
|                               |                                                        | 13               | 30   |    |            |              |                                                                                                                          |
| 481<br>Dec.<br>25             | H<br>P<br>S<br>L<br>F                                  | Victoria         |      |    |            | 215          | $\Delta$ and H based on Joliat's Tables for Nearby Earthquakes.                                                          |
|                               |                                                        | 18               | 14.5 |    |            |              |                                                                                                                          |
|                               |                                                        | 18               | 19.5 |    |            |              |                                                                                                                          |
| 483<br>Dec.<br>28             | H<br>P <sub>n</sub><br>P*<br>S <sub>n</sub><br>S*<br>F | Shawinigan Falls |      |    |            | 415          | $\Delta$ and H based on Joliat's Tables for Nearby Earthquakes. Rock burst at Lake Shore Mine at Kirkland Lake, Ontario. |
|                               |                                                        | 7                | 46.4 |    |            |              |                                                                                                                          |
|                               |                                                        | 7                | 46   | 56 |            |              |                                                                                                                          |
| 484<br>Dec.<br>30             | iZ<br>L<br>F                                           | Ottawa           |      |    |            |              |                                                                                                                          |
|                               |                                                        | 4                | 49.9 |    |            |              |                                                                                                                          |
|                               |                                                        | 4                | 50   | 52 |            |              |                                                                                                                          |
| 486<br>Dec.<br>30             | e<br>L<br>F                                            | Ottawa           |      |    |            |              |                                                                                                                          |
|                               |                                                        | 2                | 39   | 54 |            |              |                                                                                                                          |
|                               |                                                        | 3                | 30   |    |            |              |                                                                                                                          |
| 486<br>Dec.<br>30             | eZ<br>L<br>F                                           | Seven Falls      |      |    |            |              |                                                                                                                          |
|                               |                                                        | 2                | 43   | 29 |            |              |                                                                                                                          |
|                               |                                                        | 3                | 20   |    |            |              |                                                                                                                          |
| 486<br>Dec.<br>30             | eZ<br>L<br>F                                           | Ottawa           |      |    |            |              |                                                                                                                          |
|                               |                                                        | 12               | 19   | 03 |            |              |                                                                                                                          |
|                               |                                                        | 12               | 29   |    |            |              |                                                                                                                          |
|                               |                                                        |                  |      |    |            |              | W. W. Doysee.                                                                                                            |



EARTHQUAKE CORRELATION TABLE  
Month December, 1938.

| No. | Date | Ottawa       | Victoria     | Toronto     | Saskatoon   | Halifax     | Seven Falls |             | Shawinigan  | ** |
|-----|------|--------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|----|
|     |      |              |              |             |             |             | M. S.       | W. A.       |             |    |
| 449 | 1    | 2 37+1.49u   | 2 34+1 26u   | .....       | 2 25+1 01u  | .....       | 2 37+1 54u  | .....       | .....       | .. |
| 450 | 1    | 23 30+0 04v  | .....        | .....       | .....       | .....       | .....       | .....       | .....       | A  |
| 451 | 2    | 7 54+0 02P*  | .....        | .....       | .....       | .....       | .....       | .....       | .....       | .. |
| 452 | 2    | 23 00+0 29L  | 22 59+0 29L  | .....       | .....       | .....       | 23 00+0 32L | .....       | .....       | .. |
| 453 | 3    | 12 25+1 00u  | 12 30+0 10L  | .....       | .....       | .....       | 12 59+1 10L | .....       | .....       | B  |
| 454 | 4    | .....        | 15 47+1 04u  | .....       | .....       | .....       | .....       | .....       | .....       | C  |
| 455 | 4    | 17 20+0 36L  | .....        | .....       | .....       | .....       | 17 18+1 18L | .....       | .....       | .. |
| 456 | 6    | 9 32+0 15L   | 9 38+0 13L   | .....       | .....       | .....       | .....       | .....       | .....       | .. |
| 457 | 6    | 23 29+0 59u  | 23 14+1 46u  | 23 21+1 39u | .....       | .....       | 23 28+1 49u | .....       | .....       | .. |
| 458 | 7    | 13 44+1 44u  | 13 36+2 29U  | 14 03+1 39u | .....       | .....       | 13 44+2 18u | 14 30+0 08L | .....       | E  |
| 459 | 9    | 4 04+1 06u   | 4 00+1 30r   | 4 13+0 57u  | 3 58+0 34u  | .....       | 4 11+1 10u  | 4 04+0 30u  | 4 04+0 33u  | F  |
| 460 | 12   | 3 32+0 08L   | 3 24+0 09L   | 3 30+0 10L  | .....       | .....       | .....       | .....       | .....       | .. |
| 461 | 12   | .....        | 7 43+0 22L   | 8 02+0 05L  | .....       | .....       | .....       | .....       | .....       | .. |
| 462 | 12   | 22 20+0 11L  | .....        | .....       | .....       | .....       | .....       | .....       | .....       | .. |
| 463 | 13   | 9 17+0 18r   | 9 29+0 15L   | 9 21+0 12L  | .....       | .....       | .....       | .....       | 22 10+0 02P | .. |
| 464 | 13   | .....        | 14 46+0 10L  | .....       | .....       | .....       | .....       | 9 22+0 09r  | 9 17+0 15r  | G  |
| 465 | 13   | 18 08+0 27L  | .....        | .....       | .....       | .....       | .....       | .....       | .....       | .. |
| 466 | 16   | 17 41+1 20+u | 17 40+1 22+u | 17 43+2 37u | 18 21+1 39L | 18 22+1 18L | 17 49+1 30u | .....       | 17 41+0 07P | .. |
| 467 | 16   | 19 04+1 11u  | 18 52+1 58u  | .....       | .....       | .....       | 17 45+2 48u | 18 37+0 09L | .....       | J  |
| 468 | 16   | 23 34+1 56u  | 23 41+2 29u  | 23 36+1 59u | .....       | 0 30+0 32L  | 23 39+2 00u | .....       | .....       | .. |
| 469 | 17   | 15 33+0 0.3P | .....        | .....       | .....       | .....       | .....       | .....       | .....       | .. |
| 470 | 17   | 17 48+0 0.1d | .....        | .....       | .....       | .....       | .....       | .....       | .....       | .. |
| 471 | 17   | 16 48+0 58u  | .....        | 17 27+0 20L | .....       | .....       | .....       | .....       | .....       | K  |
| 472 | 17   | 18 43+0 0.6d | .....        | .....       | .....       | .....       | 16 58+1 05u | 16 48+0 01P | 16 48+0 04P | .. |
| 473 | 17   | 23 47+0 01P  | .....        | .....       | .....       | .....       | .....       | .....       | .....       | K  |
| 474 | 18   | 21 13+0 12L  | .....        | 21 11+0 11L | .....       | .....       | 21 13+0 18L | .....       | .....       | .. |
| 475 | 18   | 22 35+0 25L  | .....        | 22 33+0 17L | .....       | .....       | 22 09+0 53u | .....       | .....       | .. |
| 476 | 19   | 18 14+0 46u  | 18 12+1 11u  | 18 29+0 13L | .....       | .....       | 18 16+0 46u | .....       | .....       | .. |



## EARTHQUAKE CORRELATION TABLE

Month December, 1938.

| No. | Date | Ottawa      | Victoria    | Toronto     | Saskatoon | Halifax     | Seven Falls |             | Shawinigan  | ** |
|-----|------|-------------|-------------|-------------|-----------|-------------|-------------|-------------|-------------|----|
|     |      |             |             |             |           |             | M. S.       | W. A.       |             |    |
| 477 | 19   | 18 36+1 09u | .....       | 19 03+0 43L | .....     | .....       | 18 46+1 30u | .....       | .....       | .. |
| 478 | 21   | 12 46+0 04P | .....       | .....       | .....     | .....       | 13 12+1 45u | .....       | .....       | .. |
| 479 | 22   | 17 55+0 15L | .....       | .....       | .....     | .....       | 17 44+0 28L | .....       | .....       | .. |
| 480 | 23   | 18 41+0 17L | 18 20+0 33r | 18 25+0 49L | .....     | 18 49+0 08L | 18 34+0 37L | .....       | 18 26+0 02P | N  |
| 481 | 25   | .....       | .....       | .....       | .....     | .....       | .....       | 7 48+0 0.5v | 7 47+0 1.5v | S  |
| 482 | 26   | .....       | 6 58+0 12L  | .....       | .....     | .....       | .....       | .....       | .....       | .. |
| 483 | 27   | 4 51+0 2.6v | .....       | .....       | .....     | .....       | .....       | .....       | 4 52+0 01P  | W  |
| 484 | 28   | 2 40+1 05u  | 3 11+0 10L  | .....       | .....     | .....       | 2 43+1 46u  | .....       | .....       | .. |
| 485 | 30   | .....       | 12 19+0 04L | .....       | .....     | .....       | .....       | .....       | .....       | .. |
| 486 | 30   | 12 19+0 20u | .....       | .....       | .....     | .....       | .....       | .....       | 12 19+0 02P | .. |
| 487 | 31   | 0 36+0 25L  | 0 43+0 11L  | 0 45+0 18L  | .....     | .....       | 0 37+0 33L  | .....       | .....       | .. |