550.34

SECTION V.—SEISMOLOGY.

SEISMOLOGICAL REPORTS FOR JUNE, 1917.

W. J. HUMPHREYS, Professor in Charge.

[Dated: Weather Bureau, Washington, D. C., July 1, 1917.]

TABLE 1.—*Noninstrumental earthquake reports, June, 1917.*

Date.	Approximate time, Greenwich Civil.	Station.	Approximate latitude.	Approximate longitude.	Intensity Rossi-Forel.	Number of shocks.	Duration.	Sounds.	Remarks.	Observer.
		ALABAMA.								
1917.	H. m.		° ′	° ′			M. s.			
30	2 23	Greensboro	32 41	87 32	4-5	1	4	Rumbling	This and the next disturbance probably not seismic.	Wm. Gerby.
		Rosemary	32 40	87 30	5	1		Rumbling		H. F. Adams.
30	2 50	Rosemary	32 40	87 30	5	1		Rumbling		H. F. Adams.
		CALIFORNIA.								
2	4 35	Cahuilla	33 32	116 43	4-5	1				Dr. W. L. Shawk.
2	14 30	Victorville	34 32	117 18	3	1				
6	5 ..	Saugus	34 20	118 30	3	1				
7	15 41	Calexico	32 41	115 30	3	1	1			Ivan R. Ralston.
8	0 30	Calexico	32 41	115 30	4	1	3	Rumbling		C. N. Perry.
8	6 13	Calexico	32 41	115 30	3	2	1	Faint		C. N. Perry.
9	3 30	Carmel	36 34	121 56	4	1		Rumbling		Charlotte Vickery.
		Salinas	36 36	121 40	3	1	10	None	Dishes rattled	Dr. E. D. Eddy.
		Soledad	36 28	121 16	5	1	30	None		Wm. Weber.
11	0 20	Calexico	32 41	115 30	3	1	30	Rumbling		H. M. Rouse.
11	2 13	Calexico	32 41	115 30	3	1	½	Rumbling		Ivan R. Ralston.
11	3 54	Julian	33 05	116 37	5	1	5	Rumbling		Wm. L. Schilling.
13	4 06	Calexico	32 41	115 30	3	1	1	Rumbling		Ivan R. Ralston.
17	6 ..	Heber	32 45	115 31	5	1		Rumbling	Shook buildings	
18	9 55	Calexico	32 41	115 30	4	3		Rumbling	Awakened some people	W. J. Best.
18	14 21	Calexico	32 41	115 30	2	1	1	None		C. N. Perry.
22	4 05	Julian	33 05	116 37	4	1	7	Loud		W. J. Norman.
26	13 26	Eureka	40 38	124 11	4	1	3	Rumbling		U. S. Weather Bureau.
27	6 26	Calexico	32 41	115 30	3-4	1	¼	Rumbling	Noise preceded shock	Ivan R. Ralston.
30	23 38	Los Angeles	34 03	118 15	4	1	1	Rumbling	Followed by 4 light shocks	U. S. Weather Bureau.
		IDAHO.								
1	10 35	Cottonwood	46 03	116 20	4	1	12	None		Rev. Father Jerome.
		ILLINOIS.								
9	13 14	Cairo	37 00	89 10	4	1	3	None		U. S. Weather Bureau.
		MISSOURI.								
9	13 14	New Madrid	36 35	89 32	4	1	Few.	Rumbling		Miss Josie Smith.
		NEVADA.								
1	20 37	Winnemucca	40 58	117 43	3	1	2	None		U. S. Weather Bureau.
		TENNESSEE.								
9	13 14	Springville	36 18	88 14	2	1	2	None		H. A. Boden.
		WASHINGTON.								
9	14 30	Glenoma	46 32	122 09	4	1	30	Rumbling	Shook buildings	J. A. Welsh.
		Longmire	46 45	121 50	4-5	1	1	Loud		J. B. Flett.

TABLE 2.—*Instrumental reports, June, 1917.*

[Time used: Mean Greenwich, midnight to midnight. Nomenclature: International.]

[For significance of symbols see REVIEW for January, 1917, p. 26.]

Alaska. *Sitka. Magnetic Observatory.* U. S. Coast and Geodetic Survey. J. W. Green.

Lat. 57° 03′ 00″ N.; long., 135° 30′ 06″ W. Elevation, 15.2 meters.

Instruments: Two Bosch-Omori, 10 and 12 kg.

Instrumental constants... E: V 10, T 16.7; N: V 10, T 15.4

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 4		P_E	1 32 35	4				Phases uncertain.
		S_E	1 34 42					
		e_N	1 35 26	20				
		L_E	1 36 30	20				
		M_N	1 36 58	18		10		
		M_E	1 37 16	20	10			
		F_E	2 17 ..					
		F_N	2 37 ..					
8		e_N	1 14 40					
		L_E	1 20 31	27				
		L_N	1 20 33	28				
		M_E	1 25 30	18	20			
		M_N	1 31 54	16		100		
		C_E	1 34 ..	16				
		C_N	1 38 ..	13				
		F_E	1 46 ..					
		F_N	2 00 ..					
10		eP_N	4 31 12					Phases uncertain.
		eP_E	4 33 32					
		S_N	4 35 52					
		S_E	4 36 40					
		L_N	4 38 50	20				
		L_E	4 38 55	18				
		M_N	4 40 42	11		100		
		M_E	4 42 40	8	20			
		C_N	4 47 ..	9				
		C_E	4 49 ..	8				
		F_E	5 11 ..					
		F_N	5 42 ..					
13		e_N	7 26 ..					Nothing on E-W; only long waves on N-S.
		M_N	7 40 ..	19		10		
		F_N	8 17 ..					
24		P_N	20 02 04					Motion very slight; phases doubtful.
		S_E	20 11 30					
		S_N	20 11 32					
		C_N	20 54 ..					
26		P_E	6 01 42	6				
		P_N	6 01 44	10				
		S_E	6 11 42	12				
		S_N	6 11 46	12				
		L_E	6 25 02	25				
		L_N	6 25 06	28				
		M_N	6 28 24	17		920		
		M_E	6 33 02	17	2,400			
		C_E	6 49 ..					
		C_N	6 50 ..	19				
		F_E	8 44 ..					
		F_N	9 00 ..					

Arizona. *Tucson. Magnetic Observatory.* U. S. Coast and Geodetic Survey. F. P. Ulrich.

Lat. 32° 14′ 48″ N.; long., 110° 50′ 06″ W. Elevation, 769.6 meters.

Instruments: Two Bosch-Omori, 10 and 12 kg.

Instrumental constants.. E: V 10, T_0 13.9; N: V 10, T_0 19.1

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 1		eP_N	16 50 51	3				Motion very slight on E-W.
		eP_E	16 51 20					
		eL_N	16 51 20					
		M_E	16 51 40		40			
		M_N	16 51 46	6		50		
		F_E	16 57 —					
		F_N	17 05 —					
3		P_E	6 49 34					E-W component not in good adjustment.
		P_N	6 49 39					
		L_N	6 50 22					
		M_N	6 50 39					
		M_E	6 51 27					
		F_E	6 51 52					
		F_N	7 02 09					

Arizona. *Tucson. Magnetic Observatory*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 3		e_N	11 11 15	2				Nothing on E-W.
		M_N	11 11 50	4		20		
		F_N	11 19 —					
8		P_N	0 57 30	4				
		P_E	0 57 32					
		S_N	1 02 21	5				
		S_E	1 02 31	10				
		L_N	1 06 53	24				
		L_E	1 07 00	20				
		M_E	1 08 53	12	890			
		M_N	1 10 58	18		3,680		
		C_E	1 17 —	12				
		C_N	1 19 —	12				
		F_E	3 34 —	10				
		F_N	3 39 —	10				
10		eP_N	4 36 23	5				
		eP_E	4 38 08					
		L_N	4 40 00	14				
		M_N	4 43 07	13		30		
		M_E	4 43 13		20			
		F_E	5 33 —					
		F_N	5 41 —					
13		e_N	7 05 10					No distinct phases.
		e_E	7 05 21					
		M_E	7 42 38	16	20			
		M_N	7 43 46	15		40		
		F_N	8 27 —					
		F_E	8 31 —					
26		P_N	6 01 33	6				
		P_E	6 01 37	10				
		S_E	6 11 26	11				
		S_N	6 11 41	10				
		L_E	6 24 50	25				
		L_N	6 24 56	22				
		M_E	6 26 02	24	3,400			
		M_N	6 32 57	17		5,800		
		C_E	6 45 00	17				
		C_N	6 45 00	16				
		F_E	8 38 —	15				
		F_N	9 00 —					
29		P_N	16 09 58	4				E-W record defective: no regular waves.
		eP_E	16 11 43					
		L_N	16 14 46	10				
		eL_E	16 15 47					
		M_N	16 15 58	7		20		
		M_E	16 16 19		40			
		F_N	16 54 —					
30		e_N	18 00 40					
		C_N	18 28 —	15				

California. *Berkeley. University of California.*

Lat., 37° 52′ 16″ N.; long., 122° 15′ 37″ W. Elevation, 85.4 meters.

(*See* Bulletin of the Seismographic Stations, University of California.)

California. *Mount Hamilton. Lick Observatory.*

Lat., 37° 20′ 24″ N.; long., 121° 38′ 34″ W. Elevation, 1,281.7 meters.

(*See* Bulletin of the Seismographic Stations, University of California.)

California. *Point Loma. Raja Yoga Academy.* F. J. Dick.

Lat., 32° 43′ 03″ N.; long., 117° 15′ 10″ W. Elevation, 91.4 meters.

Instrument: Two-component, C. D. West seismoscope.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 1					*250	*300		Tremors recorded during the 24 hours ending 15h on dates given.
3					*50	*50		
4					*100	*100		
6					*100	*150		
9					*200	*200		
11					*100	*100		
24					*200	*200		

*Amplitude on instrument.

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

California. *Santa Clara. University of Santa Clara.* J. S. Ricard, S. J.

Lat., 37° 26′ 36″ N.; long., 121° 57′ 63″ W. Elevation, 27.43 meters.

(*See* record of the Seismographic Station, University of Santa Clara.)

Colorado. *Denver. Sacred Heart College.* Earthquake Station. A. W. Forstall, S. J.

Lat., 39° 40′ 36″ N.; long., 104° 56′ 54″ W. Elevation, 1,655 meters.

Instrument: Wiechert 80 kg., astatic, horizontal pendulum.

Instrumental constants .....

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 8	.....	P_N	1 01 ..	.....	.....	.....	.....	Preliminaries very indistinct.
		eP_E?	1 08 ..	.....	.....	.....	.....	
		S_N	1 04 ..	.....	.....	.....	.....	S_E?
		L_N	1 08 ..	.....	.....	.....	.....	
		L_E	1 10 ..	.....	.....	.....	.....	
		M_N	1 10 ..	18	.....	*1000	.....	
		M_E	1 11 ..	20	*1000	.....	.....	
		C_E	1 13 ..	.....	.....	.....	.....	
		C_N	1 16 ..	.....	.....	.....	.....	
		F_E	1 17 ..	.....	.....	.....	.....	
		F_N	1 24 ..	.....	.....	.....	.....	
12–13	.....	.....	.....	.....	.....	.....	.....	Distinct activity during day. At times broken waves, other times regular sinusoidal waves.
26	.....	P	6 02 ..	.....	.....	.....	.....	Very good record. Remarkably long on N–S.
		S	6 13 ..	.....	.....	.....	.....	
		L	6 28 ..	.....	.....	.....	.....	
		M_E	6 29 ..	33	*2000	.....	.....	
		M_N	6 30 ..	25	.....	*2500	.....	
		C_E	6 38 ..	.....	.....	.....	.....	
		C_N	6 45 ..	.....	.....	.....	.....	
		F_E	6 47 ..	.....	.....	.....	.....	
		F_N	7 36 ..	.....	.....	.....	.....	

*Trace amplitude.

District of Columbia. *Washington. U. S. Weather Bureau.*

Lat., 38° 54′ 12″ N.; long., 77° 03′ 03″ W. Elevation, 21 meters.

Instrument: Marvin (vertical pendulum), undamped. Mechanical registration.

Instrumental constants.. V 110 T_0 6.4

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 1	.....	P?	17 05 29	.....	.....	.....	380?	
		S	17 06 11	.....	.....	.....	.....	
		L?	17 06 55	.....	.....	.....	.....	
		F	17 15 00	.....	.....	.....	.....	
3	.....	P?	7 04 34	.....	.....	.....	290?	
		S	7 05 06	.....	.....	.....	.....	
		L?	7 05 46	.....	.....	.....	.....	
		F	7 12 —	.....	.....	.....	.....	
3	.....	P?	19 53 42	.....	.....	.....	3,360?	
		S?	19 58 40	.....	.....	.....	.....	
		L	20 01 40	.....	.....	.....	.....	
		F	20 10 00	.....	.....	.....	.....	
4	.....	P	1 39 08	.....	.....	.....	6,010	
		S	1 46 45	.....	.....	.....	.....	
		L	1 57 57	20	.....	.....	.....	
		L	1 58 35	.....	.....	.....	.....	
		L	2 03 15	16	.....	.....	.....	
		F	2 09 40	.....	.....	.....	.....	

District of Columbia. *Washington. U. S. Weather Bureau*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 7	.....	P_E	3 05 00	.....	.....	.....	7,760	No phases distinguishable on N–S.
		S_E	3 14 08	.....	.....	.....	.....	
		L_E	3 21 00	.....	.....	.....	.....	
		F	3 35 —	.....	.....	.....	.....	
8	II_r	P	0 57 31	.....	.....	.....	2,875	Salvador quake.
		S	1 02 05	.....	.....	.....	.....	
		L	1 05 10	.....	.....	.....	.....	
		L	1 06 30	16	.....	.....	.....	
		F	2 45 —	.....	.....	.....	.....	
8	.....	P	3 04 35	.....	.....	.....	2,920	
		S?	3 09 12	.....	.....	.....	.....	
		L	3 14 50	.....	.....	.....	.....	
		F	3 35 —	.....	.....	.....	.....	
9	.....	eL	18 03 00	.....	.....	.....	.....	
10	I_r	P	4 39 53	.....	.....	.....	4,030	
		S	4 45 42	.....	.....	.....	.....	
		L	4 53 36	16	.....	.....	.....	
		F	6 00 —	.....	.....	.....	.....	
12	.....	P?	2 03 24	.....	.....	.....	2,150	
		S	2 07 00	.....	.....	.....	.....	
		F	2 20 —	.....	.....	.....	.....	
13	.....	P?	7 01 37	.....	.....	.....	4,925?	
		S	7 07 15	.....	.....	.....	.....	
		L	7 11 23	16	.....	.....	.....	
		L	7 38 40	24	.....	.....	.....	
		L	7 43 30	20	.....	.....	.....	
		F	9 20 —	.....	.....	.....	.....	
16	.....	P	15 56 03	.....	.....	.....	3,580?	
		S?	16 01 25	.....	.....	.....	.....	
		L	16 08 55	.....	.....	.....	.....	
		F	16 25 —	.....	.....	.....	.....	
16	.....	P?	22 55 47	.....	.....	.....	2,760?	
		S?	23 01 12	.....	.....	.....	.....	
		L	23 10 25	.....	.....	.....	.....	
		F	23 30 —	.....	.....	.....	.....	
22	.....	P?	5 38 22	.....	.....	.....	6,075?	
		S?	5 46 02	.....	.....	.....	.....	
		L	5 56 00	.....	.....	.....	.....	
		F	6 10 —	.....	.....	.....	.....	
24	.....	P	20 07 45	.....	.....	.....	3,800	
		S	20 13 20	.....	.....	.....	.....	
		L	20 17 00	.....	.....	.....	.....	
		F	21 15 —	.....	.....	.....	.....	
26	II_u	P	6 03 44	.....	.....	.....	9,515	
		S	6 14 20	.....	.....	.....	.....	
		L	6 22 00	.....	.....	.....	.....	
		L	6 38 00	30	.....	.....	.....	
		M_E	6 45 00	.....	91	.....	.....	
		F	10 30 —	.....	.....	.....	.....	
27	.....	e	12 06 12	.....	.....	.....	.....	
		S?	12 14 48	.....	.....	.....	.....	
		F	12 20 —	.....	.....	.....	.....	
27	.....	P	12 33 05	.....	.....	.....	3,420	
		S	12 38 17	.....	.....	.....	.....	
		L	12 42 50	20	.....	.....	.....	
		F	13 15 —	.....	.....	.....	.....	
28	.....	L	14 50 00	.....	.....	.....	.....	Scarcely visible on N–S.
		F	15 05 —	.....	.....	.....	.....	
29	.....	P	16 13 34	.....	.....	.....	3,840	
		S?	16 19 12	.....	.....	.....	.....	
		L	16 28 00	.....	.....	.....	.....	
		F	17 00 —	.....	.....	.....	.....	
30	.....	P	17 57 02	.....	.....	.....	3,400	
		S	18 02 12	.....	.....	.....	.....	
		L	18 06 46	.....	.....	.....	.....	
		F	18 35 —	.....	.....	.....	.....	

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

District of Columbia. *Washington. Georgetown University.*

F. A. Tondorf, S. J.

Lat., 38° 54′ 25″ N.; long., 77° 04′ 24″ W. Elevation, 42.4 meters. Subsoil: Decayed diorite.

Instruments: Wiechert 200 kg. astatic horizontal pendulums. 80 kg. vertical.

Instrumental constants..

	V	T_0	ϵ
E	165	5.4	0
N	143	5.2	0
Z	80	3.0	0

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 1		e_E	17 06 06					Microseisms present. Phases not discernable. Vertical shows e at 17h 06m 20s.
		e_N	17 06 08					
		F	17 17 00					
4		e_E	1 38 00					
		e_N	1 38 52					
		L	1 59 00	20				
		F	2 45 00					
7		e_E	3 05 01					
		e_N	3 05 16					
		F	3 35 00					
8		P	0 57 29					
		S_E	1 02 21					
		S_N	1 02 24					
		eL_E	1 05 03					
		eL_N	1 05 04					
		M	1 07 04	13	*3700	*1200		
		F	2 31 ..					
		VERTICAL.						
		P	*0 57 28*					
		S	*1 02 17*					
		eL	*1 05 08*					
		F	*2 10 00*					
8		e_N	3 05 40					
		e_E	3 05 41					
		eL_E	3 15 08					
		eL_N	3 15 11					
		L_E	3 17 17					
		F	3 26 00					
10		eP_E	4 39 39					
		eP_N	4 39 43					
		S_E	4 45 43					
		S_N	4 45 44					
		eL_N	4 49 43					
		eL_E	4 49 45					
		M_N	4 56 12	17		*300		
		M_E	4 58 57	17	*1800			
		F	5 33 00					
12		eP_E	2 03 22					F lost in microseisms. Phases difficult to distinguish.
		eP_N	2 03 30					
		eL	2 06 57					
		F	2 15 00					
13		e_N	7 07 10					Long waves from 7h 39m 15s to 8h 4m 0s. No distinct maximum.
		e_E	7 07 13					
		eL_E?	7 11 35					
		L_E	7 39 15					
		L_N	7 39 16					
		F	9 08 00					
16		e_E	15 56 06					Microseisms present.
		e_N	15 56 15					
		L_N	16 10 20					
		L_E	16 10 26					
		F	16 30 00					
16		e	22 56 04					Heavy microseisms present.
		L_N	23 10 04	15				
		L_E	23 10 26	15				
		F	23 40 00					
24		e	20 07 47					Microseisms present.
		S_E?	20 13 40					
		S_N?	20 13 43					
		eL?	20 17 00	15				
		F	21 15 00					

* Trace amplitude.

District of Columbia. *Washington. Georgetown University*—Contd.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 26		eP_N	6 03 48					Phases difficult. Mainka instrument shows P at 6h 3m 42s; S at 6h 13m 42s; and eL at 6h 31m 42s.
		eP_E	6 03 49					
		S	6 14 48					
		M_N	6 43 58	30		*2400		
		M_E	6 45 04	24	*5400			
		F	8 56 00					
		VERTICAL.						
		eP	*6 03 56*					*S*?
		L	*6 33 42*	*40*				
		M	*6 45 28*					
		F	*9 02 00*					
27		e	12 32 21					Sheets changed at 13h 8m 0s while quake was still going on.
		L_E	12 43 16	30				
		L_N	12 44 55	24				
28		L	14 52 00					Record confused by microseisms and local disturbances.
		F	15 05 00					
29		eP	16 12 46					Microseisms present. S_E?
		S_N	16 19 32					
		eL_E	16 22 48	10				
		eL_N	16 22 54	10				
		L	16 29 00					
		F	17 10 00					
30		P	17 57 01					Microseisms present.
		S_E	18 02 12					
		S_N	18 02 13					
		L	18 09 00	20				
		F	18 50 00					

* Trace amplitude.

Hawaii. *Honolulu. Magnetic Observatory.* U. S. Coast and Geodetic Survey. Frank Neumann.

Lat., 21° 19′ 12″ N.; long., 158° 03′ 48″ W. Elevation, 15.2 meters.

Instrument: Milne seismograph of the Seismological Committee of the British Association.

Instrumental constant.. T_0 18.6

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 1		eL	9 01 24					
		M	9 08 00	19	*100			
		C	9 13 ..					
		F	9 31 00					
3		e	15 16 30					
		M	15 22 00	19	*100			
		F	15 43 00					
3		e	19 44 30					
		M	19 52 18		*100			
		F	19 59 00					
4		P	1 41 36					
		L	1 43 54	20				
		M	1 48 48		*600			
		C	1 53 06					
		F	2 54 00					
7		e	3 02 30					
		M	3 03 24	18	*100			
		F	3 18 00					
8		P	1 10 36					
		S	1 14 36					
		L	1 21 18	21				
		M	1 26 30		*3000			
		C	1 47 00					
		F	2 54 00					
10		P	4 37 48					
		L	4 45 12	19				
		M	4 52 24		*3600			
		C	4 56 06					
		F	6 18 00					

* Trace amplitude.

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

Hawaii. *Honolulu. Magnetic Observatory*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 13	.....	eP....	6 51 00	.....	.....	.....	.....	
		S.....	6 59 24	.....	.....	.....	.....	
		L.....	7 09 54	.....	.....	.....	.....	
		M.....	7 13 54	20	*3000	.....	.....	
		C.....	7 20 00	.....	.....	.....	.....	
		F.....	10 40 00	.....	.....	.....	.....	
13	.....	eP....	17 29 12	.....	.....	.....	.....	
		eL....	17 34 00	21	.....	.....	.....	
		M.....	17 37 54	.....	*500	.....	.....	
		C.....	17 42 00	.....	.....	.....	.....	
		F.....	17 56 00	.....	.....	.....	.....	
16	.....	e.....	23 03 00	.....	.....	.....	.....	
		M.....	23 07 30	18	*100	.....	.....	
		F.....	23 11 00	.....	.....	.....	.....	
17	.....	e.....	8 40 24	.....	.....	.....	.....	
		M.....	9 00 30	.....	*100	.....	.....	
		F.....	9 12 00	.....	.....	.....	.....	
18	.....	e.....	22 35 30	.....	.....	.....	.....	
		M.....	22 40 00	20	*100	.....	.....	
		F.....	22 47 12	.....	.....	.....	.....	
24	.....	eP....	19 57 36	.....	.....	.....	.....	
		S.....	20 03 30	.....	.....	.....	.....	
		L.....	20 07 06	.....	.....	.....	.....	
		M.....	20 08 00	20	*3200	.....	.....	
		C.....	20 16 00	.....	.....	.....	.....	
		F.....	21 30 00	.....	.....	.....	.....	
26	.....	eP....	5 57 00	.....	.....	.....	.....	
		S.....	6 03 30	.....	.....	.....	.....	Record off paper from 6h 07m 36s to 6h 12m 30s.
		L.....	6 07 36	.....	*17000+	*17000+	.....	
		C.....	7 05 00	.....	.....	.....	.....	
		F.....	10 39 00	.....	.....	.....	.....	
26	.....	P.....	14 12 54	.....	.....	.....	.....	
		L.....	14 15 48	.....	.....	.....	.....	
		M.....	14 16 18	20	*400	.....	.....	
		C.....	14 25 00	.....	.....	.....	.....	
		F.....	14 51 00	.....	.....	.....	.....	
27	.....	e.....	5 32 30	.....	.....	.....	.....	
		M.....	5 33 06	18	*100	.....	.....	
		F.....	5 46 00	.....	.....	.....	.....	
27	.....	e.....	13 01 00	.....	.....	.....	.....	
		M.....	13 06 24	.....	*500	.....	.....	
		C.....	13 09 00	.....	.....	.....	.....	
		F.....	13 15 00	.....	.....	.....	.....	

* Trace amplitude.

Kansas. *Lawrence. University of Kansas.* Department of Physics and Astronomy. F. E. Kester.

Lat., 38° 57′ 30″ N.; long., 95° 14′ 58″ W. Elevation, 301.1 meters.

Instrument: Wiechert.

Instrumental constants.. E: V 177, T_0 3.4, ϵ 4:1; N: V 205, T_0 3.4, ϵ 4:1

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 8	.....	iPN...	0 57 15	1-2½	.....	.....	.....	E-W component illegible.
		S? or L	1 01 42	5-10	.....	.....	.....	
		MN....	1 02 05	.....	.....	24	.....	
		LN?...	1 08 44	15-20	.....	.....	.....	
		MN....	1 09 20	.....	.....	4	.....	F lost in succeeding tremor.
8	.....	ePN...	1 38 48	.....	.....	.....	.....	
		S? or L	1 43 36	.....	.....	.....	.....	
		MN....	1 43 40	.....	.....	1	.....	
		F.....	2 14 ..	.....	.....	.....	.....	
26	.....	ePE...	6 02 41	.....	.....	.....	.....	
		ePN...	6 02 45	.....	.....	.....	.....	
		SN....	6 12 48	.....	.....	.....	.....	
		LN?...	6 30 24	.....	.....	.....	.....	
		LE....	6 31 35	.....	.....	.....	.....	
		ME....	6 36 14	.....	24	.....	.....	
		MN....	6 36 24	.....	.....	11	.....	
		F.....	9 06 00	.....	.....	.....	.....	
29	.....	ePE...	16 12 54	.....	.....	.....	.....	
		iSE....	16 16 41	.....	.....	.....	.....	
		eSE?..	16 17 43	.....	.....	.....	.....	
		LE....	16 20 07	.....	.....	.....	.....	
		ME....	16 20 32	.....	5	.....	.....	
		F.....	16 44 00	.....	.....	.....	.....	

Maryland. *Cheltenham. Magnetic Observatory.* U. S. Coast and Geodetic Survey. George Hartnell.

Lat., 38° 44′ 00″ N.; long., 76° 50′ 30″ W. Elevation, 71.6 meters.

Instruments: Two Bosch-Omori, 10 and 12 kg.

Instrumental constants.. E: V 10, T_0 33; N: V 10, T_0 25

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 1	.....	PE....	17 06 07	4	.....	.....	.....	Record very faint: no distinct phases.
		PN....	17 06 14	3	.....	.....	.....	
		ME....	17 07 12	5	10	.....	.....	
		MN....	17 07 12	.....	.....	10	.....	
		FN....	17 09 ..	.....	.....	.....	.....	
		FE....	17 13 ..	.....	.....	.....	.....	
4	.....	ePE...	1 46 11	5	.....	.....	.....	Phases not well-defined.
		ePN...	1 46 56	5	.....	.....	.....	
		M.....	1 59 44	16	10	10	.....	
		FE....	2 14 ..	.....	.....	.....	.....	
		FN....	2 25 ..	.....	.....	.....	.....	
8	.....	PN....	0 57 29	3	.....	.....	.....	
		PE....	0 57 35	3	.....	.....	.....	
		SN....	1 02 25	8	.....	.....	.....	
		SE....	1 02 27	9	.....	.....	.....	
		LE....	1 05 11	18	.....	.....	.....	
		LN....	1 05 12	18	.....	.....	.....	
		ME....	1 07 12	18	550	.....	.....	
		MN....	1 07 18	16	.....	310	.....	
		CN....	1 15 ..	15	.....	.....	.....	
		CE....	1 16 ..	13	.....	.....	.....	
		FN....	3 20 ..	.....	.....	.....	.....	
		FE....	3 30 ..	.....	.....	.....	.....	
10	.....	PN....	4 39 54	.....	.....	.....	.....	Phases uncertain.
		PE....	4 39 55	.....	.....	.....	.....	
		SE....	4 46 00	8	.....	.....	.....	
		SN....	4 47 04	.....	.....	.....	.....	
		LE....	4 53 23	13	.....	.....	.....	
		LN....	4 53 44	14	.....	.....	.....	
		MN....	4 56 19	10	.....	40	.....	
		ME....	4 59 07	10	40	.....	.....	
		CN....	5 00 ..	.....	.....	.....	.....	
		CE....	5 02 ..	.....	.....	.....	.....	
		F.....	5 31 ..	.....	.....	.....	.....	
13	.....	PE....	7 07 22	7	.....	.....	.....	Phases uncertain.
		PN....	7 07 24	4	.....	.....	.....	
		SN....	7 17 36	.....	.....	.....	.....	
		LE....	7 39 50	24	.....	.....	.....	
		LN....	7 40 10	25	.....	.....	.....	
		MN....	7 48 40	17	.....	40	.....	
		CN....	7 54 ..	16	.....	.....	.....	
		ME....	7 54 48	16	20	.....	.....	
		FN....	8 25 ..	.....	.....	.....	.....	
		FE....	8 30 ..	.....	.....	.....	.....	
24	.....	PE....	20 07 54	6	.....	.....	.....	Motion very slight; phases uncertain.
		SE....	20 13 45	8	.....	.....	.....	
		eSN...	20 14 36	8	.....	.....	.....	
		LE....	20 17 07	10	.....	.....	.....	
		ME....	20 18 30	9	10	.....	.....	
		F.....	20 35 ..	.....	.....	.....	.....	
26	.....	PN?...	6 03 06	.....	.....	.....	.....	Phases not well defined.
		ePE...	6 04 00	10	.....	.....	.....	
		SE....	6 14 26	13	.....	.....	.....	
		SN....	6 14 29	.....	.....	.....	.....	
		LE....	6 37 51	34	.....	.....	.....	
		LN....	6 38 13	26	.....	.....	.....	
		ME....	6 42 00	28	4,600	.....	.....	
		MN....	6 44 42	26	.....	3,300	.....	
		CE....	6 57 ..	17	.....	.....	.....	
		CN....	7 01 ..	22	.....	.....	.....	
		FN....	8 51 ..	18	.....	.....	.....	
		FE....	8 55 ..	18	.....	.....	.....	
27	.....	PE....	12 32 26	.....	.....	.....	.....	Phases not well defined. Nothing definite on N-S.
		SE....	12 38 24	10	.....	.....	.....	
		LE....	12 43 12	20	.....	.....	.....	
		ME....	12 44 57	20	10	.....	.....	
		F.....	13 02 ..	.....	.....	.....	.....	
29	.....	ePN...	16 22 06	6	.....	.....	.....	Motion very slight. No distinct phases.
		ePE...	16 22 49	6	.....	.....	.....	
		ME....	16 27 43	10	10	.....	.....	
		MN....	16 30 49	6	.....	10	.....	
		FN....	16 37 ..	.....	.....	.....	.....	
		FE....	16 39 ..	.....	.....	.....	.....	
30	.....	eN....	17 57 03	.....	.....	.....	.....	Phases uncertain.
		eE....	17 58 21	.....	.....	.....	.....	
		SN....	18 02 11	8	.....	.....	.....	
		SE....	18 02 12	8	.....	.....	.....	
		LN....	18 07 01	.....	.....	.....	.....	
		LE....	18 07 37	22	.....	.....	.....	
		MN....	18 09 13	18	.....	10	.....	
		ME....	18 09 26	18	20	.....	.....	
		CE....	18 15 ..	15	.....	.....	.....	
		FN....	18 28 ..	.....	.....	.....	.....	
		FE....	18 30 ..	.....	.....	.....	.....	

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

Massachusetts. *Cambridge. Harvard University Seismographic Station,* J. B. Woodworth.

Lat., 42° 22′ 36″ N.; long., 71° 06′ 59″ W. Elevation, 5.4 meters. Foundation: Glacial sand over clay.

Instruments: Two Bosch-Omori 100 kg. horizontal pendulums (mechanical registration).

Instrumental constants.. {E: V 80, T_0 23, e 0; N: V 50, T_0 25, e 4:1}

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 1		*O*	*12 02 04*				2,140	Short period L waves.
		eP_N	12 06 32					
		eP_E	12 06 39					
		i_N	12 08 32	4				Amplitude of N-S increases.
		S_E	12 10 07	6				
		eL_E?	12 11 56	8				
		L_E	12 12 08	8				Later LL irregular.
		F?	12 22 ..					
3		e_E	7 07 24					
		i	7 07 51					
		L_E	7 09 25					
		L	7 11 20	10				
		F	7 25 ..					
3		e?	19 48 18					
		e	19 53 11					
		e	19 53 53					
		L_E?	20 01 18	15				
		F	20 20 ..					
4		*O*?	*1 27 09*				7,240	Distance from L-S.
		eP_E?	1 38 41					
		S_E	1 46 31					
		eL_E	1 58 54	20				
		L	2 02 17					
		F	3 19 ..					
5		*O*?	*4 .. ..*				16,000†	
		eP?	4 18 25					
		S?	4 33 44					
		i	4 45 46					
		eL?	5 01 50	20				
		L_{repl}	{5 27 12, 5 29 42}	15				Distance from L_{repl}—L.
		F	5 34 ..					
6		*O*?	*16 27 19*				6,420?	Distance from eL-S.
		S_E?	16 45 13	8				Early phases masked by pulsations—not microseisms. Amplitude of E-W increases at L and becomes irregular in period.
		eL_E	16 55 28	16				
		L	17 04 13					
		F?	17 40 ..					
7		*O*	*2 55 07*				5,600	(N. B. Messines Ridge in France, reported blown up at about 3h.)
		P_E	3 05 13					
		P_N	3 05 16					
		S_E	3 12 28	6				
		eL_E?	3 20 38	18				
		eL_N	3 20 50	15				
		L_E	3 25 34	8				
		F	3 42 ..					
7		*O*?	*20 07 29*				3,625?	Distance from L-S. A weak record.
		eP?	20 15 24					
		S_E	20 19 45					
		eL_E	20 23 20					
		F	20 41 ..					
8		*O*	*0 51 32*				3,520	San Salvador quake [see dispatches, p. 317.]
		P_E	0 58 14					
		P_N	0 58 22					
		S_E	1 03 32					
		S_N	1 03 35					
		eL_E	1 06 20	38				
		eL_N	1 06 35	16				
		M_E	1 09 59	17				
		M_E	1 14 44	15				
		L_{repl}	{3 15 59, 3 17 59, 3 26 51}	10, 15, 13				Amplitude decreases with period.
		F	3 38 30					
9		*O*?	*17 30 12*				7,560?	
		P?	17 41 10					
		S_E?	17 50 13	7				
		eL_E	18 03 26	16				Period then becomes 17, 20. End of sinusoidals.
		L	18 17 26					
		L	{18 20 12, 18 23 08}	16				
		L	18 35 16	16				
		F	18 37 20					

† = 20,000 − ½ (25.3 meters × 320 km.).

Massachusetts. *Cambridge. Harvard University Seismographic Station*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 10		*O*	*4 32 21*				4,500	
		P_E	4 40 15	3				
		i	4 41 45	6–8				
		S_E	4 46 30					
		L_E	4 54 12	20				
		M?	4 57 43					
		C	4 58 45	8				
		C	5 08 45					A_E increases again.
		F?	5 46 ..					
12		*O*	*2 03 ..*					Felt in lower St. Lawrence (Klotz).
		e	2 03 48					
		i	2 04 30					
		i	2 04 32	4				
		L_E	2 04 42	4				
		F	2 05 25					
13		*O*?	*6 49 04*				9,760?	
		eP?	7 01 54					
		i	7 07 38					
		i	7 09 02					
		S_E	7 12 01					Sinusoidal waves set in following S. No definite eL_E. First L probably SS but looks LL.
		L	7 18 30	20				
		L	7 40 41	20–30				
		M_E	7 50 37					
		i_{repl}	9 58 24	20				
		F	10 15 10					
16		L_E	16 11 45	14				e? Periods run down to 8 secs.
		F	16 28 41					
16		e?	22 59 30					Periods run down to 8 secs.
		L_E?	23 10 59	15				
		M_E?	23 13 14	15				
		F	23 36 ..					
21		L_E	{14 01 18, 14 02 18}	14				*e? Doubtful as to being seismic.*
		L_E	{14 04 26, 14 05 27}					
		L_E	{14 06 04, 14 06 40}	8				F?
21		e?	2 53 58					Amplitude very small.
		L_E	2 59 10	20				
		F	3 08 06					
22		e	5 42 27					
		S?	5 46 11	16				
		e	5 49 55	12				
		L_E	5 58 14	20				
		F	6 25 52					
24		e?	20 07 10					*O* near 20h. Phases indistinct.
		e_E	20 08 50					
		i_E	20 13 50	6				
		i	20 14 47	9				
		i	20 31 26	12				
		L_E	20 48 28	20				
		F	21 50 ..					
26		*O*	*5 50 53*				10,000	
		eP_E	6 03 55					
		i	6 08 35					
		i	6 14 27					
		S_E	6 14 43					
		i	6 17 46					
		eL_E	6 33 15	19				
		M_E	{6 40 15, 7 21 —}	50–17				
		F	11 08 —					
27		e_N	12 34 40	2				E-W component stopped at 12h. N-S, damped, does not register clearly.
28		eL_E	14 42 24	23				
		L	14 43 46	18				Amplitude increases.
		F?	15 29 —					
29		*O*?	*16 05 03*				4,780?	Distance from L-S. eP_E, 16h 13m 30s, gives 4,480 km. and *O* at 16h 05m 34s.
		eP_E?	16 15 48	4				
		S?	16 19 48	7				
		eL_E	16 25 03	9				
		eL_N	16 25 04					
		L_E	16 27 47	19–8				
		L_N	16 27 52					
		F	17 22 —					
30		*O*?	*17 50 34*				3,880	
		iP_N	17 57 00	2				
		S_N?	18 02 14	4				S_E masked by local traffic jars.
		eL_E	18 09 36					
		F	18 58 —					

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

Missouri. *Saint Louis. St. Louis University.* Geophysical Observatory. J. B. Goesse, S. J.

Lat., 38° 38′ 15″ N.; long., 90° 13′ 58″ W. Elevation, 160.4 meters. Foundation: 12 feet of tough clay over limestone of Mississippi system, about 300 feet thick.

Instrument: Wiechert 80 kg. astatic, horizontal pendulum.

Instrumental constants.. V 80, T_0 7, ϵ 5:1

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 3	.....	e.....	15 50 00	.....	.....	.....	.....	
		F.....	16 02 00	.....	.....	.....	.....	
7	II_r...	iP.....	12 56 06	.....	.....	.....	2,800	
		S.....	13 00 30	.....	.....	.....	.....	
		L.....	13 02 00	.....	.....	.....	.....	
		F.....	13 30 —	.....	.....	.....	.....	
9	.....	eP.....	15 42 00	.....	.....	.....	.....	
		S?.....	15 45 30	.....	.....	.....	.....	
		F.....	16 22 —	.....	.....	.....	.....	
13	.....	eL.....	7 33 00	.....	.....	.....	.....	
		F.....	8 14 00	.....	.....	.....	.....	
26	II_u...	eP.....	18 03 00	.....	.....	.....	.....	
		S?.....	18 12 30	.....	.....	.....	.....	
		L.....	18 14 —	.....	.....	.....	.....	
		F.....	20 38 —	.....	.....	.....	.....	

New York. *Buffalo. Canisius College.* John A. Curtin, S. J.

Lat., 42° 53′ 02″ N.; long., 78° 52′ 40″ W. Elevation, 190.5 meters.

Instrument: Wiechert, 80 kg., horizontal.

Instrumental constants..V 80, T_0 7, ϵ 5:1

(Report for June, 1917, not received.)

New York. *Fordham. Fordham University.* Daniel H. Sullivan, S. J.

Lat., 40° 51′ 47″ N.; long., 73° 53′ 08″ W. Elevation, 23.9 meters.

Instrument: Wiechert, 80 kg.

Instrumental constants..{E: V 72, T_0 7.2, ϵ 1.5:1; N: V 72, T_0 7.2, ϵ 3.8:1}

(Report for June, 1917, not received.)

New York. *Ithaca. Cornell University.* Heinrich Ries.

Lat., 42° 26′ 58″ N.; long., 76° 29′ 09″ W. Elevation, 242.6 meters.

Instruments: Two Bosch-Omori, 25 kg., horizontal pendulums (mechanical registration).

Instrumental constants..{E: V 13, T_0 22, ϵ 4:1; N: V 14, T_0 25, ϵ 4:1}

(Report for June, 1917, not received.)

Panama Canal Zone. *Balboa Heights.* Isthmian Canal Commission.

Lat., 8° 57′ 39″ N.; long., 79° 33′ 29″ W. Elevation, 27.6 meters.

Instruments: Two Bosch-Omori, 100 kg.

Instrumental constants..V 10, T_0 20

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 8	.....	L_N....	0 44 19	.....	.....	.....	965	Direction north.
		M_N....	0 44 52	.....	.....	*1200	.....	
		M_E....	0 45 22	.....	*300	.....	.....	
		F_N....	0 46 56	.....	.....	.....	.....	
8	.....	P_N....	0 54 08	.....	.....	.....	965	Direction north.
		P_E....	0 54 10	.....	.....	.....	.....	
		L_E....	0 56 38	.....	.....	.....	.....	
		L_N....	0 56 44	.....	.....	.....	.....	
		M_N....	0 58 16	.....	.....	*4000	.....	
		M_E....	1 01 18	.....	*2000	.....	.....	
		F_E....	1 59 00	.....	.....	.....	.....	
		F_N....	2 02 05	.....	.....	.....	.....	
8	.....	M_N....	3 09 00	.....	.....	*200	965?	Direction north?
13	.....	L_E....	7 34 55	.....	.....	.....	.....	Distance and direction unknown.
		M_N....	7 39 55	.....	.....	*200	.....	
		M_E....	7 41 00	.....	*200	.....	.....	
		F_E....	8 07 00	.....	.....	.....	.....	

* Trace amplitude.

Panama Canal Zone. *Balboa Heights*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 26	.....	P_E....	6 03 32	.....	.....	.....	4,830	Direction unknown.
		P_N....	6 04 00	.....	.....	.....	.....	
		L_E....	6 14 52	.....	.....	.....	.....	
		M_E....	6 15 00	.....	*2000	.....	.....	
		L_N....	6 15 07	.....	.....	.....	.....	
		M_N....	6 16 04	.....	.....	*3000	.....	
		F_E....	8 23 00	.....	.....	.....	.....	
		F_N....	8 33 20	.....	.....	.....	.....	
27	.....	P_N....	12 27 30	.....	.....	.....	465	Direction north.
		P_E....	12 27 32	.....	.....	.....	.....	
		L_N....	12 28 28	.....	.....	.....	.....	
		L_E....	12 28 32	.....	.....	.....	.....	
		M_E....	12 28 56	.....	*39000	.....	.....	
		M_N....	12 29 04	.....	.....	*68000	.....	
		F_N....	12 56 00	.....	.....	.....	.....	
		F_E....	12 57 00	.....	.....	.....	.....	
30	.....	P_N....	17 51 14	.....	.....	.....	300	Direction probably westerly.
		P_E....	17 51 18	.....	.....	.....	.....	
		L_N....	17 51 50	.....	.....	.....	.....	
		L_E....	17 51 53	.....	.....	.....	.....	
		M_N....	17 52 04	.....	.....	*40000	.....	
		M_E....	17 52 30	.....	*53000	.....	.....	
		F.....	18 00 22	.....	.....	.....	.....	
30	.....	P.....	18 00 22	.....	.....	.....	.....	
		L_N....	18 00 57	.....	.....	.....	.....	
		L_E....	18 00 58	.....	.....	.....	.....	
		M_N....	18 01 05	.....	.....	*19000	.....	
		M_E....	18 01 24	.....	*20000	.....	.....	
		F_N....	18 16 49	.....	.....	.....	.....	
		F_E....	18 17 00	.....	.....	.....	.....	
30	.....	M_E....	22 20 03	.....	.....	.....	.....	
		M_N....	22 20 04	.....	.....	.....	.....	

* Trace amplitude.

Porto Rico. *Vieques. Magnetic Observatory.* U. S. Coast and Geodetic Survey. F. L. Adams.

Lat., 18° 09′ N.; long., 65° 27′ W. Elevation, 19.8 meters.

Instruments: Two Bosch-Omori.

Instrumental constants..{E: V 10, T_0 17.5; N: V 10, T_0 18.0}

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
June 8	.....	e_E....	0 56 51	4	.....	.....	.....	Beginning uncertain.
		S.....	0 59 18	.....	.....	.....	.....	
		L_E....	1 01 05	24	.....	.....	.....	
		L_N....	1 01 05	28	.....	.....	.....	
		M_E....	1 05 00	21	100	.....	.....	
		M_N....	1 08 00	17	.....	110	.....	
		C_E....	1 11 ..	15	.....	.....	.....	
		C_N....	1 14 ..	13	.....	.....	.....	
		F_E....	1 57 ..	13	.....	.....	.....	
		F_N....	2 05 ..	13	.....	.....	.....	
13	.....	e_E....	7 07 15	.....	.....	.....	.....	
		e_N....	7 09 44	.....	.....	.....	.....	
		S_E....	7 18 36	13	.....	.....	.....	
		S_N....	7 18 48	.....	.....	.....	.....	
		L_E....	7 38 ..	35	.....	.....	.....	
		L_N....	7 39 ..	24	.....	.....	.....	
		M_E....	7 40 ..	24	20	.....	.....	
		M_N....	7 40 ..	22	.....	10	.....	
		C.....	8 00 ..	18	.....	.....	.....	
		F_N....	9 03 ..	.....	.....	.....	.....	
		F_E....	9 08 ..	.....	.....	.....	.....	
26	.....	e_E....	6 09 01	6	.....	.....	.....	Beginning uncertain; N-S so thinly smoked that part of record could not be seen.
		e_N....	6 09 36	8	.....	.....	.....	
		S_E....	6 15 11	12	.....	.....	.....	
		S_N....	6 16 54	14	.....	.....	.....	
		L_E....	6 40 45	33	.....	.....	.....	
		L_N....	6 40 48	32	.....	.....	.....	
		M_E....	6 43 00	26	400	.....	.....	
		M_N....	6 43 28	28	.....	70	.....	
		C_E....	7 04 ..	15	.....	.....	.....	
		F_E....	9 04 ..	.....	.....	.....	.....	
30	.....	P_N....	17 54 30	4	.....	.....	.....	
		P_E....	17 54 33	4	.....	.....	.....	
		S_E....	17 57 37	10	.....	.....	.....	
		S_N....	17 57 38	7	.....	.....	.....	
		L_N....	18 00 13	20	.....	.....	.....	
		L_E....	18 00 15	19	.....	.....	.....	
		M_E....	18 03 20	18	10	.....	.....	
		M_N....	18 06 31	14	.....	10	.....	
		F_E....	18 20 ..	.....	.....	.....	.....	
		F_N....	18 26 ..	.....	.....	.....	.....	

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

Vermont. *Northfield. U. S. Weather Bureau.* Wm. A. Shaw.

Lat., 44° 10′ N.; long., 72° 41′ W. Elevation, 256 meters.

Instruments: Two Bosch-Omori, mechanical registration.

Instrumental constants.. V E 10, N 10; T_0 E 15, N 16

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 1		e	17 08 00					
		F	17 10 ..					
3		e	7 06 03					
		F	7 15 ..					
4		L	1 57 50					
		F	2 10 ..					
8		P?	0 59 00				3,050?	
		S?	1 03 47					
		L	1 08 06					
		F	2 15 ..					
8		e	3 07 00					
		L	3 15 30					
		F	3 30 ..					
10		P	4 40 00				4,400	
		S	4 46 10					
		L	4 53 35					
		F	5 50 ..					
13		e	7 02 32					
		L	7 12 16	16				
		L	7 19 00	20				
		L	7 48 00	16				
		F	9 00 ..					
24		e	20 08 52					
		F	20 45 ..					
26		e	6 04 15					
		S	6 14 35					
		L	6 22 00					
		L	6 40 00	40				
		F	8 40 ..					
29		L	16 28 30					
		F	16 50 ..					
30		P	17 57 33				4,100?	
		S?	18 03 26					
		L	18 10 45					
		F	18 30 ..					

Canada. *Ottawa. Dominion Astronomical Observatory.* Earthquake Station. Otto Klotz.

Lat., 45° 23′ 38″ N.; long., 75° 42′ 57″ W. Elevation, 83 meters.

Instruments: Two Bosch photographic horizontal pendulums, one Spindler & Hoyer 80 kg. vertical seismograph.

Instrumental constants.. V 120; T_0 26

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 1		eP_N	17 07 10					
		eP_E?	17 07 14					
		i_N	17 07 35					
		i_E	17 07 40					
		i_E	17 09 23					
		eL?	17 09 32	8				
		L_E	17 10 30	8				
		F	17 20 —					
3		eP_N	7 06 13					
		i_N	7 06 35					
		eL_N?	7 07 48	10				
		i_E	7 09 30					
		L_E	7 09 36	10				
		F	7 20 —					
3		eP?	19 53 36					
		eL	20 01 26	8				
		F	20 15 —					
4		*O?*	*1 26 45*				7,100?	
		eP?	1 37 18					
		S_E	1 45 52					
		S_N	1 46 05					
		L	1 57 00	20				
		L	2 00 —	18–17				
		L_E	2 16 —	12				
		F	2 30 —					

Canada. *Ottawa. Dominion Astronomical Observatory*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 8		*O?*	*0 51 19*				3,730?	Press report San Salvador destroyed. [See p. 317.]
		eP?	0 58 17					
		iP_N	0 58 24					
		iS_N	1 03 48					
		eL	1 08 00	28				
		M	1 10 00	20–16	30	60		
		L	1 15 —	16–18				
		L	1 32 —	12				
		LR1?	3 19 —	13				
		F	3 55 —					
9		e_N	17 57 18					
		eL_N	18 03 18					
		L	18 05 —	18				
		L	18 11 —	18				
		L	18 23 —	15				
		F	18 40 —					
10		*O*	*4 32 30*				3,940	
		iP_E	4 39 44					
		i	4 41 10					
		S_E	4 45 28					
		eL	4 50 00	10				
		M	4 54 42	20–13	17	80		
		L	5 13 —	8				
		L	5 30 —	7				
		F	6 30 —					
12		e	2 03 47					Felt in lower St. Lawrence.
		i	2 04 07					
		F	2 06 —					
			VERTICAL.					
		O	*2 01 29*					
		P?	*2 02 45*					
		S	*2 03 47*					
		L	*2 04 06*					
13		*O*	*6 48 50*				9,450	
		eP	7 01 25					
		eS_N?	7 11 50					
		iS_E	7 11 58					
		eL_N	7 29 24	17				
		L	7 35 —	20				
		M	7 50 —	17	10	30		Fine sinusoidal waves at M.
		M	7 55 —	16				
		M	8 05 —	15				
		ME	8 10 —	15				
		$LR1_N$?	8 48 —	27				
		L	9 10 —	20				
		$LR2_N$?	10 06 —	17				
		F	10 25 —					
16		e	15 55 56					
		e	16 03 20					
		eL	16 09 42	16–18				
		F	16 30 —					
16		e	22 57 08					
		eL_N	23 09 18	11				
		eL_E	23 10 42	18				
		F	23 30 —					
22		*O*	*5 28 45*				5,650	
		P	5 37 54					
		S	5 45 11					
		L	5 53 18	20				
24		*O?*	*19 54 55*				7,960?	
		P?	20 06 14					
		S	20 15 32					
		eL?	20 39 48	17				
		L	20 50 —	17				
		L	21 06 —	16				
		L	21 18 —	12				
		F	21 50 —					
26		*O*	*5 50 53*				10.000	
		P_E	6 03 55					
		S_E	6 14 53					
		eL_E	6 32 —	20				
		eL_N	6 34 —	40				
		M	6 47 —	20	70	140		
		L	7 00 —	16				
		L	7 45 —	15–18				
		LR1	8 02 —	24				
		L	8 08 —	16–19				
		$LR2_N$	9 53 —	24				
		F	10 25 —					
27		e_N	12 03 —					Apparently several quakes.
		i_N	12 16 32					
		L_N	12 26 48	13				
		i_N	12 34 00	2				
		i_N	12 35 35	2				
27		O	*12 35 58*				1,910	
		P	12 40 00					
		S	12 43 15					
		L_N	12 45 00	25				
		L_E	12 46 36	22				
		F	14 00 —					

TABLE 2.—*Instrumental reports, June, 1917*—Continued.

Canada. *Ottawa. Dominion Astronomical Observatory*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 28		eL_N	14 47 —	20				
		L	14 55 —	18				
		F	15 20 —					
29		O?	*16 06 53*				4,050?	
		P_E	16 14 15					
		S_N	16 20 05					
		eL_N	16 22 54	8				
		eL_E	16 23 54	8				
		M_N	16 27 54	8		50		
		L	16 30 —	8				
		L	16 35 —	6				
		F	17 05 —					
30		O	*17 50 25*				4,150	
		P_N	17 57 54					
		S_E	18 03 50					
		L	18 10 00	24				
		L	18 15 —	18–15				
		L	18 35 —	15				
		F	18 50 —					

Canada. *Toronto. Dominion Meteorological Service.*

Lat., 43° 40′ 01″ N.; long., 79° 23′ 54″ W. Elevation, 113.7 meters. Subsoil: Sand and clay.

Instrument: Milne horizontal pendulum, North. In the meridian.

Instrumental constant.. T_0 18. Pillar deviation, 1mm., swing of boom=0.50″.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 3		P?	19 48 48					
		L	19 59 42					
		eL	20 02 12					
		M	20 04 12		*300			
		F	20 17 06					
4		P?	1 36 36				6,790	
		S	1 44 54					
		L	1 57 06					
		iL	2 00 30					
		M	2 01 48	18–24	*1900			
		L	2 33 24					
		F?	3 41 30					
4		L	8 30 06					
		M	8 31 36		*200			
		F	8 35 06					
6		L	5 01 30					
		M	5 08 48		*200			
		F	5 35 00					
6		P?	16 35 30					Doubtful as to being seismic.
		S?	16 43 06					
		L	16 54 12					
		M	16 56 48		*200			
		F	17 09 48					
7		L	3 14 36					
		L	3 17 42					
		M	3 19 00		*400			
		F	3 32 00					
8		S	1 03 00				3,792	San Salvador quake. P not recorded. Distance from L–S.
		L	1 06 00					
		L	1 07 00					
		L	1 07 48					
		iL	1 08 54					
		M	1 09 48	18–24	*8700			
		L_{rep}	3 17 54					
		F	4 04 36					
9		L	18 03 00					Phases interfered with on account of attention to instrument.
		M	18 05 00		700			
10		S	4 45 18					P?
		L	4 52 00					
		iL	4 54 18					
		M	4 54 36		*1800			
		F	5 39 48					
13		P?	7 00 42				9,400?	Distinctly defined. Waves well defined at maxima.
		e	7 06 42					
		S	7 11 12					
		eL	7 42 00					
		M	7 48 18	18–24	*4800			
		M	7 53 12	18–24	*3300			
		M	7 59 12	18	*2300			
		L_{rep}	8 57 12					
		L_{rep}	9 56 12					
		F	10 30 18					

* Trace amplitude.

Canada. *Toronto. Dominion Meteorological Service*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 16		L	16 08 42		*50			
		F	16 23 54					
16		L	16 35 06		*50			
		F	16 52 06					
22		L	5 59 00					
		M	6 00 24		*200			
		F	6 18 54					
24		P?	20 07 18				4,780	S waves well defined.
		iS	20 13 48					
		L	20 16 42					
		M	20 18 12		*300			
		L	20 49 12					
		F	22 17 12					
26		P	6 04 18				9,650	Clear record, well defined and continuous large vibrations. P and S well marked.
		iP	6 07 36		*800			
		S	6 15 00		*5000			
		L	6 32 24	18				
		iL	6 42 00					
		iL	6 49 06	18–24				
		M	6 51 06	18–24	*20000			Amplitude doubtful.
		iL	6 59 00					
		M	7 00 18		*11000			
		iL	7 02 18					
		iL	7 10 30					
		L_{rep}	8 04 18					
		L_{rep}	8 20 36					
		F	10 51 36					
27		e	12 04 18					May be a dual earthquake.
		e	12 26 12					
		P	12 39 24					
		S	12 43 24					
		eL	12 46 24					
		M	12 48 24		*1400			
		M	12 51 06		*1400			
		L_{rep}	13 23 36					
		F	13 47 36					
28		eL	14 48 18		*400			Amplitude doubtful. Some phases lost attending instrument.
		eL	15 06 54					
29		S	16 19 24					P not recorded.
		iL	16 26 00					
		M	16 26 42		*400			
		F?	17 13 00					
30		S?	18 01 36					Beginning of disturbance lost during attention to instrument. Time of S doubtful.
		S	18 02 00					
		eL	18 09 30					
		M	18 11 30		*800			
		F	19 16 24					

*Trace amplitude.

Canada. *Victoria, B. C. Dominion Meteorological Service.*

Lat., 48° 24′ N.; long., 123° 19′ W. Elevation, 67.7 meters. Subsoil: Rock.

Instrument: Wiechert, vertical; Milne horizontal pendulum, North. In the meridian.

Instrumental constant.. T_0 18. Pillar deviation, 1 mm., swing of boom=0.54″.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 3		P	19 41 35					
		L	19 44 04					
		M	19 46 20		*400			
		F	19 50 23					
4		P	1 32 52				1,610	
		S	1 35 39					
		L	1 38 46					
		M	1 42 42		*2000			
		F	2 00 55					
			VERTICAL.		A_z			
		P	*1 32 52*	*3*				*S?*
		L	*1 38 58*	*24*				
		M	*1 39 52*	*24*	*8*			
4		P	8 10 45					
		M	8 12 43		*100			
		F	8 15 40					
6		L	4 44 17					
		M	4 46 11		*200			
		F	5 07 00					

*Trace amplitude.

TABLE 2.—*Instrumental reports, June, 1917*—Concluded.

Canada. *Victoria, B. C. Dominion Meterological Service*—Continued.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. Aa	Amplitude. An	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
June 7		P or S.	16 22 11					
		L	16 37 23		*50			F?
7		P?	2 55 25				1,100	
		S	2 57 24					
		L	2 59 52					
		M	3 00 52		*200			
		F	3 05 50					
8		P?	1 04 16				4,020	San Salvador quake.
		iP	1 06 16					
		S	1 10 04					
		L	1 14 36					
		M	1 19 31		*14000			
		L_{rep}	3 26 10					
		L_{rep}	3 29 10					
		F	3 53 54					
			VERTICAL.		A_z			
		P	*1 04 16*	*3*			*5,100*	
		S	*1 11 04*	*6*				
		L	*1 19 06*	*12*				
		M	*1 30 28*	*14*	*25*			*F?*
9		P	17 41 31					
		L	17 44 59					
		M	17 47 28		*200			
		F	18 04 49					
10		P	4 33 34				550	
		L	4 34 34					
		M	4 35 33		*3000			
		F	4 55 23					
			VERTICAL.		A_z			
		P	*4 33 34*	*2*			*550*	
		L	*4 34 20*	*6–8*				
		M	*4 38 02*	*9*	*33*			
		F	*4 48 00*					
10		L	6 04 18					Probably part of Italian quake.
		M	6 08 16		*200			
		F	6 13 44					
13		P	7 05 12				6,380	
		S	7 13 09					
		L	7 20 05					
		M	7 31 59		*2000			
		L_{rep}	9 40 05					
		F	10 00 14					
			VERTICAL.		A_z			
		P	*7 05 18*	*3*				*S?*
		L	*7 20 30*	*6*				
		M	*7 38 42*	*20*	*7*			*F?*
16		P or L.	15 50 30				1,120	
		M	15 52 28		*50			
		F	15 57 24					
			VERTICAL.		A_z			
		P or L.	*15 50 30*	*6*			*1,120*	
		M	*15 52 30*	*7*	*5*			
22		P?	5 39 43					
		L	5 40 42					
		M	5 42 11		*200			
		F	5 45 40					
24		P	20 11 23					L and M lost at cut-off.
		F	20 58 59					
26		P	6 01 56				7,510	
		S	6 10 51					
		L	6 25 14					
		M	6 30 41		*19000			
		iL	7 23 46					
		L	8 15 52					
		L	8 19 16					
		L_{rep}	9 35 58					
		L_{rep}	9 42 16					
		L_{rep}	9 46 16					
		L	9 52 58					
		F	10 22 45					
			VERTICAL.		A_z			
		P	*6 02 00*	*6*			*8,200*	
		S	*6 11 30*	*12*				
		L	*6 25 06*	*18–20*				
		M	*6 27 21*	*20*	*83*			*F?*
27		P	12 56 26					
		M	13 01 24		*200			
		F	13 09 50					
28		P	14 34 08					
		M	14 37 06		*200			
		F	14 42 33					
29		P	16 23 30					
		M	16 26 57		*100			
		F	16 33 37					
30		P	18 21 46					
		M	18 30 41		*100			
		F	18 40 37					

* Trace amplitude.

TABLE 3.—*Late seismological reports.* (*Instrumental.*)

Massachusetts. *Cambridge. Harvard University Seismographic Station.* J. B. Woodworth.

Lat., 42° 22′ 36″ N.; long., 71° 06′ 59″ W. Elevation, 5.4 meters. Foundation: Glacial sand over clay.

Instruments: Two Bosch-Omori 100 kg. horizontal pendulums (mechanical registration).

Instrumental constants.. $\begin{cases} E & 80 & 23 & 0 \\ N & 50 & 25 & 4{:}1 \end{cases}$ (V, T_0, ε)

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1917.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
Mar. 29		e_E	2 17 53	6				Record overlooked in March. First phases masked by microseisms.
		eL?	2 20 11	24				
		M?	2 28 04	20				
		L	2 46 59	10				
		F?	3 00 —					
29		L?	3 08 00	10				Probably part of preceding quake.
		F?	3 08 20					
Apr. 21		*O?*	*0 52 10*				8,450?	Only quake in April. Possibly iP. Interpretation doubtful. A very slight.
		i_N	1 12 55	3				
		i_E	1 12 55	2				
		S_E	1 13 37	10				
		L_E	1 29 46	20				
		L	1 38 56	18				
		L	1 45 56	20				
		F?	2 04 30					

SEISMOLOGICAL DISPATCHES.[1]

Washington, D. C., June 8, 1917.

Dispatches from American Minister Long at San Salvador sent at 9 o'clock last night while the volcano of San Salvador was erupting said part of the city had been destroyed by fire but that it was under control. Great damage was done.

Washington, D. C., June 8, 1917.

A dispatch said that about 6:35 p. m. yesterday severe earthquake shocks began and continued until about 8:45 with varying degrees of intensity. At about 8:45 the volcano of San Salvador began to belch forth fire and smoke apparently on the side toward Quezaltepeque. There was later one very severe shock, but the tremors of the earth continued with decreasing violence. At the same time there was a steady shower of dry ashes falling over the city. (Assoc. Press.)

Rome, June 11, 1917.

Four violent earthquakes early to-day caused a panic at Terni. Dispatches received here assert considerable damage was done. All inhabitants of the town fled to the open fields and are now camping out there, fearing further earth tremors. Terni is a town of about 31,000 population, located in the Province of Perugia, 49 miles northeast of Rome. A big Government arsenal is there. The town is famed for its Roman ruins and a cathedral. (Assoc. Press.)

San Salvador, Republic of Salvador, June 14, 1917.

Several earthquake shocks of varying intensity were felt here yesterday and to-day, but no damage has been reported.

The various relief committees are distributing provisions to the destitute, and shelters are being built to house the thousands of homeless who at present are encamped on the streets. The wounded are being attended by the Red Cross. Several bodies have been recovered at Armenia and Quezaltepeque. The tracks of the Occidental Railway are covered by streams of lava. Several craters of the volcano have formed into one. (——)

Seward, Alaska, June 18, 1917.

The Pavlof and Shishaldin Volcanoes on the Alaskan Peninsula were in violent action late in May and early in June, according to word brought here to-day by the steamer *Dora*. Smoke and flames poured forth night and day from the Pavlof crater. An earthquake shock lasting two minutes, of such force that people left their homes, was felt at Unga at 10 p. m., May 30. There have been continuous tremors since the National Geographic Society expedition, led by Dr. Robert F. Briggs of the University of Ohio, left Kodiak to visit Katmai last week. Katmai, Redoubt, Lliamna, and St. Augustine Volcanoes also are active, according to report. (Assoc. Press.)

[1] Reported by the organization indicated and collected by the seismological station at Georgetown University, Washington, D. C.