OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From January 4, 1933 to January 31, 1933 No. 2

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
4799 Jan. 4	0	21 - 10.9	4810	
	eP_E	21 - 18 - 52		
	eS_E	21 - 25 - 24		
	eSR_2	21 - 29.1		
	eL_N	21 - 32		
	F	21 - 59		
4804 Jan. 8	e	20 - 19 - 06		Slight local shock.
	F	20 - 19 - 10		
4814 Jan, 21	e	16 - 05 - 06		Felt at Alexandria, Ontario.
	F	16 - 05 - 30		
4815 Jan. 21	0	19 - 20.9	15,900	
	eP'	19 - 40 - 40		
	e_N	19 - 41 - 08		
	ePR_1	19 - 43 - 59		
	ePS_E ?	19 - 54.3		
	e_N	19 - 59 - 08		
	eSR_{1N}	20 - 02 - 35		
	eSR_2	20 - 08.0		
	e_N	20 - 14.2		
	e_N	20 - 22.7		
	eL	20 - 31		
	W_2	21 - 06		
	F	22 - 34		
4818 Jan. 24	e	16 - 40 - 38		Slight local shock.
	F	16 - 40 - 55		
4820 Jan. 27	e_E	23 - 01.6		Microseisms mask record.
	e_E	23 - 04.5		
	e	23 - 10.2		
	eL	23 - 26		
	F	0 - 30		
4822 Jan. 29	e	14 - 03 - 11		Slight local shock.
	F	14 - 03 - 27		

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood Anderson: Seven Falls-Wood Anderson: Seven Falls-Milne Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

January, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls W. A.	Seven Falls M. S.	**
4795	1	9-14+1-55U	.....	.....	9-10+2-08U	..
4796	3	15-50+1-09u	.....	.....	15-51+1-02u	..
4797	4	1-49+1-44U	.....	.....	1-49+1-38U	..
4798	4	4-08+1-22R	4-08+0-50R	4-08+0-40R	4-08+1-21R	A
4799	4	21-19+0-40R	.....	.....	21-22+0-25R	B
4800	5	7-02+0-58R	7-07+0-15L	7-09+0-12L	7-07+0-53R	..
4801	5	14-45+0-22L	.....	.....	14-46+0-24L	..
4802	7	4-30+2-07U	.....	.....	4-30+2-23U	..
4803	8	6-52+0-43u	.....	.....	7-13+0-23L	..
4804	8	20-19+0-.1d	.....	.....	.....	..
4805	9	2-25+0-50u	2-14+0-08P	2-15+0-09P	2-24+0-56u	..
	11	.....	19-18+0-.2vQ	.....	.....	C
	11	.....	23-32+0-05v	.....	.....	E
4806	12	1-35+0-16L	.....	.....	.....	..
4807	15	8-19+0-06L	.....	.....	8-23+0-03L	..
4808	15	18-23+1-18u	.....	.....	18-34+1-40u	..
4809	17	1-18+0-04L	.....	.....	.....	..
4810	17	19-10+0-03L	.....	.....	19-11+0-14L	..
4811	17	20-01+1-00L	.....	.....	19-57+1-07L	..
4812	18	9-02+1-21u	.....	.....	9-01+1-16u	..
	18	.....	17-26+0-02P	17-26+0-01P	.....	..
4813	19	11-44+0-18L	.....	.....	11-46+0-15L	..
4814	21	16-05+0-.3d	16-05+0-02v	16-06+0-01v	.....	F
4815	21	19-41+2-54U	19-41+1-45U	19-41+1-45U	19-41+3-00U	G
4816	23	18-43+0-27u	.....	.....	18-44+0-26u	..
4817	24	15-47+0-26r	15-46+0-17r	15-48+0-02P	15-48+0-25r	..
4818	24	16-41+0-.3d	.....	.....	.....	..
4819	25	17-52+0-07L	.....	.....	17-53+0-08L	..
4820	27	23-02+1-28U	.....	.....	23-05+1-55U	..
4821	29	11-57+0-06L	.....	.....	12-01+0-04L	..
4822	29	14-03+0-.3d	.....	.....	.....	..
	30	.....	14-23+0-.5vT	14-23+0-01d	.....	H

CORRELATION OF EARTHQUAKES

January, 1933

N O T E S

A : At Ottawa, Δ = 4730 km.
At Seven Falls, Δ = 4830 km.

B : At Ottawa, Δ = 4810 km.

C : Lights burned out at Seven Falls. No records of this and two following quakes.

E : At Shawinigan Falls, Δ = 230 km.
Reported by Mr. A. Boily, Baie St. Paul.

F : Felt at Alexandria, Ontario.
At Shawinigan Falls, Δ = 200 km.

G : At Ottawa, Δ = 15,900 km.

H : At Seven Falls, Δ = 50 km.
Reported by Mr. A. Boily, Baie St. Paul.

General : Microstorms on January 9, 11, 22, 27, 28, 30.

Dominion Observatory,
Ottawa, Canada,
February 11, 1933.

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood Anderson: Seven Falls-Wood Anderson: Seven Falls-Milne Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.
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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.

EARTHQUAKE CORRELATION TABLE

February, 1933

No.	Date	Ottawa	Shawinigan	Seven Falls W. A.	Seven Falls M. S.	**
	2	.....	15-51+0-03v	15-50+0-02v	.....	..
4823	2	20-48+0-29L	.....	.....	20-49+0-39L	..
4824	2	21-48+0-16L	.....	.....	21-39+0-21L	..
	3	.....	4-23+0-01v	4-24+0-.1v	.....	..
4825	3	22-24+1-21u	22-24+0-10P	22-24+0-01P	22-34+1-20u	..
	12	.....	18-29+0-.5v	.....	.....	..
4826	13	3-13+0-59u	3-02+0-04P	3-02+0-02P	3-12+1-09u	..
4827	14	6-22+0-44L	.....	.....	6-21+0-45L	..
4828	18	12-22+0-05L	.....	.....	12-24+0-08L	..
4829	18	19-57+0-33r	19-52+0-02P	.....	19-58+0-35r	..
4830	19	4-41+0-07L	.....	.....	4-45+0-05L	..
4831	19	9-05+1-20u	.....	.....	9-06+1-32u	..
4832	20	11-36+0-20L	.....	.....	11-33+0-25L	..
	21	.....	.....	.....	19-52+0-24LQ	..
	22	.....	9-24+0-.5v	9-24+0-.2v	.....	..
4833	22	18-50+0-10L	.....	.....	18-47+0-07L	..
4834	23	8-20+3-03U	8-20+1-00U	8-20+1-00U	8-20+3-17U	A
	25	.....	9-44+0-04v	9-43+0-02d	.....	B
	26	.....	.....	.....	0-00+0-05L	..
4835	27	17-29+0-41L	.....	.....	17-28+0-39L	..
4836	28	17-31+0-03L	.....	.....	.....	..

CORRELATION OF EARTHQUAKES

February, 1933

N O T E S

		Δ (km)	O
A :	Ottawa	7270	8 - 09.4
	Seven Falls	7400	8 - 09.4
	Shawinigan Falls	7400	8 - 09.4
B :	Seven Falls	80	9 - 42 - 59
	Shawinigan Falls	240	9 - 43 - 08

The disagreement in O is probably due to the uncertainty of the time correction at Seven Falls.

This tremor was reported by Mr. A. Boily of Baie St. Paul.

General : Microstorms on February 10, 13th, and 28th.

Dominion Observatory,
Ottawa, Canada,
March 13, 1933.

EARTHQUAKE CORRELATION TABLE

March, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls W. A.	Seven Falls M. S.	**
4837	2	17-44+5-15U	17-44+3-30U	17-44+3-15U	17-44+5-26U	A
4838	2	22-45+0-30L	22-46+0-04L	22-47+0-04L	.....	..
4839	3	9-37+1-09u	.....	.....	9-36+1-22u	..
4840	3	16-00+0-11L	.....	.....	15-54+0-10L	..
	8	.....	.....	.....	2-26+0-09L	..
4841	9	21-43+0-10L	.....	.....	21-41+0-15L	..
4842	11	2-01+2-35R	2-02+1-00R	2-01+1-00R	2-02+2-20R	B
4843	11	3-41+0-14L	.....	.....	3-43+0-18L	..
4844	11	4-55+0-05L	.....	.....	.....	..
4845	11	5-29+0-07L	.....	.....	5-31+0-07L	..
4846	11	5-36+0-05L	.....	.....	5-40+0-05L	..
4847	11	7-16+0-13L	7-17+0-03L	7-18+0-01L	7-18+0-10L	..
4848	11	8-27+0-01L	.....	.....	.....	..
4849	11	9-13+0-04L	.....	.....	.....	..
4850	11	9-29+0-03L	.....	.....	.....	..
4851	11	14-45+1-32u	.....	.....	14-45+1-30u	..
4852	11	17-12+0-02L	.....	.....	.....	..
4853	11	19-50+1-24r	19-50+0-15r	19-56+0-08r	19-55+1-27r	..
4854	12	4-37+0-24r	.....	.....	4-38+0-23r	..
	12	.....	.....	.....	5-53+0-08L	..
4855	13	8-10+0-07L	.....	.....	8-02+0-15L	..
4856	13	13-35+0-10L	.....	.....	13-37+0-20r	..
4857	13	17-40+0-32L	.....	.....	17-40+0-31L	..
4858	14	1-51+0-55u	.....	.....	1-46+1-08u	..
4859	14	19-20+0-09L	.....	.....	19-22+0-06L	..
4860	15	5-25+2-01u	.....	.....	.....	C
4861	15	11-32+0-04L	.....	.....	.....	..
4862	15	23-24+0-14L	.....	.....	23-25+0-13L	..
4863	17	13-56+0-11L	13-44+0-20r	13-45+0-20r	13-57+0-14L	..
4864	17	16-06+1-54U	16-07+1-00U	16-07+1-00U	16-07+1-52U	E
4865	17	19-53+2-01u	.....	.....	20-02+2-03u	..
4866	18	3-35+1-51u	.....	.....	3-33+2-25u	..
4867	18	19-11+1-01u	.....	.....	19-33+0-43L	..
4868	18	23-39+0-45r	23-30+0-15r	23-30+0-13r	23-40+0-44r	..
	19	.....	17-18+0-02P	17-18+0-02P	.....	..
4869	23	18-20+0-38L	.....	.....	18-21+0-37L	..
4870	26	19-19+0-41r	.....	.....	19-15+0-45r	..
4871	27	3-29+0-02L	.....	.....	.....	..
4872	28	4-35+0-33r	.....	.....	4-36+0-34r	..

CORRELATION OF EARTHQUAKES

March, 1933

N O T E S

		Δ (km.)	Φ
A :	Ottawa	9650	17 - 31.1
	Seven Falls	9710	17 - 31.1
	Shawinigan Falls	9730	17 - 31.1
B :	Ottawa	3800	1 - 54.2
	Seven Falls	4230	1 - 54.3
C :	Power off at Seven Falls during Nos. 4860 and 4861.		
E :	Ottawa	7570	15 - 55.6
	Seven Falls	7580	15 - 55.6

Dominion Observatory,
Ottawa, Canada,
April 12, 1933.

DOM. OBS. No. 67
3,000—12-31

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*
ERNEST A. HODGSON, *Seismologist*
W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45° 23' 38''$ N. $\lambda = 75° 42' 57''$ W. h = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Milne-Shaw	17	Photographic	Magnetic	8 mm. per min.	1 lb.
Milne-Shaw	23	Photographic	Magnetic	8 mm. per min.	1 lb.
Deformation	D	Photographic	Air	17 mm. per min.	20 g. ca.
Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kgm.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	1" tilt	DETERMINED
I	5.6		120	2:1	NS	displ'nt.	March 25, 1932.
II	8.0		120	15:1	EW		March 25, 1932.
17	12.0		250	20:1	EW	44.5 mm.	March 22, 1932.
23	12.0		250	20:1	NS	43 mm.	July 14, 1932.
D							
D							
W	6.1		160	7:1	Vert.		Nov. 17, 1932.

From January 1, 1933 *To* January 4, 1933 *No.* 1

No. and Date	PHASE	TIME h m s	DISTANCE km.	REMARKS
4795 Jan. 1	e_E	9 - 14 - 06		No. 23 NS out of focus.
	e_E	9 - 15 - 13		
	e_E	9 - 18 - 18		
	e_E	9 - 25.0		
	e_N	9 - 28.5		
	e_E	9 - 34.5		
	eL	9 - 40		
	F	11 - 09		
4797 Jan. 4	e	1 - 49 - 25		
	e	1 - 57.3		
	eL	2 - 14		
	F	3 - 33		
4798 Jan. 4	O	3 - 59.7	4730	Saskatoon Record:
	eP	4 - 07 - 36		O = 3 - 59.5
	ePR_{1E}	4 - 09 - 26		P = 4 - 04 - 40
	eS	4 - 14 - 03		S = 4 - 08 - 56
	e_E	4 - 15 - 21		Δ = 2700 km.
	eSR_1	4 - 17 - 12		
	eL	4 - 20		
	F	5 - 30		

AUXILIARY STATIONS

SASKATOON

ø = 52°08' N. λ = 106°30' W. h. = 515 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.0 secs.	9.0 secs.
Damping	Aperiodic (air)	Aperiodic (air)
Mass	139 kg.	139 kg.
V	61	44 ca
Time correction	From manually recorded radio time signals.	
Foundation	Clay and Sand	

HALIFAX

ø = 44°38' N. λ = 63°36' W. h. = 46 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.8 secs.	7.1 secs.
Damping	Air	Air
Mass	139 kg.	139 kg.
V	110 ca	150 ca
Time correction	From hourly recorded railroad time service.	
Foundation	Carbonaceous Slate	

SHAWINIGAN FALLS

ø = 46°33.1 N. λ = 72°45.8 W.

Wood-Anderson NS Comp. T_o = 0.9 secs. V = 2200

Time Correction From automatically recorded radio time signals.

Foundation Solid Granite of Canadian Shield.

SEVEN FALLS

ø = 47°07.4 N. λ = 70°49.6 W.

	Wood-Anderson EW Comp.	Milne-Shaw EW Comp.
T_o	1.0 secs.	12.0 secs.
Damping		20 to 1 (Magnetic)
V	1500	250
Time Correction	From manually recorded radio time signals	
Sensitivity		1" tilt = recorded displacement of 44.5 mm.
Foundation	Solid Granite of Canadian Shield.	

SEISMOLOGICAL BULLETINS RECEIVED

1933

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

STATIONS	BULLETINS	RECEIVED	
Wellington	November, 1932	January	3
Riverview	Provisional for November, 1932	"	3
Manila	October, 1932	"	4
Chiufeng	Preliminary for November, 1932	"	7
Balboa Bozeman Chicago Charlottesville Columbia Honolulu Pittsburg San Juan Sitka Tucson Seattle Ukiah	April, May and June, 1932	"	10
Pasadena	October, 1932	"	14
Rome	December 9 - 22, 1932	"	16
Fordham	October, November and December/32	"	17
Georgetown	December, 1932 and Seismological Despatches	"	19
Richmond	December, 1932	"	20
Strasbourg Paris Bureau Central	November, 1932	"	20
Helwan	November, 1932	"	21
Hamburg	June 20 to December 31, 1932	"	21
Rome	December 16 - 22, 1932	"	23
Rome	Years 1927 and 1930	"	23
Algiers	December, 1932	"	28
Madison	July to December, 1932	"	28
Toronto	November and December, 1932	"	30
Rome	December 23, 1932 - January 7/33	"	31

DOMINION OBSERVATORY,
OTTAWA, CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.
W. W. Doxsee,
Assistant Seismologist.

DOM. OBS. No. 67
3,000—12-31

CANADA

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OTTAWA

R. MELDRUM STEWART, *Director*
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$\varphi = 45° 23' 38''$ N. $\lambda = 75° 42' 57''$ W. h = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
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Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
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INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	1" tilt	DETERMINED
I	5.6		120	2:1	NS	displ'nt.	March 25, 1932.
II	8.0		120	15:1	EW		March 25, 1932.
17	12.0		250	20:1	EW	44.5 mm.	March 22, 1932.
23	12.0		250	20:1	NS	43 mm.	July 14, 1932.
D							
D							
W	6.1		160	7:1	Vert.		Nov. 17, 1932.

From February 1, 1933 *To* February 28, 1933 *No.* 3

No. and Date	PHASE	TIME h m s	DISTANCE km.	REMARKS
4834 Feb. 23	O	8 - 09.4	7270	Halifax record:
	iP	8 - 20 - 00		O = 8 - 09.5
	ePR_{2N}	8 - 24 - 39		P = 8 - 19 - 57
	iS	8 - 28 - 43		S = 8 - 28 - 34
	eSR_{1N}	8 - 33.5		L = 8 - 38
	eSR_{3E}	8 - 36.9		Δ = 7140 km.
	eL	8 - 39		
	W_2	10 - 40		
	F	11 - 23		

W. W. Doxsee

AUXILIARY STATIONS

SASKATOON

ø = 52°08' N. λ = 106°30' W. h. = 515 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.0 secs.	9.0 secs.
Damping	Aperiodic (air)	Aperiodic (air)
Mass	139 kg.	139 kg.
V	61	44 ca
Time correction	From manually recorded radio time signals.	
Foundation	Clay and Sand	

HALIFAX

ø = 44°38' N. λ = 63°36' W. h. = 46 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.8 secs.	7.1 secs.
Damping	Air	Air
Mass	139 kg.	139 kg.
V	110 ca	150 ca
Time correction	From hourly recorded railroad time service.	
Foundation	Carbonaceous Slate	

SHAWINIGAN FALLS

ø = 46°33!1 N. λ = 72°45!8 W.

Wood-Anderson NS Comp. T_o = 0.9 secs. V = 2200

Time Correction From automatically recorded radio time signals.
Foundation Solid Granite of Canadian Shield.

SEVEN FALLS

ø = 47°07!4 N. λ = 70°49!6 W.

	Wood-Anderson EW Comp.	Milne-Shaw EW Comp.
T_o	1.0 secs.	12.0 secs.
Damping		20 to 1 (Magnetic)
V	1500	250
Time Correction	From manually recorded radio time signals	
Sensitivity		1" tilt = recorded displacement of 44.5 mm.
Foundation	Solid Granite of Canadian Shield.	

SEISMOLOGICAL BULLETINS RECEIVED

1933

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

STATIONS	BULLETINS	RECEIVED
Matuyama	Year 1931	February 1
Sydney	November, 1932	" 1
Helwan	December, 1932	" 1
Cartuja	June and July, 1932	" 4
Apia	October, November and December, 1932	" 6
Osaka	Year 1931	" 8
Osaka	April, May and June, 1932	" 8
Taihoku	January to October, 1932	" 9
Chiufeng	December, 1932	" 9
Paris Bureau Central Strasbourg	December, 1932	" 11
Manila	November, 1932	" 13
Rome	January 8 - 21, 1933	" 14
Tòledo Cartuja Alicante Almeria Malaga	March and April, 1932	" 14
Zurich	October, 1932 to January, 1933	" 14
Sydney	December, 1932	" 16
Riverview	Provisional for December, 1932	" 16
Wellington	Preliminary for December, 1932	" 16
Harvard	December, 1929 to November, 1931	" 16
Zi-Ka-Wei	November 12 - 27, 1932	" 16
Perth	August 13 to November 29, 1932	" 16
Lemberg	January 1 to September 29, 1932	" 20
Graz	April 1 to June 29, 1932	" 20
Wien	May 27, 1932 to January 27, 1933	" 20
Richmond	January, 1933	" 20
Matuyama	Year 1932	" 21
San Fernando	November and December, 1932	" 21
Taihoku	November, 1932	" 21
Osaka	November and December, 1932	" 21
Algiers	January, 1933	" 22
Reykjavik	May to December, 1932	" 22
Georgetown	January, 1933 and Seismological Despatches	" 23
Rome	January 22 to February 4, 1933	" 24
Toronto	January, 1933	" 27

DOMINION OBSERVATORY,
OTTAWA, CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.

DOM. OBS. No. 67
3,000—12-31

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*
ERNEST A. HODGSON, *Seismologist*
W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45° 23' 38''$ N. $\lambda = 75° 42' 57''$ W. h = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Milne-Shaw	17	Photographic	Magnetic	8 mm. per min.	1 lb.
Milne-Shaw	23	Photographic	Magnetic	8 mm. per min.	1 lb.
Deformation	D	Photographic	Air	17 mm. per min.	20 g. ca.
Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kgm.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	1" tilt	DETERMINED
I	5.6		120	2:1	NS	displ'nt.	March 25, 1932.
II	8.0		120	15:1	EW		March 25, 1932.
17	12.0		250	20:1	EW	44.5 mm.	March 22, 1932.
23	12.0		250	20:1	NS	43 mm.	July 14, 1932.
D							
D							
W	6.1		160	7:1	Vert.		Nov. 17, 1932.

From March 1, 1933 *To* March 11, 1933 *No.* 4

No. and Date	PHASE	TIME h m s	DISTANCE km.	REMARKS
4837 March 2	0	17 - 31.1	9650	Halifax Record:
	iP	17 - 43 - 48		0 17 - 31.0
	iPR_1	17 - 47 - 26		P 17 - 44 - 16
	iPR_3	17 - 50 - 47		PR_1 17 - 48 - 07
	iS	17 - 54 - 25		PR_2 17 - 50.5
	$\overline{iS_cP_c}\,\overline{P_cS_E}$	17 - 54 - 37		$\overline{S_cP_c}\,\overline{P_cS}$ 17 - 55 - 19
	$ePPPS_Z$	17 - 55 - 49		S 17 - 55 - 30
	eSR_1	17 - 59.9		PS 17 - 56.8
	eSR_{2N}	18 - 04.1		$3R_1$ 18 - 01.6
	eL	18 - 10		L 18 - 14
	W_{2N} ?	19 - 44		F 20 - 30
	W_{3N}	22 - 27		Δ 10,500 km.
	F	23 - 00 ca.		
4842 March 11	0	1 - 54.2	3800	Saskatoon Record:
	eP_E	2 - 00 - 58		0 1 - 54.3
	ePR_{1E}	2 - 02 - 00		P 1 - 58 - 50
	eS_N	2 - 06 - 24		S 2 - 02 - 35
	eS_E	2 - 06 - 36		L 2 - 05
	e_N	2 - 07 - 40		F 3 - 00
	eSR_{2E}	2 - 09.6		Δ 2290 km.
	eL	2 - 11		
	F	4 - 36		

AUXILIARY STATIONS

SASKATOON

ø = 52°08' N. λ = 106°30' W. h. = 515 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.0 secs.	9.0 secs.
Damping	Aperiodic (air)	Aperiodic (air)
Mass	139 kg.	139 kg.
V	61	44 ca
Time correction	From manually recorded radio time signals.	
Foundation	Clay and Sand	

HALIFAX

ø = 44°38' N. λ = 63°36' W. h. = 46 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.8 secs.	7.1 secs.
Damping	Air	Air
Mass	139 kg.	139 kg.
V	110 ca	150 ca
Time correction	From hourly recorded railroad time service.	
Foundation	Carbonaceous Slate	

SHAWINIGAN FALLS

ø = 46°33!1 N. λ = 72°45!8 W.

Wood-Anderson NS Comp. T_o = 0.9 secs. V = 2200

Time Correction From automatically recorded radio time signals.

Foundation Solid Granite of Canadian Shield.

SEVEN FALLS

ø = 47°07!4 N. λ = 70°49!6 W.

	Wood-Anderson EW Comp.	Milne-Shaw EW Comp.
T_o	1.0 secs.	12.0 secs.
Damping		20 to 1 (Magnetic)
V	1500	250
Time Correction	From manually recorded radio time signals	
Sensitivity		1" tilt = recorded displacement of 44.5 mm.
Foundation	Solid Granite of Canadian Shield.	

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From March 11, 1933 to March 31, 1933 No. 5

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
4853 March 11	e_N	19 - 49 - 55		May be two quakes.
	$iS_?$	19 - 55 - 26		
	e	19 - 56 - 03		
	e_E	19 - 56 - 26		
	e	19 - 58 - 02		
	eL ?	20 - 03		
	F	21 - 14		
4860 March 15	e_N	5 - 25 - 26		
	e_E	5 - 27.0		
	e_N	5 - 33.2		
	e_E	5 - 40.0		
	e_N	5 - 49.4		
	eL	5 - 56		
	W_2 ?	7 - 22		
	F	7 - 26		
4864 March 17	0	15 - 55.6	7570	
	eP	16-06-30		
	ePR_{2N}	16 - 10 - 46		
	eS	16 - 15 - 29		
	e	16 - 19.9		
	eSR_2	16 - 23 - 19		
	eL	16 - 28		
	F	18 - 00		
4865 March 17	e	19 - 53.3		
	e	20 - 03.1		
	e	20 - 10.2		
	eL ?	20 - 15		
	F	22 - 00		
4866 March 18	e	3 - 34.7		
	e	3 - 41.0		
	eL ?	3 - 55		
	F	5 - 27		
4868 March 18	e_N	23 - 39 - 02		
	e	23 - 44 - 07		
	eL	23 - 49		
	F	0 - 24		

SEISMOLOGICAL BULLETINS RECEIVED

1933

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

STATIONS	BULLETINS	RECEIVED
Melbourne	October,November and December, 1932	March 2
Pasadena	November and December, 1932	" 4
Firenze	August and September, 1932	" 6
Riverview	Provisional for January, 1933	" 6
Stuttgart Hohenheim Ravensburg	Year 1932	" 6
Zi-Ka-Wei	October 9 - 30th; December 4 - 15/32	" 6
Helwan	January, 1933	" 10
Taihoku	December, 1932	" 13
Manila	December, 1932	" 13
Karlsruhe	July to December, 1932	" 13
Tyosi	May to August, 1932	" 13
Rome	February 5 - 18th, 1933	" 14
Zi-Ka-Wei	December 26, 1932	" 14
Wellington	Preliminary for January, 1933	" 15
Uccle	July 12 to December 31, 1932	" 16
Batavia	October,November and December, 1932	" 18
Strasbourg Paris Bureau Central	January, 1933	" 18
Zurich	February, 1933	" 20
Taihoku	January, 1933	" 20
Kobe	April 1 to June 30, 1932	" 21
Zi-Ka-Wei	January 1 - 8th, 1933	" 22
Nagasaki	October 3 to December 31, 1931	" 22
Nagasaki	January to September, 1932	" 22
Wellington Suva - Fiji Arapum Takaka Hastings New Plymouth	March, 1931	" 23
Chiufeng	January, 1933	" 23
Richmond	February, 1933	" 23
San Fernando	January and February, 1933	" 24
Rome	February 19 to March 4, 1933	" 27
Sydney	January, 1933	" 29
Georgetown	February, 1933	" 29
Georgetown	Seismological Despatches	" 29
Ivigtut	August 28, 1929 to December 31, 1930	" 31
Scoresby Sund	January, 1929 to June, 1930	" 31
Cape Town	October 2, 1932 to January 21/33	" 31
Tananarive	July and August, 1932	" 31
Algiers	February, 1933	" 31

DOMINION OBSERVATORY,
OTTAWA - CANADA

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Seismologist.

W. W. Doxsee,
Assistant Seismologist.

DOM. OBS. No. 67
5,000—4-29

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

R. MELDRUM STEWART, *Director*
ERNEST A. HODGSON, *Seismologist*
W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45° 23' 38''$ N. $\lambda = 75° 42' 57''$ W. h = 83m.

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Milne-Shaw	23	Photographic	Magnetic	8 mm. per min.	1 lb.
Deformation	D	Photographic	Air	17 mm. per min.	20 g. ca.
Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kgm.

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INSTRUMENT	T_o	r	V	ϵ	COMP.	1" tilt	DETERMINED
I	5.6		120	2:1	NS	displ'nt	March 25, 1932.
II	8.0		120	15:1	EW		March 25, 1932.
17	12.0		250	20:1	EW	44.5 mm.	March 22, 1932.
23	12.0		250	20:1	NS	43 mm.	July 14, 1932.
D							
D							
W	6.1		160	7:1	Vert.		Nov. 17, 1932.

From April 1, 1933 *to* April 19, 1933 *No.* 6

No. and Date	Phase	Time	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Distance	Remarks
		h m s	s	μ	μ	μ	km.	
4878 Apr. 9	0	3-58.3					4000	Saskatoon Record:
	eP	4-05-20						0 = (3-58.4)
	ePR_2	4-06-35						P = (4-04-55)
	eS_N	4-11-04						S = (4-10-18)
	eL	4-16						Δ = 3650 km.
	F	5-46						
4882 Apr. 9	e_E	21-12-19						
	eS_E?	21-16-37						
	eL	21-23						
	F	22-28						
4885 Apr. 16	e_N	19-37-45						
	e	19-47.7						
	e	19-54.8						
	eL	20-13						
	F	21-32						
4888 Apr. 19	e_N	7-03-37						
	e_N	7-10-01						
	e_N	7-12-44						
	e_E	7-13.2						
	eL_E?	7-37						
	F	8-49						

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From April 19, 1933 to April 30, 1933 No. 7

No. and Date	Phase	Time	Distance	Remarks
4890 Apr. 23	O	5 - 57.7	8060	
	eP	6 - 09 - 04		
	eS	6 - 18 - 28		
	eSR_1	6 - 23 - 21		
	eSR_2	6 - 26.6		
	eL	6 - 32		
	F	7 - 35+		
4895 Apr. 27	O	2 - 36.2	4960	Saskatoon Record:
	iP	2 - 44 - 20		O = (2-36.1)
	ePR_1	2 - 46 - 11		P = (2-41-41)
	iS	2 - 50 - 59		S = (2-46-19)
	eSR_1	2 - 54 - 20		L = (2-49)
	eL	2 - 57		Δ = 2990 km.
	W_{2N}	5 - 42		Halifax Record:
	F	6 - 00 ca.		O = 2-36.3
				P = 2-45-13
				PR_1 = 2-47-26
				S = 2-52-27
				SR_1 = 2-56-18
				SR_2 = 2-58.0
				L = 3-01
				Δ = 5610 km.

W. W. Doxsee

AUXILIARY STATIONS

SASKATOON

ø = 52°08' N. λ = 106°30' W. h. = 515 m.

	Mainka NS Comp.	Mainka EW Comp.
T₀	9.0 secs.	9.0 secs.
Damping	Aperiodic (air)	Aperiodic (air)
Mass	139 kg.	139 kg.
V	61	44 ca
Time correction	From manually recorded radio time signals.	
Foundation	Clay and Sand	

HALIFAX

ø = 44°38' N. λ = 63°36' W. h. = 46 m.

	Mainka NS Comp.	Mainka EW Comp.
T₀	9.8 secs.	7.1 secs.
Damping	Air	Air
Mass	139 kg.	139 kg.
V	110 ca	150 ca
Time correction	From hourly recorded railroad time service.	
Foundation	Carbonaceous Slate	

SHAWINIGAN FALLS

ø = 46°33.1 N. λ = 72°45.8 W.

Wood-Anderson NS Comp. T₀ = 0.9 secs. V = 2200

Time Correction From automatically recorded radio time signals.
Foundation Solid Granite of Canadian Shield.

SEVEN FALLS

ø = 47°07.4 N. λ = 70°49.6 W.

	Wood-Anderson EW Comp.	Milne-Shaw EW Comp.
T₀	1.0 secs.	12.0 secs.
Damping		20 to 1 (Magnetic)
V	1500	250
Time Correction	From manually recorded radio time signals	
Sensitivity		1" tilt = recorded displacement of 44.5 mm.
Foundation	Solid Granite of Canadian Shield.	

SEISMOLOGICAL BULLETINS RECEIVED

1933

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

STATIONS	BULLETINS	RECEIVED	
Riverview	Provisional for February, 1933	April	1
Göttingen	July to December, 1932	"	1
Osaka	January, 1933	"	1
Rome	March 5 - 18, 1933	"	8
Manila	January, 1933	"	8
Chiufeng	February, 1933	"	10
Peichiko	October, November and December, 1932	"	10
Tananarive	September, 1932	"	13
Helwan	February, 1933	"	13
Cape Town	January 29 to February 28, 1933	"	13
Paris Bureau Central Strasbourg	February, 1933	"	15
Zi-Ka-Wei	January 9 - 29th, 1933	"	18
Richmond	March, 1933	"	18
Nagoya	July to December, 1932	"	18
Georgetown	March, 1933	"	18
Georgetown	Seismological Despatches	"	18
Wellington	Provisional for February, 1933	"	18
Pasadena	January and February, 1933	"	18
La Paz	January, February and March, 1932	"	19
La Paz	April, May, June, July and August, 1932	"	20
Rome	March 19 to April 1, 1933	"	24
Toronto	February, 1933	"	25
Perth	December 31, 1932 to February 14, 1933	"	26
Sydney	February, 1933	"	26
Sydney	Copy of seismogram of March 2, 1933	"	26

DOMINION OBSERVATORY
OTTAWA - CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
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Assistant Seismologist.

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood Anderson: Seven Falls-Wood Anderson: Seven Falls-Milne Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

April, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls W. A.	Seven Falls M. S.	**
4873	1	16-23+0-59u	.....	.....	16-22+1-03u	..
4874	2	2-15+0-09L	.....	.....	2-14+0-11L	..
	2	.....	.....	.....	11-00+0-04L	..
4875	4	11-54+0-04L	.....	.....	.....	..
4876	4	12-23+0-41r	.....	.....	12-23+0-45L	..
	6	.....	0-08+0-01P	.....	.....	..
	6	.....	5-14+0-.5v	5-14+0-.2v	.....	..
4877	9	3-10+1-05+U	.....	.....	3-10+1-00+U	..
4878	9	4-05+1-41R	4-06+0-45R	4-06+0-30R	4-06+1-50R	A
4879	9	8-27+0-14L	.....	.....	8-28+0-08L	..
4880	9	11-18+0-20L	.....	.....	11-18+0-15L	..
4881	9	15-26+0-37r	.....	.....	15-30+0-24r	..
4882	9	21-12+1-16R	21-24+0-11L	21-28+0-06L	21-18+1-00R	..
4883	12	0-24+0-28L	.....	.....	6-54+0-16L	..
	12	.....	.....	.....	6-39+1-25u	..
4884	16	6-26+1-55u	.....	.....	19-39+2-00U	B
4885	16	19-38+1-54U	.....	.....	3-17+0-05L	..
4886	18	3-14+0-06L	.....	.....	2-19+1-45u	B
4887	19	2-11+1-47u	.....	.....	7-13+1-37u	..
4888	19	7-04+1-45u	.....	.....	7-18+0-01L	..
4889	22	7-13+0-07L	.....	.....	6-09+1-30+U	C
4890	23	6-09+1-26+U	.....	6-09+0-03P	7-37+1-04u	..
4891	23	7-37+1-58u	.....	.....	9-04+0-25L	..
4892	24	9-04+0-16L	.....	.....	13-57+0-09L	..
4893	24	13-52+0-14L	13-48+0-03P	13-49+0-03P	22-54+0-13L	..
4894	25	22-55+0-16L	.....	.....	23-45+0-21L	..
	26	.....	.....	.....	2-45+3-20R	E
4895	27	2-44+3-16R	2-44+2-00R	2-45+1-30R	5-28+1-00r	..
4896	27	5-33+0-32r	.....	.....	6-25+0-06L	..
4897	27	6-15+0-19L	.....	.....	6-35+0-29r	..
4898	27	6-36+0-32L	.....	.....	7-36+0-09L	..
4899	27	7-36+0-14r	.....	.....	8-02+0-05L	..
4900	27	8-02+0-14L	.....	.....		..

EARTHQUAKE CORRELATION TABLE

April, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
4901	27	9-13+0-05L	.....	.....	9-17+0-02L	..
4902	27	10-05+0-07L	.....	.....		..
4903	27	11-27+0-07L	.....	.....	11-28+0-08L	..
4904	27	12-13+1-33R	.....	.....	12-13+1-51R	..
4905	27	14-30+0-20L	14-35+0-04L	14-35+0-04L	14-29+0-27L	..
4906	27	20-00+0-15L	.....	.....	20-00+0-16L	..
4907	27	21-21+0-13L	.....	.....	21-21+0-19L	..
4908	27	22-13+0-10L	.....	.....	22-13+0-13L	..
4909	28	2-24+0-04L	.....	.....	2-24+0-06L	..
4910	28	3-15+0-12L	.....	.....	3-15+0-13L	..
4911	28	5-43+0-06L	.....	.....	.....	..
4912	28	7-00+0-23L	7-01+0-09L	7-01+0-07L	7-00+0-23L	..
4913	28	7-36+0-21L	7-37+0-06L	7-37+0-04L	7-37+0-19L	..
4914	28	19-24+0-07L	.....	.....	19-26+0-06L	..
4915	28	20-46+0-14L	.....	.....	20-47+0-10L	..
4916	29	11-05+0-09L	.....	.....	11-07+0-11L	..
4917	29	18-56+0-08L	.....	.....	18-57+0-10L	..
	29	.....	.....	.....	20-29+0-03L	..
					23-27+0-04L	..
4918	29	23-26+0-05L	.....	.....	4-06+0-24L	..
4919	30	4-06+0-22L	4-06+0-05L	4-07+0-04L	4-57+0-34u	..
4920	30	5-13+0-15L	.....	.....	19-09+0-07L	..
4921	30	19-08+0-06L	.....	.....		

CORRELATION OF EARTHQUAKES

April, 1933

N O T E S

		△ (km.)	O
A :	Ottawa	4000	3 - 58.3
	Seven Falls	4350	3 - 58.5
B :	May be two quakes		
C :	Ottawa	8060	5 - 57.7
	Seven Falls	7660	5 - 57.7
E :	Ottawa	4960	2 - 36.2
	Seven Falls	4990	2 - 36.3

Dominion Observatory,
Ottawa, Canada,
May 10, 1933.

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

FROM May 8, 1933 to May 31, 1933 No. 9

No. and Date	Phase	Time	Distance	Remarks
4938 May 11	0	19 - 09.8	7640	
	eP	19 - 20 - 49		
	eS	19 - 29 - 52		
	eSR_{1N}	19 - 35 - 20		
	eL	19 - 42		
	F	20 - 41		
4949 May 19	0	17 - 58.2	7890	
	eP	18 - 09 - 22		
	eS	18 - 18 - 38		
	ePS	18 - 19 - 05		
	eSR_{1N}?	18 - 23 - 05		
	eSR_{2N}	18 - 27.0		
	L_E	18 - 31		
	F	20 - 06		
4959 May 30	e_N	11 - 52 - 20		
	eS ?	11 - 56 - 36		
	eL	12 - 01		
	F	12 - 48		

W. W. Doxsee

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EARTHQUAKE CORRELATION TABLE

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No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
4922	1	10-26+0-18L	10-27+0-08L	10-27+0-08L	10-21+0-28r	..
4923	1	19-00+1-30U	19-00+0-45U	19-00+0-45U	18-53+1-30U	A
4924	1	20-31+1-00L	20-03+0-12P	20-03+0-04P	20-26+1-05L	..
4925	1	0-04+0-10L	.....	.....	23-56+0-24L	..
4926	3	8-57+0-05L	.....	.....	8-58+0-08L	..
4927	3	12-48+0-42R	.....	12-57+0-08L	12-46+0-49R	B
4928	4	0-54+0-03L	.....	.....	0-55+0-04L	..
4929	4	2-40+0-05L	.....	.....	2-40+0-10L	..
4930	5	4-25+0-55R	4-34+0-10L	4-22+0-30R	4-23+1-07R	..
4931	6	5-41+1-32R	5-41+0-40R	5-41+0-40R	5-43+1-35R	C
4932	6	20-40+0-32u	.....	.....	20-45+0-30u	..
4933	8	10-41+2-13R	10-41+0-45R	10-41+0-45R	10-41+3-00R	E
4934	8	18-14+0-44R	18-22+0-09L	18-24+0-08L	18-10+0-57R	..
4935	9	1-17+0-06L	.....	.....	1-17+0-07L	..
4936	9	2-50+0-38r	.....	.....	2-43+0-43r	..
4937	9	10-04+0-03L	.....	.....	10-08+0-02L	..
	10	.....	23-30+0-02P	23-30+0-01P	0-38+0-05L	..
4938	11	19-21+1-20u	.....	.....	19-20+1-20u	F
4939	12	20-34+0-05L	.....	.....	20-36+0-05L	..
4940	14	10-33+0-20r	10-34+0-05r	.....	10-38+0-26r	..
4941	14	14-34+0-13L	.....	.....	14-39+0-09L	..
4942	16	1-48+1-36u	.....	.....	1-50+1-39u	..
4943	16	4-45+0-04L	.....	.....	4-48+0-01L	..
4944	16	10-06+0-05L	.....	.....	10-07+0-04L	..
4945	16	12-04+0-14L	.....	.....	12-06+0-09L	..
4946	18	0-16+0-36u	.....	.....	0-16+0-49u	..
4947	19	10-59+0-06L	.....	.....	11-01+0-07L	..
4948	19	12-04+0-07L	.....	.....	12-04+0-04L	..
4949	19	18-09+1-57U	18-09+0-45U	18-09+0-20U	18-09+2-35U	G
4950	20	5-05+1-30u	.....	.....	5-07+1-40u	..
4951	20	9-06+0-39L	.....	.....	9-08+0-42L	..
4952	21	4-56+0-08L	.....	.....	4-56+0-06L	..
4953	21	9-14+0-39L	.....	.....	9-15+0-41L	..
4954	22	12-18+0-17L	.....	.....	12-21+0-08L	..
4955	23	7-28+0-13r	.....	.....	7-29+0-10L	..
4956	23	21-16+0-36L	.....	.....	21-26+0-25L	..
4957	25	2-56+0-08L	.....	.....	2-55+0-11L	..
	27	.....	4-31+0-01v	4-30+0-01d	.....	H
4958	29	11-10+0-30L	.....	.....	11-11+0-38L	..
4959	30	11-52+0-56U	11-51+0-05P	11-51+0-03P	11-57+1-00U	..

CORRELATION OF EARTHQUAKES

May, 1933.

N O T E S

		Δ (km.)	O
A	: Ottawa	6660	18 - 50.0
B	: Sheets being changed at Shawinigan Falls.		
C	: Ottawa	4390	5 - 33.7
E	: Ottawa	3790	10 - 33.9
F	: Ottawa	7640	19 - 09.8
G	: Ottawa	7890	17 - 58.2
	Seven Falls	7600	17 - 58.2
H	: Seven Falls	50	4 - 29.5

Dominion Observatory,
Ottawa, Canada,
June 12, 1933.

DOM. OBS. No. 67
5,000—4-29

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

R. MELDRUM STEWART, *Director*
ERNEST A. HODGSON, *Seismologist*
W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45° 23' 38''$ N. $\lambda = 75° 42' 57''$ W. h = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight. Time correction: within .25s.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Milne-Shaw	17	Photographic	Magnetic	8 mm. per min.	1 lb.
Milne-Shaw	23	Photographic	Magnetic	8 mm. per min.	1 lb.
Deformation	D	Photographic	Air	17 mm. per min.	20 g. ca.
Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kgm.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r	V	ϵ	COMP.	1" tilt	DETERMINED
I	5.6		120	2:1	NS	displ'nt	March 25, 1932.
II	8.0		120	15:1	EW		March 25, 1932.
17	12.0		250	20:1	EW	44.5 mm.	March 22, 1932.
23	12.0		250	20:1	NS	43 mm.	July 14, 1932.
D							
D							Nov. 17, 1932.
W	6.1		160	7:1	Vert.		

From May 1, 1933 *to* May 8, 1933 *No.* 8

No. and Date	Phase	Time	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Distance	Remarks
		h m s	s	μ	μ	μ	km.	
4923 May 1	0	18-50.0					6660	
	eP_N	18-59-58						
	eS	19-08-08						
	eSR_{1E}	19-13.2						
	eL	19-19						
	F	20-30 ca						
4931 May 6	0	5-33.7					4390	
	eP_N	5-41-11						
	ePR_{2N}	5-42-48						
	iS_E	5-47-18						
	eSR_2	5-50-16						
	e_E	5-51-48						
	e_N	5-52.9						
	eL	5-54						
	F	7-13						
4933 May 8	0	10-33.9					3790	
	eP	10-40-37						
	ePR_2	10-42-00						
	eS_E	10-46-08						
	eSR_{1N}	10-48.5						
	eL	10-51						
	F	12-54						

AUXILIARY STATIONS

SASKATOON

ø = 52°08' N.. λ = 106°30' W. h. = 515 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.0 secs.	9.0 secs.
Damping	Aperiodic (air)	Aperiodic (air)
Mass	139 kg.	139 kg.
V	61	44 ca
Time correction	From manually recorded radio time signals.	
Foundation	Clay and Sand.	

HALIFAX

ø = 44°38' N. λ = 63°36' W. h. = 46 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.8 secs.	7.1 secs
Damping	Air	Air
Mass	139 kg.	139 kg.
V	110 ca	150 ca
Time correction	From hourly recorded railroad time service.	
Foundation	Carbonaceous Slate.	

SHAWINIGAN FALLS

ø = 46°33'.1 N. λ = 72°45'.8 W.

Wood-Anderson NS Comp. T_o = 0.9 secs. V = 2200

Time Correction From automatically recorded radio time signals.

Foundation Solid Granite of Canadian Shield.

SEVEN FALLS

ø = 47°07'.4 N. λ = 70°49'.6 W.

	Wood-Anderson EW Comp.	Milne-Shaw EW Comp.
T_o	1.0 secs.	12.0 secs.
Damping		20 to 1 (Magnetic)
V	1500	250
Time Correction	From manually recorded	radio time signals.
Sensitivity	-	1" tilt = recorded displacement of 44.5 mm.
Foundation	Solid Granite of Canadian Shield.	

SEISMOLOGICAL BULLETINS RECEIVED

1933

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

STATIONS	BULLETINS	RECEIVED	
Apia	January, February and March, 1933	May	1
Helwan	March, 1933	"	1
Manila	February, 1933	"	8
Rome	April 2 - 15, 1933	"	8
Chiufeng	September to December, 1930	"	8
Kobe, Sumoto, Toyooka	July 1 to September 30, 1932	"	10
Cape Town	September, 1932 to March 18, 1933	"	10
Riverview	Provisional for March, 1933	"	11
Riverview	October, November and December, 1930	"	11
Sydney	March, 1933	"	11
Zurich	March and April, 1933	"	15
Ukiah, Balboa, Tucson, Columbia, Honolulu, Sitka, Technology, San Juan, Bozeman, Charlottesville, Chicago, Pittsburg, Seattle	July, August and September, 1932	"	17
Chiufeng	March, 1933	"	18
Zi-Ka-Wei	March 2 and 3rd, 1933	"	18
Strasbourg, Paris, Bureau Central	March, 1933	"	18
Richmond	April, 1933	"	22
Rome	April 16 - 29, 1933	"	23
Wellington and Auxiliary Stations	Preliminary for March, 1933	"	23
Georgetown	April, 1933	"	26
Georgetown	Seismological Despatches	"	26
San Fernando	March and April, 1933	"	26
Algiers	March and April, 1933	"	26
Frankfurt(Taunus)	Year, 1932	"	26
Zinsen	Preliminary Bulletins September to December, 1932	"	27

DOMINION OBSERVATORY,
OTTAWA, CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.

DOM. OBS. No. 67
5,000—4-29

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

R. MELDRUM STEWART, *Director*
ERNEST A. HODGSON, *Seismologist*
W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45° 23' 38''$ N. $\lambda = 75° 42' 57''$ W. h = 83m.

Lithologic foundation :boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

INSTRUMENTS—FIXED CONSTANTS

INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Milne-Shaw	17	Photographic	Magnetic	8 mm. per min.	1 lb.
Milne-Shaw	23	Photographic	Magnetic	8 mm. per min.	1 lb.
Deformation	D	Photographic	Air	17 mm. per min.	20 g. ca.
Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kgm.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r	v	ϵ	COMP.	1" tilt	DETERMINED
I	5.6		120	2:1	NS	displ'nt.	March 25, 1932.
II	8.0		120	15:1	EW		March 25, 1932.
17	12.0		250	20:1	EW	44.5 mm.	March 22, 1932.
23	12.0		250	20:1	NS	43 mm.	July 14, 1932.
D							
D							
W	6.1		160	7:1	Vert.		Nov. 17, 1932.

From June 1, 1933 *to* June 18, 1933 *No.* 10

No. and Date	Phase	Time	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Distance	Remarks
		h m s	s	μ	μ	μ	km.	
4971 June 10	e_N	11-33-08						
	e	11-38-04						
	eL_E	11-42						
	F	12-18						
4982 June 13	O	22-20.0					4910	Saskatoon Record:
	eP	22-28-08						O = 22-20.0
	eS	22-34-45						P = 22-25.4
	eSR_1	22-38.0						S = 22-29.9
	eL	22-42						Δ = 2800 km.
	F	0-02						
4985 June 18	e_E	4-12.7						
	e_E	4-18.8						
	e_N	4-19.5						
	e	4-27.6						
	eL_N?	4-42						
	W_{2E}?	6-13						
	F	6-30						

AUXILIARY STATIONS

SASKATOON

ø = 52°08' N.. λ = 106°30' W. h. = 515 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.0 secs.	9.0 secs.
Damping	Aperiodic (air)	Aperiodic (air)
Mass	139 kg.	139 kg.
V	61	44 ca
Time correction	From manually recorded radio time signals.	
Foundation	Clay and Sand.	

HALIFAX

ø = 44°38' N. λ = 63°36' W. h. = 46 m.

	Mainka NS Comp.	Mainka EW Comp.
T_o	9.8 secs.	7.1 secs
Damping	Air	Air
Mass	139 kg.	139 kg.
V	110 ca	150 ca
Time correction	From hourly recorded railroad time service.	
Foundation	Carbonaceous Slate.	

SHAWINIGAN FALLS

ø = 46°33!1 N. λ = 72°45!8 W.

Wood-Anderson NS Comp. T_o = 0.9 secs. V = 2200
Time Correction From automatically recorded radio time signals.
Foundation Solid Granite of Canadian Shield.

SEVEN FALLS

ø = 47°07!4 N. λ = 70°49!6 W.

	Wood-Anderson EW Comp.	Milne-Shaw EW Comp.
T_o	1.0 secs.	12.0 secs.
Damping		20 to 1 (Magnetic)
V	1500	250
Time Correction	From manually recorded	radio time signals.
Sensitivity		1" tilt = recorded displacement of 44.5 mm.
Foundation	Solid Granite of Canadian Shield.	

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

FROM June 18, 1933 to June 30, 1933 No. 11

No. and Date	Phase	Time	Distance	Remarks
4986 June 18	0	21 - 37.8	9820	Interpretation with Macelwane curves.
	eP	21 - 50 - 34		
	$\underline{ePR_1}$	21 - 54 - 07		
	$\underline{eScPcS}$	22 - 01 - 01		
	$i\left(\frac{S}{ScPcPcS}\right)$	22 - 01 - 19		
	ePS_N	22 - 02 - 34		
	$ePPPS_N$	22 - 03 - 15		
	eSR_1	22 - 07.3		
	eSR_{2N}?	22 - 11.1		
	eSR_3	22 - 14.3		
	eL	22 - 22		
	F	1 - 01		
4989 June 19	e_E	19 - 02 - 30		
	e_N	19 - 05 - 50		
	eL ?	19 - 11		
	F	20 - 15		
4995 June 24	e_N	22 - 14.2		
	e_N	22 - 17 - 47		
	e_N	22 - 29.6		
	e_E	22 - 35.6		
	e_N	22 - 37.2		
	e_N	22 - 41.7		
	e_N	22 - 48.5		
	eL_E	22 - 55		Earth displacement at maximum = 385 microns.
	W_{2N}?	1 - 22		
	F	2 - 55		
4997 June 25	e_E	20 - 52 - 30		Saskatoon Record 0 = 20-45.6 P = 20-49.3 S = 20-52.3 Δ = 1750 km.
	e_N	20 - 57 - 09		
	eL	21 - 02		
	F	22 - 25		
5004 June 28	eP	23 - 44 - 32		
	eS ?	23 - 52.2		
	e_N	23 - 57.1		
	eL_N?	0 - 03		
	F	1 - 26		

W. W. Doxsee

SEISMOLOGICAL BULLETINS RECEIVED

June

1933

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

STATIONS	BULLETINS	RECEIVED
Rome	April 30 to May 13, 1933	June 2
Helwan	April, 1933	" 5
Fordham	January to May, 1933	" 7
Cape Town	April, 1933	" 8
Cartuja	August and September, 1932	" 8
Riverview	Provisional for April, 1933	" 8
Zinsen	January, February and March, 1933.	" 10
Barcelona	May 28 to December 31, 1932	" 12
Manila	March, 1933	" 12
Strasbourg) Paris) Bureau Central)	April, 1933	" 12
Chiufeng	April, 1933	" 12
La Paz	August to December, 1932	" 16
Rome	May 14 - 27, 1933	" 17
Richmond	May, 1933	" 17
Georgetown	May, 1933 and Seismological Despatches	" 17
Toronto	April and May, 1933	" 19
Wellington	Preliminary for April, 1933	" 19
Victoria	January, February and March, 1933	" 21
Tananarive	October to December, 1932	" 22
Göttingen	January, February and March, 1933	" 24
Osaka	January 21 to April 27, 1933	" 24
Taihoku	February, 1933	" 24
Zagreb	July to September, 1932	" 27
Zurich	May and June, 1933	" 30
Chile	Year 1931	" 30
Quito	January and February, 1933	" 30
Algiers	May, 1933	" 30

DOMINION OBSERVATORY
OTTAWA - CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood Anderson: Seven Falls-Wood Anderson: Seven Falls-Milne Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

June, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
4960	2	8-06+1-22u	.....	.....	8-07+1-04u	..
4961	3	17-56+0-47u	.....	.....	.....	A
4962	4	13-41+0-06L	.....	.....	13-44+0-07L	..
4963	4	14-26+0-06L	.....	.....	14-28+0-03L	..
	6	.....	.....	.....	1-40+0-23L	..
4964	6	2-58+1-32u	.....	.....	3-04+1-27u	..
4965	7	6-48+0-53L	.....	.....	6-53+0-41L	..
4966	7	12-11+1-19u	.....	.....	12-12+1-25u	..
4967	8	12-51+0-21L	.....	.....	12-55+0-11L	..
4968	8	18-23+0-32r	18-22+0-08P	18-23+0-05P	18-35+0-25L	B
4969	8	18-54+1-06L	.....	.....	19-02+1-05L	..
4970	8	20-19+0-09L	.....	.....	.....	..
4971	10	11-33+0-45r	.....	.....	11-39+0-40r	..
4972	10	12-19+1-01r	.....	.....	12-18+1-00r	..
4973	11	8-51+0-24L	.....	.....	8-55+0-18L	..
4974	11	14-09+0-54L	.....	.....	14-12+0-49L	..
4975	11	15-53+0-17L	.....	.....	15-56+0-09L	..
4976	12	0-19+0-13L	.....	.....	0-23+0-06L	..
4977	12	15-38+1-00R	15-32+0-30R	15-32+0-25R	15-39+0-59R	..
4978	12	19-43+0-31L	.....	.....	19-43+0-36L	..
4979	13	14-37+0-33r	.....	.....	14-38+0-35r	..
4980	13	16-27+0-09L	16-29+0-04L	16-29+0-02L	16-29+0-09L	..
4981	13	20-57+1-15u	.....	.....	20-57+1-30u	..
4982	13	22-28+1-34R	22-28+0-45R	22-28+0-30R	22-28+1-40R	C
	15	.....	1-20+0-03P	1-20+0-01P	.....	..
4983	15	23-01+0-04L	.....	.....	23-02+0-05L	..
4984	16	1-10+0-42R	1-16+0-07L	1-17+0-05L	1-15+0-35L	..
4985	18	4-13+2-17u	.....	.....	4-14+2-23u	..
	18	.....	.....	.....	7-24+0-23L	..
	18	.....	.....	.....	14-00+0-25L	..
4986	18	21-51+3-10U	21-51+1-15U	21-51+1-00U	21-51+4-00U	E
4987	19	8-49+0-04L	.....	.....	.....	..
4988	19	10-06+0-10L	.....	.....	.....	..
4989	19	19-02+1-13R	18-56+0-20R	18-56+0-20R	19-03+1-18R	..
4990	20	17-26+0-07L	.....	.....	17-27+0-05L	..
4991	21	22-54+0-11L	.....	.....	22-55+0-08L	..
4992	23	2-24+0-10L	.....	.....	2-24+0-08L	..
	23	.....	17-46+0-.5d	.....	.....	..
4993	23	20-24+0-04L	.....	.....	.....	..
4994	24	16-50+0-10L	.....	.....	.....	..
4995	24	22-14+4-41U	22-14+2-30U	22-15+2-00U	22-15+4-38U	..

EARTHQUAKE CORRELATION TABLE

June, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
4996	25	19-05+0-35L	.....	.....	.....	..
4997	25	20-52+1-33R	20-52+0-30R	.....	.....	..
4998	26	6-46+0-07L	.....	.....	.....	..
4999	27	4-07+0-31L	.....	.....	.....	..
5000	27	15-48+0-42u	.....	.....	.....	..
5001	27	23-09+0-19L	.....	.....	.....	..
5002	28	6-20+0-05L	.....	.....	.....	..
5003	28	10-15+0-33r	.....	.....	.....	..
5004	28	23-45+1-41u	23-45+0-04P	.....	.....	..
5005	29	2-54+0-41L	.....	.....	.....	..
5006	29	13-59+0-05L	.....	.....	.....	..
5007	29	17-10+0-07L	.....	.....	.....	..
5008	29	18-45+0-14L	.....	.....	.....	..

CORRELATION OF EARTHQUAKES

June, 1933

N O T E S

A : Chart overrun at Seven Falls.

B : Sheets being changed at Seven Falls.

		Δ (km.)	O
C :	Ottawa	4910	22 - 20.0
	Seven Falls	5000	22 - 20.1
E :	Ottawa	9820	21 - 37.8
	Seven Falls	9750	21 - 37.9

F : Owing to the death of Mr. S. D. Sandall, operator at Seven Falls, the records for that station for the period June 25th to 30th have not yet been received.

Dominion Observatory,
Ottawa, Canada,
July 28, 1933.

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood Anderson: Seven Falls-Wood Anderson: Seven Falls-Milne Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

June, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
4996	25	19-05+0-35L	.....	.....	19-08+0-38L	..
4997	25	20-52+1-33R	20-52+0-30R	21-04+0-15R	20-54+1-50R	
4998	26	6-46+0-07L	.....	.....	6-50+0-03L	..
4999	27	4-07+0-31L	.....	.....	4-09+0-36L	..
5000	27	15-48+0-42u	.....	.....	15-51+0-33u	..
5001	27	23-09+0-19L	.....	.....	23-09+0-17L	..
5002	28	6-20+0-05L	.....	.....	.....	..
5003	28	10-15+0-33r	.....	.....	10-15+0-27r	..
5004	28	23-45+1-41u	23-45+0-04P	23-51+0-02P	23-45+1-48u	..
5005	29	2-54+0-41L	.....	.....	3-01+0-35L	..
5006	29	13-59+0-05L	.....	.....	.....	..
5007	29	17-10+0-07L	.....	.....	17-09+0-06L	..
5008	29	18-45+0-14L	.....	.....	18-43+0-14L	..

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*

ERNEST A. HODGSON, *Seismologist*

W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45°\ 23'\ 38''$ N. $\lambda = 75°\ 42'\ 57''$ W. h. = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

AUXILIARY STATIONS

SASKATOON

$\varphi = 52°\ 08'$ N. $\lambda = 106°\ 30'$ W. h. = 515m.

Foundation: clay and sand.
Time correction: from manually recorded radio time signals.

HALIFAX

$\varphi = 44°\ 38'$ N. $\lambda = 63°\ 36'$ W. h. = 46m.

Foundation: carbonaceous slate.
Time correction: from hourly recorded railroad time service.

SHAWINIGAN FALLS

$\varphi = 46°\ 33'{\cdot}1$ N. $\lambda = 72°\ 45'{\cdot}8$ W. h. = 60m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from automatically recorded radio time signals.

SEVEN FALLS

$\varphi = 47°\ 07'{\cdot}4$ N. $\lambda = 70°\ 49'{\cdot}6$ W. h. = 232m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from manually recorded radio time signals.

INSTRUMENTS—FIXED CONSTANTS

STATION	INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Ottawa	Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Ottawa	Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Ottawa	Milne-Shaw	17	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Milne-Shaw	23	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kg.
Halifax	Mainka	HN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Halifax	Mainka	HE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Shawinigan Falls	Wood-Anderson	SA	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Wood-Anderson	SF	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Milne-Shaw	SM	Photographic	Magnetic	6 mm. per min.	1 lb.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	DISPLACEMENT FOR 1" ARC TILT
I	5.6		120	2:1	NS	
II	8.0		120	15:1	EW	
17	12.0		250	20:1	EW	44 mm.
23	12.0		250	20:1	NS	43 mm.
W	6.1		160	7:1	Vert.	
HN	9.8		110	aperiodic	NS	
HE	7.1		147	"	EW	
SN	9.0		61	"	NS	
SE	9.0		44?	"	EW	
SA	1.0		2200		NS	
SF	1.0		1750		EW	
SM	12.0		250		EW	44 mm.

DOM. OBS. No. 67

Req. 6041—5,000—5-33

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

FROM July 1, 1933 to July 19, 1933 No. 12

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5015 July 9	O	1 - 30.2	8900	
	eP	1 - 42 - 20		
	ePR_{1N}	1 - 45 - 28		
	eS_E	1 - 52 - 23		
	eL_N	2 - 09		
	F	3 - 58		
5016 July 9	O	5 - 34.5	4010	
	eP	5 - 41 - 30		
	ePR_{1E}	5 - 42 - 45		
	eS	5 - 47 - 15		
	eL	5 - 53		
	F	6 - 59		
5019 July 9	O	12 - 30.9	8910	
	eP	12 - 43 - 00		
	eS	12 - 53 - 04		Sheets being changed.
	eL?	13 - 07		
	W_{2E}	15 - 03		
	F	16 - 03		
5024 July 10	O	3 - 21.5	4460	
	eP	3 - 29 - 01		
	ePR_1	3 - 30 - 17		
	eE	3 - 34 - 35		
	eS_N	3 - 35.2		
	eL	3 - 42		
	F	5 - 51		
5026 July 10	e	10 - 54 - 55		
	e	10 - 59 - 40		
	eL?	11 - 32		
	W_2	12 - 24		May be another quake.
	F	13 - 00		
5029 July 14	i	4 - 48 - 40		Local.
	F	4 - 49 - 16		
5033 July 19	O	5 - 09.7	2780	
	eP	5 - 15 - 04		
	eS	5 - 19 - 26		
	eL	5 - 26		
	F	6 - 10		
5034 July 19	e	11 - 04 - 00		
	eE	11 - 12 - 20		
	e	11 - 19.1		
	L	11 - 25		
	F	13 - 11		
5035 July 19	O	13 - 32.5	6700	
	eP	13 - 42 - 34		
	eS	13 - 50 - 46		
	eL	14 - 03		
	F	15 - 10+		

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

FROM July 19, 1933 to July 31, 1933 No. 13

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5036 July 19	O	15 - 00.0	6700	
	iP	15 - 10 - 04		
	eS	15 - 18 - 16		
	eL ?	15 - 31		
	F	17 - 45		
5040 July 20	e_N	23 - 26 - 49		
	e	23 - 30 - 20		
	e	23 - 37 - 13		
	L	0 - 02		
	F	0 - 36		
5042 July 21	e	20 - 25 - 05		
	e	20 - 32 - 01		
	e	20 - 35.3		
	e_E	20 - 40.3		
	eL ?	21 - 01		
	F	23 - 06		
5043 July 22	O	20 - 55.3	6400	Saskatoon Record: O = 20 - 55.3 P = 21 - 02 - 19 S = 21 - 08 - 02 Δ = 3990 km.
	eP	21 - 05 - 03		
	ePR_1	21 - 07.3		
	eS	21 - 12 - 59		
	e	21 - 14 - 48		
	eSR_{1E}	21 - 17.5		
	eL	21 - 24		
	F	1 - 12		
5044 July 23	e	4 - 23 - 19		
	e	4 - 31 - 36		
	L	4 - 45		
	F	5 - 26		
5047 July 24	e_E	19 - 14.3		Δ = 11,500 km. approximately.
	e_N	19 - 17 - 18		
	e	19 - 20 - 28		
	e_E	19 - 23 - 32		
	e	19 - 29.2		
	eL	19 - 43		
	W_2	21 - 03		
	F^2	21 - 49		
5053 July 31	O	11 - 35.5	3080	
	eP	11 - 41 - 18		
	eS	11 - 46 - 02		
	eL	11 - 50		
	F	12 - 35		

W. W. Doxsee

SEISMOLOGICAL BULLETINS RECEIVED

July

1933

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

STATIONS	BULLETINS	RECEIVED
Hamburg	January to May, 1933	July 2
Zi-Ka-Wei	March 18 to April 16, 1933	" 2
Upsala	Years 1930 and 1931	" 4
Toledo, Cartuja, Alicante, Almeria, Malaga	May and June, 1932	" 5
Perth	February 14 to April 23, 1933	" 5
Cape Town	May, 1933	" 6
Firenze	October to December, 1932	" 6
Strasbourg, Paris, Bureau Central	May, 1933	" 10
Manila	April, 1933	" 10
Georgetown	June, 1933 and Seismological Despatches	" 10
Osaka	July to September, 1932	" 11
Helwan	May, 1933	" 11
Chiufeng	May, 1933	" 11
Taihoku	April and March, 1933	" 12
Theodosia, Yalta, Simferopol, Sebastopol	July to December, 1931	" 12
Pulkova, Baku, Irkutsk, Kucino, Sverdlovsk, Tachkent, Vladivostok	November, 1931 to September, 1932	" 12
Uccle	January 1 to March 16, 1933	" 17
Sydney	April and May, 1933	" 19
Perth	April 23 to May 19, 1933	" 19
Wellington	Preliminary for May, 1933	" 19
Riverview	Provisional for May, 1933	" 20
Balboa, Bozeman, Technology, Tucson, Ukiah, Huancayo, San Juan, Charlottesville, Chicago, Columbia, Honolulu, Pittsburg, Seattle	October to December, 1932	" 20

SEISMOLOGICAL BULLETINS RECEIVED

July

1933

STATIONS	BULLETINS	RECEIVED
Richmond	June, 1933	July 22
Zi-Ka-Wei	April 19 to May 2, 1933	" 24
Quito	March and April, 1933	" 25
Tyosi	September to December, 1932	" 26
Beograd	January to May, 1933	" 27
La Plata	November, 1932 to June, 1933	" 31
Peichiko	January to March, 1933	" 31
Melbourne	January to March, 1933	" 31

DOMINION OBSERVATORY
OTTAWA - CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.

CORRELATION TABLE

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EARTHQUAKE CORRELATION TABLE

July, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
5009	1	20-47+0-29L	.....	.....	20-47+0-31L	..
5010	3	7-28+0-14L	7-24+0-12L	7-24+0-05L	7-29+0-12L	..
5011	3	16-18+0-14L	.....	.....	16-14+0-11L	..
5012	7	12-03+0-04L	.....	.....	.....	..
5013	7	15-30+0-02L	.....	.....	.....	..
5014	8	22-49+0-17L	.....	.....	.....	..
5015	9	1-42+2-16U	1-42+0-45U	1-43+0-40U	.....	A
5016	9	5-41+1-18R	5-42+0-30R	5-42+0-30R	.....	B
5017	9	9-50+1-53u	.....	.....	.....	..
5018	9	12-00+0-33L	.....	.....	.....	..
5019	9	12-43+3-23U	12-43+1-30U	12-43+1-15U	.....	C
5020	9	16-29+1-25u	.....	.....	.....	..
5021	9	18-23+0-43u	.....	.....	18-14+0-55u	..
5022	9	22-37+0-55u	.....	.....	22-37+0-56u	..
5023	10	0-45+1-08u	0-34+0-02P	0-34+0-02P	0-45+1-08u	..
5024	10	3-29+2-22R	3-30+0-45R	3-30+0-40R	3-29+2-22R	E
	10	.....	.....	.....	7-12+0-04L	..
5025	10	8-52+0-26L	.....	.....	9-00+0-14L	..
5026	10	10-55+2-05u	10-56+0-02P	10-56+0-01P	10-56+1-54u	..
5027	11	7-40+0-15L	.....	.....	.....	..
	13	.....	.....	.....	8-43+0-14L	..
5028	14	2-06+1-02u	.....	.....	2-09+0-52u	..
5029	14	4-49+0-.6d	4-49+0-02v	4-50+0-.5v	.....	F
5030	15	14-45+0-14L	.....	.....	14-45+0-13L	..
5031	18	19-35+1-18u	.....	.....	19-35+1-20u	..
5032	19	0-38+0-09L	.....	.....	0-33+0-12L	..
5033	19	5-15+0-55R	.....	.....	5-15+0-55R	G
5034	19	11-04+2-07u	10-56+0-11P	11-04+0-02P	11-04+2-16u	..
5035	19	13-43+1-27+u	.....	.....	13-43+1-27u	H
5036	19	15-10+2-35u	15-10+0-45u	15-10+0-45ı	15-10+2-40ú	I
5037	19	20-19+0-51u	.....	.....	20-41+0-29L	..
5038	20	4-34+0-09L	.....	.....	4-34+0-09L	..
5039	20	20-01+0-03L	.....	.....	.....	..
5040	20	23-27+1-09u	23-27+0-05P	23-28+0-01P	23-37+1-02u	..
5041	21	7-35+0-32r	7-35+0-16P	7-36+0-10P	7-40+0-31r	..
5042	21	20-25+2-41u	.....	.....	20-26+2-46u	..

EARTHQUAKE CORRELATION TABLE

July, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
5043	22	21-05+4-07U	21-05+1-15U	21-05+1-15U	21-05+4-06U	J
5044	23	4-23+1-02u	.....	.....	4-32+0-51u	..
5045	23	9-44+0-50u	.....	.....	9-44+0-44u	..
5046	24	9-57+0-03L	.....	.....	.....	..
5047	24	19-14+2-35U	.....	.....	19-15+2-36U	..
5048	26	5-15+0-45r	5-05+0-20r	5-05+0-20r	5-12+0-55r	..
5049	26	22-35+0-04L	.....	.....	22-37+0-06L	..
5050	28	12-05+0-28r	.....	.....	12-06+0-26r	..
5051	30	17-36+1-23u	.....	.....	17-38+1-24u	..
5052	31	9-23+0-06L	.....	.....	.....	..
5053	31	11-41+0-54r	.....	.....	.....	K
5054	31	15-41+0-44r	.....	.....	.....	..

CORRELATION OF EARTHQUAKES

July, 1933.

N O T E S

		Δ (km.)	O
A :	Ottawa	8900	1 - 30.2
B :	Ottawa	4010	5 - 34.5
C :	Ottawa	8910	12 - 30.9
E :	Ottawa	4460	3 - 21.5
	Seven Falls	4270	3 - 22.1
F :	Felt in Ottawa and district.		
	Shawinigan Falls	270	4 - 48.6
G :	Ottawa	2780	5 - 09.7
	Seven Falls	2880	5 - 09.9
H :	Ottawa	6700	13 - 32.5
	Seven Falls	6800	13 - 32.5
I :	Ottawa	6700	15 - 00.0
	Seven Falls	6800	15 - 00.0
J :	Ottawa	6400	20 - 55.3
	Seven Falls	6360	20 - 55.5
K :	Ottawa	3080	11 - 35.5

Dominion Observatory,
Ottawa, Canada,
August 21, 1933.

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From August 1, 1933 to August 25, 1933 No.14

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5060 Aug. 7	e	3 - 10 - 00		
	e	3 - 15 - 46		
	eL	3 - 23		
	F	4 - 04		
5061 Aug. 11	e_N	9 - 14 - 03		
	e_E	9 - 22.7		
	eL	9 - 48		
	F	10 - 33		
5063 Aug. 13	e_E	9 - 47 - 32		
	e_E	9 - 50 - 49		
	e_N	10 - 06.1		
	eL?	10 - 40		
	F	12 - 03		
5065 Aug. 15	e_E	0 - 52.3		
	e	0 - 57.4		
	eL	1 - 03		
	F	1 - 30		
5066 Aug. 15	e	3 - 22		
	e_E	3 - 29.6		
	L	3 - 44		
	F	4 - 19		
5069 Aug. 20	e	12 - 12		
	e	12 - 20		
	L	12 - 33		
	F	13 - 13+		
5071 Aug. 25	O	7 - 50.5	11,500	Saskatoon Record:
	eP	8 - 04 - 30		O = 7-50.5
	PR_1	8 - 08 - 40		P = 8 - 03 -41
	S_cP_cS	8 - 15 - 11		S = 8 - 14 - 46
	$\overline{S_cP_cP_cS}$	8 - 15 - 52		Δ = 10,150 km.
	SR_1	8 - 23.2		
	eL	8 - 36		
	F	11 - 33		

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From August 25, 1933 to August 31, 1933 No.15

No. and Date	Phase	Time	Distance	Remarks
		h m s		
5075 Aug. 28	O	22 - 19.6	12,500	
	eP	22 - 34.3		
	P'	22 - 38.0		
	PR_1	22 - 39.1		
	e_E	22 - 44 - 40		
	PS	22 - 48 - 24		
	SR_1	22 - 53 - 28		
	eL	23 - 05		
	F	3 - 07		
5076 Aug. 29	e	14 - 51.2		
	e	15 - 01 - 22		
	i_N	15 - 03 - 20		
	i	15 - 08 - 24		
	i	15 - 10 - 03		
	i	15 - 12 - 00		
	i_E	15 - 14 - 13		
	e_N	15 - 15 - 40		
	eL?	15 - 17		
	F	16 - 09		
5077 Aug. 31	e	3 - 05.2		
	e	3 - 07.4		
	eL?	3 - 11		
	F	3 - 46		

W. W Doxsee

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood-Anderson: Seven Falls-Wood-Anderson: Seven Falls-Milne-Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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:

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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.

EARTHQUAKE CORRELATION TABLE

August, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
5055	1	5-32+0-07L	.....	.....	5-08+0-18L	..
5056	1	12-15+0-09L	.....	.....	12-22+0-08L	..
5057	5	1-15+1-38u	.....	.....	1-08+1-50u	..
5058	6	3-12+0-18L	.....	.....	3-21+0-18L	..
5059	6	8-46+0-13L	.....	.....	8-56+0-08L	..
5060	7	3-10+0-54u	.....	.....	3-15+1-01u	..
	10	.....	.....	.....	12-45+0-19L	..
5061	11	9-14+1-19u	.....	.....	9-20+1-30u	..
5062	12	9-16+0-18L	.....	.....	9-17+0-23L	..
5063	13	9-47+2-16u	.....	.....	9-50+2-15u	..
5064	14	0-14+0-06L	.....	.....	.....	..
5065	15	0-52+0-38u	.....	.....	0-57+0-39u	..
5066	15	3-22+0-57u	.....	.....	3-22+1-26u	..
5067	15	20-11+0-30L	.....	.....	20-18+0-17L	..
5068	15	23-54+0-16L	.....	.....	23-55+0-13L	..
5069	20	12-12+1-00u	.....	.....	12-17+1-40u	..
5070	22	11-53+0-34L	.....	.....	11-59+0-40L	..
5071	25	8-04+3-30U	8-04+1-71U	8-04+1-08U	8-04+3-35U	A
5072	26	20-31+0-16L	.....	.....	20-30+0-11L	..
5073	27	0-46+0-31L	.....	.....	0-46+0-24L	..
5074	28	13-57+0-23L	.....	.....	.....	..
5075	28	22-34+4-33U	22-38+1-24U	22-38+1-51U	22-34+4-35U	B
5076	29	14-51+1-18R	15-01+0-19P	15-02+0-15P	15-02+1-08R	..
5077	31	3-05+0-41r	3-10+0-11L	3-10+0-12L	3-05+0-50r	..
5078	31	13-24+0-42L	.....	.....	13-22+0-51L	..

CORRELATION OF EARTHQUAKES

August, 1933.

.....

N O T E S

		Δ (km.)	Θ
A :	Ottawa	11500	7 - 50.5
B :	Ottawa	12500	22 - 19.6

Dominion Observatory,
Ottawa, Canada,

September 25, 1933.

SEISMOLOGICAL BULLETINS RECEIVED

August

1933

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

STATIONS	BULLETINS	RECEIVED
Algiers	June, 1933	August 3
Cape Town	June, 1933	" 3
Rome	June 25 to July 8, 1933	" 4
Kobe	October 1 to December 31, 1932	" 4
Rome	July 11 - 24th, 1933	" 5
Manila	May, 1933	" 8
Chiufeng	June 1 to July 3, 1933	" 8
San Fernando	May, 1933	" 9
Athens	January, February and March, 1933	" 10
Apia	April, May and June, 1933	" 15
Zagreb	January, February and March, 1933	" 15
Wellington	Preliminary for June, 1933	" 15
Rivierview	June, 1933	" 15
Sydney	June, 1933	" 16
Strasbourg, Paris, Bureau Central	June, 1933	" 17
Melbourne	April, May and June, 1933	" 17
Helwan	June, 1933	" 18
Richmond	July, 1933	" 18
Rome	July 9 - 22nd, 1933	" 19
Innsbruck	November 2/31 to November 20/32	" 24
Wien	December 11/32 to March 18/33	" 24
Lemberg	September 30 to December 31, 1932 and February 24 to April 27, 1933	" 24
Tsingtao	October 1931 to February, 1932	" 26
Quito	May and June, 1933	" 26

DOMINION OBSERVATORY
OTTAWA - CANADA

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*

ERNEST A. HODGSON, *Seismologist*

W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45°\ 23'\ 38''$ N. $\lambda = 75°\ 42'\ 57''$ W. h. = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

AUXILIARY STATIONS

SASKATOON

$\varphi = 52°\ 08'$ N. $\lambda = 106°\ 30'$ W. h. = 515m.

Foundation: clay and sand.
Time correction: from manually recorded radio time signals.

HALIFAX

$\varphi = 44°\ 38'$ N. $\lambda = 63°\ 36'$ W. h. = 46m.

Foundation: carbonaceous slate.
Time correction: from hourly recorded railroad time service.

SHAWINIGAN FALLS

$\varphi = 46°\ 33'{\cdot}1$ N. $\lambda = 72°\ 45'{\cdot}8$ W. h. = 60m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from automatically recorded radio time signals.

SEVEN FALLS

$\varphi = 47°\ 07'{\cdot}4$ N. $\lambda = 70°\ 49'{\cdot}6$ W. h. = 232m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from manually recorded radio time signals.

INSTRUMENTS—FIXED CONSTANTS

STATION	INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Ottawa	Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Ottawa	Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Ottawa	Milne-Shaw	17	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Milne-Shaw	23	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kg.
Halifax	Mainka	HN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Halifax	Mainka	HE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Shawinigan Falls	Wood-Anderson	SA	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Wood-Anderson	SF	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Milne-Shaw	SM	Photographic	Magnetic	6 mm. per min.	1 lb.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	DISPLACEMENT FOR 1" ARC TILT
I	5.6		120	2:1	NS	
	8.0		120	15:1	EW	
II	12.0		250	20:1	EW	44 mm.
17	12.0		250	20:1	NS	43 mm.
23	6.1		160	7:1	Vert.	
W	9.8		110	Aperiodic	NS	
HN	7.1		147	"	EW	
HE	9.0		61	"	NS	
SN	9.0		44?	"	EW	
SE	1.0		2200		NS	
SA	1.0		1750		EW	
SF	12.0		250		EW	44 mm.
SM						

DOM. OBS. No. 67

Req. 6041—5.000—5-33

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From September 1, 1933 to September 22, 1933 No. 16

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5079 Sept. 2	e	16 - 52.2		
	i	16 - 58 - 13		
	i	17 - 04 - 02		
	F	18 - 32		
5083 Sept. 6	eE	22 - 24.6		
	eE	22 - 27 - 10		
	e	22 - 30.4		
	iE	22 - 31 - 58		
	iE	22 - 33 - 11		
	iN	22 - 34 - 04		
	iE	22 - 36 - 00		
	eN	22 - 38.1		
	iN	22 - 42 - 20		
	eL?	22 - 46		
	F	0 - 45		
5084 Sept. 7	e?	22 - 49		
	e	22 - 57.3		
	e	23 - 01.3		
	eL	23 - 10		
	F	0 - 07		
5088 Sept. 9	eE	21 - 41.4		
	e	21 - 49.7		
	eL	22 - 14		
	F	23 - 48		
5089 Sept. 19	e	23 - 53.3		
	eL	23 - 57		Irregular L waves.
	F	0 - 34		
5090 Sept. 21	eE?	10 - 11.8		
	eE	10 - 17.6		
	eL	10 - 30		
	F	11 - 05		
5091 Sept. 22	eE	12 - 04.4		
	eE	12 - 13.3		
	eL	12 - 32		
	F	13 - 06		

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From September 22, 1933 to September 30, 1933 No. 17

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5092 Sept. 24	O	15 - 19.6	6780	
	eP	15 - 29 - 52		
	S	15 - 38 - 10		
	i_N	15 - 39 - 39		
	SR_{1N}	15 - 43.2		
	SR_2	15 - 44 - 52		
	eL	15 - 48.3		
	F	17 - 43		
5093 Sept. 25	e	14 - 23.8		
	eL	14 - 42		
	F	15 - 23		
5094 Sept. 25	e	19 - 08 - 48		
	e	19 - 15 - 24		
	eL	19 - 34		
	F	21 - 15		
5099 Sept. 30	e_E	14 - 43.5		
	e_N	14 - 51		
	e_E	14 - 57.0		
	eL	15 - 15		
	F	17 - 02		

ERRATUM

In previous issues of the Ottawa Bulletin the longitude of Saskatoon has been listed as 106°30' W. This should have read 106°38' W., as originally given in the Klotz Seismological Tables, Vol. III, No. 2, of the Publications of the Dominion Observatory.

W W Doxsee

SEISMOLOGICAL BULLETINS RECEIVED

September

1933

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

STATIONS	BULLETINS	RECEIVED
Oxford	April, May and June, 1929	Sept. 2
Rome	July 23 to August 5, 1933	" 2
Taihoku	May, 1933	" 2
Zi-Ka-Wei	May 3 to June 2, 1933	" 2
Hukuoka	Year 1932	" 5
Chiufeng	July, 1933	" 5
Algiers	July, 1933	" 6
Toronto	June and July, 1933	" 8
Helwan	July, 1933	" 9
Cape Town	July, 1933	" 9
Rome	August 6 - 19th, 1933	" 11
Sydney	July, 1933	" 12
Riverview	Provisional for July, 1933	" 12
Perth	May 20 - 22nd, 1933	" 13
Karlsruhe	January to June, 1933	" 15
Scoresby-Sund	July 1930 to December, 1931	" 16
Copenhagen	July to September, 1931	" 16
Manila	June, 1933	" 18
Zi-Ka-Wei	June, 1933	" 18
Richmond	August, 1933	" 18
Zurich	July and August, 1933	" 18
Georgetown	July, 1933 and Seismolcgical Despatches	" 21
Pasadena	July, 1933	" 22
Rome	August 20 to September 2, 1933	" 22
Tananarive	January to March, 1933	" 26
Taihoku	June, 1933	" 27
Cartuja	Preliminary for August, 1933	" 27
and	October to December, 1932	" 27
Wellington	Preliminary for July, 1933	" 28
Strasbourg, Paris, Bureau Central	July, 1933	" 29

DOMINION OBSERVATORY
OTTAWA - CANADA

R. Meldrum Stewart,
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Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood-Anderson: Seven Falls-Wood-Anderson: Seven Falls-Milne-Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

September, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
	1	.....	.....	.....	20-09+0-15L	..
5079	2	16-52+1-40r	17-04+0-05P	16-58+0-04P	16-58+0-35r	..
5080	4	2-00+0-10L	.....	.....	2-01+0-11L	..
5081	6	2-33+0-42L	.....	.....	.....	..
5082	6	18-02+1-20u	.....	.....	18-42+0-43L	..
5083	6	22-25+2-20U	22-26+0-28U	22-26+0-23U	22-28+2-35U	..
5084	7	22-49+1-18R	23-01+0-17R	23-01+0-16R	22-53+1-12R	..
5085	8	3-39+0-14L	.....	.....	3-39+0-11L	..
5086	8	6-55+0-18L	.....	.....	6-56+0-21L	..
5087	9	5-24+0-28u	5-24+0-01P	5-24+0-01P	5-24+0-24u	..
5088	9	21-41+2-07u	.....	.....	21-40+2-15u	A
	12	.....	.....	23-46+0-01P	.....	..
	15	.....	.....	0-17+0-02P	.....	..
5089	19	23-53+0-41R	23-58+0-12L	0-00+0-12L	23-53+0-40R	B
	21	.....	.....	.....	0-22+0-21L	..
5090	21	10-12+0-53u	.....	.....	10-11+0-55u	..
5091	22	12-04+1-02u	.....	.....	12-14+0-46u	..
5092	24	15-30+2-03U	15-30+0-37U	15-30+0-37U	15-30+2-20U	C
5093	25	14-24+1-00u	.....	.....	14-24+1-03u	..
5094	25	19-09+2-06U	19-04+1-05U	19-05+1-04U	19-05+2-21U	..
5095	26	4-04+0-14L	.....	.....	4-00+0-15L	..
5096	27	9-23+0-08L	.....	.....	9-24+0-07L	..
5097	27	22-40+0-50u	.....	.....	22-40+0-56u	..
5098	28	12-13+0-10L	.....	.....	12-14+0-08L	..
5099	30	14-44+2-18u	.....	.....	14-50+2-19u	..
5100	30	23-42+0-06L	.....	.....	23-44+0-06L	..

CORRELATION OF EARTHQUAKES

September, 1933.

.....

N O T E S

==========

	Δ (km.)	O

A : Continuous recording of micros September 10 to 20th inclusive.

B : Time signal record masked registration of preliminary phases recorded by Seven Falls Wood-Anderson seismograph.

C :	Ottawa	6780	15 - 19.6
	Seven Falls	6820	15 - 19.5

Dominion Observatory,
Ottawa, Canada,
September 12, 1933.

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*

ERNEST A. HODGSON, *Seismologist*

W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45°\ 23'\ 38''$ N. $\lambda = 75°\ 42'\ 57''$ W. h. = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

AUXILIARY STATIONS

SASKATOON

$\varphi = 52°\ 08'$ N. $\lambda = 106°\ 30'\ 38'$ W. h. = 515m.

Foundation: clay and sand.
Time correction: from manually recorded radio time signals.

HALIFAX

$\varphi = 44°\ 38'$ N. $\lambda = 63°\ 36'$ W. h. = 46m.

Foundation: carbonaceous slate.
Time correction: from hourly recorded railroad time service.

SHAWINIGAN FALLS

$\varphi = 46°\ 33'{\cdot}1$ N. $\lambda = 72°\ 45'{\cdot}8$ W. h. = 60m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from automatically recorded radio time signals.

SEVEN FALLS

$\varphi = 47°\ 07'{\cdot}4$ N. $\lambda = 70°\ 49'{\cdot}6$ W. h. = 232m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from manually recorded radio time signals.

INSTRUMENTS—FIXED CONSTANTS

STATION	INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Ottawa	Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Ottawa	Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Ottawa	Milne-Shaw	17	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Milne-Shaw	23	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kg.
Halifax	Mainka	HN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Halifax	Mainka	HE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Shawinigan Falls	Wood-Anderson	SA	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Wood-Anderson	SF	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Milne-Shaw	SM	Photographic	Magnetic	6 mm. per min.	1 lb.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	DISPLACEMENT FOR 1" ARC TILT
I	5.6		120	2:1	NS	
II	8.0		120	15:1	EW	
17	12.0		250	20:1	EW	44 mm.
23	12.0		250	20:1	NS	43 mm.
W	6.1		160	7:1	Vert.	
HN	9.8		110	Aperiodic	NS	
HE	7.1		147	"	EW	
SN	9.0		61	"	NS	
SE	9.0		44?	"	EW	
SA	1.0		2200		NS	
SF	1.0		1750		EW	
SM	12.0		250		EW	44 mm.

DOM. OBS. No. 67

Req. 6041—5,000—5-33

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

FROM October 1, 1933 to October 5, 1933 No. 18.

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
		h m s	km.	
5101 Oct. 1	e_N	2 - 49 - 44		
	e	2 - 57 - 00		
	e	2 - 57 - 56		
	eL	3 - 02		
	F	3 - 25		
5103 Oct. 2	e_E	9 - 25		
	e_N	9 - 27.3		
	eL	9 - 28.5		
	F	10 - 05		
5104 Oct. 2	e_E?	14 - 29.5		Preliminaries lost changing records.
	e_E	14 - 38.7		
	eL	14 - 58		
	F	15 - 35		
5105 Oct. 2	0	15 - 29.3	5180	Saskatoon Record:
	iP_N	15 - 37 - 58		0 = 15-29.3
	PR_1	15 - 39 - 52		eP = 15-39-11
	iS_E	15 - 44 - 50		PR_2 = 15-42-51
	PS	15 - 45 - 08		S = 15-47-09
	SR_1	15 - 48 - 30		SR_2 = 15-53-57
	SR_{2N}	15 - 49 - 48		L = 15-59
	eL_E	15 - 51.5		F = 16-52
	F	19 - 16		Δ = 6400 km.
5106 Oct. 3	0	10 - 21.3	5100	
	eP_N	10 - 29 - 56		
	PR_{1N}	10 - 31 - 50		
	S	10 - 36 - 44		
	SR_1	10 - 40 - 24		
	SR_{3N}	10 - 42 - 26		
	eL	10 - 45		
	M	10 - 49		
	F	11 - 43		
5110 Oct. 5	e	13 - 53		
	L	13 - 59		
	F	15 - 13		
5112 Oct. 12	e	7 - 32.5		
	e_E	7 - 33.2		
	F	7 - 37		

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

FROM October 5, 1933 to October 31, 1933 No.19

NO. AND DATE	PHASE	TIME	DISTANCE	REMARKS
5113 Oct. 14	O	22 - 19.1	5880	
	eP_E	22 - 28.5		
	S	22 - 36.0		
	SR_{1E}	22 - 40.0		
	eL	22 - 44.5		
	M	22 - 48		
	F	0 - 10		
5115 Oct. 17	e	13 - 46		
	eL	13 - 50		
	M	13 - 55		
	F	14 - 21+		
5124 Oct. 25	O	23 - 28.2	7380	
	eP_N	23 - 39 - 00		
	i_N	23 - 39 - 58		
	eS	23 - 47 - 48		
	i	23 - 47 - 53		
	ScS	23 - 49 - 23		
	SR_{2E}	23 - 55 - 24		
	SR_3	23 - 56 - 08		
	eL	24 - 01		
	M	24 - 05		
	F	24 - 46		
5125 Oct. 26	e_E	12 - 26		Time of onset of preliminary phases obscurred by micros.
	e	12 - 35		
	e	12 - 41		
	eL	12 - 53		
	M	13 - 05		
	F	14 - 40		
5126 Oct. 30	e_E	7 - 30.2		
	e_E	7 - 36.2		
	eL	7 - 55		
	L	8 - 04		
	F	8 - 52		

W. W. Doxsee

SEISMOLOGICAL BULLETINS RECEIVED

October, 1933.

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

STATIONS	BULLETINS	RECEIVED
Berkeley	October 1, 1931 to March 31, 1932	October 2
Manila	July, 1933	" 2
Firenze	January to March, 1933	" 2
Rome	Years 1929 and 1931	" 2
Oxford	July to September, 1929	" 5
Wellington	July to December, 1931	" 7
Zi-Ka-Wei	July 3 - 19, 1933	" 7
Chiufeng	August, 1933	" 7
Riverview	Provisional for August, 1933	" 10
Rome	September 3 - 16, 1933	" 10
Wellington	Preliminary for August, 1933	" 10
Karlsruhe	October to December, 1927	" 11
Bureau Central, Paris, Strasbourg	August, 1933	" 12
Cape Town	August, 1933	" 13
Zurich	September, 1933	" 13
San Fernando	June to August, 1933	" 14
Osaka	May to August, 1933	" 14
Peichiko	April to June, 1933	" 16
Pasadena	August, 1933	" 17
Georgetown	August and September, 1933, and Seismological Despatches	" 18
Fordham	June to September, 1933	" 20
Toledo, Cartuja, Alicante, Almeria, Malaga	July and August, 1932	" 20
Toronto	August and September, 1933	" 23
Rome	September 17 - 30, 1933	" 24
Sydney	August, 1933	" 26
Richmond	September, 1933	" 26
Cape Town	September, 1933	" 31

DOMINION OBSERVATORY,
OTTAWA, CANADA.

R. Meldrum Stewart,
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CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood Anderson: Seven Falls-Wood Anderson: Seven Falls-Milne Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

October, 1933.

No.	Date	Ottawa	Shawinigan	Seven Falls		**
				W. A.	M. S.	
5101	1	2-50+0-36r	2-50+0-10P	2-50+0-03P	2-57+0-24r	..
5102	2	4-40+0-10L	.....	.....	.....	..
5103	2	9-25+0-40r	9-29+0-08L	9-30+0-07L	9-30+0-30L	..
5104	2	14-30+1-05u	.....	.....	14-59+0-39L	..
5105	2	15-38+3-38U	15-38+1-17U	15-38+1-17U	15-38+4-07U	A
5106	3	10-30+1-13u	10-30+0-03P	10-30+0-02P	10-30+1-25u	B
5107	3	14-48+0-12L	.....	.....	14-31+0-40r	C
	3	.....	.....	.....	19-20+0-22L	..
	3	.....	.....	.....	22-11+0-07L	..
5108	5	6-09+0-05L	.....	.....	.....	..
5109	5	6-41+0-08L	.....	.....	6-39+0-16L	..
5110	5	13-53+1-20u	.....	.....	13-53+1-23u	..
5111	11	15-38+0-13L	.....	.....	15-43+0-11L	..
5112	12	7-32+0-05r	.....	.....	7-33+0-18r	..
5113	14	22-28+1-42U	.....	22-28+0-30U	22-28+2-11U	E
5114	16	3-15+0-33L	.....	.....	3-17+0-27L	..
5115	17	13-46+0-35u	.....	.....	13-47+0-41u	..
5116	17	14-53+0-10L	.....	.....	14-58+0-05L	..
5117	17	16-02+0-14L	.....	.....	16-05+0-14L	..
5118	18	21-26+0-02L	.....	.....	.....	..
5119	19	18-52+0-22T	.....	.....	.....	..
5120	21	3-31+0-37L	.....	.....	3-31+0-22L	..
5121	22	12-27+0-42L	.....	.....	12-28+0-22L	..
5122	23	5-00+0-24L	.....	.....	5-01+0-27L	..
5123	23	14-40+0-29L	.....	.....	14-34+0-30L	..
5124	25	23-39+1-07U	23-39+0-11P	23-39+0-12P	23-48+1-54U	F
5125	26	12-26+2-14U	.....	.....	12-33+1-00U	..
	30	.....	.....	0-55+0-.3d	.....	G
5126	30	7-30+1-22u	.....	.....	8-03+0-35L	..

CORRELATION OF EARTHQUAKES

October, 1933.

N O T E S

		Δ (km.)	Q
A :	Ottawa	5180	15 - 29.3
	Shawinigan Falls	5320	15 - 29.4
	Seven Falls	5480	15 - 29.3
B :	Ottawa	5100	10 - 21.3
	Seven Falls	5380	10 - 21.4
C :	Seven Falls	4780	14 - 23.1
E :	Ottawa	5880	22 - 19.1
	Seven Falls	5850	22 - 19.4
F :	Ottawa	7380	23 - 28.2
	Shawinigan Falls	7500	23 - 28.2
	Seven Falls	7500	23 - 28.2

G : Mr. A. Boily reported that this tremor was felt in Baie St. Paul, Quebec.

Dominion Observatory,

Ottawa, Canada,

November 21, 1933.

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*

ERNEST A. HODGSON, *Seismologist*

W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45°\ 23'\ 38''$ N. $\lambda = 75°\ 42'\ 57''$ W. h. = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

AUXILIARY STATIONS

SASKATOON

$\varphi = 52°\ 08'$ N. $\lambda = 106°\ 30'$ W. h. = 515m.

Foundation: clay and sand.
Time correction: from manually recorded radio time signals.

HALIFAX

$\varphi = 44°\ 38'$ N. $\lambda = 63°\ 36'$ W. h. = 46m.

Foundation: carbonaceous slate.
Time correction: from hourly recorded railroad time service.

SHAWINIGAN FALLS

$\varphi = 46°\ 33'{\cdot}1$ N. $\lambda = 72°\ 45'{\cdot}8$ W. h. = 60m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from automatically recorded radio time signals.

SEVEN FALLS

$\varphi = 47°\ 07'{\cdot}4$ N. $\lambda = 70°\ 49'{\cdot}6$ W. h. = 232m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from manually recorded radio time signals.

INSTRUMENTS—FIXED CONSTANTS

STATION	INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Ottawa	Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Ottawa	Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Ottawa	Milne-Shaw	17	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Milne-Shaw	23	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kg.
Halifax	Mainka	HN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Halifax	Mainka	HE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Shawinigan Falls	Wood-Anderson	SA	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Wood-Anderson	SF	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Milne-Shaw	SM	Photographic	Magnetic	6 mm. per min.	1 lb.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	DISPLACEMENT FOR 1″ ARC TILT
I	5.6		120	2:1	NS	
II	8.0		120	15:1	EW	
17	12.0		250	20:1	EW	44 mm.
23	12.0		250	20:1	NS	43 mm.
W	6.1		160	7:1	Vert.	
HN	9.8		110	Aperiodic	NS	
HE	7.1		147	"	EW	
SN	9.0		61	"	NS	
SE	9.0		44?	"	EW	
SA	1.0		2200		NS	
SF	1.0		1750		EW	
SM	12.0		250		EW	44 mm.

DOM. OBS. No. 67

Req. 6041—5,000—5-33

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From November 1, 1933 to November 21, 1933 No. 20.

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5129 Nov. 2	e	12 - 45.5		
	eL	12 - 54		
	F	14 - 06		
5131 Nov. 4	i	8 - 54 - 12		
	e	8 - 56 - 40		
	eL	9 - 02		
	F	9 - 29		
5134 Nov. 14	O	14 - 04.7	8800	
	iP_N	14 - 16 - 42		
	i_N	14 - 17 - 42		
	iS	14 - 26 - 42		
	PS_E	14 - 27 - 35		
	SR_{1N}	14 - 32.2		
	eL	14 - 40		
	F	15 - 00		
5138 Nov. 19	e_E	3 - 37.3		
	e_E	3 - 41 - 40		
	e	3 - 48 - 08		L waves sinusoidal and more pronounced in amplitude on EW component.
	eL	4 - 05		
	F	5 - 45		
5139 Nov. 20	O	23 - 21.7	3030	USC and GS gives ϕ = 73° N. λ = 69° W. O = 23-21.6
	iP	23 - 27 - 23		
	PR_{1N}	23 - 27 - 56		
	PR_{2N}	23 - 28 - 07		
	PR_{3N}	23 - 28 - 26		
	i_N	23 - 29 - 14		
	iS	23 - 32 - 04		Saskatoon O = 23-21.5 iP = 23-27-02 iS = 23-31-34 Δ = 2910 km.
	e_E	23 - 32 - 18		
	SR_{2N}	23 - 33 - 52		
	SR_{3N}	23 - 34 - 24		
	iL	23 - 35 - 00		
	F	3 - 38		
				Halifax O = 23-21.6 eP = 23-27-25 iS = 23-32-15 Δ = 3130 km.
5140 Nov. 21	e_N	23 - 58 - 33		
	e_N	0 - 01.6		
	eL	0 - 05		
	F	1 - 04		

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From November 21, 1933 to November 30, 1933 No. 27.

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5142 Nov. 22	e_N	5 - 00 - 52		
	e_N	5 - 05 - 18		
	eL_E	5 - 08		
	F	6 - 00		
5145 Nov. 22	e	8 - 56.6		
	eL	9 - 03		
	F	9 - 19		
5147 Nov. 22	e	13 - 03.0		
	e	13 - 08 - 12		
	i	13 - 09 - 48		
	e	13 - 10 - 52		
	e_E	13 - 12 - 48		
	e	13 - 19.4		
	e	13 - 22.5		
	eL	13 - 34		
	F	15 - 31		
5148 Nov. 23	0	18 - 57.8	4190	
	eP_N	19 - 05 - 02		
	PR_2	19 - 06 - 32		
	S_N	19 - 10 - 57		
	SR_{2E}	19 - 13 - 52		
	eL	19 - 16		
	F	20 - 19		
5151 Nov. 28	e_E	11 - 33		Preliminary phases masked by micros.
	e_E	11 - 41.6		
	eL	11 - 46		
	F	12 - 44		
5152 Nov. 29	e	5 - 16		Micros mask preliminary phases.
	eL	5 - 22		
	F	5 - 56		

W. W. Coxsee

CORRELATION TABLE

This tabulation not only provides a serially numbered list of all earthquakes recorded at the Ottawa station but also shows a correlation of the entire Ottawa series with those obtained in each of the three Quebec series (Shawinigan-Wood-Anderson: Seven Falls-Wood-Anderson: Seven Falls-Milne-Shaw). The entries for each of the four series show in hours and minutes the time of beginning of the tremors in Greenwich Mean Time. The appearance of entries for two or more series 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 Ottawa serial number of the earthquake 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.

EARTHQUAKE CORRELATION TABLE

November, 1933

No.	Date	Ottawa	Shawinigan	Seven Falls W. A.	Seven Falls M. S.	**
5127	1	2-43+0-16L	.....	.....	2-46+0-09L	..
5128	1	15-45+0-45L	.....	.....	15-47+0-39L	..
5129	2	12-46+1-20u	12-37+0-31u	.....	12-46+1-18u	..
5130	3	11-01+0-11L	.....	.....	.....	
5131	4	8-54+0-35r	8-49+0-04P	8-49+0-04P	8-54+0-35r	..
5132	4	12-13+0-16L	.....	.....	12-14+0-18L	..
5133	4	20-51+0-10L	.....	.....	20-53+0-14L	..
5134	14	14-17+0-43u	14-17+0-04P	.....	14-26+0-38LT	A
5135	14	16-03+0-.3d	.....	.....	.....	B
5136	17	4-26+0-08L	.....	.....	4-28+0-07L	..
5137	18	4-59+0-28L	.....	.....	5-07+0-24L	..
5138	19	3-37+2-08u	.....	.....	3-37+2-27u	..
5139	20	23-27+4-11R	23-27+1-49R	23-27+1-48R	23-27+4-15R	C
	21	.....	.....	2-03+0-05P	.....	..
	21	.....	.....	2-43+0-03P	.....	..
5140	21	23-58+1-06u	23-56+0-05P	23-56+0-19u	0-03+1-14u	..
5141	22	1-55+0-06L	1-52+0-03P	1-49+0-07P	1-55+0-04L	..
5142	22	5-01+0-59u	5-00+0-03P	5-00+0-03P	5-06+0-41u	..
5143	22	7-13+0-10L	.....	.....	7-18+0-09L	..
5144	22	8-24+0-19L	.....	.....	8-24+0-18L	..
5145	22	8-57+0-22u	.....	.....	9-01+0-12L	..
5146	22	10-34+0-06L	.....	.....	10-34+0-09L	..
5147	22	13-03+2-28U	13-02+0-01P	13-01+0-02P	13-08+2-04U	..
5148	23	19-05+1-32r	19-05+0-21r	19-05+0-19r	19-07+1-16r	E
5149	25	17-40+0-07L	.....	.....	.....	..
5150	27	21-25+0-06L	.....	.....	21-24+0-07L	..
5151	28	11-33+1-11u	11-20+0-06P	.....	11-49+0-53u	..
5152	29	5-16+0-40r	5-11+0-02P	5-11+0-15r	5-15+0-35r	..
5153	29	19-49+0-14L	.....	.....	19-48+0-07L	..
5154	30	4-52+0-09L	.....	.....	4-53+0-07L	..

CORRELATION OF EARTHQUAKES

November, 1933

.....

N O T E S

==========

		Δ (km.)	0
A :	Ottawa	8800	14 - 04.6
B :	May not be seismic		
C :	Ottawa	3030	23 - 21.7
	Shawinigan Falls	2970	23 - 21.6
	Seven Falls	2970	23 - 21.6
E :	Ottawa	4190	18 - 57.8

General: Micros prevailed throughout the month with storm proportions November 5 to 7th and November 10 to 12th.

Dominion Observatory,

Ottawa, Canada,

December 19, 1933.

CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY
OTTAWA

R. MELDRUM STEWART, *Director*

ERNEST A. HODGSON, *Seismologist*

W. W. DOXSEE, *Assistant Seismologist*

$\varphi = 45°\ 23'\ 38''$ N. $\lambda = 75°\ 42'\ 57''$ W. h. = 83m.

Lithologic foundation: boulder clay over limestone (Ordovician). Time: Mean Greenwich, midnight to midnight.
Time correction: within .25s.

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$\varphi = 52°\ 08'$ N. $\lambda = 106°\ \cancel{30'}\ 38'$ W. h. = 515m.

Foundation: clay and sand.
Time correction: from manually recorded radio time signals.

HALIFAX

$\varphi = 44°\ 38'$ N. $\lambda = 63°\ 36'$ W. h. = 46m.

Foundation: carbonaceous slate.
Time correction: from hourly recorded railroad time service.

SHAWINIGAN FALLS

$\varphi = 46°\ 33'{\cdot}1$ N. $\lambda = 72°\ 45'{\cdot}8$ W. h. = 60m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from automatically recorded radio time signals.

SEVEN FALLS

$\varphi = 47°\ 07'{\cdot}4$ N. $\lambda = 70°\ 49'{\cdot}6$ W. h. = 232m. ca.

Foundation: solid granite of Canadian Shield.
Time correction: from manually recorded radio time signals.

INSTRUMENTS—FIXED CONSTANTS

STATION	INSTRUMENT	SYMBOL	REGISTRATION	DAMPING	PAPER SPEED	MASS
Ottawa	Bosch	I	Photographic	Air	15 mm. per min.	200 g.
Ottawa	Bosch	II	Photographic	Magnetic	15 mm. per min.	200 g.
Ottawa	Milne-Shaw	17	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Milne-Shaw	23	Photographic	Magnetic	15 mm. per min.	1 lb.
Ottawa	Spindler-Hoyer	W	Smoked Sheet	Air	15 mm. per min.	80 kg.
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Saskatoon	Mainka	SN	Smoked Sheet	Air	15 mm. per min.	139 kg.
Saskatoon	Mainka	SE	Smoked Sheet	Air	15 mm. per min.	139 kg.
Shawinigan Falls	Wood-Anderson	SA	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Wood-Anderson	SF	Photographic	Magnetic	60 mm. per min.	15 g.
Seven Falls	Milne-Shaw	SM	Photographic	Magnetic	6 mm. per min.	1 lb.

INSTRUMENTS—DETERMINED CONSTANTS

INSTRUMENT	T_o	r/T_o^2	V	ϵ	COMP.	DISPLACEMENT FOR 1″ ARC TILT
I	5.6		120	2:1	NS	
II	8.0		120	15:1	EW	
17	12.0		250	20:1	EW	44 mm.
23	12.0		250	20:1	NS	43 mm.
W	6.1		160	7:1	Vert.	
HN	9.8		110	Aperiodic	NS	
HE	7.1		147	"	EW	
SN	9.0		61	"	NS	
SE	9.0		44?	"	EW	
SA	1.0		2200		NS	
SF	1.0		1750		EW	
SM	12.0		250		EW	44 mm.

DOM. OBS. No. 67

Req. 6041—5,000—5-33

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From December 1, 1933 to December 14, 1933 No. 22

No. and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5157 Dec. 2	e_E	5 - 59		
	e_E	6 - 14		
	eL	6 - 23		
	F	7 - 15		
5158 Dec. 2	e_N?	20 - 31		
	e_E	20 - 37.2		
	eL	20 - 46		
	F	21 - 52		
5160 Dec. 4	0	19 - 33.9	8440	Saskatoon Record:-
	iP_N	19 - 45 - 38		iP = 19-44-05
	iS	19 - 55 - 20		iS = 19-52-15
	SR_2	20 - 05		0 = 19-34.1
	eL	20 - 11		Δ = 6670 km.
	F	20 - 33		
5163 Dec. 12	e_N	(14 - 15)		Time signal failed.
	e	(14 - 26)		
	e_E	(14 - 30.4)		
	e	(14 - 36)		
	e_E	(14 - 44)		
	eL	(14 - 49)		
	F	(16 - 27)		
5164 Dec. 13	0	21 - 23.6	4060	
	P	21 - 30 - 40		
	PR_2	21 - 31 - 54		
	i_N	21 - 33 - 34		
	eS	21 - 36 - 28		
	SR_{1E}	21 - 38 - 22		
	SR_2	21 - 39 - 05		
	iL	21 - 40 - 44		
	F	23 - 44		
5166 Dec. 14	0	7 - 16.4	4060	
	P_E	7 - 23 - 28		
	PR_1	7 - 24 - 40		
	S	7 - 29 - 15		
	SR_1	7 - 31.2		
	iL	7 - 35 - 26		
	F	8 - 45		

OTTAWA, CANADA

SEISMOLOGIC STATION, DOMINION OBSERVATORY

From December 14, 1933 to December 31, 1933 No. 23

No, and Date	Phase	Time	Distance	Remarks
		h m s	km.	
5167 Dec. 15	0	7 - 42.2	3150	
	eP	7 - 48 - 02		
	iS	7 - 52 - 52		
	SR_1E	7 - 54 - 00		
	eL	7 - 55.5		
	F	8 - 47		
5169 Dec. 19	e_N	5 - 55		
	e	5 - 59		
	eL	6 - 02		
	F	6 - 22		
5170 Dec. 19	0	17 - 48.8	3000	
	eP_N	17 - 54 - 24		
	PR_1	17 - 54 - 46		
	eS	17 - 59 - 02		
	eL	18 - 01.6		
	F	18 - 42		

W. W. Doxsee

SEISMOLOGICAL BULLETINS RECEIVED

December

1933

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

STATIONS	BULLETINS	RECEIVED	
Taihoku	August, 1933	December	1
La Plata	July to October, 1933	"	2
Manila	September, 1933	"	4
Athens	April and May, 1933	"	4
Zagreb	April, May and June, 1933	"	5
Zi-Ka-Wei	August 25 to September 25, 1933	"	6
San Fernando	September and October, 1933	"	6
Perth	August 4 to September 6, 1933	"	6
Riverview	Provisional for October, 1933	"	6
Cape Town	October, 1933	"	7
Strasbourg Paris Bureau Central	October, 1933	"	7
Rome	November 5 - 18, 1933	"	9
Chiufeng	September and October, 1933	"	11
Gottingen	April to September, 1933	"	15
Cartuja	January,February and March, 1933	"	15
Georgetown	November, 1933 and Seismological Despatches	"	15
Wellington	Preliminary for October, 1933	"	20
Sydney	October, 1933	"	22
Rome	November 19 to December 2, 1933	"	26
Richmond	November, 1933	"	26
Zurich	October 2 to November 23, 1933	"	27
Saint Louis	Preliminary October 2 to November 20, 1933	"	27
Toronto	October and November, 1933	"	27
Saint Louis	Preliminary November 21 - 23, 1933	"	28
Florrissant	June, 1933	"	28

DOMINION OBSERVATORY,
OTTAWA - CANADA.

R. Meldrum Stewart,
Director.

Ernest A. Hodgson,
Seismologist.

W. W. Doxsee,
Assistant Seismologist.