SECTION V.—SEISMOLOGY.

SEISMOLOGICAL REPORTS FOR JULY, 1915.

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[Dated: U. S. Weather Bureau, Washington, D. C., Aug. 30, 1915.]

TABLE 1.—*Noninstrumental earthquake reports, July, 1915.*

Day.	Approximate time, Greenwich Civil.	Station.	Approximate latitude.	Approximate longitude.	Intensity Rossi-Forel.	Number of shocks.	Duration.	Sounds.	Remarks.	Observer.
	H. m.	CALIFORNIA.	° ′	° ′			*Sec.*			
3	23 45	Brawley	32 59	115 40						M. D. Witter.
13	5 43	Victorville	34 32	117 18						J. M. Henry.
15	18 00	Drakesbad	40 28	121 29	2	1		Faint		A. Sifford.
21	24 00	Drakesbad	40 28	121 29	3	1		Rumbling		A. Sifford.
22	11 00	Mineral	40 21	121 32	2	2				W. E. Gerber.
22	20 36	Eureka	40 48	124 11	2	1	5		Shook chandeliers	U. S. Weather Bureau.
27	19 43	Newhall	34 22	118 30	2	2	1			P. J. Coyle.
27	22 41	Newhall	34 22	118 30	2	1	½			P. J. Coyle.
		UTAH.								
15	22 00	Heber	40 35	111 28	5	1	2		Rattled dishes	John Cook.
	22 00	Lehi	40 23	111 52		1	10			Joseph Anderson.
	22 00	Midvale	40 36	111 53	5	4	8			E. D. Camomile.
	22 00	Park City	40 38	111 35	3			Rumbling		Geo. Cunningham.
	22 00	Provo	40 16	111 44	6	1	4	Rumbling	Cracked a few ceilings	U. S. Reclamation Service.
	22 00	Salt Lake City	40 46	111 54	3	1	10			U. S. Weather Bureau.
	22 00	Spanish Fork	40 08	111 41	2	1				W. P. Shippee.
	22 00	Thistle	40 00	111 36	3	1	4	Rumbling		R. H. Thomas.
30	19 50	Garland	41 45	112 11	5	2		Faint	Shook dishes from shelves	John T. Roberts.
		WASHINGTON.								
18	20 54	Lakeside	47 50	120 00	4	1		Faint		W. H. Van Meter.

TABLE 2.—*Instrumental seismological reports, July, 1915.*

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

[For significance of symbols see this REVIEW, June, 1915, p. 289.]

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.
1915. July 31			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
		P	1 38 19	3				
		S	1 43 46	12				
		L_E	1 50 14	21				
		L_N	1 50 40	20				
		M_E	1 51 42	18	970			
		M_N	1 52 15	18		1,100		
		C	1 54 00	16				
		F	2 56 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 16; N: V 10, T_0 19.6

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915. July 31			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
		P_E	1 41 51	5				
		P_N	1 41 56	4				
		S_E	1 50 25					
		S_N	1 50 29			20		
		L_E	2 02 38	22				
		M_E	2 05 07	22	30			
		M_N	2 08 50	13		10		
		C	2 10 00					
		F	2 46 00					

TABLE 2.—*Instrumental seismological reports, July, 1915*—Continued.

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.
1915.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
July 11 to 12.					*100	*100		No time obtained. Light tremors.

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.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
July 1-2								Constant activity at intervals on N-S. Only thickening of pen marks on E-W. Waves are broken and irregular.
3-4								Activity at intervals on N-S.
4-5								Activity on N-S.
16								Activity on both components, especially E-W, from 3h to 5h.
21			9 00 00					Small but distinct oscillations at intervals on N-S.
			13 00 00					
31	I_u	P_N	1 49 00					P disturbed through minute marks. S not visible.
		L_N	2 01 00					
		M_N	2 03 00	20		6		
		C_N	2 05 00					
		F_N	2 07 00					
31			11 48 00					Wavelets on N-S.
			12 04 00					

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

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

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

Instrumental constants.. V 110, T_0 6

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
July 16	I_v	P_E	20 33 45				810?	Long waves doubtful.
		S_E	20 35 13					
		M_E	20 37 25		7			
		F	20 54 00					
22	I_v	P_E	4 16 53				3,995?	Phases doubtful.
		S_E	4 22 40					
		L_E	4 29 40	12				
		F	4 45 00					
25	I_u	P_E?	21 03 15				7,235?	P and S very doubtful.
		S_E?	21 11 56					
		L_E	21 16 40					
		F	21 45 00					

* Amplitude on instrument.

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

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
29		e_E	10 49 30					Phases uncertain
		L_E	10 51 40					
		F	11 10 00					
31	I_u	P_E	1 43 01				8,165	
		S_N	1 52 29					
		L_E	2 01 00	18				Long waves continued with approximately the same magnitude until 2h 25m with a period of 20-24 seconds.
		F_E	4 00 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.

Instrumental constants.. V, T_0, ϵ: E 165 5.4 2.6; N 143 5.2 3.4

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
July 31	I	eP_E	1 36 43					
		eP_N	1 36 46	3				
		S_E	1 46 13					
		S_N	1 46 24	12				
		L_N	2 07 40	20				
		M_N	2 11 46	18		2		
		F_N	2 57 16					

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.

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

Instrumental constant.. T_0 18.9

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H. m. s.*	*Sec.*	μ	μ	*Km.*	
July 2		eL	14 00 36					
		M	14 10 12		*100			
		C	14 26 36					
4		eL	2 28 54					
		M	2 39 00		*100			
		F	2 48 30					
8		P	22 36 36					
		S	22 41 12					
		L	22 45 12					
		M	22 57 48	24	*300			
		C	23 05 48					
		F	23 23 54					
10		eL	1 01 48					
		M	1 02 42	20	*100			
		F	1 10 12					
13		eL	19 45 00					
		M	19 51 12	18	*100			
		C	19 55 36					
		F	20 03 36					
24		eL	19 18 54					
		M	19 27 36		*100			
		C	19 31 00					
		F	19 42 54					
25		eL	21 02 54					
		M	21 04 12		*100			
		F	21 14 42					
28		eL	9 27 00					
		M	9 42 48	20	*200			
		C	9 48 48					
		F	10 03 42					
31		P	1 40 12					From 1h 52m 12s to 1h 56m 48s amplitude exceeded width of record.
		S	1 46 18					
		L	1 52 30	22				
		C	3 14 36					
		F	5 35 48					

* Trace amplitude.

TABLE 2.—*Instrumental seismological reports, July, 1915*—Continued.

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

Lat., 38° 57′ 30″ N.; long., 95° 14′ 58″ W. Elevation, 304.8 meters.

Instrument: Wiechert.

Instrumental constants.. V T_0 ϵ E 177 3.4 4.0; N 205 3.4 3.8

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	μ	μ	*Km.*	
1915. July 31	.....	P.....	1 41 51	2	.....	.....	.....	
		S.....	1 50 46	5–8	.....	.....	.....	
		L.....	2 06 52	24	15	8	.....	

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.. V T_0 E 10 31; N 10 29

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	μ	μ	*Km.*	
1915. July 31	.....	P_E.....	1 43 28	2	.....	.....	.....	
		P_N.....	1 43 32	2	.....	.....	.....	
		S_N.....	1 53 34	12	.....	.....	.....	
		L_E.....	2 05 00	24	.....	.....	.....	
		L_N.....	2 06 44	26	.....	.....	.....	
		M_E.....	2 08 52	32	30	.....	.....	
		M_N.....	2 17 20	22	.....	180	.....	
		C_E.....	2 18 00	16	.....	.....	.....	
		C_N.....	2 22 00	19	.....	.....	.....	
		F_E.....	2 28 00	20	.....	.....	.....	
		F_N.....	3 17 00	20	.....	.....	.....	

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 T_0 ϵ:1 80 7 5:1

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	μ	μ	*Km.*	
1915. July 31	I_s...	P_E.....	1 42 30	.....	.....	.....	7,600	Phases and times on N-S component same as on E-W. 4 after-shocks registered on both components, with maximum amplitudes of 2 mm. and uniform periods of 18 seconds.
		S_E.....	1 51 30	.....	.....	.....	.....	
		L_E.....	1 59 00	.....	.....	.....	.....	
		F.....	3 12 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 T_0 ϵ:1 80 7 5:1

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	μ	μ	*Km.*	
1915. July 5	I....	iL_E...	19 48 30	10	24	.....	.....	P and S not discernible on either component.
		iL_N...	19 48 40	4	.....	10	.....	
		L_N.....	19 49 00	.....	.....	.....	.....	
		L_E.....	19 49 10	.....	.....	.....	.....	
8	.....	.....	.....	.....	.....	.....	.....	Microseisms on E-W component from 17h 56m to 17h 58m.
8	I....	.....	17 56 10	.....	.....	.....	.....	Mild shock from south.
9	.....	.....	.....	.....	.....	.....	.....	Microseisms on E-W component from 16h 22m to 19h 00m.
12	I....	.....	22 11 15	.....	.....	.....	.....	Shock from southwest.
31	I_u...	eP_N...	1 42 10	2	.....	.....	8,000	
		eP_E...	1 42 30	2	.....	.....	.....	
		eS_N...	1 51 30	3	.....	.....	.....	
		eS_E...	1 51 30	5	.....	.....	.....	
		iL_N...	2 06 00	10	.....	10	.....	
		iL_E...	2 08 00	20	13	.....	.....	
		M_E....	2 14 30	30	.....	.....	.....	
		L.....	2 16 00	.....	.....	.....	.....	
		C_N....	2 28 00	.....	.....	.....	.....	
		C_E....	2 30 00	.....	.....	.....	.....	

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 constant.. T_0 6

(Report for July, 1915, not received.)

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

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

Instruments: Two Bosch-Omori 25 kg.

Instrumental constants.. V T_0 8 20

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	μ	μ	*Km.*	
1915. July 14	I_v...	P.....	10 57 10	.....	.....	.....	328	Probable direction southwest.
		L.....	10 57 58	.....	.....	.....	.....	
		M_E....	10 58 04	.....	25	.....	.....	
		M_N....	10 58 04	.....	.....	62	.....	
		F_E....	11 01 00	.....	.....	.....	.....	
		F_N....	11 01 40	.....	.....	.....	.....	

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 T_0 E 10 15; N 10 16

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*			*Km.*	
1915 July 31	I_u...	P_N....	1 42 47	.....	.....	.....	7,990	
		S_E....	1 52 06	.....	.....	.....	.....	
		L.....	2 00 10	.....	.....	.....	.....	
		L.....	2 15 00	24	.....	.....	.....	
		L.....	2 22 40	18	.....	.....	.....	
		F.....	3 10 00	.....	.....	.....	.....	

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

Lat., 42° 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 T_0 120 26

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
			H. m. s.	*Sec.*	μ	μ	*Km.*	
1915 July 22	.....	P.....	4 23 00	.....	.....	.....	3,480	
		S.....	4 28 16	.....	.....	.....	.....	
		L.....	4 32 07	19	.....	.....	.....	
		F.....	4 45 00	.....	.....	.....	.....	
25	.....	P.....	21 05 13	.....	.....	.....	4,520	
		S.....	21 14 36	.....	.....	.....	.....	
		L.....	21 16 05	25	.....	.....	.....	
		F.....	21 40 00	.....	.....	.....	.....	
29	.....	L.....	10 55 05	12	.....	.....	.....	
31	.....	iP.....	1 42 32	.....	.....	.....	7,700	
		$PR1_E$.	1 45 20	.....	.....	.....	.....	
		$PR2_E$.	1 47 01	.....	.....	.....	.....	
		S_N....	1 51 37	.....	.....	.....	.....	
		S_E....	1 51 38	.....	.....	.....	.....	
		L.....	1 59 07	60	.....	.....	.....	
		L.....	2 04 00	40	.....	.....	.....	
		L.....	2 09 00	28	.....	.....	.....	
		L.....	2 22 00	18	.....	.....	.....	
		L.....	3 00 00	14	.....	.....	.....	
		F?....	4 30 00	.....	.....	.....	.....	

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=0.59″.

(Report for July, 1915, not received.)

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

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

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

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

(Report for July, 1915, not received.)

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

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=0.59″.

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
June 1		iP?	14 57 36		*300		3,245?	
		iS?	15 05 18					
		iL	15 07 30					
		L	15 09 54					
		M	15 11 18		*13,200			
		M	15 12 24		*13,000			
		M	15 12 42		*12,100			
		C	15 13 24		*900			
		C	15 13 42					
		L	15 31 54					
		M	15 32 30		*100			
		F	16 30 12					
4		P	21 23 21					
		L	21 38 12		*50			
		F	22 19 18					
4		iP	22 36 06					
		L	22 44 48					
		L	22 52 00					
		M	22 56 00		*200			
		F	23 21 18					
6		P	15 48 48					
		L	15 55 30					
		M	15 57 12		*200			
		F	16 01 36					
6		iP	20 21 30					
		iS	20 28 18					
		L	20 39 24					
		L	20 41 42					
		M	20 48 42		*300			
		L	20 52 42					
		L	21 12 24					
		F	21 18 12					
6		P	21 36 06					
		P	21 38 12					
		P	21 40 48					
		S	21 48 24					
		L	21 49 24					
		M	21 51 30		*5,000			
		M	21 56 30					
		C	21 56 36		*1,000			Long waves continued for a long time.
		C	21 59 00		*4,000			
		C	22 00 30					
		L	22 03 12					
		M	22 11 06		*5,000			
		C	22 13 36					
		L	22 14 36					
		L	22 22 06					
		L	23 16 00					
		L	23 34 06					
		F	23 32 00					
7		L	12 27 54		*50			
		F	12 36 00					
7		L?	22 48 54					
		L	22 52 00					
		M	22 52 42		*200			
		F	23 06 54					
11		L	7 37 12		*100			
		F	7 36 48					
12		L	6 43 24					
		M	6 44 00		*100			
		F	6 49 48					
22		L	3 41 00					Marked quake, P possibly not recorded.
		M	3 45 18		*900			
		F	4 13 30					
22		L	13 05 18		*50			
		F	13 13 24					
23		P	4 06 06				3,880	Origin in southern California.
		iS	4 14 42					
		L	4 17 36					
		M	4 17 36		*400			
		F	4 34 00					

* Trace amplitude.

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

Date.	Character.	Phase.	Time.	Period. T.	Amplitude. A_E	Amplitude. A_N	Distance.	Remarks.
1915.			*H.m.s.*	*Sec.*	*μ*	*μ*	*Km.*	
23		P	5 06 00				3,880	Origin in southern California.
		S	5 10 36					
		L	5 12 30					
		M	5 12 42		*400			
		F	5 32 48					
27		L	16 16 36					P lost on account of air currents.
		M	16 18 36		*300			
		F						F uncertain on account of air currents.
29		L	14 42 06					F lost in air currents.
		L	14 53 36					
		M	14 55 24		*100			

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

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

Instrument: 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.
1915.			*H. m. s.*	*Sec.*	*μ*	*μ*	*Km.*	
June 1		iP	15 00 18					
		S	15 03 18		*3,200			
		L	15 07 48					
		L	15 09 36					
		M	15 10 48		*6,000			
		F	16 14 18					
6		L	20 20 24					P lost in attention to instrument.
		L	20 21 00					
		M	20 33 36		*870			
		F	20 38 24					
6		P	21 42 24					
		L	21 43 24					
		M	21 43 24		*1,000			
		F	21 48 24					
6		P	21 49 54					
		L	21 51 54					
		M	21 53 30		*3,000			
		F	(?)					
6		P	22 11 12					
		L	22 15 06					
		M	22 20 42		*2,000			
7		F	0 18 24					
11		P	6 57 42					
		L	7 03 42					
		M	7 16 42		*200			
		F	7 26 42					
22		P	3 45 00					
		L	3 47 30					
		M	3 48 00		*200			
		F	3 58 00					
22		L	13 10 00					Measurements doubtful.
		M	13 13 48		*50			
23		P	4 07 42					Origin in southern California.
		L	4 11 00					
		M	4 12 30		*1,000			
		F	4 18 00					
23		P	5 04 00					Origin in southern California.
		L	5 07 30					
		M	5 09 00		*1,200			
		F	5 22 00					
27		P	15 53 00					
		L	16 04 30					
		M	16 16 00		*200			
		F	16 26 00					
29		P	14 25 00					
		S	14 28 00					
		L	14 41 00					
		M	14 43 00		*200			
		F	15 03 00					

* Trace amplitude.