SECTION V.—SEISMOLOGY.

SEISMOLOGICAL REPORTS FOR AUGUST, 1918.

W. J. HUMPHREYS, Professor in Charge.

[Dated: Seismological Investigations, Weather Bureau, October 2, 1918.]

TABLE I.—*Noninstrumental earthquake reports, August, 1918.*

Day.	Approximate time, Greenwich Civil.	Station.	Approximate latitude.	Approximate longitude.	Intensity Rossi-Forel.	Number of shocks.	Duration.	Sounds.	Remarks.	Observer.
1918.		CALIFORNIA.								
	H. m.		° ′	° ′			*M. s.*			
Aug. 1	19 46	Calexico	32 41	115 30	3	1	01	Faint	Rumble and bump	H. M. Rouse.
3	18 30	Stanford University	37 25	122 10	3	1	03	None		Prof. S. D. Townley.
12	16 30	Coulterville	37 43	120 13	3	1	04	Loud	Rumble in N., then an abrupt twist N-SW.	W. H. Dudley.
		North Fork (15 miles NE at Kaiser Diggings, Madera Co.)	37 20	119 20	4	1		None		U. S. Forest Service.
17	8 45	Calexico	32 41	115 30	4	3	01	Faint	Rumble; then 3 sharp, rapid, downward bumps.	H. M. Rouse.
	8 49	Calexico	32 41	115 30	4	1	01		A sharp downward bump	H. M. Rouse.
20	10 41	Eureka	40 48	124 11	4	1	10	Rumble	Then a bump and twist E-W.	L. M. Monfort.
	18 45	Morgan Hill (Santa Clara Co.).	37 08	121 38	5	1		None		San Jose Evening News.
24	16 29	Calexico	32 41	115 30	4	1	01	None	Abrupt jerk SE.-NW.	H. M. Rouse.
		MAINE.								
21	4 12	Bridgton	44 03	70 42	5	2	13	Loud	Rumble. Abrupt rocking NE.-SW.	Charles L. Chadbourne.
		Cape Elizabeth	43 35	70 14			Few			Frank W. Sparrow.
		Duck Pond Lake	43 46	70 21						Portland Daily Press.
		Lewiston	44 05	70 12						Portland Express Advertiser.
		Little Sebago Lake	43 53	70 24					Water on eastern shore of lake dropped about 4 inches.	George E. Sawyer.
		Norway	44 12	70 32	8				Chimneys fell	Charles L. Chadbourne.
		South Paris	44 13	70 30	7-8				Bricks fell from chimneys. Doors flew open.	Portland Daily Press.
		NEVADA								
19	10 53	Winnemucca	40 58	117 43	4	1	03	None	Rapid rocking N.-S.	Ray L. Fisher.

TABLE 2.—*Instrumental seismological reports, August, 1918.*

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

[For significance of symbols see REVIEW for January, 1918, p. 34.]

Alaska. *Sitka. Magnetic Observatory.* U. S. Coast and Geodetic Survey. F. P. Ulrich.

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; N: V 10, T_0 15

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	*μ*	*μ*	*km.*	
1918. Aug. 15..	.....	eP_N...	12 32 15	5	.....	.....	.....	
		eP_E...	12 35 09	5	.....	.....	.....	
		S_N...	12 42 23	16	.....	.....	.....	
		eS_E...	12 42 27	10	.....	.....	.....	
		M_E1...	12 43 11	10	140	.....	.....	
		eL_N...	12 55 05	.....	.....	.....	.....	
		M_N...	12 57 57	.....	.....	120	.....	
		C_N...	12 59 ..	.....	.....	.....	.....	
		eL_E...	13 01 26	35	.....	.....	.....	
		M_E2...	13 03 45	25	70	.....	.....	
		C_E...	13 10 ..	24	.....	.....	.....	
		F_E...	14 05 ..	16	.....	.....	.....	
		F_N...	14 09 ..	17	.....	.....	.....	

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 14; N: V 10, T_0 18

(Report for August, 1918, not received.)

California. *Berkeley. University of Califorina.*

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.
			H. m. s.	*Sec.*	*μ*	*μ*	*km.*	
1918. Aug. 28..	.....	.....	.....	.....	50	50	.....	Tremors during 24 hours preceding 15h. 00m.

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.
			H. m. s.	*Sec.*	*μ*	*μ*	*km.*	
1918. Aug. 5..	.....	.....	.....	.....	.....	.....	.....	Activity on both components from 10h. to 13h.
15	.....	L_N...	13 08 ..	40	.....	*500	.....	P not discernible. Very long record. Seems to be made up of several quakes. Record also disturbed by heavy machinery in motion.
		L_E...	13 13 ..	40	*1,000	.....	.....	
		C.....	13 18 ..	.....	.....	.....	.....	
		L_E...	13 22 ..	20	.....	.....	.....	
		C_E...	13 36 ..	.....	.....	.....	.....	
		L_E...	13 40 ..	20	.....	.....	.....	
		C_E...	13 47 ..	.....	.....	.....	.....	
		L_E...	13 49 ..	20	.....	.....	.....	
		C_E...	13 55 ..	.....	.....	.....	.....	
		L.....	13 57 ..	15	.....	.....	.....	
		C.....	14 32 ..	.....	.....	.....	.....	
		F....	14 43 ..	.....	.....	.....	.....	
17..	.....	.....	.....	.....	.....	.....	.....	Activity from 3h. to 4h.

NOTE.—No record during July.

* 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.
			H. m. s.	*Sec.*	*μ*	*μ*	*km.*	
1918. Aug. 4	.....	e_N?...	16 20 35	.....	.....	.....	.....	Amplitude small. Phases uncertain.
		e_E...	16 28 40	.....	.....	.....	.....	
		F.....	16 42 ..	.....	.....	.....	.....	
8	.....	P.....	10 08 29	.....	.....	.....	8,650	
		S.....	10 18 22	.....	.....	.....	.....	
		SREPi.	10 24 30	.....	.....	.....	.....	
		L?....	10 34 30	.....	.....	.....	.....	
		L.....	10 44 30	.....	.....	.....	.....	
		L.....	10 47 30	28	.....	.....	.....	
		F.....	11 50 ..	.....	.....	.....	.....	
15	.....	P.....	12 37 27	.....	.....	.....	5,290	
		S.....	12 44 25	.....	.....	.....	.....	
		eL....	12 50 ..	.....	.....	.....	.....	
		L.....	12 58 ..	.....	.....	.....	.....	
		L.....	13 23 ..	36	.....	.....	.....	
		L.....	14 00 ..	16	.....	.....	.....	
		F.....	15 40 ..	.....	.....	.....	.....	
15	.....	e_E...	17 51 37	.....	.....	.....	.....	
		S.....	17 52 45	.....	.....	.....	.....	
		eL....	18 10 30	.....	.....	.....	.....	
		L.....	18 38 ..	.....	.....	.....	.....	
		F.....	19 15 ..	.....	.....	.....	.....	
17	.....	P.....	7 03 30	.....	.....	.....	6,520	
		S.....	7 11 34	.....	.....	.....	.....	
		eL....	7 22 30	.....	.....	.....	.....	
		L.....	7 28 ..	24	.....	.....	.....	
		F.....	7 40 ..	.....	.....	.....	.....	
23	.....	e.....	6 56 27	.....	.....	.....	.....	Microseisms.
		eL....	7 34 ..	.....	.....	.....	.....	
		L.....	7 40 ..	20	.....	.....	.....	
		F.....	8 40 ..	.....	.....	.....	.....	

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.. E: V 165, T_0 5.4, ε 0; N: V 143, T_0 5.2, ε 0; Z: V *80*, T_0 *5.0*, ε *0*

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	*μ*	*μ*	*km.*	
1918. Aug. 4	.....	e_N.....	16 28 09	.....	.....	.....	.....	Microseisms. Does not show on E-W component.
		i_N.....	16 29 27	.....	.....	.....	.....	
		F.....	16 37 ..	.....	.....	.....	.....	
8	.....	eP_N...	10 08 19	.....	.....	.....	.....	Heavy microseisms.
		EP_E...	10 09 08	.....	.....	.....	.....	
		eS.....	10 18 29	.....	.....	.....	.....	
		L_E....	10 49 34	30	.....	.....	.....	
		L_N....	10 49 34	28	.....	.....	.....	
		F.....	11 47 ..	.....	.....	.....	.....	
15	.....	eP....	12 37 39	.....	.....	.....	.....	Record from Bosch photographic seismograph.
		S.....	12 44 31	.....	.....	.....	.....	
		eL....	12 50 24	9	.....	.....	.....	
		M_E....	13 34 08	22	*1,200	.....	.....	
		M_N....	13 50 10	23	.....	*1,100	.....	
		F.....	15 10 ..	.....	.....	.....	.....	
15	.....	e.....	17 51 00	.....	.....	.....	.....	Do.
		S_N....	17 53 11	.....	.....	.....	.....	
		S_E....	17 53 16	.....	.....	.....	.....	
		eL_N?..	18 09 12	.....	.....	.....	.....	
		eL_E?..	18 09 18	.....	.....	.....	.....	
		F.....	19 20 ..	.....	.....	.....	.....	
17	.....	eP_N...	7 03 29	.....	.....	.....	.....	Does not show on E-W.
		S_N....	7 11 34	.....	.....	.....	.....	
		eL_N...	7 25 30	.....	.....	.....	.....	
		L.....	7 28 17	22	.....	.....	.....	
		F.....	7 58 ..	.....	.....	.....	.....	
23	.....	i_E.....	7 56 48	.....	.....	.....	.....	Heavy microseisms. Record faint on E-W. [NOTE.—Time of phases is one hour later than at other stations.]
		e_N.....	7 56 48	.....	.....	.....	.....	
		e_N....	8 06 21	.....	.....	.....	.....	
		e_E.....	8 06 37	.....	.....	.....	.....	
		eL_N...	8 33 18	19	.....	.....	.....	
		eL_E...	8 33 30	21	.....	.....	.....	
		L.....	8 40 ..	19	.....	.....	.....	
		F.....	10	.....	.....	.....	.....	

* Trace amplitude.

TABLE 2.—*Instrumental seismological reports, August, 1918*—Continued.

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

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

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
Aug. 1		e	4 54 48					
		M	5 01 18	18	*100			
		F	5 05 ..					
1		eP	11 55 24					
		L	11 58 30	21				
		M	11 59 54	18	*400			
		C	12 04 ..					
		F	13 08 ..					
8		P	9 57 30					
		S	10 05 24					
		L	10 14 06	25				
		M	10 21 00	19	*5,100			
		C	10 30 00					
		F	14 43 ..					
13		P	12 30 12					Maximum amplitude probably 38 mm. Tremors continued to the beginning of the next 'quake.
		S	12 40 18					
		L	12 54 00	25				
		M	13 03 ..	19	*17,000+			
		C	13 32 ..					
		F						
15		P	17 42 12					
		S	17 51 36					
		L	18 05 06	25				
		M	18 20 00	17	*1,500			
		C	18 27 ..					
		F	19 55 ..					
17		eP	7 17 54					
		L	7 33 00					
		M	7 49 30	17	*100			
		C	7 51 ..					
		F	8 42 ..					
22		e	8 48 48					
		L	8 55 42					
		M	9 00 00	18	*100			
		C	9 02 ..					
		F	9 15 ..					
23		P	6 45 30					
		S	6 52 30					
		L	7 00 24	24				
		M	7 06 48	19	*4,600			
		C	7 13 ..					
		F	10 40 ..					
23		e	22 47 42					Possibly an artificial disturbance.
		L	22 49 48					
		M	22 50 12	18	*1,300			
		C	22 56 ..					
		F	23 48 ..					

* 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}

Report for August, 1918, not received.

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 15; N: V 10, T_0 15}

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
Aug. 8		eL$_N$	10 48 ..	27				P and S not disdiscernible.
		eL$_E$	10 49 ..	26				
		M	10 55 ..	21	10	10		
		C$_E$	10 57 ..					
		C$_N$	11 02 ..					

Maryland. *Cheltenham.* *Magnetic Observatory*—Continued.

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
Aug. 15		eP$_E$	12 37 35	3				Sheets changed on North from 12 h. 47 m. 35 s. to 13 h. 06 m. 55 s. and on East from 13 h. 08 m. 40 s. to 13 h. 20 m. 23 s.
		eP$_N$	12 37 42	3				
		eL$_E$	12 58 ..	45				
		eL$_N$	13 20 ..	35				
		ME	13 41 53	18	320			
		M$_N$	13 50 02	18		150		
		C$_E$	14 01 ..	17				
		C$_N$	14 17 ..	16				
		F$_E$	14 34 ..	17				
		F$_N$	14 53 ..	16				
15		eP	17 52 50	3				Possibly a few long waves on North about 1 hour later.
23		eL$_N$	7 39 ..					
		eL$_E$	7 41 ..					
		M$_E$	7 45 ..	17	10			
		M$_N$	7 53 ..	16		10		
		C$_N$	7 56 ..	16				
		C$_E$	7 57 ..	17				

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 0; N: V 50, T_0 25, ϵ 4:1}

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
Aug. 5		L$_E$	2 35 .. / 2 50 ..					Minutes approximate. Clock contacts failed.
8		*O*	*10 .. ..*					E damped by magnet. N undamped.
		e$_N$?	10 25 17					
		eL$_N$	10 38 21	40				
		L$_N$	10 43 31	20				
		L$_N$	10 46 21	30				
		L$_N$	10 49 55	25				
		L$_E$	10 51 00	30				
		L$_N$	10 56 47 / 10 59 11	20 / 18				Amplitude N increases.
		F$_N$	11 37 ..					
14		L$_E$	18 15 51					
		F	19 19 ..					
14		e$_E$	20 54 37					May not be seismic. Less definite on N-S.
		L$_E$	20 54 53	8–13				
		L	21 15 ..					
15		*O*	*12 26 21*				6126	Break in record changing sheets from 12h. 31m. to 13h. 03m., also E stylus tipped over from 14h. 56m. to 15h. 44m.
		P$_N$	12 35 44	2				
		i	12 37 56					
		i	12 38 07	2				
		S$_N$	12 42 43	20				
		eL$_N$	12 52 22					
		eM$_N$	12 58 ..	22				
		M$_E$	13 28 ..					
		M$_E$	13 30 30	28				
		M$_E$	13 38 30	30				
		M$_E$	13 46 36	16				
		M$_E$	13 54 ..					
		L$_E$	14 04 30					
		L$_E$	16 34 .. / 16 46 ..	24				
		F$_E$	17 15 ..					
15		*O*	*17 48 24?*				9850?	
		S$_E$?	18 10 50	8				
		L$_E$	18 30 18	26				
		L$_N$	18 30 54?					
		L$_E$	18 34 30	30				
		M$_E$?	18 39 53	24				
		L$_E$	18 49 ..	20				
		L$_E$	18 57 ..	15				
		F	19 52 ..					
21		*O*	*4 11 54*				225	Local shock near South Paris, Me. (lat. 44° 07′ 40″ N.; long. 70° 32′ 18″ W.). [See also noninstrumental reports, table 1].
		P$_E$	4 12 28					
		M$_E$	4 12 53					
		C	4 13 04 / 4 13 45	8				
		F	4 14 08					
23		*O*	*6 48 47?*				10960?	Volcanos "Llama" (Llaimas) and Lanin (lat. 39° 45′ S.; long. 71° 30′ W.) reported in eruption. Lanin distant about 9,000 kms.
		eP$_E$?	7 02 ..					
		e$_E$	7 06 13					
		S$_E$?	7 14 14	20				
		S$_N$?	7 14 59					
		eL$_E$	7 30 51	40				
		L$_E$	7 42 ..	20				
		L$_E$	7 48 54	15				
		F	8 50 ..					

TABLE 2.—*Instrumental seismological reports, August, 1918*—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.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 15	.....	eP_N	12 38 48	.....	.....	.....	5,475	
		eS_N	12 46 06	.....	.....	.....	.....	
		eS_E	12 46 12	.....	.....	.....	.....	
		eL	12 52 06	.....	.....	.....	.....	
		L	12 55 48	.....	.....	.....	.....	
		L	13 19 ..	.....	.....	.....	.....	
		M	13 22 ..	25	.....	*4,000	.....	
		L	13 34 30	.....	.....	.....	.....	
		L	13 38 18	.....	.....	.....	.....	
		L	13 43 ..	.....	.....	.....	.....	
		L	13 46 48	.....	.....	.....	.....	
		F	15 02 ..	.....	.....	.....	.....	

* Trace amplitude.

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 August, 1918, not received.)

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

Lat., 40° 51′ 47″ N.; long., 73° 53′ 08″ W. Elevation, 29.3 meters.

Instrument: Wiechert, 80 kg.

Instrumental constants.. E: V 72, T_0 5.0, ϵ 0; N: V 72, T_0 5.0, ϵ 0

(Report for August, 1918, not received.)

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

Lat., 42° 26′ 58″ N.; long. 76° 29′ 09″ W. Elevation, 242 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 August, 1918, 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 35, T_0 20

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 1	.....	P	0 05 04	20	*200	*300	.....	Trace faint.
		P_N	0 12 00	.....	.....	.....	.....	
		F_E	0 13 00	.....	.....	.....	.....	
8	.....	P	10 02 44	.....	.....	.....	285	Direction uncertain.
		L	10 03 14	20	.....	.....	.....	
		M_E	10 03 18	.....	*500	.....	.....	
		M_N	10 03 20	.....	.....	*1,000	.....	
		F_E	10 05 24	.....	.....	.....	.....	
		F_N	10 05 34	.....	.....	.....	.....	
15	.....	P_E	12 38 11	.....	.....	.....	17,380	Do.
		P_N	12 38 14	.....	.....	.....	.....	
		S_N	12 49 10	.....	.....	.....	.....	
		S_E	12 51 01	.....	.....	.....	.....	
		L_N	13 30 10	20	.....	.....	.....	
		L_E	13 30 47	20	.....	.....	.....	
		M_E	13 40 17	.....	*5,000	.....	.....	
		M_N	13 40 40	.....	.....	*1,000	.....	
		F_E	14 30 00	.....	.....	.....	.....	
		F_N	14 31 00	.....	.....	.....	.....	

* Trace amplitude.

Panama Canal Zone. *Balboa Heights*—Continued.

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 27	.....	P_E	7 03 46	.....	.....	.....	764	Do.
		P_N	7 03 54	.....	.....	.....	.....	
		L	7 05 26	20	.....	.....	.....	
		M	7 05 40	.....	*600	*300	.....	
		F_E	7 13 00	.....	.....	.....	.....	
		F_N	7 15 00	.....	.....	.....	.....	

* Trace amplitude.

Porto Rico. *Vieques. Magnetic Observatory.* U. S. Coast and Geodetic Survey. W. M. Hill.

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

Instruments: Two Bosch-Omori.

Instrumental constants.. E: V 10, T_0 18; N: V 10, T_0 20

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 8	.....	eL_N	10 59 ..	20	.....	.....	.....	Only a few L waves. E not recording.
		M_N	11 03 ..	20	.....	10	.....	
		C_N	11 12 ..	.....	.....	.....	.....	
15	.....	eP_E	12 39 03	5	.....	.....	.....	S and L uncertain.
		eP_N	12 39 05	5	.....	.....	.....	
		S_N	12 45 28	18	.....	.....	.....	
		S_E	12 45 40	17	.....	.....	.....	
		S_E	13 07 54	15	.....	.....	.....	
		S_N	13 08 06	.....	.....	.....	.....	
		M_E1	13 08 35	30	120	.....	.....	
		eL_E	13 22 15	40	.....	.....	.....	
		eL_N	13 33 00	30	.....	.....	.....	
		M_N	13 38 48	25	.....	60	.....	
		M_E2	13 39 15	27	70	.....	.....	
		C	13 51 ..	19	.....	.....	.....	
		F	14 45 ..	17	.....	.....	.....	
23	.....	eL	7 44 ..	19	.....	.....	.....	Only a few L waves.
		M_E	7 50 ..	.....	10	.....	.....	
		M_N	7 52 ..	.....	.....	10	.....	
		C_E	7 55 ..	.....	.....	.....	.....	

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.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 8	.....	eL_E	10 50 ..	.....	.....	.....	.....	
		F	11 00 ..	.....	.....	.....	.....	
15	.....	e	12 38 30	.....	.....	.....	.....	
		eL	12 56 30	.....	.....	.....	.....	
		L	13 14 ..	30	.....	.....	.....	
		L	13 26 ..	24	.....	.....	.....	
		L	13 40 ..	18	.....	.....	.....	
		L	13 50 ..	16	.....	.....	.....	
		L	14 04 ..	14	.....	.....	.....	
		F	14 40 ..	.....	.....	.....	.....	

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 80k. vertical seismograph.

Instrumental constants.. V 120, T_0 26

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 4	.....	e_N	16 21 ..	6	.....	.....	.....	
			16 42 ..	8	.....	.....	.....	
5	.....	e_N?	2 05 30	.....	.....	.....	.....	
		eL_N?	2 30 ..	12	.....	.....	.....	
		eL_N	2 39 30	16	.....	.....	.....	
		L	2 42 ..	16	.....	.....	.....	
		L	2 50 ..	16	.....	.....	.....	
		L_E	2 56 ..	16	.....	.....	.....	
		F	3 05 ..	.....	.....	.....	.....	
8	.....	*O*	*9 56 34*	.....	.....	.....	8,640	
		P	10 08 28	.....	.....	.....	.....	
		S	10 18 20	.....	.....	.....	.....	
		S_{Grepi}	10 25 04	.....	.....	.....	.....	
		eL_E	10 36 ..	.....	.....	.....	.....	
		L	10 40 ..	30	.....	.....	.....	
		L	10 50 ..	24	.....	.....	.....	
		L	10 54 ..	20	.....	.....	.....	
		L	11 05 ..	17	.....	.....	.....	
		L	11 20 ..	16	.....	.....	.....	
		F	11 55 ..	.....	.....	.....	.....	

TABLE 2.—*Instrumental seismological reports, August, 1918*—Continued.

Canada. *Ottawa. Dominion Astronomical Observatory*—Continued

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 15		*O*	*12 27 33*				6,300	F merges into next 'quake. Tremors lasted, faintly marked, for nearly five hours.
		P_N	12 37 20					
		S_N	12 45 12					
		L	12 56 ..	50				
		L	13 17 ..	35				
		L	13 30 ..	23				
		L	13 51 ..	16				
		L	14 10 ..	15				
		L	14 35 ..	17				
		L	14 55 ..	15				
		F	.. .. ..					
15		i	17 51 08					
		i	17 56 30					
		i_E	18 08 ..					
		eL_E?	18 21 ..					
		L_E	18 30 ..	24				
		L	18 40 ..	22				
		L	18 45 ..	19				
		F	19 10 ..					
17		*O*	*6 53 27*				7,300	
		P	7 04 11					
		S	7 12 55					
		eL_E	7 25 ..					
		L	7 30 ..	24				
		L	7 35 ..	18				
		F	8 00 ..					
21		*O*	*4 12 50*				420	Reported from South Paris, Me. Record barely visible. Distance taken from the globe and used with P to get *O*.
		iP_N	4 13 48					
		e	4 14 03					
		F	4 14 30					
22		e_N	{8 44 56 {9 10 ..					Faint traces only on E-W. May not be seismic.
23		i	6 56 13					
		e	7 02 21					
		e	7 06 23					
		i	7 12 54					
		eL	7 36 ..	18				
		L	7 44 ..	16				
		L	7 51 ..	15				
		L	8 03 ..	14				
		L	8 13 ..	14				
		L_N	8 24 ..	13				
		L	8 44 ..	13				
		F	9					

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, 1 mm. swing of boom=0.50″.

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 4								Light off. at time some stations record quake at 16h. 21m.
5		L	2 42 00?					Microseisms mask phases.
8		S_{repl}	10 25 24					P and S not recorded.
		e	10 34 30					
		L	10 48 00					
		iL	10 49 06					
		L_E	10 55 30					
		M	10 59 18		*1,200			
		F	12 59 24?					
15		P ?	12 37 30					P may not be seismic.
		P_E	12 39 48					
		i	12 45 42					Microseisms going on some time previous.
		iS	12 51 24					
		iS	12 55 12					
		L	12 58 00					
		L	13 02 06					Clear record.
		iL	13 27 18					
		iL	13 35 06					
		M	13 39 36		*14,400			
		iL	13 50 30					
		iL	13 55 36					
		L	14 02 18					
		F						Merged in next quake.

* Trace amplitude.

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

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*km.*	
Aug. 15		L	17 51 54					
		L	18 13 00					
		L	18 57 00					
		M	18 59 06		*300			
		F	20?06 06					
16		L	9 20 42		*50			Doubtful as to being seismic.
17		L	7 31 36					F lost im microseisms.
		eL	7 40 06					
		M	7 41 42		*200			
		F						
21		L	4 14 24					Doubtful as to being seismic. F lost in microseisms.
		M	4 14 36					
		F						
22		L	8 42 18		*50			Doubtful as to being seismic.
		F	8 47 36					
23		P	7 01 12?					Microseisms at 6h. 55m. 05s.
		iP	7 05 54					
		S	7 12 54					
		eL	7 17 06					
		eL	7 35 36					
		eL	7 37 48					
		M	7 47 24		*2,300			
		L	8 08 12					
		L	8 57 36					
		F	10 10 00?					

*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. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
Aug. 5		P	2 12 58?				5,200	
		S	2 19 51					
		L	2 29 01					
		M	2 35 35		*300			
		F	3 01 39?					
8		P	10 11 45				4,120	
		S	10 17 39					
		L	10 19 57					
		M	10 41 45		*1,500			
		F	12 27 29					
			VERTICAL.			*Az*		
		P	*10 11 54*	*6*			*4,330*	
		S	*10 17 39*					
		L	*10 29 30*	*30*				
		M	*10 34 30*	*24*		*4*		
15		P	12 32 18				10,440	Probably in vicinity of Malay Archipelago.
		S	12 43 36					
		L	12 55 24					
		or	12 58 21					
		M	13 23 27		*9,000			
		F	17 10 10					
			VERTICAL.			*Az*		
		P	*12 32 18*	*3*			*11,770*	*Probably in vicinity of Malay Archipelago.*
		S	*12 44 30*	*8–10*				
		L	*13 04 30*	*24*				
		M	*13 06 18*	*30*		*18*		
		F	*? ? ?*					
15		P	17 55 54				9,890	May be from above area.
		S	18 06 47					
		L	18 17 03					
		M	18 42 37		*400			
		F	19 11 09?					
16		L or S	9 22 34					
		M	9 38 47		*100			
17		L	7 43 40					
		M	7 45 28		*100			
		F	7 47 20					
			VERTICAL.			*Az*		
22		*Local*	*15 21 35*			*1*		*Lasted 1 second, preceded by a rumbling noise. Felt at Victoria Observatory and in rocky parts of city, causing articles to rattle. Probably under Strait of De Fuca.*
23		P	6 59 31				4,140	Extreme western part of Aleutian Islands.?
		S	7 05 26					
		L	7 15 45					
		M	7 27 06		*4,000			Vertical out of order.
		F	9 36 24					

*Trace amplitude.

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

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 13.6; N: V 10, T_0 18.6

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
July 3	.....	eP_E	7 15 49	7	.....	.....	.....	Very faint. Nothing on N.
		eL_E	7 39 ..	.....	.....	.....	.....	
		M_E	7 59 ..	17	10	.....	.....	
		F_E	9 23 ..	.....	.....	.....	.....	
8	.....	e_E?	10 43 12	5	.....	.....	.....	
		eL_E	11 17 50	40	.....	.....	.....	
		eL_N	11 22 37	25	.....	.....	.....	
		M_E	11 26 17	25	10	.....	.....	
		C_N	11 37 ..	.....	.....	.....	.....	
		F_E	12 08 ..	17	.....	.....	.....	
14	.....	eP_E	18 21 00	4	.....	.....	.....	Probably local.
		eP_N	18 21 05	2	.....	.....	.....	
		M	18 22 45	5	10	10	.....	
		F	18 26 ..	.....	.....	.....	.....	
15	.....	P	0 26 42	4	.....	.....	.....	
		S_N?	0 29 37	4	.....	.....	.....	
		S_E	0 29 41	4	.....	.....	.....	
		L_E	0 30 47	18	.....	.....	.....	
		L_N	0 30 53	18	.....	.....	.....	
		M_N	0 32 30	12	.....	340	.....	
		M_E	0 33 12	13	360	.....	.....	
		C_N	0 37 ..	10	.....	.....	.....	
		C_E	0 40 00	9	.....	.....	.....	
		F_N	1 18 ..	8	.....	.....	.....	
		F_E	1 25 ..	8	.....	.....	.....	
21	.....	eP_E	6 27 15	.....	.....	.....	.....	Phases very doubtful. Nothing on N.
		eS_E	6 35 50	.....	.....	.....	.....	
		eL_E	6 54 35	25	.....	.....	.....	
		M_E	7 00 35	19	20	.....	.....	
		C_E	7 16 ..	16	.....	.....	.....	
		F_E	7 53 ..	16	.....	.....	.....	
31	.....	eL_E	14 55 ..	.....	.....	.....	.....	Only a few long waves.
		eL_N	14 57 ..	.....	.....	.....	.....	
		M_N	15 00 ..	18	.....	10	.....	
		M_E	15 10 ..	12	10	.....	.....	
		C	15 15 ..	.....	.....	.....	.....	
		F	.. .. ..	.....	.....	.....	.....	

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, E-W component.

Instrumental constant....T_0

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
July 1	.....	P	6 19 12	.....	.....	.....	.....	Period of pendulum on July 1, 29.4 seconds, sensitiveness 0.28″; period of pendulum after July 1, 25.5 seconds sensitiveness 0.46″; Pendulum readjusted on July 23 to a period of 18.2 seconds, sensitiveness 1.11″.
		S	6 29 18	.....	.....	.....	.....	
		L	6 41 54	30	.....	.....	.....	
		M	6 44 00	.....	*1500	.....	.....	
		C	6 47 36	.....	.....	.....	.....	
		F	7 39 ..	.....	.....	.....	.....	
3	.....	P	7 02 30	.....	.....	.....	.....	
		S	7 11 12	.....	.....	.....	.....	
		L	7 23 24	30	.....	.....	.....	
		M	7 26 06	.....	*3300	.....	.....	
		C	7 55 ..	.....	.....	.....	.....	
		F	10 47 ..	.....	.....	.....	.....	

*Trace amplitude.

Hawaii. *Honolulu. Magnetic Observatory*—Continued.

Date.	Character.	Phase.	Time.	Period T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1918.			*H. m. s.*	*Sec.*	*μ*	*μ*	*km.*	
Aug. 6	.....	eP	20 29 00	.....	.....	.....	.....	
		eL	20 37 30	30	.....	.....	.....	
		M	20 40 30	.....	*400	.....	.....	
		C	20 44 00	.....	.....	.....	.....	
		F	20 51 ..	.....	.....	.....	.....	
8	.....	e	5 54 12	.....	.....	.....	.....	Tremors and waves very irregular, about 1 1 mm. amplitude except at M, which is well marked. Probably only part of this disturbance is seismic.
		M	11 18 00	.....	*6500	.....	.....	
		C	11 22 ..	.....	.....	.....	.....	
		F	19 30 ..	.....	.....	.....	.....	
9	.....	eP	2 17 48	.....	.....	.....	.....	
		eL	2 31 00	.....	.....	.....	.....	
		M	2 33 00	28	*100	.....	.....	
		F	3 45 ..	.....	.....	.....	.....	
11	.....	e	22 07 00	.....	.....	.....	.....	
		M	22 09 00	23	*100	.....	.....	
		F	22 16 ..	.....	.....	.....	.....	
15	.....	eP	0 30 00	.....	.....	.....	.....	Recorded on variometer.
		L	0 37 06	.....	.....	.....	.....	
		M	0 40 00	.....	*1000	.....	.....	
		C	0 42 36	.....	.....	.....	.....	
		F	1 54 ..	.....	.....	.....	.....	
21	.....	P	6 18 06	.....	.....	.....	.....	
		S	6 26 18	.....	.....	.....	.....	
		eL	6 33 00	.....	.....	.....	.....	
		M	6 37 00	.....	*3100	.....	.....	
		C	6 44 ..	.....	.....	.....	.....	
		F	8 48 ..	.....	.....	.....	.....	
21	.....	eP	10 01 12	.....	.....	.....	.....	Probably a recurrence of the preceding 'quake.
		eL	10 10 30	.....	.....	.....	.....	
		M	10 12 00	.....	*500	.....	.....	
		F	10 49 ..	.....	.....	.....	.....	
23	.....	eP	13 39 24	.....	.....	.....	.....	Pendulum adjusted just after this.
		eL	13 47 00	29	.....	.....	.....	
		M	13 52 00	.....	*500	.....	.....	
		C	13 56 ..	.....	.....	.....	.....	
		F	14 18 ..	.....	.....	.....	.....	
29	.....	eP	11 32 06	.....	.....	.....	.....	
		eL	11 38 00	.....	.....	.....	.....	
		M	11 45 18	.....	*600	.....	.....	
		C	11 49 ..	.....	.....	.....	.....	
		F	12 30 ..	.....	.....	.....	.....	
29	.....	eP	17 00 42	.....	.....	.....	.....	
		S	17 09 00	.....	.....	.....	.....	
		eL	17 19 00	.....	.....	.....	.....	
		M	17 34 12	20	*1000	.....	.....	
		C	17 42 ..	.....	.....	.....	.....	
		F	19 30 ..	.....	.....	.....	.....	
31	.....	P	14 48 30	.....	.....	.....	.....	
		S	14 56 54	.....	.....	.....	.....	
		L	15 09 12	27	.....	.....	.....	
		M	15 13 48	.....	*400	.....	.....	
		C	15 18 ..	.....	.....	.....	.....	
		F	16 48 ..	.....	.....	.....	.....	
31	.....	P	22 14 00	.....	.....	.....	.....	
		L	22 22 00	19	.....	.....	.....	
		M	22 28 30	.....	*500	.....	.....	
		F	23 28 ..	.....	.....	.....	.....	

*Trace amplitude.

SEISMOLOGICAL DISPATCHES.[1]

There were no press reports of seismological or vulcanological disturbances during August, 1918.

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