DEPARTMENT OF MINES AND TECHNICAL SURVEYS

DOMINION OBSERVATORIES BRANCH

SEISMOLOGICAL SERVICE OF CANADA

SEISMOLOGICAL BULLETIN

January and February

1951

000

DOMINION OBSERVATORY

OTTAWA - CANADA

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA

C. S. Beals, Dominion Astronomer
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S T A T I O N S

OTTAWA

φ = 45°23'38" N. λ = 75°42'57" W. h = 83m.

Time correction within 0.10s.

Foundation: boulder clay over limestone

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

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

HALIFAX

Dalhousie University

φ = 44°38' N. λ = 63°36' W. h = 46m.

Time correction from recorded radio time signals

Foundation: Carbonaceous slate

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

SEVEN FALLS

Quebec Power Company

φ = 47°07!4 N. λ = 70°49!6 W. h = 232m. ca.

Time correction from recorded radio time signals

Foundation: Solid granite of Canadian Shield

Instruments: Wood-Anderson and Milne-Shaw, both EW component, designated SF and SM, respectively, each with photographic registration, magnetic damping, SF a paper speed of 60 mm. per min. and mass 15g., SM a paper speed of 8 mm. per min. and mass 1 lb.

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

VICTORIA

Dominion Astrophysical Observatory

φ = 48°31'14" N. λ = 123°24'56" W. h = 197m.

Time correction from recorded radio time signals

Foundation: rock

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

Benioff Vertical, short-period, designated B 5705, photographic registration, paper speed of 60 mm. per min., mass 235 lbs., installed June, 1948.

SHAWINIGAN FALLS

Shawinigan Water and Power Company

φ = 46°33!1 N. λ = 72°45!8 W. h = 60m. ca.

Time correction from recorded radio time signals

Foundation: solid granite of Canadian Shield

Instrument: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15g.

SASKATOON

University of Saskatchewan

φ = 52°08' N. λ = 106°38' W. h = 515m.

Time correction from radio time signals

Foundation: clay and sand

Instrument: Milne-Shaw NE and NW components, designated 18 and 22, respectively, each with photographic registration, magnetic damping, paper speed of 8 mm. per min., mass 1 lb.

DETERMINED CONSTANTS

INSTRUMENT	Ts	Tg	V	ε	DISPLACEMENT FOR 1" ARC TILT
17 (Ottawa)	12.0		300	20:1	50 mm.
23 (Ottawa)	12.0		300	20:1	50 mm.
BS (Ottawa)	1.0	0.1			
BL (Ottawa)	1.0	48			
HN (Halifax)	5.0		125	20:1	
HE (Halifax)	5.0		125	20:1	
SA (Shawinigan)	1.0		2200		
B 5705 (Victoria)	1.0	0.1			
20 (Victoria)	12.0		300	20:1	50 mm.
21 (Victoria)	12.0		300	20:1	50 mm.
SF (Seven Falls)	1.0		2200		
SM (Seven Falls)	12.0		300	20:1	50 mm.
18 (Saskatoon)	10.0		150	20:1	18 mm.
22 (Saskatoon)	10.0		150	20:1	18 mm.

NOTE:- Universal Time used throughout

SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

STATIONS:

O - Ottawa
H - Halifax
SF - Seven Falls
SH - Shawinigan Falls
R - Rolphton
L - La Cave

January, 1951 No. 1

DATE	STN.	PHASE	h m s	REMARKS
[illegible]	O	eP_Z	03 20 37	Mongolia
		i_Z	03 20 40	
1	O	e_Z	20 35 11	New Hebrides
	SF	e	20 53 57	USCGS: φ = 18° S.
		L	21 17	λ = 169°E.
				20:16:20
2	O	e_Z	23 21 15	Off coast of Peru
3	O	eP_Z	12 28 40	USCGS: φ = 18°N.
		eS	12 34 30	λ = 106°W.
		e	12 41 27	H = 12:21:31
	H	L	12 46	Off coast of Colima,
	SF	P	12 29 12	Δ = 41°.5. Mexico
		PP	12 31 01	
		S	12 35 32	
		L	12 43 24	
	SH	e	12 29 06	
		L	12 42 12	
3	O	eP_Z	13 11 34 d	
		eS	13 17 24	
		e	13 24 21	
	SF	e	13 12 06	
	SH	e	13 14 38	
		L	13 25.3	
3	O	eP_Z	17 39 43	
5	O	eP	00 59 55 d	Δ = 38°
		ePP	01 01 28	USCGS: φ = 7° N.
		eS	01 05 49	λ = 81° W.
	H	PP	01 01 49	H = 00 52 40
		S	01 06 19	Panama Coast
	SF	P	01 00 20	Δ = 40°
		S	01 06 28	
		SS	01 09 23	
5	O	e_Z	16 29 35	
6	O	iP_Z	05 30 11	USCGS: φ = 36° N.
		iPP_Z	05 31 05	λ = 70°.5 E.
		eS	05 41.0	H = 05:17:19
		i	05 43 40	Afghanistan
	H	e	05 42 05	Δ = 85°
	SF	P	05 29 56	
		PS	05 41 17	
		PPS	05 41 45	
		SS	05 45 53	
		G	05 51 32	
		L	06 01 45	
	SH	eP	05 30 04	
		eS	05 41 50	

January, 1951

DATE	STN.	PHASE	h m s	REMARKS
6	O	eP	07 58 46	Δ = 38°
		iS	08 04 40	USCGS: φ = 7°5 N.
	H	e	08 00.9	λ = 81° W.
		S	08 05.2	Southern Panama
				07:51:31
	SF	P	07 59 08	Δ = 40°5
		S	08 05 18	
		SS	08 08 15	
		SSS	08 08 53	
		L	08 10 40	
	SH	P	07 59 02	Δ = 40°
		PP	08 00 35	
		PPP	08 01 10	
		S	08 05 14	
		SS	08 08.7	
		L	08 13.7	
6	O	eP	19 49 36	Δ = 180 km.
		iP	19 49 37	
		eS	19 49 56	
		eL	19 50 03	
7	O	eP	18 42 31	
8	O	e	18 45 36	USCGS: φ = 35° N.
				λ = 140° E.
				Japan
8	O	eP	21 58 26 d	New Britain
9	O	eZ	16 09 47	Arctic Ocean
10	SF	L	09 28	
10	SF	L	11 15	
10	O	eZ	19 34 32	Aleutian Islands
		eL	19 35	
	SF	L	19 35.4	
	SF	L	20 27	
13	O	ePnZ	19 52 01.5	Δ = 159 km.
		eSnZ	19 52 19	
		eS2Z	19 52 20.5	
		eLZ	19 52 25.5	
13	O	eZ	20 38 34.5	Cape Mendecino, Cal.
		e	20 51.0	
14	O	e	11 16.2	
		e	11 20.0	
	SF	L	11 19	
15	O	eP'Z	04 30 50 d	Δ = 120°
		pP'	04 31 20	USCGS: φ = 15° S.
		i	03 34 19	λ = 167° E.
		SKS	04 37 36	New Hebrides
		SKKS	04 38 32	H = 04:12:14
		PS	04 41 45	
		SS	04 49.0	
	H	L	05 12	
	SF	P'	04 31 04	Δ = 124°
		PPP	04 35 29	
		SKS	04 37 49	
		PS	04 42 37	
		SS	04 49 37	

DATE	STN.	PHASE	h m s	REMARKS
15	SF	e	17 33 43	
		e	17 36 24	
	SH	eL	17 36 50	
18	O	ePn_Z	16 57 12	Δ = 195 km.
		eP_1	16 57 13	
		eS_n	16 57 33	
		eL	16 57 37	
18	O	eP_Z	21 26 08 c	Δ = 63°
		i_Z	21 26 11	USCGS: φ = 52° N.
		ePP	21 26 47	λ = 177° W.
		eS	21 34 27	Aleutian Islands
		eSSS	21 41.5	21:15:50
		e	21 47.3	
	SF	P	21 26 19	Δ = 63°5
		S	21 34 47	
		SSS	21 41 46	
		L	21 47	
19	O	eP_Z	01 47 29 c	Off coast of El Salvador
		e	01 58.0	
19	O	e_Z	04 27 50	Solomon Islands
19	O	eP_n	16 23 49	Δ = 170 km.
		eP_2	16 23 50	
		eS_n	16 24 08	
		eS_2	16 24 10	
		e	16 24 14	
19	O	eP_Z	20 19 21	
20	O	eP_Z	13 18 52	Guatemala
		e	13 20.0	
		e	13 28.3	
21	O	eP_Z	12 51 11	
		e	13 02.2	
22	O	e	11 34.3	
	SF	e	11 34 41	
22	O	i_Z	12 35 00	Mozambigue Channel
		e	13 11.0	
	SF	e	13 11.5	
22	O	e_Z	13 12 23	
23	O	eP_Z	07 08 32 d	USCGS: φ = 55° S.
		e	07 08 47	λ = 136° W.
		e	07 22.0	H = 06 52 42
		e	07 27.7	South Pacific Ocean
		eL	07 48.0	
	SF	e	07 22.5	
		e	07 23.6	
		L	07 41.5	
24	SF	e	05 25.0	
		L	05 38	

January, 1951 No. 4

DATE	STN.	PHASE	h m s	REMARKS
24	O	eP_Z	07 23 44	$\Delta = 34°.5$
		eS	07 29 12	USCGS: 33° N., 116° W.
		e	07 31.9	H = 07:17:01
		e	07 33 18	Imperial Valley, Cal.
		e	07 34 11	
		i	07 34 50	
	H	e	07 38 14	
	SF	P	07 24 15	$\Delta = 38°.5$
		PP	07 25 49	
		PPP	07 26 11	
		S	07 30 10	
		L	07 36 06	
	SH	e	07 24 15	
		L	07 35.2	
24	O	eP_nZ	18 27 05	$\Delta = 155$ km.
		e	18 27 07	
		eS_n	18 27 22	
		eS_2	18 27 24	
		eL	18 27 31	
25	O	e	17 47	
	SF	e	17 43	
26	O	eZ	16 28 04	
		eZ	16 28 05	
		eZ	16 28 20	
		eZ	16 28 29	
27	O	iP_Z	00 47 11	Argentina
29	O	eZ	05 51 00	USCGS: H = 05:43:47
		eL	06 02.2	Off Cape Mendocino, Cal.
	SF	e	05 51 23	
29	O	eP_Z	10 37 27 c	USCGS: $\varphi = 15°.5$ N.
		eZ	10 34 50	$\lambda = 92$ W.
		iZ	10 34 52	H = 10:27:59
		iZ	10 35 01	
	SH	eP	10 35 07	
30	O	eZ	11 23 41	Foreshock of next quake
		e	11 29 19	
30	O	eP	19 07 28 c	$\Delta = 36°$
		S	19 13 08	USCGS: $\varphi = 15°.5$ N.
		eL	19 22.3	$\lambda = 99°$ W.
				H = 19:00:30
	SF	PP	19 09 32	$\Delta = 40°$
		S	19 14 06	
		SS	19 16 55	
		ScS	19 18 03	
		L	19 22.9	
30	O	iZ	23 19 34	$\Delta = 58°$
		e	23 29 35	USCGS: H = 23:07:40
	SF	e	23 28 55	Near Cyprus
		L	23 40	

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SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

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February, 1951 No. 5

DATE	STN.	PHASE	h m s	REMARKS
2	O	e	20 25.5	
		eL	20 36 00	
2	O	ePZ	21 16 11	
3	O	ePZ	00 10 48.5	
		eZ	00 11 12	
4	SF	P	14 25 47	Local
		S	14 25 52	
6	SF	e	06 32.4	Δ = 215 km.
6	O	ePZ	18 46 50.5	
		eSZ	18 47 21.5	
6	O	ePnZ	19 13 25.5	Δ = 180 km.
		eP2Z	19 13 27.3	
		LZ	19 13 50.0	
7	O	ePZ	03 52 08	Bonin Islands
8	SF	eL	11 40	
10	O	ePZ	03 47 03 d	
		e	03 53 33	
		e	04 06.5	
		eL	04 25.0	
	SF	i	03 50 47	
		e	04 07 49	
		L	04 33.2	
10	O	ePZ	08 50 32.5	Japan
10	O	iPZ	10 56 43	Near Guam
10	O	ePZ	15 35 17	
10	O	eZ	22 11 16	Off coast of New Guinea
		e	22 20 16	
		eL	22 44.1	
	SF	e	22 25 10	
		L	22 49.1	
12	O	eZ	03 42 07	Near Rat Islands
		eL	04 02.4	
	SF	L	03 56.0	

DATE	STN.	PHASE	h m s	REMARKS
12	O	P_Z	17 32 52.5 d	USCGS: φ = 66° N.
		i	17 32 53.5 d	λ = 136° E.
		S'	17 41 42	H = 17:22:02
		e	17 57 58	Siberia
	SF	P	17 32 48	Δ = 69°
		S	17 41 42	
		SS	17 45 57	
		SSS	17 48 42	
		G	17 51.0	
	SH	e	17 32 49	
		e	17 41 37	
		L	18 01.0	
13	O	eL	02 00.4	
	SF	e	01 25 42	
		L	01 53	
13	O	e	06 33 07	Lower California
		e	06 34.3	
	SF	L	06 35	
13	O	eZ	08 56 56	Off coast of Guatemala
		e	09 02 17	
13	O	eP	12 13 47	USCGS: φ = 15° S.
		e	12 14 13	λ = 175° W.
		e	12 20 00	H = 11:55:50
		e	12 23 08	Samoa Islands
		ScS	12 23 52	
		e	12 29.2	
	SF	PP	12 14 13	Δ = 112°5
		SKS	12 20 12	
		SKKS	12 21 08	
		PS	12 23 43	
		PPS	12 24 53	
		SS	12 29 53	
13	SF	e	16 41 02	Off coast of Guatemala
		L	16 43.9	
13	O	eP	22 21 46	USCGS: φ = 56° N.
		eS	22 28 42	λ = 155 1/2° W.
		iScS	22 31 37	H = 22:12:58
		eSS	22 32 13	
		iSSS	22 32 42	
		e	22 34.0	
		i	22 39.0	
	H	P	22 22 41	Δ = 57°
		S	22 30 25	
		ScS	22 32 27	
		SS	22 34 13	
		L	22 39.9	
	SF	P	22 21 56	Δ = 50°5
		PP	22 23 59	
		S	22 29 11	
		ScS	22 31 46	
		SS	22 33 03	
		L	22 37.0	
	SH	P	22 21 51	Δ = 50°
		PP	22 23 46	
		e	22 26 20	
		S	22 28 49	
		e	22 29 03	
		ScS	22 31 42	
		L	22 36 50	

DATE	STN.	PHASE	h m s	REMARKS
15	SF	L	05 39.8	Off coast of Colima, Mexico
15	O	eP_{nZ}	21 07 22.3	Δ = 225 km.
		eP_{2Z}	21 07 24	
		eS_{2Z}	21 07 51.1	
17	O	e	21 25 44.5	Δ = 126°7
		iP	21 25 53	USCGS: φ 7° S.
		iPP	21 27 54	λ = 146° E.
		e	21 28 54	H = 21:06:58
		P	21 29 10	New Guinea
		e	21 30 43	
		iSKS	21 32 42	
		iSKKS	21 34 34	
		e	21 39 36	
		iSS	21 44 56	
	H	P'	21 26 09	Δ = 134°
		PP	21 28 41	
		PKS	21 29 39	
		SKKS	21 35 41	
		PS	21 38 43	
		SS	21 46	
	SF	P'	21 25 56	Δ = 127°
		PP	21 28 04	
		PKS	21 29 19	
		e	21 30 14	
		SKS	21 32 46	
		SKKS	21 34 44	
		PS	21 38 11	
		SS	21 45 11	
		e	21 47 38	
		G	21 59.6	
	SH	P'	21 25 55	Δ = 126°
		PP	21 27 42	
		e	21 29 15	
		PPP	21 30 44	
		SKS	21 32 44	
		SKKS	21 34 39	
18	O	PZ	15 27 14.5	Local
		PZ	15 27 28.0	
		iZ	15 27 31.0	
19	O	ePZ	21 10 46.5	
19	O	ePZ	22 24 01	USCGS: φ = 25° S.
		e	22 34 00	λ = 117° W.
		e	22 39 08	H = 22:11:54
		e	22 45.3	
	SF	i	22 34 40	
20	O	ePZ	00 23 17	
		eZ	00 23 30	
20	O	ePZ	15 53 43	USCGS: φ = 22° S.
		e	16 01 16	λ = 114° W.
		e	16 02 35	
		e	16 04.6	
	SF	L	16 04	
21	O	eZ	07 38 17	Kermadec Islands
		eZ	07 38 41	
		e	08 19.0	
		e	08 22.0	

February, 1951 No. 8

DATE	STN.	PHASE	h	m	s	REMARKS
21	O	eP_Z	15	49	41	
21	SH	L	17	22	26	Wyoming
21	O	eP_Z	20	46	21	
22	O	eP_Z	02	04	48.5	New Guinea
		e	02	24		
	SF	L	02	21		
22	O	P_Z	18	07	45.3	
22	O	eP_Z	21	30	16.5	
23	O	e	03	16	1	Off coast of Oregon
		e	03	18	3	
	SF	e	03	20	30	
		e	03	23	00	
23	O	e_Z	09	30	55	
24	O	eP_Z	06	14	17	
24	O	eP_Z	21	11	37	
25	O	eZ	00	03	22	
25	O	eP_Z	07	36	11.5	
		e_Z	07	36	18.5	
26	O	e_Z	16	40	33	
26	O	eP_Z	19	22	52	
27	O	e	18	58	6	
28	O	e_Z	15	14	51.4	

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OTTAWA - CANADA

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DOMINION OBSERVATORY, OTTAWA

STATIONS:

O - Ottawa
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March, 1951 No. 9

DATE	STN.	PHASE	h	m	s	REMARKS
2	O	P_Z	00	41	17.5	
	SH	e	00	41	36	
2	O	e_Z	01	38	23	USCGS: φ = 53° N., λ = 35° W.
		e	01	46	13	H = 01 32 39
	SF	P	01	37	49	North Atlantic
		S	01	42	12	
		L	01	44	.8	
	SH	e	01	38	08	
3	O	eP_Z	20	15	27	
4	O	eP	11	27	32	USCGS: φ = 16° S.
		eS	11	35	49	λ = 74° W.
		e	11	36	18	H = 11:17:33
		e	11	39	14	
		e	11	41	.0	
	SF	e	11	27	40	
		e	11	36	00	
		L	11	47		
	SH	e	11	27	46	
		e	11	31	23	
4	O	e_Z	18	02	20	
		e_Z	18	02	22.5	
		e_Z	18	02	34.5	
5	O	e_Z	00	57	10.5	Off coast of Guatemala
		e	01	09	36	
5	O	e_Z	11	24	55	Mid Atlantic
5	O	eP_Z	14	55	26	Alaska
5	O	eP_Z	20	25	29.5	Δ = 106°5
		epP	20	29	48	USCGS: φ = 29° N., λ = 128° E.
		e	20	35	53	H = 20:11:45
		e	20	37	03	Ryukyu Is.
		e	20	38	56	
		e	20	39	51	
		e	20	52	.0	
	SF	eS	20	36	54	
		L	20	53	.4	
6	O	eP_Z	08	57	04	
		e_Z	08	57	35.5	
7	SF	S	16	36	16	
	SH	e	16	36	59	
7	O	eP_Z	20	10	09	
8	O	e_Z	12	47	22	

DATE	STN.	PHASE	h m s	REMARKS
8	0	iP_Z	15 31 01.5	Solomon Is.
		L	16 14.0	
8	0	eP_Z	16 28 36	
8	0	e_Z	18 08 24	
9	0	e_Z	01 06 27	
9	0	e_Z	14 07 23.5	
9	0	P_Z	20 03 44	USCGS: H = 19:44:16
		L	20 25.1	Flores Sea
	SF	e	20 03 59	
		L	20 24.2	
	SH	e	20 04 07	
10	0	P'_Z	22 16 07 d	$\Delta = 116°$
		PP	22 17 24	USCGS: H = 21:57:37
		PPP_Z	22 19 32	New Hebrides
		SKKS	22 24 04	
		e	22 25 20	
		PS	22 26 06	
		e	22 29 56	
		SS	22 33 30	
	H	PP	22 19 44	
		SKS	22 24 12	
		SKKS	22 26 17	
	SF	P'	22 16 18	$\Delta = 120°$
		PP	22 17 50	
		SKS	22 22 50	
		SKKS	22 24 10	
		e	22 25 37	
		PS	22 27 28	
		PPS	22 28 25	
		SS	22 35 22	
		SSS	22 38 50	
		L	22 42.9	
	SH	e	22 16 15	
13	0	e_Z	00 30 33	Peru
	SH	e	00 30 40	
14	0	P_Z	12 33 49	
16	0	e_Z	19 45 17	Aleutians
	SH	e	19 45 22	
17	0	L	05 15	
	SF	e	05 12.6	
17	SF	e	16 10 17	
		L	16 13 07	
	SH	e	16 10 14	
19	SF	e	03 13 32	North Atlantic
		L	03 21	
19	0	P_Z	20 39 56	USCGS: φ = 57° N., 160° E.
		L	21 05	H = 20:28:55
	SF	e	20 49 07	
		L	21 03	
	SH	eP	20 39 56	

March, 1951 No. 11

DATE	STN.	PHASE	h	m	s	REMARKS
23	O	eZ	21	57	14	USCGS: φ = 31° S., λ = 180° W.
		e	21	58	34	H = 21:38:54
		i	22	05	19	Kermadec Is.
		i	22	06	.5	
		e	22	08	32	
		e	22	09	44	
	SF	P'	21	57	21	Δ = 125°
		PP	21	59	11	
		e	22	00	38	
		PPP	22	01	53	
		SKS	22	04	04	
		SKKS	22	05	45	
		e	22	07	30	
		PS	22	09	11	
		PPS	22	10	21	
		e	22	12	08	
		SS	22	16	.2	
		L	22	29		
24	O	eZ	00	36	09	Santa Cruz Islands
24	O	PnZ	15	48	47.0 d	Δ = 215 km.
		SnZ	15	49	11.2	
24	O	PZ	20	59	17	USCGS: φ = 13° N., λ = 88° W.
		e	21	04	43	H = 20:52:36
		L	21	10		Off coast of El Salvador
	H	L	21	12		
	SF	e	20	59	42	
		L	21	10	.1	
	SH	e	20	59	32	
27	O	e	12	19	.8	
	H	L	12	24	.1	
	SF	e	12	21	44	
		i	12	24	29	
	SH	e	12	20	25	
28	O	eZ	02	13	36	USCGS: φ = 35° S., 178° E.
		eZ	02	15	05	H = 01:54:44
	SF	e	02	16	33	
		e	02	17	08	
		L	02	33	.5	
28	O	eZ	10	06	02	
		e	10	31	26	
		L	10	55		
	SF	e	10	33	56	
		L	10	46		
29	O	e	06	07	42	Southern Chile
29	O	e	06	23	19	
31	O	e	09	28	39	USCGS: H = 09:20:34
	SF	L	09	35		Southern Alaska
	SH	e	09	28	44	

W. G. Milne
Assistant Seismologist

SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

STATIONS:

O - Ottawa
H - Halifax
SF - Seven Falls
SH - Shawinigan Falls
R - Rolphton
L - La Cave

April, 1951 No. 12

DATE	STN.	PHASE	h m s	REMARKS
1	O	e	19 40	Off Cape Mendocino, Cal.
	SF	e	19 42	
1	O	eZ	20 58 11	Southern Chile
2	O	P	00 20 23	USCGS: φ = 13° N., 90° W.
		S	00 25 44	H = 00:13:34
		L	00 28.8	Off coast of El Salvador
	H	PP	00 22 47	
		S	00 27 13	
		SS	00 30 07	
		L	00 33.3	
	SF	P	00 20 54	Δ = 37°
		PP	00 22 24	
		S	00 26 39	
		SS	00 29 24	
		ScS	00 31 09	
		L	00 33.7	
	SH	P	00 20 39	
		L	00 36 12	
2	O	eZ	18 07 26	
2	O	PZ	22 28 32	USCGS: H = 22:09:29
		L	23 08	New Britain
6	SF	e	20 32.4	North Atlantic
		L	20 44.3	
6	O	PZ	23 05 56 c	
8	O	eZ	21 50 05	USCGS: H = 21:38:20
	SF	P	21 49 44	Near coast of Turkey
		L	22 14.2	
	SH	P	21 49 52	
10	O	e	11 44	Samoa Is.
	SF	SKS	11 20 48	
		PS	11 24 09	
		SS	11 30 19	
		L	11 46.2	
13	O	PZ	10 34 22	USCGS: φ = 10° S., 119° E.
		S	10 47 33	
		L	11 33	
14	O	iP	00 56 12	Δ = 70°
		pP	00 56 57	USCGS: H = 00:45:28
		iS	01 05 05	Northern Argentina
		L	01 13	
	H	P	00 56 52	
		S	01 04 47	
		e	01 05 45	
	SH	P	00 56 19	Δ = 68°5
		iP	00 57 06	
		S	01 05 15	

DATE	STN.	PHASE	h m s	REMARKS
14	O	P_Z	04 23 11	Southeastern Turkistan
		e_N	04 33 26	
		L_N	04 55,5	
14	O	P_Z	13 44 15	$\Delta = 74°$
		S	13 53 25	USCGS: $\varphi = 61°$ N., 136° E.
		SS	13 57 40	H = 13:32:59
		L	14 06.8	Eastern Siberia
	H	eS	13 54 03	
		eSSS	14 02	
		L	14 06	
15	O	P	00 05 42	
		L	00 35	
	SF	e	00 05 37	
		L	00 34.8	
16	SF	e	10 55 00	
18	O	iP_{nZ}	17 01 22.7	$\Delta = 135$
		i_Z	17 01 24.2	
		eS_{nZ}	17 01 39.0	
		i_Z	17 01 42	
22	O	eP_Z	12 42 32	$\Delta = 31°$
		eS_Z	12 47 38	USCGS: H = 12:36:16
		L	12 52.5	Baffin Bay
	SF	P	12 42 47	$\Delta = 33°$
		SSS	12 50 54	
	SH	eP	12 42 10	
		e	12 52 11	
		e	12 52 37	
22	O	eP	12 51 48	
23	O	eP_Z	01 03 32	USCGS: H = 00:52:21
	SF	P	01 03 53	Hawaii
		S	01 13 15	$\Delta = 72°5$
		L	01 28 21	
23	O	iP_Z	07 09 14	
	SF	P'	07 09 30	Off coast of New Zealand
		i	07 12 38	
		e	07 13 26	
23	SF	eP	12 20 17	Banda Sea
		eP_N	12 20 35	
23	O	eP_Z	13 27 21	$\Delta = 65°$
		eS	13 35 48	USCGS: H = 13:17:00
				Southern Bolivia
29	O	iP_Z	07 45 12	$\Delta = 55°5$
		S	07 52 51	USCGS: $\varphi = 80°5$ N., 121° E.
	SF	e	07 56 28	H = 07:35:46
29	O	iP_Z	19 57 13	
30	O	iP_Z	15 47.5	USCGS: H = 15:28:00
		SKS	15 54 09	Solomon Islands
		e	15 58 27	
		e	16 05 30	
		SS	16 08 30	
	SF	PP	15 49 02	$\Delta = 126°$
		SKS	15 54 16	
		SKKS	15 55 56	
		PPS	16 00 48	
		SS	16 05 54	
		SSS	16 10 48	

W. G. Milne
Assistant Seismologist

SEISMOLOGICAL BULLETINS RECEIVED

January, 1951

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

STATION	BULLETINS
Madagascar	1950
Japan	1947
Santa Clara	November, December, 1950
Tacubaya	October, 1950
Richmond	November, 1950
Algiers	July, August, 1950
Tamanrasset	July, August, 1950
Columbia	December 21, 1950 - January 3, 1951
Rome	September, 1950
Kalocsa	November, 1950
Budapest	November, 1950
De Bilt	November, 1950
Rome	October, 1950
Weston	December, 1950
Strasbourg	December, 1950
Bureau Central	September, 1950
Bureau Central U.G.G.I.	August, 1950
Japan	September, 1950
Prague	November, 1950
Ksara	1946-1947
Columbia	January 5-15, 1951
Beograd	November, 1950
Japan	1948
Helwan	July, August, 1950
Tortosa	November, 1950
Toledo	September - November, 1950
USCGS	October-December, 1945
Tacubaya	November, 1950
Saint Louis and Auxiliary Stations	February, March, September, October

February, 1951

Wellington	August, 1950
Malaga	March, April, 1951
Cleveland	August, September, 1950
Trieste	May - August, 1950
De Bilt	December, 1950
Columbia	January 18-31, 1951
Richmond	December, 1950
Wellington	August, 1950
Cleveland	October, November, 1950
Stara Dala	May, November, 1950
Hautes Tatra	November, 1950
Cheb	May, September, November, 1950
Beograd	1940, 1942-1946
Ksara	October - December, 1950
Kalocsa	December, 1950
Budapest	December, 1950
Pasadena	July - September, 1950
Japan	October, 1950
Athens	September - November, 1950
Edinburgh	1942, 1949

SEISMOLOGICAL BULLETINS RECEIVED
February, 1951
(cont'd)

STATION	BULLETINS
Prague	December, 1950
Eger	December, 1950
Stara Dala	September, December, 1950
Pittsburg	January - December, 1950
Columbia	February 8 - 20, 1951
Perth	July-September, 1950
Brisbane	October, November, 1950
Beograd	December, 1950
Rome	November, 1950
Strasbourg	January, 1951
Bureau Central	October, 1950
Bureau Central (B.C.I.S.)	September, 1950

Dominion Observatory,
Ottawa - Canada,
July 3, 1951

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

DOMINION OBSERVATORIES BRANCH

SEISMOLOGICAL SERVICE OF CANADA

SEISMOLOGICAL BULLETIN

May to August

1951

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DOMINION OBSERVATORY

OTTAWA - CANADA

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

SHAWINIGAN FALLS

Shawinigan Water and Power Company
φ = 46°33!1 N. λ = 72°45!8 W. h = 60 m. ca.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks of Canadian Shield

Instrument: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15g.

KIRKLAND LAKE

φ = 48°08'41" N. λ = 80°01'45" W. h = 310 m.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks (Timiskaming Tuff)

Instrument: Sprengnether Vertical, short-period, designated No. 1130, galvanometric registration on photographic paper, paper speed 60 mm. per min.

DETERMINED CONSTANTS

INSTRUMENT	Ts	Tg	V	ε	DISPLACEMENT FOR 1" ARC TILT
17 (Ottawa)	12.0		300	20:1	50 mm.
23 (Ottawa)	12.0		300	20:1	50 mm.
BS (Ottawa)	1.0	0.1			
BL (Ottawa)	1.0	48			
HN (Halifax)	5.0		125	20:1	
HE (Halifax)	5.0		125	20:1	
SA (Shawinigan)	1.0		2200		
SF (Seven Falls)	1.0		2200		
SM (Seven Falls)	12.0		300	20:1	50 mm.
S1130 (Kirkland Lake)	1.4	1.4			

NOTE:- Universal Time used throughout

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA

C. S. Beals, Dominion Astronomer
Ernest A. Hodgson, Chief, Seismological Division

S T A T I O N S

OTTAWA

ϕ = 45°23'38" N. λ = 75°42'57" W. h = 83m.

Time correction within 0.10s.

Foundation: boulder clay over limestone

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

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

HALIFAX

Dalhousie University

ϕ = 44°38' N. λ = 63°36' W. h = 46m.

Time correction from recorded radio time signals

Foundation: Carbonaceous slate

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

SEVEN FALLS

Quebec Power Company

ϕ = 47°07!4 N. λ = 70°49!6 W. h = 232m. ca.

Time correction from recorded radio time signals

Foundation: Solid granite of Canadian Shield

Instruments: Wood-Anderson and Milne-Shaw, both EW components, designated SF and SM, respectively, each with photographic registration, magnetic damping, SF a paper speed of 60 mm. per min. and mass 15g., SM a paper speed of 8 mm. per min. and mass 1 lb.

SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

STATIONS: O - Ottawa; H - Halifax; SF - Seven Falls; SH - Shawinigan Falls

May, 1951 No. 14

DATE	STN.	PHASE	h m s	REMARKS
1	O	iP'_Z	05 22 26	Δ = 16,750 km.
		PP_{NE}	05 26 10	USCGS: 50 1/2°S, 149°E.
		e_{NE}	05 33 00	H = 05:02:41
		PS_{NE}	05 36 30	400 mi. South of Tasmania
		SS_{NE}	05 45 42	
	SH	e	05 22 35	
		e	05 23 16	
	SF	eP'	05 22 41	
		PKS	05 26 07	
		e	05 36 46	
		e	05 41 25	
		SS	05 46 03	
	H	e	05 29 11	
		e	05 32 19	
		e	05 36 11	
		eL	05 52.7	
2	SF	e	17 00 8	
		L	18 30	
		F	18 50	
3	O	iP_Z	04 15 08	Δ = 3550 km
		S	04 20 10	USCGS:
		e	04 27 10	15 1/2° N., 61° W.
				Leeward Islands
				H = 04:08:49
				Depth = 150 km.
	SF	eP	04 15 11	
		eS	04 20 16	
		eSS	04 22 16	
4	O	e	19 50.3	
		F	19 55	
6	O	iP_Z	21 49 21	Δ = 3920
		eS	21 55 20	USCGS:
		e	22 02 00	11° N., 85 1/2° W
				H = 21:42:20
	SF	e	21 51 36	
		e	21 58 36	
		L	22 01.7	

DATE	STN.	PHASE	h m s	REMARKS
6	0	iP_Z	23 10 04	Δ = 3760
		iP_Z	23 14 33	USCGS:
		eS	23 15 28	13 1/2° N., 88° W.
		eS	23 20 08	Eastern El Salvador
	SF	eP	23 10 36	H = 23:03:35, and
		e	23 15 05	23:08:04
		eS	23 16 21	
		e	23 19 06	
		e	23 20 44	
		L	23 22 7	
	H	e(PP)	23 12 04	
		eS	23 16 28	
		eSS	23 19 24	
		eL	23 22	
7	0	iP	20 29 07	
		eS	20 34 04	
		e	20 40 00	
	SH	eP	20 29 24	
	SF	eS	20 35 29	
		eSS	20 38 18	
		eScS	20 39 43	
		eL	20 41 32	
8	0	eP	20 10 07	
	SH	eP	20 10 43	
	SF	eP	20 10 39	
		eS	20 18 11	
		e	20 24.4	
10	0	e	09 38 32	
	SF	eP'	09 38 03	
		SKKS	09 45 21	
		PS	09 47 53	
		SS	09 53 51	
		L	10 14	
10	0	e	19 56 41	
		e	20 04 10	
	SF	e	20 04 04	
		L	20 15	
10	0	e	21 44 59	
		e	21 55 00	
	SH	e	21 45 05	
	SF	eP	21 45 10	
		eS	21 55 16	
		L	21 08	
11	0	eP	02 22 31	USCGS:
		e	02 22 47	13° N., 87 1/2° W.
		eS	02 27 51	Near Coast of Nicaragua
	SH	eP	02 22 45	H = 02:15:51
		eS	02 28 12	
	SF	eP	02 23 02	
		e	02 24 29	
		eS	02 28 28	
		L	02 32 19	
11	0	e_Z	03 22 45	
12	0	e_{NE}	16 30 39	
	SF	e	16 30 43	

DATE	STN.	PHASE	h m s	REMARKS
13	0	eP_{NE}	10 05 42	
		eS	10 15 35	
	SF	e	10 10 56	
13	SF	eL	17 53	
14	0	eL	04 58.0	
	SF	eL	04 53.1	
14	SF	e	13 11 38	
		eL	13 19.1	
15	0	eP	05 29 25	Δ = 7450 km.
		iP	05 29 39	USCGS:
		S	05 38 12	21° S., 69 1/2° W.
		PS	05 38 38	Depth = 100 km
		ScS	05 39 20	H = 05:18:46
		e	05 39 42	
		e	05 42 36	
		e	05 45 25	
		L	05 53	
	SH	eP	05 29 32	
		S	05 38 15	
		PS	05 38 51	
	SF	P	05 29 36	
		S	05 38 32	
		PS	05 39 00	
		e	05 39 51	
		SS	05 42 47	
	H	eP	05 29 24	
		S	05 38 03	
		L	05 47.8	
15	0	eP	18 19 54	
15	0	e	23 04 12	
	SH	e	23 04 01	
16	0	e	14 25 21	
17	0	eL	02 41	
17	0	e_N	16 02 50	
18	0	eP_Z	16 01 52	Δ = 150 km.
		eS_Z	16 02 09	H = 16:01:28
		eL	16 02 19	
18	0	e_Z	17 48 15	
19	0	e_Z	07 41 30	
19	0	eP_Z	16 03 36	Δ = 5700
		eL	16 19 5	USCGS:
		eP	16 03 09	38° N., 4° W.
		eS	16 10 10	South central Spain
		eL	16 21.6	H = 15:54:25
20	0	e_Z	04 10 04	
		e	04 25.1	

DATE	STN.	PHASE	h m s	REMARKS
20	0	e_Z	07 27 25	
20	0	e_Z	07 30 40	
21	0	P'	08 46 00	Δ = 13,460
		PP	08 47 32	USCGS:
		SKS	08 52 52	6° S., 154 1/2° E.
		e	08 55 28	Solomon Islands
		e_Z	08 56 04	Depth = 150 km
		e	08 57 16	H = 08:27:21
		e	09 03 07	
		e	09 13 00	
	SH	P'	08 46 04	
		PP	08 47 44	
	SF	PP	08 47 56	
		SKS	08 52 38	
		SKKS	08 56 04	
		PS	08 57 26	
		SS	09 04 28	
		G	09 17.4	
26	0	e_Z	04 19 14	
26	0	e_Z	06 19 30	
27	0	eP_Z	04 37 32	Δ = 3650
		eS	04 42.5	USCGS:
				23 1/2° N., 45° W.
				North Atlantic Ocean
				H = 04:30:55
	SH	eP	04 37 22	
	SF	e	04 42 24	
		eL	04 46.2	
28	0	eP_Z	14 28 19	
28	0	eP_Z	17 34 22	
29	0	eP'_Z	06 22 13	Δ = 14,200
		e	06 34.2	USCGS:
		L	07 02 8	3° S., 138 1/2° N.
	SF	ePP	06 24 28	Northern New Guinea
		PKS	06 25 46	H = 06:03:06
		SKKS	06 31 16	
		SS	06 42.5	
30	0	e_Z	01 04 54	
		e_N	01 10.0	
30	0	e_Z	17 46 33	Local shock
30	0	e_Z	20 16 20	Δ = 11,350
		$ePPP_{NE}$	20 19 50	USCGS:
		e	20 21 00	3° S., 126 1/2° E.
		e	20 23 40	Molucca Islands
		e	20 24 20	H = 19:57:01
		e	20 25 25	
		e	20 30 40	
	SH	ePPP	20 19 46	
	SF	ePPP	20 19 49	
		e	20 24 03	
		e	20 23.3	

May, 1951 No. 18

DATE	STN.	PHASE	h	m	s	REMARKS
31	O	eP'_Z	21	14	50	Δ = 12,900
		e_{NE}	21	15	23	USCGS:
		e	21	21	13	19° N., 121° E.
		e	21	22	21	Philippine Islands
		e	21	24	55	Depth = 100 km.
		G	21	42	45	H = 20:56:00
	SF	e	21	15	26	
		e	21	15	50	
		SKS	21	19	54	
		SKKS	21	21	05	
		e	21	23	20	
		PPS	21	25	01	
		SS	21	30	33	
		e	21	33	58	
		L	21	47		

J. H. Hodgson
Seismologist

SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

STATIONS: O - Ottawa; H - Halifax; SF - Seven Falls; SH - Shawinigan Falls

June, 1951 No. 19

DATE	STN.	PHASE	h m s	REMARKS
1	0	e_Z	20 12 06	USCGS:
		e_Z	20 12 33	52 1/2° N., 172° W.
	SF	eS	20 20 16	Aleutian Islands
		SoS	20 21 51	H = 20:02:14
		SSS	20 27 00	Depth = 100 km.
		L	20 31.5	
2	0	P'_Z	07 06 58	USCGS:
		e_{NS}	07 14 20	7° N., 117° E.
		e_{NS}	07 19 27	North Coast of Borneo
		e_{NS}	07 20 43	H = 06:47:52
	SF	SKKS	07 16 00	
		e	07 16 53	
		PS	07 19 54	
		SS	07 25 55	
3	0	P_Z	13 14 18	
5	0	iP_Z	01 41 22	Δ = 4050 km.
		PP	01 42 50	USCGS:
		S	01 47 08	9 1/2° N., 86° W
		e	01 53 40	Near Coast of Costa Rica
		e	01 56 14	H = 01:34:20
	SH	e	01 41 35	Depth = 60 km.
	SF	e	01 49 11	
		eL	01 53.1	
5	0	iP_Z	17 11 30	Δ = 11,100 km.
		PP_Z	17 14 50	USCGS:
		e	17 15 36	30° N., 132° E.
		e	17 19 34	South of Kyushu, Japan
		S	17 22 13	
		PS	17 23 36	
		e	17 24 50	H = 16;57:47
		e	17 38 40	Depth = 100 km.
	SH	e	17 15 11	
		e	17 22 05	
	SF	PP	17 15 14	
		e	17 19 59	
		S	17 22 26	
		e	17 23 04	
		SS	17 28 49	
		e	17 30 00	
		SSS	17 32 34	
		G	17 37.5	
		L	17 45.5	
	H	PP	17 16 20	
		e	17 20 22	
		SKS	17 22 46	
		PS	17 25 28	
		PPS	17 26 32	
		e	17 29 38	
		SS	17 31 14	
		SSS	17 34 59	
6	0	e_Z	15 51 39	Small local shock

DATE	STN.	PHASE	h m s	REMARKS
6	0	iP	16 18 27	Δ = 4500 km.
		PP	16 20 08	USCGS:
		S	16 24 42	71 1/2° N., 8° W.
		SS	16 27 40	Jan Mayen Island
		e	16 29 05	H = 16:10:52
		e	16 29 34	Depth = 60 km.
		e	16 32 36	
	SH	P	16 18 10	
		PP	16 19 43	
		S	16 24 13	
		L	16 31.6	
	SF	P	16 13 01	
		PP	16 19 32	
		PPP	16 19 56	
		S	16 24 00	
		SS	16 26 35	
	H	P	16 18 18	
		PP	16 19 46	
		S	16 24 00	
		e	16 24 54	
		e	16 25 53	
		e	16 27 40	
7	0	e_Z	05 40 34	
7	0	e_{NE}	23 24.6	
		e_{NE}	23 26.8	
		e_{NE}	23 28.6	
		e_{NE}	23 24 15.0	
	SF	SKS	23 24 55	USCGS:
		SKKS	23 26 24	27 1/2° S., 176° W.
		PS	23 28 58	Kermadec Islands region
		e	23 29 30	
		PPS	23 30 32	H = 22:59:00
		SS	23 35 45	
		L	00 01.5	
9	0	P'	05 27 36	Δ = 117
		S'	05 27 50	H = 05:27:16
9	0	eP_Z	11 34 54	USCGS:
		e_N	11 58 24	Western Iran
		eS_N	11 45 38	H = 11:22:05
9	0	e_Z	14 54 47	Local
9	0	e_Z	19 09 32	Local
10	0	Pn	17 22 05	Δ = 670 km.
		Sn	17 23 10	Felt in northeastern U.S.A.
	SH	e	17 23 10	
	SF	e	17 23 24	
12	0	e	22 53 30	
13	0	Pn	14 16 21	Δ = 150 km
		e	14 16 23	
		Sn	14 16 38	
		e	14 16 43	
		L	14 16 46	
		F	14 17	

DATE	STN.	PHASE	h m s	REMARKS
14	0	e	13 04 04	Local
		L	13 04 11	
14	0	e	15 54 34	
14	0	e	16 21 38	
15	0	e	08 16 11	Local
		L	08 19	
16	0	PP	23 55 49	USCGS:
		S	00 00 20	Foreshock of next
		L	00 05.8	H = 23:46:58
	SF	PP	23 56 18	
		S	00 00 50	
		SS	00 04 25	
		L	00 08.6	
17	0	iP_Z	09 47 36	Δ = 4100
		ePP	09 49 08	
		S	09 53 34	
		SS	09 56 16	USCGS:
		L	09 59.5	44 1/2° N., 130° W.
	SH	P	09 47 49	300 miles off coast of Oregon
		PP	09 49 20	H = 09:40:15
		e	09 50 18	
		S	09 53 44	
		SS	09 56 47	
		L	09 59.7	
	SF	PP	09 49 26	
		S	09 54 06	
		ll	10 01.2	
	H	e	09 55 36	
		L	10 02.3	
18	0	P	17 51 18	Δ = 3950
		i	17 51 40	USCGS
		PP	17 52 42	11° N., 85° W
		PPP	17 52 48	
		S	17 56 49	Costa Rica - Nicaragua Border
		SSS	17 59 40	H = 17:44:27
		L	18 01.3	Depth = 100 km.
	SH	P	17 51 33	
		e	17 51 55	
		PP	17 52 57	
		S	17 57 15	
		L	18 01 34	
	SF	P	17 51 41	
		PP	17 53 17	
		S	17 57 29	
		SS	18 00 14	
		L	18 02.5	
20	0	i	18 46 49	
		i	18 47 27	
		i	18 49 04	
		e_N	18 49 06	
	SH	e	18 48 00	
		e	18 50 16	
	SF	e	18 51 16	
24	0	i_Z	01 53 50	
		i_Z	01 54 03	

DATE	STN.	PHASE	h m s	REMARKS
24	0	i_Z	05 00 48	
		i_Z	05 01 07	
		e_Z	05 04 08	
		e_N	05 20 12	
	SF	e	05 04 24	
24	0	P'	17 08 09	
		e	17 08 35	
		SKKS	17 16 34	
		PPS	17 21, 0	
		SS	17 26, 4	
25	0	P	16 20 36	Δ = 4850
		PP	16 22 19	USCGS:
		S	16 27 04	61° N., 150° W.
		SS	16 30 20	Southern Alaska
		L	16 32, 3	
	SH	P	16 20 40	
		PP	16 22 28	
		S	16 27 16	
		L	16 35 12	
	SF	P	16 20 44	
		S	16 27 21	
		SS	16 30 43	
		L	16 35, 0	
25	0	e_Z	19 56 43	
		e_{NZ}	20 03 13	
25	0	P	20 24 43	
		S	20 31 14	
		SS	20 34 20	
		SSS	20 35 06	
27	0	P_Z	13 21 02	Δ = 1440
		S	13 23 30	
	SH	P	13 20 32	
		S	13 22 34	
	SF	P	13 20 15	
		e	13 20 25	
		S	13 22 00	
	H	e	13 20 47	
27	0	e	17 50 37	
28	0	P_n	01 05 43	Δ = 810 km.
		S_n	01 07 04	
		e	01 07 15	
		e	01 07 44	
	SH	eP_n	01 05 18	
		S_n	01 06 09	
		e	01 06 17	
		S_2	01 06 31	
		e	01 06 33	
		S_1	01 06 39	
	SF	P_n	01 04 52	Δ = 440 km.
		P_2	01 04 59	
		S_n	01 05 35	
		e	01 05 47	
		S_2	01 05 52	
		S_1	01 06 01	

June, 1951 No. 23

DATE	STN.	PHASE	h	m	s	REMARKS
28	0	e	03	47	15	
		i	03	47	43	
	SH	e	03	47	49	
29	0	iP_Z	18	41	39	
		eS_N	18	48	00	
30	0	P	15	59	56	$\Delta =$ 150 km.
		i	15	59	58	
		S	16	00	13	
		L	16	00	23	

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SEISMOLOGICAL SERVICE OF CANADA

DOMINION OBSERVATORY, OTTAWA

STATIONS: O - Ottawa; H - Halifax; SF - Seven Falls; SH - Shawinigan Falls

July, 1951 No. 24

DATE	STN.	PHASE	h m s	REMARKS
1	SH	e	18 08 24	
		F	18 08 31	
	SF	P_1	18 07 43	Δ = 65 km
		P_2	18 07 44	
		P_n	18 07 46	
		S_1	18 07 50.5	
2	O	i_Z	05 25 17	
		i_Z	05 27 22	
2	O	iP_Z	07 04 51	
2	O	iP_Z	07 44 04	
2	O	e	22 13 40	
		L	22 37	USCGS:
	SF	SKS	22 11 58	21° S., 176° W.
		PS	22 15 34	Tonga Island region
		SS	22 22 24	
		L	22 41.9	H = 21:46:30
6	O	P_n	17 20 42	
		i	17 20 49	= 120 km.
		S	17 20 57	
8	O	P'_Z	06 03 15	= 13,600
		PP	06 04 51	USCGS:
		PPP	06 07 16	11°N., 122° E.
		SKS	06 10 15	Panay Island, Philippines
		SKKS	06 12 04	H = 05:44:20
		S	06 14 48	
		SS	06 21 40	
		SSS	06 26 24	
		G	06 34.0	
	SH	e	06 03 11	
	SF	PP	06 04 49	
		SKS	06 10 13	
		PS	06 14 30	
		SS	06 21 18	
		G	06 35.1	
	H	PP	06 05 53	
		PS	06 16 03	
		SS	06 22 57	
8	O	iP_Z	11 07 02	
8	O	iP_Z	23 40 27	
		i_Z	23 40 37	

DATE	STN.	PHASE	h m s	REMARKS
9	0	P	00 10 35	Δ = 3800
		S	00 16 02	USCGS:
		L	00 21.5	16° N., 96° W.
				Near Coast of Oaxaca, Mexico.
				H = 00:03:54
				Depth = 60 km.
	SH	P	00 10 53	
		S	00 16 33	
	SF	P	00 11 05	
		PP	00 12 29	
		S	00 16 53	
		SS	00 19 35	
		L	00 22 35	
9	0	iP_Z	01 44 08	
9	0	iP_Z	18 18 46	
9	0	iP_Z	21 24 00	
		e	21 32.5	
		L	21 37.5	
11	0	eP_Z	13 06 43	
11	0	P_n	15 42 19	Δ = 150 km.
		S_n	15 42 36	
		L	15 44 00	
11	0	P_Z	18 34 51	Δ = 11,050 km.
		e	18 36 37	
		PP	18 39 02	
		SKS	18 44 38	USCGS:
		PS	18 47 16	28 1/2° N., 139 1/2° E.
		SS	18 52 50	Bonin Islands region
		G	19 01 45	H = 18:22:00
	SH	P	18 34 52	Depth= 550 km.
		e	18 36 41	
		PP	18 39 02	
		SKS	18 44 38	
		i	18 44 50	
		e	18 45 40	
		PS	18 47 51	
	SF	P	18 35 00	
		e	18 36 39	
		PP	18 39 01	
		SKS	18 44 39	
		S	18 45 41	
		PPS	18 47 09	
		SS	18 52 31	
		SSS	18 55 04	
		G	19 02.5	
	H	e	18 44 58	
		e	18 46 22	
		e	18 49 26	
11	0	iP_Z	23 55 29	USCGS:
		iP_Z	23 56 01	18° N., 69 1/2° W.
				Eastern Dominican Republic
				H = 23:44:10
				Depth= 100 km.

DATE	STN.	PHASE	h m s	REMARKS
12	O	i_Z	00 44 50	
13	O	e_{NE}	02 21.3	
	SF	e_E	02 22 38	
		e_E	02 25 28	
	H	e	02 24.5	
13	O	P'_Z	20 12 49	
		e_{NE}	20 20 46	
		L	20 44.5	
	SF	e_E	20 25 08	
		L	20 45.4	
14	O	e	07 30 10	
	SF	e	07 40 07	
16	O	P'	10 59 12	Δ = 14,100
		e	10 59 41	
		PP	11 01 08	
		e	11 01 50	USCGS:
		e	11 03 10	6° S., 146° E.
		SKS	11 06 04	Eastern New Guinea
		e	11 08 42	H = 10:40:23
		PS	11 11 05	Depth = 200 km.
		PPS	11 12 61	
		SS	11 17.5	
		e	11 22 5	
		e	11 26.7	
	SH	e	10 59 32	
	SF	e	11 01 58	
		e	11 18 06	
	H	e	11 01 50	
17	O	eP	09 27 14	
17	O	e	13 50 14	
		L	13 50 22	
17	O	PP	15 07 20	
		e	15 14 02	
18	O	P	09 16 35	Δ = 6800 km
		e	09 17 30	USCGS:
		PP	09 18 57	1° N.,27° W.
		PPP	09 20 30	Mid-Atlantic Ocean
		S	09 25 00	H = 09:06:16
		PPS	09 25 44	
		e	09 28.5	
		SS	09 29 16	
		SSS	09 32.0	
		M	09 35	
	SH	P	09 16 28	
		PcP	09 17 18	
		PP	09 18 43	
		PPP	09 20 06	
		S	09 24 45	
		PPS	09 25 18	
		SS	09 28.7	
		SSS	09 31.5	
	SF	P	09 16 23	
		i	09 19 08	

Continued on next page

DATE	STN.	PHASE	h m s	REMARKS
18 (Cont'd)	SF	i	09 19 52	
		i	09 21 15	
		S	09 24 41	
		ScS	09 26 26	
		SSS	09 31 16	
		L	09 34.7	
	H	P	09 15 44	
		PPP	09 19 04	
		e	09 20 36	
		S	09 23 24	
		ScS	09 25 26	
		SSS	09 28.7	
		L	09 31.7	
18	0	i	09 45 42	
19	0	P	20 51 45	Δ = 6800km
		PcP_Z	20 52 30	
		S	21 00 12	USCGS:
		ScS	21 01 36	51 1/2° N., 177 1/2° W.
		L	21 10.6	Near Adak, Aleutian Islands
	SH	P	20 51 49	H = 20:41:25
		ScS	21 01 40	Depth = 60 km
	SF	P	20 51 54	
		e	20 55 04	
		S	21 00 23	
		SS	21 04 59	
		SSS	21 07 47	
		L	21 10.7	
19	0	i_Z	23 44 21	
		i_Z	23 44 28	
		L	00 00.3	
21	0	P'	01 50 50	
		PP	01 51 30	
		SKS	01 57 14	
		PS	02 00 24	
		L	02 29	
22	0	iP	09 11 23	
		L	09 40	
24	0	P	17 52 23	Δ = 3800 km.
		i	17 52 43	USCGS:
		PPP	17 54 07	18 1/2° N., 101 1/2° W.
		S	17 57 40	Southern Mexico
		SS	18 00 16	H = 17:45:40
				Depth = 100 km.
25	0	P_1	00 23 53	Δ = 370 km.
		S_n	00 24 22	Felt at Ancienne Lorrette,
		i	00 24 28	near Quebec City
		S_2	00 24 35	
		S_1	00 24 41	
	SH	P_1	00 23 15.5	Δ = 110 km.
		P_2	00 23 23.5	
		S_1	00 23 29.5	
		S_n	00 23 31	
		i	00 23 32	
	SF	P_1	00 23 09	Δ = 40 km.
		S_1	00 23 14	
		S_2	00 23 15.5	

July, 1951 No. 28

DATE	STN.	PHASE	h m s	REMARKS
25	0	i_Z	06 51 12	
		i_Z	06 51 19	
	SH	i	06 50 13	
		i	06 50 16	
	SF	P_1	06 49 50	
		P_2	06 49 52.5	Δ = 45 km.
		i	06 49 54	
		S_1	06 49 56	
		S_2	06 49 57.5	
		i	06 50 03	
25	0	i	12 25 21	
25	0	P_Z	15 09 15	Δ = 130 km
		i	15 09 20	
		S_2	15 09 31	
		L	15 09 39	
25	0	i	17 25 46	
25	0	P	18 48 53	Δ = 3800 km
		PP	18 49 24	USCGS:
		PP	18 50 13	14° N., 90 1/2° W.
		PPP	18 50 22	Off Coast of Guatemala
		S	18 54 08	H = 18:42:14
		SS	18 56 14	Depth = 100 km.
		SSS	18 56 44	
26	0	P	10 12 41	
		SKKS	10 23 17	
		PPS	10 24 47	
	SF	S	10 23 17	
		SSS	10 32 27	
		G	10 34.8	
		L	10 42.3	
26	0	P_n	15 57 16	
		P_2	15 57 17.5	Δ = 225 km
		S_n	15 57 40	
		S_2	15 57 45	
		S_1	15 57 47.5	
		L	15 58 09	
27	0	i_Z	00 22 08	
		i_Z	00 22 16	
		i_Z	00 25 33	
28	SF	e	23 28 25	
		e	23 34 38	
		e	23 38 24	
29	0	i_Z	23 52 01	
		i_Z	23 52 14	
		i_{NE}	23 54 36	
		i_{NZ}	23 55 32	
	SH	e	23 52 04	
		e	23 52 33	
		e	23 55 31	
		e	24 02 16	
	SF	e	23 52 09	
		e	23 55 34	

DATE	STN.	PHASE	h m s	REMARKS
30	0	e_Z	04 38 11	
		i_Z	04 38 21	
		i_Z	04 38 26	
30	0	i_Z	16 58 21	
		e_N	17 08 50	
31	0	P_1	01 32 00	Δ = 95 km
		S_1	01 32 12	
		i	01 32 16 c	
31	0	i_Z	13 51 04	
		i_Z	13 51 22	

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STATIONS: O - Ottawa; H - Halifax; SF - Seven Falls; SH - Shawinigan Falls

August, 1951 No. 30

DATE	STN.	PHASE	h m s	REMARKS
1	0	P	03 30 34	Δ = 4900 km
		pP	03 30 41	
		S	03 37 02	
		e	03 40.6	USCGS:
		L	03 43.5	3° N., 84° W.
	SF	P	03 30 54	Off Coast of Columbia
		S	03 37 39	H = 03:22:46
		e	03 39 30	Depth = 100 km.
		SS	30 41 15	
		SSS	03 42 18	
		L	03 57.0	
2	0	P'	00 32 07	Δ = 25 km
		S'	00 32 10	
		S_2	00 32 12.5	
2	0	P'	03 58 25	Δ = 13.450
		i	04 00 24	
		PPP	04 01 16	USCGS:
		SKS	04 04 33	4° S., 154 1/2° E
		SKKS	04 06 08	New Britain Islands
		i_Z	04 08 36	H = 03:40:27
	SF	SKS	04 04 40	Depth = 500 km.
		SKKS	04 06 20	
		SS	04 16 25	
		e	04 19 12	
2	0	e	10 41.5	
		e	10 43.5	
	SF	e	10 42 05	
		e	10 49 08	
2	0	P	20 36 55	USCGS:
		S	20 42 22	Foreshock of next quake
				H = 20:30:17
	SF	S	20 43 00	
		SS	20 45.5	
3	0	P	00 30 37	Δ = 3650 km
		S	00 36 02	USCGS:
	SH	eP	00 30 54	13° N., 87 1/2° W.
	SF	eP	00 31 03	Near south coast of Nicaragua
		S ?	00 36 48	H = 00:23:58
		SS	00 39 15	Depth = 100 km.
	H	eS	00 37.0	
		eSS	00 39.5	
		L	00 40 9	
3	0	iP	00 41 50	
	SH	eP	00 42 08	After shock of above
3	0	P	05 32 24	After shock of above
		S	05 37 43	
	SH	eP	05 32 40	
	SF	e	05 38 37	
		e	05 41 05	
6	0	i	07 40 51	

August, 1951 No. 31

DATE	STN.	PHASE	h m s	REMARKS
6	0	eP	08 15 36	Δ = 3750
		S	08 21 10	USCGS:
	SH	eP	08 15 54	13° N., 87 1/2° W.
	SF	P	08 16 04	Near South Coast of Nicaragua
		S	08 21 50	H = 08:08:56
		e	08 24.1	Depth = 100 km.
6	0	P'	15 29 40	Δ = 13650
		i	15 29 45	USCGS:
				60° S., 152° E.
				New Britain Island
				H = 15:10:42
6	0	P_n	23 02 43	Rockburst at Kirkland Lake
		P_2	23 02 56.5	Time at origin 23:01:47
		S_n	23 03 46	Δ = 450 km.
	SH	e	23 02 53	
		e	23 03 10	
7	0	i	04 18 06	
	SH	e	04 18 18	
8	0	P_1	09 36 41	Δ = 95 km
		S_1	09 36 53	
		S_n	09 36 55.5	
	SH	P_n	09 36 50	Δ = 165 km.
		S_n	09 37 08	
	SF	P_n	09 37 12.5	
		P_2	09 37 17	Δ = 360 km.
		S_n	09 37 49	
8	0	iP	12 50 08	
		L	13 02	
8	0	P	22 35 47	USCGS:
		PP	22 37 17	44° N., 128° W.
		S	22 41 38	Off coast of Oregon
		L	22 47	H = 22:28:40
	SF	S	22 42 17	
		L	22 49.2	
10	0	iP	00 15 26	
	SH	eP	00 15 35	
10	0	eP	05 41 10	Δ = 5350
		i_Z	05 41 20	USCGS:
		PcP	05 42 37	8 1/2° N., 40° W
		PP	05 43 11	H = 05 32 33
		S	05 48 10	
		L	05 54.3	
	SH	eP	05 41 06	
		i	05 41 14	
	SF	eP	05 40 57	
		S	05 47 55	
		ScS	05 50 55	
		L	05 56	
	H	eS	05 46.6	
		eSS	05 49.5	

DATE	STN.	PHASE	h m s	REMARKS
10	0	P_n	06 26 26.5	
		P_2	06 26 35	
		P_1	06 26 40	
		i	06 27 07	
		S_n	06 27 12	
		i	06 27 25	Rockburst at Kirkland Lake
		S_2	06 27 29	Time at Origin 06:25:24.5
		S_1	06 27 40	Δ = 450 km.
	SH	i	06 26 41	
		e	06 27 40	
		e	06 27 53	
		e	06 28 01	
	SF	i	06 28 39	
10	0	iP	23 12 13	Δ = 9150
		S	23 22 00	USCGS:
	SH	P	23 12 13	46° N., 143 1/2° E
		S	23 22 03	Off Hokkaido, Japan
	SF	S	23 21 58	H = 23:00:21
				Depth = 300 km.
11	0	P	10 05 22	
12	0	P'	21 29 05	USCGS:
		PP	21 31 05	3 1/2° S., 141° E
		L	22 09.9	New Guinea
				H = 21:10:00
13	0	i	03 11 49	
13.	0	P	18 45 02	Δ = 7950
		i	18 45 06	USCGS:
		PP	18 47 50	43° N., 32 1/2° E
		i	18 49 08	Black Sea, Off north coast
		PPP	18 49 36	of Turkey
		S	18 54 35	H = 18:33:40
		PS	18 55 15	
		SS	18 59 22	
		SSS	19 02.1	
	SH	P	18 44 52	
		PP	18 47 33	
		S	18 54 00	
		SSS	19 01.8	
	SF	P	18 44 38	
		PPP	18 48 49	
		S	18 53 45	
		i	18 53 57	
		ScS	18 54 45	
		SS	18 58 15	
		SSS	19 01 57	
		G	19 03.0	
	H	P	18 44 28	
		PP	18 47 02	
		PPP	18 48 30	
		S	18 53 16	
		e	18 53 54	
		ScS	18 54 22	
		e	18 57 30	
		SSS	19 00 42	

DATE	STN.	PHASE	h m s	REMARKS
14	0	i_Z	09 01 32	
14	0	e_Z	19 10 46	
14	0	i_Z	20 08 50	
14	0	e	20 52 32	
15	0	P_n	17 00 13	
		P_2	17 00 20	Δ = 220 km
		P_1	17 60 21	
		S_n	17 00 42	
		S_2	17 00 47	
		S_1	17 00 50	
		L	17 01 10	
16	0	P	19 54 46	
16	0	P	21 51 18.5	
		e	21 51 20	
		S_n	21 51 35.5	Δ = 150 km.
		e	21 51 39	
		L	21 51 49	
17	0	P_Z	00 05 36	
		e_{NE}	00 16 06	
	SF	e_E	00 15 46	
18	0	e_Z	03 57 23	
		e_{NE}	04 01 04	
	SF	e_E	04 00 24	
20	0	P	05 56 47	Δ = 3800
		e	05 58 30	USCGS:
		S	06 02 12	23 1/2° N., 108° W
		L	06 07.8	Gulf of California
	SH	e	06 06 51	H = 05:49:58
		L	06 08.2	
	SF	e	06 06 19	
		L	06 09.7	
	H	e	06 12 01	
		e	06 14 19	
		L	06 15.8	
20	0	P	06 06 04	
20	0	e	09 06 19	
21	0	P	11 08 09	Δ = 7700
		PP	11 10 50	
		S	11 17 20	
		G	11 25.9	
		L	11 30.6	USCGS:
	SH	P	11 08 25	19 3/4° N., 156° W.
		S	11 17 40	West Coast of Hawaii
		L	11 29.4	H = 10:56:57.5
	SF	P	11 08 28	
		PP	11 11 12	
		PPP	11 12 55	
		S	11 17 55	
		SS	11 22 46	
		SSS	11 25 43	
		G	11 27 42	
	H	P	11 08 55	

(Continued on next page)

DATE	STN.	PHASE	h m s	REMARKS
21 (Cnnt'd)	H	PPP	11 13 43	
		S	11 18 49	
		PS	11 19 35	
		PPS	11 19 53	
		G	11 29.9	
		L	11 34.8	
21	0	i	19 08 54	
22	0	P	05 48 34	'SCGS:
		S	05 54.3	10° N., 83° W
		L	06 00.0	Costa Rica
	SH	e	05 48 45	H = 05:41:31
	SF	e	05 50 34	
24	0	i	10 38 35	
24	0	P	14 33 23	Δ = 8700 km.
		i	14 36 15	
		PP	14 36 26	USCGS:
		S	14 43 08	47° N., 151° E
		SS	14 48.5	Kuriles
		SSS	14 51 44	H = 14:21:15
	SH	P	14 33 24	
		PP	14 36 13	
		S	14 43.0	
		e	14 43 23	
	SF	P	14 33 27	
		S	14 43 11	
		SS	14 48 17	
		SS	14 51 39	
	H	eS	14 43 51	
24	0	P	23 14 06	
26	0	i	18 45 12	
		L	18 56.3	
28	0	sP	16 48 45	Δ = 13,400
		P'	16 48 58	27° S., 178° E.
		PP	16 50 37	Kermadec Islands
		SKS	16 56 12	H = 16:31:11
		SKKS	16 57 34	
		PS	17 00 26	
		PPS	17 02 18	
		e	17 09.3	
	SF	SKS	16 55 14	
		SKS	16 56 49	
		e	16 59 29	
28	0	i	16 59 17	
31	0	P_n	02 04 18	Δ = 150 km
		S_n	02 04 35	
31	0	P	12 40 53	
	SF	P	12 40 34	
31	0	P	20 29 57	

J.H. Hodgson,
Seismologist.

We acknowledge, with thanks, the receipt of the following seismological bulletins and publications:- March, 1951

STATIONS	BULLETINS
Saint Louis and Auxiliary Stations	Preliminaries Oct. 5, 8, 21, 28, 31, Nov. 1, 2, 5, 22, Mar. 20, 27, 29, Apr. 4, 10,14/51
Wellington	Apr., June, 1949; Sept., Oct., 1950
De Bilt	January, 1951
Cleveland	December 1950, January 1951
South Africa	December, 1950
Weston	January, 1951
Budapest	January, 1951
Cartuja	1948, 1949
Japan	1949
Tortosa	December, 1950
Zurich	November, December, 1950, January, 1951; 1949
Toledo	November, December, 1950
Eger	October, 1950
Stara Dala	August, 1950
Hautes Tatra	September, October, December, 1950
Toledo	December, 1950, January, 1951
Helsinki	October-December, 1950
Richmond	January, 1951
Pasadena	April-June, 1950
Saint Louis and Auxiliary Stations	Preliminaries April 15, 16, Sept. 29, Oct. 23, Dec. 1, 2
Tamanrasset	September, 1950
Algeria	September, 1950
Tacubaya	December, 1950
Santa Clara	February, 1951
La Paz	October, 1949
Columbia	February 20 - March 19
De Bilt	February, 1951
Belgium	1947
Rome	December, 1950
Athens	December, 1950
Pasadena	April-June, 1950
Wellington	November, 1950
Tortosa	January, 1951
Lisbon	October-December, 1950
Weston	February, 1951
Strasbourg	February, 1951
Bureau Central	November, 1950
Bureau Central, B.C.I.S.	October, 1950
Berkeley	October-December, 1943, January-September, 1944, July-September, 1949
India	May, June, 1950
Tacubaya	January, 1951
Beograd	January, 1951
Cleveland	February, 1951
Wellington	November, 1950
Dublin	October-December, 1950
South Africa	January, 1951
Tortosa	February, 1951
Rome	January, 1951
Algeria	October, 1950
Tamanrasset	October, 1950

We acknolwedge, with thanks, the receipt of the following seismological publications and bulletins:- April, 1951

STATIONS	BULLETINS
Algiers	November, December, 1950
Tamanrasset	November, December, 1950
Tananarive	April, 1950
Perth	October-December, 1950
Stara Dala	October, 1950
Prague	January, 1951
Hautes Tatra	August, 1950, January, 1951
Eger	August, 1950, January, 1951
Stara Dala	January, 1951
Brisbane	December, 1950
Richmond	February, 1951
Apia	October-December, 1950
Harvard	July-December, 1950
Athens	January, 1951
Pasadena	October-December, 1950
Malaga	May, June, 1950
Japan	November, 1950
Rome	February, 1951
Toledo	January, February, 1951
Helwan	September, December, 1950
De Bilt	March, 1951
Columbia	March 21-April 3, 1951
Chinchina	January-May, 1950
Galerazamba	April, 1949-May, 1950
Strasbourg	March, April 1-10, 1951
Bureau Central	December, 1950
Bureau Central B.C.I.S.	November, 1950
De Bilt	1946

May, 1951

Columbia	April 8-15, 1951
Tacubaya	February, 1951
South Africa	February, 1951
Wellington	December, 1950
Beograd	February, 1950
Djakarta	January-March, 1950
Weston	March, 1951
Ksara	January-March, 1951
Columbia	April 22-May 3
Istanbul	June, 1950-March, 1951
Wellington	December, 1950
Hautes Tatra	February, 1951
Eger	February, 1951
Stara Dala	February, 1951
Prague	February, 1951
Pasadena	July-September, 1950
Beograd	March, 1950
Tacubaya	March, 1951
Santa Clara	March, 1951
Prague	1949
Zurich	February, March, 1951
Richmond	March, 1951
Prague	March, 1951
Eger	June, July, 1950
Stara Dala	June, July, 1950
Hautes Tatra	June, July, 1950
Columbia	September-December, 1950, May 4-May 11, 1951
Helwan	January, 1951

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

May, 1951 (cont'd)

Toledo	February, March, 1951
Dublin	January-March, 1951
Tamanrasset	January, 1951
Algiers	January, 1951
Strasbourg	April 11-May 10, 1951
Bureau Central	January, February, 1951
Bureau Central B.C.I.S.	December, 1950
Hautes Tatra	March, 1951
Stara Dala	March, 1951
South Africa	March, 1951
De Bilt	April, 1951
Athens	February, 1951
Malaga	July, 1950
Seattle	1950
Dublin	January-March, 1951
Saint Louis and Auxiliary Stations	April 16, 18, 19, 20, 26, 30, May 2, 9, 10, 13, October 15, December 9, 10/50
Tortosa	March, 1951
Helwan	February, 1951
Rome	March, 1951

June, 1951

Helsinki	January-March, 1951
Athens	March, 1951
Tortosa	April, 1951
Japan	December, 1950, 1944, 1946
Istanbul	1945
Copenhagen	January-November, 1949
Richmond	April, 1951
Helwan	March, 1951
Prague	April, 1951
Eger	March, 1951
Istanbul	April, 1951
Tacubaya	April, 1951
Columbia	May 25-June 2, 1951
Algeria	February, 1951
Tamanrasset	February, 1951
Athens	April, 1951
Djakarta	April-June, 1950
Beograd	April, 1951
Weston	April, 1951
Potsdam	1949
Seattle	July-December, 1949
De Bilt	May, 1951
Saint Louis and Auxiliary Stations	April 30, May 25, 26, 27, 16, 17, 19
Strasbourg	May 11-20, 1951
Bureau Central	March, 1951
Bureau Central B.C.I.S.	January, 1951
Rome	April, 1951
Toledo	March, April, 1951
South Africa	April, 1951
Tacubaya	May, 1951
Columbia	June 12-18

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

July, 1951

Stara Dala	April, 1951
Hautes Tatra	April, 1951
Richmond	May, 1951
Helwan	April, 1951
U.S.C.G.S.	January-March, 1949
Algiers	March, 1951
Tamanrasset	March, 1951
Strasbourg	June 11-30, 1951
Bureau Central	April, 1951
Lisbon	January-April, 1951
Bureau Central B.C.I.S.	February, 1951
Weston	May, June, 1951
Santa Clara	May, June, 1951
New Zealand	1948-1949
Wellington	January-March, 1951
C.M.O. Japan	January, 1951
Columbia	June 29-July 8, 1951
Pasadena	Locals-January-March, 1951
Tortosa	May, June, 1951
Rome	May, 1951
De Bilt	June, 1951
Prague	May, 1951
Pennsylvania	July-December, 1941
South Africa	May, 1951
Perth	January-March, 1951
Apia	January, 1951
Istanbul	May, 1951
Palisades	January-April, 1951
Kalocsa	February, March, 1951
Budapest	February-April, 1951
Toledo	April, May, 1951
Saint Louis and Auxiliary Stations	Preliminaries May 19, Sept. 22, Oct. 5, 25, 26, Nov. 6, 8, 16, 17, 18, 26, 1950
Bogota	June-November, 1950
Galerazamba	June, July, September, November, 1950
Chinchina	June-November, 1950

August, 1951

Chile	1950
Helwan	May, 1951
Tacubaya	June, 1951
Saint Louis and Auxiliary Stations	Nov. 24, Dec. 2, 4, 10, 11, 14, 1950; January 1, 2, 3, 5, 6, 8, 1951
Zurich	April-June, 1951
Algiers	April, May, 1951
Tamanrasset	April-May, 1951
Richmond	June, 1951
Columbia	July 13-25, 1951
Santa Clara	July, 1951
Istanbul	June, 1951
Ksara	April-June, 1951
Tananarive	July-September, 1950
De Bilt	July, 1951
Strasbourg	July, 1951
Bureau Central	May, 1951
Bureau Central B.C.I.S.	March, 1951
South Africa	June, 1951
Lisbon	May, June, 1951

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

August, 1951 (cont'd)

Athens	May, 1951
Madrid	1948
Tortosa	July-September, 1947
Columbia	August 3-13, 1951
Tortosa	July, 1951
Dublin	April-June, 1951
Hautes Tatra	May, 1951
Stara Dala	May, 1951
Rome	June, 1951
Beograd	June, 1951
Uppsala	July, 1949-June, 1950
Trieste	May-December, 1950, January-April, 1951

Dominion Observatory,
Ottawa, Canada,
November 22, 1951.

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

DOMINION OBSERVATORIES BRANCH

SEISMOLOGICAL SERVICE OF CANADA

SEISMOLOGICAL BULLETIN

September and October

1951

00

DOMINION OBSERVATORY

OTTAWA - CANADA

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

SHAWINIGAN FALLS

Shawinigan Water and Power Company
φ = 46°33'1 N. λ = 72°45'8 W. h = 60 m. ca.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks of Canadian Shield

Instrument: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15g.

KIRKLAND LAKE

φ = 48°08'41" N. λ = 80°01'45" W. h = 310 m.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks (Timiskaming Tuff)

Instrument: Sprengnether Vertical, short-period, designated No. 1130, galvanometric registration on photographic paper, paper speed 60 mm. per min.

DETERMINED CONSTANTS

INSTRUMENT	Ts	Tg	V	ε	DISPLACEMENT FOR 1" ARC TILT
17 (Ottawa)	12.0		300	20:1	50 mm.
23 (Ottawa)	12.0		300	20:1	50 mm.
BS (Ottawa)	1.0	0.1			
BL (Ottawa)	1.0	48			
HN (Halifax)	5.0		125	20:1	
HE (Halifax)	5.0		125	20:1	
SA (Shawinigan)	1.0		2200		
SF (Seven Falls)	1.0		2200		
SM (Seven Falls)	12.0		300	20:1	50 mm.
S1130 (Kirkland Lake)	1.4	1.4			

NOTE:- Universal Time used throughout

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA

C. S. Beals, Dominion Astronomer
Ernest A. Hodgson, Chief, Seismological Division

S T A T I O N S

OTTAWA

φ = 45°23'38" N. λ = 75°42'57" W. h = 83m.

Time correction within 0.10s.

Foundation: boulder clay over limestone

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

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

HALIFAX

Dalhousie University

φ = 44°38' N. λ = 63°36' W. h = 46m.

Time correction from recorded radio time signals

Foundation: Carbonaceous slate

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

SEVEN FALLS

Quebec Power Company

φ = 47°07!4 N. λ = 70°49!6 W. h = 232m. ca.

Time correction from recorded radio time signals

Foundation: Solid granite of Canadian Shield

Instruments: Wood-Anderson and Milne-Shaw, both EW component, designated SF and SM, respectively, each with photographic registration, magnetic damping, SF a paper speed of 60 mm. per min. and mass 15g., SM a paper speed of 8 mm. per min. and mass 1 lb.

SEISMOLOGICAL SERVICE OF CANADA
Eastern Network
DOMINION OBSERVATORY, OTTAWA

STATION: O - Ottawa
H - Halifax

SF - Seven Falls
SH - Shawinigan Falls
KL - Kirkland Lake (Placed in operation as teleseismic station Sept. 18)

September, 1951 No. 35

DATE	STN.	PHASE	h m s	REMARKS
1	O	eS_{NE}	09 12 26	Δ = 9400 km.
		SS_{NE}	09 18 16	USCGS: 33°S, 110°W.
		G	09 24.5	H = 08:49:18
2	O	eP_Z	16 34 32	USCGS: 31°N., 117°W.
		e_{NE}	16 45.1	H = 16:27:32
	SF	e	16 47 58	
3	O	eZ	15 44 37	
		L	15 45 02	
3	O	eZ	18 14 39	
		L	18 14 58	
3	O	P_n	21 27 41	Δ = 515 km.
		i	21 27 47.5	H = 21:26:31
		S_n	21 28 32	Felt in New York State
		i	21 28 37	
	SH	e	21 29 00	
		e	21 29 07	
		F	21 31.2	
	SF	e	21 29 29	
8	SF	e	06 53.2	
8	SF	e	11 58 28	
9	O	PP_Z	05 02 36	Δ = 11800 km.
		e_{EZ}	05 09	USCGS: 16°S, 173°W.
		e_{EZ}	05 12	Samoa Islands
	SF	e	05 09 10	H = 04:43:00
		e	05 12 27	
10	SH	e	21 23 31	
		e	21 23 34	
		F	21 23 56	
11	O	iZ	11 57 35	
	SH	e	11 57 33	
	SF	e	11 56 51	
11	O	iZ	22 17 16	
12	O	iZ	05 39 34	
12	O	iZ	14 04 24	
12	O	iZ	15 19 14	
	SH	e	15 22 25	
12	O	PZ	15 22 31 C	Δ = 8850
				USCGS: 45 1/2°N., 151°E.
				Kurile Islands region
				H = 15:10:18

DATE	STN.	PHASE	h m s	REMARKS
13	0	P'_Z	16 45 49	USCGS: Banda Sea Region H = 16:26:25
14	0	P	07 14 22	Δ = 3900 USCGS: 49°N., 128 1/2°W. Vancouver Island region H = 07:07:21
15	0	eP	08 17 30	Δ = 3650 km.
		pP	08 17 51	USCGS: Near San Juan, Porto Rico
		S	08 22 41	H = 08:11:14
		i	08 23 04	
		sS	08 23 20	
16	0	P'	01 50 37	USCGS: 15°S, 167 1/2°E. New Hebrides Islands H = 01:31:58
16	0	iZ	12 32 27	Local
		iZ	12 32 29	
		L	12 32 52	
17	0	eZ	12 39 20	Local
		iZ	12 39 26	
		F	12 43	
18	0	PZ	07 10 34	Δ = 14°
		e	07 10 56	H = 07:07:14
		S	07 13 14	
		e	07 13 33	
		e	07 13 43	
	SH	e	07 10 42	
	SF	e	07 13 19	
18	0	i	09 37 08	Local
		e	09 37 19	
		F	09 37 42	
19	0	PZ	04 24 26	USCGS: 17°S., 71°W.
		iZ	04 24 51	H = 04:14:09
	KL	eP	04 25 12	d = 100 km.
19	0	PZ	08 21 26	Δ = 840 km.
		eZ	08 21 35	H = 08:19:35
		eZ	08 21 41	
		SZ	08 22 47	
		e	08 22 58	
		e	08 23 19	
	SH	P_n	08 21 03	Δ = 675 km.
		e	08 21 50	H = 08:19:33
		S_n	08 22 10	
		e	08 22 17	
		e	08 22 43	
	SF	P_n	08 20 34	Δ = 420 km.
		i	08 20 43	H = 08:19:36
		S_n	08 21 16.5	
		i	08 21 26	
		i	08 21 28	
		S_2	08 21 33	
		S_1	08 21 41	
	KL	eS	08 23 22	Δ = 1005 km. using Ottawa H
		eL	08 24 23	

DATE	STN.	PHASE	h m s	REMARKS
20	0	P_Z	05 57 04	Δ = 5700
		S_{NE}	06 04 08	USCGS: 5 1/2°S., 81°W.
		PPS_{NE}	06 04 28	Near coast of Peru
	KL	eP	05 57 31	H = 05:48:03
	SH	e	05 57 26	
20	KL	eP	12 46 32	USCGS: 65°N., 154°W.
	0	eP_Z	12 47 02	Central Alaska
		e_{NE}	12 58.5	H = 12:38:40
		e_{NEZ}	13 01.5	
	SH	eP	12 47 04	
	SF	e	13 01 55	
	H	e	13 03.5	
20	0	P	17 57 49	
21	0	P_Z	04 27 44	
		S_{NE}	04 32.3	
21	0	P'	09 29 31	
		i_Z	09 32 53	
	SH	e	09 32 56	
22	0	P_Z	10 23 50	
22	0	P_Z	23 47 54	
		eScS	23 58 10	
	SH	e	23 47 48	
24	0	P_Z	13 22 17	USCGS: 49 1/2°N., 156°E.
		i	13 26 04	d = 100 km.
		S	13 32 20	H = 13:10:41
		SS	13 37 26	
		SSS	13 41 12	
		L	13 50.3	
	SH	e	13 22 39	
	SF	S	13 31.9	
		SS	13 37.9	
25	0	P_1	15 45 15	Δ = 90
		P_2	15 45 16.5	H = 15:45:00
		P_n	15 45 17	
		S_1	15 45 26.5	
		e	15 45 31	
	SH	P_n	15 45 33	Δ = 230
		eP_1	15 45 36	H = 15:44:59
		iS_n	15 45 58	
		i	15 46 14	
	SF	P_2	15 45 58.5	Δ = 390
		P_1	15 46 03.5	H = 15:44:49
		e	15 46 14.5	
		S_n	15 46 33	
		e	15 46 35.5	
		e	15 46 40	
		S_2	15 46 45	
27	KL	eP	19 30 38 C	
		eL	19 40.8	
	0	P_Z	19 31 10	Δ = 3400
		i_Z	19 31 46	USCGS: 49°N., 129°W.
		PP	19 32 33	Off coast of Vancouver
		S	19 36 48	Island
		SS	19 39 08	H = 19:24:12
		SSS	19 39 50	
		ScS	19 41.6	
		L	19 42.5	

DATE	STN.	PHASE	h m s	REMARKS
27 (cont'd)	SH	eP	19 31 27	
		eS	19 37 16	
		eSS	19 39 58	
		eScS	19 41 42	
		L	19 43 07	
	SF	eP	19 31 30	
		PP	19 33 00	
		S	19 37 23	
		SSS	19 40 35	
		L	19 43.6	
27	O	P_n	20 40 32	Δ = 150 km,
		i	20 40 34	H = 20:40:08
		S_n	20 40 49	
		i	20 40 52	
28	O	P	12 14 03	The time marks are missing at
		i_Z	12 14 12	KL but equivalent phase is a c.
		i_Z	12 14 33	USCGS: 11 1/2°N., 86°W.
		eS	12 19 36	H = 12:07:24
		e_{NZ}	12 20 03	
		G	12 22 03	
	SH	eP	12 14 19	
28	O	P	14 57 56	Again a c at KL
		PP	14 59 20	Aftershock of above
		e	15 03 45	H = 14:51:17
		e	15 07 36	
		e	15 09 08	
	SH	eP	14 58 12	
28	O	P'	23 47 24	
		SKS	23 54 16	
		SKKS	23 55 40	
		PS	23 58 40	
	SF	e	23 49 37	
		eSKS	23 54 36	
		eSKKS	23 56 05	
		e	23 58 57	

J. H. Hodgson
Seismologist

SEISMOLOGICAL SERVICE OF CANADA

EASTERN NETWORK

DOMINION OBSERVATORY, OTTAWA

STATIONS:

O - Ottawa
H - Halifax
SF - Seven Falls
SH - Shawinigan Falls
KL - Kirkland Lake

October, 1951 No. 39

DATE	STN.	PHASE	h m s	REMARKS
1	O	ePZ	10 21 13	Δ = 6000 km.
		e	10 33.1	USCGS: 55°N., 166°W.
		L	10 38.1	Fox Islands, Aleutians
	KL	eP	10 20 44 C	H = 10:11:40
		iP	10 20 47 C	
	SF	eS	10 29 13	
		SS	10 33 27	
		L	10 37.8	
3	O	i	11 17 36	
	KL	eP	11 17 58	
		e	11 18 16	
3	KL	e	15 29 02	
3	O	P_n	20 01 19	Δ = 295 km.
		i	20 01 20.5	H = 20:00:47
		i	20 01 22	
		S_n	20 01 49	
		i	20 01 58	
		i	20 02 03	
		L	20 02 16	
8	KL	iP	04 17 08 C	
		e	04 28 07	
		eL	04 30.1	
		F	04 40	
	O	P_Z	04 17 36	Δ = 4000 km.
		S_{NE}	04 23 16	USCGS: 40°N., 125°W.
		eN	04 25.3	Off Cape Mendocino, Calif.
		SS	04 26 00	H = 04:10:35
		ScS	04 28.3	
	SH	e	04 17 57	
		L	04 29.8	
	SF	P	04 18 02	
		PP	04 19 37	
		S	04 23 55	
		L	04 29.7	
	H	e	04 25 24	
		L	04 33.6	
9	O	eZ	15 59 20	
11	O	$P'Z$	01 56 30	Δ = 13,550
		iZ	01 56 43	USCGS: 5°S., 152°E.
		SKS	02 03 30	New Britain Island
		SKKS	02 05 02	H = 01:37:31
		e	02 06 02	
		PS	02 08 02	
		SS	02 14 40	
		e	02 17 40	
		G	02 28.3	

DATE	STN.	PHASE	h m s	REMARKS
11 (cont'd)	SF	SKS	02 03 33	
		SKKS	02 05 18	
		e	02 06 19	
		PS	02 08 16	
		SS	02 15 31	
		G	02 29.0	
11	O	P_Z	05 05 37	
12	O	e_Z	12 28 14	
12	KL	e?	21 50 28	May be microseism
		e	21 50 33	
13	KL	eP'	22 48 12 d	
14	KL	eP'	09 49 05 d	
16	KL	e	07 02 45	USCGS: 76°N., 5°E.
	O	eP_Z	07 02 47	Arctic Ocean
		eS_N	07 09 30	H = 06:54:33
		L	07 18.6	
18	KL	eP	08 38 47 c	Δ = 9600 km.
		e	08 39 02 c	USCGS: 42°N., 142°E.
	O	eP_Z	08 39 04	Near coast of Hokkaido,
		S_{NE}	08 49 30	Japan
		e	08 50 12	H = 08:26:25
		G	08 57 40	d = 100 km.
	SH	eP	08 39 04	
	SF	eP	08 39 14	
	H	e	08 50 20	
		e	08 50 54	
		L	09 08.7	
18	O	i_Z	19 50 32	
		i_Z	19 50 42	
19	KL	e	15 04.1	USCGS: 41°N., 142°E.
	O	eP_Z	15 04 10	Off south coast of
		i_Z	15 04 29	Hokkaido, Japan
	SH	eP_Z	15 04 18	H = 14:51:14
				d = 100 km.
21	KL	e	21 52 49	USCGS: Foreshock of Formosa
	O	e_{NE}	21 53 10	quake
		e_{NEZ}	21 59.3	H ; 21:34:13
		e_N	22 02 20	
	SH	e	21 53 30	
	SF	PP	21 53 47	
		SKKS	22 00 35	
		PS	22 02 57	
		SS	22 08 42	
		SSS	22 12 46	
		G	22 19.8	
	H	e	21 53 56	
		e	22 01 24	
		e	22 03 16	
		e	22 09 26	
21	O	e	22 04 01	
	KL	e	22 04 09	
		eL	22 36	

DATE	STN.	PHASE	h m s	REMARKS
22	O	e_{NZ}	03 47.5	Δ = 12,000 km.
		e_{NEZ}	03 58.0	USCGS: 24°N., 122°E.
		L	04 15	East coast of Formosa
	KL	e	03 48 04	H = 03:29:26
		eL	04 27	
	SH	e	03 56.8	
		L	04 25	
	SF	e	03 49 04	
		PPP	03 51 52	
		SKKS	03 56 20	
		PS	03 58 58	
		e	04 03 37	
		e	04 07 50	
		SSS	04 09 36	
		G	04 16	
	H	e	03 55 03	
		e	03 58 35	
22	KL	e	06 01.5	USCGS: Aftershock of Formosa quake
		eL	06 44	H = 05:43:01
	SF	e	06 09 26	
		e	06 17 11	
		L	06 32.5	
	H	e	06 09.8	
		e	06 12.1	
23	O	eZ	01 46.1	
		e_{NE}	01 58.1	
	SF	SKKS	01 46 03	
		e	01 53 47	
		e	01 58 11	
		G	02 03.9	
23	O	eE	09 21.8	
		e_{NEZ}	09 40.2	
		L	09 52	
24	O	P_{1Z}	15 52 38	Δ = 135 km.
		S	15 52 54	
		L	15 53 03	
25	O	P_Z	04 12 45	USCGS: 15°N., 93°W.
		PP	04 14 02	H = 04:06:00
		S	04 18 18	
		e	04 21.8	
		L	04 24.6	
25	O	iP_1	07 08 05	Δ = 80 km.
		i	07 08 05.4	H = 07:07:52
		S_1	07 08 15	Felt in vicinity of Cornwall, Ont.
	SH	P_n	07 08 28	Δ = 245 km.
		S_n	07 08 53.5	
		i	07 08 55.5	
		S_2	07 09 00.5	
	SF	P_n	07 08 50	Δ = 360 km.
		S_n	07 09 28	
		i	07 09 33	
		i	07 09 34	
		i	07 09 39	
25	O	P_1	07 30 43	Aftershock of above
		S_1	07 30 53	
	SH	S_n	07 31 32.5	

October, 1951 No. 42

DATE	STN.	PHASE	h m s	REMARKS
25	O	e_{NE}	12 44.6	
28	KL	eP	07 07 20 d	
		iP	07 07 20.4 c	
	O	eZ	07 07 22	c on long-period Benioff
		e_{NEZ}	07 21.0	Direction not clear on short-
		e_{NEZ}	07 26.3	period Benioff
		e	07 31	
		e	07 35.5	
	SH	e	07 07.4	
31	O	PP_Z	07 18 27	
		PKS	07 19 34	
		SS_E	07 36.3	
		L	08 08.0	

J. H. Hodgson
Seismologist

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

DOMINION OBSERVATORIES BRANCH

SEISMOLOGICAL SERVICE OF CANADA

Eastern Division

Seismological Bulletin

November and December

1951

00

DOMINION OBSERVATORY

OTTAWA - CANADA

min. and mass 1 lb.

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

SHAWINIGAN FALLS

Shawinigan Water and Power Company
φ = 46°33!1 N. λ = 72°45!8 W. h = 60 m. ca.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks of Canadian Shield

Instrument: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15g.

KIRKLAND LAKE

φ = 48°08'41" N. λ = 80°01'45" W. h = 310 m.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks (Timiskaming Tuff)

Instrument: Sprengnether Vertical, short-period, designated No. 1130, galvanometric registration on photographic paper, paper speed 60 mm. per min.

DETERMINED CONSTANTS

INSTRUMENT	Ts	Tg	V	ε	DISPLACEMENT FOR 1" ARC TILT
17 (Ottawa)	12.0		300	20:1	50 mm.
23 (Ottawa)	12.0		300	20:1	50 mm.
BS (Ottawa)	1.0	0.1			
BL (Ottawa)	1.0	48			
HN (Halifax)	5.0		125	20:1	
HE (Halifax)	5.0		125	20:1	
SA (Shawinigan)	1.0		2200		
SF (Seven Falls)	1.0		2200		
SM (Seven Falls)	12.0		300	20:1	50 mm.
S1130 (Kirkland Lake)	1.4	1.4			

NOTE:- Universal Time used throughout

		Sn	17 56 10	[illegible]
	KL	eSn	17 57.1	H = 17:54:41.5
		iS_2	17 57 34	
6	KL	eP	19 02 03	Aftershock of Kurile quake
	O	eP	19 02 25	H = 18:50:27
	SH	eP	19 02 26	
		eS	19 12 18	

SEISMOLOGICAL SERVICE OF CANADA
Eastern Division
DOMINION OBSERVATORY, OTTAWA

STATION:

O - Ottawa
H - Halifax
SF - Seven Falls
SH - Shawinigan Falls
KL - Kirkland Lake

November, 1951 No. 43

DATE	STN.	PHASE	h m s	REMARKS
2	O	Pz	22 07 45	USCGS: 44° N., 45° E.
		S	22 17 36	H = 21:55:52
		L	22 38.5	
4	O	eZ	11 28 36	
6	KL	eP	15 08.8	Foreshock of next quake
	O	P	15 09 13	H = 14:57:15
		S	15 19 06	
		L	15 37.3	
	SH	eP	15 09 15	
6	KL	e	16 51 40	May be microseism
		iP	16 51 43	Compression
		F	18.0	
	O	P	16 52 04	Δ = 8650
		i	16 52 07	USCGS: 47 ° N., 154° E.
		PP	16 55 09	Kurile Islands
		PPP	16 56 58	H = 16:40:06
		S	17 01 54	
		ScS	17 02 20	
		SS	17 07 12	
		SSS	17 10.6	
	SH	eP	16 52 05	
		i	16 52 09	
		PP	16 55 04	
		S	17 01 59	
		SS	17 07 07	
		SSS	17 11 02	
	SF	eP	16 52 10	
		S	17 02 00	
		G	17 13.6	
	H	eP	16 52 36	
		S	17 02 28	
		e	17 02.8	
		PPS	17 03.8	
		SS	17 07.9	
		L	18 18,8	
6	O	Pn	17 55 11.5	Δ = 195
		i	17 55 16	H = 17:54:41.5
		Sn	17 55 33	
	SH	Pn	17 55 12	Δ = 200 km.
		i	17 55 15.5	H = 17:54:41.5
		Sn	17 55 34	
	SF	Pn	17 55 31.5	Δ = 370 km.
		i	17 56 03.5	Δ and H based on Alvey's Tables.
		Sn	17 56 10	USCGS: 45° N., 73°6 W.
	KL	eSn	17 57.1	H = 17:54:41.5
		iS_2	17 57 34	
6	KL	eP	19 02 03	Aftershock of Kurile quake
	O	eP	19 02 25	H = 18:50:27
	SH	eP	19 02 26	
		eS	19 12 18	

DATE	STN.	PHASE	h m s	REMARKS
6	O	i	22 32 10	
	KL	e	22 32 28	
8	KL	eP	13 53 51	Probably compression
		eL	14 12.5	USC : 54 1/2° N., 160° W.
		F	15.0	Off south coast of
	O	P	13 54 18	Alaska peninsula
		Remainder of record		H = 13:45:09
	lost in changing of sheet			
	H	PP	13 57 36	
		S	14 03 24	
8	O	Sn	19 54.6	
		LNE	20 08.5	
9	O	P	22 18 40	Δ = 7550 km.
		PP	22 21 09	USCGS: 22° S., 68° W.
		S	22 27 26	Chile-Bolivia border
		e	22 27 32	H = 22:07:53
		SS	22 31 46	
		SSS	22 34 40	
	KL	iP	22 19 00 d	
		i	22 19 31.5 d	
		i	22 19 54 d	
	SF	e	22 18 53	
	H	S	22 27 16	
		e	22 34.8	
11	KL	eP	12 27 20	USCGS: 47° N., 152° E.
	O	eP	12 27 36	Kurile Islands
				H = 12:15:28
12	KL	eP	08 21 08 c	
	O	eP_Z	08 21 26	Δ = 8600
		PPP	08 26 22	
		S	08 31 22	USCGS: 47° N., 154° E.
		L	08 45.0	Kurile Islands
	SH	eP	08 21 31	H = 08:09:26
		S	08 31 21	
	H	eS	08 32.3	
		e	08 37.8	
12	O	e	09 33 18	
12	O	iP	09 42 47	USCGS: 17° N., 61° W.
	KL	iP	09 43 21 c	Leeward Islands
	SH	eP	09 42 49	H = 09:36:36
				d = 100 km.
12	KL	eP	19 33 05 c	
	O	eP	19 33 27	
	SH	eP	19 33 37	
14	O	eP_Z	08 46 47	
		L	08 57.5	
15	KL	e	08 36.8	Kamchatka foreshock
	O	eP_Z	08 37 07	H = 08:25:53
		S	08 46 06	
		SS	08 51 07	
		e	08 54.8	
		L	08 57.5	
15	KL	e	10 42.7	Kamchatka foreshock
	O	P	10 42 50	H = 10:31:33

DATE	STN.	PHASE	h m s	REMARKS
15	KL	e	15 13.9	
		e	15 14 01	
	0	e	15 14 14	
		e	15 23 25	
15	KL	e	19 53.2	USCGS: 52 1/2 N., 160 1/2 E.
	0	P	19 53 38	East coast of Kamchatka
		PP	19 56 20	H = 19:42:12
		PPP	19 58 00	d = 60 km.
		S	20 02 40	
		SSS	20 10 52	
15	0	P	22 10 34	Kamchatka aftershock
				H = 21:59:18
16	KL	eP	15 14 15	Kamchatka aftershock
	0	eP	15 14 40	H = 15:03:26
16	KL	eP	15 31.6	Kamchatka aftershock
	0	eP	15 32 05	H = 15:20:44
16	0	Pn	17 30 03.5	Δ = 145 km.
		i	17 30 05.5	H = 17:29:40
		Sn	17 30 20.5	
16	0	P'	17 52 03	USCGS: 29 1/2 S., 178 W.
				h = 60 km.
				H = 17:33:22
17	KL	eP	18 13 14	
18	0	ePP	09 44 57	Foreshock of Tibet quake
18	KL	eP	09 49 41	USCGS: 31° N., 90 1/2° E.
		e	09 53 33	Eastern Tibet
		i	09 53 49	H = 09:35:43
		F	11 20	
	0	P	09 49 53	
		PP	09 54 03	
		PPP	09 56 07	
		SKS	10 00.5	
		PS	10 03 00	
		PPS	10 03 55	
		SS	10 08 50	
		SSS	10 12.6	
		G	10 17.5	
	SH	P	09 49 50	
		PP	09 53 55	
		SKS	10 00 24	
		PS	10 02 56	
		SS	10 08 23	
		SSS	10 11.8	
	SF	eP	09 49 53	
	H	PP	09 53 56	
		SKS	10 00 22	
		PS	10 02 53	
		SS	10 08.4	
		G	10 16.3	
22	0	P'	02 23 48	USCGS: 5° S., 151 1/2° E.
		SKKS	02 32.6	New Britain
		PS	02 35 10	H = 02:04:49
		SS	02 41.8	

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DATE	STN.	PHASE	h m s	REMARKS
24	O	P	19 04 55	USCGS: 23° N., 121 1/2° E.
		e	19 06 26	East coast of Formosa
		PP	19 09 30	H = 18:50:19
		SKS	19 15 33	
		SKKS	19 16 10	
		S	19 16 36	
		PS	19 18.6	
		PPS	19 19.3	
		SS	19 24.0	
	KL	e	19 09.0	
		F	20 30	
	SH	e	19 09 13	
		SKS	19 14 50	
		SKKS	19 15 59	
		PPS	19 18 41	
	SF	e	19 07 17	
		SKKS	19 16 51	
		e	19 17 43	
		PPS	19 20 04	
		SS	19 24 42	
		SSS	19 28 53	
		G	19 34.5	
		L	19 38.0	
	H	PPP	19 12 02	
		SKS	19 15 29	
		SKKS	19 16 25	
		PS	19 19 16	
		SS	19 25.6	
		SSS	19 29.9	
		G	19 35.6	
26	O	SKS	07 03.5	
		PS	07 06.5	
		SSS	07 15.5	
	SF	e	07 12 44	
		L	07 23.7	
27	O	P'	16 35 17	USCGS: 34 1/2° S., 18°
				H = 16:16:29
28	O	i	17 19 25	
		i	17 22 40	
		F	17 26.5	
	KL	e	17 19 15	
		e	17 22 25	
	SH	e	17 18 56	
		e	17 21 49	
		e	17 26 53	
		e	17 18 41	
		e	17 21 30	
		F	17 26 37	
29	O	P'	05 04 44	USCGS: 1° N., 121° E.
		i	05 05 22	Northern Celebes Islands
		PKS	05 08 15	H = 04:45:44
	KL	iP'	05 04 49 d	
		i	05 05 14	
	SH	eP'	05 04 55	
		PKS	05 08 14	

November, 1951 No. 47

DATE	STN.	PHASE	h	m	s	REMARKS
30	O	P	07	57	30	
		S	08	02	.5	
	KL	eP	07	58	10	
	SF	eP	07	57	14	
		PP	07	58	13	
		S	08	01	58	
		SS	08	03	28	
		L	08	05	.0	

J. H. Hodgson
J. L. O'Connor

SEISMOLOGICAL SERVICE OF CANADA
Eastern Division
DOMINION OBSERVATORY, OTTAWA

STATIONS:

O - Ottawa
H - Halifax
SF - Seven Falls
SH - Shawinigan Falls
KL - Kirkland Lake

December, 1951 No. 48

DATE	STN.	PHASE	h m s	REMARKS
4	O	eP	08 56 39 d	USCGS: 600 miles southeast of Greenland
		L	09 04.6	H = 08:50:50
	KL	eP	08 56 47	
	SH	eP	08 56 15	
	SF	eP	08 56 02	
		PP	08 56 40	
		S	09 00 19	
		L	09 03.2	
6	O	eP	14 36 53	USCGS: 5 1/2° N., 77 1/2° W. Near west coast of Colombia
		S	14 43 00	H = 14:29:18
	KL	eP	14 37 16	
	SH	eP	14 37 03	
	SF	S	14 43 30	
		SS	14 46 28	
		SSS	14 47 13	
		L	14 49.6	
8	O	e	03 52 57	
8	KL	iP'	04 33 49	USCGS: 34° S., 56 1/2° E. 900 miles southeast of Madagascar
		F	06.7	h = 100 km.
	O	iP'	04 33 40	H = 04:14:20
		PP	04 37 00	
		PKS	04 37 20	
		e	04 39 39	
		PPP	04 39 51	
		SKS	04 40 37	
		SKKS	04 43 36	
		PS	04 47 20	
		PPS	04 49 40	
		SS	04 55 50	
		SSS	05 00 50	
		G	05 16.3	
	SH	eP'	04 33 44	
		PP	04 36 45	
		PKS	04 37 32	
		PPP	04 39 08	
		SKS	04 40 58	
		SKKS	04 43 07	
		PPS	04 49 43	
	SF	P'	04 33 34	
		PP	04 36 32	
		PKS	04 37 20	
		PPP	04 39 18	
		SKS	04 40 56	
		SKKS	04 42 48	
		SKKP	04 45 00	
		PPS	04 48 56	
		SS	04 55 11	
		SSS	04 59 56	

DATE	STN.	PHASE	h m s		REMARKS
8 (cont'd)	H	PP	04 36 10		
		PKS	04 37 08		
		SKS	04 41 02		
		e	04 44 20		
		PPS	04 48 09		
		SS	04 53 56		
		SSS	04 59 00		
8	KL	e	15 25 12		
	SH	e	15 26 59		
8	KL	e	20 11 47		
	SH	e	20 11 24		
		e	20 14 05		
9	KL	e	01 16 10		
12	O	eP	01 44 01		USCGS: 17° N., 94 1/2° W.
		pP	01 44 22		h = 100 km.
		PP	01 45 10		Oaxaca, Mexico
		S	01 49 12		H = 01:37:34
		e	01 49 50		
		SS	01 50 56		
		SSS	01 51 44		
	KL	iP	01 44 08	c	
		i	01 44 10	c	
		i	01 44 12	c	
		F	02 15		
	SH	eP	01 44 20		
		pP	01 44 41		
		PP	01 45 36		
		PcP	01 46 44		
		S	01 49 44		
		sS	01 50 15		
	SF	P	01 44 30		
		pP	01 44 54		
		sP	01 45 10		
		PP	01 45 59		
		PcP	01 46 50		
		S	01 50 11		
		sS	01 50 40		
	H	pP	01 45 11		
		PP	01 46 24		
		S	01 50 32		
		sS	01 51 13		
		G	01 53.2		
17	O	iP	17 58 23	c	USCGS: 11° N., 86 1/2° W.
	KL	iP	17 58 39	c	h = 100 km.
	SH	eP	17 58 38		H = 17:51:34
	SF	eP	17 58 47		
21	KL	i	20 03 42	)	Rockbursts, Lake Shore Mines, Kirkland Lake. Probably other large bursts occurred in addition, their record lost in the off scale section of those listed. The several bursts have caused a record too complex to permit interpretation
		i	20 04 52	)	
		i	20 06 07	)	
	O	iPn	20 04 44		

DATE	STN.	PHASE	h m s	REMARKS
21	SH	e	20 04 58.5	
		e	20 05 01.5	
		e	20 05 39	
		e	20 05 48	
		e	20 05 58	
		e	20 06 14	
		e	20 07 27	
	SF	e	20 05 14	
		e	20 05 16.5	
		e	20 06 24	
		e	20 06 56	
23	O	eP	07 03 40	USCGS: 15° N., 61° W.
	SH	eP	07 03 43	Windward Islands
	SF	eP	07 03 44	H = 06:57:20
				h = 100 km.
24	O	i	05 58 34	USCGS: Off coast of Mexico
		S	06 03 56	H = 05 50 41
		e	06 06.6	
	SF	e	06 08 01	
		L	06 12.8	
25	O	eP	06 08 53	
	KL	eP	06 09 02 d	
25	KL	e	14 39 51	
25	O	iP'	15 50 50 c	
25	O	eP	16 10 11 d	USCGS: 49° N., 155 1/2° E.
		i	16 10 25	Kurile Islands
	KL	eP	16 10 01	H = 15:58:28
	SH	eP	16 10 14	h = 60 km.
	SF	eP	16 10 17	
		S	16 19 55	
25	O	e	22 23 22	
	KL	e	22 23 24	
26	KL	iP	00 53 26 c	USCGS: 32°.6 N., 118°.7 W.
	O	iP	00 53 47 c	Off coast of southern
		PP	00 55 07	California
		PcP	00 56 19	H = 00:46:49
		L	01 05 14	
	SH	eP	00 54 06	
	SF	iP	00 54 18	
		PP	00 55 46	
		L	01 07	
	H	L	01 09 52	
26	KL	eP	16 44 04	USCGS: Northern Kansu Province,
	O	iP	16 44 15 c	China
	SH	eP	16 44 08	H = 16:30:51
26	O	eP	17 05 13	USCGS: 49 1/2° N., 156° E.
		i	17 05 18	H = 16:53:23
		e	17 15.0	
	SH	eP	17 05 07	
	SF	eP	17 05 22	
		e	17 14 53	
26	O	eP	17 34 11	USCGS: 50 1/2°N., 156° E.
	SH	eP	17 34 13	H = 17:22:20

DATE	STN.	PHASE	h m s	REMARKS
27	O	eP	02 33 44	
28	O	iP	09 27 11 c	USCGS: 17° N., 98 1/2° W.
		i	09 27 20	Guerrero, Mexico
		PP	09 28 29	H = 09:20:25
		S	09 32 41	
		e	09 35 02	
		e	09 37.5	
	KL	iP	09 27 15 c	
		F	10 15	
	SH	eP	09 27 30	
		PP	09 28 51	
		PcP	09 29 59	
		S	09 33 01	
		e	09 35 26	
		e	09 36 07	
	SF	eP	09 27 42	
		PP	09 29 16	
		PPP	09 29 45	
		PcP	09 30 07	
		e	09 33 15	
		S	09 33 42	
		e	09 36 03	
		e	09 36 35	
		e	09 38 07	
		L	09 39.5	
	H	eP	09 28 12	
		PP	09 29 52	
		PPP	09 30 18	
		S	09 34 34	
		SS	09 37 36	
		SSS	09 38 20	
		L	09 39.3	
28	O	eP	16 07 45	USCGS: 10° S., 71 1/2° W.
	KL	iP	16 08 05 c	h = 650 km.
		e	16 08 48	H = 15:59:06
	SH	eP	16 07 52	
	SF	eP	16 07 58	
28	O	eP_1	22 33 16.5	Δ = 90 km.
		P_2	22 33 17.5	H = 22:33:01
		S_1	22 33 28.5	
		S_2	22 33 32,5	
	SH	e	22 33 44.5	
	SF	e	22 34 26	
29	O	iP	13 00 27 d	
	SH	eP	13 00 54	
	SF	eP	13 00 56	
30	KL	e	17 49 50	
	O	iP	17 50 22 c	
		e	18 00 38	
		L	18 04.3	
	SH	eP	17 50 26	
	SF	eP	17 50 29	
		PP	17 52 21	
		S	17 57 02	
		SS	18 00 24	
		L	18 03 22	

December, 1951

DATE	STN.	PHASE	h	m	s	REMARKS
30	O	i	18	34	45	
30	O	eP	22	30	03	USCGS: Foreshock of next quake
		e	22	33	20	H = 22:17:51
		S	22	40	16	
	KL	eP	22	30	10	
30	O	eP	22	35	19	USCGS: 28° S., 114 1/2° W.
		S	22	45	20	Pacific Ocean, West of
	KL	eP	22	35	22	Easter Island
	SH	eP	22	35	28	H = 22:23:05
	SF	eP	22	35	38	
		S	22	46	04	
	H	e	22	46	20	
31	O	iP	20	12	30 d	
	KL	eP	20	12	43	
31	O	iP_1	20	16	11.5	
		S_1	20	16	24.5	
		e	20	16	29	
	SH	e	20	16	36	
	SF	e	20	17	17	

J. H. Hodgson
J. L. O'Connor

SEISMOLOGICAL BULLETINS RECEIVED

September, 1951

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

STATION	BULLETINS
Egypt	June, 1951
Richmond	July, 1951
Malaga	November, December, 1950
Toledo	May, June, 1951
Pasadena	September - December, 1949
Beograd	July, 1951
Toledo	June, July, 1951
Istanbul	July, 1951
Wellington	April, May, 1951
Santa Clara	August, 1951
Tacubaya	July, 1951
Reykjavik	1944, 1950
Beograd	May, 1951
Apia	April - June, 1951
USCGS	January - March, 1946
Japan	January, February, 1951
Saint Louis and Auxiliary Stations	January 15, 18, 19, 22, 23, 24, 29, 30, February 9, 10, 18, 21, March 9
Weston	July, August, 1951
Pasadena Locals	April-June, 1951
South Africa	July, 1951
Athens	June, 1951
Eger	April - June, 1951
Prague	June, 1951
Stara Dala	June, 1951
Hautes Tatra	June, 1951
Malaga	January, February, 1951
Saint Louis and Auxiliary Station	March 19, 24, 31, April 8, 10, 12, 13
India	August, October - December, 1950

October, 1951

Tortosa	August, 1951
Perth	April - June, 1951
De Bilt	August, 1951
Strasbourg	August 1 - September 20, 1951
Bureau Central	June, 1951
B.C.I.S.	April, 1951
Zurich	July, August, 1951
Wellington	June, 1951
Santa Clara	September, 1951
Richmond	August, 1951
Helwan	July, 1951
Columbia	September 20 - 28
Helsinki	April - June, 1951
Tacubaya	August, 1951
Columbia	October 3-14, 1951
Rome	July, 1951
Prague	July, 1951
Eger	July, 1951
Stara Dala	July, 1951
Hautes Tatra	July, 1951
Tortosa	September, 1951
Istanbul	August, 1951
Toledo	July, August, 1951
Saint Louis and Auxiliary Stations	February 12, 13, 17, 19, March 2, April 14
Cleveland	March-August, 1951
Toledo	April-June, 1951
South Africa	August, 1951

SEISMOLOGICAL BULLETINS RECEIVED

November, 1951

Japan	March-May, 1951
De Bilt	September, 1951
Richmond	September, 1951
Tananarive	October-December, 1950
Ksara	July-September, 1951
Trieste	January-April, 1951
Rome	August, 1951
Santa Clara	October, 1951
Weston	September, 1951
Tacubaya	September, 1951
Columbia	October 15-24, 1951
Budapest	May, June, July, 1951
Kalocsa	April-June, 1951
La Plata	1949
Beograd	August, 1951
USCGS	1948
Bureau Central	July, August, 1951
B.C.I.S.	May, June, 1951
Strasbourg	September 21-20, 1951, October 1-10, 1951
Helwan	August, 1951
Hautes Tatra	August, 1951
Stara Dala	August, 1951
Eger	August, 1951
Prague	August, 1951
Wellington	July, 1951
Helsinki	July-September, 1951
Pennsylvania	January-August, 1950
Athens	July-September, 1951
South Africa	September, 1951
USCGS	April-June, 1946, April-June, 1949
Beograd	September, 1951
Columbia	November 2 - 14
Budapest	1949
Zurich	September, October, 1951
Athens	October, 1951
Wellington	July, 1951
Djakarta	July-September, 1950
Harvard	January-June, 1951
Toledo	August-September, 1951

December, 1951

Algeria	June, July, 1951
Nanking	July-December, 1950, January-June, 1951
Rome	September, 1951
De Bilt	October, 1951
Istanbul	September, 1951
Beograd	October, 1951
Santa Clara	November, 1951
Lisbon	January-August, 1951
Columbia	November, 1951
Saint Louis and Auxiliary Stations	Preliminaries - March, April, May, 1951
Dublin	July 1 to September 30, 1951
Tacubaya	October, 1951
Richmond	October, 1951
India	September, 1950
Algeria	August, 1951
Tamanrasset	August, 1951
Hautes Tatra	September, 1951
Stara Dala	September, 1951

SEISMOLOGICAL SERVICE OF CANADA
DOMINION OBSERVATORY, OTTAWA

C. S. Beals, Dominion Astronomer
Ernest A. Hodgson, Chief, Seismological Division

S T A T I O N S

OTTAWA

ϕ = 45°23'38" N. λ = 75°42'57" W. h = 83m.

Time correction within 0.10s.

Foundation: boulder clay over limestone

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

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

HALIFAX

Dalhousie University

ϕ = 44°38' N. λ = 63°36' W. h = 46m.

Time correction from recorded radio time signals

Foundation: Carbonaceous slate

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

SEVEN FALLS

Quebec Power Company

ϕ = 47°07!4 N. λ = 70°49!6 W. h = 232m. ca.

Time correction from recorded radio time signals

Foundation: Solid granite of Canadian Shield

Instruments: Wood-Anderson and Milne-Shaw, both EW components, designated SF and SM, respectively, each with photographic registration, magnetic damping, SF a paper speed of 60 mm. per min. and mass 15g., SM a paper speed of 8 mm. per min. and mass 1 lb.

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

SHAWINIGAN FALLS

Shawinigan Water and Power Company
φ = 46°33'1 N. λ = 72°45'8 W. h = 60 m. ca.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks of Canadian Shield

Instrument: Wood-Anderson NS component, designated SA, photographic registration, magnetic damping, paper speed of 60 mm. per min., mass 15g.

KIRKLAND LAKE

φ = 48°08'41" N. λ = 80°01'45" W. h = 310 m.

Time correction from recorded radio time signals

Foundation: Precambrian basement rocks (Timiskaming Tuff)

Instrument: Sprengnether Vertical, short-period, designated No. 1130, galvanometric registration on photographic paper, paper speed 60 mm. per min.

DETERMINED CONSTANTS

INSTRUMENT	Ts	Tg	V	ε	DISPLACEMENT FOR 1" ARC TILT
17 (Ottawa)	12.0		300	20:1	50 mm.
23 (Ottawa)	12.0		300	20:1	50 mm.
BS (Ottawa)	1.0	0.1			
BL (Ottawa)	1.0	48			
HN (Halifax)	5.0		125	20:1	
HE (Halifax)	5.0		125	20:1	
SA (Shawinigan)	1.0		2200		
SF (Seven Falls)	1.0		2200		
SM (Seven Falls)	12.0		300	20:1	50 mm.
S1130 (Kirkland Lake)	1.4	1.4			

NOTE:- Universal Time used throughout

SEISMOLOGICAL BULLETINS RECEIVED

December, 1951 (cont'd)

Eger	October, 1951
Prague	September, 1951
Pasadena	Locals July-September, 1951, January-March, 1951
Weston	October, 1951
Helwan	September, 1951
Columbia	November 30-December 17, 1951
Bureau Central	September, 1951
B.C.I.S.	July, 1951
Strasbourg	October 21-November 30, 1951
Tortosa	October, 1951
Malaga	March, April, 1951
Istanbul	October, 1951
Lisbon	July-September, 1951
Barcelona	1949
De Bilt	November, 1951