H A R V A R D U N I V E R S I T Y
Division of Geological Sciences
Cambridge, Massachusetts, U.S.A.

SEISMOGRAPH STATION--Oak Ridge Observatory, Harvard, Mass.

Latitude	42° 30' 26" North ± 1"
Longitude	71° 33' 45" West ± 15"
Height	180 meters
Foundation	Micaceous schist

Time: Mean Greenwich, midnight to midnight.
E. Howard pendulum clock corrected
by radio time signals.
Accuracy: ± .05 sec.

BULLETIN NO. 1

1933 March 30 to 1933 December 31
by L. Don Leet, seismologist in charge

The new Oak Ridge Observatory of this station is described in the Bulletin of the Seismological Society of America, Vol. 24, No. 1, 1934.

INSTRUMENTS--FIXED CONSTANTS

Instrument	Symbol	Registration	Damping	Paper Speed	Mass
Milne-Shaw 43	NE-SW	photographic	magnetic	15 mm per min	1 lb
Milne-Shaw 44	NW-SE	photographic	magnetic	15 mm per min	1 lb
Wood-Anderson[1]	N-S	photographic	magnetic	15 mm per min	15 g
Wood-Anderson[1]	E-W	photographic	magnetic	15 mm per min	15 g
Benioff (Moll)[2]	Z	galvanometric	magnetic	15 mm per min	112.7 kg
Benioff (L-N)[2]	Z_{13}	galvanometric	magnetic	15 mm per min	112.7 kg

[1] See Bulletin Seis. Soc. Am., Vol. 15, No. 1, 1925.
[2] See Bulletin Seis. Soc. Am., Vol. 22, No. 2, 1932.

INSTRUMENTS--NORMAL OPERATING CONSTANTS

Instrument	T_o	T_g	V	ε	Displacement for 1" arc tilt	Displacement for accel'n = .00001g
NE-SW	12		250	20:1	44 mm	
NW-SE	12		250	20:1	44 mm	
N-S	1		2800	20:1	18 mm	
E-W	1		2800	20:1	18 mm	
Z	.85	.2		20:1		60 to 80 mm
Z_{13}	.85	13.3		20:1		60 to 80 mm

TABLES USED: J. B. Macelwane's "Preliminary Table of Observed Travel Times of Earthquake Waves for Distances Between 10° and 180° Applicable Only to Normal Earthquakes," St. Louis University, 1933 November.

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PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 April 23						
	e 07-50.4					
L	e 08-01 ca					
April 27						
H = 02-36-22	$\Delta = 42.9^{o} = 5325$ km. S-P = 7-02				USCGS gives O = 02-36-10 $\varphi = 61^{o}$ N $\lambda = 150^{o}$ W	
P			i 02-44-56			
PR_1			i 46-48			
S	i 02-51-54					
	e 53-56					
	e 02-55-36					
L	e 57-08		i 03-01-38			
	e 06-26-48					
	e 28-52					
	e 38.3					
	e 07-38.3	e 07-40.6				
	e 08-03.9	e 08-07.3				
	e 09-16.8					
	e 11-27.9					
L	e 30.3	e 11-33.3				
	e 12-14-10	e 12-14-34				
	e 15-36					
	e 17-48					
	e 19-54					
			e 21-41			
L	e 25-36		e 30-36			
	e 14-31-45					
	e 34-47					
		e 14-35-44				
L	e 36-50		e 39-10			
	e 20-02-18					
		e 20-03-34				
	e 04-18					
L			e 05-48			
L	e 21-22-43	e 21-25-55				
L	e 22-15-07	e 22-19-46				
April 28						
L	e 02-25-43	e 02-28-56				
L	e 03-17-40	e 03-20-40				
L	e 05-45-54					
L	e 07-02-50	e 07-03-42				
April 30						
L	e 04-09 ca	absolute time unknown				
L	e 19-11.5 ca	"	"	"		
May 1						
L	e 10-29.5 ca	"	"	"		
L	e 19-25 ca	"	"	"		

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 May 3						
	e 12-53.5 ca	absolute time unknown				
L	e 59 ca	" " "				
May 5		St. Louis gives H = 04-14-10				
	e 04-28-02					
	e 30-34					
L	e 34.5	e 04-35.5	e 04-36.0			
May 6				USCGS gives 0 = 05-33.3		
H = 05-33-42	Δ = 37.3° = 4140 km.			φ = 58° N		
	S-P = 5-56			λ = 84° W		
P	e 05-40-55	e 05-40-55	e 05-40-55			
PR_1	i 42-28	i 42-25	e 42-21			
PR_2		i 44				
	e? 46-35					
S		i 46-51	e 46-51			
	e 48-53	e 48-53	e 48-57			
SR_2	e 49-07	i 49-27				
		i 50-51				
	e 20-43.8					
May 8				USCGS gives 0 = 10-33.7		
H = 10-33-58	Δ = 33.9° = 3770 km.			φ = 17° N		
	S-P = 5-32			λ = 100° W		
				St. Louis: probable depth 100 km.		
P	i 10-40-44		i 10-40-42			
PR_1	e 41-54	e 10-41-54	e 42-36			
S	e 46-16	e 46-18	e 46-14			
	e 49-38					
L	e 54-46	e 54.0	e 54-22			
L	i 57-42	i 58-06	i 57-54			
		St. Louis gives H = 18-01-16				
	e 18-09-35					
	e 14-31					
		e 18-17-45				
L	e 22-33	21-27	e 18-21-35			
		e 23-47				
L	i 25-41	i 25-39				
May 9						
L	e 01-19-36	e 01-23-00				
	e 02-47-28					
	e 56-02	e 02-54-58				
L	i 58-44	e 58-36				
L	e 10-05-27	trace				
May 11						
H = 19-09-54	Δ = 67° = 7445 km.			Ottawa gives 0 = 19-09.8		
	S-P = 8-58			Δ = 7640 km		
P	i 19-20-43	e 19-20-53				
S	e 29-41	e 29-43				
SR_1	e 33-55					
L	e 45.5	e 42		e 19-49.0		

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 May 12	e 20-36.5	e 20-37.5				
May 16	e 01-56-16					
		e 02-07-00				
L	e 02-11-26					
L		e 16-00				
L	e 04-47-26					
L		e 04-50-24				
L	e 10-08-40					
L		e 10-11-42				
L	e 12-05-50	e 12-06-00				
		e 08-44				
May 19						
L	e 12-05-48					
H = 17-58-24	$\Delta = 65.5^{\circ} = 7275$ km. S-P = 8-51	USCGS: O = 17-58-00 $\varphi = 2^{\circ}$S $\lambda = 15^{\circ}$ W				
P		i 18-09-03	i 18-09-03	i 18-09-03		
PR_2		e 13-38				
S	e 18-17-54	i 17-54	i 17-54	e 17-54		
SR_1		e 21-42				
SR_2	e 25-18					
L	e 28-00	e 28-00				
May 20	e 05-05-30	e 05-05-32				
	e 07-16	e 07-06				
	e 13-26					
	e 18-06					
		e 20-30				
	e 30-44	e 31-08				
L	e 37.0	e 37-42				
May 21	e 04-58-10	trace				
L	e 09-15-18	trace				
May 22						
L	e 12-19.0	e 12-18.8	trace	trace		
May 23	e 07-29.5	e 07-29.3	trace	trace		
May 29						
L	e 11-11-32	e 11-11-40				
May 31 19h to June 2 16h	no records					
June 3						
L	e 17-58.5	e 18-01.0				
June 4						
L	e 13-43-46	trace				
L	e 14-26-54	e 14-27-12	trace			

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
June 6						
L	e 01-41 ca					
		e 02-58-33				
	e 03-05-31	e 03-05-51				
	e 11-45					
		e 20-17				
L	24-45	e 25-25	trace	trace		
June 7						
		e 06-28-11				
L	e 06-50 ca	e 49.8				
	e 12-12-47	e 12-12-47				
L	e 35-39	e 36-27	trace			
June 8						
	e 18-23-32					
L	e 30-40					
		St. Louis: H = 18-10-48 "somewhat deep"		$\varphi = 40^{\circ}$ N $\lambda = 144^{\circ}$ E		
	e 18-34-10					
	e 32	e 18-34-40				
	e 36-39					
	e 37-28					
L	e 57 ca	e 55.3	trace	trace		
June 10		St. Louis: H = 11-27-05		$\varphi = 17^{\circ}$ N $\lambda = 85^{\circ}$ W		
		e 11-32-41				
	e 11-37-42	e 37-31				
L	e 41-05	e 40-51	trace	trace		
		St. Louis: H = 12-07-16		$\varphi = 64^{\circ}$ N $\lambda = 25^{\circ}$ W		
	e 12-19-21	e 12-19-15				
L	e 21-47	e 24-43	trace	trace		
June 11						
	e 08-52-40	e 08-52-42	e 08-52-41	no record		
		e 53-20	e 53-19			
L	e 14-11-11	trace				
L	e 15-55-17	trace				
June 12						
	no	e 15-48-30	no time			
L	record	i 52-40	marks	trace		
June 13						
	"	e 14-36-49				
		e 41-37	"			
	"	e 16-31-31	"	i 16-31-55		
		e 20-57-33				
	"	e 21-21-27	"	trace		

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 June 13				USCGS:	0 = 22-19.0	
H = 22-19-41		Δ = 49.6° = 5500 km.			φ = 61° N	
		S-P = 7-13			λ = 151° W	
P		e 22-28-30		e 22-28-39		
PR_1		e 30-31				
S	no	e 35-43	no	e 35-43		
SR_1		e 39-09				
		e 43-00	time			
L	record	e 44-25		e -44-25		
M		i 49-09	marks			
June 15						
		e 22-51-30				
L	trace	e 23-03-34		trace		
June 16						
	e 01-10-06					
L	e 15-26	e 01-15-46	e 01-15-20	trace		
June 18						
	e 04-13-08	e 04-13-08				
	e 19-08	e 19-04				
		e 20-06				
	e 22-08	e 22-17				
		e 23-15				
	e 28-20	e 28-12				
	e 39-00	e 38-56				
L	e 43-20	e 43-22	trace	e 04-44 ca		
June 18						
L	e 07-22.5	e 07-23-06				
H = 21-37-53		Δ = 90.5° = 10,055 km.		USCGS:	0 = 21-37.6	
		S-P = 10-57			φ = 38° N	
	St. Louis: probable depth 40-50 km.				λ = 142° E Off Japan	
P	e 21-50-54	i 21-50-53	e 21-50-53			
PR_1	e 54-42	e 54-36				
ScPcS	i 22-01-26	i 22-01-26		e 22-01-46		
S	i 52	i 50				
PS		i 02-58				
SR_2	i 15-20	e 14-50		e 15-16		
L	e 17-00	e 17-54				
L		e 23-48				
June 19						
	e 19-03-36	e 19-03-36				
		e 06-18				
L	e 12 ca	e 11-32	trace	trace		
June 20						
L	e 17-28-08	trace				
June 24		St. Louis: H = 21-54-44			φ = 4° S	
					λ = 101° E	
	e 22-14-08	e 22-14-44	e 22-14-14	e 22-14-22		
	e 17-52	e 18-32				
	e 22-36	e 22-36				
Q?	e 36.0					
L	e 53.0	i 55-42	e 55-42	e 54-36		

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 June 25		USCGS: 0 = 20-45.5		$\varphi = 39^{o}$ N $\lambda = 119^{o}$ W		
S	e 20-58-06	e 20-59-10				
L	e 21-02.5	e 21-02.5	e 21-02.5	e 21-03.5		
June 26						
		e 06-56.0				
June 27						
L	no	e 15-56.0				
June 28	record					
		e 06-21-48				
		e 10-25.0				
H = 23-35-23		$\Delta = 56.3^{o}$ = 6250 km. S-P = 8-04		USCGS: 0 = 23-35.0 $\varphi = 53^{o}$ N $\lambda = 167^{o}$ W		
		St. Louis: Probable depth = 50-60 km.				
P		e 23-45-00	e 23-45-00			
S	e 23-53-04					
L	e 00-03.0	e 00-07.0	trace	trace		
June 29						
		e 02-50-32				
L	trace	e 03-02 ca				
L	trace	e 17-11 ca				
		e 18-41.0				
L	trace	e 45.0				
July 8						
L	e 22-52.0	trace				
July 9						
H = 01-30-14		$\Delta = 83.8^{o}$ = 9300 km. S-P = 10-25		USCGS: 0 = 01-30.2 $\varphi = 45^{o}$ N $\lambda = 150^{o}$ E		
P		e 01-42-41				
S	e 01-53-06	e 53-06				
L	e 02-09-08	e 02-09.0	trace	trace		
H = 05-34-32		$\Delta = 36.4^{o}$ = 4040 km. S-P = 7-06		USCGS: 0 = 05-34.6 $\varphi = 17^{o}$ N $\lambda = 105^{o}$ W		
P	e 05-41-38					
PR_1	e 43-00					
S	e 47-32	e 05-47-28				
L	e 53.2	e 54-48	trace	trace		
				USCGS: 0 = 09-28.1 $\varphi = 45^{o}$ N $\lambda = 150^{o}$ E		
S	e 09-51-04	no time				
L	e 10-07.2	marks	trace	trace		
L	e 12-06.0	"				

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 July 9				USCGS:	0 = 12-30.5	
H = 12-30-46		Δ = 84.4° = 9380 km.			φ = 45°N	
		S-P = 10-28			λ = 150° E	
P	e 12-43-16	no	traco	traco		
S	i 53-44	time	"	"		
L	e 13-02.0	marks	"	"		
S?	e 16-30-08					
L	e 46.0					
L	e 22-57.5					
July 10						
S?	e 00-45-36					
L	e 01-08.5					
H = 03-21-55		Δ = 36.9° = 4100 km.		USCGS:	0 = 03-21.5	
		S-P = 6-00			φ = 17°N	
					λ = 104° W	
P	e 03-29-05			e 03-29-06		
	i 30-38	no	traco	i 30-32		
	e 34-09	time				
S	i 35-05	marks				
L	e 40-24		e 03-42-06			
M	i 45-40			i 45-44		
L	e 09-00.5					
		St. Louis: H = 10-46-03				
	e 11-02-08					
	e 05-48					
	e 13-32					
L	e 42 ca					
July 19		St. Louis: H = 05-06-37				
	e 05-15-46	e 05-15-38				
		e 20-21				
L	e 27.5	e 27.2				
H = 10-45-44		Δ = 63.6° = 7070 km.		USCGS:	0 = 10-45.5	
		S-P = 8-40			φ = 51°N	
					λ = 174° W	
P		e 10-56-10				
S	e 11-04-50					
		e 11-06-16				
	e 13-11	e 13-04				
L	e 17.5	e 22.0	traco	traco		
H = 13-32-31		Δ = 64° = 7100 km.		USCGS:	0 = 13-32.5	
		S-P = 8-42			φ = 51°N	
	St. Louis: estimated depth = 80 km.				λ = 174° W	
P		e 13-43-00				
S	e 13-51-42	e 51-42				
PS	e 52-38					
L	e 59.0	e 14-07.0	traco	traco		

PHASE	NE-SW	NW-SE	N-S	E-W

1933 July 19
H = 15-00-09 Δ = 63.1° = 7010 km. USCGS: 0 = 14-59.9
S-P = 8-38 φ = 51°N
λ = 174° W
St. Louis: estimated depth = 80 km.

P		i 15-10-32		
S	e 15-19-12	e 19-10		
PS	e 20-20			
L	e 26.0	e 34.0	trace	trace
	trace	e 23-37-39		

July 20
e 23-58-01
L e 00-02.0 e 00-05.0

July 21
L e 03-26.0 trace

	e 07-34-14	i 07-34-13		e 07-34-14
	e 38-25	i 38-25		e 38-24
			no	e 40
				e 47
L	e 42.0	e 44-15		
L	trace	e 20-21.0		
	e 20-24-30			
	e 25-24	e 20-25-20	record	e 20-25-22
	e 26-28			
		e 31-38		
	e 33-07			e 33-04
		e 34-32		
L	e 49.0			e 51.0
L		e 21-00.0		

July 22
H = 20-55-26 Δ = 60.5° = 6725 km. USCGS: 0 = 20-55.3
S-P = 8-22 φ = 52°N
λ = 169° W
St. Louis: probable depth 80-100 km.

P		i 21-05-31		e 21-05-31
PR_1	trace	e 07-53		
PR_2	trace	e 09-17		
S	i 21-13-53	i 13-53	e 21-13-53	e 13-53
PS	e 15-09			
SR_1	e 17-53	e 18-37	e 18 ca	
SR_2	e 20-53			
L	e 22 ca		e 23 ca	e 21 ca
L		e 25-11		
		i 28-51		

July 23
H = 04-13-21 Δ = 56.5° = 6275 km.
S-P = 7-56

P	e 04-22-59	e 04-22-59	
PR_2		e 25-11	
S	e 30-55	e 30-56	
PS	e 32-57		
SR_1	e 34-45	e 35-01	
SR_2	e 36-53		
		e 38-11	
L	e 44 ca	e 42 ca	

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 July 23						
		St. Louis: H = 09-37-56				
	e 09-43-29	e 09-43-25		trace	e 09-43-27	
	e 47-41	e 48-01				
		e 49-55				
L	e 50 ca	e 51-07		trace		
July 24	Preliminary phases lost in changing records. USCGS: O = 18-55.7 φ = 15° S λ = 170° W Δ = 108° ca = 12,000 km.					
L	e 19-46.0	e 19-49.0				
July 26						
		e 05-12-34				
S?	e 05-16-02	e 16-02				
L	e 20-18	e 20 ca				
July 30		St. Louis: H = 17-33-28				
	e 17-52-16					
L	e 18-09.0					
July 31		no				
L	e 09-24.0	time marks				
	H = 11-35-27	Δ = 24.9° = 2770 km.		S-P = 4-26		
P	e 11-41-11	no				
S	e 45-37	time				
L	e 48.5	marks		trace		
	e 15-41-49					
L	e 54.0					
August 1						
L	e 12-16.0					
August 7						
	e 03-09.8 }					
	e 15.7 }	Approximate times--no time correction				
	e 27.0 }					
August 11						
	e 09-13-23	no				
	e 22-47					
L	e 44.0	record				
August 12						
	trace	e 09-16-35				
August 13						
	e 09-50-28	e 09-50-28				
	e 10-02-55					
	e 08-49	e 10-08-49				
L	e 42.0	e 37.0				
August 15						
	e 00-51-45					
	e 53-04	e 00-53-08				
	e 57-24	e 57-22				
L	e 01-01.0	e 01-01.0				

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 August 15						
		e 03-22-21				
		e 30-11				
L	trace	e 52.0				
		e 20-09-09				
		e 13-19				
L	trace	e 17.0				
L	e 23-55.0	e 23-55.0				
August 20						
	e 12-15-37	e 12-15-33				
	e 22-11	e 22-21				
L	e 34.0	e 34.5				
August 25						
H = 07-50-28	$\Delta = 106^\circ = 11{,}800$ km.	S-P = 12-00		USCGS: O = 07-50.3	$\varphi = 31^\circ$ N	$\lambda = 101^\circ$ E
P	e 08-04-42	e 08-04-42	trace			
PR_1	e 09-00	e 09-00	e 08-09-08	e 08-09-24		
ScPcS	i 15-40	e 15-14	e 15-26			
ScPcPcS	i 16-12	i 16-12				
S	i 42	e 42		e 16-42		
PS	i 18-20	i 18-22	e 18-20			
PPS	e 19-14					
	e 23-06	e 22-48				
SR_1	e 24-12	e 24-40				
	e 30-14					
	e 31-38	e 31-46				
L	e 34-40	e 35-40	e 34.5	e 40 ca		
August 26						
L	e 20-30.5	e 20-35.5				
August 28						
H = 22-19-47	$\Delta = 103^\circ = 11{,}450$ km.	S-P = 11-48		USCGS: O = 22-19.8 ca "probably South Atlantic Ocean in region between Sandwich Islands and	$\varphi = 50^\circ$ S	$\lambda = 00^\circ$
St. Louis: H = 22-19-46	$\varphi = 58^\circ$ S	$\lambda = 27^\circ$ W				
P	no trace	e 22-33-47	trace	trace		
	e 22-34-17					
	e 37-43	e 37-42	i 22-37-43			
PR_1	e 38-19	e 38-19		trace		
	e 39-49					
	e 41-27					
ScPcS	i 44-45	i 44-42	i 44-42	e 22-44-43		
S	e 46-09	e 45-35				
	e 47-07					
SR_1	e 47	i 47-52	e 48-00			
SR_2	trace	i 50-16				
	e 53-19	e 53-18				
SR_3		e 56				
L	i 23-04-45	i 23-04-36	e 23-04.5	e 23-04.0		

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}

1933 August 29

St. Louis: H = 14-52-38 Depth = 300-400 km.
φ = 8.3° S
λ = 70.6° W (Headwaters of Purus River, Brazil)

e	15-00-59	e 15-01-01	i 15-01-00		trace	
i	02-57	i 02-57	i 02-59		trace	
e	07-37	i 07-45	i 07-45		trace	
	(low amp.)	(sharp)				
i	09-41	e 09-37	e 09-40			
	(sharp)	(low amp.)				
e	11-05	e 10-53			trace	
		e 13-47				

no L

August 29 17h to
September 1 01h no records

September 2 Observer in room from 16-50 to 17-02

St. Louis: H = 16-41-12
φ = 5° N
λ = 178° E Depth = 400 km

i	17-04-25	i 17-04-25	
	trace	e 05-40	

September 6

St. Louis: H = 22-08-29 φ = 24° S λ = 178° W Depth = 600 km.
USCGS: O = 22-07.8 φ = 18° S λ = 179° W
(Azimuth from Oak Ridge, West; $\Delta_{meas.}$ = 13,000 km. ca)

e	22-24-45						e	22-25-42
				e	22-26-17	e		26-09
e	27-27	i	22-27-33			e		27-30
e	30-18	e	29-48					
i	32-09	i	32-09			e		32-07
e	33-13	e	32-59			e		33-17
i	34-26	i	34-31	i	34-29			
e	36-10	i	36-27	e	36-55	e		36-25
i	38-31	i	38-34	e	38-30			
e	40-00	e	40-14			e		40-13
i	42-51	i	42-58	i	42-53	e		43-09
		e	45-57	e	46-17			
e	23-07-37							
e	13-29	e	23-13-29	e	23-13-29			

September 7

e	22-56-40		
		e	22-57-57
		e	58-26
		e	23-02-11
e	23-03-18		
		e	05-43
		e	06-52
e	11-52		

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 September 8						
	e 03-41-18					
		e 03-43-34				
		e 06-52-20				
		e 56-54				
		e 59-22				
September 9						
	e 05-24-15	e 05-24-15	e 05-24-13			
	e 24-43	e 24-54	e 24-52			
	e 28-26	e 28-23				
	e 30-29					
	e 31-23					
		e 34-13				
		e 37-57				
	e 40-56					
	St. Louis: H = 21-19-05		$\varphi = 30^{\circ}$ N $\lambda = 141^{\circ}$ E			
	(Near Island of Ponafidin, Bonin Archipelago)					
	e 21-40-13	e 21-40-19				
	e 55					
		e 45-19				
	e 46-17	e 46-13				
		e 49-51				
		e 57-11				
	e 22-04-47					
L	e 13-17	e 22-16-45	trace			
September 19						
		e 23-57-32				
L	e 00-01.0	e 00-02.0	trace	trace		
September 20 18h50m to September 25 20h 30m			No records during installation of Benioff vertical-components			
September 27						
	e 09-25-12					
L		e 09-28-14		no record		e 09-28.0
L	e 22-46.0	e 22-48.0				e 22-45.0
September 30						
						e 14-42-23
	trace	e 14-43-24				e 43-44
	e 14-59.0					
	e 15-05-52	e 15-05-50				
		e 08-46				
L	e 15.7	e 27.0				e 15-23.0
L	e 23-43.0	e 23-43.0				e 23-45.0
October 1						
	i 02-49-26	i 02-49-26	i 02-49-26	e 02-49-26	i 02-49-26 (rarefaction)	i 02-49-26
			e 37			i 38
				i 46		
						i 52
	i 56-26	i 56-26				
L		e 57-28				

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 October 2						
	e 09-27-23	-				e 09-27.0
	e 29-35	e 09-29 ca		e 09-30-06		e 29.0
				e 33.0		
L	e 14-59.0	e 15-00 ca				e 14-55.0
H = 15-29-51		$\Delta = 42^{\circ} = 4665$ km. St. Louis: H = 15-29-50				
		S-P = 6-16			$\varphi = 2.5^{\circ}$ S	
		Azimuth southerly			$\lambda = 80^{\circ}$ W	
					Depth = 230 Km. ca	
P	i 15-37-43	i 15-37-43	i 15-37-42	e 15-37-44	i 15-37-42	i 15-37-42
						i 38-33
PR_2		e 39-55	e 40.0			
S	e 44-08	i 44-09		i 44-17		
					i 46-55	
SR_2		e 47-29	e 47-38	e 47-37		
L	e 48.5	e 49.0	e 50.0	e 52 ca		e 49 ca
October 3						
H = 10-22-04		$\Delta = 39.7^{\circ} = 4400$ km.				
		S-P = 6-12				
P	e 10-29-41	e 10-29-45	e 10-29-39		i 10-29-37	i 10-29-37
	e 31-29					
S	e 35-49	e 36-03		e 10-36-15		
	e 40-11	e 39-17		e 39-32		e 40 ca
L	e 43 ca	e 46 ca				e 45 ca
	e 14-30-05					microseisms obscure
		e 14-31-57				
	e 36-45	e 37-37				
		e 40-07				
L	e 46 ca	e 48.0				e 14-46 ca
L						e 19-21.0
October 5						
L	e 06-42.5	e 06-43.0				
L	e 14-16-09	e 14-17.5				
October 11						
L	e 15-42-33	e 15-43.0				e 15-42-29
October 12						
			i 07-23-22 (ground moved north)		i 07-23-22	i 07-23-22 (rarefaction)
					i 33	
					i 37	
			e 48	e 07-23-48	i 47	i 47
	e 07-32-33					
October 14						
P					i 22-28-55.5	
					i 29-06	
		e 22-31-57				
		e 40-55				
		e 43-15				
L	e 22-51.0	e 49.0				e 22-52.5

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 October 17						
	e 13-46 ca					e 13-41.0
L	e 54.5	e 13-48.0				e 54.5
October 22						
	e 12-15-32					
L	e 35.0	trace				
October 23						
L	e 05-00.0	trace				e 05-00.0
L	e 14-43 ca					trace
October 25						
	Early phases lost in changing records and large microseisms					
	USCGS: 0 = 23-28.2		St. Louis: depth = 180 km. ca			
	φ = 22.5° S					
	λ = 67° W		Δ_{meas} = 7100 km.			
	i 23-47-12	i 23-47-11				
	i 48-15					
	e 49.5					
	e 54-21					
L	e 58.0	e 54.5				e 23-55 ca
October 26						
	e 12-35-18	i 12-35-12				
	e 39-52	e 40-06				
	e 42-22					
L	e 53.0	e 55.0				e 12-55 ca
October 30						
L	e 07-58 ca					e 08-00 ca
November 1						
L	e 02-45.0					e 02-44.0
L	e 15-44.5					e 15-53.0
November 2						
	e 12-46.5					
L	e 54.0	e 13-00 ca	trace			e 13-05
November 4						
H = 08-41-24	Δ = 32.9° = 3650 km.					
	S-P = 5-25					
P			i 08-48-02	i 08-48-02 i 43	i 08-48-02	i 08-48-02
PR_2		e 08-50-09	i 49-25			
S	e 08-53-27	e 53-27		e 53-27		
SR_1		e 55-03				
L	e 09-00 ca	e 09-03 ca				e 09-03.5
L					i 12-03-56 (rarefaction)	e 12-19 ca
L	e 20-53-27	trace				e 20-54 ca
November 7						
L	e 14-16 ca					

PHASE	NE-SW	NW-SE	N-S	E-W
1933 November 9				
Local		i 23-52-00	i 23-51-59	i 23-52-01
Duration 2 min.			i 52-17	
Local			i 23-55-59	i 23-55-55
Duration 2 min.		i 23-56-09	i 56-07	
November 10				
Local		trace	i 00-14-59	trace
Duration 2 min.			i 15-06	
November 14			St. Louis: H = 14-05-13	
H = 14-05-25	Δ = 71.5° = 7950 km.		φ = 32.7° S	
	S-P = 9-23		λ = 70° W	
(Reported felt over a wide area in Chile and Argentina)			Depth = 100 km.	
P	e 14-16.7	e 14-16.7	i 14-16-42	i 14-16-42
				i 17-24
S	e 26-07	e 26-05		
PS	i 27-04	i 27-04		
November 19				
		e 03-33-30		
	e 03-37-20	e 37-27		
		e 39-14		
		e 41-58		
		e 43-40		
		e 44-42		
		e 47-24		
		e 48-38		
		e 51-46		
	e 53-32	e 52-52		
		e 55-42		
		e 57-26		
Q?	e 04-02.0			
		e 04-03-19		
		e 05-46		
R		e 09.5		e 04-09.7
November 20			USCGS: O = 23-21.6	
H = 23-21-55	Δ = 28° = 3110 km.		φ = 73° N	
	S-P = 4-50		λ = 69° W (Baffin Bay)	
	Azimuth northerly			
P	i 23-27-50 (SW 2 mm)	i 23-27-49 (SE 2+ mm)	i 23-27-49 (S)	e 23-27-51	i 23-27-49	i 23-27-49 (compression)
						i 28-28
						i 30-51
		i 31-23				e 31-40
S	e 32-39					
S	i 56	i 32-53	e 32-51	e 32-50		e 32-55
L	e 33-51	e 34-20		e 33-38	e 33.5	e 33-45
				e 36.0		
November 21						
		St. Louis: H = 23-48-41				
		φ = 9° N				
		λ = 83° W				
	($\Delta_{P?-H}$ = 34.8° = 3865 km.)					
P?				e 23-55-35		
	e 23-57-06	trace				
	e 00-01-28	e 00-01-10				
L	e 03.6	e 03-32				e 00-03.5

PHASE	NE-SW	NW-SE	N-S	E-W
1933 November 22				
L?	trace	e 01-58 ca		e 01-59.0
	$\Delta_{P-H} = 35^{\circ} = 3890$ km.	St. Louis: H = 04-52-08	$\varphi = 9^{\circ}$ N	$\lambda = 84^{\circ}$ W
P			i 04-59-03	e 04-59-03
	e 05-00.5			
L	e 04-34	e 05-04.5		e 05-09.5
	e 08-27.5			
	e 31.8			
	e 56-04			
L	e 09-01 ca	e 09-01 ca		
	$\Delta_{P'-H} = 124.9^{\circ} = 13,880$ km.	St. Louis: H = 12-42-26	$\varphi = 3^{\circ}$ S	$\lambda = 150^{\circ}$ E (E. Indies
P'			i 13-01-27	e 13-01-28
PR_1		i 13-03-44		e 03-22
ScPcP	no	e 04-40		e 04-42
ScPcPcS		i 10-18		
PS				e 13-08
PPS	record	e 14-54		
SR_1		e 20-20		
SR_2		e 26-23		
L		e 41.0	e 13-48.0 e 13-51.0	e 42.2
November 23				
	e 19-04-50		i 19-04-48	e 19-04-51
	e 06-04	e 19-06.0	e 19-06-01	e 06-08
	e 09.8	e 10.3		
L	e 14.2	e 12.5	e 17.0	e 14.0
November 28				
	e 11-07.0			
	e 34.0	no		
	e 42.3			
L	e 47.2	record		trace
November 29				
L	e 05-16.0	e 05-18.0		
November 30				
L	e 04-49.5	e 04-50.0		
December 1	20-29 to 22-00	no records, current off for work in vault		
December 2				
L	trace	e 03-19.5		
	e 06-04-24			
	trace	e 06-16.1		
L	e 25.0	e 29.0		
	e 20-31.0			
	e 37-38	e 20-37-36		heavy microseism
L	e 43.5	e 45.5		e 20-53.0
December 3				
L	e 12-53.4	e 12-55-12		e 12-55.5

PHASE	NE-SW	NW-SE	N-S	E-W	Z	Z_{13}
1933 December 21 L	e 00-57.0	o 00-57.0				
December 23 21h to December 24 21h			no records			
December 31						
			(compression)		i 21-49-58.5	
	Local				i 50-11.5	
					i 50-23	
					i 50-43	