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SEISMOGRAPHIC STATIONS

No. 18, pp. 371-385 April 21, 1920

THE REGISTRATION OF EARTHQUAKES AT THE BERKELEY STATION

AND

AT THE LICK OBSERVATORY STATION

FROM

APRIL 1, 1919, TO SEPTEMBER 30, 1919

BY

E. F. DAVIS

UNIVERSITY OF CALIFORNIA PRESS

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CONTENTS

* The writer would acknowledge gratefully the assistance received from Mr. W. E. Inman in the preparation of this bulletin and the reading of the proof.

Symbols and Notation

1. *Character of the Earthquake—*

I. Perceptible II. Moderately strong. III. Strong.

d (terrae motus domesticus)	Local shock (origin less than 100 kilometers distant).
v (terrae motus vicinus)	Near shock (origin from 100 to 1,000 kilometers distant).
r (terrae motus remotus)	Distant shock (origin from 1,000 to 5,000 kilometers distant).
u (terrae motus ultimus)	Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. *Phases of the Seismogram—*

P (undae primae)	First phase, or first preliminary tremors.
PR_n	Waves n-times reflected at the earth's surface.
S (undae secundae)	Second phase, or second preliminary tremors.
SR_n	Waves n-times reflected at the earth's surface.
PS	Waves changed from longitudinal to transverse oscillation, or vice versa, through reflection at the earth's surface.
L (undae longae)	Long waves, chief phase, or principal part.
M (undae maximae)	Greatest motion in the chief phase.
C (coda)	Tail or end portion.
F (finis)	End of discernible movement.

3. *Nature of the Motion—*

i (impetus)	Sudden beginning of the motion.
e (emersio)	Gradual beginning of the motion.
T (period)	Time of one complete oscillation.
A	Amplitude of the motion, measured from the median line in microns ($\mu = 1/1000$ mm.).
A_E	E-W component of A.
A_N	N-S component of A.
A_V	Vertical component of A.

4. *Time—*

O (origin)	Time of shock at point of origin.

THE BERKELEY STATION

CONSTANTS

Latitude and longitude of the center of the seismographic room:

$\phi = 37° 52' 15''.79$ N. Lat.

$\lambda = 122° 15' 36''.6$ W. from Greenwich.

Time. All determinations are reduced to Greenwich mean civil time.

Altitude, 85.4 meters (280 feet) above mean sea-level.

Constants of the Seismographs

	Period	Magnif.	Damping
Bosch-Omori Seismograph N-S component	15s	80	8–1
Bosch-Omori Seismograph E-W component	15s	80	8–1
Wiechert Seismograph Vertical component	6s	80	8–1
Omori Tromometer N-S component	2s	60	-----
Omori Tromometer E-W component	2.5s	60	-----
Marvin Strong-motion Seismograph—			
E-W component	6.5s	5.8	1.3–1
N-S component	6.5s	5.1	1.4–1

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919								
1	2 Apr.	1_d	i P_{EN}	23 30 42.4					No definite maximum on north-south component.
			i–L_N	23 30 44.6					
			i L_E	23 30 44.8					
			M	23 30 47	¾	2			
			M_V	23 30 47	1			4	
			F	23 31 14					
2	14 Apr.	I_d	i P_E	indefinite					Marvin strong motion seismograph was started.
			i P_{NV}	23 32 19.2					
			i L_E	23 32 21.1					
			i L_N	23 32 21.6					
			i L_V	23 32 22.1					
			M_N	23 32 24	¾		4		
			M_E	23 32 27	1½	4			
			M_V	23 32 27	1			4	
			F	23 32 49					
3	17 Apr.	I_u	*O*	*11 22 12*					Δ = 9400 km.
			i P_V	11 34 44					*F* lost in microseisms after $4^h\,40^m$.
			e P_{EN}	11 34 54?					
			e S_N	11 45 14					
			e L	indefinite					
			F	12 46+					
4	17 Apr.	I_r	*O*	*20 52 49*					Δ = 3920 km.
			e P_V	21 00 00					*Trace amplitude.
			e P_E	21 00 01					
			eP_N	21 00 03					
			e S_{EN}	21 05 44					
			e L_E	21 09 02					
			e L_N	21 09 32					
			M_N	21 16 10	16		115		
			M_E	21 16 12	18	196			
			M_V	21 16 39	14			2100*	
			F	22 21±					
5	18 Apr.	I_r	*O*	*21 00 21?*					Δ = 2875 km.
			e P_N	21 06 06					Phases not readily separable; beginning and ending confused by microseisms. No definite maximum on vertical.
			e P_V	21 06 08					
			e L_V	21 12 49?					
			e L_N	21 12 58					
			e L_E	21 13 04					
			M_N	21 15 14	15		38		
			M_E	21 22 24	8	14			
			F	22 07±					
6	21 Apr.	I_d	i P_N	23 30 17.9					Chief phase consists of a series of minute waves with period about a second. No definite maximum on north-south or vertical.
			i L_N	23 30 20.3					
			M_E	23 30 26	1	4			
			F	23 29 06					
7	28 Apr.	I_u?	e	7 03 30±					Trace of a distant earthquake on horizontal components.
			F	7 31 30±					
8	30 Apr.	III_u	*O*	*7 17 12*					Δ = 8260 km.
			e P_N	7 28 45					†Trace amplitude.
			e P_E	7 28 46					Main phase registered by Omori tromometers.
			e S_E	7 38 18					
			e S_N	7 38 23					
			e L_E	7 49 42					
			e L_N	7 48 47					
			M_{E_1}	7 51 27	11	310			
			M_{N_1}	7 51 37	11		540		
			M_V	8 04 37	15			6000†	
			M_{E_2}	8 05 15	16	450			
			M_{N_2}	8 05 49	16		580		
			M_{N_3}	8 26 05	16		550		
			F	12 36 30±					
9	1 May	I_u?	e	6 16 30±					Trace of a distant earthquake on horizontal components.
			F	6 51 30±					
10	2 May	I_u?	e	2 28 30±					Trace of a distant earthquake on horizontal components.
			F	3 56 30±					
11	3 May	I_u	*O*	*0 52 02*					Δ = 7530 km.
			e P_N	1 02 58					*F* lost in microseisms after $4^h\,11^m$.
			e P_E	1 03 00					
			e P_V	1 03 02					
			e S_N	1 11 54					
			e S_E	1 12 02					
			e L_N	1 22 40					
			M_{N_1}	1 23 50	10½		103		
			M_E	1 24 26	10½	39			
			M_{N_2}	1 27 28	9		121		
			M_V	1 27 41	11			50	
			F	4 11+					
12	6 May	I_d	i P	18 07 13					A series of minute vibrations of very short period are visible on all components. Phases are not separable.
			F	18 07 27					
13	6 May	I_u	*O*	*19 40 18*					Δ = 10,980 km.
			e P_E	19 54 04					
			e P_V	19 54 08					
			e P_N	19 54 40?					
			e S_V	20 05 41					
			e S_E	20 05 46					
			e S_N	20 05 51					
			e L_N	20 17 20?					
			M_E	20 33 31	16	116			
			M_V	20 33 31	16½			23	
			M_N	20 24 16	15		110		
			F	23 22±					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
14	7 May	I_a?	e	5 49 30±					Trace of a distant earthquake on all components.
			F	7 00±					
15	8 May	I_r?	e	21 06 20					Trace of a distant earthquake on all components.
			F	21 23±					
16	12 May	I_v	e	21 06 08					A series of small irregular vibrations on horizontal components; trace of a near shock.
			F	21 06 58					
17	18 May	I?	e	10 34 30±					Trace of a distant earthquake on horizontal components.
			F	10 46 30±					
18	20 May	I_r?	e L_E	4 22 42					Preliminary tremors are weak and so confused by strong microseisms that their times of beginning cannot be determined. *F* lost in strong microseisms after $4^h\,42^m\,30^s$. Not registered by vertical seismograph.
			e L_N	4 22 55					
			M_E	4 25 12	10	42			
			M_N	4 26 12	7		68		
			F	4 42 30±					
19	22 May	I?	e	12 08 30±					Trace of a distant earthquake on all components.
			F	13 16 30±					
20	5 June	I_d	e	22 32 33					A series of minute short period vibrations. Phases not separable.
			F	22 31 48					
21	8 June	I_d	e	21 52 20					A series of short period vibrations of small amplitude.
			F	21 52 37					
22	14 June	I_v	e	7 55 46					A series of irregular vibrations; the trace of a near shock. Visible on all components.
			F	8 02 01					
23	20 June	I_v	e	4 16 54					A series of irregular vibrations; the trace of a near shock. Barely perceptible on east-west. Driving clock on vertical stopped before earthquake.
			M_N	4 16 59	$2\frac{1}{2}$		4		
			F	4 21±					
24	21 June	I_v	e	11 14 41					Series of irregular vibrations; the trace of a near shock.
			M_N	11 14 50	2		9		
			M_E	11 14 51	2	4			
			M_V	11 15 04	2			2	
			F	11 17 47					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
25	$29\frac{1}{30}$ June	I_a	e	23 21 45					Record of a distant earthquake on horizontal components. Newspapers report a destructive earthquake in Italy.
			M_N	23 37 57	21		4		
			M_E	23 40 21	21	16			
			F	0 21±					
26	6 July	I_r?	e	7 15 45±					Trace of a distant earthquake on all components.
			F	7 36 45±					
27	8 July	I_r?	e	22 18 04					Trace of a distant earthquake on horizontal components.
			F	23 06±					
28	8 July	I_a	e	22 27 02					Strong thickening of pen trace on north-south component. Barely perceptibe on vertical. A weak focal shock occurring during the registration of a distant earthquake.
			F	22 27 08					
29	9 July	I_r?	e	19 24 44					Trace of a distant earthquake on horizontal components.
			F	19 55±					
30	15 July	I_a	i P_V	13 15 27.6					Registered by Omori tromometers. Absolute values of times may be in error by one to two seconds. First shift of ground west, south, and up.
			i P_{EN}	13 15 27.8					
			i L_E	13 15 31.1					
			i L_N	13 15 31.5					
			M_N	13 15 32	$\frac{3}{4}$		37		
			M_E	13 15 32	$\frac{1}{2}$	10			
			M_V	13 15 33	$\frac{1}{2}$			6	
			C	13 15 34					
			F	13 17 09					
31	25 July	I_a	i P	6 03 52					Record of a very near weak focal shock on horizontal components.
			F	6 04 04					
32	31 July	I_v	e P_E	21 31 29					
			e P_V	21 31 30					
			e L	21 31 51					
			e L_V	21 31 57					
			M_E	21 32 05	2	11			
			M_V	21 32 08	$2\frac{1}{2}$			8	
			M_N	21 32 09	2		9		
			F	21 36 25					
33	13 Aug.	I_a	e P_N	21 20 44					Strong thickening of pen trace on east-west component. Not registered by vertical seismograph.
			i LM_N	21 20 47	$\frac{1}{2}$		6		
			C	21 20 51					
			F	21 21 11					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
34	18 Aug.	I_u	*O*	*16 55 26*					Δ = 8100 km.
			e P_N	17 06 52					Beginnings of first two phases are sharply marked but the rest of the record consists of long flat waves without definite maximum.
			e P_V	17 06 54					
			e P_E	17 06 55					
			e S_E	17 16 17					
			e S_N	17 16 18					
			e S_V	indefinite					
			F	18 31±					
35	18 Aug.	I_u?	e	21 29±					Barely perceptible long flat waves; the trace of a distant earthquake.
			F	21 58±					
36	24 Aug.	I_{r-u}	e	5 18±					Trace of a distant earthquake on horizontal components.
			F	6 00±					
37	24 Aug.	I_{r-u}	e	12 44±					Trace of a distant earthquake on horizontal components.
			F	12 59±					
38	26 Aug.	I_v	e	12 13 51					Series of minute irregular vibrations on all components. Origin near Santa Barbara.
			F	12 20±					
39	26 Aug.	I_v	e	14 58 51					Faint trace of a near shock on all components. Origin near Santa Barbara.
			F	15 01 20±					
40	27 Aug.	I?	e	5 54±					Trace of a distant earthquake on all components.
			F	6 19±					
41	29 Aug.	I_u?	e	6 02 21					A series of barely perceptible vibrations on horizontal components.
			F	7 31±					
42	31 Aug.	I_u	*O*	*17 22 53*					Δ = 10,340 km.
			e P_V	17 33 06					Chief phase consists of very flat waves. No definite maximum on east-west or vertical components.
			e P_N	17 33 08					
			e P_E	17 33 10					
			e S_V	17 44 17					
			e S_{EN}	17 44 19					
			M_N	17 55 59	28		22		
			F	19 06±					
43	2 Sept.	I_d	i P	21 22 28					A series of very minute vibrations. Thickening of pen traces on east-west and vertical.
			i L	21 22 31					
			M_N	21 22 32	½		2		
			F	21 22 00					
44	4 Sept.	III_d	i–P_{EN}	20 15 47.9					Registered by Omori tromometers and a weak record was obtained on Marvin strong motion seismograph. First shift of ground was east, south, and *down*. Origin near Hercules. Cracked cement pipe and reservoir at Hercules.
			i P_V	20 15 48.6					
			i LM_{EN}	20 15 50.2	½	89	120		
			i LM_V	20 15 51.1	½			17	
			C	20 15 56					
			F	20 17 34					
45	4 Sept.	I_d	e	20 39 52					Strong thickening of pen trace on north-south component; visible on east-west and vertical. An aftershock of No. 44.
			F	20 39 56					
46	6 Sept.	I_u?	e	9 56±					Trace of a distant earthquake on horizontal components.
			F	10 22±					
47	11 Sept.	I_r?	e	21 35 10					Trace of a distant earthquake on horizontal components.
			F	21 47±					
48	15 Sept.	I_u?	e	4 02±					Barely perceptible trace of a distant earthquake on horizontal components.
			F	5 26±					
49	15 Sept.	I_r?	e	17 36 05					Trace of a distant earthquake on horizontal components.
			F	18 03±					
50	19 Sept.	I_u?	e	3 25±					Trace of a distant earthquake on horizontal components.
			F	3 47±					
51	26 Sept.	I_u?	e	20 18±					Trace of a distant earthquake on all components.
			F	21 07±					
52	30 Sept.	I_v	e	7 40 11					Origin near Calexico.
			M_E	7 42 49	8	9			
			M_N	7 43 41	8		10		
			F	7 57 29					

THE LICK OBSERVATORY STATION

CONSTANTS

Constants of the Station

Latitude and longitude of the center of the seismographic room:

$\phi = 37° 20' 24''.5$ N. Lat.
$\lambda = 121° 38' 34''$ W. from Greenwich.

Time. All determinations are reduced to Greenwich mean civil time.

Altitude, 1281.7 meters (4202.25 feet) above mean sea level.

Constants of the Seismographs

	Period	Magnif.	Damping
Wiechert Seismograph N-S component	7.0	80	8:1
Wiechert Seismograph E-W component	6.0	80	8:1
Wiechert Seismograph Vertical component	3.0	80	8:1

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
1	14 Apr.	I_d	e	22 47 42					Strong thickening of pen traces on all components.
			F	22 47 50					
2	14 Apr.	I_d	e	23 19 04					Strong thickening of pen traces on all components.
			F	23 19 17					
3	15 Apr.	I_d	e	23 30 31					Strong thickening of pen traces on all components.
			F	23 30 38					
4	16 Apr.	I_d	i P	11 41 14.5					Registered on vertical by a series of small irregular vibrations.
			i LM	11 41 16.9	½	22	19		
			C	11 41 21					
			F	11 41 45					
5	17 Apr.	I_r?	e	21 05±					†Trace amplitude.
			M_E	21 16 01	16	1800†			No definite maximum on north-south component.
			F	22 00±					
6	18 Apr.	I_r	e	21 12±					Barely perceptible long flat waves on horizontal components.
			F	21 35±					
7	30 Apr.	I_u	*O*	*7 16 51*					Δ = 8860 km.
			e P_N	7 28 56					†Trace amplitudes.
			e S_N	7 38 59					
			e L_N	7 50 34					
			M_N	8 02 47	14		14,400†		
			M_E	8 03 29	17	3200†			
			F	9 10±					
8	2 May	I_d	i	22 59 16					A series of short-period pen strokes resulting in a strong thickening of the pen traces on all components.
			F	22 59 24					
9	2 May	I_d	e	23 06 13					Strong thickening of pen traces on all components.
			F	23 06 26					
10	3 May	I_u?	e	1 12 38					Record of a distant earthquake on horizontal components. Phases not separable. †Trace amplitude.
			M_E	1 27 29	9	800†			
			M_N	1 29 18	10		6500†		
			F	3 05±					
11	6 May	I_u?	e	20 06 52					Record of a distant earthquake on horizontal components. Phases not discernible. †Trace amplitude.
			M_N	20 24 53	10		2800†		
			M_E	20 35 00	24	3600†			
			F	21 50±					
12	12 May	I_d	e P	21 06 02.1					Registered on vertical component by a series of irregular vibrations of small amplitude.
			e L	21 06 07.6					
			M_{EN}	21 06 10	½	12	9		
			C	21 06 16					
			F	21 06 47					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
13	15 May	I_d	e	20 02 22					Strong thickening of pen traces on all components.
			F	20 02 11					
14	16 May	I_d	e	22 54 45					Strong thickening of pen traces on all components.
			F	22 54 54					
15	20 May	I_r?	e	4 19±					Trace of a distant earthquake on horizontal components.
			F	4 40±					
16	21 May	I_d	e	22 09 04					Strong thickening of pen traces on east-west and vertical components. Barely perceptible on north-south component.
			F	22 09 54					
17	28 May	I_d	i P	23 04 31.7					Series of closely spaced pen strokes; phases not separable.
			M_E	23 04 37.3	½	5	7	7	
			F	23 04 46					
18	29 May	I_d	i P	23 14 31					Strong thickening of pen traces on all components.
			F	23 14 43					
19	8 June	I_d	i P	21 49 08					Registered on vertical by a slight thickening of pen trace and a shifting of the line.
			i L	21 49 16					
			M	21 49 18	¾	9	10		
			C	21 49 23					
			F	21 49 51					
20	13 June	I_d	i P	18 31 29.1					Registered on vertical by a thickening of the pen trace.
			i–LM	18 31 30.6	½	4	5		
			C	18 31 32					
			F	18 31 37					
21	16 June	I_d	e	15 21 45					Registered on east-west and on vertical by a thickening of the pen traces.
			M_N	15 21 54	½		7		
			F	15 22 02					
22	17 June	I_d	i P	22 59 28					A series of short-period vibrations so closely spaced that they produce a thickening of the pen trace.
			M	22 59 37	½	4	10		
			F	22 59 40					
23	20 June	I_v	e	4 16 18					Trace of a near shock. Very faint on east-west. Not apparent on vertical.
			M_N	4 16 58	2		7		
			F	4 19 17					
24	20 June	II_d	i P	18 09 22.2					M_V unmeasurable because of shifting of pen trace.
			i L	18 09 24.0					
			M	18 09 29	½	31	30		
			F	18 10 02					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
25	21 June	I_v	e	11 14 39					A series of irregular vibrations. Not registered by vertical seismograph.
			M_N	11 14 45	2		15		
			M_E	11 14 48	2	6			
			F	11 16 23					
26	29/30 June	I_d	e	23 27 30					Series of long flat waves. See No. 25 in Berkeley list.
			F	0 14±					
27	1 July	I_d	i P	22 56 46					Strong thickening of pen traces on all components.
			F	22 56 57					
28	2 July	I_d	e	23 02 53					Strong thickening of pen traces on all components.
			F	23 03 02					
29	3 July	I_d	e	22 58 05					Strong thickening of pen traces on all components.
			F	22 58 20					
30	8 July	I_u?	e	22 16±					A series of barely perceptible long flat waves on horizontal components.
			F	23 20±					
31	9 July	I_u?	e	19 29±					A series of barely perceptible long flat waves on horizontal components.
			F	12 08±					
32	9 July	I_d	i P	21 07 56.9					Thickening of pen traces on east-west and vertical components.
			i LM	21 08 00.8	½		13		
			C	21 08 03					
			F	21 08 05					
33	15 July	I_d	e	23 27 15					Strong thickening of pen traces on all components.
			F	23 27 25					
34	22 July	I_d	i P	0 22 30					Not registered by vertical because of stopping of driving clock.
			i LM	0 22 32	½	6	6		
			C	0 22 38					
			F	0 22 51					
35	30 July	I_d	i P	22 16 23					A series of short-period vibrations of small amplitude in which no phases are discernible. Registered on vertical by a thickening of the pen trace and a sudden shift of the line.
			M	22 16 29	½	6	11		
			F	22 16 37					
36	30 July	I_d	e	22 17 24					Thickening of pen traces on horizontal components.
			F	22 17 30					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
37	31 July	I_V	i P_{EN}	21 31 22.6					A series of weak irregular vibrations on vertical component.
			i L_{EN}	21 31 38.8					
			M_{EN}	21 31 42	2½	34	30		
			C	indefinite					
			F	21 34 38					
38	31 July	I_d	i P	23 10 21					A series of closely spaced vibrations of short period in which no phases are discernible.
			M	23 10 28	½	5	13	5	
			F	23 10 39					
39	14 Aug.	I_d	e	22 48 10					Strong thickening of pen traces on all components.
			F	22 48 22					
40	15 Aug.	I_d	e	23 49 36					Strong thickening of pen traces on all components.
			F	23 49 41					
41	23 Aug.	I_d	e	17 35 38					A series of minute vibrations on horizontal components.
			F	17 36 26					
42	25 Aug.	I_d	e	15 02 23					Strong thickening of pen traces on all components.
			F	15 02 33					
43	26 Aug.	I_V	e	12 13 26					A series of minute irregular vibrations on horizontal components. Origin near Santa Barbara.
			F	12 16 14					
44	26 Aug.	I_d	e	14 04 05					Strong thickening of pen traces on all components.
			F	14 04 17					
45	26 Aug.	I_V	e	14 58 44					A series of minute vibrations on horizontal components. Origin near Santa Barbara.
			F	14 58 25					
46	26 Aug.	I_d	e	23 03 19					Registered on east-west and vertical by a strong thickening of the pen traces.
			M_N	23 03 26	½		10		
			F	23 03 32					
47	29 Aug.	I?	e	6 29±					Trace of a distant earthquake on horizontal components.
			F	7 22±					
48	31 Aug.	I?	e	17 28±					Trace of a distant earthquake on horizontal components.
			F	18 35±					
49	2 Sept.	I_d	i	14 01 22					Strong thickening of pen trace on north-south component only.
			F	14 01 35					

No.	Date	Charac.	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_V	Remarks
	1919			h m s	s	μ	μ	μ	
50	3 Sept.	I_d	i	0 15 03					Thickening of pen trace on both horizontal components.
			F	0 15 08					
51	4 Sept.	I_d	i	15 21 22					
			F	15 21 35					
52	4 Sept.	I_d	e	20 16 08					
			F	20 16 45					
53	5 Sept.	I_d	i	18 34 35					Registered on all components as a series of rapid pen strokes. No phases discernible.
			M_V	18 34 39	<½			6	
			F	18 34 42					
54	8 Sept.	I_d	i	17 25 14					Registered on all components as a series of rapid pen strokes. No phases discernible.
			M_N	17 25 15	<½		9		
			F	17 25 22					
55	16 Sept.	I_d	i	23 16 31					Strong thickening of pen trace on north-south component. Series of rapid strokes on east-west and vertical components.
			M_{E_1}	23 16 32	<½	6			
			M_{E_2}	23 16 40	<½	6			
			F	23 16 41					
56	18 Sept.	I_d	i	19 07 59					Series of rapid pen strokes on north-south and east-west components. Vertical record not good.
			M_N	19 08 10	<½		12		
			F	19 08 12					
57	18 Sept.	I_d	i	19 08 52					Aftershock of No. 56. Registered on both horizontal components.
			F	19 09 00					
58	24 Sept.	I_d	i P_{EN}	15 19 36.9					Δ = 25.9 km. Phases uncertain. Series of rapid pen strokes on all components.
			L_{EN}	15 19 39.5					
			M_N	15 19 45	½		11		
			F	15 19 50					
59	24 Sept.	I_d	i	19 04 19					Strong thickening of pen traces on all components.
			F	19 04 31					
60	26 Sept.	I_V(?)	e	20 28±					Trace of a distant earthquake on east-west component only.
			F	20 35±					
61	30 Sept.	I_V	e	7 41 04					Not registered on vertical component. No phases discernible. No definite maximum. Oscillations of low amplitude. Origin near Calexico.
			F	7 51±					
62	30 Sept.	I_d	e	23 37 08					
			F	23 37 20					