

A.R. 1940



SEISMOLOGICAL SERVICE OF CANADA

SEISMOLOGICAL BULLETIN
January
1940

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DOMINION OBSERVATORY
OTTAWA, CANADA

SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

R. Meldrum Stewart, Dominion Astronomer
Ernest A. Hodgson, Seismologist
W. W. Doxsee, Station Superintendent
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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 0.10s.

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 radio 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 8 mm. per min. and mass 1 lb.

VICTORIA

Dominion Astrophysical Observatory

$\phi = 48^{\circ}31'14''$ N. $\lambda = 123^{\circ}24'56''$ W. $h = 197$ m.

Time correction from recorded 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, smoked sheet registration, air damping, paper speed of 15 mm. per min., mass 80 kg.

11/11/50
Lull

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.

KIRKLAND LAKE

Lake Shore Mines

$\phi = 48^{\circ}09'$ N. $\lambda = 80^{\circ}03'$ W. $h = 320$ m.

Time correction from recorded radio time signals

Foundation: rock

Instruments: Converted Heiland Field Seismometer, vertical component, designated KL, photographic registration, paper speed of 30 mm. per min.

DETERMINED CONSTANTS

INSTRUMENT	T_0	V	ϵ	DISPLACEMENT FOR 1" ARC TILT	DISPLACEMENT FOR 10 ⁻⁶ g
17 (Ottawa)	12.0	300	20:1	50 mm.	11 mm. 17 mm.
23 (Ottawa)	12.0	300	20:1	50 mm.	
BS (Ottawa)	1.0				
BL (Ottawa)	1.0				
HN (Halifax)	5.0	125	20:1		
HE (Halifax)	5.0	125	20:1		
SA (Shawinigan)	1.0	2000			
18 (Toronto)	10.0	165	20:1	20 mm.	
22 (Toronto)	10.0	165	20:1	20 mm.	
20 (Victoria)	12.0	300	20:1		
21 (Victoria)	12.0	300	20:1		
WV (Victoria)	4.0	120	15:1		
SF (Seven Falls)	1.0	2500			
SM (Seven Falls)	12.0	300	20:1	50 mm.	
SN (Saskatoon)	9.2	59	Aper.		
SE (Saskatoon)	9.2	60	"		
KL (Kirkland Lake)	1/30	2x10 ⁴	at 30 cycles		

NOTE: Universal Time used throughout.

CORRELATION TABLE
 ::::::::::::::::::::::

This tabulation not only provides a yearly numbered list of all earthquakes recorded in Canada but also correlates the seismic registrations of the eight Canadian stations. The seismograph at the Kirkland Lake rockburst station (Established Dec. 19, 1939) records only the bursts and those earthquakes originating very close to Kirkland Lake. Entries for this station in the Correlation Table will be confined to those earthquakes and rockbursts which registered at Kirkland Lake and also at one or more outside stations. Such entries will be indexed as notes. Entries for each station show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries in two or more columns in the same line indicates that these are known to be concerned with the same earthquake even though the times of beginning may differ slightly. The figures after the plus sign show the duration of the record in hours and minutes. The earthquake number and the day of the month on which it occurred are listed in the first and second columns, respectively, while the extreme right hand column is reserved for index letters to a series of notes following the tabulation. Certain letters are reserved for the purpose of classifying the entries: these are as follows:-

- d (domesticus) epicentre less than 100 km.
- v (vicinus) epicentre between 100 and 1000 km.
- r (remotus) epicentre between 1000 and 5000 km.
- u (ultimus) epicentre beyond 5000 km.

(above lower-case letters apply to earthquakes of the lowest order of intensity on a scale of three.)

- D, V, R, U : distance as above, intensity intermediate.
- D, V, R, U : distance as above, intensity - top of scale,
- L Long (or surface waves) alone recorded.
- Q Questionable (may not be seismic).
- T Time uncertain.
- P Preliminary tremors alone recorded.
- * Recorded only by short period seismograph.

CORRELATION OF EARTHQUAKES
January, 1940.



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N O T E S
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A	: Ottawa	$\Delta = 8920$ km.	H = $11^h07^m.5$ U.T.
B	: Ottawa	$\Delta = 290$ km.	H = $0^h34^m.2$ U.T.
	Slight tremor felt at Temiskaming, Quebec.		
C	: Ottawa	$\Delta = 12900$ km.	H = $14^h03^m.4$ U.T.
	Victoria	$\Delta = 9960$ km.	H = $14\ 03.6$ U.T.
	Seven Falls	$\Delta = 14000$ km.	H = $14\ 03.3$ U.T.
E	: Ottawa	$\Delta = 11800$ km.	H = $1^h15^m.1$ U.T.
	Victoria	$\Delta = 7020$ km.	H = $(1\ 15.4)$ U.T.
	Toronto	$\Delta = 11500$ km.	H = $1\ 15.3$ U.T.
	Saskatoon	$\Delta = 9260$ km.	H = $1\ 15.2$ U.T.
	Halifax	$\Delta = 12000$ km.	H = $1\ 15.3$ U.T.
	Seven Falls	$\Delta = 11900$ km.	H = $1\ 15.1$ U.T.
F	: Epicentre probably within 50 km. of the Seven Falls station.		

Dominion Observatory,
Ottawa - Canada,
February 27, 1940.

double



SEISMOLOGICAL BULLETINS RECEIVED

January, 1940

We acknowledge, with thanks, the receipt of the following seismological publications and bulletins:-

STATIONS	BULLETINS	RECEIVED
Fordham	April to September, 1939	January 2
New Zealand Stations	October, 1939	" 2
India Stations	July to September, 1938	" 5
Weston	December, 1939	" 9
Algiers	October, 1939	" 10
Paris)	August, 1939	" 10
Strasbourg)		
Bureau Central)		
Ksara	November, 1939	" 11
Manila	October, 1939	" 11
Batavia	January to March, 1939	" 11
Rome	Years 1934 and 1936	" 15
New Zealand Stations	November, 1939	" 17
San Fernando	September and October, 1939	" 17
Brisbane	November, 1939	" 17
Riverview	October and November, 1939	" 19
Pittsburg	December, 1939	" 19
Pasadena	Local Shocks for August and September, 1939	" 20
India Stations	October to December, 1938	" 20
Ksara	August, 1939	" 22
Apia	October to December, 1939	" 25
Zurich	December, 1939	" 27
Saint Louis	May, 1939	" 29
Florissant	June to September, 1939	" 29
Saint Louis and Auxiliary Stations	Preliminaries for July 18, October 4, 10, 17, 19, 20, 22, 30, 1939	" 29
Paris)	September, 1939	" 30
Bureau Central)		
Bucarest	December, 1939	" 30
Algiers	November, 1939	" 30
Pasadena	Preliminary report for Sept.-Oct. and Nov.-Dec., 1939	" 31

DOMINION OBSERVATORY,
OTTAWA - CANADA.

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SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM January 1, 1940 to January 6, 1940 No. 1

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS	
		h m s			
1 Jan. 2		Ottawa	8920	USCGS. gives: $\phi = 31^\circ$ S. $\lambda = 108^\circ$ W.	
	H	11 07.5			
	iP _Z	11 19 35			
	S	11 29.7			
	L	11 41			
	F	12 30			
3 Jan. 5		Ottawa	290	Slight tremor felt at Temiskaming, Quebec.	
	H	0 34.2			
	iP ₂	0 34 58			
	iS _n	0 35 26			
	iS ₂	0 35 30			
	F	0 37			
5 Jan. 6		Ottawa			
	iZ	8 27 50			
	L	9 00			
	F	9 18			
6 Jan. 6		Ottawa	12900	USCGS. gives: $\phi = 22^\circ$ S. $\lambda = 170^\circ$ E.	
	H	14 03.4			
	iP' _Z	14 22 07			
	PPZ	14 22 45			
	S	14 31			
	PPS	14 34			
	SS	14 39			
	SSS	14 43			
	L	15 00			
	F	17 00			
		Victoria			9960
	H	14 03.6			
	P	14 16 33			
PP	14 20.0				
S	14 27.4				
PS	14 28.0				
PPS	14 28 43				
SS	14 34.2				
L	14 45				
F	16 00 ca.				
	Toronto				
i	14 33 16				
i	14 34 20				
e	14 39.0				
e	14 40.3				
e	14 42.8				
e	14 49.8				
L	14 53				
F	16 20				
	Halifax				
e	14 25.3				
i	14 26 29				
e	14 35.3				
L	15 06				
F	16 00				

Double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM January 6, 1940 to January 17, 1940 No. 2

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
		h m s	km.	
6 Jan. 6 (Cont'd)		Seven Falls		
	H	14 03.3	14000	
	PP	14 24 08		
	SKP	14 25 32		
	PS	14 34 03		
	e	14 37 15		
	SS	14 41.8		
	L	15 03		
	F	16 55		
13 Jan. 17		Ottawa		
	H	1 15	11800	USCGS. gives: $\phi = 17^\circ \text{ N.}$ $\lambda = 148^\circ \text{ E.}$
	PP	1 33 32		
	SKS	1 39.9		
	PPS	1 43.7		
	SS	1 48.5		
	SSS	1 53		
	L	1 58		
	F	4 00 ca.		
		Victoria		
	H	(1 15.4)	7020	
	P	(1 25 45)		
	PPP	(1 28.2)		
S	(1 34 24)			
SS	(1 38.7)			
SSS	(1 40.5)			
L	(1 45)			
F	4 15 ca.			
	Toronto			
H	1 15.3	11500		
PP	(1 33.9)			
SKS	1 39 57			
S	1 40.1			
PPS	1 43.8			
SS	1 48.2			
SSS	1 53			
L	1 56			
F	4 00 ca.			
	Saskatoon			
H	1 15.2	9260		
P	1 27 38			
i	1 28 14			
SKS	1 37.7			
S	1 38 00			
SKKS	1 38 08			
i	1 38 34			
PPS	1 39.0			
SS	1 44			
L	1 49			
F	3 00 ca.			

double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM January 17, 1940 to January 26, 1940 No. 3

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
		h m s	km.	
		Halifax		
13 Jan. 17 (Cont'd)	H	1 15.3	12000	
	PP	1 34.2		
	SKKS	1 41.2		
	SS	1 49.5		
	L	2 00		
	F	3 15		
		Seven Falls		
	H	1 15.1	11900	
	PP	1 33 44		
	PPP	1 35.9		
	SKS	1 39.9		
	PS	1 42 57		
	SS	1 48 53		
	SSS	1 52.9		
	L	1 59		
	F	4 06		
		Shawinigan Falls		
	e	1 33.7		
	L	2 04		
	F	2 31		
		Victoria		
15 Jan. 20	e	4 06		
	L	4 14		
	F	4 25		
		Ottawa		
16 Jan. 20	e	10 33		
	L	10 56		
	F	12 00 ca.		
		Victoria		
	e	10 26		
	e	10 33		
	e	10 43		
	L	10 48		
	F	12 00		
		Ottawa		
19 Jan. 26	iz	7 00 31		
	e	7 03.4		
	e	7 07.5		
	e	7 09		
	e	7 12.4		
	e	7 26.5		
	L	7 36		
	F	8 30		
			Seven Falls	
	e	7 19.7		
	L	7 36		
	F	8 24		

double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM January 26, 1940 to January 31, 1940 No. 4

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS	
		h m s	km.		
21 Jan. 26	iZ e S? L F	Ottawa			
		17 22 37			
		17 26.7			
		17 31 40			
			17 50		
			19 00 ca.		
			Seven Falls		
		e	17 31.7		
		e	17 37.2		
		L F	17 50 18 54		
22 Jan. 27	iZ L F	Ottawa			
		10 21 29			
		10 34 10 56			
23 Jan. 28	iZ L F	Ottawa			
		7 37 39			
		7 48 8 00 ca.			
24 Jan. 28	iZ i F	Ottawa			
		8 35 25			
		8 48 30 9 15			
			Victoria		
		e	8 30 02		
		iS	8 36 30		
		i	8 37 06		
		F	8 50		
			Halifax		
		i	8 52 07		
		i	8 52 30		
		i	8 54 52		
		F	9 04		
			Seven Falls		
		e	8 48.2		
	F	8 56			
		Shawinigan Falls			
	e	8 35 31			
	e	8 48 39			
	F	9 00 ca.			
27 Jan. 30	iZ iZ iZ F	Ottawa			
		12 07 24		Nearby quake.	
		12 07 36			
		12 07 40			
		12 08.5			

W. W. Doysee.

double



CORRELATION OF EARTHQUAKES
February, 1940.

NOTES

A	Ottawa	$\Delta = 7120$ km.	$H = 17^h 16^m 3$ U.T.
	Victoria	$\Delta = 4100$ km.	$H = 17 16.2$ U.T.
	Toronto	$\Delta = 6940$ km.	$H = 17 16.5$ U.T.
	Saskatoon	$\Delta = 4980$ km.	$H = 17 16.2$ U.T.
	Halifax	$\Delta = 7750$ km.	$H = 17 16.4$ U.T.
	Shawinigan Falls	$\Delta = 7140$ km.	$H = 17 16.3$ U.T.
B	Ottawa	$\Delta = 150$ km.	$H = 20^h 57^m 3$ U.T.
C	Ottawa	$\Delta = 8060$ km.	$H = 0 01.5$ U.T.
	Toronto	$\Delta = 7940$ km.	$H = 0 01.4$ U.T.
	Seven Falls	$\Delta = 8120$ km.	$H = 0 01.6$ U.T.
E	Ottawa	$\Delta = 6380$ km.	$H = 8^h 29^m 5$ U.T.
F	Ottawa	$\Delta = 5640$ km.	$H = 9^h 18^m 0$ U.T.
G	Ottawa	$\Delta = 98$ km.	$H = 8^h 59^m 7$ U.T.
J	Victoria	$\Delta = 10,000$ km.	$H = 2^h 18^m$ U.T.
K	Ottawa	$\Delta = 94$ km.	$H = 19^h 05^m 3$ U.T.
N	Ottawa	$\Delta = 8060$ km.	$H = 16^h 07^m 8$ U.T.

Dominion Observatory,
Ottawa, Canada,
April 23, 1940.

Boyle

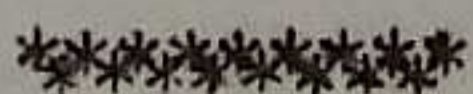


SEISMOLOGICAL SERVICE OF CANADA

SEISMOLOGICAL BULLETIN
February
1940



DOMINION OBSERVATORY
OTTAWA, CANADA



SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA

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S T A T I O N S

OTTAWA

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Time correction within 0.10s.

Foundation: boulder clay over limestone

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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.

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SEVEN FALLS

Quebec Power Company

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Time correction from recorded radio time signals

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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 8 mm. per min. and mass 1 lb.

VICTORIA

Dominion Astrophysical Observatory

$\phi = 48^{\circ}31'14''$ N. $\lambda = 123^{\circ}24'56''$ W. $h = 197$ m.

Time correction from recorded 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, smoked sheet registration, air damping, paper speed of 15 mm. per min., mass 80 kg.

double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM February 1, 1940 to February 7, 1940 No. 5

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS	
		h m s			
30 Feb. 7		Ottawa			
	H	17 16.3	7120	USCGS. gives: $\phi = 52^\circ \text{ N.}$ $\lambda = 174.5^\circ \text{ E.}$	
	iP	17 26 44			
	iz	17 27 37			
	iPPz	17 29 12			
	iS	17 35 28			
	PS	17 36 08			
	SS	17 40.0			
	SSS	17 43.0			
	L	17 46			
	F	20 00 ca.			
			Victoria		
	H	17 16.2	4100		
	P	17 23 23			
	PP	17 24 51			
	PPP	17 25 19			
	S	17 29 17			
	PS	17 29 39			
	SS	17 31.8			
	SSS	17 32.6			
	L	17 34			
	F	20 00 ca.			
			Toronto		
	H	17 16.5 -	6940		
	P	17 26 46			
	PPP	17 30 33			
	S	17 35 20			
	PPS?	17 36 22			
	SS	17 39 33			
	L	17 45			
	F	19 10			
			Saskatoon		
	H	17 16.2	4980		
	P	17 24 25			
	S	17 31 08			
	SS	17 34 15			
L	17 37				
F	18 20				
		Halifax			
H	17 16.4	7750			
P	17 27 29				
S	17 36.7				
PS	17 37 21				
SS	17 41.2				
SSS	17 44.7				
L	17 50				
F	18 30				

Double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM February 7, 1940 to February 12, 1940 No. 6

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS		
		h m s				
30 Feb. 7 (Cont'd)		Shawinigan Falls				
	H	17 16.3	7140			
	P	17 26 48				
	S	17 35 33				
	L	17 49				
	F	18 08				
			Seven Falls			
	H	17 16.4	7120			
	P	17 26 54				
	S	17 35 38				
	SS	17 39 47				
	SSS	17 42 10				
	L	17 45				
	F	19 32				
	31 Feb. 8		Ottawa			
iz		8 12 37				
e		8 18.2				
e		8 23				
F		9 00 ca.				
		Saskatoon				
e		8 09.8				
L		8 14				
F		8 32				
		Ottawa				
35 Feb. 10	H	20 57.3	150	Δ and H based on Leet's Travel Time Chart.		
	P ₂	20 57 40.7				
	P ₁	20 57 41.5				
	i	20 57 43.5				
	S ₂	20 57 58.5				
	S ₁	20 57 59.5				
	F	21 03				
		Shawinigan Falls				
	e	20 58 45				
	e	20 58 51				
	F	21 00				
		Seven Falls				
e	20 59 36					
F	21 00					
36 Feb. 12		Ottawa				
	H	0 01.5	8060			
	iP	0 12 51				
	iS	0 22 20				
	PSE	0 22 38				
	L	0 33				
	F	1 15				

shull

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM February 12, 1940 to February 12, 1940 No. 7

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
36 Feb. 12 (Cont'd)		h m s	km.	
		Victoria		
	eS	(0 20.0)		
	L	(0 43)		
	F	(1 30)		
		Toronto		
	H	0 01.4	7940	
	P	0 12 38		
	PP	0 15 32		
	S	0 22.0		
	L	0 36		
	F	1 10		
		Seven Falls		
	H	0 01.6	8120	
	P	0 13 06		
e	0 13 40			
S	0 22 38			
PS	0 23 00			
L	0 35			
F	1 13			
	Ottawa			
37 Feb. 12	iZ	5 36 10		
	L	5 56		
	F	6 11		
		Ottawa		
38 Feb. 12	H	8 29.5	6380	
	iPz	8 39 16		
	eS	8 47.3		
	SS	8 51.0		
	L	8 56		
	F	9 18		
		Victoria		
	i	(8 33.4)		
	i	(8 34.5)		
	iS?	(8 43.5)		
	F	(9 15)		
		Toronto		
	e	8 47.2		
	e	8 48.8		
	e	8 56.5		
	F	9 12		
		Seven Falls		
	e	8 47.7		
	e	8 51.6		
	L	8 59		
	F	9 15		

double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM February 12, 1940 to February 15, 1940 No. 8

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
		h m s	km.	
40 Feb. 12		Ottawa	5640	
	H	9 18.0		
	iPz	9 26 57		
	eS	9 34 17		
	eN	9 35.6		
	SS	9 38.0		
	L	9 42		
	F	10 40		
		Victoria		
	i	(9 23.0)		
	iS?	(9 27.6)		
	F	(10 30)		
		Toronto		
	e	9 34.0		
e	9 41.5			
e	9 42.6			
F	10 30			
	Seven Falls			
e	9 27 04			
e	9 28.6			
S	9 34.7			
L	9 43			
F	10 29			
41 Feb. 14		Ottawa		
	eN	0 06.7		
	L	0 11		
42 Feb. 14		Ottawa		
	iZ	2 17 10		
	iZ	2 19 53		
	L	2 58		
43 Feb. 14		Ottawa		
	F	3 56		
	eN	10 53		
44 Feb. 15		Ottawa		
	L	11 12		
	F	12 40		
44 Feb. 15		Ottawa		
	iZ	2 06 07		
	iZ	2 06 38		
	F	2 09		
				Rockburst at Lake Shore Mines, Kirkland Lake, Ont.

double

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM February 15, 1940 to February 20, 1940

No. 9

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS			
		h m s					
		Ottawa					
45 Feb. 15	H	8 59.7	98	Δ and H based on Leet's Travel Time Chart.			
	P ₁ Z	8 59 57					
	iZ	8 59 58					
	iZ	8 59 59.5					
	S ₁ Z	9 00 09					
	F	9 01					
		Ottawa					
46 Feb. 15	iZ	10 59 01		Nearby quake.			
	iZ	10 59 09.5					
	iZ	10 59 13.5					
	iZ	10 59 45					
	iZ	10 59 54					
	F	11 00.5					
		Ottawa					
47 Feb. 16	e	14 35.0					
	L	14 37					
	F	14 46					
		Ottawa					
48 Feb. 17	iZ	16 23 52		Nearby quake.			
	iZ	16 24 02.5					
	F	16 24.5					
		Ottawa					
49 Feb. 19	iZ	7 20 02					
	e _N	7 31.6					
	L	7 38					
	F	7 48					
		Ottawa					
<i>now</i> 50 Feb. 20	iZ	2 36 48		USCGS. gives:- φ = 12° S. λ = 167° E.			
	e	2 38.1					
	eZ	2 38.4					
	iZ	2 47 06					
	iZ	2 47 10					
	e	2 47.4					
	e	2 48.5					
	e _E	2 50.2					
	e	2 55.3					
	i	3 02 50					
	F	5 07					
					Victoria	10,000ca.	
	H	2 18ca.					
P	2 30 48						
P _P _E	2 34.2						
P _P _P _E	2 36 40						
S _K _S	2 40 58						
P _S _E	2 42 38						
S _S _N	2 47 10						
e _N	2 53.2						
L	3 00						
F	5 15						

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA

double



FROM February 20, 1940 to February 26, 1940 No. 10

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
		h m s	km.	
50 Feb. 20 (Cont'd)		Toronto		
	eE	2 37.7		
	e	2 47.2		
	eE	2 53.4		
	L	3 08		
	F	4 13+		
		Saskatoon		
	eE	2 37.4		
	eE	2 46.3		
	eE	2 47.7		
	eE	2 54.6		
	L	3 01		
	F	3 38		
		Shawinigan Falls		
	e	2 37		
e	2 47			
e	3 01.3			
F	3 05			
58 Feb. 24		Ottawa		
	iZ	11 54 33		
	eN F	12 08.3 12 16		
59 Feb. 24		Ottawa		
	iZ	12 19 10		
	L	13 04		
	F	14 00ca.		
		Victoria		
	eE	(12 21)		
	eE	(12 30)		
	L ^E	(12 45)		
	F	(13 25)		
		Toronto		
	e	12 55		
	L	13 04		
F	13 38			
61 Feb. 26		Ottawa	94	
	H	19 05.3		Δ and H based on Leet's Travel Time Chart.
	iP1Z	19 05 24		
	iS1Z	19 05 35.5		
	S1S1Z	19 05 37		
	2(S1S1)Z	19 05 40.5		
	F	19 06		

stable

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA



FROM February 26, 1940 to February 29, 1940 No. 11

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS	
		h m s	km.		
		Ottawa			
64 Feb. 29	H	16 07.8	8060		
	iP	16 19 13			
	eN	16 20			
	eS?	16 28.7			
	L	16 43			
	F	17 04			
		Victoria			
	e	16 31.3			
	L	16 49			
	F	17 22			
				<i>W. W. Doxsee.</i>	