SEISMOLOGICAL REPORTS FOR MARCH, 1916.

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TABLE 1.—*Noninstrumental earthquake reports, March, 1916.*

Day.	Approximate time, Greenwich Civil.	Station.	Approximate latitude.	Approximate longitude.	Intensity Rossi-Forel.	Number of shocks.	Duration.	Sounds.	Remarks.	Observer.
1916.		ARIZONA.								
Mar. 30	H. m. 5 47	Nogales	° ′ 31 20	° ′ 110 52	3	1	Secs. 5	Rumbling		S. F. Noon.
		CALIFORNIA.								
1	19 15	Los Alamos	34 45	120 15		1				J. W. Robbins.
12	3 15	Imperial	32 50	115 35	4	1	2			D. C. Gale.
22	4 06	Mount Wilson	34 13	118 16	1		10		2 feebler shocks later	W. P. Hoge.
		NEVADA.								
10	22 30	Reno	39 32	119 49	1	1	2		Doors swung slightly	J. C. Jones.
		WASHINGTON.								
2	23 15	Cedar Falls	47 24	120 49	2	1	2			D. A. Brown.

TABLE 2.—*Instrumental seismological reports, March, 1916.*

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

[For significance of symbols see this REVIEW, January, 1916, p. 39.]

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_0 17.4; N: V 10, T_0 15.6

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			H. m. s.	Sec.	μ	μ	Km.	
Mar. 16		eL_E	22 46 44					
		eL_N	22 47 00					
		M_E	22 47 16	8	70			
		M_N	22 48 00	8		60		
		F	23 06 00					
31		e	11 13 44	18				
		M_E	11 14 20	18	40			
		M_N	11 17 26	11		20		
		F	11 34 --					

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 15.2; N: V 10, T_0 19

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			H. m. s.	Sec.	μ	μ	Km.	
Mar. 12		e_N	7 36 40	4				
		L_E	7 41 38					
		L_N	7 40 44					
		M_E	7 46 38	7	10			
		M_N	7 45 22	4		10		
		F_N	7 52 –					
		F_E	7 55 –					
25		eL_N	0 03 22	6				
		eL_E	0 04 14	5				
		M_E	0 04 40	9	10			
		M_N	0 04 49	10		10		
		F	0 07 –					
31		P_E	11 20 26	4				Clock out of adjustment on N-S.
		L_E	11 25 21	11				
		M_E	11 25 46	10	60			
		C_E	11 25 58	10				
		F_E	11 34 09	8				

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.
1916.			H. m. s.	Sec.	μ	μ	Km.	
Mar. 12	I_2		3 12 30		*200	*200		Intensity II Rossi-Forel.

*Amplitude on instrument.

(No shocks recorded during January and February, 1916.)

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.)

TABLE 2.—*Instrumental seismological reports, March, 1916*—Continued.

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.
1915.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 9	.....	e.....	16 00 00	.....	.....	.....	.....	Distinct activity. Thickening of pen marks on both components.
		F.....	19 15 00	.....	.....	.....	.....	
15	.....	e.....	16 40 00	.....	.....	.....	.....	Very small but distinct wavelets on both components.
		F.....	16 47 00	.....	.....	.....	.....	
15	.....	e.....	17 03 00	.....	.....	.....	.....	Small waves, somewhat larger than preceding.
		F.....	17 05 00	.....	.....	.....	.....	
19	.....	.....	.....	.....	.....	.....	.....	Activity. Thickening of pen marks at intervals during day.
20	.....	e.....	18 00 00	.....	.....	.....	.....	Activity. Thickening of pen marks on E-W.
		F.....	18 42 00	.....	.....	.....	.....	
26	.....	e.....	16 00 00	.....	.....	.....	.....	Activity. Distinct, but very irregular waves.
		F.....	18 15 00	.....	.....	.....	.....	
30	.....	e.....	9 00 00	.....	.....	.....	.....	Quake reported from Fort de France, Martinique. Long irregular waves on E-W especially.
		F.....	11 15 00	.....	.....	.....	.....	

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.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 1	.....	L_E.....	19 54 50	.....	.....	.....	.....	Beginning and end lost in microseisms.
12	.....	P.....	7 37 25	.....	.....	.....	3,290	
		S.....	7 42 29	.....	.....	.....	.....	
		L?.....	7 45 25	.....	.....	.....	.....	
		L.....	7 47 30	.....	.....	.....	.....	
		F.....	8 15 00	.....	.....	.....	.....	
16	.....	L.....	23 02 55	.....	.....	.....	.....	P, S, and F lost in microseisms.
		F?.....	23 30 00	.....	.....	.....	.....	
28	.....	L.....	7 56 25	.....	.....	.....	.....	
		F.....	8 05 00	.....	.....	.....	.....	
29	.....	eP.....	19 00 38	.....	.....	.....	2,625	
		S.....	19 04 53	.....	.....	.....	.....	
		L.....	19 11 35	20	.....	.....	.....	
		F.....	19 25 00	.....	.....	.....	.....	
31	.....	P?.....	11 25 28	.....	.....	.....	3,360?	
		S?.....	11 30 36	.....	.....	.....	.....	
		M.....	11 34 30	.....	64	100	.....	
		F.....	12 15 00	.....	.....	.....	.....	
31	.....	e.....	16 56 30	.....	.....	.....	.....	All phases indeterminable.
		F.....	17 15 00	.....	.....	.....	.....	

District of Columbia. *Washington. Georgetown University.*

F. L. 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.

Astatic pendulums after Mainka, 130 kg.

Instrumental constants:

	V	T_0	ϵ
E	165	5.4	2.6
N	143	5.2	3.4
Z	*80*	*3.0*	*0*

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 12	.....	eP_E.....	7 37 01	.....	.....	.....	.....	Wind markings.
		eP_N.....	7 37 25	.....	.....	.....	.....	Measurements made from record of Mainka instrument. Wiechert does not show P.
		S_E.....	7 42 49	.....	.....	.....	.....	
		S_N.....	7 42 58	.....	.....	.....	.....	
		eL_N.....	7 46 12	6	.....	.....	.....	No distinct M.
		eL_E.....	7 46 18	6	.....	.....	.....	
		F_N.....	8 02 04	.....	.....	.....	.....	
		F_E.....	8 02 09	.....	.....	.....	.....	
16	.....	eP.....	22 54 13	.....	.....	.....	.....	Microseisms due to wind.
		S_E?.....	22 58 26	.....	.....	.....	.....	
		S_N?.....	22 58 32	.....	.....	.....	.....	
		eL_N.....	23 02 05	.....	.....	.....	.....	
		eL_E.....	23 02 10	.....	.....	.....	.....	
		L_E.....	23 04 08	10	.....	.....	.....	
		L_N.....	23 04 10	9	.....	.....	.....	
		F_E.....	23 17 00	.....	.....	.....	.....	
		F_N.....	23 20 00	.....	.....	.....	.....	
29	.....	eP_E?.....	19 05 00	.....	.....	.....	.....	
		eP_N.....	19 05 22	.....	.....	.....	.....	
		S_E.....	19 09 32	.....	.....	.....	.....	
		S_N.....	19 09 36	.....	.....	.....	.....	
		eL_N?.....	19 13 54	.....	.....	.....	.....	eL_E not discernible.
		F.....	19 28 00	.....	.....	.....	.....	
29	.....	e.....	21 16 22	.....	.....	.....	.....	Microseisms present.
		i.....	21 17 11	.....	.....	.....	.....	
		F.....	21 18 00	.....	.....	.....	.....	
31	.....	eP_E.....	11 23 03	.....	.....	.....	.....	Microseisms present.
		eP_N.....	11 23 24	.....	.....	.....	.....	
		S_N?.....	11 28 31	.....	.....	.....	.....	
		L.....	11 31 03	.....	.....	.....	.....	
		M_N.....	11 34 09	12	.....	6	.....	
		M_E.....	11 34 14	12	9	.....	.....	
		F.....	11 58 00	.....	.....	.....	.....	
31	.....	e.....	16 54 44	.....	.....	.....	.....	Microseisms present.
		eL_N?.....	17 00 02	.....	.....	.....	.....	
		eL_E?.....	17 00 11	.....	.....	.....	.....	
		L_N?.....	17 01 07	.....	.....	.....	.....	
		L_E?.....	17 01 16	.....	.....	.....	.....	
		F.....	17 38 00	.....	.....	.....	.....	
31	.....	e.....	18 19 18	.....	.....	.....	.....	Microseisms present.
		F.....	19 10 00	.....	.....	.....	.....	

TABLE 2.—*Instrumental seismological reports, March, 1916*—Continued.

Hawaii. *Honolulu. Magnetic Observatory.* U. S. Coast and Geodetic Survey. Wm. W. Merrymon.

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 19.4.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 4		P	7 20 00					
		S	7 27 18					
		L	7.35 36	22				
		M	7 44 06		100			
		C	7 55 42					
		F	8 32 24					
12		P	7 50 48					
		L	8 01 06	22				
		M	8 05 12	20				
		C	8 10 18					
		F	8 24 54					
16		e	22 57 12					
		M	22 59 12		20			
		F	23 05 12					
18		P	1 15 12					
		L	1 20 00	24				
		M	1 25 12		20			
		C	1 29 06					
		F	1 39 12					
19		P	12 10 06					
		S	12 17 42					
		L	12 23 42	23				
		M	12 30 54		70			
		C	12 36 48					
		F	13 06 24					
19		eP	23 37 06					
		S	23 43 42					
		L	23 51 06	22				
		M	23 54 48		20			
		C	23 59 24					
		F	24 02 06					
23		P	9 00 48					
		S	9 03 54					
		L	9 06 36	24				
		M	9 10 12		40			
		C	9 14 24					
		F	9 33 12					
26		P	0 13 12					
		S	0 19 30					
		L	0 25 24	24				
		M	0 33 36		110			
		C	0 41 00					
		F	3 20 30					
27		eL	23 08 54					
		M	23 14 24		10			
		C	23 17 36					
		F	23 27 36					
31		P	11 24 12					
		L	11 26 00					
		M	11 27 12		30			
		C	11 32 00					
		F	11 56 00					

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; N: V 205, T_0 3.4, ϵ 4

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 31		P_N?	11 16 12					
		P_E	11 16 13					
		L	11 27 01					
		M_E	11 27 19	12	4			
		M_N	11 27 48			4		
		F	11 55 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 32; N: V 10, T_0 27

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 12		P_E	7 33 20					
		L_E	7 40 16	5				
		L_N	7 41 40	6				
		M_E	7 48 08	5	10			
		M_N	7 49 10	6		20		
		F	7 57 00					
31		eL	11 30 10					
		M_E	11 34 20	10	50			
		M_N	11 35 28	9		50		
		F	11 39 00					

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, ϵ:1 0; N: V 50, T_0 25, ϵ:1 4

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 4		*O*?	*7 39 14*				8,130?	P and S heavily masked by microseisms, of 5s to 6s period.
		eP_E?	7 50 48					
		S?	8 00 08	7?				
		ii?	8 08 12					
		eL?	8 15 10					
		L	8 17 40	20				
		C	8 22 00					
		F?	8 45 30					F in microseisms.
7		L_E	19 38 06	17				e to F in microseisms.
		L_E	19 38 59	20				3 waves in first L_E and 1 in second.
8		*O*	*3 46 20*				0	Minute local shock.
		iE	3 46 26	10				
		F	3 46 36					
12		*O*?	*7 31 15*				3,490?	P & S in microseisms. Record of dubious interpretation; may be much more distant.
		eP_E	7 37 55					
		S	7 43 11	9				
		eL_E	7 46 31	8				
		L	7 49 35	20				
		L	7 49 68					
		F	8 25 00					
16		*O*	*22 50 00*					P and S masked by microseisms. N-S out of commission.
		eL_E?	23 02 50	16				
		L	23 04 06	12				
		F?	23 28 30					
20		O	*21 04 33*				290	Local shock; not reported as felt.
		P	21 05 15					
		L	21 05 47					
		M	21 05 51		62			
		F	21 06 17					
25?		*O*?	*23 00 00*					Day of *O* undetermined.
26		eL_E?	0 50 02					
		L	0 50 49	27				
		L	0 55 43	20				
		F	1 06 00					
31		O?	*11 10 56*				4,220?	
		eP?	11 18 24					
		S?	11 24 24					
		eL_E?	11 27 27	11				
		L	11 30 38	8				
		e_N	11 31 07	6				
		eL_E?	11 31 36					Amplitudes, except for M_E, diminish.
		eL_N	11 31 42	8				
		M_E	11 32 38	15				
		M_E	11 35 00	13				
		F	12 15 00					

O=time at origin.

TABLE 2.—*Instrumental seismological reports, March, 1916*—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.

Instruments: 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.
1916. Mar. 12	I_r	eP_N	*H. m. s.* 7 35 00	*Sec.*	μ	μ	*Km.* 670	
		S_N	7 36 26					
		M_N	7 37 57					
		F	7 40 00					F in microseisms.
12	I	e_N	7 42 00					
		L_N	7 43 20					
		F	7 44 00					F in microseisms.
31	II_r	eP	11 24 00					
		S?	11 26 30					
		L?	11 27 15					
		M	11 29 11					
		F	11 38 00					

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

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916. Mar. 12	III_r	eP_N	*H. m. s.* 7 35 30	*Sec.*	μ	μ	*Km.*	P_E?
		S_E	7 38 15					
		S_N	7 38 20					
		L_E	7 41 40					
		L_N	7 42 00					
		M_E	7 44 15	6	7			
		M_N	7 44 20	8		6		
		F_N	7 59 30					
		F_E	7 59 50					
29		M_E?	19 02 00					No record on N-S, pens not working properly on either component on Mar. 29.
		F_E?	19 06 00					
31	III_r	iP_E	11 17 45					
		iP_N	11 18 00					
		S_E	11 22 40					
		S_N	11 23 20					
		L_E	11 28 40					
		L_N	11 28 45					
		M_E	11 31 00	10	24			
		M_N	11 31 10	10		12		
		F_E	11 49 00					
		F_N	11 50 00					Microseisms on 3d. 4th, 5th, 8th, 9th, Severe microseisms on 15th, 16th, and 17th, consisting of groups of damped sine waves, period of 6s. About 40 groups per hour. Mild microseisms on 19th, 20th, and 21st.

New York. *Fordham. Fordham University.* W. C. Repetti, S. J.

Lat., 40° 57′ 47″ N.; long., 73° 53′ 08″ W. Elevation, 23.9 meters.

Instrument: Wiechert 80 kg.

Instrumental constants.. V E 72, N 73; T_0 E 7.2, N 7.2; ϵ E 1.5, N 3.75

(Report for March, 1916, 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 kgm., horizontal pendulums (mechanical registration.)

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

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916. Mar. 16		eL_E	*H. m. s.* 23 00 55	*Sec.* 10	μ	μ	*Km.*	Microseisms.
		eL_N	23 02 01	14–6				
		F_E	23 09 00					
		F_N	23 12 30					
31		e_N	11 28 31	7				
		L_E	11 29 59	6–10				
		L_N	11 30 02	8–18		36		
		F_E	11 42 00					
		F_N	11 50 00					

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. A_E	Amplitude. A_N	Distance.	Remarks.
1916. Mar. 1		P_N	*H. m. s.* 19 50 16	*Sec.*	μ	μ	*Km.*	Distance and direction unknown.
		P_E	19 50 22					
		F_E	19 56 00					
		F_N	19 57 00					
21		P_N	19 56 56				398	Direction unknown.
		P_E	19 56 58					
		L	19 57 44					
		M_N	19 57 50			30		
		M_E	19 57 56		40			
		F_E	19 59 46					
		F_N	19 59 58					
27		P_N	13 43 38				51	Wave moved NE-SW.
		L	13 43 40					No record on E-W, clock stopped.
		M	13 43 46			180		
		F	13 44 14					
29		P_N	10 08 56				103	Direction SW.
		P_E	10 09 00					
		L_N	10 09 05					
		M_N	10 09 06			2180		
		L_E	10.09 09					
		M_E	10 09 10		1600			
		F_E	10 10 50					
		F_N	10 11 28					

Porto Rico. *Vieques. Magnetic Observatory.* U. S. Coast and Geodetic Survey. H. M. Pease.

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

Instruments: Two Bosch-Omori.

Instrumental constants.. V E 10, N 10; T_0 E 21.4, N 21.1

(No earthquakes recorded in March, 1916.)

TABLE 2.—*Instrumental seismological reports, March, 1916*—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: E: V 10, T_0 15; N: V 10, T_0 16

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 12		e	7 38 08					All phases indeterminable.
		F	8 00 00					
16		L	23 02 48					Microseisms present.
		F	23 15 00					
28		L	7 55 50					
		F	8 05 00					
31		e	11 21 14					Very faint record, most pronounced on N-S.
		M	11 31 15			100		
		F	12 00 00					
31		e	16 56 33					Phases indeterminable.
		M	16 57 15			17		
		F	17 15 00					

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.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Mar. 1		eL_E	19 53 12	24				
		L_E	19 57 00	14				
		F	20 13 00					
12		*O*	*7 31 10*				3,900	
		P_N	7 38 21					
		S	7 44 02					
		eL_E	7 47 24	20				
		eL_N	7 48 36	9				
		L_E	7 49 00					
		F	8 15 00					
16		*O?*	*22 50 49*				1,900?	
		eP?	22 54 50					
		S_E?	22 58 03					
		eL	23 00 42	20				
		M	23 02 00	10				
		F	23 25 00					
26		L_E	0 46 42	60				
		L_N	0 53 36	60				
		F	1 12 00					
28		eL_E	7 56 00	15				Some record precedes but failed to interpret it.
		eL_N	7 56 30	15				
		F	8 10 00					
29		*O*	*18 59 58*				3,300	
		P	19 06 22	2				
		PR1	19 07 22					
		L_N	19 14 18	20				
		L_E	19 14 24	20				
		L	19 15 00	18				
		F	19 30 00					
31		i_E	11 19 32					
		e_E	11 23 06	12				
		e_N	11 23 24					
		eL	11 29 18	20				
		M	11 29 48		60	30		
		F	12 20 00					
31		e	16 55 00					
		F	17 15 00					

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

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

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
Jan. 1		e_E	13 53 21	48				
		e_N	13 53 36	36				
		$?_N$	14 07 16	48				
		$?_E$	14 07 32	59				
		M_E	14 19 48	26	231			
		M_N	14 21 47	23		286		
		F_N	15 44 00					
		F_E	15 59 00					
13		eP_E	6 40 01	5				
		eP_N	6 41 09	4–7				
		$?_E$	6 41 10	5–7				
		$?_E$	6 57 31	13				
		$?_N$	6 57 40	12				
		eL_N	7 27 17	21				
		eL_E	7 27 25	28				
		F_N	8 02 00					
		F_E	8 09 00					
13		eP_E	8 42 29	4				
		eP_N	8 42 40	4				
		$?_N$	8 43 32	4				
		$?_E$	8 43 32	4				
		$?_N$	8 47 12	12				
		$?_E$	8 47 37	8				
		$?_N$	8 52 45	7				
		L_N	9 00 07	46				
		L_E	9 00 23	52				
		F_N	10 54 00					
		F_E	11 00 00					
24		e_N	7 22 22	6				Microseisms.
		L_N	7 31 10	40				
		L_E	7 31 22	41				
		F_E	7 59 00					
		F_N	8 06 30					
26		eL_N	13 20 56	20				
		eL_E	13 26 44	20				
		F_N	13 32 00					
		F_E	13 48 00					
31		e_E	18 19 20	4				
		e_N	18 19 22	4				
		L_E	18 33 43	39				
		L_N	18 37 04	31				
		F_E	18 56 30					
		F_N	18 59 00					
1916.								
Feb. 1		L_N	8 34 51	15				
		L_E	8 36 44	23				
		F_E	8 58 00					
		F_N	9 04 00					
3		e_N	5 16 40	4–9				
		e_E	5 20 24					
		F_E	5 28 00					
		F_N	5 30 00					
6		e_E	22 11 12	5				
		e_N	22 11 33	7				
		eL_N	22 18 50	20				
		eL_E	22 23 22	18				
		M_N	22 31 25	20		79		
		F_E	23 52 00					
7		F_N	0 05 00					
8		e_N	15 49 12	7				
		F_N	15 57 00					
		L_E	16 16 52	16				
		F_E	16 19 00					
15		e_N	11 50 52	5				
		e_E	11 50 54	4				
		eL_E	11 58 54	4–11				
		L_N	11 59 12	10				
		M_N	11 59 48	9		50		
		F_E	12 22 00					
		F_N	12 29 00					

TABLE 3.—*Late seismological reports*—Continued.

New York. *Ithaca. Cornell University*—Continued.

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1916. Feb. 20	.....	S_E	18 05 38	13	.....	.....	.....	
		S_N	18 07 40	9	.....	.....	.....	
		eL_E	18 17 06	18	.....	.....	.....	
		eL_N	18 17 12	13	.....	.....	.....	
		F_E	19 20 00	.....	.....	.....	.....	
		F_N	19 22 00	.....	.....	.....	.....	
21	.....	e_N	23 43 22	2	.....	.....	.....	
		e_E	23 43 23	2–4	.....	.....	.....	
		F_N	23 45 00	.....	.....	.....	.....	
		F_E	23 49 30	.....	.....	.....	.....	
27	.....	P_N	20 27 59	4	.....	.....	.....	
		P_E	20 28 18	3–4	.....	.....	.....	
		$?_E$	20 29 22	4–6	.....	.....	.....	
		$?_N$	20 29 23	7	.....	.....	.....	
		S_N	20 33 30	10	.....	.....	.....	S_E indistinct.
		$?_E$	20 35 49	.....	.....	.....	.....	
		L_N	20 38 09	29	.....	.....	.....	
		M_N	20 41 46	16	.....	757	.....	
		F_E	22 04 00	.....	.....	.....	.....	
		F_N	22 05 00	.....	.....	.....	.....	

Porto Rico. *Vieques. Magnetic Observatory.* U. S. Coast and Geodetic Survey. H. M. Pease.

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

Instruments: Two Bosch-Omori.

Instrumental constants.. { E: V 10, T_0 21.4; N: V 10, T_0 21.1 }

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	*μ*	*μ*	*Km.*	
1916. Feb. 6	.....	eL_E	22 36 28	24	.....	.....	.....	
		eL_N	22 41 55	24	.....	.....	.....	
		M_N	22 44 20	24	.....	30	.....	
		M_E	22 45 00	24	10	.....	.....	
		F	23 08 00	.....	.....	.....	.....	
27	.....	P	20 26 11	2	.....	.....	.....	Apparently two shocks, a short time apart, the second being much heavier than the first.
		S_N	20 30 20	8	.....	.....	.....	
		S_E	20 30 35	10	.....	.....	.....	
		L	20 33 40	16	.....	.....	.....	
		M_E	20 36 10	16	900	.....	.....	
		M_N	20 38 30	16	.....	2,400	.....	
		C_N	20 45 00	.....	.....	.....	.....	
		C_E	20 46 00	.....	.....	.....	.....	
		F_N	21 07 00	.....	.....	.....	.....	
		F_E	21 23 00	.....	.....	.....	.....	

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, ε:1 0; N: V 50, T_0 25, ε:1 4 }

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	*μ*	*μ*	*Km.*	
1916. Feb. 6	.....	i	11 14 39	10	.....	.....	.....	e and F uncertain among waves of about 7ˢ period on E-W. Microseisms of 2.6ˢ period on N-S.
		L?	11 15 40	15	.....	.....	.....	
8	.....	e_E	15 39 14	13	.....	.....	.....	
		L	15 40 14	15	.....	.....	.....	
			15 40 47	.....	.....	.....	.....	
		i	15 52 17	.....	.....	.....	.....	
		L	16 14 46	20	.....	.....	.....	
		L	16 21 20	13	.....	.....	.....	
		F?	16 35 00	.....	.....	.....	.....	

SEISMOLOGICAL DISPATCHES.[1]

Rio de Janeiro, via Galveston, Tex., Mar. 1, 1916.

An earthquake of considerable intensity was registered by the seismograph instruments in the Government observatory here this morning. The disturbance was approximately 5,700 kilometers distant from Rio de Janeiro. (Mexican cable to N. Y. Herald.)

Ambato, Ecuador, Mar. 8, 1916.

Tunguragua volcano, in this Province, has been in eruption for several days. The city of Ambato and the surrounding region are almost in darkness on account of falling ashes. During the night the flames from the volcano are visible at a great distance. The people of Ambato are greatly alarmed, fearing a catastrophe. (Assoc. Press.)

Rome, Mar. 12, 1916, 10:15 p. m.—via Paris, Mar. 13, 1916, 1:40 a. m.

Earthquake shocks, lasting from 10 to 20 seconds, were felt in the region represented by a triangle with sides running between Venice, Ancona, and Florence. The observations made at Florence observatory indicated that the epicenter was about 300 miles distant, probably in the Adriatic Sea. No damage has been reported. (Assoc. Press.)

Calcutta, Mar. 25, 1916.

The first scientific survey of the effects of the destructive earthquake which had its center in Russian Turkestan in 1910, has just been completed by a party under the leadership of Dr. Aurel Stein. The quake produced some very extensive geographical changes, and is believed by many to have been the most violent seismic disturbance which has occurred in several centuries. At one point the fall of a whole mountain completely blocked the Bartang River, converting the Serezpamir gorge into an Alpine lake 15 miles long. (Assoc. Press.)

Panama, Mar. 29, 1916.

Two earthquake shocks occurred to-day, one at 5 o'clock this morning and the other this afternoon. No damage resulted. The earlier shock was the most severe. It lasted 1 minute and 20 seconds and reached the third category of intensity in the seismograph wave motions and showed a width of 22 millimeters. Most of the Isthmian population was awakened by the disturbance. This is the second severe shock in the last 24 months, the first taking place on May 18, 1914, and having an intensity of the sixth category. There were numerous tremors during the day, but, like an extremely slight shock last Monday, these were barely noticeable. (———)

CORRIGENDUM.

Instrumental report, Toronto, Canada, MONTHLY WEATHER REVIEW, February, 1916. Page 94, column 2, Feb. 27, P should be $20^h\ 29^m\ 12^s$.

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