THE REGISTRATION OF EARTHQUAKES AT THE BERKELEY STATION

AND

AT THE LICK OBSERVATORY STATION

FROM

April 1, 1930, to Sept. 30, 1930

BY

PERRY BYERLY

BULLETIN OF THE SEISMOGRAPHIC STATIONS, VOL. 2, NO. 20

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BULLETIN OF THE SEISMOGRAPHIC STATIONS

BERKELEY STATION, UNIVERSITY CAMPUS

LICK OBSERVATORY STATION, MOUNT HAMILTON, CALIFORNIA

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VOLUME 1. 1912–1924

Records from October, 1910, to September, 1920 inclusive

THE REGISTRATION OF EARTHQUAKES—

AT THE BERKELEY STATION ONLY:

No. 1. From October 30, 1910, to March 31, 1911.
No. 2. From April 1 to September 30, 1911.

AT THE BERKELEY STATION AND THE LICK OBSERVATORY STATION:

No. 3. From May 23 to September 30, 1911.
No. 4. From October 1, 1911, to March 31, 1912.
No. 5. From April 1 to September 30, 1912.
No. 6. From October 1, 1912, to March 31, 1913.
No. 7. From April 1 to September 30, 1913.
No. 8. From October 1, 1913, to March 31, 1914.
No. 9. From April 1, 1914, to September 30, 1914.
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No. 11. From April 1, 1915, to September 30, 1915.
No. 12. From October 1, 1915, to March 31, 1916.
No. 13. From April 1, 1916, to September 30, 1916.
No. 14. From October 1, 1916, to March 31, 1917.
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No. 16. From October 1, 1917, to March 31, 1918.
No. 17. From April 1, 1918, to September 30, 1918.
No. 18. From October 1, 1918, to March 31, 1919.
No. 19. From April 1, 1919, to September 30, 1919.
No. 20. From October 1, 1919, to March 31, 1920.
No. 21. From April 1, 1920, to September 30, 1920.

N. Ambraseys

THE REGISTRATION OF EARTHQUAKES AT THE BERKELEY STATION

AND

AT THE LICK OBSERVATORY STATION

FROM

APRIL 1, 1930, TO SEPT. 30, 1930

BY

PERRY BYERLY

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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.
$\overline{P_cP_c}$ $\overline{P_cP}$	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 of surface phase preceding M.
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:

$\overline{P}$	The longitudinal wave which has traveled its whole path in the surface layer or crust of the earth.
$\overline{S}$	The transverse wave which has traveled its whole path in the surface layer of the earth.
P*	The longitudinal wave which has travelled the horizontal portion of its path in the intermediate layer.
S*	The corresponding transverse wave.

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	Trace amplitude measured from the media line, + earth motion toward east, north, or zenith, − toward west, south, 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.

THE BERKELEY STATION

CONSTANTS

Latitude and longitude of the center of the seismographic room:

$\varphi = 37° 52' 15''$ N Lat.
$\lambda = 122° 15' 36''$ W from Greenwich.

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

Altitude, 85 meters (280 feet) above mean sea level.

Constants of the Seismographs

Date	Apparatus	Component	V	T_0	ϵ	$\frac{r}{T_0^2}$
1930 June	Bosch-Omori 100 kg.	E	45	14	10	0.0008
		N	50	14	10	0.0014
	Wiechert 80 kg.	Z	44	4	5	0.005
			K	T	T_1	μ^2
1930 Sept.	Galitzin	E	126	12	12	0
		N	125	12	12.1	0
		Z	121	12	11.8	0

In the following, the times measured from seismograms written by Galitzin instruments are marked by a †.

Three components of Wilip-Galitzin seismographs were put in operation in the Berkeley station in September.

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
1	April 9	IIv	eP_E	21 57 23		−			Felt at Tahoe, Calif. and vicinity. See page 473 for discussion.
			e_{NZ}	21 57 24			+		
			e_{EN}	21 57 31					
			e_Z	21 57 32					
			e_E	21 57 47					
			e_{NZ}	21 57 48					
			iS_E	21 57 53					
			i_N	21 57 54					
			e_Z	21 57 56					
			i_E	21 58 02					
			e_N	21 58 03					Period of 4 sec. superposed by shorter period.
			i_Z	21 58 03					
			F	22 01					
2	April 12	Iv	eP_N	12 57 33					See page 474 for discussion.
			e_E	12 57 55					
			iS_N	12 58 03	2				
			i_Z	12 58 05	3			−	
			e_E	12 58 08					
			e_Z	12 58 22	2				
			e_Z	12 58 49	5				
			i_N	12 58 55	4				
			e_Z	12 59 05	5				
			F	13 02±					
3	April 16	I	$e_{EN}z$	14 33 49		−	+	+	
			e_N	14 34 24					
			e_Z	14 34 31					
			e_N	14 34 49					
			eM_Z	14 36 29					
			eM_N	14 36 39					
			eM_E	14 36 44	10(?)				
			F	14 45 19					
4	April 26		eP_Z	16 26 08				+	
			e_N	16 26 10			+		
			e_E	16 26 14		−			
			e_E	16 27 51					
			e_E	16 29 11					
			eS_E	16 32 29					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
4	April 26 (contd.)		e_{NZ}	16 32 30					
			eL_E	16 35 38					
			eL_Z	16 35 45					
			eL_N	16 35 56					
			eM_E	16 37 52					
			eM_{EZ}	16 38 10					
			F	17 30 10					
5	May 5	Iu	eP_E	14 15 21					Calcutta U. S. C. & G. S. epicenter at 17°N 95°E
			eS_E	14 22 09					
			e_E	14 29 09					
			eL_E	14 39 01	20				
			eL_N	14 39 01					
			eM_N	14 48 29	14				
			eM_E	14 49 01	20				
			F	14 30 01					
6	May 6	IIu	eP_N	22 52 20			+		Persia.
			e_E	22 53 00		−			
			e_{EN}	22 59 10					
			e_{EN}	23 03 26					
			e_E	23 07 24					
			eSR_{1N}	23 08 20					
			eSR_{2E}	23 13 16					
			eSR_{2N}	23 13 24					
			e_N	23 16 16					
			eSR_{3E}	23 16 32					
			e_E	23 20 22					
			e_N	23 22 12	40?				
			e_E	23 22 16	32				
			e_E	23 24 36	36				
			e_N	23 27 00	28				
			e_E	23 28 40	24				
			e_E	23 36 28	20				
			F	24 20					
7	May 8	I	e_E	14 13 47	25				
			e_Z	14 15 15					
			e_N	14 15 21					
			e_E	14 20 59	17				
			F	14 28					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
8	May 13	Id	eP_{ENZ}	10 16 16		−	+	−	R—F.4 at Arroyo Sanitarium, near Livermore. Epicenter probably within 5 miles of headwaters of San Antonio Creek, Santa Clara County.
			iS_{ENZ}	10 16 23					
			e_{ENZ}	10 16 25					
			F	10 17 34					
9	May 22		eP_Z	16 43 44				−	
			e_Z	16 43 54					
			eS_E	16 44 20					
			e_{NZ}	16 44 23					
			e_N	16 44 29					
			iM_N	16 45 12					
			F	16 57					
10	May 31	Ir	eP_E	10 27 23					U. S. C. & G. S. epicenter at 46° N 132° W.
			e_N	10 28 59	10				
			e_E	10 29 29	8				
			e_N	10 29 46	10				
			eS_E	10 30 21	6				
			e_N	10 31 11					
			e_N	10 32 04	8				
			e_E	10 32 14	13				
			e_E	10 33 11	6				
			e_N	10 34 21	6				
			e_E	10 35 25					
			e_N	10 36 10					
			e_N	10 38 51					
			F	10 42.5					
11	June 10	II	e_E	01 15 09	24				
			e_E	01 20 32					
			e_E	01 31 53	30	0.5			
			e_E	01 35 10	21	0.5			
			e_Z	01 35.5					
			e_E	01 39 53	18				
			e_E	01 42 02	18	0.5			
			e_Z	01 42.5					
			e_E	01 45 09	16				
			F	01 50					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
12	June 12	Iv	eP_{NZ}	09 51 47					
			e_E	09 51 48					
			e_N	09 52 00					
			eS_Z	09 52 29					
			e_{EN}	09 52 30					
			e_Z	09 52 44					
			$e\overline{S}_{EN}$	09 52 47					
			eM_N	09 53 10					
			eM_E	09 53 12					
			eM_Z	09 53 13					
			F	09 57.5					
13	June 13	I	e_N	01 09 52	16				U. S. C. & G. S. Epicenter at 52° N 172° W
			e_N	01 11 46	12				Surface waves
			e_E	01 11 56					
			e_E	01 13 20	10				
			F	01 25.6					
14	June 23	I	e_E	00 56 13.5					U. S. C. & G. S. Epicenter at 41° N 4° E
			e_N	00 59 13.5	20				
			e_N	00 59 21.5	20				
			F	01 19.8±					
15	June 30	I	e_E	23 16.5	9				Surface waves
			e_N	23 16 26	10				
			F	23 59					
16	July 1	Iu	eP_N	01 13 26					U. S. C. & G. S. Epicenter at 52° N 137° W.
			e_{EN}	01 16 20					
			eL_N	01 17 56	11				
			eM_N	01 18 10	10				
			e_N	01 18 52	10				
			F	01 31					
17	July 2	Iu	eP_{EN}	21 22 41		−	−		
			e_E	21 28 17					
			eS_E	21 32 09	5?				
			e_N	21 32 17					
			e_E	21 32 37					
			e_E	21 41 09	16				
			e_E	21 51.8	32?				
			e_N	21 56.2	18				
			e_E	22 04.9	20				
			F	22 34±					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
18	July 13	Ir	eP_E	01 02 30		−			Felt in Montana.
			e_N	01 02 31			+		
			eS_{EN}	01 04 58					
			i_{EN}	01 05 22					
			iL_N	01 06.4					
			iL_E	01 06.5					
			F	01 13±					
19	July 14	IIr	eP_{EN}	22 48 12		+	+		Felt in Guatamala
			e_E	22 49 18					
			e_N	22 49 20					
			eS_E	22 53 33					
			e_N	22 53 36					
			e_N	22 54.5					
			eSR_{2E}	22 56 14					
			eL_N	22 57 14					
			e_E	22 58 30					
			eM_N	22 59 32	20				Very large amplitude.
			eM_E	22 59 36	18				Very large amplitude.
			e_Z	23 01 56	24				
			F	23 46±					
20	July 25	I	e_E	21 39.4	14				Fairly large ampli-
			e_N	21 39.7	15?				Surface waves. [tude.
			F	21 57±					
21	July 27	I	e_N	19 16.0					U. S. C. & G. S.
			e_E	19 16.1					Epicenter at 12° N
			e_N	19 21.9	10?				91° W.
			e_E	19 22.1	12?				Surface waves.
			F	19 32±					
22	Aug. 4	II	e_E	05 14 27		+			
			e_N	05 14 31			−		
			e_N	05 22 35					
			e_E	05 22 39	4				
			F	05 28					
23	Aug. 5	II	i_E	00 12 16	1.5				
			i_N	00 12 17					
			i_N	00 12 27	2				
			i_E	00 12 51	8				
			i_N	00 13 08					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
23	Aug. 5 (contd.)	II	e_N	00 13 49	8				
			i_E	00 14 11	9				
			e_N	00 14 51					
			e_E	00 15 28	13				
			e_N	00 15 43	9				
			e_N	00 16 46					
			e_N	00 17 36	6				
			e_N	00 18 19					
			e_E	00 18 54					
			e_E	00 20 02	7				
			e_N	00 21 24	7				
			F	00 25.5					
24	Aug. 28	Id	e_E	05 16 48.5	1.0				R — F 4 at Soledad,
			e_E	05 16 56.5	0.8				Calif.
			e_E	05 17 05					
			F	05 17 52					
25	Aug. 31		eP_E	00 41 50					Felt throughout Los
			e_E	00 41 57.5	0.5				Angeles, Ventura,
			e_N	00 41 57.5					and Orange Coun-
			e_{EN}	00 42 04.5	1.8				ties.
			e_E	00 42 40.5	4				R — F. 8 at Santa
			e_E	00 43 26.5	4				Monica
			F	00 54					
26	Sept. 17	IIr	iP_E	03 17 44†	4.5	1			
			i_N	03 17 44†	5		1.5		
			i_N	03 18 12†	4		1		
			i_E	03 18 22†					
			i_N	03 18 23†	4.5		1.5		
			i_E	03 20 22†	10	1.5			
			i_N	03 20 24†	6		1.5		
			iS_N	03 22 11†	9		4		
			i_N	03 22 13†	10.5		6		
			i_E	03 22 27†	10	2.5			
			e_N	03 24 51†	6.5		6		
			e_E	03 27 09†	7	2			
			e_N	03 27 10†	8		6		
			e_N	03 32 40†	8		3		
			F	03 42 47†					

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
27	Sept. 22	I	e_E	00 00 30					
			e_E	00 01 01†					
			e_E	00 01 05	20				
			e_E	00 03 05	14				
			e_E	00 05 14	30				
			e_E	00 06 43†	10	1.5			
			e_E	00 09.5	20				
			e_E	00 11 05†	4.5	1.5			
			F	00 21 †					
28	Sept. 22	Iu	iP_E	01 44 38.5†	4	+2.2			
			i_E	01 46 40†	6.5	1.5			
			e_E	01 55 03	13				
			eS_E	01 55 09†	8	2.5			
			e_N	01 55 09					
			e_E	01 58 37	9				
			e_E	02 09 42†	12	1.5			
			e_E	02 09 48	12				
			e_N	02 11 04					
			e_E	02 15 01†	9	3			
			e_E	02 15 54	10				
			e_N	02 16 31	9				
			e_E	02 17 10†	9	3			
			M_{NE}	02 18 44†	9	4.5			Surface waves.
			e_N	02 20 39	18				
			e_E	02 21 32	18				
			e_N	02 23 25	8				
			e_E	02 27 45	18				
			e_N	02 32 26	16				
			F	03 07.5					
29	Sept. 23	Iv	eP_Z	02 57 46†	4.7				May be microseisms
			e_N	02 57 47†	7		1.5		or P wave.
			e_{EN}	02 58 02		+	+		
			e_E	02 58 14					See page 476 for dis-
			e_N	02 58 15					cussion.
			i_E	02 58 16†					
			i_Z	02 58 33†	4.0			5	
			e_E	02 58 36					
			e_N	02 58 36					
			e_E	02 58 49					
			i_E	02 58 49†	4.5	4.7			

BERKELEY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
30	Sept. 23		i_N	02 58 49†	5	4.2			
	(contd.)		e_N	02 58 50					
			i_{EN}	02 59 13					
			i_E	02 59 19†	5.1	7.3			
			i_Z	02 59 20†	4.5			3.8	
			i_N	02 59 21†	8		16		
			i_Z	02 59 29†	5.2			8.5	
			F	03 4.5±					
30	Sept. 24	I	e_Z	12 58± †					Surface waves.
			e_E	13 01± †					Microseisms super-
			e_Z	13 02± †	20±			0.5	posed.
			e_E	13 03± †	20	0.2±			
			F	13 07± †					
31	Sept. 25	I	e_N	04 44.5†	10		3.3		
			e_Z	04 45.2†					
			e_E	04 46.0†					
			e_Z	04 46.4†	8			1.3	
			e_N	04 48.0†	8		2.4		
			F	04 56±					
32	Sept. 25	I	e_N	18 44 57†	8				
			e_N	18 47 19†	10		1.8		
			e_N	18 51 51†	9		4.3		
			e_E	18 52 06†	8	0.6			
			i_Z	18 53 09†	10			2	
			e_N	18 53 29†	10		4.0		
			e_N	18 53 29†	10		4.0		
			e_N	19 01.9±†	15		3.0		Shorter period super-
			i_Z	19 01.9†	14			1	posed.
			e_N	19 16.4±†	15		3.3		
			e_Z	19 16.4±†	16			1.5	
			F	19 34±†					
33	Sept. 30	I	e_Z	22 04.4†	24				Surface waves.
			e_E	22 04.5†	20				
			eL_Z	22 06.4†	20			3.2	
			eL_E	22 07.6†	20	1.8			
			eM_E	22 17.3†	18				
			eM_Z	22 18.1†	18			2.0	
			F	22 38†					

THE LICK OBSERVATORY STATION

CONSTANTS

Constants of the Station

Latitude and longitude of the center of the seismographic room:

$\varphi = 37° 20' 24\overset{s}{.}5$ 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	e
1929					
October	Wiechert	E	90	6	5
	160 Kg. H.	N	90	6	5
	80 Kg. Vertical	Z	56	3	7
October	Anderson-Wood	E	3000	1	aperiodic
	Torsion	N	3000	1	"

In the following, the times measured from seismograms written by the Wiechert instruments are marked by an *.

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
1	April 2	Id	iP_E	07 11 53	0.5	+			
			iP_N	07 11 53			−		
			iS_E	07 11 56	0.5	+2.5			
			i_N	07 11 57.5			1.7		
			F	07 12 44.5					
2	April 4	Id	iP_E	20 49 09.5	0.8	−			
			iP_N	20 49 09.5	0.5		−		
			iS_E	20 49 20.5	0.6	−			
			iS_N	20 49 20.5			−		
			F	20 50					
3	April 4	Id	iP_E	22 07 46	0.8	+			
			eS_N	22 07 52					NS record blurred.
			iS_E	22 07 52.5		−			
			e_E	22 07 52.5					
			F	22 08 27.5					
4	April 5	Id	iP_N	19 44 02.5			2.5		
			iP_E	19 44 03		+2.5			
			iS_E	19 44 04.5	0.6	14			
			iS_N	19 44 05			9.5		
			e_E	19 44 08	0.5	1			
			e_N	19 44 08			1		
			F	19 44 12.5					
5	April 6	Iv	eP_N	04 23 02.5	1		1		R — F 5 at Sugar Pine, Calif. Felt also at Big Creek and Laws.
			iP_N	04 23 04*			+		
			eP_E	04 23 04.5					
			eS_E	04 23 32	1	4			
			eS_N	04 23 32	1		2.5		
			iS_N	04 23 32*			+		
			e_{EN}	04 23 44					
			e_N	04 23 54*					
			F	04 26					
6	April 6	Iv	iP_E	04 35 14.5	1	+0.7			
			eP_N	04 35 15					
			e_N	04 35 22*			+		Did not record on E. W. Wiechert.
			eS_N	04 35 43			1.5		
			eS_E	04 35 44.5	1	2			
			iS_N	04 35 45*			+		
			F	04 37 20					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
7	April 9	IIv	iP_E	21 57 25.5	0.7	4.5			See page 473 for discussion.
			iP_N	21 57 26	0.7		5		
			iP_N	21 57 26*			+		
			e_N	21 57 41					
			i_E	21 57 44	0.8	6			
			iS_E	21 57 54	1.2	28			
			eS_N	21 57 55	0.8		22.5		
			iS_N	21 57 56*			−1.5		
			e_E	21 58 57.5	0.6	10.5			
			F	22 04 37.5					
8	April 9	Iv	eP_N	22 14 49.5					
			eP_E	22 14 51.5					
			iS_E	22 15 20					
			eS_N	22 15 21	0.8		0.6		
			F	22 16 32.5					
9	April 12	IIv	eP_E	12 57 21					See page 474 for discussion.
			i_E	12 57 24.5					
			e_N	12 57 27*					
			i_E	12 57 28.5					
			e_N	12 57 33*					
			e_N	12 57 49*					
			iS_E	12 58 03.5	1	12			
			e_N	12 58 09*			−0.6		
			e_E	12 58 57					
			F	13 01 24					
10	April 16	Ir	eP_E	14 33 54.5	1.6	+			
			e_E	14 34 07.5		+			
			eS_E	14 36 32.5	4				
			eL_E	14 38 53.5	8				
			eM_E	14 39 00.5					
			F	14 56					
11	April 29	Iv	eP_E	20 17 47.5					R — F. 5-6 at Redding and Millville, Calif. Reported also at Inskip and Kenneth, R—F. 4.
			e_E	20 17 52					
			eS_E	20 18 24.5					
			e_E	20 18 51.5					
			F	20 19 50					
12	May 4	Id	iP_{EN}	23 43 51.5	0.7				
			iS_N	23 43 53	0.6				
			i_E	23 43 53.5	0.8				
			F	23 45 30					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
13	May 5	IId	iP_E	00 12 49.5	0.3	+0.4			
			i_N	00 12 49.5	0.4		−0.6		
			iS_E	00 12 53.5	0.3	7.6			
			i_N	00 12 53.5	0.4		+7.1		
			i_E	00 12 57.5	0.6	+			
			i_N	00 12 57.5	1.0		+1.7		
			F	00 14 06.5					
14	May 5	Id	iP_E	06 07 18	0.5	+			
			i_N	06 07 18					
			iS_E	06 07 19	0.5	+			
			i_N	06 07 19.5					
			F	06 08					
15	May 6	I	e_N	23 15					
			e_N	23 24		30			Surface waves.
			e_N	23 29		17			U. S. C. & G. S. epicenter in northern Persia.
			F	23 58					
16	May 7	IId	iP_{EN}	13 36 26.5		1.5	1.5		R—F. 4 at Aptos, Capitola, Santa Cruz, Watsonville.
			i_E	13 36 27.5		2.6			
			i_N	13 36 28			7.5		
			iS_E	13 36 32		7.6			
			i_N	13 36 32			7.5		
			e_E	13 36 44.5	0.4				
			e_N	13 36 44.5					
			e_N	13 36 58					
			e_E	13 37 03	1.0				
			F	13 38 21					
17	May 10	I	e_E	22 19 9	15				
			F	22 29.7					
18	May 13	IId							Quake started about $10^h\ 16^m\ 12^s$. Time not recording maximum amplitude of S wave = 15 mm. S—P = 4.5 sec. Duration $1^m\ 40^s$ E W record only. See Berkeley report.

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
19	May 17	Id							Quake started about $9^h\ 50^m$. Time not recording S—P=19 seconds. Duration $1^m\ 10^s$.
20	May 22	I							Quake started about $20^h\ 44^m$. Time not recording Duration $7^m\ 10^s$.
21	May 24	I							Quake started about $4^h\ 22^m\ 19^s$. Time not recording Duration $1^m\ 20^s$.
22	May 25	IId	eP_N	02 43 13					
			e_N	02 43 16					
			iS_N	02 43 21			3.6		
			i_N	02 43 22					
			e_N	02 43 33					
			e_N	02 43 44					
			F	02 45 05					
23	May 28	IId	eP_{EN}	01 17 18*					
			iP_N	01 17 19			+		EW not recording.
			i_N	01 17 20	0.5				
			i_E	01 17 20*					
			i_N	01 17 22					
			iS_N	01 17 30			−15.0		
			i_E	01 17 31*		−			
			e_E	01 17 37*					
			i_N	01 17 37			−11.9		
			e_N	01 17 53					
			e_N	01 18 21	1.2				
			e_N	01 18 52					
			F	01 23					
24	May 28	Id	eP_N	13 11 56					E-W not recording.
			e_N	13 12 12	0.6				
			iS_N	13 12 05	0.8				
			e_N	13 12 07.5	0.7				
			F	13 13					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
25	May 28	Id	iP_N	13 24 20					E-W not recording.
			e_N	13 24 22.5					
			iS_N	13 24 43.5					
			F	13 25 10					
26	May 29	IId	eP_N	05 09 48.5					
			e_E	05 09 49					
			e_N	05 09 50.5					
			e_E	05 09 52					
			e_N	05 09 57.5					
			iS_N	05 10 01	1.2		−		
			i_E	05 10 01	1.0	+			
			i_N	05 10 04	1.0				
			e_N	05 10 07					
			e_E	05 10 24.5					
			e_N	05 10 24.5	1.2				
			e_E	05 10 28					
			F	05 12					
27	May 29	Id	eP_N	05 43 46					
			i_E	05 43 54.5		+			
			iS_N	05 43 55	0.9		+		
			F	05 44 35					
28	May 29	I	eP_N	05 45 52.5	0.7				E-W not recording.
			e_N	05 45 59	1.0				
			F	05 46 13					
29	May 29	I	e_E	07 12 44					Very small amplitude. Probably two quakes overlapping.
			e_N	07 12 44.5	0.8		−		
			e_N	07 12 51	0.8		−		
			e_E	07 12 53	0.7				
			e_E	07 13 26.5					
			e_N	07 13 35			−		
			e_E	07 14 22					
			e_N	07 14 26.5	0.9				
			e_N	07 14 39	0.9				
			e_N	07 14 57	0.8		+		
			F	07 15 38					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A$_E$	Amplitude A$_N$	Amplitude A$_Z$	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
30	May 29	Id	eP$_E$	08 39 56	1.0				
			e$_N$	08 39 56.5					
			e$_N$	08 39 59.5					
			e$_E$	08 40 00.5					
			eS$_E$	08 40 08.5					
			e$_N$	08 40 10					
			F	08 42 18					
31	May 29	Id	eP$_N$	09 09 43.5	0.9		−		
			e$_E$	09 09 44.5					
			eS$_E$	09 09 52					
			F	09 10 18					
32	May 29	Id	eP$_N$	09 18 59.5					
			iS$_{EN}$	09 19 09					
			e$_E$	09 19 16.5					
			e$_N$	09 20 16	1.0				May be beginning of second quake.
			e$_E$	09 20 29					
			F	09 20 50					
33	May 29	Id	ePE$_N$	10 11 03.5					R—F. 2 at Dos Palos, Calif.
			iS$_N$	10 11 16	1.0			1.7	
			i$_E$	10 11 16.5		+			
			i$_E$	10 11 23					
			i$_N$	10 11 23	0.9			1.3	
			F	10 12 38					
34	May 29	Id	eP$_N$	10 21 42					
			e$_E$	10 21 44					
			iS$_N$	10 21 50	1.0			2.5	
			e$_E$	10 21 51					
			i$_N$	10 21 57	0.6			1.9	
			e$_N$	10 22 17	1.2				
			F	10 23 53					
35	May 29	IIId	iP$_E$	13 15 32.5		−4.6			
			i$_N$	13 15 32.5	1.0			+10.6	R—F. 5 at Los Banos, Calif., 4 at Trent Station and S. Dos Palos.
			i$_N$	13 15 33*				+<0.1	
			i$_E$	13 15 34*		<0.1			
			i$_E$	13 15 36*		+0.2			
			i$_N$	13 15 37*				−0.4	
			i$_E$	13 15 38.5		7.2			

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A$_E$	Amplitude A$_N$	Amplitude A$_Z$	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
35	May 29 (contd.)	IIId	iS$_E$	13 15 45		27.5			
			i$_N$	13 15 45			−41.6		
			i$_{EN}$	13 15 46*		−2.0	−2.9		
			i$_{EN}$	13 16 06		12	9.7		
			e$_N$	13 16 10*	1.5				
			e$_E$	13 16 12*	1.0				
			F	13 20 38					
36	May 29	Id	eP$_N$	14 06 08					
			eS$_N$	14 06 14.5					
			F	14 06 26					
37	May 30	IIId	iP$_{EN}$	00 08 28*					
			i$_E$	00 08 28.5		3.5			
			i$_N$	00 08 28.5	0.8		3.6		
			iS$_{EN}$	00 08 32*					
			i$_E$	00 08 32		21.6			
			i$_N$	00 08 32	0.7		17		
			i$_{EN}$	00 08 39		5.1	3.5		
			i$_E$	00 08 42.5					
			F	00 10 08					
38	May 30	Id	eP$_E$	02 08 55.5					
			e$_N$	02 08 57					
			eS$_N$	02 09 07	0.8				
			e$_E$	02 09 08					
			e$_N$	02 09 13					
			e$_E$	02 09 15					
			F	02 09 38					
39	May 30	Id	eP$_N$	06 01 21.5					R—F. 4 at South Dos Palos, Calif.
			e$_N$	06 01 25					
			e$_E$	06 01 25.5					
			eS$_E$	06 01 33.5	0.7	+			
			i$_N$	06 01 34			−		
			i$_N$	06 01 41					
			e$_E$	06 01 41					
			F	06 02 49					
40	May 31	I	eP$_N$	10 24 54	1.2				U. S. C. & G. S. epicenter at 46° N 132° W.
			e$_E$	10 25 02.5					
			e$_N$	10 25 19					
			e$_N$	10 25 39					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
40	May 31 (contd.)	I	e_E	10 27 26.5	8.5				
			e_E	10 29 41.5	8.0				
			e_N	10 29 54.5	8.5				
			e_N	10 31 17					
			e_E	10 32 06.5	8.0				
			e_E	10 34 53.5	7.5				
			F	10 38 35					
41	June 3	Id	eP_E	04 15 56.5					
			e_N	04 15 58.5					
			iS_N	04 16 03.5					
			e_E	04 16 04.5					
			i_N	04 16 07.5					
			i_N	04 16 10.5					
			e_E	04 16 12					
			F	04 16 50					
42	June 3	I	i_N	16 19 28	1.8				
			e_N	16 19 37					
			e_N	16 19 39					
			F	16 21±					
43	June 9	I	eP_N	09 48 53.5					
			e_N	09 49 12.5					
			F	09 51 05					
44	June 11	I	eL_E	01 35.7± *	21				
			eM_E	01 39.2± *	17				
			F	01 50.2*					
45	June 11	I	e_N	14 49 29					
			e_E	14 49 29.5					
			e_N	14 49 32					
			e_E	14 49 37.5					
			F	14 50 06					
46	June 12	I	eP_E	09 50 56*					
			e_{EN}	09 51 39					
			e_E	09 51 50.5					
			iS_E	09 51 53*	3	—			
			e_N	09 51 53					
			eL_E	09 52 29*	9				Shorter period superposed.
			F	09 57 50					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
47	June 13	I	e_E	01 11.8*					J. S. A. epicenter at 52° N 172° W.
			e_E	01 13.7*	9				
			e_E	01 15.6	19				
			F	01 28±					
48	June 16	Id	eP_N	21 04 37					No time marks on E-W.
			iS_N	21 04 41					
			e_N	21 04 59					
			e_N	21 05 05.5					
			F	21 05 45.5					
49	June 18	Id	eP_N	15 51 29					
			eS_N	15 51 33.5	1.5		+		
			e_N	15 51 52.5					
			e_N	15 52 19.5	1.5				
			F	15 53 08					
50	June 21	Id	eP_N	05 11 48.5					May begin earlier.
			eS_N	05 12 05	0 7				
			e_N	05 12 37.5					
			F	05 13 55					
51	June 24	Id	iP_N	11 30 23.5	0.6		−		
			i_E	11 30 24					
			iS_N	11 30 31.5	0.5		−		
			i_E	11 30 34					
			F	11 31 57					
52	June 25	II	iP_{EN}	08 58 13.5	0.5		5		
			i_N	08 58 15					
			i_N	08 58 18					
			i_N	08 58 19.5	0.5		2.5		
			e_N	08 58 35.5					
			F	08 59 22					
53	June 25	Iv	eP_E	21 32 41					
			e_N	21 32 41.5					
			eS_E	21 33 19					
			e_N	21 33 19	2				
			F	21 35 07					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
54	June 26	Id	iP_N	01 26 59.5	0.5		−		
			i_E	01 27 00					
			i_N	01 27 04.5	0.4		+		
			i_E	01 27 05.5					
			iS_N	01 27 07.5	0.6		−		
			e_N	01 27 23.5					
			F	01 28 32					
55	June 26	Id	iP_N	12 06 57	0.5		+		
			e_E	12 06 57.5					
			iS_N	12 06 59			−		
			i_E	12 06 59.5					
			F	12 07 17					
56	July 1	I	e_E	01 16 32±					U. S. C. & G. S. epicenter at 52° N 137° W
			e_N	01 16 42±	7				
			e_N	01 17 17	14				
			e_E	01 19 22					
			e_N	01 19 27	10				
			F	01 28 12					
57	July 2	Id	eP_N	02 50 55.5					Single oscillation.
			e_E	02 50 57					First regular waves.
			e_N	02 50 57	0.5				
			eS_E	02 51 06					
			i_N	02 51 06.5	0.6				
			i_N	02 51 12.5	1.0				
			e_N	02 51 15.5	0.8				
			F	02 52 00					
58	July 2	Ir	eP_E	21 22 29*					Assam?
			e_E	21 22 47.5					
			e_N	21 22 48.5					
			e_E	21 22 58*					
			e_N	21 23 02*					
			e_E	21 23 02.5	3				
			i_N	21 23 02.5	2.8		+		
			e_E	21 23 12.5					
			e_{EN}	21 25 22*					
			eS_E	21 25 28.5	4				
			e_N	21 25 28.5	3.5		+		
			e_E	21 32.5	6				

LICK OBSERVATORY STATION

No	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
58	July 2 (contd.)	Ir	e_N	21 32.5	7				
			eL_E	22 05	30				
			e_E	22 05 11±*					
			e_N	22 05 12*	28				
			e_N	22 06.3	20				
			eM_{EN}	22 09.4	20				
			eM_{EN}	22 09.5*	20				
			F	22 25					
59	July 7	II	e_E	13 52 29*	21	0.4			Surface waves. Δ = 35.6°
			e_E	13 54 35*	11	0.5			
			F	14 07 2*					
60	July 11	Id	iP_E	12 02 02					
			e_N	12 02 02					
			eS_N	12 02 05	0.6		2.2		
			i_N	12 02 09	0.4				
			i_N	12 02 12					
			F	12 02 46					
61	July 13	Ir	eP_N	01 02 17					
			e_E	01 02 19	1.0				Felt in Montana.
			e_E	01 02 21	1.1				
			e_N	01 02 21					
			e_E	01 02 30	1.2				
			e_N	01 02 31	1.2				
			e_N	01 04 31					
			eS_E	01 05 27					
			i_N	01 05 30	3.5		−		
			i_E	01 05 41	3.8	−			
			e_N	01 09 14	7				
			e_E	01 09 23	6				
			F	01 15					
62	July 14	Id	iP_E	12 56 37.5					
			i_N	12 56 37.5	0.4		−2		
			iS_N	12 56 39	0.4		+5.5		
			i_E	12 56 41					
			i_N	12 56 41	0.5		−1.5		
			F	12 57 20					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A$_E$	Amplitude A$_N$	Amplitude A$_Z$	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
63	July 14	IIr	eP$_N$	22 47 42	1.5				U.S.C.& G.S. epicenter at 13° N 89° W. Felt in Guatemala City.
			e$_E$	22 47 43	1.5				
			e$_N$	22 52 33	6				
			eS$_E$	22 53 23	12	+			
			e$_N$	22 53 29	12				
			eL$_E$	22 59 31	18.5	2			
			eL$_N$	22 59 46	22		2.5		
			e$_N$	23 00 04*					
			e$_N$	23 00 24*					
			e$_N$	23 01 04*			4.5		
			e$_Z$	23 01 15*	18	6.1 μ			
			e$_E$	23 03 00	15	5.5			Δ = 36.3° Az = 315°
			e$_N$	23 04 30*					
			eM$_N$	23 04 31	12.5		1		
			e$_E$	23 05 51	14.5	2			
			e$_Z$	23 06 00*	15				
			F	23 48					
64	July 15	I	eP$_E$	23 47 07					
			e$_E$	23 47 14.5					
			F	23 47 45					
65	July 15	Id	eP$_E$	23 47 55.5					
			eS$_E$	23 48 01					
			e$_N$	23 48 04					
			e$_E$	23 48 07					
			e$_E$	23 48 15.5					
			e$_N$	23 48 19.5					
			F	23 49 18					
66	July 21	IId	iP$_E$	07 26 13	0.6	+2.3			R—F. 2 at Spreckles, Calif.
			i$_N$	07 26 13	0.5		−3.2		
			i$_N$	07 26 14*					
			i$_N$	07 26 15	0.6		−2.1		
			i$_N$	07 26 21	0.6		−1.6		
			iS$_E$	07 26 22		+5.5			
			i$_N$	07 26 22	0.8		+7.0		
			i$_N$	07 26 22*					
			i$_N$	07 26 29	0.4				
			F	07 28 43					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude A$_E$	Amplitude A$_N$	Amplitude A$_Z$	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
67	July 22	Id	eP$_N$	05 46 08					
			i$_E$	05 46 08.5					
			iS$_N$	05 46 19					
			i$_E$	05 46 19.5	0.8				
			F	05 47 17.5					
68	July 22	I	eP$_{EN}$	19 36 24					Italy?
			e$_N$	19 36 26.5	0.5				
			e$_N$	19 36 29	1.1				
			e$_E$	19 36 30					
			e$_E$	19 36 36					
			e$_E$	19 36 51.5		1.0			
			e$_N$	19 36 58					
			e$_E$	19 36 59					
			e$_N$	19 37 00.5					
			e$_N$	19 37 05					
			F	19 39 37					
69	July 25	I	e$_E$	21 39 15.5					
			e$_N$	21 39 21.5					
			e$_E$	21 39 22.5					
			e$_E$	21 39 35.5					
			e$_E$	21 39 44.5					
			e$_N$	21 39 49.5					
			e$_N$	21 39 59.5					
			e$_N$	21 40 03*	16				
			e$_N$	21 40 28.5					
			e$_E$	21 42 33.5	12				
			e$_E$	21 42 01.5					
			e$_N$	21 42 21.5	11				
			i$_N$	21 42 25*	9				
			F	21 48					
70	July 29	I	eP$_E$	06 31 30.5		−			
			e$_N$	06 31 31.5			−		
			e$_E$	06 31 43					
			F	06 32					
71	Aug. 3	Id	iP$_{EN}$	21 24 10.5			−		
			iS$_E$	21 24 11					
			i$_N$	21 24 11.5	0.4		−		
			i$_N$	21 24 12					
			F	21 24 21					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
72	Aug. 4	II	e_N	05 14 26.5	1.0		−		
			e_E	05 14 27.5					
			e_{EN}	05 14 28.5					
			i_N	05 14 29.5	0.8		+		
			e_E	05 14 30					
			e_E	05 14 36.5					
			e_N	05 14 40					
			e_E	05 14 47.5	0.6				
			e_N	05 15 08.5	1.2				
			e_N	05 22 30.5	2.5				
			e_E	05 22 32.5					
			F	05 23 50±					
73	Aug. 7	I	e_N	04 45 21.5					
			e_N	04 45 27.5	0.7				
			e_E	04 45 34.5					
			e_E	04 45 42.5					
			e_N	04 45 46.5	0.6				
			e_E	04 46 05.5					
			e_N	04 46 06.5	0.5				
			e_E	04 46 12.5					
			e_N	04 46 35.5	1.1				
			F	04 47 45					
74	Aug. 7	Id	eP_E	10 42 16.5					
			i_N	10 42 16.5	0.4		−		
			i_N	10 42 18.5		−			
			e_E	10 42 19.5					
			iS_E	10 42 25.5	0.6				
			e_N	10 42 26					
			e_E	10 42 27					
			e_N	10 42 27.5	0.7				
			e_E	10 42 31.5					
			F	10 43 25					
75	Aug. 8	IId	iP_E	07 40 34.5	1.0	−			
			i_N	07 40 35	0.7		−		
			i_N	07 40 37					
			i_E	07 40 38					
			i_{EN}	07 40 39					
			iS_E	07 40 46		−6.5			
			i_N	07 40 46	0.4		+		

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
75	Aug. 8 (contd.)	IId	i_N	07 40 47.5			5.5		
			i_E	07 40 55					
			i_E	07 41 10.5					
			F	07 43 04					
76	Aug. 10	Id	iP_{EN}	03 47 13			−		
			e_E	03 47 14					
			i_N	03 47 14.5	0.6				
			e_E	03 47 17.5					
			iS_N	03 47 18	0.5				
			e_E	03 47 20					
			i_N	03 47 20.5	0.6				
			e_E	03 47 26.5					
			F	03 48 13					
77	Aug. 11	Iv	eP_E	13 01 02	0.7				
			i_N	13 01 03	0.6		−0.5		
			i_N	13 01 19	0.7		+0.7		
			i_N	13 01 27.5	0.8		0.7		
			eS_E	13 01 49.5	0.4	1.2	+1.5		
			i_N	13 01 49.5	1				
			e_N	13 01 54.5	0.5		1.7		
			e_E	13 01 56.5	0.5		0.4		
			F	13 03 28					
78	Aug. 11	I	e_N	19 51 19	1				
			e_N	19 51 26					
			e_E	19 51 27.5					
			e_N	19 51 31					
			e_N	19 51 43	0.7				
			e_N	19 52 00					
			e_E	19 52 02.5	0.8				
			i_N	19 52 04					
			i_N	19 52 05					
			e_E	19 52 06.5					
			e_E	19 52 19.5					
			e_N	19 52 20					
			e_N	19 52 27.5					
			F	19 53 08					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
79	Aug. 11	Iv	eP_E	20 20 28					
			e_N	20 20 29					
			e_N	20 20 36					
			e_E	20 20 40.5					
			e_N	20 20 41					
			e_N	20 20 44					
			i_N	20 20 53					
			iS_N	20 21 11	0.8				
			i_E	20 21 13.5	1.0				
			i_N	20 21 13.5					
			e_N	20 21 16	0.6				
			e_E	20 21 17					
			F	20 22 08					
80	Aug. 11	Iv	eP_N	20 54 31					Very small amplitude.
			e_N	20 54 42					
			e_E	20 54 48.5					
			iS_N	20 55 19	0.7				
			e_E	20 55 22					
			F	20 56 33					
81	Aug. 17	I	e_E	18 13 52					
			e_N	18 13 52.5					
			i_E	18 13 53.5		1.7			
			e_N	18 13 53.5					
			i_N	18 13 54	0.4		−2.2		
			e_E	18 13 54.5					
			i_N	18 13 54.5	0.3		−0.6		
			e_E	18 13 56					
			F	18 14 06					
82	Aug. 18	Iv	eP_E	13 09 57					
			eS_E	13 10 37.5					
			F	13 11 58.5					
83	Aug. 19	IId	iP_N	09 43 29.5			2.4		
			i_E	09 43 30		2.9			
			iS_N	09 43 30.5	0.3		17		
			i_E	09 43 31		7.2			
			i_E	09 43 34					
			e_N	09 43 36					
			i_N	09 43 41	0.4				
			i_N	09 43 44.5	0.5				
			F	09 44 18					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
84	Aug. 25	Id	iP_N	00 05 53			+		
			e_E	00 05 53.5					
			eS_E	00 06 13.5					
			e_N	00 06 15.5					
			F	00 07 22					
85	Aug. 28	IId	eP_{EN}	05 15 25					R—F. 4 at Soledad, Calif.
			e_{EN}	05 16 29.5					
			e_E	05 16 33.5					
			e_N	05 16 34.5					
			e_N	05 16 41					
			eS_N	05 16 42					
			i_E	05 16 42.5					
			e_N	05 16 45					
			e_E	05 16 47					
			F	05 18 16					
86	Aug. 28	IId	eP_N	05 49 10.5					
			e_E	05 49 11					
			eS_E	05 49 21					
			i_N	05 49 21.5					
			i_N	05 49 22.5					
			i_E	05 49 27.5					
			e_E	05 49 46.5					
			F	05 50 21					
87	Aug. 29	Id	eP_E	08 35 56.5					
			e_N	08 35 58.5			1.5		
			e_E	08 36 02.5					
			eS_N	08 36 10.5	1				
			F	08 37 25					
88	Aug. 30	Id	eP_E	12 14 39		0.7	+		
			e_N	12 14 39		0.5		−	
			iS_E	12 14 42					
			i_N	12 14 42		0.3		+	
			i_E	12 14 43.5		0.4			
			e_N	12 14 47					
			e_E	12 14 48					
			F	12 15 10					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
89	Aug. 31		eP_E	00 41 40					Blur only.
			e_N	00 41 40	1		−0.1		See Berkeley report.
			i_E	00 41 42					
			i_N	00 41 42			0.5		
			iS_N	00 41 48			0.5		
			i_N	00 42 00			1		
			i_E	00 42 35.5					
			F	00 57.5					
90	Sept. 2	Iv	e_N	13 35 49					R—F. 4 at Halcyon, Calif. Felt also at South San Luis Obispo
			eP_N	13 35 52					
			e_E	13 35 53					
			e_E	13 35 56					
			e_N	13 36 01.5					
			e_N	13 36 07					
			e_N	13 36 10					
			e_E	13 36 22					
			eS_N	13 36 24					
			e_E	13 36 24.5	0.8				
			e_N	13 36 30.5					
			F	13 37 09					
91	Sept. 5	IId	iP_E	23 19 09					
			i_N	23 19 09	0.4		−2.1		
			iS_E	23 19 10.5					
			i_N	23 19 10.5	0.6		+2.2		
			e_E	23 19 11					
			e_N	23 19 14.5	0.5				
			i_N	23 19 20					
			e_E	23 19 20.5					
			F	23 19 36					
92	Sept. 11	Id	eP_N	01 49 01					Blur only.
			e_E	01 49 01.5					
			iS_E	01 49 02.5		+			
			i_N	01 49 02.5	0.6		−		
			F	01 53 11					
93	Sept. 18	IId	eP_N	02 51 34.5					
			eS_E	02 51 35.5		−			
			i_N	02 51 35.5	0.3		−2.8		
			e_E	02 51 37					

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude			Remarks
						A_E	A_N	A_Z	
	1930			h. m. s.	s.	mm.	mm.	mm.	
93	Sept. 18 (contd.)	IId	e_N	02 51 38.5					
			e_N	02 51 59			−0.1		
			F	02 52 00					
94	Sept. 18	I	i_E	02 55 37		+			
			i_N	02 55 37	0.3		−0.6		
			F	02 55 39					
95	Sept. 19	IId	iP_E	18 03 04.5					
			e_N	18 03 05	0.8		1.6		
			i_N	18 03 06	0.6		+11.5		
			iS_N	18 03 07.5			−9.4		
			i_N	18 03 10					
			e_E	18 03 12					
			i_N	18 03 16.5	0.6		0.6		
			e_E	18 03 17					
			e_E	18 03 19.5					
			e_N	18 03 23.5					
			F	18 03 57					
96	Sept. 22	IIu	eP_{EN}	01 44 23					
			eS_E	01 52.3±					
			e_N	01 55.5±	5				
			eL_N	02 12.9±	5				
			e_E	02 13 06*	8				
			e_E	02 13.2±					
			i_E	02 16 26*	9				
			e_E	02 19 36*	15				
			e_E	02 23 29*					
			e_E	02 25 26*					
			eM_E	02 25 35*	16				
			e_E	02 29.4±					
			e_N	02 32.8	15				
			M_{NE}	02 35 41*					
			F	02 44±					
97	Sept. 23	Iv	iP_E	02 57 56		+			See page 476 for discussion.
			i_N	02 57 56	0.5				
			e_N	02 58 38					
			e_E	02 58 40.5	0.7				
			eS_E	02 58 42.5	0.9				
			e_N	02 58 43	0.6				

LICK OBSERVATORY STATION

No.	Date	Character	Phase	Time G. M. C. T.	Period	Amplitude AE	Amplitude AN	Amplitude AZ	Remarks
	1930			h. m. s.	s.	mm.	mm.	mm.	
97	Sept. 23 (contd.)	Iv	e_N	02 58 59.5					
			e_E	02 59 02					
			e_E	02 59 46.5					
			e_E	03 00 01.5	2.0				
			e_N	03 00 02	1.3				
			e_E	03 01 14					
			e_N	03 01 46.5	3				
			F	03 05 11					
98	Sept. 24	IId	iP_E	15 16 31					
			i_N	15 16 31	0.2		−0.7		
			iS_E	15 16 32					
			i_N	15 16 32.5	0.4		12.9		
			i_N	15 16 33.5					
			e_N	15 16 36	0.4				
			e_E	15 16 36.5					
			e_E	15 16 39.5					
			e_N	15 16 42	0.4				
			F	15 17 26					
99	Sept. 26	Iv	eP_N	09 10 52					R—F. 4 at Portola, Calif.
			e_E	09 10 54.5					
			e_N	09 10 54.5	0.7				
			e_E	09 11 10	0.6				
			e_N	09 11 13.5	0.7				
			eS_N	09 11 27.5	0.7				
			e_E	09 11 29.5					
			e_N	09 11 38					
			e_E	09 11 43	0.5				
			F	09 13					

THE EARTHQUAKE OF APRIL 9, 1930

On April 9, 1930 at about 1h 57m P. M., P. S. T., an earthquake shook the region in eastern California and western Nevada centering near Lake Tahoe. The intensity was greatest at Tahoe (California), Glenbrook (Nevada) and a few miles west of Minden (Nevada), according to reports. In these localities cracks were caused in masonry walls and plaster, justifying an intensity rating of VII–VIII Rossi-Forel.

As is the case for many of the earthquakes originating near or in the Sierras the region in which this shock was felt was roughly triangular in shape. The vertex was near Oakdale, California and the base reached from Yerington, Nevada, to Twain, California.

The intensity of this earthquake on the Rossi-Forel scale was estimated as given below for various points on the basis of reports:

VII–VIII. Angels Camp, California; 5 miles west of Minden, Nevada; Glenbrook, California; Tahoe, California.

V–VI. Carson City, Nevada; Genoa, Nevada; Minden, Nevada; Stanislaus, California; Weimar, California.

IV. Al Tahoe, California; Camino, California; Cisco, California; Clements, California; Colgate Power House, California; Davis, California; Dayton, California; Dobbins, California; Forest, California; Gardnerville, Nevada; Georgetown, California; Iowa Hill, California; Jackson, California; Log Cabin, California; Ludwig, Nevada; Milton, California; North Bloomfield, California; Omo Ranch, California; Pike, California; Rail Road Flat, California; Spring Garden, California; Stewart, Nevada; Stockton, California; Strawberry Valley, California; Tahoe Pines, California; Truckee, California; Valley Springs, California; Vya, Nevada; Verdi, Nevada; Yerington, Nevada.

III. Cromberg, California; Douglas Flat, California; Fernley, Nevada; Floriston, California; Forest Hill, California; Isleton, California; Rocklin, California; Shingle, California; Smith, Nevada; Steamboat, Nevada; Susanville, California; Twain, California.

I–II. Jamestown, California; Lodi, California; Mason, Nevada; Oakdale, California; Oroville, California; Reno, Nevada.

The earthquake was reported not felt at: Bridgeport, California; Clarksburg, California; El Portal, California; Fern, California; Gerlach, Nevada; Gridley, California; Hawthorne, Nevada; Hazen, Nevada; Jonesville, California; Knights Landing, California; Las Plumas, California; Lathrop, California; Linden, California; Live Oak, California; Modesto, California; Mono Lake, California; Mound House, Nevada; Nicolaus, California; Nixon, Nevada; Pyramid, Nevada; Quincey, California; Rand, Nevada; Rawhide, Nevada; Schurz, Nevada; Simpson, Nevada; Smartville, California; Storrie, California; Sweetwater, California; Topaz, California; Wabuska, Nevada; Walnut Grove, California; Wellington, Nevada; Wendel, California; Westwood, California; Wichman, Nevada; Winters, California; Woodland, California.

A study of the records of this earthquake made at Berkeley, Lick Observatory, Reno, and Tinemaha leads to the placing of the epicenter in Lake Tahoe. Due to errors it may well be that the epicenter lay on one of the faults which bound the lake.

The epicenter was located by use of the travel time curves drawn by Byerly for the Sierran earthquake of November 28, 1929.

THE EARTHQUAKE OF APRIL 12, 1930

On April 12, 1930, at about 4h 55m A. M., P. S. T., another earthquake shook west-central Nevada and the adjoining portion of California. The center of this earthquake apparently lay to the east of that of the shock of April 9. The greatest intensity was reported from Fallon, Fernley, Gardnerville, and Schurz. At these points furniture was moved, dishes were broken, etc. The reports seem to justify a rating of VII Rossi-Forel scale to the intensity at these points. The earthquake was felt as far north as Unionville and as far south as Luning. It was not felt at Austin. On the west it was felt as far as Beckwith, California, and Fallen Leaf, California. The area in which the shock was felt resembled a trapezoid with the base lying between Unionville and Luning.

The following lists the intensity on the Rossi-Forel scale at various points as based on reports:

VII. Fernley, Fallon, Gardnerville, Schurz.

V–VI. Carson City; Vinton, California; Virginia City.

IV. Boca, California; Camp Richardson, California; Fallen Leaf, California; Glenbrook; Greenville, California; Hobart Mills, California; Lovelock; Loyalton, California; Luning; Mason; Steamboat; Stewart; Stillwater; Tahoe, California; Unionville· Wabuska; Weeks; Yerington.

III. Beckwith, California; Minden; Nixon; Reno; Verdi; Wichman.

I–II. Gold Hill, Hudson, Oceana, Sparks, Tahoe Pines.

The following report the earthquake not felt: Arlemont; Austin; Battle Mountain; Betty O'Neal; Calpine, California; Candelaria; Cortez; Downieville, California; Doyle; Duckwater; Dyer; Gilbert; Hilltop; Imlay; Ione; Lower Rochester; Mill City; Mina; Millet; Mt. Montgomery; Portola, California; Potts; Pyramid; Rand; Red Rock; Round Mountain; Sattley, California; Sierra City, California; Smith; Tonopah; Wellington.

From the seismograms of Berkeley, Lick Observatory, Reno and Tinemaha the epicenter was placed near Hazen, Nevada. In locating this epicenter the travel time curves for the Sierran region found by Byerly for the November 28, 1929 earthquake were used.

THE EARTHQUAKE OF MAY 15, 1930

On May 15, 1930 at about 7h 30m A. M., P. S. T., an earthquake was felt in the region of Cape Mendocino. At Waddington the intensity was about V R.F. At Alton, Dyerville, Ettersburg, Ferndale, Loleta and Shively the intensity was IV R.F. At Briceland, Weott and Whitlow it was about II R.F.

This shock was not recorded at Berkeley or Lick Observatory.

THE EARTHQUAKE OF SEPTEMBER 3, 1930

On September 3, 1930 at about 11h 42m, A. M., P. S. T., an earthquake was reported felt at Big Creek (R.F. 4) and at Bass Lake, California. This shock was not recorded at Berkeley or Lick Observatory.

THE EARTHQUAKE OF SEPTEMBER 22, 1930

On September 22, 1930, at about 6h 57m P. M. an earthquake was felt in Humboldt County, California. At Eureka and Fields' Landing the intensity was sufficient to throw down chimneys, meriting an intensity rating of VIII on the Rossi-Forel scale. The earthquake was felt throughout Humboldt County. The only towns outside the county reporting it were Fort Dick, Sawyers Bar and Denny.

The following lists the intensity, Rossi-Forel scale at towns reporting:

VIII. Eureka, Fields Landing.

VII. Bayview, Crannell, Holmes, Korbel, Samoa.

V–VI. Hydesville, Loleta, Stumpville.

IV. Alton, Arcata, Bayside, Beatrice, Benbow, Bridgeville, Capetown, Cutler, Denny, Dyerville, Falk, Fernbridge, Ferndale, Fieldbrook, Fort Dick, Fortuna, Freshwater, Garberville, Grizzly Bluff, Hoopa, Kneeland, Miranda, Orick, Showers Pass, Shivley, Skelly, Trinidad, Upper Mattole, Waddington, Weott, Whitlow, Yager.

III. Eel Rock, McCann, Orleans, Pepperwood.

I–II. Alder Point, Blocksburg, Briceland, Sawyer's Bar, Weitchpec.

An aftershock of this earthquake on September 23, 1930 at about 6 A. M., P. S. T., was reported from Bridgeville, Ferndale and Trinidad. The shock was light.

UNIVERSITY OF CALIFORNIA PUBLICATIONS—(Continued)

VOLUME 2. 1924–

Records from October 1920–

THE REGISTRATION OF EARTHQUAKES—

AT THE BERKELEY STATION AND THE LICK OBSERVATORY STATION:

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No. 2. From April 1, 1921, to September 30, 1921.
No. 3. From October 1, 1921, to March 31, 1922.
No. 4. From April 1, 1922, to September 30, 1922.
No. 5. From October 1, 1922, to March 31, 1923.
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No. 11. From October 1, 1925, to March 31, 1926.
No. 12. From April 1, 1926, to September 30, 1926.
No. 13. From October 1, 1926, to March 31, 1927.
No. 14. From April 1, 1927, to September 30, 1927.
No. 15. From October 1, 1927, to March 31, 1928.
No. 16. From April 1, 1928, to September 30, 1928.
No. 17. From October 1, 1928, to March 31, 1929.
No. 18. From April 1, 1929, to September 30, 1929.
No. 19. From October 1, 1929, to March 31, 1930.
No. 20. From April 1, 1930, to September 30, 1930.

Issued June 26, 1931