HARVARD UNIVERSITY
Division of Geological Sciences
SEISMOGRAPH STATION

Latitude 42° 30' 26" North
Longitude 71° 33' 45" West
Foundation Micaceous schist
Height 180 meters
Time Mean Greenwich. An E. Howard pendulum clock, corrected daily by radio time signals from Arlington, Va., on 113 kc., and Ottawa, Canada, on 7335 kc. Accurate to nearest .1 sec. unless otherwise noted.

Mail address:

SEISMOGRAPH STATION
c/o L. D. LEET
HARVARD, MASS., U. S. A.

(Note: Inclusion of "Harvard University" in mail address frequently results in missending to Cambridge, Mass., which is 25 miles away.)

BULLETIN NO. 4

1935 January 1d to June 30d

By L. D. Leet, Seismologist in Charge

Paper number 19 , published under the auspices of the Committee on Geophysical Research and of the Division of Geological Sciences at Harvard University.

During the interval covered by this Bulletin, a fundamental change in the equipment of the station was made. It had been found, as may be noted from the data of all Oak Ridge Bulletins, that the Benioff vertical seismometer's short-period component gave remarkable results in the registration of important phases in teleseisms, as well as previously unsuspected local shocks, and quarry blasts up to distances of 200 km. As a result of this, the Geophysical Committee purchased two horizontal Benioffs, with long- and short-period components whose constants match those of the vertical. Computations of azimuth, particularly for the local quakes, and studies of angles of emergence to supplement travel-time data, are among the valuable new possibilities opened by the installation of this complete set of Benioff instruments. The Milne-Shaw seismographs are to be devoted temporarily to tilt measurements. It is planned to equip the Wood-Anderson short-period seismometers with intermediate-period suspensions to fill the gap left between the long- and short-period Benioffs. As short-period units, paralleling the Benioffs, they do not record a large enough fraction of the activity characteristic of this station, to justify the expense of photographic paper for their records.

Special investigations of accurately timed quarry blasts, local earthquakes, and microseisms, are currently under way at this station.

INSTRUMENTS--FIXED CONSTANTS

Instrument	Symbol	Registration	Damping	Paper Speed	Mass
		1935 January 1d	to March 31d		
Milne-Shaw 43	NW	photographic	magnetic	15 mm per min	1 lb
Milne-Shaw 44	NE	photographic	magnetic	15 mm per min	1 lb
Wood-Anderson	NS	photographic	magnetic	15 mm per min	15 g
Wood-Anderson	EW	photographic	magnetic	15 mm per min	15 g
Benioff Vertical					112.7 kg
Short Period	Z-SP	galvanometric	magnetic	30 mm per min	
Long Period	Z-LP	galvanometric	magnetic	15 mm per min	
		After 1935 April 1d			
Benioff Vertical					112.7 kg
Short Period	Z-SP	galvanometric	magnetic	30 mm per min	
Long Period	Z-LP	galvanometric	magnetic	15 mm per min	
Benioff Horizontal North-South					112.7 kg
Short Period	N-SP	galvanometric	magnetic	30 mm per min	
Long Period	N-LP	galvanometric	magnetic	15 mm per min	
Benioff Horizontal East-West					112.7 kg
Short Period	E-SP	galvanometric	magnetic	30 mm per min	
Long Period	E-LP	galvanometric	magnetic	15 mm per min	

INSTRUMENTS--NORMAL OPERATING CONSTANTS

Instr.	T_o	T_g	V	ε	Displacement for 1" of arc tilt	Displacement for acceleration of 10^{-6} g
NW	12		250	20:1	44 mm	
NE	12		250	20:1	44 mm	
NS	1		2800	20:1	18 mm	
EW	1		2800	20:1	18 mm	
Z-SP	1	.2		20:1		15 mm
Z-LP	1	14		20:1		15 mm
N-SP	1	.2		20:1		15 mm
N-LP	1	14		20:1		15 mm
E-SP	1	.2		20:1		15 mm
E-LP	1	14		20:1		15 mm

TABLES USED: Macelwane's 1933 November.
For local earthquakes, travel time data based on preliminary results of the registration of quarry blasts.

DIRECTION OF MOTION: Displacements of the ground upward, or toward the North or East, are designated by +, downward, or toward the South or West, by -.

AMPLITUDES. From the beginning of registration with three Benioff seismometers, figures for trace amplitudes are given occasionally to indicate relative importance of phases, comparative intensities, and probable accuracy of reading (which is obviously much greater for large amplitudes than small.) One column gives the trace amplitude (half-range) of the impulse whose time is given for the phase. The second column gives the maximum trace amplitude (half-range) observed in succeeding oscillations presumably caused by the same phase.

PHASE	Z-SP	Z-LP	NE	N.
1935 January 1d				
St. Louis: H = 13-21-10			USCGS: H = 13-20-56	
φ = 14.8 S λ = 175 W			φ = 17 S λ = 174 W	
Depth = 300 km			Depth about 240 km	
		$\Delta_{meas.}$ = about 111°		
			e 13-47-ca	
			e 50	
			e 58.5	
Jan. 2d				
H = 22-41-00 Δ = 39.6° = 4400 km. S-P = 6-12				
St. Louis: H = 22-41-06, φ = 40.9 N λ = 124.3 W				
P	e 22-46-32	large microseisms		
S			e 22-54-44	trace
L		e 23-03 ca	e 23-00	e 23-02.5
Jan. 3d				
L			e 02-37	e 02-38
Jan. 4d				
	e 14-52-42	large micro-seisms	e 15-02	
			e 06	trace
L		trace	e 16	e 15-15
	e 16-31-15			
			e 16-43	
			e 53	e 16-53
L		trace	e 58.5	
Jan. 5d				
	e 10-26-24	trace		
Jan. 8d				
	e 03-31-25			
Jan. 17d				
	i_+ 02-27-11			
			e 02-46	
			e 49.2	
L		trace	e 03-10	
	e 08-34-38			
	e 51			
	e 38.7			
L		08-44 to 48		08-44 to 48
Jan. 18d				
	e 19-12-10			
	e 13-11	Local?		
Jan. 19d				
	i_- 12-47-19			
	i_- 13-08-43			
Jan. 20d				
	i_+ 00-07-39			
Jan. 21d				
	i_- 15-41-32			

PHASE	Z-SP	Z-LP	NE	NW
1935 Jan. 23d				
H = 07-24-16	Δ = 60.8° = 6755 km.		S-P = 8-24	
St. Louis: H = 07-24-18			USCGS: H = 07-24-07	
φ = 52.4 N, λ = 166			φ = 52 N, λ = 170 W	
Depth = 38 km. (sic!)			Depth normal	
P	i_ 07-34-25	i+ 07-34-24		e 07-34-25
		e 36.3	out	e 36-34
		e 38.3	of	e 38-14
S		i+ 42-54	order	iSE 42-48
				eSE 47
L		e 54		e 54
P'P'	i_ 08-04-30			
SKPP'?	i+ 08-41.5			
?	i+ 10-45			
		e 08-36.5		
		e 10-30		e 10-29
Jan. 28d				
	e 09-03-37	Reported felt at Malone, N. Y.		Local
	i+ 04-15			
Jan. 30d				
H = 20-20-00.9	Δ = 12 km. = 7.4 mi.	S-P = 1.4 secs.		Local
News report from Billerica, Mass. (Δ = 24 km.) stated tremors felt somewhere in vicinity of that town, exact place unknown.				
	i_ 20-20-03.1			
	i_ 04.5			
Jan. 31d				
L		e 18-47		e 18-48
1935 February 4d				
	i+ 08-07-18	trace		
	i+ 38			
L		e 18-24		e 18-24
Feb. 6d				
H = (01-53-52)	Δ = 26.8°	S-P?= 4-42		
P?	i+ 01-59-35	e 01-59-41		trace
S?				e 02-04-17
L		e 02-06.5		e 02-06.3
Feb. 13d				
	i_ 09-40-36			
	i_ 17-32-49	lost in changing records		
	i_ 33-15			
Feb. 20d				trace about 11h 50m
Feb. 22d				
H = 17-05-50	Δ = 71°	S-P = 9-20		
St. Louis: H = 17-05-59			USCGS: H = 17-06.2	
φ = 50.5 N, λ = 176.6 E			φ = 52 N, λ = 175 E	

PHASE	Z-SP	Z-LP	NE	N
1935 February 22d continued				
P	i_ 17-17-04			
		e 17-17-10		e 17-17-10
	i_ 21	i_ 21		
S			e 17-26-24	e 26-25
L	e 42 ca	e 42 ca	e 36 ca	e 38 ca
Feb. 24d		e 02-04.5	e 02-04.1	e 02-04.1
Feb. 25d				
H = 02-51-02	Δ = 75.2°	S-P = 9-43		
P	i+ 03-02-41	trace		
S			trace	e 03-12-24
L				e 22.5
Feb. 28d				
	i_ 07-20-46	trace		
	(Max trace amplitude = 24 mm)			
1935 March 1d	Δ meas = about 18°			
St. Louis: H = 10-59-45	φ = 40° 13' N, λ = 95° 47' W			
	i+ 11-09-16	(traces of motion about a minute before this lost in microseisms)		
Mar. 8d				
	i_ 12-08-05.5			
Mar. 10d	no records from 05h 32m to 20h 10m			
Mar. 17d				
H = 21-31-04	Δ = 48.5°	S-P = 7-06		
St. Louis: H = 21-33-15, φ = 13.9 N, λ = 92.8 W. Depth = 120 km				
	(Δmeas = 34.2°)			
P	i+ 21-39-46	i+ 21-39-46	iNE 21-39-46	
pP?	i+ 40-08			
	i+ 18	i+ 40-14		
S				e 21-46-52
L		e 50 ca	trace	e 53 ca
Mar. 18d	Quarry blast, Southwick, Mass. φ = 42° 04' 20" N			
			λ = 72° 42' 40" W	
	Δ = 106.1 km.	S-P = 13.5 secs.		
P	i 18-21-24			
S	i 37.5	(Max trace amplitude = 12 mm		
P	i+ 20-51-40.6	trace		
	i+ 42.8			
	i- 52.6			
L	e- 55-30	trace		
Mar. 19d				
	i+ 14-02-16			
Mar. 21d				
L		e 00-00 ca		e 23-58 (20d)
Mar. 21d				
	i- 09-21-44			
	i- 47			

PHASE	Z-SP	Z-LP	NE	NW
1935 Mar. 26d				
	i_ 20-04-25			

H = 20-25-03.0 Δ = 110 km. S-P = 13.1 secs Local or blast

P	i+ 20-25-20.6			
S	e+ 33.7			

Mar. 29d			e 13-19	
	e 13-26.5	trace	e 26.5	

1935 March 30d 13h 15m to April 9d 00h all instruments out of service between 13h and 22h each day for installation of new Benioff horizontal seismometers. Milne-Shaw and Wood-Anderson seismometers removed from service Mar. 30d 13h 15m.

April 1d Quarry blast, 32,000 pounds of dynamite, near Albany, N.Y.
φ = 41° 31.2' N λ = 73° 51.3' W, Azimuth = N 89° 37' W
Δ = 187.8 km. S-P = 21.0 secs.

P	i+ 20-54-16.4
S	i+ 37.4

PHASE	Z	trace mm i max.	N	trace mm i max.	E	trace mm i max.
Apr. 11d						

St. Louis: H = 23-14-51, φ = 37.2 N, λ = 53.5 E
Destructive in Mazandaran Province, Northern Persia
Δ_{mean} = 85.5°

P	e 23-27-30		NS seismometer oriented E. for test
	i+ 28-12		until May 7d
	e+ 30-55		
L	e 56.0		

Apr. 15d			
	i+ 07-14-59.5		i+ 07-14-59.5
	i+ 15-02		
	i+ 13		
	i_ 24		

Apr. 17d			
	i+ 04-45-19 4.5		i+ 04-45-19 1.5
	i+ 47		i+ 47

Apr. 18d
H = 22-14-17 Δ = 37.1° S-P = 5-55

P	e 18-21-29		
S	e 27-24		
L	i 30-03		e 18-30-03

Note: very gradual emergence of S makes reading of its arrival time uncertain, though amplitudes of reflected S and all L phases are quite large--max. trace amplitude 23 mm.

Apr. 19d
H = 15-23-37 Δ = 66.3° S-P = 8-56 St. Louis: H = 15-23-32
φ = 32N, λ = 15E

	i+ 15-34-21 3.0		
	i_ 28		
R_1	e+ 37		
R_2	i_ 38-03		

PHASE	Z	trace mm i max	N	trace mm i max		i max
1935 April 19d continued						
S					o 15-43-17	
SR2	o 15-50-43					
L	o 58.6					

Apr. 19d
I = 19-14-16 Δ = 125 km. S-P = 15 secs. Local

P	i 19-14-37		
S	i 52		
L	c 56		
	o 20-42-36		

Apr. 20d
I = 05-10-55 Δ = 68.3° S-P = 9-06

	i 05-21-58 2.0	i+	05-21-52 2.0
R1	o 24-16	i+	59
		e	30-58
SR2	c 38.5		
	e 43.0		

St. Louis: H = 22-01-53, φ = 24.2 N, λ = 120.6 E
Destructive in Formosa

traces from about 22h 20m. Early phases, if any, lost in changing records.

Apr 24d
I = 01-24-06.7 Δ = 117.5 km. S-P = 14 secs. Local
Felt on Cape Cod, at Provincetown, Mass., and neighboring places. Harvard approximate location from field reports and S-P distance: φ = 42° 10' N, λ = 70° 13' W
See Proceedings of the National Academy of Sciences, Vol. 21, No. 6, pp 308-313, June, 1935.

	i 01-24-25.5	i+	01-24-25.5
	i 39.5	i+	39.5

Δ = 235 km ca S-P = 28 secs Local

		e	21-34-32
		e	35-00

I = 22-10-37 Δ = 143 km. S-P = 17 secs Local

		i+	22-11-00
		e	17

Apr. 26d
I = 22-18-02 Δ = 143 km. S-P = 17 secs. Local

	i+ 22-18-25	i+	22-18-25
	i 42	i+	42

I = 22-29-44 Δ = 143 km. S-P = 17 secs. Local

	i+ 22-30-07	i+	22-30-07
	i 24	i+	24

Apr. 29d
i 11-58-04 2.0
i+ 12-01-33 3.5

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 Apr. 29d						
H = 17-03-07	Δ = 10[illegible] km.	S-P = 13 secs.				Local
P					e 17-03-25	
S					i 38	
S	i 16-49-26					Local
P?	e 21-13-02					Local
S	i 14					
Apr. 30d						
H = 20-50-34	Δ = 100 km.	S-P = 12 secs				Local
P	i_ 20-50-51				i_ 20-50-51	
S	i 51-03				i 51-03	
May7d	i_ 06-14-31 1.5					
	i+ 17-51 4.5	no trace			no trace	
May 7d						
	i_ 16-53-57 3.5 15.0		i_ 16-53-57 2.5 4.0		i+ 16-53-57 1.5 2.5	
May 13d						
	i+ 23-2[illegible]-56 2.0 4.0					
	i- 29-05 5.0	no trace			no trace	
L	e 00-43.2					
May 14d						
St. Louis: H = 23-23-00, φ = 5[illegible]° S, λ = 25° W.			Δ_{meas} = 10[illegible]°			
PR$_1$	e 23-41-39					
SKS			i 23-47-43 3.0		i 23-47-45 3.0	
SKKS			i+ 48-42 3.5		i+ 48-43 2.5	
S					i+ 49-09 2.0	
PS?					i+ 50-01 3.5	
			e 52-11			
	e 52-52					
					i 53-13 2.5	
SR$_1$					i+ 57-33 5.5	
May 15d					i+ 00-07-55 5.0 (T=24s)	
			i+ 00-07-57 1.5			
L	e 00-18 ca					
May 16d						
H = 17-15-11	Δ = 90 km.	S-P = 11 secs.				Local
P	e 17-15-27					
S	i 38					
H = 22-47-44	Δ = 74 km.	S-P = 9 secs.				Local
P	i+ 22-47-57					
S	i 48-06					
L	i 10	15.0				
May 17d						
H = 15-41-4[illegible]	Δ = 74 km.	S-P = 9 secs.				Local
P	e 15-42-01					
S	i 10					
L	i 14	12.0				

PHASE	Z	trace mm i max	N	trace mm i max		trace mm i max
1935 May 17d						
= 17-09-21	Δ = 110 km.	S-P = 15 secs.				Local
	i_+ 17-09-39.5					
	i^+ 54.5	8.0				
	i 10-00.0					
= 19-10-41	Δ = 170 km.	S-P = 20 secs.	Azimuth S'ly			Local
	i_+ 19-11-0[illegible]		i_+ 19-11-08		i_+ 19-11-08	
	i				i 28	4.0
May 18d					i_- 17-45-41	3.0
	i_+ 17-46-05 (SP)					
	e^+ 08 (LP)					
May 22d						
= 19-03-16	Δ = 145 km.	S-P = 17 secs.	Azimuth N'ly			Local
	i_+ 19-03-39		i_- 19-03-39			
	i^+ 56		i^- 56		i 19-03-56	
= 20-01-34	Δ = 105 km.	S-P = 13 secs.				Local
					i_+ 20-01-52	
			i 20-02-05			
= 20-03-29	Δ = 105 km.	S-P = 13 secs.	Azimuth SE'ly			Local
	i_- 20-03-47		i_- 20-03-47		i_+ 20-03-47	
	i^- 04-00		i^- 04-00		i^+ 04-00	
	e 07		e 07		e 07	
May 23d						
St. Louis: H = 17-59-13, φ = 24.5 N, λ = 46 W.			Δ_{meas} = 27° ca			
	i_+ 18-05-03	4.0			i_- 18-05-03	1.0
	i^+ 16	2.5				
					i_+ 19	1.5
					i^+_- 24	1.5
	i_- 32	3.0				
	i^- 40	3.0	i_- 18-05-40	1.0	i_+ 40	3.0
	e 12.3					
May 24d						
St. Louis: H = 05-36-42, φ = 12.8 N, λ = 125 E.			Δ_{meas} = 123.5° ca			
North of Samar Is., P.I.; felt in Eastern Visayas.						
P_1'	e 05-55-31					
	i 37	6.5				
PR_1	e^+ 57-13					
	e 06-02-19					
			e 06-07.0			
	i_- 12-56	2.0				
	i^-_+ 13-27	2.0				
					e 06-14	
L	e 40 ca				e 40 ca	

May 25d Quarry blast, 25,000 pounds of 40 per cent dynamite, at Reed Gap, Conn., quarry of The Connecticut Quarries Co., Inc. Through the courtesy of F. H. Edwards, Gen'l Supt., F. B. Kimball, Supt., S. H. Russell of Du Pont Co., the blast was timed, using Ottawa 7335 kc continuous time-signal emission.

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 May 25d continued			φ = 41° 28' 00" N, λ = 72° 24' 10" W Azimuth from Oak Ridge: S 41-07-33 W			
H = 17-47-46.0		Δ = 152.5 km.	Computed azimuth: S 42.1° W			
P	i_+ 17-48-09.8		i_+ 17-48-09.8		i_+ 17-48-09.8	
S	i^+ 27.4		i^+ 27.5		i^+ 27.3	
H = 21-18-11.1		Δ = 65 km.	S-P = 7.6 secs.			Local
P	i_- 21-18-21.6		i_+ 21-18-21.6		no trace	
S	i^- 29.3		i^+ 29.3		i 21-18-29.2	
May 30d						
H = 21-32-59		Δ = 98.5°	USCGS: H = 21-33.0, φ = 28.5 N, λ = 65.5 E			
	Casualties and destruction at Quetta and nearby places, British Baluchistan					
P	e 21-46-38					
PR,	e 50-18					
SKS					e 21-57-36	
S					e 58-10	
L	e 22-19 ca					
1935 June 3d						
	e 02-49-53		no trace		no trace	
	i_- 50-01 3.0 6.5				i_- 02-50-01 0.5	
	i^+_- 53-23 4.5		no trace		no trace	
June 5d						
	e 06-31-35		e 06-31-35		e 06-31-35	
H = 21-11-23.5		Δ = 150 km.	S-P = 17.5 secs.			Local
P	i_+ 21-12-14.5		i_+ 21-12-14.5		i_+ 21-12-14.5	
S	i^+ 32.0		i^+ 32.0		i^+ 32.0	
June 7d						
	i_+ 12-31-37 1.0					
	i_+ 45 1.0 4.5					
	i_- 15-41-00 7.0 16.0		i_- 15-41-00 1.5 4.5		i_+ 15-41-00	
	i_+ 02 4.0		i_- 02			
	i_+ 20 2.5		i_+ 20			
	i_+ 22 2.5		i^+_- 22		i_+ 22	
	i_- 16-44-19 1.5 3.0		i_+ 16-44-19 1.5			
	i 17-39-24		i 17-39-24		i 17-39-24	Local
June 8d						
	i_- 03-19-51 5.0		i_- 03-19-51 3.0		e 03-19-51	
	e 24-10					
P	e 23-59-26				i_- 23-59-26	Local or
S	i 29				i 29	
					i_+ 37	blast
	e 09-49-21 3.5					
	e 29 5.0					
			e 09-49-30 1.0		e 09-49-30 0.5	

PHASE	Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935 June 14d									
L e	23-08-42							Local	

June 17d through the balance of this bulletin, all long-period components out of service.

June 20d

Δ = about 250 km. Azimuth N'ly. S-P = 30 secs. Local

P	i	20-01-40	1.0		no trace		i	20-01-40	1.0	
S	i+	02-10		i	20-02-10		i+	02-10		

June 22d Blast at quarry of Callanan Rd. Improvement Co., near Albany, N. Y. Well-drilled; about 30,000 pounds Du Pont Nitromon. Through the courtesy of Mr. Keith Callanan, and of Mr. S. H. Russell of the Du Pont Co., this blast was timed by an oscillographic record of Ottawa's 7335 kc time-signal and the first impulse to reach a portable seismometer 1000 ft from the blast, which was fired by fuse.

H = 20-28-46.8 Δ = 187.6 km. Azimuth = N 89° 37.'3 W
φ = 42° 31.'2 N, λ = 73° 51.'3 W (see Apr. 1d)

P	i	20-29-17.4			no trace		i	20-29-17.4		
S	i+	38.4		i	20-29-38.4		i+	38.4		

Note: the form of the trace of June 22d is identical in every respect, except amplitude, with that of April 1d, down to details of the smallest superposed jogs.

June 23d Blast at the quarry of the Connecticut Quarries Co., Granby, Conn. Timed by Ottawa's 7335 kc signal, through the courtesy of Mr. Fred H. Edwards, General Superintendent, Mr. E. Hutterman, quarry superintendent, and Mr. S. R. Russell, of the Du Pont Co. Tunnel-loaded, about 14,000 pounds of 40 per cent dynamite.

I = 18-14-54.7 Δ = 115.3 km. Azimuth = S 61° W. φ = 41° 59.8' N
S-P = 13.9 secs. λ = 72° 46.3I W

P	i+	18-15-14.1		i+	18-15-14.1		i+	18-15-14.1		
S	i+	28.0		i+	28.0		i+	28.0		

June 24d

H = 19-13-30 Δ = 122 km. S-P = 14.6 secs. Az SS. Local

P	i+	19-13-50	1.5	4.5	i+	19-13-50	0.5	3.5	i+	19-13-50	0.2	1.0
S	i+	14-04.6			i+	14-04.6			i+	14-04.6		
S	i	22-33-32			i	22-33-32			i	22-33-32	Local	

St. Louis: H = 23-23-12, φ = 15.3 S, λ = 167.5 E Depth about 140
Δ_{meas} = 124.2°

	i-	23-40-22	3.0		trace only			trace only		
PR_1	i+	41-57	2.0	6.0			i-	23-41-58	1.0	1.5
	e+	55.3		4.0			e-	55.3		

June 25d

	i-	12-46-11	1.5	4.0	trace only			trace only		

PHASE	Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
June 26d	Blast at quarry of Massachusetts Broken Stone Co., Greenfield, Mass. Notified by Mr. J. W. Morrissey, Medford, Mass. Timed through the courtesy of Mr. L. Robinson, superintendent, by means of the Ottawa 7335 kc time-signal. Fired electrically. Well-drilled, about 3900 pounds of Du Pont Nitromon.								
I = 15-30-18.6	Δ = 84.5 km. Az = N 85.5° W. S-H = 25.3 secs.						φ = 42° 33.9' N λ = 72° 35.1' W		
?	i 15-30-43.9			i 15-30-43.9			i 15-30-43.9		
June 27d									Local
? or Le	o 16-03-11	52	4.0	trace o 16-03-11		3.0	trace o 16-03-11		1.5
June 28d	i_+ 02-12-26	1.5	10.5	o 02-12-26	2.0		o 02-12-26	1.0	
S?	i_+ 19-41-34	1.0	1.5				trace	Local?	
June 29d	St. Louis: H = 06-46-53, φ = 18.2 N, λ = 103.3 W. Δ_{meas} = 37°								
P	i_+ 06-55-56	2.0		trace			i_+ 06-55-56	1.5	
	e^+ 07-08-52		7.0	e 07-08-52		7.0	e^+ 07-08-52		8.0
	o 12.6		17.0				o 12.6		10.0
	o 08-22-33			o 08-22-33			o 08-22-33		
	o 23-22								
				e 23-29			e 23-29		

End of Oak Ridge Bulletin No. 4

Harvard, Mass.
1935 Sept. 20

HARVARD UNIVERSITY

Division of Geological Sciences

SEISMOGRAPH STATION

L. D. LEET, Seismologist in charge

Latitude	42° 30' 26" North	Time: Mean Greenwich
Longitude	71° 33' 45" West	E. Howard pendulum clock
Foundation	Micaceous schist	corrected daily by radio time
Height	180 meters	signals from Arlington, Va., 113 kc:, and Ottawa, Canada, 7335 kc. Accurate to nearest .1 sec unless otherwise noted.

Mail Address:

SEISMOGRAPH STATION
c/o L. D. LEET
HARVARD, MASS., U.S.A.

BULLETIN NO. 5

1935 July 1d to December 31d

By M. P. Collins, Observer

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Paper no. 33 published under the auspices of the Committee on Geophysical Research and of the Division of Geological Sciences at Harvard University.

One object of this station's bulletins is to give, in readily accessible form, a summary of the outstanding features of the records of its seismographs. Interpretations are given for some of the larger earthquakes, in the form of phase identifications and distance computations. These are necessarily tentative, designed to give seismologists a clue to the character of the records, and others a general picture of the range of seismic activity which has been recorded. Particularly in the case of local earthquakes, distance computations do not necessarily give a measure of the space separating this station from the epicenter, since the depth of focus is unknown.

The readings here reported are selected primarily for their possible usefulness to the compilers of the International Seismological Summary at Oxford, England. Another consideration is potential assistance to investigators of particular earthquakes in cases where it is not feasible to collect original seismograms from a large number of stations.

INSTRUMENTS--FIXED CONSTANTS

Instrument	Symbol	Registration	Damping	Paper Speed	Mass
Benioff Vertical					112.7 kg
Short Period	ZSP	galvanometric	magnetic	30 mm per min	
Long Period	ZLP	galvanometric	magnetic	15 mm per min	
Benioff Horizontal North-South					
Short Period	NSP	galvanometric	magnetic	30 mm per min	112.7 kg
Long Period	NLP	galvanometric	magnetic	15 mm per min	
Benioff Horizontal East-West					
Short Period	ESP	galvanometric	magnetic	30 mm per min	112.7 kg
Long Period	ELP	galvanometric	magnetic	15 mm per min	

INSTRUMENTS--NORMAL OPERATING CONSTANTS

Instrument	T_o	T_g	ε	Displacement for acceleration of 10^{-6} g
ZSP	1	.2	20:1	15 mm
ZLP	1	14	20:1	15 mm
NSP	1	.2	20:1	15 mm
NLP	1	14	20:1	15 mm
ESP	1	.2	20:1	15 mm
ELP	1	14	20:1	15 mm

TABLES USED: Macelwane's 1933 November
For local earthquakes, travel time data based on preliminary results of the registration of quarry blasts.

DIRECTION OF MOTION: Displacements of the ground upward, or toward the North or East are designated by +, downward, or toward the South or West by -.

AMPLITUDES: Figures for trace amplitudes are given where possible to indicate relative importance of phases, comparative intensities, and probable accuracy or reading (which is obviously much greater for large amplitudes than small). One column gives the trace amplitude (half range) of the impulse whose time is given for the phase. The second column gives the maximum trace amplitude (half range) observed in the succeeding oscillations presumably caused by the same phase.

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max

1935 July 1d to August 2d all long-period components out of service.

July 1d

H = 18-40-11 Δ = 136 kms S-P = 16 secs. Local

P	i+	18-40-33			i+	18-40-33			i+	18-40-33	
S	i	49			i	49			i	49	

July 3d

I = 21-19-14 Δ = 65 km S-P = 8 secs. Local

P	e	21-19-26									
S	i	34			i	21-19-34			i	21-19-34	
L	e	38			e	38			e	38	
	i-	22-06-32	5.0	20.0	i+	22-06-32	0.5	4.0	i-	22-06-32	0.5 3.0

Deep focus?

July 5d

Strasbourg: φ about 39°N, λ about 67°5 W.

P?	i+	18-06-06	1.7	2.4	Trace				Trace		
	i+	18	0.9	2.6							

July 6d

					i-	0 -53-56	0.8	1.2	i-	03-53-56	1.6
	e	03-54-06		1.8							
					e	54-12		2.1			
	i+		20	0.9 2.0							
	i-		30.5	3.3							
	e		46	2.3					e	54-45	3.1

July 8d

	i+	13-08-43	1.4		i+	13-08-43	0.6	1.0	No trace		
	i+	54	1.0	2.2	e	54		1.0			
	e	58		1.8							
	i-	09-03	1.7	4.6	i-	09-03	0.9	1.6			Local
					e	17-04-24		0.7			
	i+	17-04-34	1.3	5.6	i-	34	1.2	1.7	i-	17-04-35	0.5 1.4
					i-	45	1.0	1.6			

~~18-07-22~~ Δ = 126 km S-P = 15 secs. Local

	e	18-07-43		3.7	i+	18-07-41	0.5	3.0	e	18-07-42	0.8
	e	56		4.7	e	56		2.9		56	3.5
		08-02		4.3	e	08-01		2.7			
	e	21-29-55		3.8	e	21-29-55		2.5	e	21-29-56	3.5
											Local
	e	21-59-46		2.1	e	21-59-46		2.2	e	21-59-45	3.6
											Local

July 9d

	i+	06-52-09	2.4	7.5	i+	06-52-11	0.8	3.5	i-	06-52-11	1.0 1.3
					e	22		1.3	e	22	0.8
	i-		47	2.1 4.1							
											Deep Focus?
	i-	12-32-35	1.0	5.2	i+	12-32-35	0.7	1.6	i+	12-32-37	0.7
	i-		46	1.7 5.5							
	i-		55	1.7 5.5							
											Deep Focus?

PHASE	Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935 July 11d H = 17-15-27	Δ = 188 km			S-P = 21 secs.			Local or blast		
P	i- 17-15-53	1.6	2.7	i+ 17-15-54	1.0	1.5	i- 17-15-54	0.9	1.5
S	i- 16-15	1.0	2.4	e 16-14		2.5	e 16-14		2.0
	e 21-21-16			e 21-21-16			e 21-21-16		
	i- 19	0.7	2.0	e 19			e 20		3.0
							Local trace		
	i- 23-22-01	3.6	26	i+ 23-22-01	0.8	5.9	i- 23-22-01	1.0	3.2
				i- 06	1.2	2.4			
							i+ 21	0.7	1.2
							Deep Focus?		
	i- 23-24-40	1.3	3.0				Another quake?		
	i- 23-29-53	1.5	6.9	i- 23-29-53	0.9	1.6	i+ 23-29-53	0.7	1.1
							Another quake?		
July 12d									
	i+ 03-54-15	0.8	1.8	No trace			No trace		
				i+ 16-38-10	0.3	0.6	e 16-38-10		0.7
	i+ 16-38-12	0.4	1.8				e 12		1.4
				e 15		1.5			
	e 20-09-05		1.2	e 20-09-05		2.2	i- 20-09-05	1.0	1.5
							Local trace		
July 16d H = 02-15-34	Δ = 126 km			S-P = 15 secs			Local		
P							e 02-15-55		
S				e 02-16 10		1.0	e 16-10		1.1
L	e 02-16-14		3.2	e 14		5.1	e 14		6.7
H = 20-31-25	Δ = 118 km			S-P = 14 secs			Local or blast		
P	i+ 20-31-44	0.5	7.0	i+ 20-31-44	0.4	5.4	i+ 20-31-44	0.5	7.5
S	e 58		7.4	e 58		17	e 58		12
	e 20-09-55		3.0	No trace			No trace		
L	e 23-11		3.5						
July 17d									
	i+ 00-33-10	1.2	1.5	e 00-33-10		1.7	Trace		
	i+ 17	1.7	2.8						
	e 24		5.8				Deep Focus		
July 18d									
	i+ 20-20-20	1.0	1.5	i+ 20-20-20	1.0	1.7	e 20-20-20		1.0
	i- 39	1.0	1.4	e 40		2.5	e 40		2.6
							Local		
July 19d									
	e 01-03-11		1.7						
				e 01-03-21		0.5			
	i- 20-53-25	0.7	4.5	i+ 20-53-25	0.5	3.5	i+ 20-53-25	0.4	7.0
	39		2.[illegible]				Local ?		

PHASE	Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935, July 20d									
	i- 10-32-29	0.7	4.5	i- 10-32-31		2.7	e 10-32-31		
	e 53		2.5						
July 22d									
H = 15-36-48	Δ = 74 km			S-P = 9 secs.				Local	
P	e 15-37-01						e 15-37-00		0.6
S	e 09			e 15-37-10		4.0	e 09		1.6
L	i- 11	0.5	3.2				e 11		4.0
	i+ 16-29-07	0.5	2.3	e 16-29-07		1.0	e 16-29-07		2.0
July 23d									
H = 21-13-04	Δ = 90 kms			S-P = 11 secs				Local	
P	e 21-13-20			e 21-13-19					
S	i- 30								
L	e 39			e 38			i- 21-13-39		
July 25d									
	e 14-42-11		1.3	i+ 14-42-11	1.0	1.3	e 14-42-11		1.2
								Local?	
	e 19-10-48		2.5	Trace				Local?	
				e 21-39-03			i- 21-39-03		
	2 21-39-05						i- 06		
								Local	
July 26d									
	e 04-50-25		0.7						
	i+ 38	1.0	1.1	i+ 04-50-38			Trace		
	i+ 08-15-19	1.5	26	i+ 08-15-20	1.0	6.0	i+ 08-15-20	1.5	6.0
	i+ 29	1.5	4.0	i- 30	1.3	3.5	i- 29	2.5	3.7
	i- 36	1.5	5.0						
	i- 41	1.5	2.7	i- 41	1.5	2.5	i+ 44	1.0	2.5
				i- 51	1.5	2.5	i- 51	1.7	2.5
	i+ 57	0.7	1.7						
	e 16-06		1.5				i- 16-06	1.2	1.8
	i+ 17-08	0.6	2.5						
	e 15		2.7						
								Deep focus	

The following three disturbances have been interpreted from record character and grouping as quarry blasts at the General Crushed Stone Co., Blueberry Mtn., Winchester, Mass. See 1934, July 13d.

φ = 42-28-25 N λ = 71-08-15 W Δ = 35.2 km

	e 15-01-49		3.5	e 15-01-49		1.1	i+ 15-01-49		2.5
	e 51		8.0	i- 51			e 51		6.2
	e 15-05-02		2.5	i- 15-05-02	1.1	3.0	e 15-05-02		2.0
	i+ 04	2.0	5.5	i- 04	6.0	7.5	e 15-05-04		4.0
	e 15-14-05		2.5	e 15-14-05		3.0	e 15-14-05		2.0
	i+ 07		5.0	i- 07		7.0	e 07		4.5

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 July 26d (continued)						
			i+ 21-00-56	0.5 1.1		
	e 21-01-59		e 21-00-59	2.8	e 21-00-59	4.1
Quarry blast at N. Branford, Connecticut.						
H = 22-00-27	Δ = 165.33 km. = 102.73 mi.				φ = 41-20-10 N	
	S-P = 19.4 secs				λ = 72-47-34 "	
P	i+ 22-00-54.6		i- 22-00-55	6.6	i- 22-00-55	13
	i- 01-08				e 01-08	
S	e 14		i+ 01-14		e 14	
			i- 16	10	i+ 16	10
			i+ 22-46-19.2			
	i+ 22-46-28	1.0 1.5	e 27	2.0	e 22-46-27	1.0
	i- 31	5.0	e 30	4.0	e 30	4.0
					Local	
July 27d						
	i+ 10-24-47	4.0 6.0	i+ 10-24-48	0.5 1.0	i- 10-24-48	0.5 1.0
July 29d						
USGS: H = 07-36-52			St. Louis: H = 07-36-47			
φ = 23° S λ = 178° "			φ = 22.9 S λ = 178.2 "			
Depth about 500 km			Depth 490 km			
	Δ meas = 117°5					
P	i- 07-56-42	1.2 2.0	e 07-56-44	1.1	e 07-56-43	2.5
	i+ 47	1.5 3.0				
	i- 57-11					
	e 53	3.0			e 57-53	1.7
	i- 59-43	1.5 2.5			e 59-27	1.0
July 30d						
	i- 06-04-16	1.5 4.0	i- 06-04-19	0.5 0.6		
			i+ 26	1.4 2.2	i+ 06-04-27	1.1 2.4
			i+ 49	0.9 1.4	i+ 48	1.2 1.8
			e 57	1.5		
	(e 07-51-07	1.5	e 07-57-07		Trace)	
			i+ 06-01-06.5			
	e 06-01-11	5.0	e 17	6.7	e 06-01-11	4.5
	i+ 50	1.4			i- 50	2.5 4.5
					Different quakes?	
July 31d						
	i- 14-35-37.5		e 14-35-35		Trace	
					Local.	
1935 August 1d						
USGS: H = 16-08.3			St. Louis H = 16-08-17			
φ = 10° S λ = 86°			φ = 11.1 S λ = 86° "			
Δ meas = 3850 km. P-H = 37°0 km.						
P	i+ 16-15-04	0.7 4.5	i- 16-17-04	1.2 2.0	i- 16-17-05	0.6 1.4
	i+ 50	0.8 2.4			e 46	1.7
	i- 16-02	0.7 1.5				
	e 22-56-01	2.5	e 22-56-01	1.7	e 22-56-01	1.2

PHASE	Z	trace mm i max			trace mm i max			E	trace mm I max
1935 August 2d									
			e	17-34-21			e	17-34-21	
	i-	17-43-29	0.7	2.3	i-	29	1.0 2.2	i+ 29	0.5 1.7
August 3d									
USCGS: H = 01-10.1					St. Louis: T = 01-10-09				
φ = 5°		λ = 96°E			φ = 4.7°N		λ = 97°E		
Δ meas = 14650 km (132°)					S-H = 131.7				
P'	i-	01-29-17	1.1	2.3				e 01-29.3	
PR_1	e	31-41		1.0	e	01-31-29			
SKP	i+	32-36	0.6	3.3	i+	32-46	0.2 1.2		
	e	43		3.9	e	42	0.4 0.8		
S					e	39-43			
L	Beginning marked by artificial disturbances 01-44 ca								
August 4d									
	i-	02-31-07	0.6	1.3	e	02-31-07	0.7	e 02-31-08	0.8
	i+	16	1.5	3.3	i+	16	0.7 1.0	e 16	1.2
		25	0.7	1.5					
L	e	45.5		1.2	Trace			e 45.7	1.0
	i-	09-45-16	0.5	1.1	e	09-45-16		e 09-45-17	
	e	27		1.7	e	28	0.7	i- 2	
					i+	47-28			
L	e	09-59.7			e	59.5		e 58.7	
August 6d									
	e	00-02			on Z&P only. Seismic origin questionable.				
	e	16-18.8			i-	16-18-50	0.5 1.8	e 16-18-51	1.5
					i+	40-10	0.5 1.2	e 40-10	
August 7d									
USCGS: H = 09-02.1					St. Louis: T = 09-02-18				
φ = 1° N		λ = 77° W			φ = 1° S		λ = 77.5 W		
Many killed and injured in Colombia.					Depth 95 km.				
P	i+	09-10-04	1.2	4.5	i+	09-10-04	0.5 1.7	e 09-10-04	1.6
					i-	10			
PcP	i-	11-53	1.7	2.4					
PR_2	e	12-06		1.0	e	12-05	1.4		
								i+ 09-12-25	0.7 1.4
S					e	16-22		e 16-22	
SR_2	e	20-12			e	20-12	2.6		
L	e	09-27			e	09-27		e 09-27	
H = 18-34-22		Δ = 126 km.				S-P = 15 secs.		Local or blast	
P	e	18-34-43		2.6	e	18-34-43	3.4	e 18-34-43	0.7
	i+	56							
S	e	58			e	58		e 58	
L	e	35-03		5.1	e	35-03	2.8		
August 10d									
H = 19-46-2615		Δ = 188 km.				S-P = 22 secs.			
Interpreted from record character and distance as blast at Albany.									
P	i+	19-49-56.5			e	19-49-57		e 19-49-57	
	e	50-08							
S	i+	18.5			e	50-19		i 18.5	

PHASE		Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935 August 10d (continued)										
	e	17-51.1								
					e	17-58.2				
	e	18-01.5			e	18-00.5		e	18-01.6	
L	e	27.3						e	28.2	
August 11d										
L	e	08-02			e	08-02		e	08-02	
August 12d										
	i-	02-00-13½.5		5.9	e	02-00-13	1.3		Trace	
	e	18		2.0						
August 14d										
	i-	11-15-47	1.4	1.8		No trace			No trace	
	i-	52		1.2						
	i+	55	1.2	1.7					Seismic?	
	e	16-01		2.0						
L	e	21-48-54		1.6				e	21-48-54	1.1
August 15d										
	i+	05-01-47	0.7	0.9		Trace			Trace	
	i-	02- 1	0.5	1.2						
	i+	08	0.8	1.2						
L	e	14-55.5				Trace		e	14-54.7	
August 16d										
	e	14-03-37			e	14-03-38		e	14-03-38	Local
August 17d										
USCGS: H = 01-44.7								St. Louis: H = 01-44-57		
φ = 20°S λ = 172°E								φ = 20°S λ = 171.5 E		
Δ meas = 123.3 PR$_1$-H = 123°5								Depth 120 km.		
P	e	02-00-14								
P'	e	03-32		2.0						
pP'	i-	04-20		3.5						
PR$_1$	i+	05-32		3.0	i-	02-05-32	1.5	i-	02-05-32	3.2
SKP	e	06-08		3.0						
PR$_2$	e	07-09		3.5						
					e	07-48	2.0			
	e	09-34		2.0						
S?	e	13-04		1.7						
					e	13-34	1.7			
PS	e	15-30		3.0				e	15-30	
PPS	i+	16-34		3.5						
L	e	02-45		9.0	e	02-45	9.0	e	02-45	
	i-	10-03-13		1.5		Trace			Trace	
	i-	29		1.0						
	e	13-03-00				Trace		e	13-02-59	
	e	10-48		1.0				e	10-49	
	e	53		1.7						
August 18d										
	e	09-39-48						e	09-39-49	
August 19d										
	i+	07-02-18	0.6	1.5	e	07-02-17		e	07-02-18	
	e	43		1.0					Distant?	

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 August 19d (continued)						
	e 17-21-37	1.8	e 17-21-38	3.3	e 17-21-38	
						Local trace
	e 23-37-23	1.0	e 23-37-23	2.6	e 23-37-22	
						Local trace
August 20d						
	i- 00-06-43 1.0 1.5		e 00-06-43	1.3	e 00-06-43	
	i- 08-16 0.5 0.8					
L	e 00-24		Trace		e 00-24	
I = 17-31-22	Δ = 126 km.		S-P = 15 secs		Local	
P	i 17-31-43.5	3.5	e 17-31-43	2.9	e 17-31-44	
	e 55	1.0	e 55	1.0	e 55	
S	i 58	6.0	e 58	2.0	e 58	4.7
L	i- 32-03	6.0	i- 32-03	3.8	e 32-02	2.4
August 21d						
L	e 00-03				e 00-03	
L	e 10-03	1.2	e 10-03		e 10-03	
I	e 14-17				e 14-17	
August 22d						
	USCGS: H = 20-30.8			St. Louis: H = 20-30-49		
	φ = 73.5 N λ = 66° W			φ = 73° N λ = 66° W		
	Δ meas = 31.1		P-H = 31.1			
P	i+ 20-37-11 1.6 4.3		i- 20-37-11 1.0 2.0		e 20-37-11	1.2
	i+ 49 1.8 5.1				e 49	1.8
PR1	i- 38-08 3.1 5.4		e 38-00	4.0		
PR2	e 35	3.5	i+ 35	1.6 2.5		
PcP	i+ 40-07 1.8 4.0					
S	e 42-17	1.0	e 42-16	1.0	e 42.3	
	i+ 43-03 1.1 2.9					
					i- 43-24	3.7 5.3
			e 43-59	4.5		
L	e 20-46.3		e 20-46.7		e 20-46.7	
August 23d						
	e 10-31.7					
	e 33-44		e 10-33-44		e 10-33.7	
			e 12-03.2		e 12-03.4	
	e 12-05-05	1.2				
	i- 06-11 1.7	2.5	e 06-03	2.2	i+ 06-06	1.2 3.8
	e 14-17-07	1.6	Trace		Trace	
	e 20-12	1.2				
	e 15-20.1				e 15-20.9	
	e 15-28		e 15-28			
August 24d						
P = 21-37-47	Δ = 83 km		S-P = 10 secs		Local	
	e 21-38-01		e 21-38-03			
	e 11	1.5	e 11	2.1	e 21-38-11	1.7
	i- 15.5		e 15.5	4.7		

PHASE		Z	trace mm i	max		N	trace mm i	max		E	trace mm i	max	
1935 August 24d (continued)													
	i-	23-41-13	1.0	2.0	e	21-41-12		1.7	e	21-41-13		1.7	
	e	27		2.0	e	27		2.7	e	27		2.7	
													Local
August 25d													
Strasbourg:													
H = 05-07-50													
P	e	05-16-14		1.5									
					e	05-16-49							
S	e	23-06		1.2	e	23-02			e	05-23.1			
		26-54		1.0	e	26.5							
	e	29.9		2.6									
L	e	33.7			e	31.4			e	32.5			
August 26d													
I	e	13-24				Trace			e	13-25			
	i-	17-50-27	0.7	2.6	e	17-50-27		1.1	e	17-50-27			Local?
	e	19-49-33		1.5	e	19-49-33			e	19-49 32			Local
	e	21-21-07		1.4	e	21-21-07		2.2	e	21-21-07		2.0	
					e	09		1.8	e	09		1.2	
	e	11		2.7	e	11		3.1	e	11		4.8	
													Local?
August 27d													
H = 17-36-05.5				Δ = 98 km			S-P = 11.5 secs.						Local
P	e	17-36-22		4.1	e	17-36-22		2.8	e	17-36-22		1.0	
S	e	35		6.8	e	37		2.6	e	37		2.0	
L	e	42		6.0	e	42		3.5	e	42		2.0	
August 29d													
	No time marks		ZSP		e	11-28-48		1.2		Trace			
					e	32-54		1.5	e	11-32-54		1.5	
The next five records have been interpreted from character and groupin as quarry blasts at Winchester, Mass. See 1935, July 26d and 1934, July 13d.													
I	No time marks		ZSP		e	14-09-02		2.0	e	14-09-02		1.0	
S	"	"	"		e	14-23-10			e	14-23-10			
L					e	11			e	11			
H = 14-26-57.5				Δ = 35.2 km.			S-P = 4 secs						
P									e	14-27-03			
S					e	14-27-07			e	07			
L					e	09			e	09			
H = 14-30-08				Δ = 35.2 km.			S-P = 4 secs						
P									e	14-30-13.5			
S					e	14-30-17.5			e	17.5			
L					e	19			e	19			
H = 14-33-24				Δ = 35.2 km.			S-P = 4 secs.						
P									e	14-33-29.5			
S					e	14-33-33.5			e	33.5			

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 August 29d (continued)						
L			e 14-33 35	4.7	e 14-33-36	5.5
H = 18-39-15.8	Δ = 122 kms		S-P = 14.5 secs.		Local	
P	e 18-39-36	3.5	e 18-39-36	1.1		
S	i+ 50.5	5.8	e 51	2.5	e 18-39-51	4.7
L	e 56	6.0	e 57	3.5	e 56	2.1
August 30d						
H = 16-02-55	Δ = 102 km.		S-P = 12 secs.		Local	
P	i- 16-03-12					
S	e 24	1.4	e 16-03-24	2.5	e 16-03-24	0.8
L	e 27	5.6	e 26	3.5	e 26	5.0
August 31d						
L	e 18-29		e 18-30		e 18-29	
1935, September 1d						
	Trace		e 00-55-10		e 00-55-10	
	i- 00-55-18	1.0				
	i- 33 1.0	3.5	e 31	1.4	e 32	1.5
I	e 01-07 ca		e 01-06 ca		e 01-07 ca	Same quake?
September 4d						
USCGS: H = 01-27.7			St. Louis: H = 01-27-51			
φ = 65°N λ = 152°W			φ = 63°N λ = 151°W			
	Δ = 48°4 S-P = 7-06					
P	i- 01-36-30 1.0	2.7	i- 01-36-20 0.5	1.0	i- 01-36-32	1.1
PR_1	e 38-29	1.0			e 38-28	0.6
S	e 43-41	0.7	e 43-38	0.6	e 43-36	0.6
					e 45-14	0.5
					e 47-14	0.5
	e 47-46	1.6				
L	e 51.2		e 51		e 51	
M	e 53.1		e 53		e 53.4	
September 5d						
H = 17-52-4[illegible]	Δ = 126 kms.		S-P = 15 secs		Local	
P	e 17-53-07	4.7	No NSP record		No ESP record	
S	e 22	5.0				
L	e 27	7.5				
September 6d						
Confused by micro-seisms			e 19-30-20	2.0	No time marks	
September 7d						
Confused by micro-seisms			e 16-51-35	1.2		
			i+ 55 0.7	2.1		
	e 19-58-12	1.2	e 19-58-11	1.2	e 19-58-11	1.3
September 9d						
St. Louis: H = 16-17-40	φ = 5°8[illegible]	λ = 139°E	Depth = 160 kms.			
P'-H = 18-51	Δ = 120°5 (Uncorrected for depth)					

PHASE		Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935 September 9d (continued)										
P'	e	06-36-31		3.7	Trace			Trace		
PR_1	e	38-17		1.5						
L	e	47.8			e	06-47.5		e	06-47.5	
September 10d										
Microseisms obscure traces					e	16-00-39	2.0	e	16-00-41	1.2
									Local trace	
L	e	07-27 ca			e	07-27 ca		e	07-27 ca	
September 11d										
USCGS: H = 14-04-00					St. Louis: H = 14-04-12.2					
φ = 45°N λ = 146°E					φ = 44.5 N λ = 147°E					
Δ meas = 86.9 S-P = 86.9					Depth 60 kms.					
P	i+	14-16-49	4.0	15	i-	14-16-49	0.7 10	i+	14-16-42	2.0 5.0
PcP	i+	17-07			i-	17-07	2.7 7.5			
pP	i-	12								
PR_1	e	20-20		9.7						
SKS					e	27-13	5.0	e	27-12	9.0
S					e	28	5.0		31	4.9
PS	i-	28-26	1.5	9.7				e	28-26	5.0
					e	28-36	5.0			
SR_1								e	33-18	4.0
SR_2	e	40-14		4.7						
L	e	14-45.8		25	e	14-45.8	9.0	e	14-46	12
	i-	16-12-44		2.0						
	e	50-06		2.0						
September 12d										
H = 17-01-55 Δ = 126 km. S-P = 15 secs. Local										
P	No ZSP record this date				i+	17-02-16	0.5 3.5	e	17-0 -17	
					e	29	0.5			
S					e	31	4.0	e	32	
					i-	35	1.5 4.0			
					i-	43	1.4 3.2	i-	45	2.4 4.0
September 13d										
H = 03-48-41.3 Δ = 74 km = 45 mi. S-P = 9secs. Local										
Felt at Concord, New Hampshire										
P	e	03-48-54		1.5	i-	03-48-55	1.2			
	i-	49-00	1.1	1.7	e	49-00		e	03-49-02	0.7
S	e	03		6.0	e	04	7.5	e	04	8.0
L	e	06		8.7						
					e	20-14-20	1.1			
	e	20-14-32		2.0	e	32	2.0	i-	20-14-33	1.2 1.7
					i-	38	1.0 1.8			
September 14d										
								e	20-54-47	0.6
	e	20-55-01		1.4	Trace					
	e	21-03-36								
L	e	08-10								
	e	23-32-42								

PHASE	Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935 September 15d									
	e 01-30			e 01-30 ca			e 01-30 ca		
	e 02-05-52		2.0	e 02-05-50		1.7	Trace		
	e [illegible]-09-56		2.7	e 09-54					
							e 02-10-53		2.0
	e 29.5						e 29.3		
	See note under 04-06-52 this date								
	e 04-06-52		1.1	e 04-06-52					
	i+ 07-06			i+ 07-06	2.5	5.0	e 04-07-07		3.5
	e 10-52		1.5	e 10-56			e 10-58		
	e 11-08		10	i+ 11-07		1.7	e 11-08		9.0
L	e 15-44								
	e 28-20								
	e 30-09			e 30-12					
	e 56			e 53		2.7	e 30-55		3.2

The above record is of very unusual character. On all short-period component records there are three distinct groups of about two minutes' duration each. The long-period records are ordinary except for very small surface waves. By analogy with the shock of November 10d which produced a similar record on the short-period components, 04-06-52 may be P and 04-11-08 S, in which case

H = 04-01-59 Δ = 23°4 = 2600 kms

	e 12-19.5			e 12-19.5			e 12-20		

I = 14-08-53 Δ = 80°3 = 8920 km S-P = 10-07

USCGS: H = 14-08.9 St. Louis: H = 14-09-10

φ = 29°S λ = 114°W φ = 28°S λ = 113°3 W

Δ meas = 9000 km = 81° Depth 110 kms

	i- 14-21-08	0.7	3.5						
	i- 22-04		1.5						
	i- 23-10								
PR_1				e 14-24-12					
	e 26-58								
				e 31-15			i+ 14-31-18		
L	e 34-00			e 34-00			e 34-00		

September 17d

e 20-16-18 1.9 Local trace

September 18d

	i+ 01-41-41	2.5	8.5	No NSP record			No ESP record		
	i- 42-00	3.2	6.5						
	e 46-04		1.2						
	i- 09	1.0	10						
	i- 47-00	1.5	3.5	This record similar to September 15d 04-06-52					
	e 02-02.8								

[illegible] = 04-58-03 Δ = 36°3 = 4035 km. S-P = 5-50

St. Louis: H = 04-58-07 φ = 7°N λ = 77°7W. Depth possibly somewhat greater than normal

	i- 05-05-09	1.5	11	e 05-05-09		1.2	e 05-05-11		
R_1	i- 35	2.0	6.5						
	e 11-01			e 11-05			i+ 10-59	0.5	1.5

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 September 18d (continued)						
	e 05-13-49	1.6			i+ 05-13-41	1.2
L	e 17.3	Small			e 18	Small
	i- 05-36-53	5.0 9.0				
	i+ 37-12	1.2 5.5				Deep Focus?
	i- 09-03-06	3.0 4.5				
	e 20	1.2				
	e 25	2.1				Deep Focus?
Blast at the quarry of the Connecticut Quarries Co., Granby, Conn. 14,000 pounds of 40 per cent dynamite. See 1935, June 23d. H = 14-21-17.2 Δ = 115.3 km. Azimuth . S 61° W. φ = 41° 59.8' N S-P = 13.8 secs. λ = 76° 46.3' W						
P	i+ 14-21-36.4		i- 14-21-36.4		i- 14-21-36.4	
S	e 50.2		e 50.2		e 50.5	
September 19d						
L	e 03-30.1		e 03-30.2		e 03-30.1	
	i+ 10-05-13	3.5 26.5	i+ 10-05-13	0.5 5.0	i- 10-05-14	0.7 4.5
	i+ 21					
	i- 24		i+ 26	10 1.2		
			i- 30	0.5 1.4		Deep Focus?
S	e 21-12-39	1.7	e 21-12-39			
L			e 41		e 21-12-41	Local
September 20d						
USCGS: H = 01-46.8 φ = 1°.5 S λ = 142° E Δ meas 132°.2 = 14,400 kms			St. Louis: H = 01-46-39 φ = 4° S, λ = 140°.5 E P-H = 132.1			
P	e 02-02-54					
P'	i- 05-47	2.5 [illegible]				
	i+ 51	4.3 [illegible]				
	i+ 56	3.8 [illegible]				
	i- 57	3.8 [illegible]	e 02-06-00		i- 02-05-57	1.0 [illegible]
	i- 06-09				e 06-05	
	i- 12	5.2 14.7	i- 15	1.0 1.7		
			e 22	2.0	i+ 22	2.5 [illegible]
	e 07-28	8.0				
			e 08-11	1.5	e 08-10	
	e 08-44	20.0				
SKP	i- 09-13	6.0 24.0	i+ 09-21	3.0 3.5	e 09-12	6.0
					i- 56	3.0 5.0
			e 10-21			
	e 21-35				i+ 21-20	4.0
			i- 25-40	3.0		
			i- 27-39	3.0		
			e 30-22			
			i- 31-44	4.0 6.0		
L	e 02-47.7				e 02-45.5	
	i+ 49-20	2.0			e 49-18	
	i+ 04-25-57	1.0	No trace		No trace	
	i- 29-20	3.0 12.0				

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max

1935 September 20d (continued)

H = 05-23-50 Δ = 123° = 13665 kms (PR_1 - P')
St. Louis: H = 05-23-41 φ = 0°N λ = 146° E Focal depth normal

	e	05-42-11		4.5								
P'	i+	47	2.0									
PR_1	e	44-21		2.5								
SKP	i+	45-43	4.0	10.5	i+	05-45-43	1.5	3.0	i-	05-45-40	1.0	2.0
					e	49-16						
SKKS					e	51-32		1.5				
PS					e	54-32		2.0	e	54-32		3.0
					e	56-44						
									e	57-42		4.0
SR_1	i-	06-00-50										
L	e	06-28			e	06-28			e	06-29		10
	e	20-24-30		3.8	No trace				No trace			
	i-	21-24-10	2.0									
	i-	25-34	0.5	0.7								
	i-	26-52	0.7	1.0					e	21-26-44		
	e	57-42		2.5								
L	e	22-10ca			e	22-11 ca			e	22-11 ca		

September 21d
H = 13-15-23.5 Δ = 94 km. S-P = 11 secs. Local

P	e	13-15-39			e	13-15-39			e	13-15-39		
	i+	50			e	50			e	50		
S					i-	51.5			e	51		
L	i-	54		2.0					i+	55		1.5

H = 17-20-23.5 Δ = 103 km. S-P = 12 secs. Local

P	i+	17-20-40.5			No NSP record				No ESP record			
S	e	52.5										
L	i-	56.5		2.5								

September 23d
e 00-09-30

H = 09-18-15 Δ = 130°3 = 14480 km. PR_1 - P' = 2-10
USCGS: H = 09-18.3 St. Louis: H = 09-18-30
φ = 1°.5 S λ = 142° E φ = 0°.5 N λ = 141°.5 E
Δ meas = 129°.2 = 14350 km.

P'	i+	09-37-26	1.5									
	i+	29										
PR_1	e	39-36		2.5								
SKP	i-	40-52	2.0	3.0	i-	09-40-52			i-	09-40-52	1.0	3.7
	i+	41-18	2.0									
	e	40		1.7	i+	41-52	0.5	1.8				
PS									e	49-42		3.7
	i+	52-30	0.8	1.0					e	52-24		1.5
SR_1									e	57-54		1.0
SR_2					e	10-02-28		1.0				
L	e	10-08		12	e	10-08		4.7	e	10-08		7.0

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 September 24d						
	e 05-22-28					
	i+ 23-38 3.2					
			e 05-32.8		e 05-32.8	
L	e 06-06		e 06-06		e 06-06	
H = 22-12-24		Δ = 39°3 = 4365 km.		S-P = 6-10		
USCGS: H_o = 22-12.4				St. Louis: H = 22-12-21		
φ = 5° N λ = 130° W				φ = 5° N λ = 129° W		
Δ meas = 4460 km.						
P	i+ 22-19-54 0.5 1.0				i- 22-19-54	
	i+ 20-12 0.7 1.1					
	e 26 1.0					
PR_1					i- 21-27 0.5 1.0	
S			e 22-26-04 1.2		e 26-06 1.7	
SR_2	e 28-59 1.7		e 28-52 2.2		e 28-52 2.5	
L	e 31.2 38		e 31.7 19		e 31.8 26	
September 25d						
	i+ 10-38-54 0.7 2.5		Traces obscured by microseisms			
S	e 19-45-49 2.7		e 19-49-46 1.4		e 19-45-49 0.5	
L					e 51 1.7	
					Local	
September 27d						
	i- 04-11-21 2.0 5.5		No trace		No trace	
	i- 35 1.2 2.0					
	i+ 50 1.2 4.0					
September 28d						
The following record has been interpreted from character and distance as a blast at Albany, N.Y. See 1935, June 22d and Aug. 10d						
H = 22-35-04.2		Δ = 188 km.		S-P = 22 secs.		
P	e 22-35-36.5		e 22-35-37		e 22-35-37 2.0	
S	i+ 58.5		e 58.5 5.0		i+ 58.5 4.0	
L	e 36-03		e 36-03		e 36-03	
September 29d						
	i+ 19-09-07 1.0 3.5					
I	e 19-27		e 19-27		e 19-27	
1935 October 2d						
H = 05-33-04		Δ = 86°5 = 9610 km.		S-P = 10-38		
St. Louis: H = 05-33-06		φ = 43°8 N		λ = 146°5 E	Depth 80 km	
P	i+ 05-45-44 3.2 21		i+ 05-45-46 2.0		Trace obscured by microseisms	
	i+ 57 4.0 20					
PR_1	i+ 49-00 2.5 3.5					
S			e 56-22 2.5			
L	e 06-20 Small		e 06-20 Small		e 06-20 Small	
L	e 17-19		e 17-19		e 17-21	
October 5d						
I	e 21-48		No trace		e 21-48	

PHASE	Z	traco mm i max	N	traco mm i max	E	traco mm i max
1935 October 6d						
L	e 05-44		No trace		e 05-44	
October 7d						
L	e 05-19		e 05-20		e 05-20	
October 8d						
L	e 10-10.5		Traco		e 10-10.5	
October 9d						
			e 19-59-24			
			e 30			
L	e 19-59-33		e 33		e 19-59-33	Local
	No trace		e 22-06-56		e 22-06-56	Local
H = 22-08-48	Δ = 3920 km. = 35°3 Az NE'y		S-P = 5-42			
	Strasbourg: φ = 62°.5 N λ = 22°.5 W					
	Reported felt in SW Iceland					
P	i- 22-15-47	1.7	e 22-15-47		e 22-15-47	
S			e 21-29		e 21-29	1.1
SR_1			e 23-29	1.2		
ScS			e 25-56	2.0	e 25-47	2.5
L	e 22-28.1	3.5	e 22-28	3.0	e 22-28.1	3.5
	No trace		e 04-53-22	1.5	e 04-53-22	1.5
			e 43	1.5	e 43	1.5
						Local
L	05-10-34	3.0	No trace		No trace	Local
October 11d						
H = 22-16-04	Δ = 129°1 = 14345 km.		PR_1 - P' = 2-04			
P'	e 22-35-13					
PR_1	e 37-17					
PKP?					e 22-38-39	
PS?					e 47-17	
					e 49-59	
	e 50-15					
					e 54-53	
			e 22-55-07			
L	e 23-17		e 23-17		23-17	
	Confused by micro-seisms		e 06-44-13	2.0	Trace	
			e 08-04-28		i- 08-04-31	
					e 05-29	
	i+ 08-05-43		i- 05-35	1.2 3.7	e 43	
	e 07-23		e 07-21		e 07-39	
	e 10-08					
	No surface waves.					
H = 16-45-48	Δ = 92°5 = 10280 km.		S-P = 11-05			
	St. Louis: H = 16-45-44 φ = 43° N λ = 144° E					
	i+ 16-58-34 2.0 3.0		Traco			
SKKS					e 17-09-29	
			e 17-09-39			

PHASE	Z	trace mm i	max	N	trace mm i	max	E	trace mm i	max
1935 October 11d (continued)									
PS	e 17-10-43								
							e 17-11-03		
L	e 17-25.5			e 17-31					
October 14d									
	i- 17-44-15	1.2	1.5	No trace			No trace		
October 15d									
L	e 10-49			Trace			e 10-49		
October 17d									
	e 20-42-56		3.7	e 20-42-57		2.2	e 20-42-56		2.2
October 18d									
H = 00-11-56	Δ = 92°.5 = 10280 km.						S-P = 11-05		
St. Louis: H = 00-12-34	φ = 43.8 N λ = 147° E Depth = 80 km.								
P	i+ 00-25-06	1.2	2.5						
SKKS							e 00-36-02		5.5
S	e 36-12		2.0	e 00-36-16		1.5			
PS	e 37-14		3.5	e 37-16		2.2			
							e 45-44		3.7
L	e 00-59		12	e 00-59		4.2	e 00-59		16
	Tentative phase identifications agree with Δ about 13000 km.								
PR_1	i+ 11-25-09	2.0	5.5				i+ 11-25-11		1.0
PR_2	i+ 27-45	1.2	4.0	e 11-27-45		1.5			
SKKF							i+ 32-17	1.0	1.2
				e 35-15		1.2	i- 35-17	1.5	
PPS	e 35-53		2.7						
	e 37-07								
	e 41-35								
L	e 11-59		2.5	e 11-59		2.5	e 11-59		3.0
L	e 15-46						e 15-42		
October 19d									
H = 04-48-01	Δ = 28°.7 = 3190 km.						S-P = 4-56		
USCGS: H = 04-48-03							St. Louis: = 04-48-04		
φ_Δ = 46°.6 N	λ = 112°.0 W						φ = 46°.6 N λ = 111°.8 W		
Δ_{meas} = 3200 km.							Damage at Helena, Montana		
P	i+ 04-54-02	2.0	2.5						
	i+ 28								
							e 04-54-52		
S							i- 58-58	1.0	2.5
	e 59-14		2.0						
	e 05-01-04		3.0				e 05-01-08		1.5
							i+ 59	2.5	3.0
L	e 05-02.7		25	e 05-02.5		28	e 05-02.7		24
October 23d									
	i- 13-31-05	3.7	5.5	i- 13-31-05.5		2.0	i- 13-31-05	1.0	1.5
	i- 12	2.7	4.0						
							Deep Focus?		

PHASE	Z	trace mm i max	N	trace mm i max		i max
1935 October 23d (continued)						
	i- 17-18-15	2.5 5.2	i+ 17-18-15	1.5 2.0	Trace	
	i+ 41	1.2 3.0				
	i- 55	1.5 2.5				
October 25d						
			e 15-07-23		e 15-07-27	1.5
	e 15-09-53	4.0			i+ 09-55	1.5 3.0
October 26d						
L	e 00-57 ca		Trace		e 00-57 ca	
October 27d						
	i+ 09-12-03	1.2 3.7	i+ 09-12-03	0.5 1.2	e 09-12-03	
	i+ 39	3.7 5.5	i+ 39	1.0 1.7		
					i+ 22-10-43	1.2 1.5
			i+ 22-11-43	1.0 3.0		
	i+ 22-12-17	3.5 11.5	i+ 12-17	1.2 4.7	i+ 12-17	2.0 3.0
	i+ 23-52-12	2.5 3.5	e 23-52-12	2.5	e 23-52-12	2.5
	i- 54-12	2.7 4.0	e 54-12		e 54-11	
October 28d						
	e 15-26-11		e 15-26-12	2.5	e 15-26-08	2.2
H = 16-01-11		Δ = 145 km.	S-P = 17 secs.		Local	
P	e 16-01-34		e 16-01-33			
S	e 50	2.5	e 50		e 16-01-50	1.5
October 29d						
	e 10-24-49	1.3				
	e 10-37-15		e 10-37-15	1.0	e 10-37-11	
			e 38-07	1.7		
	i+ 40-23	2.7			e 40-21	1.5
					Same quake as above	
	e 22-12-36					
	e 39	7.0				Local ?
October 30d						
	e 15-02-59	1.2	Microseisms con-		i+ 15-02-58	0.7
	i+ 03-00	1.2 2.5	fuse trace		e 59	1.2
October 31d						
H = 18-37-48		Δ = 3190 km.	S-P = 4-56			
	Destructive at Helena, Montana. See October 19d					
	St. Louis: H = 18-37-51 φ = 46°.6 N λ = 111°.8 W					
P	i+ 18-42-49				e 18-43-49	
S					e 48-45	1.5
SR_1	49-11					
L	e 51.5	39	e 18-51.5	24	e 51.8	21
1935 November 1d						
St. Louis: H = 06-03-35 φ = 46°.6 N λ = 79°.3 W			Ottawa: φ = 46° 47' N λ = 79° 04' W Depth 200 km.			

Felt over wide area in eastern North America. This quake is the

PHASE	Z	traco mm i max	N	traco mm i max		traco mm i max
1935 November 1d (continued)						
subject of special study at Ottawa.						
P	i 06-05-16		i 06-05-16		i 06-05-16	
	e 17-05-12	3.5	e 17-05-11	3.5	e 17-05-14	3.2
L	e 17-27		e 17-27		e 17-27	
	Confused by microseisms		e 18-54-19	1.7	e 18-54-20	1.2
			e 59-18	1.2	e 59-16	1.0
November 2d						
			e 00-45-35	3.0	e 00-45-25	
	e 00-45-52	6.0			e 53	5.5
	i 14-33-26		i 14-33-26		i 14-33-26	
F	14-47		14-47		14-47	
	Aftershock of November 1d					
	i- 21-13-43	2.2 8.0				
November 4d						
	Trace		e 04-15-08	7.8	Trace	
			e 10-31-34			
			e 32-18	2.0	e 10-32-36	
			e 14-11-48		e 14-11-48	1.2
	e 14-12-06					
			e 14-12-36		e 12-23	
					e 14-14	
					e 16-32	
			e 14-20-02			
			e 44	2.5		
			e 22-02	2.5	Separate quakes?	
November 5d						
			e 10-14-33			
	e 10-14-43	3.5	e 44	3.7	e 10-14-44	2.5
November 7d						
L	e 21-23		e 21-23		e 21-24	
November 9d						
Blast near Albany, N.Y. See 1935 June 22d..						
H = 22-36-30.6	Δ = 188 km.		Az =		89° 37.3 W	
	φ = 41°31.2 N		λ = 73°51.3 W		S-P = 22 secs	
P	22-37-01.2		No trace		e 22-37-01.2	
S	23.2	2.5i+	22-37-23.5	0.7 2.2e	23.2	1.7
November 10d						
H = 18-27-40	Δ = 27°0 = 3000 km.		S-P = 4-43			
USCGS: H = 18-27.5			St. Louis: H = 18-27-49			
φ = 16°7 N λ = 62°2 W			φ = 18°0 N λ = 62°8 W			
Δ meas = 2980 km.						
P	e 18-33-24	6.0	i- 18-33-24	1.0 3.0		
PR_1	i- 34-08	9.0	i- 34-08	2.0 6.5		
S	e 38-19	2.0	e 38-07	1.2	e 18-38-07	2.0

PHASE	Z	trace mm i max	N	trace mm i max		i max
1935 November 10d (continued)						
	e 18-38-34				e 18-38-43	6.0
L	e 40 ca	12.5	e 18-40 ca	5.0	e 40	12
	e 57-42	5.0	e 57-30	4.2	e 57-45	4.0
November 14d						
L	e 00-16		No time marks		e 00-15	
	i+ 20-15-41	3.0 5.0	No trace		No trace	
L	e 20-5[illegible] ca				e 20-58 Same quake?	
November 17d						
Microseism storm obscures all traces. Range (double amplitude) of many equals 3 cm.						
November 23d						
H = 07-52-31	Δ = 43°6 = 4845 km.		S-P = 6-36			
USCGS: H = 07-52.5			St. Louis: H = 07-52-34			
φ = 1°.0 N λ = 86°.0 W			φ = 0° N λ = 86°.0 W			
Δ meas = 43°.2						
P	e 08-00-35					
PR1			e 08-02-21		e 08-07-00	
S			e 07-11			
L					e 10.3	
November 24d						
Microseisms obscure all traces						
November 25d						
Beginning uncertain because of microseisms			e 06-23-51	3.5	e 06-23-37	
					e 50	5.0
November 27d						
	i+ 19-35-22	1.5 2.5	e 19-35-20	2.0	i- 19-35-22	1.5 3.0
			e 14-54.5		e 14-54-18	
	e 14-56-49	4.0	e 56-47	11.2	e 56-47	5.5
November 30d						
H = 03-39-53	Δ = 32°5 = 3610 km		S-P = 5-23			
USCGS: H = 03-39-45			St. Louis: H = 03-39-59			
φ = 10°.1 N λ = 79°.5 W			φ = 11°.0 N λ = 80°.5 W			
Δ meas = 3650 km.						
P	e 03-46-28		e 03-46-28		e 03-46-28	
S			e 51-51		e 51-53	
			i- 58	4.0		
L	e 55.5	25	e 56.5	12	e 55.5	12
1935 December 1d						
	e 16-05-16		No trace		No trace	
December 2d						
I	e 00-46		e 00-46		e 00-47	
L	e 17-06-43	3.5	Trace		e 17-06-43	2.0 Local

PHASE		Z	traco mm i max	N	traco mm i max	E	traco mm i max
1935 December 3d							
L	c	02-39		c 02-37.5		c 02-38	
L	c	06-15		c 06-15.7		c 06-15	
December 7d							
L	c	18-48		c 18-48		c 18-48	
December 14d							
H = 01-31-18			Δ = 4890 km.		S-P = 6-38		
USCGS: H = 01-31-22				St. Louis: H = 01-31-24			
φ = 6°.5 S λ = 72°.5 W				φ = 5°.5 S λ = 73°.3 W			
Δ meas = 5450 km.				Depth = 350 km.			
P	i-	01-39-27 5.0 55		i- 01-39-25 3.0 57.5		i- 01-39-27 3.7 54	
PR_1	i	41-17 3.0 5.0		i- 41-27 2.0		c 41-17 2.0	
	i	42-37 3.0 5.0		c 42-26 2.6			
				e 44-40 2.0			
	c	45-00 4.0		c 45-26			
S	i-	46-04 5.0		i- 46-05 4.0 10		i- 46-04 2.5 9.0	
				i- 47-10		c 47-16	
				i- 48-05		i 48-07 1.5 8.0	
						c 49-18	
USCGS: H = 22-05-18			φ = 14°.0 N	λ = 92°.0 W	Δ meas = 3750 km		
P	i-	22-11-58		i+ 22-11-59 1.5 6.5		i- 22-11-58 2.0 6.5	
				e 12-35		c 12-34	
				c 13-06			
				c 13-32		i- 13-50	
				c 14-14			
	c	17-16		c 17-16			
December 15d							
H = 07-08-06			Δ = 123°.7 = 13745 km		PR_1-P = 1-37		
USCGS: H = 07-08-06			φ = 12°.5 S	λ = 161° E	Δ meas = 14400 km		
P'	i+	07-27-05 2.5 4.0					
PR_1						c 07-[illegible]-42	
						c 32-20	
						c 34-18	
S						c 36-42	
PS						e 38-54	
						e 39-32	
L	c	08-06		c 08-06		c 06.5	
December 16d							

Note: Sensitivities of instruments reduced owing to microseismic disturbances as follows:

	Displacement for acceleration of 10^{-5} g		Displacement for acceleration of 10^{-6} g
ZSP	45 mm	ZLP	9.5 mm
NSP	47.5 mm	NLP	13 mm
ESP	47.5 mm	ELP	17 mm

	i-	17-05-36 2.0 4.0		i- 17-05-36 1.5 2.2		i- 17-05-36 1.7 4.0	
	e	06-17 5.0					
	e	08-07 4.0					

PHASE	Z	trace mm i max	N	trace mm i max	E	trace mm i max
1935 December 17d						
L	e 19-47		e 19-46.5		e 19-54	
December 18d						
	Trace		e 02-11-35		Trace	
December 20d						
L	e 08-05		Trace		e 08-05	
L	e 19-38		Trace		e 19-38	
December 21d						
L	e 05-49		Trace		e 05-49	
I	e 07-45		Trace		e 07-45	
L	e 12-12		Trace		e 12-12	
December 23d						
			e 12-44-32			
	e 20-33-17	3.0				
	e 34-15		e 20-34-15	1.5		
	e 35-22	3.2	i+ 35-22	2.0 4.5		
December 24d						
	i- 12-31-44	1.2 4.7	i- 12-31-51	1.0 2.5	Trace	
			e 12-37			
					e 12-38-14	
December 28d						
H = 02-35-20		Δ = 139°3 = 15480 km.			$PR_1 - P'$ = 2-48	
USCGS: H = 02-35.2		Φ = 3°.0 S λ = 97°.0 E			Δ meas = 15300 km.	
P'	i+ 02-54-48	1.0 4.0				
PR_1	i- 57-36	1.5 13				
			e 02-57-46	4.0	e 02-57-44	6.0
SKP	e 58-28	15	i- 58-30	3.5 12	e 58-30	4.0
PR_2	i+ 03-00-39	5.0 12	i- 03-00-40	2.5 5.0	i- 03-00-48	5.0
(SKS)	i+ 02-08	4.5				
SK'S	e 04-15	4.0				
	e 06-23	5.0			i+ 06-24	4.0
(SKSP)			i- 07-50	6.0		
PPS	i- 10-06	10			e 10-06	3.0
	i+ 30	5.0				
	i+ 13-06	5.0 9.0				
	e 13-30	5.0				
(SS)					e 13-44	
	i- 16-32	7.0				
	i+ 17-17	4.0 6.0				
	i+ 18-40	7.0 11				
I	e 40	37	e 40	35	e 40	33
	i- 04-59-04	4.0 16.5	i- 04-59-04	1.0 6.0	i+ 04-59-04	1.5 2.2
	i- 19-39-47	2.0 7.0	No trace		No trace	
	e 19-14-12	2.5			e 19-14-10	2.0
December 30d						
L	e 00-54					
December 31d						
	e 13-22-06					

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