THE REGISTRATION OF EARTHQUAKES AT THE BERKELEY STATION

AND

AT THE LICK OBSERVATORY STATION

FROM

April 1, 1924, to September 30, 1924

BY

PERRY BYERLY
AND
GEORGE D. MITCHELL

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CONTENTS

Symbols and Notations

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)	Normal first phase, or first preliminary tremors (longitudinal).
P′	First preliminary tremors which have penetrated the core of the earth.
PR_n	Waves n times reflected at the earth's surface.
S (undae secundae)	Second phase, or second preliminary tremors (transverse).
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.
PPS	Waves twice reflected at the earth's surface, having been longitudinal on two branches of the path and transverse on one branch.

In general a bar over two letters denoting types of waves indicates refraction. The subscript $_c$ denotes the boundary at about 2900 km. depth between the metallic core and the middle shell which surrounds it. Thus:

$\overline{S_cP_cS}$	Waves which have penetrated the core, having been transverse before entering and after leaving the core, and longitudinal within the core.
$\overline{P_cP_c}$ $\overline{P_cP_c}$	Waves refracted at the core boundary into the core, reflected once at this boundary while within the core and again refracted out of the core, having remained longitudinal on all branches of the path.
L (undae longae)	Long waves at the beginning of the surface phase.
M (undae maximae)	Shorter and more regular waves of large amplitude in the surface phase.
M_n	Greatest motion in the surface phase.
C (coda)	Tail or end portion.
F (finis)	End of discernible movement.

For local earthquakes a special notation is used:

$\bar{P}$	The longitudinal wave which has traveled its whole path in the surface layer or crust of the earth.
$\bar{S}$	The transverse wave which has traveled its whole path in the surface layer of the earth.

In general R_1 denotes reflection once at the lower (inferior) surface of the earth's crust. R_{12} denotes reflection twice at this surface. R_0 indicates reflection at the upper (superior) surface of the crust, i.e., the surface of the earth. Thus, e.g.:

$R_{12}\bar{P}_2\bar{S}_2$	A wave in the earth's crust which has been reflected twice at the lower surface, having been longitudinal on two branches of its path and transverse on two branches.

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 earth motion, measured from the median line in microns (μ=1/1000m.), + toward the north, east, or zenith, − toward the south, west, or nadir.
A_E	E–W component of A.
A_N	N–S component of A.
A_Z	Vertical component of A.

4. *Time*—

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

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CONSTANTS

Latitude and longitude of the center of the seismographic room:

$\varphi = 37° 52' 15''.9$ 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

Date	Apparatus	Component	V	T_0	ϵ	$\frac{r}{T_0^2}$
1924						
May 9	Bosch-Omori 100 kg.	E	42	12.4	4.4 4.7	0.0030
	"	N	55	12.4	3.8 3.6	0.0035
	Wiechert 80 kg.	Z	42	5.4	4.6 3.9	0.0038
June 2	B.-O. 100 kg.	E	62	12.3	4.1 4.5	0.0031
	"	N	66	12.3	4.5 5.0	0.0028
	W. 80 kg.	Z	42	5.4	5.5 6.2	0.0024
Sept. 12	B.-O. 100 kg.	E	44	12.7	4.5 5.5	0.0029
	"	N	50	12.5	4.0	0.0031
	W. 80 kg.	Z	42	5.5	6.7 7.0	0.0021

The Berkeley seismograms for this Bulletin were measured by Dr. J. B. Macelwane, S. J., and Mr. W. L. Appleford.

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No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			n. m. s.	s.	μ	μ	μ	
1	Apr. 3–4	IId	$i\bar{P}_Z$	23 53 55					△=69 km. The epicenter was in the Calaveras Valley.
			$i\bar{P}_N$	23 53 56					
			$i\bar{P}_E$	23 53 57					
			$i\bar{S}_{NZ}$	23 54 02					
			iM_{EN}	23 54 06					
			iM_Z	23 54 07					
			F	0 11±					
2	Apr. 14	IIIu	eP_Z	16 34 34					△=11,333 km. According to Manila and Strasbourg the epicenter was S.E. of Mindanao at φ= 6°–7° N, λ=127°–128° E.
			P'_Z?	16 38 08					
			PR_{1Z}	16 38 34					
			PR_{1E}	16 38 35					
			$\bar{S}_cP_c\bar{S}$	16 45 16					
			PS_E	16 47 48					
			P PS_E	16 48 31					
			SR_{1E}	16 53 20					
			iL_E	17 03 02					Velocity of L ca. 4.4 km./sec.
			iL_{NZ}	17 03 12					
			e_{ENZ}	17 04 14					Velocity ca. 4 km./sec.
			i_{ENZ}	17 09 02					
			F	19 08±					Velocity ca. 3.9 km./sec.
3	Apr. 15	Id	$i\bar{P}_{EZ}$	21 11 32	<1				S–P=10 sec. △=90 km. Felt in Santa Clara and at Mt. Hamilton.
			$i\bar{P}_N$	21 11 33	<1				
			$i\bar{S}_{ENZ}$	21 11 42	<1				
			iM_{NZ}	21 11 43	<1				
			iM_E	21 11 44	<1				
			M_{1EN}	21 11 45	<1				
			M_{2E}	21 11 47					
			F	21 12 19					
4	Apr. 21	IIr	iP_{ENZ}	20 06 40					S–P=4 min. 36 sec. △=2900 km. Felt in Mexico City.
			iS_{ENZ}	20 11 16					
			i_E	20 12 02					
			i_N	20 12 05					
			L_E?	20 13 16					
			iM_E	20 14 50					
			M_{2E}	20 15 17	22	+36			
			F	20 40±					
5	Apr. 22	Id	$i\bar{P}_{EZ}$	10 08 41					S–P=8 sec. Probably on Haywards-Sunol Fault System north-west of Lick Observatory.
			$i\bar{P}_N$	10 08 43					
			$\bar{S}_{ENZ}$	10 08 50					
			M_{EZ}	10 08 53	<1				
			M_N	10 08 54	<1				
			F	10 11±					
6	Apr. 30	IId	$\bar{P}_N$	7 56 05	<1				△=26 km. by Omori's Formula.
			$\bar{P}_{EZ}$	7 56 06					
			M_N	7 56 08	<1				
			F	7 56 30					

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No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
7	May 1	IIr	iP_{EZ}	20 01 45					Rarefaction. △=4,200 km. Epicenter in Central America.
			iP_{NZ}	20 01 47					
			S_E	20 07 45					
			S_N	20 07 47					
			S_Z	20 07 54					
			L_{EN}	20 13 14					
			L_Z	20 13 16					
			M_E	20 16 59					
			M_N	20 17 15					
			M_Z	20 17 36					
			F	21 15±					
8	May 2	Id	$i\bar{P}_{EN}$	22 52 43					$\bar{S}$–$\bar{P}$=1.5 sec. △=16 km. S SE The z component falls on the minute mark so that measurements are not possible.
			$i\bar{S}_{EN}$	22 52 45					
			M_{EN}	22 52 46					
			F	22 53 16					
9	May 4	Iu	eP_{EN}	17 02 59					△=8000 km. The surface waves are very small. It is possible that we are dealing with the superposed records of more than one earthquake.
			iP_{ENZ}	17 03 00					
			i_Z	17 03 16					
			i_{EZ}	17 04 58					
			PR_{1Z}	17 08 47					
			eS_E	17 12 13					
			iS_{ENZ}	17 12 20					
			i_N	17 12 28					
			i_E	17 15 51					
			i_N	17 15 54					
			eL_{EN}	17 25 40					
			F	18 40±					
10	May 8	I	eL_{NZ}	6 33 6					
			F	6 43±					
11	May 8	Id	$i\bar{P}_Z$	16 07 20					
			F	16 07 21					
12	May 8	Id	$i\bar{P}_Z$	16 10 28	<1				
			F	16 10 29					
13	May 8	Id	$i\bar{P}_Z$	16 11 01	<1				
			F	16 11 02					
14	May 8	Id	$i\bar{P}_Z$	16 14 45					
			F	16 14 46					
15	May 8	Id	$i\bar{P}_Z$	16 15 11	<1				
			F	16 15 12					
16	May 8	Id	$i\bar{P}_Z$	16 16 29	<1				
			F	16 16 30					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
17	May 8	Id	$i\bar{P}_z$	16 17 23	<1				
			F	16 17 24					
18	May 8	Id	$i\bar{P}_z$	16 19 20	<1				
			F	16 19 21					
19	May 8	Id	$i\bar{P}_z$	16 22 44	<1				
			F	16 22 45					
20	May 8	Id	$i\bar{P}_z$	16 23 04	<1				
			F	16 23 05					
21	May 8	Id	$i\bar{P}_z$	16 23 31	<1				
			F	16 23 32					
22	May 8	Id	$i\bar{P}_z$	16 26 08	<1				
			F	16 26 09					
23	May 8	Id	$i\bar{P}_z$	16 28 13	<1				
			F	16 28 14					
24	May 8	Id	$i\bar{P}_z$	16 30 09	<1				
			F	16 30 10					
25	May 8	Id	$i\bar{P}_z$	16 31 46	<1				
			F	16 31 47					
26	May 8	Id	$i\bar{P}_z$	16 32 23	<1				
			F	16 32 24					
27	May 8	Id	$i\bar{P}_z$	16 32 52	<1				
			F	16 32 53					
28	May 8	Id	$i\bar{P}_z$	16 33 19	<1				
			F	16 33 20					
29	May 8	Id	$i\bar{P}_z$	16 33 57	<1				
			F	16 33 58					
30	May 8	Id	$i\bar{P}_z$	16 34 19	<1				
			F	16 34 20					
31	May 8	Id	$i\bar{P}_z$	16 35 01	<1				
			M	16 35 02	<1				Δ<10 km.
			F	16 35 03					
32	May 8	Id	$i\bar{P}_z$	16 36 29	<1				
			M_z	16 36 31					
			F	16 36 32					
33	May 8	Id	$i\bar{P}_z$	16 36 52	<1				
			F	16 36 56					
34	May 8	Id	$i\bar{P}_z$	16 37 50	<1				
			$\bar{S}_z$	16 37 51					Δ<10 km.
			M_z	16 37 52					
			F	16 37 54					

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No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
35	May 8	Id	e_z	16 38 15	<1				
			F	16 38 18					
36	May 8	Id	i_z	16 38 48	<1				
			F	16 38 49					
37	May 8	Id	i_z	16 39 06					
			F	16 39 08					
38	May 8	Id	i_z	16 39 20					
				16 39 21					
39	May 8	Id	e_z	17 11 30	<1				
			F	17 11 33					
40	May 8	Id	$i\bar{P}_z$	17 12 38	<1				
			M_z	17 12 39					
			F	17 12 40					
41	May 8	Id	$i\bar{P}_z$	17 13 09	<1				
			M_z	17 13 10					
			F	17 13 12					
42	May 8	Id	$i\bar{P}_z$	17 13 34	<1				
			M_z	17 13 35					
			F	17 13 36					
43	May 8	Id	$i\bar{P}_z$	17 14 04	<1				
			M_z	17 14 05	0.5			600	
			F	17 14 06					
44	May 8	Id	$i\bar{P}_z$	17 15 10	<1				Δ<10 km.
			M_z	17 15 10.5	<1				
			F	17 15 12					
45	May 8	Id	$i\bar{P}_z$	17 15 31	<1				Δ<10 km.
			M_z	17 15 31.5	<1				
			F	17 15 32					
46	May 8	Id	$i\bar{P}_z$	17 17 04	<1				Δ ca. 14.3 km.
			M_z	17 17 06	<1				
			F	17 17 07					
47	May 8	Id	$i\bar{P}_z$	17 17 24	<1				Δ<10 km.
			M_z	17 17 24.5	<1				
			F	17 17 25					
48	May 8	Id	$i\bar{P}_z$	17 17 48	<1				Δ<10 km.
			M_z	17 17 48.5					
			F	17 17 49					
49	May 8	Id	$i\bar{P}_z$	17 18 59	<1				
			F	17 19 00					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
50	May 8	Id	$i\bar{P}_Z$	17 19 28	<1				
			F	17 19 29					
51	May 8	Id	$i\bar{P}_Z$	17 51 44					
			F	17 51 46					
52	June 4	Id	i_Z	2 33 48					
			F	2 33 49					
53	June 4	Id	i_Z	2 34 36					
			F	2 34 37					
54	June 4	Id	i_Z	6 45 30					
				6 45 31					
55	June 6	Id	$i\bar{P}_E$	19 02 39					△=ca. 81.6 km. On Calaveras Fault. Felt in San Francisco.
			$i\bar{P}_{NZ}$	19 02 40					
			$i\bar{S}_{ENZ}$	19 02 50					
			iL_{EN}	19 02 51	<1				
			iL_Z	19 02 52	02				
			i_{EN}	19 02 52					
			iM_N	19 02 58					
			iM_{EZ}	19 02 59	02				
			F	19 03.2±					
56	June 18		e_E	16 28 49					
			i_E	16 28 57	06				
			eL_E	16 35 03	36				
			e_N	16 35 13	16				
			M_{1E}	16 35 23	14				
			F	16 46±					
57	June 26	IIu	eP'_Z	01 56 14	05				Epicenter in South Pacific.
			PR_{1Z}	01 57 15	06			−11	
			PR_{1Z1}	01 57 18	06			+7	
			PR_{1EN}	01 57 21	09				
			i_Z	01 57 50	08			−13	
			i_Z	01 57 54	08			+13	
			i_E	01 57 54	04.5				
			i_N	01 57 54	09				
			PR_{2E}	01 59 04	05				
			i_Z	01 59 04	10				
			i_Z	01 59 30	10			−14	
			i_Z	01 59 35	10			+14	
			PR_{2N}	02 01 29					
			i_Z	02 02 07	08				
			$\overline{S_cP_cS_N}$	02 03 02	09		+4		
			$\overline{S_cP_cS_N}$	02 03 06	09		−4		
			$\overline{S_cP_cS_E}$	02 03 09	09	+4			
			$\overline{S_cP_cS_E}$	02 03 13	09	−4			
			$\overline{S_cP_c}\ \overline{P_cS_Z}$	02 04 05	12			−11	
			$\overline{S_cP_c}\ \overline{P_cS_Z}$	02 04 11	12			+21	
			S_E	02 04 20	12	+4			
			S_N	02 04 20	12				

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
57	June 26 (cont.)	IIu	$\overline{P_cP_c}\ \overline{P_cP_N}$	02 05 40	12				
			$\overline{P_cP_c}\ \overline{P_cP_N}$	02 06 24	09		−3		
			PS_N	02 06 56	20		−18		
			PS_E	02 07 02	24	+91			
			PS_{N1}	02 07 06	24		+84		
			PS_Z	02 07 11	12			−21	
			PS_Z	02 07 17	12			+64	
			PPS_Z	02 08 22	26			+324	
			PPS_Z	02 08 35	26			−270	
			i_Z	02 08 40	12			+54	
			i_Z	02 08 46	12			−54	
			S'_Z	02 09 03	14			+11	
			S'_Z	02 09 10	14			−21	
			i_Z	02 09 18	12			+43	
			i_Z	02 09 24	12			−54	
			i_Z	02 13 04	12			+54	
			SR_{1Z}	02 13 48	26			+432	
			SR_{1Z}	02 14 01	26			−324	
			PS_E	02 07 14					
			$\overline{S_cP_cS}\ P_N$	02 07 21	22		−135		
			i_E	02 07 30	16	+31			
			$\overline{S_cP_cS}\ P_N$	02 07 32	16		+62		
			PPS_E	02 08 14	18	+24			
			PPS_N	02 08 22	18		−34		
			PPS_E	02 08 23	18	−32			
			PPS_N	02 08 31	18		+50		
			S'_N	02 09 30	12		+7		
			S'_N	02 09 36	12		−4		
			S'_E	02 10 13	24	−91			
			S'_N	02 10 16	26		−68		
			S'_E	02 10 25	26	+91			
			S'_N	02 10 29	26		+54		
			i_N	02 11 30	12		−3		
			i_N	02 12 30	20		+11		
			i_N	02 12 40	20		−11		
			SR_{1N}	02 13 04	36		−210		
			SR_{1N}	02 13 22	36		+140		
			i_N	02 13 40	14		−13		
			SR_{1N}	02 13 54	28		−192		
			SR_{1E}	02 13 57	26	−136			
			SR_{1E}	02 14 10	26	+109			
			i_N	02 14 24	32		−160		
			i_Z	02 14 31	18			−153	
			i_Z	02 14 40	18			+128	
			i_E	02 14 42	17	+11			
			i_E	02 14 50	17	−11			
			i_Z	02 17 10	22			−770	
			SR_{2N}	02 17 48	20		−18		
			SR_{2Z}	02 17 57	18			−153	
			SR_{2N}	02 17 58	18		+14		
			SR_{2E}	02 17 58	19	+23			
			SR_{2Z}	02 18 06					
			SR_{2E}	02 18 07	19	−14			

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
57	June 26 (cont.)	IIu	SR_{3E}	02 18 08	17	+ 7			
			SR_{3E}	02 18 16	17	− 7			
			SR_{3N}	02 18 40	12		+ 1		
			SR_{3N}	02 18 46	12		− 3		
			$\overline{S_cP_cS}\ P_Z$	02 20 00	09			− 12	
			$\overline{S_cP_cS}\ P_N$	02 20 09	09		− 3		
			i_N	02 20 34	09		+ 3		
			i_N	02 20 38	09		− 5		
			i_N	02 25 21	40		−107		
			i_E	02 25 28	38	+160			
			i_N	02 25 41	38		+ 49		
			i_E	02 25 47	38	−120			
			i_N	02 26 04	25		− 62		
			i_N	02 26 16	25		+ 37		
			L_E	02 30 40	36	+1850			
			L_Z	02 30 40	40	−1040			
			eL_N	02 30 40	40		+178		
			L_E	02 30 58	40	−382			
			eL_N	02 31 00	40		−107		
			i_N	02 31 57	24		−157		
			i_N	02 22 09	24		+ 67		
			M_Z	02 33 40	20			−640	
			M_E	02 33 40	20	+140			
			M_Z	02 33 50					
			M_E	02 33 50	20	−120			
			iM_N	02 33 33	24		−252		
			M_{E1}	02 34 28	20	−200			
			M_{Z1}	02 34 35	18			−625	
			M_{N1}	02 34 43	19		−224		
			M_{Z2}	02 34 44	18			+450	
			M_{Z3}	02 34 52	18			−625	
			M_{N2}	02 35 01	18		−288		
			M_{N3}	02 35 36	18		+235		
			M_{N4}	02 35 52	20		+317		
			i_E	02 37 20	16	+ 64			
			i_E	02 37 28	16	− 32			
			C_N	02 39 27	14		+ 30		
			C_N	02 39 34	14		− 16		
			i_Z	02 39 40	17			−352	
			i_Z	02 39 48	17			+220	
			i_E	02 40 16	18	+ 80			
			i_N	02 40 17	17		+170		
			C_E	02 40 20	17	+ 4			
			i_E	02 40 25	17	− 4			
			i_N	02 40 25	17		165		
			i_Z	02 40 26	20			−558	
			C_E	02 40 28	20	− 50			
			i_Z	02 40 36	20			+403	
			i_E	02 48 38	16	− 31			
			i_E	02 48 46	16	+ 25			
			i_Z	02 53 35	15			− 34	

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
58	June 30	Iu	P_Z	15 54 47					Epicenter west of Kuriles near Saghalin Island.
			P_{EN}	15 54 49					
			*P_{N1}	15 54 53	3				*Record taken off vertical component.
			PR_2	15 58 37					
			S_N?	16 02 43					
			S_E	16 03 17					
			SR_1	16 07 31					
			SR_{2E}	16 10 07					
			L_N	16 10 41					Velocity=4.4. km./sec.
			L_E	16 11 35					
			i_N	16 13 33					
			M_N	16 18 33					
			F						Records taken off at 18h. 00m. 33s.
59	July 1	I	e_Z	3 03 33					
			e_E	3 04 33					
			$eL?_Z$	3 25 33					
			eM_E	3 29 33					
			M_Z	3 30 33					
			M_{Z1}	3 32 55	7				
			M_{Z2}	3 33 02	7				
			F	3 52.5					
60	July 3	IIu	P_{N1}	4 54 30	4				△=ca. 11,440 km. Epicenter in Tibet.
			L_N	5 29 40					
			eL_Z	5 30 30					
			L_{Z1}	5 32 10	45				
			L_{N1}	5 32 38	44				
			L_{N2}	5 33 22	40				
			M_N	5 36 26					
			M_Z	5 36 30	30				
			M_{N1}	5 36 58	28				
			M_{Z1}	5 37.0	30				
			M_{N2}	5 40 54	22				
			M_{Z2}	5 41.0	20				
			M_{Z3}	5 41.3	18				
61	July 6	II	e_N	14 34 59					
			e_E	14 36 27					
			eL_{N1}	14 44 27	24				
			eL_{N2}	14 44 51	24				
			eL_{E1}	14 47 31	24				
			M_{E1}	14 48 47	20				
			M_{E2}	14 49 07	20				
			F	15 06±					
62	July 12	II	eL_{E1}	20 33 45	40				
			eL_{N1}	20 34 01	40				
			L_{E2}	20 34.4	40				
			M_{E1}	20 43.4	22				
			M_{E2}	20 43.8	22				
			M_{N1}	20 45.9	20				

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A$_E$	Amplitude A$_N$	Amplitude A$_Z$	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
62	July 12 (cont.)	II	M_{N2}	20 46.3	16				
			M_{N3}	20 46.6	20				
			F	21 30±					
63	July 22	Iu	P_Z	4 13 54					△ = ca. 6220 km.
			S_E	4 21 30					
			S_N	4 21 40	6				
			S_{N1}	4 21 46	6				
			F	4 48.3±					
64	July 24	Iu	eP_Z	5 09 40					
			PR_{1Z}	5 14 31					
			i	5 16 13					
			$\overline{S_cP_cS_Z}$	5 17 00					
			PR_{2Z}	5 17 05					
			$?\overline{S_cP_c\ P_cS_Z}$	5 18 06					
			PS_Z	5 20 38					
			i	5 21 57					
			i_E	5 24 13					
			i_Z	5 24 15					
			i_E	5 25 15					
			SR_{1Z}	5 25 28					
			PR_{3E}	5 30 11					
			SR_{2Z}	5 30 23					
			i_E	5 31 11					
			L_{E1}	5 40 53	52				
			L_{E2}	5 41 45	40				
			L_Z	5 45 04	22				
			M_E	5 47 13	12				
			M_{E1}	5 47 25	12				
			M_Z	5 55 10	17				
			M_{Z1}	5 55 27	22				
			M_{Z2}	5 55 59	17				
			F	6 25.2±					
65	July 29	Iu	e_Z	11 59 27					Not recorded on E-W or N-S components.
			i_Z	12 00 54					
			L_Z?	12 49 37					
			F	13 02±					
66	July 31	Id	$\bar{P}_{NE}$	19 36 58					Local shock.
			F	19 37					
67	Aug. 10	IIu	eP_Z	6 24 37					Epicenter near Fiji Islands.
			eP_N	6 24 52					
			e_N	6 35 08					
			i_Z	6 35 42					
			L_{ENZ}	6 50 52					
			L_{E1}	6 50 52	24				
			L_{E2}	6 51 16	24				
			L_{N1}	6 52 12	24				
			M_{NZ}	6 57 52					
			M_{N1}	6 59 52	18				
			F	7 33±					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A$_E$	Amplitude A$_N$	Amplitude A$_Z$	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
68	Aug. 13	IIr	P_Z	13 38 06					
			S_{NE}	13 44 20					
			L_Z	13 50 02					
			L_N	13 50 22	20				
69	Aug. 14	IIu	P_{NZ}	18 14 18					△ = 7900 km. Epicenter in Japan.
			P_E	18 14 20					
			PR_{2Z}	18 18 46					
			S_E	18 23 38					
			S_N	18 23 40					
			S_Z	18 23 51					
			S_{E1}	18 26 50	14				
			S_{E2}	18 27 04	14				
			SR_{2E}	18 31 46					
			SR_{3EN}	18 33 06					
			L_{EN}	18 35 53					
			L_Z	18 36 21	30				
			L_{Z1}	18 36 51	30				
			L_{E1}	18 36 53	28				
			M_{E1}	18 40 44	20				
			M_{Z1}	18 42 16	20				
			M_{Z2}	18 43 36					
			F	20 08±					
70	Aug. 24	IIu	P_{NZ}	23 16 13					Epicenter in Kamchatka, 55° N., 160° E.
			S_N	23 23 33					
			eM_{Z1}	23 45 33	15				
			M_{Z2}	23 45 48	15				
			F	23 56.5±					
71	Aug. 30	IIu	P_Z	3 18 55	4				△ = 9330 km. Epicenter south of Japan.
			P_E	3 19 05					
			PR_{1E}	3 22 55					
			PR_{1Z}	3 22 58	2				
			PR_{1Z1}	3 23 00	3				
			PR_{2Z}	3 25 04	5				
			PR_{2Z1}	3 25 09	2				
			S_{NE}	3 29 29					
			S_{E1}	3 30 01	6				
			L_N	3 47 05	30				
			L_E	3 49 45					
			L_{E1}	3 51 25	30				
			L_{E2}	3 51 55	30				
			M_{E1}	3 54 25	18				
			F	3 41±					
72	Sept. 2	IIu	e_Z	15 59 50					
			eL_N	16 00 22					
			L_E	16 00 22	20				
			L_{E1}	16 00 42	20				
			L_{N1}	16 00 50	20				
			L_{E2}	16 01 02	20				
			L_{N2}	16 01 10	20				

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1924			h. m. s.	s.	μ	μ	μ	
72	Sept. 2 (cont.)	IIu	M_{E1}	16 01 50	12				
			M_{N1}	16 02 22	12				
			M_{N2}	16 02 34	12				
			M_{E2}	16 03 02	12				
			F	16 13±					
73	Sept. 7	Iu	e_Z	13 31 35					
			e_N	13 31 47					
			e_E	13 31 50					
			i_{NZ}	13 32 04					
			i_E	13 32 11					
			i_E	13 32 37					
			i_N	13 32 39					
			i_{NZ}	13 33 16					
			i_E	13 33 17					
			i_Z	13 33 30					
			iL_E	13 33 40					
			iL_N	13 33 45					
			iL_Z	13 33 51					
			i_Z	13 34 14					
			M_N	13 34 34	7		10		
			M_E	13 34 56	8	5			
			M_Z	13 35 07	7			7	
			F	13 53±					
74	Sept. 13	Iu	e_Z	14 52 13					
			e_N	14 52 18					
			e_N	15 01 13					
			e_N	15 05.7					
			$eL?_E$	15 19 13					
			$eL?_{ENZ}$	15 32 13					
			F	16 05±					
75	Sept. 14	I	e_{NZ}	13 21 12					
			e_E	13 27 12					
			e_N	13 29 12					
			e_{ENZ}	13 34.2					
			F	14 10±					
76	Sept. 17	I	eL_Z	17 26±					Small groups of sinusoidal L waves, unmistakably of seismic origin, but very faintly recorded.

THE LICK OBSERVATORY STATION

CONSTANTS

Constants of the Station

Latitude and longitude of the center of the seismographic room:

$\varphi = 37° 20' 24''.5$ 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

Date	Apparatus	Component	V	T_0	ε
May 12	Wiechert 160 Kg. H.	E	70	10.0	4.7
		N	82	7.7	5.5
	Wiechert 80 Kg. V.	Z	58	3.2	7.6
June 4	160 Kg. H.	E	102	11.0	4.2
		B	102	8.0	6.4
	80 Kg. V.	Z	56	3.7	7.7
July 7	160 Kg. H.	E	94	10.6	5.6
		N	90	8.0	4.4
	80 Kg. V.	Z	57	3.2	8.5
Sept. 25	160 Kg. H.	E	100	11.7	6.0
		N	79	8.3	6.1
	80 Kg. V.	Z	51	3.2	8.2

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1924			h. m. s.	s.	μ	μ	μ	
1	Apr. 3	IId	$i\bar{P}_Z$	23 53 48					Remainder of record lost.
2	Apr. 14	IIu	e_N	16 38 00					△=11,300 km. See Berkeley Bulletin for epicentral location.
			ePR_{1N}	16 38 51					
			$i\overline{S_cP_cS_N}$	16 45 16					
			iPS_N	16 47 16					
			i_N	16 49 05					
			i_N	16 52 18					
			iSR_{1N}	16 53 36	19				
			iSR_{2N}	16 57 21					
			iSR_{2N1}	16 57 51	16		− 26		
			iL_N	17 03 16					Velocity of L=4.4 km./sec. ca.
			iL_{N1}	17 04 18	26		+160		
			eM_Z	17 08 21	29			−282	
			iM_N	17 08 50					
			iM_{N1}	17 10 14	25		−185		
			F	18 27±					
3	Apr. 15	Id	$i\bar{P}_{ENZ}$	21 11 23					△=14.3 km. ca. Epicenter probably on Haywards Fault, N.E. of Coyote.
			$i\bar{S}L_{ENZ}$	21 11 25					
			F	21 11.6±					
4	Apr. 21	I(r?)		20+					Distant shock registered about this time on N. component in all phases but time marker was not functioning.
5	Apr. 22	IIId	$i\bar{P}_{ENZ}$	10 08 29					△=11 km. ca.
			$i\bar{S}?_N$	10 08 30					
			$i\bar{S}_Z$	10 08 30.5					
			F	10 10.8					
6	Apr. 22	IIId	$i\bar{P}_Z$	10 12 27					△=11 km. ca. After shock of preceding shock.
			$i\bar{P}_{EN}$	10 12 28					
			$i\bar{S}_{EN}$	10 12 28.5					
			F	10 12.9					
7	May 30	Id	$i\bar{P}_{ENZ}$	3 02 40.5					Swarm type earthquake. Other smaller ones on this date. Probably a second shock.
			$i\bar{S}_Z$	3 02 41					
			$i\bar{S}_N$	3 02 41.5					
			i_{EN}	3 02 43.5					
			F	3 03.5					
8	June 6	IId	$i\bar{P}_{EN}$	19 02 27					Record on E. component illegible due to poor smoking. △=6 km. ca. Probably on Calaveras fault.
			$i\bar{P}_Z$	19 02 28					
			$i\bar{S}_N$	19 02 28					
			$i\bar{S}_Z$	19 02 29					
			F	19 05.5					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1924			h. m. s.	s.	μ	μ	μ	
9	June 26	IIu	i_E	01 57 19					Epicenter in South Pacific.
			i_N	01 57 23					
			iPR_{1N}	01 57 29	6		− 5		
			iPR_{1E}	01 57 29	6	− 7			
			iPS_N	02 07 06	23		+118		
			iPS_E	02 07 06	24	+150			
			iPS_{N1}	02 07 17	24		−203		
			iPS_{E1}	02 07 18	24	−200			
			$i\overline{S_cP_cS}\ P_E$	02 07 26	20	+ 99			
			$i\overline{S_cP_cS}\ P_E$	02 07 36	20	− 40			
			i_E	02 08 18	25	+ 97			
			i_N	02 08 25	17		− 45		
			i_N	02 08 33	17		+ 45		
			iS'_E	02 10 10	34	+100			
			iS'_N	02 10 12	32		−103		
			iS'_{E1}	02 10 26	32	+117			
			iS'_{N1}	02 10 28	32		+ 86		
			iSR_{1E}	02 12 54	32	+ 54			
			iSR_{1E1}	02 13 10	32	− 90			
			i_N	02 13 31	19		+ 55		
			$P'R_{2E}$	02 14 16	24	+140			
			$P'R_{2E1}$	02 14 27	24	− 70			
			i_N	02 25 25	34		− 78		
			i_E	02 25 28	32	+108			
			i_E	02 25 43	32	− 72			
			iL_N	02 30 43	43		+312		
			iL_E	02 30 46	30	+308			
			iL_{E1}	02 31 01	30	−270			
			iL_{N1}	02 31 04	30		−148		
			iL_{N2}	02 31 49	30				
			iL_{N3}	02 32 47	24		− 38		
			iL_{N4}	02 32 59	24		+ 38		
			iM_{E1}	02 34 05	23	+383			
			iL_{N5}	02 34 18	22		+ 46		
			iL_{N6}	02 34 29	22		− 46		
			iL_{N7}	02 39 07	17		− 27		
			iL_{N8}	02 39 15	17		+ 18		
			iM_{E2}	02 39 48	17	+229			
			iM_{E3}	02 39 52	17	−325			
			iM_{N1}	02 40 02	17		−306		
			iM_{N2}	02 40 04	17		+252		
			iM_{E4}	02 40 35	17	+244			
			i_E	02 48 55	15	+ 23			
			i_E	02 49 16	17	+ 81			
			i_E	02 49 24	17	−115			
			i_N	02 53 06	17				
			i_E	02 53 17	16	+ 20			
			i_N	02 54 00	17		−117		
			i_E	02 55 20	14	+ 30			
			i_E	02 55 27	14	− 45			
			i_N	02 58 03	17		− 23		
			i_N	02 58 12	17		+ 15		

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						Ae	An	Az	
	1924			h. m. s.	s.	μ	μ	μ	
10	June 30	Iu	iP_{ENZ}	15 54 55					△=7322 km. Epicenter near Sagahlin Island.
			i_Z	15 55 30					
			iPR_{1E}	15 57 06					
			iPR_{2E}	15 59 38					
			ePR_{2N}	15 59 49					
			i_{EN}	16 00 16					
			iS_E	16 03 32					
			iS_N	16 03 32	10		+ 6		
			eSR_{2E}	16 10 59					
			iL_{EN}	16 11 55	23	− 14			Velocity of L=4.4 km./sec. ca.
			F	17 21±					
11	July 1	I(?)	$iP?_E$	3 30 03					Not recorded on Z.
			$eP?_N$	3 30 06					
			i_E	3 30 10					
			i_N	3 30 16					
			F	3 52±					
12	July 3	Iu	iP_{EN}	4 52 42					Not recorded on Z. △=13,670 km.
			i_N	4 54 59					
			i_E	4 55 04					
			e_N	4 56 06					
			iP'_E	4 57 11					
			i_E	4 57 12					
			iPR_{1E}	4 57 59					
			iL_E	5 30 14					
			eL_N	5 31 50					
			iL_{1E}	5 32 44	33				
			M_N	5 40					
			M_E	5 40 44					
			M_{E1}	5 42 36	21	+ 75			
			F	6 06±					
13	July 11	Iu	iP_E	20 04 54					△=11,110 km. Epicenter in Tibet.
			iPR_{1E}	20 09 00					
			iPR_{2E}	20 11 40					
			i_E	20 14 42					
			iPS_E	20 17 44					
			eL_E	20 34 28	44	+ 19			
			iL_{E1}	20 42 41					
			M_E	20 44 03	26				Prominent impulse near end of L group.
			M_N	20 44.1					
			M_{E1}	20 46 37	20	+132			
			M_{N1}	20 56 03	20		+124		
			F	21 44±					
14	July 26	Iu	e_N	14 46 13					Preliminary phases lost in microseisms. Not recorded on Z.
			e_E	14 46 37	14				
			F	15 05±					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						Ae	An	Az	
	1924			h. m. s.	s.	μ	μ	μ	
15	Aug. 10	Iu	iP_E	6 24 48					Not recorded on N. nor Z components. See Berkeley Bulletin for location of epicenter.
			iPR_{1E}	6 28 03					
			eS_E	6 35 08	6				
			eL_E	6 50 01					
			iL_{E1}	6 51 41	28				
			M_E	6 59 17					
			F	7 22±					
16	Aug. 14	Id	$iP?_E$	00 55 56					Not recorded on N. nor Z. Heavy microseisms on this date.
			i_E	01 00 18					
			i_E	01 02 52	11				
			F	01 35±					
17	Aug. 14	Ir	eP_N	18 14 20					Not recorded on Z. △=7933 km.
			iP_E	18 14 21					
			i_E	18 17 07					
			i_E	18 20 07					
			iS_E	18 23 43	23				
			iS_N	18 23 48					
			iPS_E	18 24 17	7				
			i_E	18 26 07					
			$iSR_1?_E$	18 28 37	18				
			$iSR_2?_E$	18 33 22					
			i_N	18 33 42					
			i_E	18 33 54					
			iL_E	18 37 38	23				
			iL_N	18 37 45					
			M_E	18 42 42	19				
			M_{E2}	18 43 26	18	+ 65			
			M_{E3}	18 46 56	18	− 47			
			F	12 33±					
18	Aug. 17	Iu	eP_N	02 22 27					Vertical record damaged. Peculiarly short waves.
			i_N	02 24 23	10				
			i_E	02 45 49	>2				
			i_E	02 45 32					
			i_E	02 48 05	9				
			i_N	02 48 20	9				
			F	03 19±					
19	Aug. 17	Id	$i\bar{P}_{EN}$	05 59 33					Vertical record damaged. △=37.1 km. ca.
			$i\bar{S}L_N$	05 59 38					
			$i\bar{S}L_E$	05 59 45					
			M_E	05 59 50	7				
			F	06 00±					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1924			h. m. s.	s.	μ	μ	μ	
20	Aug. 25	Iu	eP_E	14 35 35					Not recorded on Z.
			iS_E	14 42 28					
			iPS_E	14 42 39					
			i_N	14 42 42					
			i_E	14 44 53					
			e_E	14 45 48					
			eL_N	15 02 06					
			eL_E	15 04 06					
			iM_{N1}	15 07 48					
			iM_{E1}	15 12 35					
			F	16 08±					
21	Aug. 30	Iu	i_E	03 23 15					Not recorded on N. nor Z. Heavy microseisms occur on this date.
			eS_E	03 29 20					
			eL_E	03 50 57					
			iL_{E1}	03 51 43	32	− 27			
			M_E	03 53 57					See Berkeley Bulletin for location of epicenter.
			iM_{E1}	03 55 27	23	+ 63			
			F	04 27±					
22	Sept. 14	Iu	e_E	13 21 11					Not recorded on N. nor Z.
			i_E	13 27 52					
			$L?_E$	13 34 38	20	− 3			
			i_E	13 40 38					
			F	14 03±					