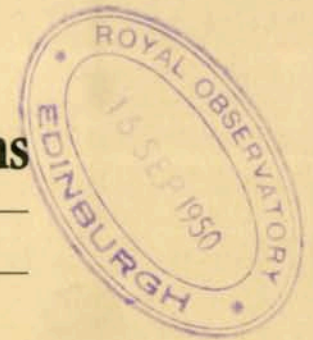


Bulletin of the Seismographic Stations

Volume 13, No. 1, pp. 1-32



EARTHQUAKES IN NORTHERN CALIFORNIA
AND
THE REGISTRATION OF EARTHQUAKES
AT
BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE—FRESNO

From January 1, 1943, to March 31, 1943

BY
CHARLES E. HERRICK
AND
CAROLYN H. PENDERY

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES
1950

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BULLETIN OF THE SEISMOGRAPHIC STATIONS

CALIFORNIA

CAMBRIDGE UNIVERSITY PRESS

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	Page
EARTHQUAKES IN NORTHERN CALIFORNIA	5
THE REGISTRATION OF EARTHQUAKES	8
CAMBRIDGE UNIVERSITY PRESS	
Symbols and Notation	7
LONDON, ENGLAND	
BERKELEY	8
Constants	8
Tabulation of Shocks	9
HONEY HILL	16
Constants	16
Tabulation of Shocks	17
HELO ALTO	20
Constants	20
Tabulation of Shocks	21
SAN FRANCISCO	24
Constants	24
Tabulation of Shocks	25
VERMILION	27
Constants	27
Tabulation of Shocks	28
PRESNO	29
Constants	29
Tabulation of Shocks	30

Issued April 21, 1950

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EARTHQUAKE INTENSITY SCALE

CONTENTS

Intensities are given by Roman numerals in the list of California

	Page
EARTHQUAKES IN NORTHERN CALIFORNIA	5
THE REGISTRATION OF EARTHQUAKES.	6
<u>Intensity</u>	
Symbols and Notations Employed	7
II BERKELEY	8
Constants	8
Tabulation of Shocks	9
IV MOUNT HAMILTON	16
Constants	16
Tabulation of Shocks	17
VII PALO ALTO	20
Constants	20
Tabulation of Shocks	21
SAN FRANCISCO	24
Constants	24
Tabulation of Shocks	25
XI FERNDALE	27
Constants	27
Tabulation of Shocks	28
XIII FRESNO	29
Constants	29
Tabulation of Shocks	30

EARTHQUAKE INTENSITY SCALE

1913 - Pacific Standard Time

Intensities are given by Roman numerals in the list of California

earthquakes on the following page, when sufficient information on the effects of the quake is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

Intensity

- II Felt by a few people only. Duration or direction not appreciable.
- III Duration or direction appreciable.
- IV Rattling of doors and windows; swinging of suspended objects.
- V Disturbance of movable objects; plaster cracked.
- VI Overthrow of movable objects; cracking of chimneys and other brickwork.
- VII Fall of some chimneys; some damage to buildings.

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood-Anderson amplitudes, using the nomogram by Nordquist, "Bulletin of the Seismological Society of America", 32: 164.

Latitude and longitude are given for each epicenter in the following list. Only those earthquakes are given numbers for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

EARTHQUAKES IN NORTHERN CALIFORNIA

1943 - Pacific Standard Time

<u>No.</u>	<u>Date</u>	<u>Time</u>	<u>Richter Magnitude</u>	<u>Latitude North</u>	<u>Longitude West</u>	<u>Quality</u>
1	Jan. 13	17-00-02	3.6	38.6°	119.2°	d
2	Feb. 6	00-47-19	4.3	38° 41'	119° 39'	c
3	27	03-34-23	2.9	36° 45'	121° 00'	c
4	Mar. 10	10-05-22	3.1	37° 22'	121° 27'	b
5	10	17-13-16	3.7	39° 12'	123° 27'	c

IV at Comptche, Potter Valley and Stonyford. II in Ukiah.

6	12	19-11-12	2.9	36° 53'	121° 19'	c
7	19	14-08-40	3.9	38.8°	121.1°	d
8	27	21-52-45	2.8	37° 38'	121° 52'	b

Foreshock of quake following.

9	29	03-45-55	4.2	37° 38'	121° 52'	a
---	----	----------	-----	---------	----------	---

IV in El Granada and Pleasanton.

10	29	16-00-47	4.2	39.3°	119.4'	d
11	30	13-08-28	5.3	39° 26'	120° 24'	c

Felt widely in the Northern Sierra Nevada. V at Blue Canyon, Truckee and Stewart, Nevada. IV at Emigrant Gap, Markleeville, Nevada City and Carson City, Minden and Reno, Nevada. III at Bijou, Colusa, Las Plumas, Sacramento, Soda Springs and Steamboat, Nevada. II at Marysville and Sierra City.

12	30	23-06-09	3.6	37° 41'	121° 51'	b
----	----	----------	-----	---------	----------	---

BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Earthquake--

Note -- All observations are reduced to Universal Time.

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

Latitude -- 81 meters (266 feet) above sea level.

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. Nature of the Motion--

i (impetus)	Sudden beginning of the motion.
e (emersio)	Gradual beginning of the motion.

		K	T	T_1	μ^2	L_1 (cm)	M (cm)
Galitzin	E	112	12	11.8	0.00	115	11.3
	N	122	12	12.4	0.03	119	11.8
	Z	109	12	12.9	0.01	131	12.9
Benioff			V	Coupled Period			ξ
	Z			0.7			5

The letter O before a reading designates that the microgram was from the Galitzin instrument; N, Necker; A, Wood-Courti; S, Wood-Anderson; B, Benioff.

BERKELEY

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Jan. 1	Iv	iPZ iSNZ F	H 22 25 05.8 AH 22 28 16 22 28 21	Pasadena: Northern Owens Valley
2	Jan. 2	Id	iPZ iSZ F	H 06 01 07.3 H 06 02 10 06 02 14	
3	Jan. 2	Id	iPZ F	H 10 45 36.1 A 10 46 40	
4	Jan. 4	Id	iPZ iNZ eSN	H 18 16 48.3 AH 18 18 51 A 18 18 55	
	Jan. 27	Id	F	18 18 55.7	
5	Jan. 10	I	eZ eZ	G 10 01 17 G 10 02 25	
	Jan. 30	Iu	F	G 10 06 35	U.S.C.G.S.: 2°S 80°W
6	Jan. 12	Id	iPZ iSZ F	H 23 35 28.7 H 23 36 30 G 23 36 38	
7	Jan. 14	Iv	ePZ	H 02 00 02.0	See list p. 5
	Feb. 1	Id	eSZ F	H 20 50 33.0 A 02 01 36.9	
8	Jan. 15	Id	iPZ iSNZ F	H 00 43 16.8 AH 00 44 54 AH 00 44 54	
9	Jan. 17	Id	iPZ iSEZ F	H 13 21 25.4 AH 13 23 33.0 H 13 23 37.0	See list, p. 5
10	Jan. 24	IIR	iPZ iPE ePcPNE ePcPZ iSN iSZ iZ eE eN iMN iN F	G 20 48 55 G 20 48 58 G 00 49 24 G 00 49 28 G 00 54 37.5 G 00 54 39.5 G 00 54 42 G 00 59.7 G 21 00.5 G 21 01 18 G 21 02 46 AH 21 14 51	U.S.C.G.S.: 15°N 91°W Aftershock

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
11	Jan. 27	Iir	ePZ eSNZ eE iE eNE iScSNE eScSNE eLE eLZ eLE eLN iNE F	G 02 52 43 G 59 03 G 21 G 29 G 03 02 29 G 55 A 56 G 04.2 G 04.8 A 06.4 A 06.5 G 09.1 05 00	U.S.C.G.S.: 52°N 180°W
	Feb. 17	I			
	Feb. 18	Id			
12	Jan. 27	Id	iPZ iSZ F	H 22 01 05.7 H 11.8 22 02	
13	Jan. 30	Iu	iPNZ eZ iSNE eNZ iE F	G 05 42 35 G 45 56 G 50 21 G 59.6 G 06 03 38 06 20	U.S.C.G.S.: 2°S 80°W
	Feb. 21	Id			
	Feb. 22	IIIr			
14	Feb. 1	Id	iPZ iSNE F	H 20 50 36.0 A 36.9 20 51	
15	Feb. 3	Id	iPZ iSEZ F	H 23 26 52.9 AH 54 23 27	
	Feb. 25	Id			
16	Feb. 6	Iv	iPZ iZ iSNEZ F	H 08 47 55.0 H 57.0 AH 48 24.5 08 49	See list, p. 5
	Feb. 27	Iv			See list, p. 5
17	Feb. 6	Iv	iPZ iZ iSN iSEZ F	H 08 52 49 H 51 A 53 17.5 AH 18.5 08 54	Aftershock 36.5°N 104.5°W M = 2.3
18	Feb. 15	Id	iPZ F	H 11 47 50.5 11 48	
19	Feb. 16	Iu	ePNEZ iPNEZ eSNE eSNE F	AH 07 39 41 G 42 A 48 48 G 49 08 22	J.S.A.: 15.2°S 68.5°W

BERKELEY

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
1943					
h. m. s.					
20	Feb. 16 (cont.)	Iu	iPZ eE eZ F	G 14 51 48 G 15 17.5 G 18.6 16 00	Pasadena: 11°S 164°E
21	Feb. 17	I	eNEZ eNZ eMNEZ F	G 03 03.3 G 08.1 G 16.0 03 45	
22	Feb. 18	Id	iPZ iSEZ F	H 19 21 05.9 AH 07 19 22	U.S.C.G.S.: 57°N 164°E
23	Feb. 20	Id	iPZ iSEZ F	H 00 39 33.8 AH 36.1 00 40	
24	Feb. 21	Id	iPZ F	H 12 35 07.6 12 36	
25	Feb. 21	Id	iPZ F	H 12 50 45.6 12 51	
26	Feb. 22	IIIr	iPZ iPE iPN F	G 09 26 19 G 21 G 22 12 30	U.S.C.G.S.: 56°S 22°W
27	Feb. 24	Id	iPZ F	H 17 06 20 17 07	
28	Feb. 25	Id	iPZ F	11 45 40.6 11 46	Aftershock
29	Feb. 27	Iv	ePZ F	H 11 34 52.5 11 36	See list, p. 5
30	Feb. 28	Iu	eN eZ eE eN F	G 13 12 39 H 40 G 43 G 18 36 14 14	Pasadena: 36.5°N 70.5°E See list, h = 210 km
31	Mar. 2	Id	iPZ iSNZ F	H 22 06 46.7 AH 48.0 22 07	
32	Mar. 5	IIu	iPNEZ eZ eE eN eSN	AHG 00 40 29 G 42 07 G 28 G 34 A 47 21	U.S.C.G.S.: 5.8°N 82.8°W

BERKELEY

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
32	Mar. 5 (cont.)	IIu	eSE	A 00 47 29	See list, p. 5
			iSNEZ	G 00 47 33	
			iE	G 00 51 18	
			eN	G 00 52.2	
			iE	G 00 52 56	
			eLE	A 00 55.2	
			eLN	A 00 55.7	
			iME	G 00 56 22	
			eNZ	G 00 56.8	
			iN	G 01 02.2	
F	02 00	into following shock			
33	Mar. 7	IIu	ePNEZ	AH 03 10 32	U.S.C.G.S.: 57°N 164°E J.S.C.S.: 13.5°S 68.3°W h = 120 km
			iPNEZ	G 03 10 34	
			eZ	H 03 11 55	
			eSN	A 03 16 39	
			eSE	A 03 16 46	
			eSN	G 03 17 41	
			eSE	G 03 20 45	
			eSZ	G 03 20 50	
			eLZ	G 03 21 25.7	
			eLE	G 03 26.1	
			eZ	G 03 33 24	
			F	05 25	
			34	Mar. 8	
F	09 50				
35	Mar. 9	IIu	ePPNEZ	G 10 09 40	U.S.C.G.S.: 56°S 22°W
			eN	G 10 28 29	
			F	13 45	
36	Mar. 10	Iu	ePPNEZ	G 09 36 05	Aftershock
			F	10 30	
37	Mar. 10	Iv	iPNZ	AH 18 05 39.1	See list, p. 5
			iSNE	A 18 52.4	
			F	18 07	
38	Mar. 11	IIv	iPEZ	AH 01 13 43.5	See list, p. 5
			ePZ	G 01 06 44	
			iNE	A 01 06 49	
			eNE	G 01 06 49	
			iSNE	G 01 14 05	
			eSE	A 01 11 10	
			eSN	A 01 11 12	
			F	01 22	
39	Mar. 11	Iu	ePZ	G 09 47 05	Wellington: 22°S 171°E
			eNE	G 09 57.4	
			eLE	G 10 10.2	
			eLN	G 10 10.6	
			F	11 00	

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
40	Mar. 13	Iv	iPZ iSZ F	H 03 11 35.2 H 03 13 52.3 03 13	See list, p. 5
41	Mar. 14	IIu	ePE iZ iN iE iMN iME F	G 17 23 51 G 31 49 G 05 34 30 G 35 43 G 53.1 G 58.3 G 00 27.6	U.S.C.G.S.: 22°S 170°E Wellington: 16.5°S 175°E
42	Mar. 14	Iu	iPZ iZ iZ eN iE eZ F	H 18 49 38.1 G 20 37 39 H 50 06 G 21 58 46 G 59 10 G 19 01 15 G 20 10 15	U.S.C.G.S.: 21°S 71°W J.S.A.: 13.5°S 68.3°W h = 120 km
43	Mar. 14	Id	iPZ iSZ F	H 21 49 29.0 H 23 30 32 21 50	U.S.C.G.S.: 6°S 116°E
44	Mar. 15	Iu	iPNZ ePZ eSN eZ eN eINE iNE iMN F	G 02 37 18 H 18 18 05 G 17 47 59 G 18 49 10 G 18 53.2 G 03 04.8 G 12.1 G 05 13.1 A 04 00 59.7	Passagens South Atlantic U.S.C.G.S.: 21°S 169°E Wellington: 23°S 176.5°W h = 100 km
45	Mar. 15	Iu	iPZ eZ ePZ iSNE eLE eLN F	H 05 00 54.8 H 11 01 23.8 G 31 G 11 44.3 G 24.8 G 25.1 06 20	U.S.C.G.S.: 10°N 142°E See list, p. 5 17 Foreshocks and 20 aftershocks recorded
46	Mar. 15	IIu	iPNEZ iPZ epPNEZ ipPZ iEZ iSNEZ eSNE F	G 23 10 16 H 16.3 AH 00 11 25 G 25 G 21 13 00 G 19 17 A 20 A 00 20	U.S.C.G.S.: 14°S 174°W h = 300 km
47	Mar. 16	Id	iPZ iSZ F	H 04 00 29 H 37 04 01	See list, p. 5

BERKELEY

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
48	Mar. 16	Iu	iPZ F	H 04 34 03.2 04 35	Tonga Region h = 600 km
49	Mar. 19	Iv	iPZ F	H 22 09 12.4 22 11	See list, p. 5.
50	Mar. 20	IIu	eZ eSE eSN eE eLNZ eLE	G 05 02 52 G 12 54 G 58 G 26.3 G 27.3 G 27.6	Wellington: 16.5°S 175°E
51	Mar. 20	I	eNE eZ F	G 20 57 48 G 58 51 21 07	
52	Mar. 21	IIu	ePEZ eSKSNE eMN eME F	G 20 48 45 G 59 15 G 21 16.3 G 16.8 23 30	U.S.C.G.S.: 6°S 146°E
53	Mar. 25	Iu	eNZ F	G 18 48 05 18 55	Pasadena: South Atlantic
54	Mar. 26	IIu	iPNEZ ePPZ iSNEZ F	G 17 50 11 G 53 25 G 18 00 06 18 57	Wellington: 23°S 176.5°W h = 100 km
55	Mar. 28	Id	iPNZ iSNE F	AH 05 52 53.2 A 59.7 05 54	See list, p. 5.
56	Mar. 29	IIId	iPNZ iPNEZ iSN iSNEZ iMN F	AH 11 46 02.8 G 03 A 09.3 G 10 A 13 11 50	See list, p. 5 17 Foreshocks and 20 aftershocks recorded
57	Mar. 30	Iv	iPZ iSNE F	H 00 01 28.4 A 47.2 00 02	See list, p. 5
58	Mar. 30	IIv	iPZ iN iN iSN F	H 21 08 03.2 A 06.4 A 18 A 30.8 21 12	See list, p. 5

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
59	Mar. 31	IId	iPNEZ iSNE iMNE F	AH 07 06 16.6 A 23 A 30.1 07 09			See list, p. 5 1 foreshock and 6 aftershock recorded
60	Mar. 31	Id	iPZ F	H 19 48 34.4 19 49			Aftershock

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude:

 $\phi = 37^{\circ} 20' 11''$ N.
 $\lambda = 121^{\circ} 30' 16''$ W.

Time -- All determinations are reduced to Universal Time.

Elevation -- 261.7 meters (859 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAMS

Component	V	τ_0	ξ
K	3000	1	15
H	3000	1	15

No.	Date	Char-acter	Time	Remarks														
MOUNT HAMILTON THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA MOUNT HAMILTON, CALIFORNIA.																		
1	Jan. 1	Iv	1PHE 20 26 59.2 1SHE 20 27 00.2 P 20 27	Founding Northern Owens Valley														
2	Jan. 5	Id	1PHE 02 12 13.5 1SHE 02 13 P 02 13															
3	Jan. 7	Id	1PHE 18 51 09.2 1SHE 09.4 P															
CONSTANTS																		
CONSTANTS OF THE STATION																		
Latitude and longitude:																		
			$\phi = 37^{\circ} 20' 14''$ N.															
			$\lambda = 121^{\circ} 38' 16''$ W.															
Time -- All determinations are reduced to Universal Time.																		
Altitude -- 1281.7 meters (4205 feet) above mean sea level.																		
CONSTANTS OF THE SEISMOGRAPHS																		
8	Jan. 27	Id	22 51 (ca)	S-P = 2.8 seconds														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Apparatus</th> <th style="width: 10%;">Component</th> <th style="width: 10%;">V</th> <th style="width: 10%;">T₀</th> <th style="width: 10%;">ε</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Wood-Anderson</td> <td>E</td> <td>3000</td> <td>1</td> <td>15</td> </tr> <tr> <td>N</td> <td>3000</td> <td>1</td> <td>15</td> </tr> </tbody> </table>					Apparatus	Component	V	T ₀	ε	Wood-Anderson	E	3000	1	15	N	3000	1	15
Apparatus	Component	V	T ₀	ε														
Wood-Anderson	E	3000	1	15														
	N	3000	1	15														
11	Feb. 9	Id	09 37 49.8 1SHE 51.6 P 09 39															
12	Feb. 13	Iv	13 00 18 1SHE 55.1 P 13 02															
13	Feb. 16	Id	07 39 37 1SHE 41.5 1SHE 46 40 1SHE 42 P 07 53	J.S.A. 15.2°S - 68.5°W														
14	Feb. 17	Iv	05 08 27 1SHE 53.7 P 05 10															

MOUNT HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Jan. 1	Iv	iPNE iSNE F	22	24	59.2 29.2 27	Pasadena: Northern Owens Valley
2	Jan. 5	Id	iPNE iSNE F	02	12	11.5 13.3 13	Pasadena: Northern Owens Valley
3	Jan. 7	Id	iPNE iSNE F	18	51	07.2 09.4 52	See list, p. 5
4	Jan. 8	Id	eNE F	20	10	09 11	Pasadena: 36° 58'N 117° 15'W
5	Jan. 13	Iv	ePN iSNE F	00	05	30 32 07	U.S.G.O.S.: 5.0°N 122.8°W
6	Jan. 14	Iv	ePNE iSNE F	01	59	59 23 02	See list, p. 5
7	Jan. 14	IIId	iPNE iSNE F	20	21	59.7 01.0 23	U.S.G.O.S.: 57°N 141°E
8	Jan. 27	Id		22	51	(ca)	S-P = 2.8 seconds
9	Feb. 6	Iv	eP*NE iSNE F	08	47	56 21.4 50	See list, p. 5
10	Feb. 6	Iv	ePNE iSNE F	08	52	48 15.4 55	Aftershock See list, p. 5
11	Feb. 9	Id	iPNE iSNE F	09	37	49.8 51.6 39	U.S.G.O.S.: 21°S 171°W J.S.A.: 18.5°S 68.2°W h = 120 km
12	Feb. 13	Iv	ePN eSN F	13	00	18 55.1 02	See list, p. 5
13	Feb. 16	Iu	ePNE iPN eSN eSE F	07	39	37 41.5 40 42 53	J.S.A.: 15.2°S 68.5°W
14	Feb. 17	Iv	ePNE iSNE F	05	08	27 53.7 10	

MOUNT HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
15	Feb. 17	Iv	ePNE eSNE F	06 43 18 44 06 44	
16	Feb. 18	Iv	ePNE iSNE F	14 53 58 54 23.0 14 56 37	Pasadena: Northern Owens Valley h = 100 km
17	Feb. 27	Id	ePNE eSNE F	11 34 40.2 51.9 11 35 27.0	See list, p. 5 See list, p. 5
18	Mar. 4	Iv	ePN iSNE F	22 55 05 49.0 22 57	Pasadena: 36° 58'N 117° 15'W
19	Mar. 5	Iu	eNE eLNE F	00 40 24.3 47.5 00 56	U.S.C.G.S.: 5.8°N 82.8°W 5 foreshocks and 11 after-shocks recorded
20	Mar. 6	Id	ePE iSNE F	06 29 10.5 10.7 06 30	See list, p. 5
21	Mar. 7	Iu	eNE eNE F	03 10 39.5 17 58.9 03 26 17.0	U.S.C.G.S.: 57°N 164°E
22	Mar. 10	IIId	iPE iSE F	18 05 26.1 28.8 18 07 16.0	See list, p. 5 See list, p. 5
23	Mar. 11	Iv	ePNE F	01 13 54 01 18	See list, p. 5
24	Mar. 13	Id	ePNE iSNE F	03 11 23.1 31.3 03 13	See list, p. 5 Followed by 2 aftershocks
25	Mar. 14	Iu	eNE F	18 49 35 18 52	U.S.C.G.S.: 21°S 71°W J.S.A.: 18.5°S 68.3°W h = 120 km
26	Mar. 19	Iv	ePNE eSE iSE iSN F	22 09 12 38.9 39.6 40.3 22 11	See list, p. 5
27	Mar. 24	Id	iPNE iSNE F	00 23 19.8 22.3 00 24	

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

President's Northern Owens Valley

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 25'11'' \text{ N.}$$

$$\lambda = 122^{\circ} 10'18'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 83 meters (272 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson	E	3000	1	15
	N	3000	1	15

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Jan. 1	Iv	iPNE iE iSE iSN	22 25	05.5 40.9 46.2 47.5		Pasadena: Northern Owens Valley
	Jan. 27	Iv	F	22 28			See list, p. 5
2	Jan. 4	Id	ePNE iSNE	22 03	53 04 04.7		
	Jan. 7	Id	F	22 06			U.S.G.C.S.: 57°N 168°E
3	Jan. 7	IIId	iPNE iSE	19 00	48.8 50.3		
	Jan. 10	Id	F	19 02			See list, p. 5
4	Jan. 9	Id	iPNE iSNE	22 56	23.3 25.4		See list, p. 5
	Jan. 11	Iv	F	22 57			
5	Jan. 10	Ir	eNE F	09 54	39 09 57		
6	Jan. 14	Id	ePNE iSNE	20 46	00 02.0		See list, p. 5
			F	20 47			
7	Jan. 18	IIId	iPNE iSNE	13 20	17.2 19		U.S.G.C.S.: 6°S 116°E
			F	13 21			
8	Jan. 19	Id	iPNE iSNE	05 09	04.9 06.8		Wellington: 23°S 176.5°W
			F	05 09			h = 100 km
9	Jan. 19	Id	ePE iSNE	17 39	37.2 39.2		
			F	17 40			
10	Feb. 4	IIId	iPNE iSNE	19 06	38.3 39.7		
			F	19 08			
11	Feb. 5	IIId	iPNE iSNE	23 34	47.5 49.0		See list, p. 5
			F	23 36			
12	Feb. 6	Iv	eP*NE iSNE	08 48	02.0 29.7		See list, p. 5
			F	08 49			shocks recorded
13	Feb. 6	Iv	ePNE iSNE	08 52	56.0 23.0		Aftershock
			F	08 54			Aftershock

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
14	Feb. 18	Iv	ePNE iSNE F	14 54 03.9 33.6 14 56	Pasadena: Northern Owens Valley
15	Feb. 27	Iv	ePNE iSNE F	11 34 45.4 35 01 11 36 39.8	See list, p. 5
16	Mar. 7	Iu	eNE eN F	03 10 39 17 48 03 19 21.8	U.S.C.G.S.: 57°N 164°E See list, p. 5
17	Mar. 10	Id	iPE F	18 05 33.9 (ca) 18 07 11	See list, p. 5 Aftershock
18	Mar. 11	Iv	ePE iSE iS*E iE F	01 13 51 14 19.5 24 40 01 19	See list, p. 5
19	Mar. 13	Id	ePNE iSNE F	03 11 30 40 03 13	See list, p. 5
20	Mar. 21	Iu	eE eE eE F	20 48 52 58 52 21 17.2 22 05	U.S.C.G.S.: 6°S 146°E
21	Mar. 26	Iu	ePNE eNE eSN eSE F	17 50 11 36 18 00 04 08 18 03	Wellington: 23°S 176.5°W h = 100 km
22	Mar. 27	Id	ePNE iSNE F	19 09 02 10 14.5 19 11	
23	Mar. 28	Id	ePNE iSNE F	05 52 52 58.2 05 55	See list, p. 5
24	Mar. 29	IIId	iPNE F	11 46 01.7 11 50	See list, p. 5 9 foreshocks and 7 after- shocks recorded
25	Mar. 29	Id	ePNE iSNE F	12 13 31 38.0 12 15	Aftershock

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.) h. m. s.	Remarks
	1943				
26	Mar. 29	Id	ePE iSE F	14 48 58 49 04.7 14 50	Aftershock
27	Mar. 30	IIv	iPNE iSN iSE F	21 08 09.0 38.9 39.8 21 12	See list, p. 5
28	Mar. 31	IIId	iPNE iSNE F	07 06 16.5 21.6 07 09	See list, p. 5
29	Mar. 31	Id	ePNE eSNE F	19 48 41 53 19 50	Aftershock

All determinations are reduced to Universal Time.

Station is 30 meters (325 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAMS

Component	ν	τ_0	ϵ
W-E	1500	1	15
N-S	3000	1	15

SAN FRANCISCO

SAN FRANCISCO

THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO
SAN FRANCISCO, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 46' 14'' \text{ N.}$$

$$\lambda = 122^{\circ} 27' 12'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 100 meters (328 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson.....	E 15° S	1500	1	15
	N	3000	1	15

10	Feb. 6	14	185	08 52 56	Aftershock
			185	08 53 22	
			F	08 50	
11	Feb. 6	14	185	23 33 00.9	Aftershock
			185	02.3	
			F	23 34	
12	Feb. 13	1	185	11 14 16	
			F	11 16	
13	Mar. 1	14	185	19 09 17.5	
			185	29.6	
			F	19 10	
14	Mar. 6	14	185	14 05 53.4	
			185	06 00.5	
			185	25.3	
			F	14 08	

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
1	Jan. 1	Id	ePE iSE F	12 28 12 29	37.5 40.3	See list, p. 5
2	Jan. 1	Iv	ePE iSE F	22 25 22 32	07 51.1	Pasadena: Northern Owens Valley
3	Jan. 15	Id	ePN eSN F	23 25 23 27	46 48.5	
4	Jan. 18	Id	eN F	13 36 13 37	30.6	
5	Jan. 26	Id	ePN eSN F	00 13 00 14	39 41	
6	Jan. 27	Id	ePNE eSNE F	10 01 10 02	30 32	
7	Jan. 29	Id	ePE eSE F	22 35 22 36	29 33	
8	Feb. 1	Id	eE F	01 00 01 01	53	
9	Feb. 6	Iv	ePE eSE F	08 47 08 55	59 28.2	See list, p. 5
10	Feb. 6	Iv	ePE iSE F	08 52 08 50	54 22	Aftershock
11	Feb. 6	Id	iPE eSE F	23 33 23 34	00.9 02.3	Aftershock
12	Feb. 13	I	eE F	11 14 11 16	16	
13	Mar. 2	Id	iPE iSE F	19 09 19 10	17.5 29.6	
14	Mar. 8	Iv	iE iE iE F	18 05 18 06 18 08	53.4 00.5 25.3	

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
15	Mar. 10	Id	iPE iSE F	18 05 40.0 52.6 18 07	See list, p. 5
16	Mar. 11	Iv	iPNE iSE F	01 13 48.9 14 08.6 01 19	See list, p. 5

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:

 $\phi = 37^{\circ} 34' N.$
 $\lambda = 122^{\circ} 16' W.$

Time — All determinations are reduced to Universal Time.

Altitude — 17 meters (55 feet) above mean sea level.

CONSTANTS OF THE INSTRUMENTS

Apparatus

Response

Earth-Coupled (5 kg.)

5

10

15

20

The station is operated by Dr. John Douglas, of Berkeley,

in cooperation with the University of California.

FERNDALE

No.	Date	Char-acter	Time	Remarks
1	1963 Jan. 24	I		THE FERNDALE STATION FERNDALE, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude:

$$\begin{aligned} \phi &= 40^{\circ} 34' \text{ N.} \\ \lambda &= 124^{\circ} 16' \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 17 meters (55 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Bosch-Omori 25 kg.	E	12	11	5
	N	12	8	6

The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.

9	Mar. 16	I	1PK 1PM F	00 18 27 30 00 24
10	Mar. 21	Ia	e-PME eN eE F	21 58 16 22 13 24 15 00 23 12

FERNDALE

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Jan. 24	I	ePN	21 53 36	
			eN	54 02	
			eE	04	
			eLE	22 03 34	
			eLN	07 00	
			F	22 11	
2	Feb. 11	I	eE	16 36 48	
			eN	50	
			iE	37 09	
			iN	26	
			iE	38 17	
			F	16 45	
3	Feb. 21	Id	iPNE	15 48 54	
			iSN	57	
			iSE	49 01	
			F	15 50	
4	Feb. 22	IIr	iPE	09 26 00	U.S.C.G.S.: 17.6°N 101.3°W
			iSE	31 00	
			iE	33 48	
			iME	37 28	
			F	12 06	
5	Mar. 5	Iu	eSN	00 47 07	U.S.C.G.S.: 5.8°N 82.8°W
			iGN	59 46	
			F	01 10	
6	Mar. 7	Iu	eE	04 15	
			iN	19 36	
			F	05 00	
7	Mar. 11	Iv	iPN	02 12 43	See list, p. 5
			iPE	45	
			iSNE	13 11	
			F	02 15	
8	Mar. 14	Iu	ePNE	18 53 00	U.S.C.G.S.: 21°S 71°W J.S.A.: 18.5°S 68.3°W h = 120 km
			eE	04 00	
			eN	06 00	
			F	20 03	
9	Mar. 16	I	iPE	00 18 27	
			iPN	30	
			F	00 24	
10	Mar. 21	Iu	ePNE	21 58 16	U.S.C.G.S.: 6°S 146°E
			eN	22 13 24	
			eE	15 00	
			F	23 12	

No.	Date	Character	Place	Remarks
-----	------	-----------	-------	---------

FRESNO

THE FRESNO STATION, FRESNO STATE COLLEGE
FRESNO, CALIFORNIA

1 Jan. 8

2 Jan. 14

3 Jan. 20

4 Jan. 20

CONSTANTS

CONSTANTS OF THE STATION

5 Latitude and longitude:

$$\phi = 36^{\circ} 46' 11'' \text{ N.}$$

$$\lambda = 119^{\circ} 47' 18'' \text{ W.}$$

6 Time -- All determinations are reduced to Universal Time.

7 Altitude -- 88.4 meters (290 feet) above mean sea level.

8 Feb. 4

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson	N	3000	0.9	15

11 Feb. 7

12 Feb. 12

13 Feb. 12

14 Feb. 13

15 Feb. 13

16 Feb. 13

17 Feb. 16

18 Feb. 18

Aptia: Near Easter Island

J.T.A.: 15.2°S 68.5°W

Pasadena: Northern Owens Valley

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Jan. 4	Iv	ePN iSN F	11 30	54		
					31 17.1		
				11 32			
2	Jan. 14	Iv	iPN iSN F	01 59	54.0		See list, p. 5
				02 00	20.5		
				02 02			
3	Jan. 20	Id	iN F	11 57	09.7		
				11 57			
4	Jan. 20	Id	iN F	12 24	43.3		
				12 25			
5	Jan. 24	Ir	ePN eN F	20 48	30		U.S.C.G.S.: 15°N 91°W
				21 06	10		
				21 05			
6	Jan. 27	Iu	ePN	02 53	28		U.S.C.G.S.: 52°N 180°W
7	Jan. 30	Iu	ePN F	05 42	ca.		U.S.C.G.S.: 2.0°S 80.0°W
				05 47			
8	Feb. 4	Iv	iPN iSN F	21 23	19.5		
					35.6		
				21 25			
9	Feb. 6	Iv	iPN iSN F	08 47	52.1		See list, p. 5
					48 17.9		
				08 51			
10	Feb. 6	Iv	iPN iSN F	08 52	45.0		Aftershock
					53 10.8		
				08 55			
11	Feb. 7	Iu	ePN F	04 36	57		Apia: Near Sunday Island
				04 38			
12	Feb. 12	Id	iN	22 19	38.9		
13	Feb. 12	Id	iN	23 16	18.1		
14	Feb. 13	Id	iN	01 43	18.7		
15	Feb. 13	Id	iN	06 46	19.5		
16	Feb. 13	Id	iN	06 46	30.9		
17	Feb. 16	Iu	iPN F	07 39	01.8		J.S.A.: 15.2°S 68.5°W
				07 50			
18	Feb. 18	Id	iPN iPN iSN F	14 53	37.5		Pasadena: Northern Owens Valley
					38.7		
					48.2		
				14 26			

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
19	Feb. 18	Id	iPN iSN iN F	19 16	12.2 23.2 28.3		See list, p. 5
20	Feb. 25	Iv	iPN F	20 29	13.3		U.S.C.G.S.: 21°S 72°W J.S.M.: 18.5°S 68.3°W h = 120 km
21	Feb. 26	Iv	iPN iSN F	02 02	18.5 38.6		U.S.C.G.S.: 11°S 172°W h = 300 km
22	Feb. 26	Id	iPN F	02 43	59.5		Pasadena: 38°11'N 115°26'W
23	Feb. 27	Iv	ePN iSN iSN F	11 34	41.5 59.6 35 02.7		See list, p. 5
							Obscured by train
24	Mar. 4	Iv	ePN iSN iN F	22 54	42.7 55 01.9 05.0		Pasadena: 36°58'N 117°15'W
25	Mar. 5	Iu	ePN eLN F	00 40	13 58		U.S.C.G.S.: 5.8°N 82.8°W
26	Mar. 5	Iv	ePN iSN F	01 16	49 17 06.7		Aftershock of quake of March 4, 1949 - 2254 G.C.T.
27	Mar. 5	Iv	ePN iSN F	04 55	29 45.8		
28	Mar. 5	Iv	iPN iSN iN F	13 51	46.0 52 05.6 08.5		Aftershock of quake of March 4, 1949 - 2254 G.C.T.
29	Mar. 7	Iu	ePN F	03 10	51		U.S.C.G.S.: 57°N 164°E
30	Mar. 10	Iv	eSN F	18 06	07.5		See list, p. 5
31	Mar. 11	Iv	ePN iSN iN F	01 14	14 21.5 58.2		See list, p. 5

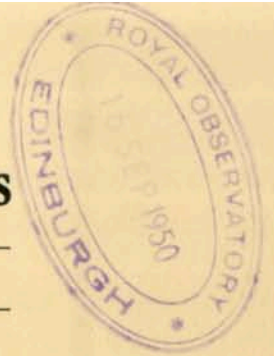


FRESNO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
32	Mar. 13	Iv	iSN F	03 11 59.2 03 13	See list, p. 5
33	Mar. 14	Iu	iPN F	18 49 24.0 19 05	U.S.C.G.S.: 21°S 71°W J.S.A.: 18.5°S 68.3°W h = 120 km
34	Mar. 15	Iu	iPN eSN eN F	23 10 23.2 19 32 20 11 23 28	U.S.C.G.S.: 14°S 174°W h = 300 km
35	Mar. 17	Iv	iPN iN F	00 42 26.1 43 35.9 00 47	Pasadena: 32°44'N 115°26'W
36	Mar. 19	Iv	ePN eSN F	22 09 13.1 36.5 22 11	See list, p. 5
37	Mar. 26	Iv	iPN iSN F	03 51 12.1 32.0 03 53	
38	Mar. 26	Iu	ePN eSN F	17 50 17.5 18 00 15 18 06	Wellington: 23°S 176.5°W h = 100 km
39	Mar. 29	Iv	iPN iN iSN iSN F	11 46 26.1 42.3 49.1 47 04.0 11 54	See list, p. 5
40	Mar. 30	Iv	iPN iSN F	00 01 25.8 50.5 00 04	See list, p. 5
41	Mar. 30	IIv	ePN iPN iSN iN F	21 08 11.0 11.9 45.0 09 18.3 21 17	See list, p. 5
42	Mar. 31	Iv	ePN iSN F	07 06 41 07 16.6 07 12	See list, p. 5

Bulletin of the Seismographic Stations

Volume 13, No. 2, pp. 33-82



EARTHQUAKES IN NORTHERN CALIFORNIA
AND
THE REGISTRATION OF EARTHQUAKES
AT
BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE—FRESNO

From April 1, 1943, to June 30, 1943

BY
CHARLES E. HERRICK
AND
CAROLYN H. PENDERY

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES
1950

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CALIFORNIA

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CONTENTS

UNIVERSITY OF CALIFORNIA PRESS		Page
BERKELEY AND LOS ANGELES,		
EARTHQUAKES IN NORTHWESTERN CALIFORNIA		37
CALIFORNIA		
THE REGISTRATION OF EARTHQUAKES		39
Symbols and Notations Employed		40
BERKELEY	-----	41
Constants		41
CAMBRIDGE UNIVERSITY PRESS		
Tabulation of		42
LONDON, ENGLAND		
MOUNT HAMILTON		57
Constants		57
Tabulation of Shocks		58
PAID ALTO		65
Constants		65
Tabulation of Shocks		66
SAN FRANCISCO		73
Constants		73
Tabulation of Shocks		74
PERDUE		75
Constants		75
Tabulation of Shocks		76
MISISSAUGA		78
Constants		78
Tabulation of Shocks		79

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CONTENTS

	Page
EARTHQUAKES IN NORTHERN CALIFORNIA	37
THE REGISTRATION OF EARTHQUAKES	39
Symbols and Notations Employed	40
BERKELEY	41
Constants	41
Tabulation of Shocks	42
MOUNT HAMILTON	57
Constants	57
Tabulation of Shocks	58
PALO ALTO	65
Constants	65
Tabulation of Shocks	66
SAN FRANCISCO	73
Constants	73
Tabulation of Shocks	74
FERNDALE	75
Constants	75
Tabulation of Shocks	76
FRESNO	78
Constants	78
Tabulation of Shocks	79

EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California earthquakes on the following page, when sufficient information on the effects of the quake is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

Intensity

- II Felt by a few people only. Duration or direction not appreciable
- III Duration or direction appreciable.
- IV Rattling of doors and windows; swinging of suspended objects.
- V Disturbance of movable objects; plaster cracked.
- VI Overthrow of movable objects; cracking of chimneys and other brickwork.
- VII Fall of some chimneys; some damage to buildings.

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood-Anderson amplitudes, using the nomogram by Nordquist, "Bulletin of the Seismological Society of America", 32: 164.

Latitude and longitude are given for each epicenter in the following list. Only those earthquakes are given numbers for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

May 6 1891
 May 8 1891
 V at Livermore. IV at Hayward, Holt and Milpitas III at Paris and Centerville.

EARTHQUAKES IN NORTHERN CALIFORNIA

1943 -- Pacific Standard Time

No.	Date	Time of Origin	Richter Magnitude	North Latitude	West Longitude	Weight
1	April 1	05:39:56	3.1	34° 41'	121° 45'	b
2	4	22:24:48	2.2	37° 43'	121° 41'	c
3	6	16:15:01	3.4	37° 39'	121° 47'	b
4	7	16:13:04	3.0	37° 41'	121° 48'	b
5	8	19:17:18	2.9	36° 45'	121° 08'	c
6	10	18:16:29	2.5	37° 42'	121° 47'	b
7	12	13:20:42	2.9	37° 41'	121° 46'	b
8	15	04:28:11	3.2	37° 41'	121° 46'	b
		Foreshock.				
9	15	07:23:04	4.0	37° 41'	121° 46'	a
		Large foreshock.				
10	15	07:31:02	4.1	37° 41'	121° 46'	a
		This shock, the largest of a series occurring on April 15, was felt as far north as Martinez and as far east as Stockton. Maximum intensity of V was reported from Tracy; IV at Newark, San Francisco and Stockton; III at Brentwood, Concord and Palo Alto.				
11	17	11:59:01	3.2	36° 49'	121° 28'	c
		Depth about 15 km.				
12	19	18:00:19	2.2	37° 39'	121° 51'	c
13	20	18:18:41	3.2	36° 52'	120° 52'	c
14	21	01:01:22	3.6	36° 38'	121° 05'	c
		Depth about 6 km.				
15	21	15:39:44	4.2	37° 41'	121° 43'	a
		IV in Dublin, Newark, Livermore, Pleasanton and San Francisco.				
16	26	03:54:00	4.1	37° 37'	121° 47'	a
		Maximum intensity of V at Dublin, Livermore, Moraga and Niles. IV at Alvarado, Holt, Diablo and Rio Vista. III at El Granada, Glenwood, Newark and San Ramon.				
17	May 6	18:01:04	3.5	36° 6'	121° 1'	d
18	8	04:29:39	3.4	37° 44'	121° 42'	b
		V at Livermore. IV at Hayward, Holt and Milpitas; III at Banta and Centerville.				

<u>No.</u>	<u>Date</u>	<u>Time of Origin</u>	<u>Richter Magnitude</u>	<u>North Latitude</u>	<u>West Longitude</u>	<u>Weight</u>
19	May 19	04:04:14	3.0	36°9	121°4	d
20	26	22:10:01	2.8	37° 43'	121° 45'	c
21	28	20:57:05	2.7	37° 40'	121° 48'	c
IV at Livermore.						
22	29	17:04:09	3.7	37° 40'	121° 48'	c
IV at Livermore.						
23	June 9	21:55:27	2.5	37° 38'	121° 50'	c
24	22	10:50:07	2.4	37° 59'	121° 14'	c
25	28	18:50:53	3.1	36°5	121°1	d
26	28	20:54:23	3.4	37° 44'	121° 42'	b
IV at Livermore.						

THE REGISTRATION OF EARTHQUAKES

SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

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

d (terrae motus domesticae)	Local shock (origin less than 100 kilometers distant).
v (terrae motus vicinae)	Near shock (origin from 100 to 1,000 kilometers distant).
r (terrae motus remotae)	Distant shock (origin from 1,000 to 5,000 kilometers distant).
u (terrae motus ultimae)	Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. Nature of the Motion --

i (impetus)	THE REGISTRATION OF EARTHQUAKES
s (seismic)	Gradual beginning of the motion.

SYMBOLS AND NOTATIONS EMPLOYED

THE HERBERT W. HUTTON, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

1. Character of the Seismogram --

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).

Altitude -- 81 meters (266 feet) above mean sea level.

2. Nature of the Motion --

- i (impetus) Sudden beginning of the motion.
 e (emersio) Gradual beginning of the motion.

Apparatus	Component	τ	τ_0	δ	$\frac{\tau}{\tau_0}$	
Wood-Anderson 100 kg. ..	E	25	12	10	0.48	
Wheeler 50 kg.	E	15	12	10	0.80	
Wood-Anderson	E	300	0.9	15		
	V	300	0.9	15		
		τ	τ_1	u^2	A_1 (cm)	A_2 (cm)
Galitzin	E	112	12	0.00	115	11.5
	V	122	12	0.03	119	11.9
	E	109	12	0.01	131	13.1
		τ	Coupled Period		τ	
Benioff	E			0.7		5

The letter E before a reading designates that the seismogram was from the Galitzin instrument; W, Wheeler; A, Wood-Anderson; B, Benioff.

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Latitude and Longitude:

$$\begin{aligned} \phi &= 37^{\circ} 52'13 \text{ N.} \\ \lambda &= 122^{\circ} 15'16 \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 81 meters (266 feet) above mean sea level.

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Apparatus	Component	V		T_0	ϵ	$\frac{r}{T_0^2}$	
Bosch-Omori 100 kg. ..	E	45		12	10	0.001	
	N	45		12	10	0.001	
Wiechert 80 kg.	Z	44		4	5	0.005	
Wood-Anderson	E	3000		0.9	15		
	N	3000		0.9	15		
Galitzin		K	T	T_1	μ^2	A_1 (cm)	l (cm)
	E	112	12	11.8	0.00	115	11.3
	N	122	12	12.4	0.03	119	11.2
	Z	109	12	11.9	0.01	131	14.9
Benioff		V		Coupled Period		ϵ	
	Z			0.7		5	

The letter G before a reading designates that the seismogram was from the Galitzin instrument; W, Wiechert, B, Bosch-Omori; A, Wood-Anderson; H, Benioff.

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Apr. 1	Id	iPZ eSN F	H 13 41 02.1 A 06 13 42	Aftershock
2	Apr. 1	II	eE	G 14 43 54	
3	Apr. 1	Iv	ePZ F	H 21 07 15.1 21 10	Aftershock of quake of March 29, 1943, 23 59 47 G.C.T.
4	Apr. 2	Id	iPZ iSZ F	H 13 40 05.5 H 12.5 13 41	See list, p. 37 In addition to those listed, 4 foreshocks and 8 after- shocks were recorded.
5	Apr. 3	Id	iPNZ iSN F	AH 00 17 58.2 A 18 04.4 00 19	Aftershock
6	Apr. 5	ID	iPZ eSN F	H 06 24 58.0 A 25 05 06 26	See list, p. 37
7	Apr. 6	Iu	ePNEZ iPZ iPN eSN eSE iSN iSZ iSSN eLN eLE F	AH 16 19 41 G 41 G 44 A 29 59 A 30 01 G 04 G 10 G 34 50 A 47.1 A 48.2 20 00	U.S.C.G.S. 32°S, 70°W Pas: 30-3/4°S, 72°W
8	Apr. 6	Id	iPZ iSNE F	H 16 21 58.8 A 22 00.0 16 23	
9	Apr. 7	Id	iPNEZ iSNE F	AH 00 15 10.1 A 16.0 00 17	See list, p. 37
10	Apr. 7	Iu	iPZ iSE F	G 13 19 37 G 29 52 14 44	Aftershock of quake of April 6, 1943, 16-19-14 G.C.T.

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
11	Apr. 7	Iu	iPZ iSNE eLN eLZ eLE F	G 23 30 25 G 40 44 G 57 27 G 58 51 G 59 27 01 02	Aftershock
12	Apr. 8	Id	iPZ iSNE F	H 00 13 12.0 A 18.0 00 15	See list, p. 37
13	Apr. 9	Iu	iPZ iPZ iPN iPE	G 09 00 47 H 51.8 G 56 G 01 00	U.S.C.G.S.: 19°N, 145° E h = 100 km.
	Apr. 12	Id	eZ eSN eSE eLZ F	H 03 55 A 10 41 A 43 G 27 33 09 59	Aftershock
14	Apr. 9	Id	iPZ iSNE F	H 15 47 14.4 A 15.0 15 48	Aftershock
15	Apr. 9	Id	iPZ F	H 22 42 37.2 22 44	Foreshock
16	Apr. 9	Id	iPZ F	H 23 42 38.8 23 44	Foreshock
17	Apr. 9	Id	iPZ F	H 23 43 39.2 23 45	Foreshock
18	Apr. 10	Id	iPZ F	H 05 01 23.0 05 02	Foreshock
19	Apr. 11	Id	iPZ eSN F	H 02 13 29.0 A 35.5 02 15	Foreshock
20	Apr. 11	Id	iPZ eSN F	H 02 16 37.8 A 44.5 02 18	See List, p. 37
21	Apr. 11	Id	iPZ eSN F	H 02 17 45.0 A 51.5 02 19	Aftershock

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
22	Apr. 11	IIu	iPZ iSZ iSE iSN eLZ F	G 14 57 32 G 15 06 53 G 55 G 59 G 19 34 16 55	Pas: Near 38°N, 142°E In addition to those listed, there were 8 foreshocks and 17 aftershocks recorded.
23	Apr. 12	Id	iPZ eSN F	H 05 06 39.7 A 46.3 05 08	Near Livermore
24	Apr. 12	Id	iPNZ eSN F	AH 21 20 51.1 A 59 21 22	See list, p. 37
25	Apr. 12	Id	iPNZ eSN F	AH 21 35 40.0 A 48 21 37	Aftershock
26	Apr. 12	Id	iPZ eSN F	H 21 36 30.5 A 38 21 38	Aftershock
27	Apr. 12	Id	iPZ eSN F	H 21 39 59.1 A 40 07 21 41	Aftershock
28	Apr. 15	Iu	iPZ iPN F	G 10 57 58 G 58 11 11 11	Aftershock
29	Apr. 15	Iu	iPZ iPN iSN iSZ eZ eN F	G 11 47 15 G 34 G 57 38 G 58 11 G 12 16 08 G 16 13 31	Pas: Chili Small local superimposed on surface waves at 12-28.5.
30	Apr. 15	Id	iPNZ iSNE F	AH 12 28 19.8 A 26.5 12 30	See list, p. 37 Foreshock
31	Apr. 15	IIId	iPNEZ iPNZ iSN F	AH 15 23 12.6 G 14 G 28 15 26	See list, p. 37 Large foreshock.

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No.	Date	Char-acter	Phase	Time			Remarks
				(U.T.)			
				h.	m.	s.	
	1943						
32	Apr. 15	IIId	iPNEZ iSN iSZ F	AH 15 31	11.2		See list, p. 37 Main Livermore shock. In addition to those listed, there were 8 foreshocks and 17 aftershocks recorded.
				G	16		
				G	30		
				15 33			
33	Apr. 15	IIId	iPNEZ F	AH 15 33	43.5		Aftershock
				15 36			
34	Apr. 15	IIId	iPN iPNEZ iPZ iSZ iSN F	G 15 37	24		Aftershock
				AH	24.3		
				G	27		
				G	32		
				G	38		
				15 44			
35	Apr. 15	Id	iPZ iSE F	H 17 29	32.2		Aftershock
				A	39.5		
				17 31			
36	Apr. 15	IIId	iPNEZ F	AH 17 59	28.8		Aftershock
				18 05			
37	Apr. 15	IIId	iPZ iSNE F	H 22 07	51.4		Aftershock
				A	58		
				22 10			
38	Apr. 16	Id	iPZ iSNE F	H 10 44	30.6		Aftershock
				A	36.5		
				10 45			
39	Apr. 17	Iv	iPZ iZ eN F	H 19 59	21.2		See list, p. 37
				H	22.9		
				A	39		
				20 02			
40	Apr. 20	Id	iPZ iSN F	H 02 00	26.6		See list, p. 37
				A	33		
				02 02			
41	Apr. 21	Iv	iPZ F	H 09 01	47.4		See list, p. 37
				09 03			
42	Apr. 21	IIId	iPNEZ iSN iSE F	AH 17 12	13.3		Foreshock
				A	19.0		
				A	21.0		
				17 15			
43	Apr. 21	IIId	iPNEZ iSNE F	AH 23 28	19.9		Foreshock
				A	26.0		
				23 31			

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
44	Apr. 21	IIId	iPNEZ iSE F	AH 23 39 52.9 A 40 02 23 43	See list, p. 37 Main shock
45	Apr. 21	IIId	iPNEZ iSNE F	AH 23 58 05.9 A 12 00 01	Aftershock
46	Apr. 23	Id	iPZ eSNE F	H 12 06 06.4 A 13 12 07	Aftershock
47	Apr. 26	IIId	iPNEZ iPNEZ iSNE iN iZ F	AH 11 54 08.8 G 09 A 16 G 19 G 20 12 01	See list, p. 37 8 additional aftershocks are not listed.
48	Apr. 26	Id	iPNEZ F	AH 12 02 14.4 12 03	Aftershock
49	Apr. 26	Id	iPNEZ iSNE F	AH 18 23 55.3 A 24 03 18 25	Aftershock
50	Apr. 27	Id	iPNEZ iSN F	AH 00 40 02.9 A 09.9 00 41	Aftershock
51	Apr. 29	Id	iPNZ iSNE F	AH 06 10 49.5 A 56 06 12	Aftershock
52	Apr. 29	Id	iPZ iSNE F	H 08 09 35.6 A 42 08 11	Aftershock
53	May 1	Id	iPNEZ iSNE F	AH 02 51 43.2 A 50.4 02 53	Aftershock Intensity V in Livermore.
54	May 2	IIIu	iPNEZ ePNE iSEZ iSN eLNE eZ F	G 17 26 55 A 55 G 34 07 G 09 A 40.5 G 43.0 20 17	U.S.C.G.S.: 6.4°N, 80.1°W h = 50-100 km.

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
55	May 3	Iu	iPZ iPPNEZ iSKSE F	G 02 12 56 G 16 56 G 23 46 04 51	Pas: 12.5°N, 125.5°E
56	May 5	IId	iPNE iSNE F	A 06 05 36.9 A 37.8 06 06	
57	May 5	Id	iPZ iSE iSN F	H 11 48 10.2 A 16.5 A 17 11 49	Livermore shock.
58	May 5	Id	iPZ iSNZ F	H 22 46 11.5 H 13.1 22 47	
59	May 6	Id	iPZ iSN F	H 07 55 51.0 A 51.6 07 56	
60	May 8	Id	iPZ iSNE F	H 12 29 48.1 A 54.8 12 31	See list, p. 37
61	May 14	Id	iPZ eSN F	H 00 58 56.1 A 59 03.4 01 00	
62	May 18	Id	iPZ iSZ F	H 22 22 48.5ca H 53.6ca 22 23.5	
63	May 18	Id		22 55	S-P = 02.9 sec.
63a	May 19	Id		04 09	S-P = 4 sec.
64	May 19	Iv	iPZ iZ iSZ F	H 12 04 36.4 H 38.9 H 51.4 12 06	See list, p. 38
65	May 19	Iv	iPZ iSZ F	H 12 09 00.0 H 15.8 12 10	Aftershock
66	May 19	Id	iPZ iSZ F	H 12 45 51.0 H 55.6 12 46.5	

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
67	May 20	Id	iPZ iSZ F	H 03 45 48.9 H 51.8 03 46.5	
68	May 20	Id	iPZ iSZ F	H 10 00 32.7 H 38.7 10 01	
69	May 20	Id	iPZ iSZ F	H 10 20 58.4 H 59.4 10 21.5	
70	May 20	IIId	iPZ ePE iSN iSZ iSE F	H 11 57 21.9 A 22.2 A 28.0 H 28.5 A 29.0 11 58	
71	May 21	Id	iPZ iZ iZ F	H 08 05 49.6 H 54.8 H 57.7 08 06	
72	May 21	Id	iPZ iSZ F	H 08 09 45.6 H 52.0 08 10	
73	May 22	Id	iPZ iZ iZ F	H 00 37 22.0 H 23.0 H 31.5 00 38	
74	May 22	Id	iPZ iSZ F	H 04 59 48.4 H 51.8 05 00	
75	May 22	Iu	iPZ ePZ iSN iSE eN eLN eLZ eLE F	G 19 14 23 H 15 26 G 24 43 G 47 G 30 13 G 42 01 G 23 G 47 10 28	Pasadena: 30-3/4°S, 72°W Aftershock of April 6, 1943, 16 19.6 G.C.T.
76	May 22	Id	iPZ iZ F	H 09 26 18.8 H 22.5 09 27	

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No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
77	May 22	Id	iPZ F	H 09 30 31.7 09 31	
78	May 23	Id	iPNZ iPE iSNEZ iN iE F	AH 23 04 14.9 A 15.6 AH 18.1 A 22.4 A 23.2 23 05	
79	May 24	Id	iPZ iSZ eSNE F	H 08 18 14.5 H 21.6 A 22 08 18	
80	May 25	Id	iPZ F	H 04 05 06.7 04 06	
81	May 25	Id	iPZ iZ F	H 04 10 07.4 H 11.2 04 11	
82	May 25	Id	iPZ F	H 04 20 20.8 04 21	
83	May 25	Id	iPZ iZ F	H 08 10 08.9 H 12.3 08 11	
84	May 25	Id	iPZ iSZ iZ F	H 08 20 06.5 H 08.7 H 14.5 08 21	
85	May 25	IIIu	iPE iPNZ ePE ePN iPPE iPPZ ePPN ePPE eN iSKSE eE eLN eLNE F	G 23 21 29 AG 30 A 33 G 35 G 25 47 G 49 A 51 A 53 G 26 01 G 32 03 A 39.0 A 49.0 A 54 33 03 30	U.S.C.G.S.: 7.5°N, 126.5°E

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No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
86	May 26	Iir	ePN ePE iPNEZ iSNE eZ eN eE F	A A G G G G A A	10 36 50 52 54 40 25 43 37 45 04 46 27 11 31	U.S.C.G.S.: 17.5°N, 106.5°W Round Valley, Rose County
87	May 27	Id	iPZ ePN iSNEZ F	H A AH A	06 10 10.1 10.6 17.6 06 11	See list, p. 38
88	May 27	Id	iPZ iZ eSNE F	H H A A	12 19 49.9 51.8 52.8 12 20	
89	May 29	Id	iPNEZ iZ iZ eSN iSNE iNE F	AH H H A A A A	04 57 13.5 14.5 17.0 20.0 20.8 27.1 04 58	See list, p. 38
90	May 29	Id	iPZ ePE iSZ iZ eN iE F	H A H H A A A	10 25 09.4 10 11.6 15.0 15.8 18.2 10 26	
91	May 30	IId	iPNEZ iPNEZ iZ iSNE iSZ iSN iE iN iE iE F	G A H A G G A A G A A	01 04 18 18.2 23.2 25.4 30 34 35.0 37.2 38 40.1 01 08	See list, p. 38
92	May 30	Id	iPNEZ iZ iSN F	AH H A A	01 15 26.6 29.8 33.4 01 17	Aftershock

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
93	May 31	Id	iPE iSZ iN iEZ F	H H A AH 09	09 03 36.1 38.8 44.7 45.8		
94	May 31	Iv	iPNEZ iSE iSN F	AH A A 20	17 18 23.4 21	41.6 22.7 23.4	Round Valley, Inyo County
95	June 1	Ir	iPNEZ eE eZ eN F	G G G G 04	20 24 10 14 54	08 04 10 14	
96	June 3	Iu	iPZ iSN iSE eGN eGE eZ eE eN F	G G G G G G G G 22	20 14 42 23 38 26 58 27 15	05 10 14 22 42 23 25 38 26 52 58 02	Pas: 16°S, 173°W
97	June 4	Iv	iPZ iN iE iSNE eN eE iZ F	H A A G A A G 02	20 26 17.5 29 31.0 32.0 55 26	05.5 14.0 17.5 29 31.0 32.0 55	
98	June 7	Iu	eN eZ eE eEZ eN F	G G G G G 02	23 42 43 00 23 02	40 50 35 29 13 13 32	Pas: Sumatra
99	June 8	Id	iPZ iSZ F	H H 05	04 39.3 00	35.9 39.3	
100	June 8	Id	iPZ iSZ F	H H 11	11 30 31	02.8 06.6	

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
101	June 8	IIu	iPZ	G 21 01 30	U.S.C.G.S.: 3°S, 102.5°E
			iE	G 03 52	
			iN	G 58	
			iE	G 15 14	
			iN	G 24 46	
			iZ	G 42 51	
			eLN	A 52 33	
			eLE	A 53 28	
			F	A 00 42	
102	June 9	IIu	iPZ	G 03 25 28	U.S.C.G.S.: 3°S, 102.5°E
			iPN	G 26 48	
			iPE	G 27 13	
			iN	G 29 37	
			eZ	G 59 42	
			F	05 41	
103	June 9	Id	iPZ	H 23 48 08.3	Afternoon
			iSZ	H 09.2	
			iZ	H 11.6	
			F	23 49	
104	June 9	Id	iPNZ	AH 20 13 45.5	
			F	21 04	
105	June 9	Id	iPZ	H 09 25 35.7	
			iSZ	H 38.1	
			iZ	H 39.2	
			F	09 26	
106	June 9	Id	iPZ	H 09 40 35.8	U.S.C.G.S.: 28.5°N, 112°W
			iSZ	H 38.4	
			F	09 41	
107	June 10	IIId	iPNZ	AH 03 57 29.7	Pass Kurile Islands
			iSNEZ	AH 31.0	
			F	03 58	
108	June 10	Id	iPZ	H 05 55 35.4	See list, p. 38
			ePN	A 36	
			iSNZ	AH 41.8	
			F	05 57	
109	June 10	Id	iPZ	H 06 34 50.4	U.S.C.G.S.: 14.5°N, 93°W
			iSZ	H 54.6	
			F	06 35	

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
110	June 13	Iu	ePNZ	AH	05	22 49	U.S.C.G.S.: 43°N, 142°E
			ePZ	G		49	
			ePE	G	23	02	
			ePN	G		05	
			iSE	G	31	45	
			eSNE	A	32	05	
			iSN	G		05	
			eLZ	G	43	46	
			eLNE	A		44.0	
			F		08	12	
111	June 13	Iu	ePE	G	08	48 14	Aftershock
			iPN	G		25	
			iPZ	G	48	11	
			iSE	G	57	10	
			iSZ	G		12	
			iSN	G		13	
			eLZ	G	09	10 15	
			F		10	49	
112	June 13	Iu	iPZ	G	17	50 30	Aftershock
			iSNE	G		59 28	
			eZ	G	18	11 39	
			eE	G	13	04	
			F		19	17	
113	June 14	Id	iPZ	H	02	13 22.9	
			iSNE	A		32.4	
			F		02	14	
114	June 14	IIr	iPZ	G	17	26 22	U.S.C.G.S.: 28.5°N, 112°W
			eSNE	G		29 13	
			eSZ	G		25	
			F		17	54	
115	June 15	Iu	iPZ	G	11	21 58	Pas: Kurile Islands
			iPNE	G		22 01	
			eSNE	G		31 01	
			eSZ	G		02	
			eLZ	G		43	
			F		13	08	
116	June 15	IIIr	ePE	A	18	28 35	U.S.C.G.S.: 14.5°N, 93°W
			ePNZ	AG		36	
			iPNE	G		37	
			ePPN	A		55	
			ePPE	A		59	
			iSN	G	34	10	
			iSE	G		21	
			eLE	A	38	55	
			eLN	A		57	
			eMZ	G		42 00	
			F		22	01	

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
	1943				
117	June 20	Iu	ePPZ ePPE eN eLE eLN eLZ F	G 15 52 28 G 31 G 59 23 G 16 18 07 G 20 33 G 28 52 17 14	Pas: Destructive at Adabazar, Turkey.
118	June 20	Id	iPZ iZ iZ F	H 18 15 30.0 H 31.1 H 32.6 18 16	
119	June 21	Id	iPZ iSZ F	H 01 23 31.3 H 33.0 01 24	
120	June 21	Id	iPZ iSZ F	H 05 00 09.6 H 13.1 05 00.5	Pas approximately 15°N, 175°W. A - 150 cm.
121	June 21	Id	iPZ iSZ iZ F	H 09 24 06.3 H 07.1 H 11.0 09 24.5	
122	June 21	Id	iPZ lSZ F	H 09 30 16.6 H 17.5 09 30.5	
123	June 22	Ir	iPZ F	H 15 32 09.1 15 34	
124	June 22	Id	iPNZ iPE lSZ iN iZ iE F	AH 18 50 07.4 A 08.0 H 09.4 A 13.6 H 14.4 A 15.4 18 51	See list, p. 38
125	June 23	Id	iPZ lZ iZ iZ F	H 00 54 38.5 H 39.2 H 02 51 39.7 H 42.8 00 55	See list, p. 38
126	June 23	Id	iPZ ePNE iSZ F	H 10 44 35.1 A 35 H 35.8 10 45	See list, p. 38

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
127	June 24	Iu	iPEZ iSE LSN iZ eLZ eLE F	G 20 33 57 G 44 07 G 11 G 45 27 G 21 03 17 G 23 21 47	Pas: Approximately 15°S, 168°E
128	June 25	Iv	ePZ iSZ iSZ eSN eSE eN eE F	H 17 00 55 G 01 11 H 12.0 G 13 G 14 A 15 G 03 30 17 06	Humboldt County, near Miranda.
129	June 25	Iu	iPNEZ iPZ iNE eN eE F	G 19 26 21 H 21.1 G 33 28 G 36 58 G 37 01 20 01	Pas: Approximately 18°S, 178°W. h = 550 cm.
130	June 26	Id	iPZ iZ iNE F	H 01 14 03.2 H 06.1 A 12.4 01 14.5	
131	June 26	Id	iPZ iSZ F	H 18 07 44.6 H 46.1 18 08	
132	June 26	Id	iPZ iSZ F	H 22 04 01.1 H 03.3 22 04.5	
133	June 26	Id	iPZ F	H 22 19 55.2 22 20	
134	June 27	Id	iPZ F	H 05 11 36.3 05 12	
135	June 29	Id	iPZ iZ F	H 02 51 20.1 H 23.1 02 52	See list, p. 38
136	June 29	IIId	iPNEZ iSNE iNE F	AH 04 54 32.5 A 40.0 A 46.9 04 58	See list, p. 38

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
137	June 30	Iu	iPZ iZ F	H 11 06 H 07 11 10	34.3 34.5		Pas: Roughly 7°S, 121°E h = 700 km.
138	June 30	Id	iPZ ePE ePN iSE F	H 15 18 A A A 15 20	40.9 41.5 42.2 42.9		

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Latitude and Longitude:
 $\phi = 37^{\circ} 20' 14''$ N.
 $\lambda = 122^{\circ} 30' 16''$ W.

Time -- All determinations are reduced to Universal Time.

Altitude -- 1201.7 meters (4270 feet) above mean sea level.

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Apparatus	Component	V	T ₀	E
Wood-Anderson	E	3000	1	15
	N	3000	1	15

MOUNT HAMILTON

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MOUNT HAMILTON, CALIFORNIA

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Latitude and Longitude:

$$\phi = 37^{\circ} 20' 14'' \text{ N.}$$

$$\lambda = 121^{\circ} 38' 16'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 1281.7 meters (4205 feet) above mean sea level.

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Apparatus	Component	V	T ₀	ε
Wood-Anderson.....	E	3000	1	15
	N	3000	1	15

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Apr. 1	Id	ePNE iSNE F	08	14	08 10.9 15	
2	Apr. 1	Iv	ePNE iSNE F	21	07	18 47.8 09	Aftershock of earthquake of March 29, 1943, 23-59-47 GCT
3	Apr. 2	Id	iPN iSE iSN F	04	03	19.0 24.3 25.0 04 04	Foreshock
4	Apr. 2	Id	iPNE iSNE F	08	25	26.3 32.3 08 26	Foreshock
5	Apr. 2	Id	iPNE iSE iSN F	11	30	35.4 40.6 41.0 11 31	Foreshock
6	Apr. 2	Id	iPNE iSNE F	11	31	38.8 44.4 11 33	Foreshock
7	Apr. 2	Id	iPNE iSE iSN F	13	40	03.4 41 08.3 08.8 13 42	See list, p. 37
8	Apr. 2	Id	iPNE iSE iSN F	13	51	17.0 23.3 23.9 13 52	Aftershock
9	Apr. 2	Id	iPNE iSE iSN F	13	52	04.8 53 10.2 11.5 13 58	Aftershock
10	Apr. 3	Id	iPNE iSNE F	00	17	58.8 18 04.0 00 19	Aftershock
11	Apr. 5	Id	iPNE iSE iSN F	06	24	55.9 25 01.2 02.2 06 26	See list, p. 37

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				.h.	m.	s.	
	1943						
12	Apr. 6	Iu	iPNE eSN iSE eLN eLE F	16	19	39.5 29 55 57.0 42 23 45 58 17 48	U.S.C.G.S.: 32°S, 70°W Pas: 30-3/4°S, 72°W
13	Apr. 7	Id	iPN iN F	00	15	07.6 14.7 00 18	See list, p. 37
14	Apr. 7	Id	iPN iSN F	14	44	15.5 21.6 14 45	
15	Apr. 8	Id	iPN iN iSN iSE F	00	13	10.6 13.1 15.5 16.0 00 15	See list, p. 37
16	Apr. 9	Id	iPNE iSNE F	03	17	32.7 45.5 03 19	See list, p. 37
17	Apr. 9	Iu	ePNE eSN eSE F	09	00	10 49 51 09 12	U.S.C.G.S.: 19°N, 145°E h = 100 km.
18	Apr. 9	Id	ePNE eSE eSN F	16	29	41.4 56.9 57.4 16 30	U.S.C.G.S.: 19°N, 145°E h = 100 km. Main Livermore shock. In addition to those listed, 8 foreshocks and 20 after- shocks were recorded.
19	Apr. 11	Id	iPN iSE iSN F	02	13	27.7 33.7 34.2 02 14	Foreshock
20	Apr. 11	Id	iPN iE iN F	02	16	36.7 42.2 47.2 02 18	See list, p. 37
21	Apr. 12	Id	iPN iSE iSN F	05	06	37.6 42.5 43.5 05 08	Near Livermore.
22	Apr. 12	Id	iPN iSNE F	21	20	49.4 55.0 21 22	See list, p. 37

MT. HAMILTON

No.	Date	Character	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
23	Apr. 12	Id	iPNE iSE iSN F	21 35 39.0 44.0 44.5 21 37	Aftershock
24	Apr. 12	Id	iPNE iSE iSN F	21 36 30.0 34.0 34.7 21 38	Aftershock
25	Apr. 12	Id	iPNE iSE iSN F	21 39 58.3 40.02.5 02.9 21 41	Aftershock
26	Apr. 14	Id	iPNE iSNE F	21 56 57.3 57 02.8 21 58	Foreshock
27	Apr. 15	IIId	iPE ePN iSE F	12 28 17.8 18.1 22.9 12 30	See list, p. 37 Foreshock
28	Apr. 15	IIId	iPNE F	15 23 10.8 15 27	See list, p. 37 Large Foreshock
29	Apr. 15	IIId	iPNE F	15 31 09.3 15 34	See list, p. 37 Main Livermore shock. In addition to those listed, 8 foreshocks and 20 after- shocks were recorded.
30	Apr. 15	IIId	iPNE iSNE F	15 33 41.2 45.7 15 35	Aftershock
31	Apr. 15	IIId	iPNE F	15 37 22.4 15 41	Aftershock
32	Apr. 15	IIId	iPNE iSE F	17 59 26.4 31.4 18 04	Aftershock
33	Apr. 15	IIId	iPNE iSNE F	22 07 49.5 54.8 22 11	Aftershock
34	Apr. 16	Id	iPNE iSNE F	10 44 28.0 33.4 10 46	Aftershock

MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
35	Apr. 17	Id	iPNE iSN iSE F	19 59 11.7 19.3 19.8 20 91	See list, p. 37
36	Apr. 20	Id	iPNE iSNE F	02 00 25.8 29.7 02 02	See list, p. 37
37	Apr. 21	Id	iPNE iSNE F	02 18 55.9 19 08.5 02 20	See list, p. 37
38	Apr. 21	Id	iPNE iSNE F	09 01 37.9 49.4 09 03	See list, p. 37
39	Apr. 21	Id	iPNE iSE F	17 12 11.2 16.3 17 15	Foreshock Aftershock
40	Apr. 21	Id	iPNE iSNE F	23 28 18.2 26.3 23 31	Foreshock Aftershock Intensity V in Livermore.
41	Apr. 21	Id	iPNE iSE F	23 39 50.5 55.3 23 44	See list, p. 37 Main shock. Aftershock
42	Apr. 21	Id	iPNE iSE iSN F	23 47 33.8 38.8 39.4 23 48	Aftershock Aftershock Aftershock h = 50-100 km.
43	Apr. 21	Id	iPNE iSE iSNE F	23 58 03.2 07.8 35.1 00 03	Aftershock
44	Apr. 21	Id	iPNE iPE iSNE F	23 58 29.8 30.3 35.1 23 59	Aftershock
45	Apr. 23	Id	iPNE iSNE F	12 06 03.1 08.1 12 07	Aftershock
46	Apr. 26	IID	iPNE iSE F	11 54 07.0 11.9 11 58	See list, p. 37 In addition to those listed, there were 6 after-shocks recorded.

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
47	Apr. 26	IIId	iPNE iSE F	12 02	12.8 18.4		Aftershock
				12 03			
48	Apr. 26	IIId	iPNE iSNE iE F	18 23	53.2 58.3 13.7		Aftershock
				18 26			
49	Apr. 27	IIId	iPNE iSNE iE F	00 40	00.7 06.1 09.6		Aftershock
				00 42			
50	Apr. 29	Id	iPNE iSNE F	06 10	47.3 52.4		Aftershock
				06 12			
51	Apr. 29	Id	iPNE iSE F	08 09	33.9 41.4		Aftershock
				08 11			
52	May 1	Id	iPN iPE iSE F	02 51	41.7 42.6 48.1		Aftershock Intensity V in Livermore.
				02 53			
53	May 2	Id	iPNE iSNE F	15 16	56.8 01.9		Aftershock
				15 18			
54	May 2	Iu	ePNE iPE eSE eSN eLNE F	17 26	50 55.0 53 59 46		U.S.C.G.S.: 6.4°N, 80.1°W h = 50-100 km.
				18 06			
55	May 5	Id	iPNE iSE iSN F	11 48	07.2 12.2 12.7		Livermore shock
				11 49			
56	May 7	Id	iPNE iSN iSE F	02 01	20.0 31.5 31.9		See list, p. 37
				02 03			
57	May 8	Id	iPNE iSNE F	12 29	46.3 51.5		See list, p. 37
				12 32			

MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
58	May 17	Id	iPNE iSNE F	07 43 39.9 45.6 07 45	
59	May 19	Id	ePNE iSNE F	12 04 24.6 32.3 12 06	See list, p. 38
60	May 25	Iu	ePNE ePPE eLN eLE F	23 21 38 25 49 49 41 54 06 00 26	U.S.C.G.S.: 7.5°N, 126.5°E
61	May 26	Ir	ePNE F	10 36 44 10 55	U.S.C.G.S.: 17.5°N, 106.5°W
62	May 27	Id	iPNE iSNE F	06 10 08.7 14.4 06 11	See list, p. 38
63	May 29	Id	ePE ePN iSNE F	04 57 12.0 12.6 58 17.0 04 58	See list, p. 38
64	May 30	IIId	iPNE iSE F	01 04 16.2 21.5 01 08	See list, p. 38
65	May 30	Id	ePN ePE iSE iSN F	01 15 25.0 26.0 29.9 31.0 01 17	Aftershock
66	May 31	Iv	iPNE iSNE F	20 17 34.5 50.5 20 21	Round Valley, Inyo County
67	June 2	Id	iPNE iSN iSE F	02 52 54.0 57.0 57.4 02 54	
68	June 2	Id	iPNE iSNE F	23 57 57.6 58.6 23 58	
69	June 10	Id	iPNE iSE iSE F	05 55 33.5 38.7 41.7 05 57	See list, p. 38

MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
70	June 13	Iu	ePE ePN eN eE eLE eLN F	05 22 54 59 23 12 13 45 40 46 28 05 58	U.S.C.G.S.: 43°N, 142°E
71	June 15	Ir	ePNE ePPE eLE eLN F	18 28 32 46 39 50 57 18 57	U.S.C.G.S.: 14.5°N, 93°W
72	June 22	Iv	ePN eSN iSN F	15 32 04.0 29.7 32.9 15 34	
73	June 24	Id	ePN iSN iN F	17 41 14.5 24.2 25.8 17 43	San Benito County, near Hollister.
74	June 25	Iv	ePN eN F	17 01 05 26 17 03	Humboldt County, near Miranda.
75	June 29	Id	iPN iSN F	02 51 11.6 24.9 02 53	See list, p. 38
76	June 29	Id	iPN iSN F	04 54 30.9 36.7 04 57	See list, p. 38

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

1	Apr. 1	Id	178E 180E 182E P	21 07 21.6 53.7 54.2 21 09	Aftershock of quake of March 29, 1943. 23-57-47 G.C.T.
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2	Apr. 1	Id	178E 178E 182E P	01 01 34.5 34.5 37.5 01 03	Foreshock
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CONSTANTS

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Latitude and longitude:

$$\phi = 37^{\circ} 25' 11'' \text{ N.}$$

$$\lambda = 122^{\circ} 10' 18'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 83 meters (272 feet) above mean sea level.

6	Apr. 2	Id	178E 182E	13 51 15.0 24.8	Aftershock
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CONSTANTS OF THE SEISMOGRAPHS

7	Apr. 3	Id	178E 182E	00 17 58.6 28 22.8	Aftershock
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Apparatus	Component	V	T ₀	ε
Wood-Anderson.....	E	3000	1	15
	N	3000	1	15

9	Apr. 6	Id	178E 182E 182E P	16 19 42 29 59 42 11 47 11 16 29	U.S.G.C.S. 32°N, 70°W Dist 30-3/4°N, 72°W
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10	Apr. 7	Id	178E 178E 182E P	00 15 09.2 09.7 14.6 20 17.5	See list, p. 37
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11	Apr. 8	Id	178E 178E 182E P	00 13 11.4 12.9 17.7 18.4 00 14.5	See list, p. 37
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PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
1	Apr. 1	Iv	ePNE iSN iSE F	21 07 21 09	21.4 53.7 54.4	Aftershock of quake of March 29, 1943, 23-59-47 G.C.T.
2	Apr. 1	Id	iPE iPN iSNE F	01 01 01 03	34.5 34.9 37.5	Foreshock
3	Apr. 2	Id	iPNE iSNE F	08 25 08 29	30.5 34.4	Foreshock
4	Apr. 2	Id	iPNE iSNE F	11 30 11 32+	38.2 42.8	Foreshock
5	Apr. 2	Id	ePNE iSN iSE F	13 40 13 42	05.2 10.5 10.9	See list, p. 37
6	Apr. 2	Id	iPE iSNE F	13 51 13 52	15.8 24.8	Aftershock
7	Apr. 3	Id	iPNE iSNE F	00 17 00 18 00 20	58.5 03.9	Aftershock
8	Apr. 5	Id	ePE ePN iSNE F	06 24 06 25 06 26	58.5 59.5 03.0	See list, p. 37
9	Apr. 6	IIu	ePNE eSNE eGNE eLNE F	16 19 16 29 16 42 16 47 16 29	41 59 11 11	U.S.C.G.S.: 32°S, 70°W Pas: 30-3/4°S, 72°W
10	Apr. 7	Id	iPE iPN iSE F	00 15 00 17.5	09.2 09.7 14.6	See list, p. 37
11	Apr. 8	Id	iPE iPN iSE iSN F	00 13 00 14.5	11.4 12.9 17.7 18.4	See list, p. 37

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
	1943				
12	Apr. 9	Iv	iPN ePE iSNE F	03 17 38.3 40 54.2 03 19	See list, p. 37 Main Livermore shock. In addition to those listed 7 foreshocks and 27 after- shocks were recorded.
13	Apr. 9	Iu	iPE iPN eSE F	09 00 53.6 54.8 10 31 09 11	U.S.C.G.S.: 19°N, 145°E h = 100 km.
14	Apr. 11	Id	iPNE iSNE F	02 16 37.9 43.4 02 18	See list, p. 37
15	Apr. 12	Id	iPE iPN iSNE F	05 06 40.0 40.9 44.7 05 09	Near Livermore. Aftershock
16	Apr. 12	Id	iPNE iSE F	21 20 50.8 56.3 21 24	See list, p. 37 See list, p. 37
17	Apr. 12	Id	iPE iPN iSNE F	21 35 41.2 42.2 46.4 21 36.5	Aftershock
18	Apr. 12	Id	iPNE iSE iSN F	21 36 30.5ca 35.6 36.2 21 39	Aftershock See list, p. 37
19	Apr. 12	Id	iPNE iSNE F	21 40 00.5 04.8 21 41.5	Aftershock See list, p. 37
20	Apr. 14	Id	iPNE iSNE F	21 57 01.4 04.3 21 58.5	See list, p. 37
21	Apr. 15	IIId	iPNE iE iNE F	12 28 19.2 24.7 28.3 12 31	See list, p. 37 Foreshock Foreshock
22	Apr. 15	IIId	iPNE iE F	15 23 12.1 16.8 15 30	See list, p. 37 Large Foreshock Foreshock

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
23	Apr. 15	IIId	iPNE F	15 31 11.4 15 34	See list, p. 37 Main Livermore shock. In addition to those listed, 7 foreshocks and 27 after- shocks were recorded.
24	Apr. 15	IIId	iPNE iSE F	15 33 43.0 51.0 15 34	Aftershock
25	Apr. 15	IIId	iPNE F	15 37 24.3 15 42	Aftershock
26	Apr. 15	IIId	iPNE iSNE F	22 07 51.4 56.7 22 09	Aftershock
27	Apr. 15	IIId	iPE iPN F	17 59 28.0 28.4 18 06	Aftershock
28	Apr. 17	Id	iPNE iSE iS*NE F	19 59 17.5 28.3 30.5 20 01.5	See list, p. 37
29	Apr. 18	Id	iPNE iSNE F	19 31 27.2 28.4 19 32.5	
30	Apr. 20	Id	iPNE iSE iSNE F	02 00 26.0 31.6 34.7 02 02	See list, p. 37
31	Apr. 21	Iv	iPNE iSN F	02 19 02.6 19.8 02 02.5	See list, p. 37
32	Apr. 21	Iv	iPNE iSNE F	09 01 43.2 59.2 09 04	See list, p. 37
33	Apr. 21	IIId	iPE iPN iSNE F	17 12 11.7 12.1 14.9 17 16	Foreshock
34	Apr. 21	IIId	iPNE iSNE F	23 28 19.1 21.2 23 22	Foreshock

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
	1943				
35	Apr. 21	IIId	iPNE iSE F	23 39 52.6 57.8 23 47	See list, p. 37 Main shock.
36	Apr. 21	IIId	iPNE iSNE F	23 58 04.9 07.4 00 01	Aftershock
37	Apr. 21	Id	iPNE F	23 58 33.3 00 01	Aftershock
38	Apr. 26	IIId	iPNE iSNE F	11 54 08.2 13.7 11 59	See list, p. 37
39	Apr. 26	Id	iPE iPN iSNE F	12 01 32.5 33.5 37.8 12 02.5	Aftershock
40	Apr. 26	Id	iPNE iSNE F	12 02 14.5 19.9 12 05	Aftershock
41	Apr. 26	Id	iPE iPN iSNE F	13 07 52.1 53.1 57.1 13 09	
42	Apr. 26	Id	iPNE iSNE F	18 23 54.7 24 00.3 18 26	Aftershock
43	Apr. 27	Id	iPNE iSNE F	00 40 01.9 07.9 00 43.5	Aftershock
44	Apr. 27	Id	ePE iSNE F	12 00 41 46.4 12 02	Aftershock
45	Apr. 29	Id	iPNE iSNE F	06 10 49.6 55.1 06.13	Aftershock
46	Apr. 29	Id	iPNE iSNE F	08 09 35.5 40.7 08 11	Aftershock
47	Apr. 29	IIId	iPNE iSE F	22 13 31.6 33.6 22 15	

PALO ALTO

No.	Date	Char-acter	Phase	Time		Remarks
				(U.T.)		
				h.	m.	s.
	1943					
48	May 1	Id	iPNE iSNE F	02 51 48.8 02 54	42.8	Aftershock Intensity V in Livermore.
49	May 2	Id	iPNE iSNE F	15 16 17 05.4 15 19	58.6	Aftershock
50	May 2	Iu	ePNE eSNE eLNE F	17 26 34 59 40 28 18 06	56	U.S.C.G.S.: 6.4°N, 80.1°W h = 50-100 km.
51	May 5	Id		11 48		S-P = 05.4 Sec. Livermore shock.
52	May 7	Id	iPNE iSE iSN F	02 01 41.7 42.7 02 03	27.2	See list, p. 37
53	May 8	Id	iPNE iSNE F	12 29 53.8 12 32	48.3	See list, p. 37
54	May 12	Id	iPNE iSN iSE F	21 10 50.5 51.2 21 11	48.5	
55	May 17	Id	ePE iPN iSNE F	07 43 43.5 47.8 07 44.5	42.2	
56	May 19	Id	iPNE iSE F	12 04 40.9 12 06	31.0	See list, p. 38
57	May 19	Id	iPNE iSE F	12 08 09 04.2 12 09.5	55.0	Aftershock
58	May 25	Iu	ePNE ePPNE eLN eE F	23 21 25 27 50 25 52 53 00 22	32	U.S.C.G.S.: 7.5°N, 126.5°E
59	May 26	Ir	iPE iPN F	10 36 48.7 49.8 10 49	48.7	U.S.C.G.S.: 17.5°N, 106.5°W

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
60	May 27	Id	ePNE iSNE F	06 10 11.2 16.8 06 11		See list, p. 38
61	May 29	Id	iPNE iSNE F	04 57 12.9 18.4 04 58		See list, p. 38
62	May 30	IId	iPNE iSNE F	01 04 17.1 22.8 01 08		See list, p. 38
63	May 30	Id	ePNE iSNE F	01 15 26.9 31.0 01 17		Aftershock
64	May 31	Iv	iPNE iNE iSN iSE F	20 17 40.4 48.2 18 18.6 19.2 20 21		Round Valley, Inyo County
65	June 4	Iv	ePNE eSE F	02 20 16.0 48.0 02 22		See list, p. 38
66	June 8	Iu	ePE eNE F	12 14 58 25 44 12 48		
67	June 9	Id	iPNE iSNE F	05 48 55.3 58.6 05 49.5		
68	June 10	Id	iPNE eSN F	05 55 34.2 43.6 05 57		See list, p. 38
69	June 13	Iu	ePE ePN eLE eLN F	05 23 01 02 45.5 46.5 05 51		U.S.C.G.S.: 43°N, 142°E
70	June 19	Id	iPNE eSN F	16 08 25.0 27.8 16 09		
71	June 20	Id	iPNE iSN F	19 57 46.6 48.2 19 58		

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
72	June 22	Iv	iPE iSE F	15	32	09.1 44.4	
73	June 22	Id	iPNE iSNE F	18	50	16.3 30.1	See list, p. 38
74	June 24	Id	ePN iSN F	17	41	23.6 32.8	San Benito County, near Hollister.
75	June 25	Iv	ePNE iN iE F	17	01	01.1 02 01.6 05.6	Humboldt County, near Miranda.
76	June 29	Iv	iPNE iSNE iSN F	02	51	16.4 33.3 35.3	See list, p. 38
77	June 29	Id	iPNE iPN iPE F	04	54	33.2 36.8 37.8	See list, p. 38

SAN FRANCISCO

THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO
 SAN FRANCISCO, CALIFORNIA

1 Apr. 25 III 10 54 3-7 + 6.9 Sec.
 2 Apr. 25
 From 1304 to 2315 there were 6 II d's and 24 I d's with an S-P of 8 Sec.

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Latitude and longitude:

$$\phi = 37^{\circ} 46' 14'' \text{ N.}$$

$$\lambda = 122^{\circ} 27' 12'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 100 meters (328 feet) above mean sea level.

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Apparatus	Component	V	T ₀	ξ
Wood-Anderson	E 15° S	1500	1	15
	N	3000	1	15

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Apr. 15	Id		10 54	S-P = 6.9 Sec.
2	Apr. 16				From 1302 to 2315 there were 4 II d's and 24 I d's with an S-P of 8 Sec.
3	Apr. 21	IIId		17 12	Foreshock
4	Apr. 21	IIId		23 28	Foreshock
5	Apr. 21	IIId		23 40	Main shock. See list, p.37
6	Apr. 21	IIId		23 57	Aftershock
7	June 22	Id		18 50	S-P = 3.8 Sec. See list, p. 38

FERNDALE

THE FERNDALE STATION
 FERNDALE, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:

$$\begin{aligned} \phi &= 40^{\circ} 34' \text{ N.} \\ \lambda &= 124^{\circ} 16' \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 17 meters (55 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Bosch-Omori 25 kg.	E	12	11	5
	N	12	8	6

The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.

FERNDALE

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Apr. 6	Iu	iPNE iSE iSN iSSN iSSE eLNE eN eE F	16 19 00 29 34 41 35 29 34 40 28 52 35 53 00 18 19	U.S.C.G.S.: 32°S, 70°W Pas: 30-3/4°S, 72°W
2	Apr. 15	Iu	ePN ePE F	10 57 20 24 11 04	
3	Apr. 15	Iu	ePNE eSE eSN F	15 24 32 32 26 34 15 41	
4	Apr. 15	Iv	ePN ePE eSN F	18 00 18 46 02 06 18 06	Livermore aftershock. U.S.C.G.S.: 43°N, 144°W
5	Apr. 18	Id	iPNE iSNE F	19 37 35 41 19 39	
6	May 2	Iu	iPN iPE iPcPN eLN eLE F	17 26 19 22 27 34 41 32 42 10 18 23	U.S.C.G.S.: 6.4°N, 80.1°W h = 50-100 km.
7	May 23	IIId	iPN ePE iSNE F	11 38 12 14 18 11 40	Hamilton County, Tenn. Kirtland.
8	May 25	Id	iPN iSE F	11 49 24 33 11 51	
9	May 25	Iu	ePE iP'E iP'N iSKSE eLN eLE F	23 21 42 24 51 25 02 31 25 49 30 51 16 00 56	U.S.C.G.S.: 7.5°N, 126.5°E

FERNDALE

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
10	June 2	Iv	iPE	15 52 42	
			iPN	44	
			iSE	58	
			iSN	53 00	
			F	15 54	
11	June 6	Id	iPNE	07 02 33	
			iSN	38	
			iSE	40	
			F	07 03	
12	June 8	Iu	ePE	21 02 40	U.S.C.G.S.: 30°S, 102.5°E
			ePN	03 00	
			eLE	50	
			eLN	22 01	
			F	22 58	
13	June 9	Iu	eLE	04 14	U.S.C.G.S.: Probably Tongan region. h = 600 km. ca.
			eLN	17	
			F	05 16	
14	June 13	Iu	ePN	05 21 43	U.S.C.G.S.: 43°N, 142°E
			ePE	46	
			eSNE	30 30	
			eLE	43 20	
			F	06 50	
15	June 14	Ir	ePN	17 31 16	U.S.C.G.S.: 28.5°N, 112°W
			ePE	43	
			F	17 41	
16	June 15	Ir	ePE	18 28 00	U.S.C.G.S.: 14.5°N, 93°W
			eE	40 00	
			F	19 10	
17	June 25	Id	iPNE	17 00 47	Humboldt County, near Miranda.
			iSNE	52	
			F	17 03	

FRESNO

THE FRESNO STATION, FRESNO STATE COLLEGE
FRESNO, CALIFORNIA

CONSTANTS

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Latitude and longitude:

$$\phi = 36^{\circ} 46' \text{ N.}$$

$$\lambda = 119^{\circ} 47' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 88.4 meters (290 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson	N	3000	0.9	15

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Apr. 1	Iv	ePN iSN F	21	07	26.8 58.6	Aftershock of quake of March 29, 1943, 23-59-47 G.C.T.
2	Apr. 4	Iv	iPN iSN F	15	49	12.3 31.0	
3	Apr. 4	Iv	iPN iSN F	15	52	17.2 36.6	Obscured by train.
4	Apr. 6	Iu	iPN eSN eLN F	16	19	31.6 29 41 46 41	U.S.C.G.S.: 32°S, 70°W Pas: 30-3/4°S, 72°W
5	Apr. 6	Iv	iPN iSN F	22	37	03.4 32.1	
6	Apr. 7	Iv	ePN iN F	00	15	38.3 16 12.2	See list, p. 37
7	Apr. 9	Iv	iPN iSN F	03	17	38.1 52.6	See list, p. 37
8	Apr. 9	Iu	iPN F	09	01	08.7	U.S.C.G.S.: 19°N, 145°E h = 100 km.
9	Apr. 15	Iv	iPN iS*N eN F	15	23	20ca 24 02.1 26 26	See list, p. 37 Large foreshock.
10	Apr. 15	IIv	iPN iSN eN F	15	31	34.4 54.9 34 26	See list, p. 37 Main Livermore shock.
11	Apr. 15	Iv	iPN iSN F	15	37	48.3 38 16.6	Aftershock
12	Apr. 15	Iv	iPN iSN F	17	59	54.7 18 00 15.6 18 08	Aftershock
13	Apr. 17	Iv	ePN iSN F	19	59	28.7 44.4	See list, p. 37
				20	02		

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
14	Apr. 21	Id	iSN F	02 19 02 20	10.9	See list, p.37
15	Apr. 21	Id	ePN iSN iN F	09 01 02 01.6 09 05	46 58.3	See list, p.37
16	Apr. 21	Iv	iPN iSN F	05 30 05 32	11.4 38.2	
17	Apr. 21	Iv	ePN iN iSN F	17 12 13 01.5 17 17	40 46.7	Foreshock
18	Apr. 21	Iv	ePN iSN F	23 28 23 34	45 58.0	Foreshock
19	Apr. 21	Iv	ePN iSN eN F	23 40 42 58 23 48	16.5 39.4	Main shock. See list, p. 37
20	Apr. 21	Iv	ePN iSN F	23 58 00 04	32.5 52.1	Aftershock
21	Apr. 24	Iv	iPN iSN F	01 12 13 11.9 01 15	47.4	
22	Apr. 26	Iv	ePN iSN iN eN F	11 54 55 06.8 57 23 12 02	33.8 55.8	See list, p. 37
23	May 2	Iu	ePN iPN eLN F	17 26 43 17 59	36 43.7	U.S.C.G.S.: 6.4°N, 80.1°W h = 50-100 km.
24	May 3	Id	iPN iSN F	07 31 07 33	35.1 36.0	
25	May 5	Iv	iPN iSN F	11 58 59 05.4 12 01	46.0	

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
26	May 7	Iv	ePN iSN F	02 01	27.3 42.2		See list, p. 37
27	May 8	Iv	ePN ePN eSN F	12 30	18 21 42		See list, p. 37
28	May 25	Iu	ePN ePPN eLN F	23 22	01 26 14 50 59		U.S.C.G.S.: 7.5°N, 126.5°E
29	May 26	Ir	iPN F	10 36	30.6		U.S.C.G.S.: 17.5°N, 106.5°W
30	May 30	Iv	ePN ePN iN F	01 04	43.9 46.0 05 02.4		See list, p. 38
31	May 30	Iv	iPN iSN F	07 51	26.2 45.6		
32	May 31	IIv	iPN iN iSN F	20 17	13.5 14.1 28.7		Round Valley, Inyo County.
33	June 6	Iv	iPN iSN F	04 54	20.1 37.3		
34	June 7	Iv	ePN iPN iN eN F	15 20	28.3 29.8 32.5 22 00.0		
35	June 11	Iv	iPN iSN F	15 24	02.5 22.1		
36	June 13	Iu	ePN eSN F	05 23	03 32 26		U.S.C.G.S.: 43°N, 142°E
37	June 14	Ir	ePN eSN F	17 28	28 31 15		U.S.C.G.S.: 28.5°N, 112°W

FRESNO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
38	Apr. 15	Ir	ePN F	18 28 16 18 53	U.S.C.G.S.: 14.5°N, 93°W
39	Apr. 16	Id	iSN eSN F	19 59 27.0 29.6 20 00	
40	Apr. 18	Iv	ePN iSN F	16 17 12 18 11.1 16 21	
41	Apr. 24	Id	eSN iSN F	17 41 37.5 38.4 17 42	San Benito County, near Hollister.
42	Apr. 29	Id	iSN F	02 51 28.3 02 52	See list, p. 38
43	Apr. 29	Id	ePN F	04 55 04.4 04 59	See list, p. 38

Bulletin of the Seismographic Stations

Volume 13, No. 3, pp. 83-116



**EARTHQUAKES IN NORTHERN CALIFORNIA
AND
THE REGISTRATION OF EARTHQUAKES
AT
BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE—FRESNO**

From July 1, 1943, to September 30, 1943

BY
CHARLES HERRICK
AND
CAROLYN H. PENDERY

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES
1950

UNIVERSITY OF CALIFORNIA PRESS
BULLETIN OF THE SEISMOGRAPHIC STATIONS

CALIFORNIA

UNIVERSITY PRESS

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EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California earthquakes on the following page, when sufficient information on the effects of the quake is available. Criteria of the Modified Mercalli

CONTENTS

	Page
EARTHQUAKES IN NORTHERN CALIFORNIA	87
THE REGISTRATION OF EARTHQUAKES	88
II Symbols and Notations Employed	89
BERKELEY	90
III Constants	90
IV Tabulation of Shocks	91
MOUNT HAMILTON	98
VI Constants	98
Tabulation of Shocks	99
PALO ALTO	102
C Constants	102
Tabulation of Shocks	103
SAN FRANCISCO	108
Constants	108
Tabulation of Shocks	109
FERNDALE	110
C Constants	110
Tabulation of Shocks	111
FRESNO	113
Constants	113
Tabulation of Shocks	114

EARTHQUAKE INTENSITY SCALE

Intensities are given by Roman numerals in the list of California earthquakes on the following page, when sufficient information on the effects of the quake is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

No.	Date	Time	Magnitude	North	West	Quality
<u>Intensity</u>						
1	05-13-43		2.9	37° 57'	121° 50'	a
2						b
3			3.2	37° 58'	121° 50'	b
4	19-04-43		3.5	37° 58'	121° 50'	c
5						d
6	Sept. 1	17-06-40	3.5	36° 58'	121° 50'	e
7						d
8	13	11-10-43	2.6	37° 58'	121° 50'	c
9						d
10	26	05-12-46	3.5	37° 30'	121° 48'	b

EARTHQUAKE MAGNITUDE SCALE

Richter magnitudes given in the list of epicenters on the next page are found from the Wood-Anderson amplitudes, using the nomogram by Nordquist, "Bulletin of the Seismological Society of America," 32:164.

- - - - -

Latitude and longitude are given for each epicenter in the following list. Only those earthquakes are given numbers for which epicenters were located. The letter represents the excellence with which the epicenter has been located, a indicating excellent, b good, c fair, d poor.

EARTHQUAKES IN NORTHERN CALIFORNIA

1943 - Pacific Standard Time

<u>No.</u>	<u>Date</u>	<u>Origin Time</u>	<u>Richter Magnitude</u>	<u>Latitude North</u>	<u>Longitude West</u>	<u>Quality</u>
1	July 5	05-13-13	2.9	37° 57'	121° 50'	c
2	5	08-30-29	3.9	36° 23'	121° 50'	c
3	6	05-35-29	3.2	37° 52'	121° 52'	b
4	26	19-04-05	3.5	37° 40'	120° 45'	c
5	Aug. 3	10-46-01	2.9	37° 3	121° 2	d
6	Sept. 1	17-06-20	2.5	36° 56'	121° 38'	c

Depth about 5 km.

7	3	15-26-09	2.9	37° 7	120° 9	d
8	13	14-10-19	2.6	37° 28'	121° 47'	c

Depth about 12 km.

9	19	01-53-30	2.4	37° 24'	121° 20'	c
10	26	09-48-26	3.5	37° 30'	121° 44'	b

IV at San Jose

BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

CONSTANTS

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Latitude and Longitude:

$\phi = 37^{\circ} 52' 13''$ N.

$\lambda = 122^{\circ} 15' 16''$ W.

Time -- All determinations are reduced to Universal Time.

SYMBOLS AND NOTATIONS EMPLOYED

Altitude -- 81 meters (266 feet) above mean sea level.

1. Character of the Seismogram--

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

Apparatus	Component	Local shock (origin less than 100 kilometers distant),	Near shock (origin from 100 to 1,000 kilometers distant),	Distant shock (origin from 1,000 to 5,000 kilometers distant),	Very distant shock or teleseism (origin more than 5,000 kilometers distant).
Wood-Anderson	E				
	H		3000	0.9	15

2. Nature of the Motion--

Galilean	i (impetus)	Sudden beginning of the motion.	μ^2	A_1 (cm)	l (cm)
	e (emersio)	Gradual beginning of the motion.	0.00	115	11.3
			0.05	119	11.2
			109	12	11.9
				0.01	131
					14.9
			V	Coupled Period	E
Benioff				0.7	5

The letter G before a reading designates that the seismogram was from the Galilean instrument; W, Wiechert; B, Bosch-Osori; A, Wood-Anderson; H, Benioff.

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 THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
 BERKELEY, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:

$$\phi = 37^{\circ} 52' 13'' \text{ N.}$$

$$\lambda = 122^{\circ} 15' 16'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 81 meters (266 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V		T_0	\mathcal{E}	$\frac{r}{T_0^2}$	
		K	T			A_1 (cm)	l (cm)
Bosch-Omori 100 kg. ...	E	45		12	10	0.001	
	N	45		12	10	0.001	
	Z	44		4	5	0.005	
Wiechert 80 kg.	E	3000		0.9	15		
	N	3000		0.9	15		
Galitzin	E	112	12	11.8	0.00	115	11.3
	N	122	12	12.4	0.03	119	11.2
	Z	109	12	11.9	0.01	131	14.9
Benioff	Z	V		Coupled Period		\mathcal{E}	
				0.7	5		

The letter G before a reading designates that the seismogram was from the Galitzin instrument; W, Wiechert, B, Bosch-Omori; A, Wood-Anderson; H, Benioff.

BERKELEY

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	July 1	Id	iPNE iPZ iSNE F	A 00 30 46.9 H 47.4 A 53.1 00 32	Near Livermore
2	July 1	Iu	iPZ F	H 04 51 15.1 04 53	Pasadena: iP 04 51 42
3	July 4	Iu	iPZ iSNE eN eE eZ F	G 10 00 11 G 06 50 G 15 46 G 16 36 G 18 04 10 25	U.S.C.G.S.: 9° N 84.5° W
4	July 5	Id	iPNEZ F	AH 13 13 20 ca 13 14	See list, p. 87 S-P = 5 sec.
5	July 5	Id	iPNE iPZ iSNE F	A 15 11 52.1 H 52.6 A 57.3 15 13	Aftershock
6	July 5	Iv	iPZ eN iZ F	H 16 30 59.3 A 31 07 H 31.6 16 34	See list, p. 87
7	July 6	Id	iPEZ iSE iE F	AH 13 35 34.8 A 39.4 A 43.6 13 37	See list, p. 87
8	July 9	Ir	iPEZ eNE eZ F	G 23 35 18 G 43 23 G 44 22 00 54	Pasadena: Alaska U.S.C.G.S.: 10.5° S 117.5° W
9	July 11	IIu	iPZ iPZ ePNE iPE iPN ipPZ ipPZ iSE iSN iN iE eN iZ F	G 02 22 59 H 23 00.2 A 23 02 G 21 02 G 23 03 H 23 43.5 G 29 44 G 33 51 G 34 30 G 46 58 G 47 05 A 49 G 50 40 05 10	Pasadena: 33° S 178.5° W h = 180 km

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
10	July 11	Id	iPZ iZ F	H 06	11	18.1 20.2 06 12	
11	July 20	Id	iPZ F	H 15	18	09.1 15 19	U.S.C.G.S.: 16.9° N 87.0° W
12	July 21	Iu	iPZ iN iE iN eE eZ eN eE F	G 04	29	51 35 02 08 39 55 45 44 49 15 37 50 07 05 36	Pasadena: South of Easter Island
13	July 22	Iv	ePN iPZ eN iPE eN iPNZ iE iSNE eSN F	A 00	11	10 21.1 22.0 26 31.0 32 37 49 49.5 00 19	Off Coast of Mendocino County Pasadena: 20° S 170° E R = 230 km
14	July 22	Iu	iPNE iPZ iSE iSN eE F	G 02	18	44 45 26 24 25 39 20 03 12	Pasadena: Ecuador Wellington: 45.5° S 166.8° E
15	July 23	Iu	iPZ iPEZ iPN iZ iE iE eN eE eZ eN F	G 15	12	03 04 08 13 54 14 54 20 43 21 49 23 19 49 29 04 17 47	U.S.C.G.S.: 10.5° S 117.5° E See list p. 87 Pasadena: 30° 12' S 118° 12' W
16	July 25	Id	iPZ iZ iZ F	H 18	28	47.2 48.8 50.3 18 29	

BERKELEY

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
17	July 27	Id	iPZ	H 18 05 11.0	
			iZ	H 18 06 12.6	
			F	18 06	
18	July 29	Iu	iPEZ	G 03 11 20	U.S.C.G.S.: 18.9° N 67.0°W
			iPN	G 03 11 22	
			ePN	A 03 11 23	
			iPZ	H 03 11 24.0	
			ePE	A 03 11 25.5	
			eSE	A 18 32	
			iSE	G 18 53	
			eN	A 23 23	
			eE	A 28 27	
			eZ	H 32 11	
			F	07 37	
19	July 30	Iu	iPE	G 01 11 30	Aftershock
			iPZ	G 01 11 34	
			iSE	G 18 57	
			iSN	G 18 59	
			iN	G 29 55	
			iE	G 31 06	
			eZ	G 32 32	
			F	02 36	
20	Aug. 1	Iu	iPZ	G 16 31 01	Pasadena: 20° S 170° E h = 230 km
			iSN	G 16 41 02	
			iSE	G 16 18	
			iSZ	G 16 20	
			F	17 45	
21	Aug. 2	IIu	ePNEZ	G 01 04 59	Wellington: 45.5° S 166.8° E
			eSKSN	G 02 14 20	
			eSKSE	G 02 24	
			eLN	G 30 22	
			eLE	G 31 33	
			eZ	G 34 49	
			F	03 55	
22	Aug. 3	Id	iPZ	H 18 46 20.7	See list p. 87
			F	18 47	
23	Aug. 9	IIv	iPZ	G 05 31 00	Pasadena: 38° 12' N 118° 12' W
			iPE	A 05 31 00.6	
			iPZ	H 05 31 01.1	
			iPN	A 05 31 01.6	
			iPE	G 05 31 02	
			iZ	H 05 31 04.1	
			ePN	G 05 31 07	
			iN	A 05 31 08.6	
			iN	G 05 31 36	
			iN	A 05 31 39.7	
			iN	G 05 31 41	

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
23	Aug. 9 (cont.)	IIv	iE iE eZ eN eN F	G 05 31 47 A 47.8 G 51 G 32 00 A 33 25 06 46	U.S.C.G.S.: 13.5° N 92.5° W Pasadena: h = 80 km
31	Sept. 2	Iv	F	06 46	See list, p. 87
24	Aug. 10	IIu	iPZ iPNE iSN iSE eLE eLZ F	G 15 22 33 G 41 G 29 57 G 58 G 38 35 G 52 17 43	U.S.C.G.S.: 54° N 161° E U.S.C.G.S.: 0° 125° E Pasadena: 4° N 123° E
25	Aug. 18	Id	iPNEZ iSE iSN F	AH 13 22 03.1 A 07.8 A 08.3 13 23	U.S.C.G.S.: 53.2° S 159.4° E
26	Aug. 19	Id	iPN iPZ iSN iSE F	A 23 05 59.3 H 59.8 A 06 02.6 A 03.6 23 07	
27	Aug. 20	Iu	ePNE eZ eLN eLE eLZ F	G 01 46 30 G 49 13 G 02 08 05 G 17 G 38 03 46	U.S.C.G.S.: 35.1° N 133.3° E
28	Aug. 27	Iu	iPZ iPE iSNE eE eN eZ F	G 00 53 38 G 54 09 G 01 04 00 G 16 02 G 32 G 21 13 02 30	U.S.C.G.S.: 16.5° S 173° W
29	Aug. 29	Iv	iPEZ iPN iPN iPEZ iSN iSE iZ iN iE F	AH 03 46 38.0 A 41.1 G 46 G 48 G 47 54 G 55 G 48 03 A 10.0 A 16.4 04 07	Pasadena: 34° 16' N 116° 58' W
36	Sept. 13	Id			See list, p. 87

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
30	Aug. 31	Ir	iPZ ePNEZ eSN F	G AH AG G	16 17 43 23 23 16 59	42 43 23 59	U.S.C.G.S.: 13.5° N 91.5° W Pasadena: h = 80 km
31	Sept. 2	Iv	iPZ F	H G	01 06 01 07	39.4	See list, p. 87
32	Sept. 5	Iu	iPE iPNZ iE iZ iN eE eN eZ F	G G G G G G G G G	08 53 03 48 59 42 09 02 03 08 09 12 19 32 24 14 11 29	45 48 42 54 08 12 32 14 29	U.S.C.G.S.: 0° 125° E Pasadena: 4° N 123° E
33	Sept. 6	IIIu	ePNEZ eP'Z eP'E iPPZ iPPNE iPKKPEZ iPKKPE eLZ F	G H A G G AG G H G	03 56 04 00 22 01 06 07 10 47 10 49 08 34 08 40	21 07 22 06 07 47 49 22 40	U.S.C.G.S.: 53.2° S 159.4° E
34	Sept. 10	IIu	iPZ iPNZ ePE iPNE iSNE eSN eSE eLZ eLNE F	H AG A G G A A G A A	08 48 59 49 00 01 58 56 07 57 59 02 09 10.5 11 11.7 12 24	58.5 59 00 01 56 57 02 05 11.7 24	U.S.C.G.S.: 35.1° N 133.3° E
35	Sept. 11	Iu	ePNEZ iPZ iPNE iSN iSE eN F	AH G G G G A A	19 45 21 31 32 32 11 54 11 55 20 07 21 43	30 31 32 55 04 08 43	U.S.C.G.S.: 16.5° S 173° W
36	Sept. 13	Id	iPZ F	H G	22 10 22 11	30.3	See list, p. 87

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
37	Sept. 14	IIu	iPE iPZ ePNE iPN iSE iSN iSZ eLE eLN F	G G A G G G G A A A	02 13 14 14 24 24 47 47 03	58 59 10 12 33 35 46 13 15 58	Pasadena: 22° S 171° E h = 50 km ca.
38	Sept. 14	IIu	iPNEZ eLN eLE F	AG A A A	04 27 05	00 53 55 06	Pasadena: 22° S 170° E h = 50 km ca.
39	Sept. 14	IIu	iPZ iPNEZ iSNE eSZ eSE eLN eLZ eLE F	G GAH G G A A G A A	07 42.9 41 16 19 56 46 57 10	41 41 10 16 19 38 46 00 33	Pasadena: 30° S 177° W h = 60 km ca.
40	Sept. 14	Iv	ePZ iPZ iSZ eSNE F	H H H A A	15 15	47 02.3 04.1 30.5 30.6 48	Sierra County 15° N 92° W
41	Sept. 16	Iv	iPZ iPE ePN iSE iSN F	H A A A A A	07 54	53 26.7 29.2 34 21.7 22.1 58	Pasadena: 36° 1' N 117° 56' W
42	Sept. 17	Iu	iPZ iSNE F	G G G	10 11	21 53 03 52	Pasadena: Approximately 16° S 170° E
43	Sept. 19	Iu	iPZ iSN iSE eE eN eZ F	G G G G G G G	04 07 19 07	59 44 00 31 31 35 43 06	Pasadena: Region of Easter Island

BERKELEY

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
44	Sept. 19	Id	iPZ iSNEZ F	H AH 09	53 47.7 54	39.6	See list, p. 87
45	Sept. 20	IIr	iPEZ iPN iPZ iPNE eN eE iSN iSE iSZ F	AH A G G A A G G G 01	00 58 31.5 32.0 33 34 44 46 01 02 46 47 52 01 17		U.S.C.G.S.: 19.5° N 109° W
46	Sept. 22	Id	iPEZ iPN iSE iSNZ F	AH A A AH 09	09 30 30.3 31.1 33.5 34.2 34		
47	Sept. 22	IIu	iPN eE eN F	G G G 02	23 31 26 41 56 59 17		Pasadena: 34° S 179° W
48	Sept. 23	Ir	iPNE iSNE iN F	G G G 16	15 07 35 13 06 48 28		U.S.C.G.S.: 15° N 92° W
49	Sept. 23	Id	iPZ iSEZ iSN F	H AH A 23	23 10 20.5 23.8 24.2 23 11		
50	Sept. 26	Id	iPE iPNZ iSNEZ F	A AH AH 17	17 48 37.7 38.0 46.5 17 50		See list, p. 87
51	Sept. 27	IIu	iPZ iPE iPN iSN iSE F	G G G G G 23	22 16 16 19 36 26 35 38 23 38		Pasadena: Near 30° S 176° W h = 70 km
52	Sept. 28	Iu	iPZ iPE iE F	G G G 10 11 12	10 57 37 54 07 56 29		Pasadena: Japan?

MOUNT HAMILTON
 THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA
 MOUNT HAMILTON, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:

$$\phi = 37^{\circ} 20' 14'' \text{ N.}$$

$$\lambda = 121^{\circ} 38' 16'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 1281.7 meters (4205 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson	E	3000	1	15
	N	3000	1	15

MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	July 5	Id	iPN iSN F	13 13 25.1 33.4 13 15	See list, p. 87
2	July 5	Id	iPN iSN F	16 30 48.8 31 05.9 16 37	See list, p. 87
3	July 6	Id	iPN eSN F	13 35 40.3 48.8 13 38	See list, p. 87
4	July 11	Iu	ePN F	02 23 03 03 17	Pasadena: 33° S 178.5° W h = 180 km
5	July 22	Iv	ePNE eE iN F	00 11 33 55.2 12 27.4 00 17	Off Coast of Mendocino County
6	July 26	Id	iPNE iSNE F	02 32 57.6 58.9 02 34	
7	July 27	Id	ePNE iSNE F	03 04 21.6 33.3 03 06	See list, p. 87
8	July 29	Iu	iPNE eSN eLN F	03 11 20.8 18 33 28 31 04 25	U.S.C.G.S.: 18.9° N 67.0° W
9	Aug. 3	Id	iPNE iSNE F	18 46 08.9 17.9 18 47	See list, p. 87
10	Aug. 9	IIv	ePNE iPNE iSE F	05 30 55.9 58.9 07 32 34.0 05 44	Pasadena: 38° 12' N 118° 12' W h = 60 km
11	Aug. 21	Id	iPE iSE F	07 40 34.3 36.1 07 41	Sierra County
12	Aug. 28	Id	iPNE iSNE F	11 19 02.6 13.4 11 21	Pasadena: 36° 01' N 117° 56' W

MT. HAMILTON

No.	Date	Char-acter	Phase	Time	Remarks
				(U. T.)	
	1943			h. m. s.	
13	Aug. 29	Iv	iPNE iSN iSE F	03 46 28.4 47 41.8 42.3 03 56	Pasadena: 34° 16' N 116° 58' W
14	Sept. 2	Id	iPNE iSE iSN F	01 06 27.9 33.6 34.0 01 08	See list, p. 87 N 109° W
15	Sept. 3	Id	iPN iPE iSNE F	23 26 24.5 24.9 35.9 23 28	See list, p. 87
16	Sept. 6	Iu	ePN ePE ePKKPN F	04 01 04 05 10 48 05 23	U.S.C.G.S.: 53.2° S 159.4° E
17	Sept. 9	Id	iPNE iSNE F	15 28 17.8 19.3 15 29	
18	Sept. 13	Id	iPNE iSE iSN F	06 37 03.7 06.8 07.2 06 37.5	
19	Sept. 13	IIId	iPNE iSNE F	22 10 23.4 26.9 22 11	See list, p. 87
20	Sept. 14	Iu		02 45	Surface Waves Pasadena: 22° S 171° E
21	Sept. 14	Iu		04 42	Surface Waves Pasadena: 22° S 170° E
22	Sept. 14	Iu	ePN ePE eN F	07 30 46 47 56 08 26	Pasadena: 30° S 177° W h = 60 km ca.
23	Sept. 14	Iv	ePNE eSE iSNE F	15 47 07.0 35.0 37.8 15 50	Sierra County
24	Sept. 16	Iv	iPNE F	07 53 18.0 07 58	Pasadena: 36° 01' N 117° 56' W

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
25	Sept. 19	Id	ePNE eSN eSE F	09 53 33 45.0 45.5 09 54			See list, p. 87
26	Sept. 20	Ir	ePNE F	00 58 35 01 18			U.S.C.G.S.: 19.5° N 109° W
27	Sept. 26	IIId	iPNE iSE F	17 48 30.1 32.0 17 51			See list, p. 87

Apparatus	Component	V	T ₀	ε
Wood-Anderson	E	3000	1	15
	N	3000	1	15

No.	Date	Chart number	Phase	Time (U.T.)	Remarks
PALO ALTO					
1	July 1		THE BRANNER STATION, STANFORD UNIVERSITY PALO ALTO, CALIFORNIA		
2	July 3	11d	175 178 182 185	19 16 06.2 06.6 06.2 06.4	
3	July 5	1d	e7N e7E e3SE	13 13 24.0 24.4 25.0	See list, p. 87
CONSTANTS					
CONSTANTS OF THE STATION					
Latitude and Longitude:					
$\phi = 37^{\circ} 25' 11''$ N.					
$\lambda = 122^{\circ} 10' 18''$ W.					
Time -- All determinations are reduced to Universal Time.					
Altitude -- 83 meters (272 feet) above mean sea level.					
4	July 6	1d	175 182	13 35 29.7 29.3	See list, p. 87
CONSTANTS OF THE SEISMOGRAPHS					
Apparatus		Component	V	T ₀	ϵ
Wood-Anderson		E	3000	1	15
		N	3000	1	15
5	July 11	1d	e7N e7E F	02 23 00 03 02 26	Pasadena: 33° S 178.5° W h = 180 km
7	July 13	1d	17NE 182 188 19	23 51 13.8 16.8 17.4 24.3	
10	July 19	1d	17NE 182 F	20 28 01.7 03.9 20 28.5	

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
	1943				
1	July 1	Id	iPNE iSNE F	00 30 50.5 57.4 00 32	Near Livermore County
2	July 3	IIId	iPE iPN iSE iSN F	19 16 06.2 06.6 08.2 08.6 19 16.5	
3	July 5	Id	ePN ePE eSNE F	13 13 24.0 24.4 32.0 13 14	See list, p. 87. $38^{\circ} 12' N$ $118^{\circ} 12' W$
4	July 5	Id	ePNE eSN eSE F	15 11 57.9 12 04.5 04.9 15 12.5	Aftershock See list, p. 87
5	July 5	Iv	iPNE iSE iSN F	16 30 53.7 31 11.5 13.4 16 33	See list, p. 87 $38^{\circ} 12' N$ $118^{\circ} 12' W$
6	July 6	Id	iPN iPE iSN iSE F	13 35 39.7 40.2 46.8 47.3 13 37	See list, p. 87 See list, p. 87
7	July 6	Id	iPE iPN iSN F	19 20 07.3 08.3 22.2 19 21	
8	July 11	Iu	ePN ePE F	02 23 00 03 02 26	Pasadena: $33^{\circ} S$ $178.5^{\circ} W$ h = 180 km
9	July 13	Id	iPNE iSE iSN iN F	23 57 13.8 16.8 17.4 24.3 23 57.5	Pasadena: $38^{\circ} 12' N$ $118^{\circ} 12' W$
10	July 19	Id	iPNE iSN F	20 28 01.7 03.9 20 28.5	

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
11	July 22	Iv	ePN iPE eE eN F	00	11	23 24.9 51.0 52.0	Off Coast of Mendocino County
12	July 22	Id	iPNE iSNE F	15	51	40.3 41.5	
13	July 23	Iu	ePNE F	15	12	06 30	U.S.C.G.S.: 10.5°S 117.5° E
14	July 24	Id	iPNE iSNE F	06	26	23.5 26.5	
15	July 27	Iv	ePNE iSNE F	03	04	27.3 42.7 20.5	See list, p. 87
16	July 29	Iu	ePE ePN eSN eSE eLN F	03	11	24 27 18 41 46 26 27 04 23	U.S.C.G.S.: 18.9° N 67.0° W
17	Aug. 3	Id	iPNE iSNE F	18	46	14.9 24.4 18 48	See list, p. 87
18	Aug. 3	Id	iPNE iSNE F	22	13	05.6 06.6 22 13.5	See list, p. 87
19	Aug. 8	Iv	iPNE iSNE F	07	30	32.7 50.3 07 31.5	See list, p. 87
20	Aug. 9	IIv	iPN iPE iSN iSE iN F	05	31	01.2 03.3 10.7 12.7 45.1 05 42	Pasadena: 38° 12' N 118° 12' W
21	Aug. 11	Id	iPNE iSNE F	18	06	23.2 24.1 18 07	U.S.C.G.S.: 35.1° N 119.3° E

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
33	Sept. 11	Iu	iPN eSN eLN F	19 45 30.7 55 03 20 09 36 20 24	U.S.C.G.S.: 16.5° S 173° W
34	Sept. 13	Id	ePN ePE iSNE F	22 10 25.9 26.9 30.8 22 11	See list, p. 87
35	Sept. 14	Iu	ePE ePN eE eN F	02 14 00 04 41 44 45 49 03 02	Pasadena: 22° S 171° E h = 50 km ca.
36	Sept. 14	Iu	ePNE eLE eLN F	04 00 01 27 35 28 05 04 44	Pasadena: 22° S 170° E h = 50 km ca.
37	Sept. 14	Iu	iPNE eSN eLN eLE F	07 30 44.6 41 09 56 09 49 08 25	Pasadena: 30° S 177° W h = 60 km ca.
38	Sept. 14	Iv	ePNE eSNE iSE iSN F	15 47 09.3 38.1 41.3 42.0 15 50	Sierra County
39	Sept. 14	Id	iPNE iSN F	19 29 48.1 51.8 19 31	
40	Sept. 16	Iv	iPNE iSNE F	07 53 26.4 54 25.9 07 58	Pasadena: 36° 01' N 117° 56' W
41	Sept. 19	Id	iPN iSNE F	09 53 32.3 34.1 09 55	See list, p. 87
42	Sept. 20	Ir	iPE iPN F	00 58 34.3 38.0 01 13	U.S.C.G.S.: 19.5° N 109° W

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						SAN FRANCISCO
43	Sept. 23	Ir	ePE ePN eSN eSE eE eN F	15 13 17 15	07 00 43 22	32 33 00 01 43 44	U.S.C.G.S.: 15° N 92° W
44	Sept. 23	Id	iPNE iSN F	23 23	28 30	26.6 30.4	
45	Sept. 26	IId	iPNE iSNE F	17 17	48 51	33.9 38.9	See list, p. 87
46	Sept. 26	Ir	ePN ePN F	22 22	31 37	44 48	Pasadena: Central America
47	Sept. 30	Id	iPNE iSN F	23 23	07 09	59.7 02.7	

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	γ	τ_0	ϵ
Wood-Anderson	B 15° S	1500	1	15
	N	3000	1	15

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time	Remarks
THE SAN FRANCISCO STATION, UNIVERSITY OF SAN FRANCISCO SAN FRANCISCO, CALIFORNIA					
1	July 5	Iv		18 46 21 ca	See list, p. 87 S-P = 21.5 sec.
2	Aug. 3	Iv		18 46 21 ca	See list, p. 87 S-P = 15.0 sec.

3	Sept. 14	Iv		16 00 ca	S-P = 29.2 sec.
4	Sept. 27	Id		06 00 ca	S-P = 9.2 sec.

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:
 $\phi = 37^{\circ} 46!4 \text{ N.}$
 $\lambda = 122^{\circ} 27!2 \text{ W.}$

Time -- All determinations are reduced to Universal Time.

Altitude -- 100 meters (328 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ϵ
Wood-Anderson	E 15° S	1500	1	15
	N	3000	1	15

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
1	July 5	Iv		16	31	See list, p: 87 S-P = 21.5 sec.
2	Aug. 3	Iv	eP	18	46 21 ca	See list, p. 87 S-P = 15.0 sec.
3	Sept. 14	Iv		16	00 ca	S-P = 29.2 sec.
4	Sept. 27	Id		06	00 ca	S-P = 9.2 sec.

CONSTANTS OF THE STATION

Latitude and Longitude:
 $\phi = 10^{\circ} 31' N.$
 $\lambda = 122^{\circ} 16' W.$
 Time -- All determinations are reduced to Universal Time.
 Altitude -- 17 miles (55 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	Scale		
		F	T ₀	E
Seis-Chori 5 kg.	E	12	11	5
	N	12	8	6

The station is operated by Mr. Joseph Boggs, of Fernside,
 in cooperation with the University of California.

FERNDALE

1943

1 July 9 In THE FERNDALE STATION
FERNDALE, CALIFORNIA

2 July 11 In PRESIDENTA: 33° 8' 17.5" N
h = 100 km

3 July 22 In OFF Coast of Mendocino
County

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:

$$\phi = 40^{\circ} 34' N.$$

$$\lambda = 124^{\circ} 16' W.$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 17 meters (55 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Bosch-Omori 25 kg.	E	12	11	5
	N	12	8	6

8 Sept. 10 The station is operated by Mr. Joseph Bognuda, of Ferndale,
in cooperation with the University of California.

9 Sept. 11 In U.S.C.G.S.: 16.5° N 173° W

10 Sept. 14 In PRESIDENTA: 30° N 177° W
h = 50 km ca.

11 Sept. 20 In U.S.C.G.S.: 19.5° N 109° W

FERNDALE

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	July 9	Iu	eE F	23 42 16 23 54	Pasadena: Alaska
2	July 11	Iu	ePE eSE eE F	02 22 54 33 40 47 44 03 32	Pasadena: 33° S 178.5° W h = 180 km
3	July 22	Iv	iPNE iSNE iN F	00 10 20 45 11 02 00 13	Off Coast of Mendocino County
4	Aug. 9	Iv	iPNE iSNE F	05 31 58 33 04 05 44	Pasadena: 38° 12' N 118° 12' W
5	Aug. 21	Id	iPNE F	08 12 59 08 13	
6	Sept. 6	Iu	ePN ePE eE ePKKPN eSSE eSSN eLE eLN F	04 01 08 18 10 12 11 00 17 16 20 32 00 17 05 56	U.S.C.G.S.: 53.2° S 159.4° E
7	Sept. 6	Id	iPNE iSN iSE F	08 31 28 30 32 08 33	Felt along coast.
8	Sept. 10	Iu	eE eN F	08 58 32 36 10 19	U.S.C.G.S.: 35.1° N 133.3° E
9	Sept. 11	Iu	eN eE F	19 55 08 18 21 10	U.S.C.G.S.: 16.5° S 173° W
10	Sept. 14	Iu	iPNE eSE eSN eLNE F	07 30 48 41 28 36 57 36 08 50	Pasadena: 30° S 177° W h = 60 km ca.
11	Sept. 20	Iu	ePNE F	01 03 ca 01 26	U.S.C.G.S.: 19.5° N 109° W

FERNDALE

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
12	Sept. 22	Iu	eE F	23 59 ca 00 41	Pasadena: 34° S 179° W
13	Sept. 23	Iu	iSE iSN iN F	15 13 46 51 18 00 15 31	U.S.C.G.S.: 15° N 92° W
14	Sept. 26	Id	iPE iPN iSNE F	22 31 06 10 21 22 35	

Latitude and Longitude:

$\lambda = 36^{\circ} 45' 11''$ N.
 $\phi = 119^{\circ} 57' 18''$ W.

Time — All determinations are reduced to Universal Time.

Altitude — 88.1 meters (290 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAMS

Apparatus	Component	V	T ₀	E
Wood-Anderson	N	3000	0.9	15

FRESNO

No.	Date	Char-acter	Phase	Time	Remarks
FRESNO					
1	1943 July 5	Iv			
THE FRESNO STATION, FRESNO STATE COLLEGE FRESNO, CALIFORNIA					
2	July 10	Iv			
CONSTANTS					
3	July 11	Iu			
CONSTANTS OF THE STATION					
Latitude and Longitude:					
$\phi = 36^{\circ} 46:1$ N.					
$\lambda = 119^{\circ} 47:8$ W.					
Time -- All determinations are reduced to Universal Time.					
Altitude -- 88.4 meters (290 feet) above mean sea level.					
7	July 29	Iu			

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ϵ
Wood-Anderson	N	3000	0.9	15

10	Aug. 9	Iv		07 14 17 36.5	Afternoon
11	Aug. 10	Iv		04 43 14.9 38.3	Afternoon
12	Aug. 10	Iv		12 25 06 27 15 12 29	
13	Aug. 10	Iu		15 22 49 15 33	U.S.C.G.S., 34° N 161° E
14	Aug. 15	Id		04 14 48.4 13H 58.4 04 16	

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	July 5	Iv	ePN iSN eN F	16 31 33 16	30 06.3 00.7 36	52.0	See list, p. 87
2	July 10	Iv	iPN iN iSN F	03 03	13 09.9 29.3 16	07.1	
3	July 11	Iu	ePN F	02 03	23 01	04	Pasadena: 33° S 178.5° W h = 180 km
4	July 15	Iv	iPN iSN F	00 00	45 48	09.7 25.3	See list, p. 87
5	July 22	Iv	ePN F	00 00	11 18	50.1	Off Coast of Mendocino County.
6	July 27	Id	iSN F	03 03	04 05	45.6	See list, p. 87
7	July 29	Iu	ePN eLN F	03 04	11 07	09 52	U.S.C.G.S.: 18.9° N 67.0° W
8	Aug. 3	Id	iSN F	18 18	46 48	44.1	See list, p. 87
9	Aug. 9	IIv	iPN iN eN F	05 05	30 32 37 45	39.8 04.3 13	Pasadena: 38° 12' N 118° 12' W Fore shock
10	Aug. 9	Iv	ePN iSN F	07 07	44 45	12 36.5	Aftershock Fore shock
11	Aug. 10	Iv	iPN iSN F	04 04	43 44	14.9 38.3	Aftershock Pasadena: 38° 12' N 118° 12' W The larger of a small group
12	Aug. 10	Iv	eN eN F	12 12	25 29	06 15	
13	Aug. 10	Iu	ePN F	15 15	22 33	49	U.S.C.G.S.: 54° N 161° E 19.5° N 109° W
14	Aug. 15	Id	iPN iSN F	04 04	14 16	44.4 58.4	

FRESNO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
	1943				
15	Aug. 29	IIId	iPN iN iN F	03 46 08 16.5 47 00.9 03 58	Pasadena: 34° 16' N 116° 58' N
16	Aug. 29	Iv	iPN iSN F	03 58 58.4 59 42.4 04 01	See list, p. 87
17	Aug. 31	Ir	ePN F	16 17 22 16 22	U.S.C.G.S.: 13.5° N 91.5° W Pasadena: 14.2° N 91.5° W h = 80 km
18	Sept. 3	Iv	ePN eSN eN F	23 26 34.1 48.1 54.1 23 28	See list, p. 87
19	Sept. 6	Iu	ePN eLN F	04 01 07.9 34 13 05 21	U.S.C.G.S.: 53.2° S 159.4° E
20	Sept. 14	Iu	ePN eLN F	07 30 46 57 23 08 31	U.S.C.G.S.: 35.1° N 133.3° E
21	Sept. 14	Iv	ePN iN iN iN F	15 47 12.1 48.9 53.7 57.3 15 50	Sierra County
22	Sept. 16	Iv	iPN iSN F	00 16 44.4 18 06.1 00 22	Foreshock
23	Sept. 16	Iv	iPN iSN F	00 47 52.5 49 14.0 00 51	Foreshock
24	Sept. 16	IIv	iPN iSN F	07 52 54.2 54 15.6 08 02	Pasadena: 36° 01' N 117° 56' W The larger of a swarm from this source.
25	Sept. 16	Iv	iPN iSN F	08 14 08.8 31.9 08 17	Aftershock
26	Sept. 20	Ir	ePN F	00 59 13 01 17	U.S.C.G.S.: 19.5° N 109° W



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Volume 13, No. 4, pp. 117-155

EARTHQUAKES IN NORTHERN CALIFORNIA
AND
THE REGISTRATION OF EARTHQUAKES
AT
BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE—FRESNO

From October 1, 1943, to December 31, 1943

BY
CHARLES HERRICK
AND
CAROLYN H. PENDERY

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES
1950

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and

Carolyn H. Pendery

Issued November 8, 1950

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES

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CONTENTS

	Page
UNIVERSITY OF CALIFORNIA PRESS	
BERKELEY AND LOS ANGELES,	
EARTHQUAKES IN NORTHERN CALIFORNIA	121
THE REGISTRATION OF EARTHQUAKES	123
Symbols and Notations Employed	124
BERKELEY	125
CAMBRIDGE UNIVERSITY PRESS	
Constants	125
LONDON, ENGLAND	
Tabulation of Shocks	126
MOUNT HAMILTON	131
Constants	133
Tabulation of Shocks	134
PALO ALTO	139
Constants	139
Tabulation of Shocks	140
SAN FRANCISCO	145
Constants	145
Tabulation of Shocks	146
YUBA	148
Constants	148
Tabulation of Shocks	149
YUBA	151
Constants Issued November 8, 1950	151
Tabulation of Shocks	152

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EARTHQUAKE INTENSITY SCALE

CONTENTS

Intensities are given by Roman numerals in the list of California earthquakes on the following page, when sufficient information on the effects of the quake is available. Criteria of the Modified Mercalli Scale which are used to rate the intensity are:

	Page
EARTHQUAKES IN NORTHERN CALIFORNIA	121
THE REGISTRATION OF EARTHQUAKES	123
Symbols and Notations Employed	124
III BERKELEY	125
Constants	125
Tabulation of Shocks	126
V MOUNT HAMILTON	133
Constants	133
Tabulation of Shocks	134
VII PALO ALTO	139
Constants	139
Tabulation of Shocks	140
SAN FRANCISCO	145
Constants	145
Tabulation of Shocks	146
FERNDALE	148
Constants	148
Tabulation of Shocks	149
FRESNO	151
Constants	151
Tabulation of Shocks	152

EARTHQUAKES IN NORTHERN CALIFORNIA

1943 - Pacific Standard Time

No.	Date	Origin Time	Richter Magnitude	Latitude North	Longitude West	Quality
1	Oct. 1	22-56-41	4.6	40°5'	124°6'	d
		IV at Ferndale.				
2	13	21-50-15	3.6	39° 15'	122° 24'	c
		IV at Maxwell and Williams. III at Gridley and Oroville.				
3	14	14-26-25	3.7	39° 17'	122° 18'	c
		Maximum intensity of V at Colusa. IV at Gridley and Maxwell.				
4	25	20-50-33	4.9	37° 26'	121° 41'	b
		This quake was felt widely in central California; as far north as Santa Rosa, as far east as Eridgeport, and as far south as San Ardo.				
		Maximum intensity of VI was reported from Alviso, Boulder Creek, Cupertino, Decoto, Half Moon Bay, La Honda, Los Gatos, Milpitas, Mountain View, Palo Alto, San Gregorio, San Jose, San Mateo, San Martin, Santa Cruz, Sausalito, Sunny Vale, Tracy and Watsonville.				
		The depth of focus was about 12 km.				
5	26	03-58-57	3.8	39°2'	122°7'	d
		IV at Lakeport, Potter Valley, Ukiah, and Upper Lake.				
6	30	05-08-28	3.0	37° 58'	121° 46'	c
7	Nov. 14	21-36-28	4.0	39° 13'	122° 14'	c
		This quake, which was one of the largest of a series of shocks that occurred near Colusa, was felt as far north as Oroville and as far south as Yolo. A maximum intensity of V was reported from Colusa and Oroville.				
8	15	22-15-24	3.8	39° 14'	122° 11'	c
		VI at Stonyford, V at Colusa and Oroville, IV at Butte City.				
9	16	13-38-47	3.6	37° 47'	122° 07'	b
		VI at San Leandro and Oakland, IV at San Ramon, III at San Francisco.				

<u>No.</u>	<u>Date</u>	<u>Origin Time</u>	<u>Richter Magnitude</u>	<u>Latitude North</u>	<u>Longitude West</u>	<u>Quality</u>
10	Nov. 23	05-40-38	2.5	37° 40'	121° 51'	c
11	Dec. 4	12-13-43	4.0	39° 11'	122° 12'	c
IV at Colusa, Meridian and Willows.						
12	7	19-43-49	3.5	37° 06'	121° 04'	c
13	18	17-52-28	3.1	37° 41'	121 49'	a
Felt at Livermore.						
14	19	16-57-16	3.0	37° 44'	121° 41'	b
Felt at Livermore						
15	20	22-11-23	2.5	37° 46'	122° 35'	c

SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Seismogram --

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). |

THE REGISTRATION OF EARTHQUAKES

2. Nature of the Motion --

- | | |
|---------------|----------------------------------|
| i (impetus) | Sudden beginning of the motion. |
| s (celeritas) | Gradual beginning of the motion. |

Symbol	Description	I	II	III
d	Local shock	100	100	100
v	Near shock	100	100	100
r	Distant shock	100	100	100
u	Very distant shock	100	100	100
i	Sudden beginning	100	100	100
s	Gradual beginning	100	100	100

The symbols and notations employed in this report are those of the International Seismological Centre, Geneva, Switzerland.

SYMBOLS AND NOTATIONS EMPLOYED

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

1. Character of the Seismogram --

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).

Time -- All determinations are reduced to Universal Time.

2. Nature of the Motion -- (56 feet) above mean sea level.

- i (impetus) Sudden beginning of the motion.
- e (emersio) Gradual beginning of the motion.

Apparatus	Component	V		T ₀	E	F	
		K	T			T ₁	A ₁ (cm)
Wischert 80 kg.	H	45	12	12	10	0.001	
	H	45	12	12	10	0.001	
	Z	44	4	4	5	0.005	
Wood-Anderson	E	3000	0.9	0.9	15		
	H	3000	0.9	0.9	15		
Gallatin	H	112	12	11.8	0.00	115	11.3
	K	122	12	12.4	0.03	119	11.3
	Z	109	12	11.9	0.01	131	14.9
Berloff	Z	V		Coupled Period			E
				0.7		5	

The letter E before a reading designates that the seismogram was from the Galitzin instrument; H, Wischert; K, Wood-Anderson; A, Wood-Anderson; B, Berloff.

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No. Date THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
 1943 BERKELEY, CALIFORNIA

1 Oct. 2 IV

CONSTANTS

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Latitude and Longitude:

$$\begin{aligned} \phi &= 37^{\circ} 52' 13'' \text{ N.} \\ \lambda &= 122^{\circ} 15' 16'' \text{ W.} \end{aligned}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 81 meters (266 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V		T ₀	ε	r	
		K	T			T ₀	l
Bosch-Omori 100 kg. ..	E	45		12	10	0.001	
	N	45		12	10	0.001	
Wiechert 80 kg.	Z	44		4	5	0.005	
Wood-Anderson	E	3000		0.9	15		
	N	3000		0.9	15		
Galitzin	E	112	12	11.8	0.00	115	11.3
	N	122	12	12.4	0.03	119	11.2
	Z	109	12	11.9	0.01	131	14.9
Benioff	Z	V		Coupled Period			ε
				0.7			5

The letter G before a reading designates that the seismogram was from the Galitzin instrument: W, Wiechert, B, Bosch-Omori; A, Wood-Anderson; H, Benioff.

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No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Oct. 2	Iv	ePNE iPZ ePZ ePN ePE iSNZ eSN eSE iSE eMN eME eMZ F	A 06 57 29 H 30.0 G 35 G 36 G 50 G 58 06.0 A 06.5 A 07.0 G 12.0 G 36 G 38 G 59 00 07 08	See list, p.121 U.S.C.O.S. 16.5°S, 178°E
2	Oct. 4	Id	iPZ iSNE F	H 09 52 22.1 A 23.6 09 53	U.S.C.O.S. 25°N, 92.5°E
3	Oct. 4	Iu	iPZ iPE iPN eSN eSE eLE eLZ F	G 10 52 12 G 19 G 21 G 11 02 43 G 46 G 18 G 19 12 38	Pasadena: Roughly 15.5°S, 168° E Pasadena: 22°S, 174°W
4	Oct. 13	Ir	iPN ePNE iPZ iPZ iPE iSN iSE eSE eLNE eMZ F	G 04 48 32 A 33 G 35 H 37.3 G 39 G 51 34 G 37 A 44 A 53 00 G 37 05 24	Pasadena: Near 26° N, 108° W See list, p. 121
5	Oct. 14	Iv	iPZ ePN eE eSE eN F	H 05 50 39.5 A 40 A 44 A 54 A 51 11.0 05 56	See list, p. 121 See list, p. 121
6	Oct. 14	Iv	iPNZ eE eNE iSN iSE F	AH 22 26 49.9 A 52 A 27 00.0 A 21.3 A 21.9 22 32	See list, p. 121 See list, p. 121

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
7	Oct. 18	Id	iPE iPNZ iSNE	A AH A	23 40 27 36 10.0	07.2 07.7 10.0	Pasadena: 25.8°N, 118.0°W
15	Nov. 2	Iv	iZ F	H G	23 41 23 41	11.2 11.2	Pasadena: 32° 58' N, 116° 00' W
8	Oct. 21	Iu	iPZ iPE iPN	G G G	23 19 23 02 23 50	47 49 50	U.S.C.G.S. 16.5°S, 178°E
16	Nov. 2	IIIu	iSNE eSZ eMZ F	G G G G	18 29 18 29 18 41 01 07	25 36 50 53	Pasadena: 50½°S, 25°W
9	Oct. 23	IIu	ePZ ePPZ	G G	17 37 17 41	44 55	U.S.C.G.S. 25°N, 92.5°E
17	Nov. 3	IIIu	ePPNE eSKSN eSKSE eNE eZ eMZ F	G G G G G G G	18 42 18 48 18 15 18 51 18 22 18 22 20 16	06 13 15 20 22 17 16	U.S.C.G.S. 28°N, 152°W
10	Oct. 24	IIu	iPN iPE iPZ iSE iSN iSZ eLZ F	G G G G G G G G	16 16 16 49 16 35 26 26 26 29 26 56 09 41 20 23	33 34 35 26 29 32 35 23	Pasadena: 22°S, 174°W
11	Oct. 26	IIIId	iPNEZ iPNE iPZ iSE iE F	AH G G A A G	04 50 04 46 04 47 07 07 05 51 05 05	45.6 46 47 56.7 27.9 05	See list, p. 121 170°E
12	Oct. 26	Iv	ePE iPZ	G H	11 59 11 20	16 20.6	See list, p. 121
20	Nov. 14	IIu	ePE ePN iE iNZ iNE F	A G A GAH A H	13 28 13 22 13 25 13 32 13 50 12 05	21.0 22 25.8 26.0 50.3 31.2	Foreshock
21	Nov. 14	IIu	F	H	12 05	31.2	Foreshock
13	Oct. 30	Id	iPZ iSNE F	H A G	13 08 13 08 13 10	36.5 42.4 10	See list, p. 121

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
14	Oct. 31	Iv	iPZ F	H 17 54	42.6		Pasadena: 35.8°N, 120.8°W
15	Nov. 2	Iv	iPZ iPN iPE iZ F	G 17 53	24 29 32 56 21 18 02		Pasadena: 32° 58' N, 116° 00' W
16	Nov. 2	IIu	iPZ iZ iNE eN eE F	G 18 27	24 29 29 41 46 55 47 07 21 33		Pasadena: 58 $\frac{1}{4}$ °S, 25°W
17	Nov. 3	IIIr	ePNEZ iPNE iE iZ eSE eLE F	GAH 14 38	27 28 42 26 38 43 27 45 23 19 02		U.S.C.G.S. 62°N, 151°W See list, p. 121 Large aftershock Aftershocks Nov. 16, 1943, 1045 OCT and 1130 OCT
18	Nov. 6	IIu	iPNEZ iPPZ iPPE ePPN eFPZ eSKSN eLN F	GAH 08 45	43 49 41 51 50 16 18 56 14 09 15 35 13 21		U.S.C.G.S.: 5.5°S, 134°E
19	Nov. 13	Iu	iPZ iPE iPN iSN iSE eLEZ eLN F	G 18 56	37 0 43 7 45 19 07 01 0 21 42 02 23 22 42 46 9 20 07 47 3		Pasadena: 20°S, 170°E Aftershock
20	Nov. 14	Id	iPNZ ePE iN F	AH 18 28	15.1 16 37.8 18 32 46 3		Foreshock Aftershock Nov. 16, 1943, 06 15 OCT
21	Nov. 14	Id	iPZ ePN iN F	H 22 02	31.2 32 03 04.2 22 06 36 3		Foreshock

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No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
22	Nov. 15	Id	iPNZ ePE iPZ iN iNZ	AH 05 36 52.1 A 53 G 56 G 37 01 AH 02.2	See list, p. 121
	Nov. 25	Id	iE iE F	G 03 G 23 05 42	
23	Nov. 15	Id	iPZ eN eE F	H 06 55 02.3 A 12 A 16 06 57	Aftershock
24	Nov. 15	Id	iPNEZ iSNEZ F	AH 11 07 32.6 AH 38.5 11 08	
25	Nov. 16	Id	iPN ePEZ eNE eN iN iE iZ F	A 06 15 48.0 AG 50.0 G 58 A 59 A 16 13.0 G 20 G 21 06 21	See list, p. 121 Large aftershock Aftershocks Nov. 16, 1943, 1045 GCT and 1132 GCT
26	Nov. 16	Iu	ePE ePN iPZ iSE F	G 11 48 57 G 49 02 G 06 G 21 58 24 12 44	Pasadena: 15°S, 74°W h = 70 km?
27	Nov. 16	IId	iPN iPNEZ iPEZ iSNEZ F	G 21 38 49.0 AH 49.7 G 50 GA 06 52.0 21 42	See list, p. 121
28	Nov. 16	Id	iPNE iPZ iSNE iSZ F	A 22 42 46.9 H 47.3 A 49.6 H 50.7 22 43	Aftershock
29	Nov. 17	Id	iPZ eNE F	H 07 11 46.3 A 50 07 16	Aftershock Nov. 16, 1943, 06 15 GCT
30	Nov. 17	Id	iPZ eSNE iSZ F	H 09 43 53.3 A 56.3 H 56.7 09 44	

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
31	Nov. 23	Id	iPNZ iFE iSNE F	AH 13 A A 13	40 45.9 51.8 42	45.4	See list, p. 121
32	Nov. 25	Id	iPZ F	H 22 22	01 03	56.9	Pasadena: Very roughly 30°S, 178°W
33	Nov. 26	Iu	iPZ iZ F	H 21 H 21	44 46 47	11.9 06.8	Sumatra? 3°S, 181°E
34	Nov. 26	Iu	ePN ePE	A 22 A	34 27	25	Pasadena: Roughly 42°N, U.S.C.G.S.: 41°N, 36°E
35	Nov. 27	Id	iPNZ ePE iSNZ F	AH 00 A AH 01 00	11 22 55 12	21.0 22 23.7	See list, p. 122
36	Nov. 30	Iv	iPZ iPNE iN iSN F	H 21 A A A 22	57 46.3 52.7 58 00	45.7 46.3 52.7 10.9	Pasadena: 36.3°N, 120.5°W
37	Dec. 1	Iu	iPZ iZ ePPZ	G 06 H 08 H	18 19 22	19.7 12.0	Pasadena: 4-3/4°S, 144°E h = 120 km.
38	Dec. 1	Iu	iPPZ iZ F	G 13 G 13 07	04 31 41	04 22	Pasadena: Colombia or Ecuador
38	Dec. 1	Iu	iPZ iPNZ ePE	H 10 AG 15 A	46 01 30	27.4 28	Pasadena: 31° 20' N, U.S.C.G.S.: 20.2°S, 68.1°W h = about 100 km.
39	Dec. 23	Iu	iSZ eNE F	G 15 A 11	56 57 24	12 10	U.S.C.G.S.: 13-1°W, 70.4°W

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No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
39	Dec. 2	Id	iPZ iPN iSNE F	H 01 01 A A 01 02	36.0 37.4 46.1	U.S.C.G.S.: 6°S, 150°W Pasadena: 5.5°S, 153.5°W h = 50 km.	
40	Dec. 2	Iu	iPZ F	H 02 06 02 09	40.4	Pasadena: Very roughly 30°S, 178°W	
41	Dec. 3	Iu	iPZ F	H 04 51 04 53	38.9	Pasadena: 3°S, 141°E	
42	Dec. 3	Iu	iPZ F	H 07 03 07 07	45.1	Pasadena: Roughly 42°N, 143°E. h = 60 km.	
43	Dec. 4	IIv	iPNZ iZ eSNE F	AH 20 14 H A 20 19	07.2 16.9 22.9	See list, p. 122 Pasadena: 6°S, 156°W	
44	Dec. 8	Iv	iP _{nl} ONZ ePE eSNE F	AH 03 43 A A 03 45	10.5 12.5 30.0	See list, p. 122 Pasadena: Roughly 22°N, 109°W	
45	Dec. 19	Id	iPNEZ iSN iSE F	AH 01 52 A A 01 55	37.6 44.3 45.0	See list, p. 122	
46	Dec. 20	Id	iPNZ iPE eSNZ eSE F	AH 00 57 A AH 05 02 A 00 59	25.2 25.7 31.2 31.6	See list, p. 122 Pasadena: Mexico	
47	Dec. 21	Id	iPNZ iSNEZ F	H 06 11 AH 06 12	28.6 32.7	See list, p. 122	
48	Dec. 22	Iu	iPZ F	G 13 02 13 49	05	Pasadena: Colombia or Ecuador	
49	Dec. 22	Ir	iPZ iSZ F	G 15 52 G 16 01	17 06	Pasadena: 34° 20' N. 115° 48' W.	
50	Dec. 23	Iu	iPZ iPE iPN eE eN F	G 16 05 G G G G 17 10	13 15 16 23 20 26	U.S.C.G.S.: 13.3°N, 70.4°W	

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No.	Date	Char-acter	Phase	Time		Remarks
				(U.T.)		
	1943			h.	m. s.	
51	Dec. 23	IIu	iPZ	H 19 13	07.3	U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km.
			iPZ	G	08	
			iPN	A	10.8	
			iPE	G	13	
			iPE	A	16.3	
			iPN	G	21	
			iPPE	G	16 20	
			IPPZ	G	36	
			iZ	G	22 32	
			iSE	G	23 32	
			eSN	A	44	
			iN	G	50	
			eLN	A	36 34	
			eLE	A	40 19	
			F		23 35	
52	Dec. 24	IIIu	iPZ	G 02 00	54	Pasadena: 6°S, 156°E
			iPE	G	01 23	
			iPN	G	36	
			iE	G	12 13	
			F		03 55	
53	Dec. 25	Ir	ePNZ	AH 08 21	15	Pasadena: Roughly 22°N, 109°W
			ePZ	H	24.6	
			iPE	GA	25	
			iPZ	G	27	
			eLN	A	24 34	
			eLE	A	25 31	
			eZ	G	26 04	
F		09 24				
54	Dec. 26	Ir	iPZ	G 05 02	53	Pasadena: Mexico
			iSE	G	07 18	
			iSN	G	21	
			eZ	G	13 02	
			F		06 32	
55	Dec. 29	Id	iPZ	H 08 12	42.2	
			iSNE	A	51.5	
			F		08 14	
56	Dec. 31	Id	iPZ	H 17 17	45.7	
			iZ	H	18 00.9	
			iN	A	11	
			F		17 19	

MOUNT HAMILTON

THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA
MOUNT HAMILTON, CALIFORNIA

1	Oct. 2	Iv	ePHE eSH eSE	06 37 40.3 58 28.5 28.8	See list, p. 121
			F	07 03	
2	Oct. 13	Ir	ePHE eS eSE	04 18 21 29 52 12	Pasadena: Near 26°N, 108°W
			F	05 05	

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Latitude and longitude:

$$\phi = 37^{\circ} 20' 14'' \text{ N.}$$

$$\lambda = 121^{\circ} 38' 16'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 1281.7 meters (4205 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson	E	3000	1	15
	N	3000	1	15

7	Oct. 15	IIV	ePHE F	16 51 19 16 55	Pasadena: 34° 21' N, 116° 52' W
8	Oct. 17	Id	ePE 1PHE 1SE 1SW F	04 09 54 55.1 56.8 57.2 04 11	
9	Oct. 24	Iu	ePHE eSHE F	16 16 34 26 32 16 56	Pasadena: 22°S, 176°W
10	Oct. 26	III	1PHE F	04 50 35.8 04 52	See list, p. 121
11	Oct. 26	Iv	1PHE F	11 59 31.5 12 05	See list, p. 121

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Oct. 2	Iv	ePNE eSN eSE F	06 58 08 07	57 26.5 28.6 03	40.8	See list, p. 121
2	Oct. 13	Ir	ePNE eE eLN eLE F	04 12 12 03 05	48 51 52 08 05	21 29 42 51 57.7	Aftershock of Oct. 26, 1943 Pasadena: Near 26°N, 108°W
3	Oct. 13	Id	iPN iPE iSE iSN F	13 13 13 13 13	08 08 08 08 11	44.5 45.4 55.6 56.1 59.3	See list, p. 121
4	Oct. 14	Iv	ePN ePE eSN eSE F	05 17 17 17 05	50 54 51 55 55	49 54 10 10.5 59.9	See list, p. 121 Pasadena: 25.8°N, 120.8°W
5	Oct. 14	Iv	ePNE F	13 13	30 34	00 53.2	
6	Oct. 14	Iv	ePN ePE ePNE iE iSN F	22 27 04 14 22 22	26 27 26 38 32 32	59.0 00.0 04.5 15.7 23.8 42.7	See list, p. 121 U.S.G.C.S.: 62°N, 151°W
7	Oct. 15	IIv	ePNE F	16 16	51 55	19	Pasadena: 34° 21' N, 116° 52' W
8	Oct. 17	Id	ePE iPNE iSE iSN F	04 10 10 10 04	09 07 07 07 11	54 55.1 56.8 57.2 57.5	Aftershock of Oct. 26, 1943 04 50 OCT.
9	Oct. 24	Iu	ePNE eSNE F	16 16 16	16 26 56	34 32 57	Pasadena: 22°S, 174°W U.S.G.C.S.: 51°S, 134°E
10	Oct. 26	IIId	iPNE F	04 04	50 52	35.8 10	See list, p. 121
11	Oct. 26	Iv	iPNE F	11 12	59 05	31.5	See list, p. 121

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
12	Oct. 27	Id	iPNE iSNE F	08 53 54 08 55	59.9 01.9		Aftershock of Oct. 26, 1943 04 50 GCT.
13	Oct. 27	Id	iPNE iSNE F	12 51 12 52	43.2 45.1		Aftershock of Oct. 26, 1943 at 04 50 GCT.
14	Oct. 29	Id	iPNE iSE iSN F	03 09 03 09 03 10	23.9 25.7 26.3		
15	Oct. 30	Id	iPNE eSE iSNE F	13 08 13 09	40.9 48.0 49.3		See list, p. 121
16	Oct. 31	Iv	ePE iPN iPE iNE F	17 54 17 57 17 56	34 35.1 36.9 55.9		Pasadena: 35.8°N, 120.8°W Aftershock at 06 55 GCT, Nov. 15, 1943
17	Nov. 3	Iv	ePE ePN eSN eSE F	04 23 04 24 04 24 04 26	52.2 53.2 51.2 52.0		See list, p. 121 Large aftershock Smaller aftershock at
18	Nov. 3	Ir	ePN ePE iPPN eE eSNE eLE eNE F	14 38 14 39 14 40 14 43 14 45 14 47 14 57	35 36 42.7 13 39.2 31.1		U.S.C.G.S.: 62°N, 151°W See list, p. 121
19	Nov. 4	Id	iPNE iSNE F	10 57 10 58	45.6 47.6		Aftershock of Oct. 26, 1943 04 50 GCT.
20	Nov. 6	Iu	ePN ePE ePPNE eSKSE eE eLN eLE F	08 45 08 49 08 56 08 58 09 17 09 22 10 53	47 57 03 24 10 50		U.S.C.G.S.: 5.5°S, 134°E U.S.C.G.S.: 41°N, 36°E

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
21	Nov. 7	Id	iPNE eSNE F	06 33 51.4 53.4 06 34	Aftershock of Oct. 26, 1943 04 50 GCT.
22	Nov. 8	Id	iPNE iSNE iPNE iSNE F	16 31 26.9 21 29.2 06 58 33.1 35.1 16 32	Two shocks. U.S.C.G.S.: 20.2°N, 68.1°W h = 100 km.
23	Nov. 14	Iv	ePN ePNE eE eN F	18 28 14 23.5 11 03 40.6 41.1 18 30	Foreshock
24	Nov. 14	Iv	ePN ePNE F	22 02 43 45.5 22 05	Foreshock
25	Nov. 15	Iv	iPNE ePN ePE iN iSNE F	05 37 02.0 06.5 20 28 07.1 21.9 28.4 05 42	See list, p. 121 Aftershock at 06 55 GCT, Nov. 15, 1943.
26	Nov. 16	Iv	ePNE ePNE iSN iSE iE F	06 15 57.5 16 02.5 23.6 03 32 24.0 42.4 06 22	See list, p. 121 Large aftershock Smaller aftershock at 18 20 GCT, Nov. 16, 1943.
27	Nov. 16	IIId	iPN iSE F	21 38 58.2 39 07.1 21 42	See list, p. 121
28	Nov. 18	Id	iPN iSNE F	09 59 13.1 14.9 09 59.5	
29	Nov. 23	Id	iPN iSE F	13 40 45.3 50.8 13 44	See list, p. 122
30	Nov. 26	Iu	ePN ePE ePPN eLE eLN F	22 34 36 39 08 38 42.0 23 07 34.5 08 56.4 00 12	U.S.C.G.S.: 41°N, 36°E Near Tlaxcala

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
31	Nov. 30	Iv	iPNE iSNE F	21 57	46.8 52.9		Pasadena: 36.3°N, 120.5°W
32	Dec. 1	Iu	ePNE ePPE F	06 17 21 59	18 58		Pasadena: 4-3/4°S, 144°E h = 120 km.
33	Dec. 1	Iu	ePN ePE eSE eSN F	10 46 23 56 04 06 11 07	21 4 1 07		U.S.C.G.S.: 20.2°S, 68.1°W h = 100 km.
34	Dec. 2	Id	iPNE iSE F	00 54	24.9 25.6		Pasadena: 34° 20' N, 125° 48' W
35	Dec. 2	Id	iPNE iSNE F	22 58	53.5 55.2		U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km
36	Dec. 4	Iv	ePNE ePN ePE iS*NE iSN iSE F	20 14 08 44 09 39	15.5 20.5 21.0 40.9 47.9 50.4		See list, p. 122 22° N, 109° W
37	Dec. 6	Id	iPNE iSNE F	03 32	27.6 29.1		
38	Dec. 8	Id	ePNE iSE F	03 43	00.2 07.7		See list, p. 122
39	Dec. 16	Id	iPNE iSNE F	21 01	00.7 02.7		
40	Dec. 17	Iv	iPE iPN iSN iSE F	00 20	12.3 13.3 46.3 47.3		Foreshock
41	Dec. 17	Iv	iPNE iSN iSE F	04 38 39	46.0 19.5 20.4		Near Tinemaha
				04 42			

MT. HAMILTON

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
42	Dec. 19	Id	iPNE iSNE F	01 52 35.6 41.1 01 56	See list, p. 122
43	Dec. 20	Id	iPNE iSE F	00 57 23.5 29.1 00 59	See list, p. 122
44	Dec. 21	Id	iPNE iSN iSE F	06 11 32.8 40.4 41.1 06 11.5	See list, p. 122
45	Dec. 22	Iv	iPNE F	15 51 52.4 15 57	Pasadena: 34° 20' N, 115° 48' W
46	Dec. 23	Iu	ePNE ePPE eLN eLE F	19 13 12 16 39 40 26 53 20 54	U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km
47	Dec. 25	Ir	ePN ePE F	08 21 12 14 08 44	Pasadena: Roughly 22° N, 109° W
48	Dec. 29	Id	iPNE iSNE F	09 39 22.9 24.7 09 40	

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

No.	Date	Char-	Time	Remarks														
	1943																	
1	Oct. 1	Iv	21 52 11.0 17.6 17.3															
2	Oct. 2	Iv	06 57 36.3 59.9 11.0	See list, p. 121														
CONSTANTS OF THE STATION																		
Latitude and longitude:																		
			$\phi = 37^{\circ} 25' 11''$ N. $\lambda = 122^{\circ} 10' 18''$ W.															
Time -- All determinations are reduced to Universal Time.																		
Altitude -- 83 meters (272 feet) above mean sea level.																		
CONSTANTS OF THE SEISMOGRAPHS																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Apparatus</th> <th>Component</th> <th>V</th> <th>T₀</th> <th>ϵ</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Wood-Anderson</td> <td>E</td> <td>3000</td> <td>1</td> <td>15</td> </tr> <tr> <td>N</td> <td>3000</td> <td>1</td> <td>15</td> </tr> </tbody> </table>					Apparatus	Component	V	T ₀	ϵ	Wood-Anderson	E	3000	1	15	N	3000	1	15
Apparatus	Component	V	T ₀	ϵ														
Wood-Anderson	E	3000	1	15														
	N	3000	1	15														
7	Oct. 15	Id	20 17 11.1 32.4															
8	Oct. 22	Id	23 50 08.5 11.2															
9	Oct. 24	Id	16 16 30 26 22 16 51	Passadena: 22°S, 174°W														
10	Oct. 26	IIIId	04 50 40.8 41.3 05 03	See list, p. 121														

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Oct. 1	Id	iPN iPE iSN F	21 52 14.0 14.6 17.3 21 53	See list, p. 121
2	Oct. 2	Iv	ePE eFN eN eSE eSN F	06 57 36.3 40 59.5 58 11.0 13 13.5 07 03	See list, p. 121 See list, p. 121
3	Oct. 13	Ir	iPN F	04 48 30.7 05 00	Pasadena: Near 26°N, 108°W
4	Oct. 14	Iv	ePNE iPNE eSNE iN iN F	05 50 48 51.6 51 07.0 17 29.7 31.9 05 54	See list, p. 121 Pasadena: 32° 50' N, 116° 00' W
5	Oct. 14	Iv	ePNE eSE F	14 30 05.5 41 14 34	Pasadena: 34°20'N, 116°53'W
6	Oct. 14	Iv	ePNE iPNE iN iE iN F	22 26 58 27 01.8 17.2 17.9 32.4 22 32	See list, p. 121 U.S.G.O.S.: 62°N, 151°W
7	Oct. 15	Id	iPNE iSNE F	20 17 31.1 32.4 20 18	U.S.G.O.S.: 5.5°S, 134°E
8	Oct. 22	Id	iPNE iSNE F	23 50 08.5 11.2 23 51	Pasadena: Approx. 14° N
9	Oct. 24	Iu	ePNE eSE F	16 16 38 26 22 16 51	Pasadena: 22°S, 174°W
10	Oct. 26	IIId	iFN iPE F	04 50 40.8 41.3 05 03	See list, p. 121 Forestock

PALO ALTO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
				h. m. s.	
	1943				
11	Oct. 26	Iv	ePNE iE iNE iNE F	11 59 27.5 36.2 03 38.9 12 00 09.9 12 04	See list, p. 121
12	Oct. 30	Id	iPNE iSN iSE F	13 08 40.7 49.0 49.7 13 10	See list, p. 121 See list, p. 121
13	Oct. 30	Id	iPNE iSE F	19 11 55.8 57.9 19 13	Aftershock
14	Oct. 31	Iv	iPNE iN iN F	17 54 38.7 55 00.1 15 02.6 17 57	Pasadena: 35.8°N, 120.8°W See list, p. 121 Large aftershock
15	Nov. 2	Iv	ePE ePN eN F	17 53 10 54 11 19 15 25.2 19 27	Pasadena: 32° 58' N, 116° 00' W Aftershock
16	Nov. 3	Ir	ePE iPN eSE eSN eLE F	14 38 30 21 32.8 18 43 33 38 21 46 41.0 17 03	U.S.C.G.S.: 62°N, 151°W See list, p. 121
17	Nov. 6	Iu	ePN ePE ePPN ePPE eSKSE eLE F	08 45 32 54 22 50 20.5 27.0 56 51.5 09 03 13 09 25	U.S.C.G.S.: 5.5°S, 134°E Aftershock
18	Nov. 9	Iu	ePNE F	11 57 10 12 11	Aftershock of Nov. 16, 1943 Pasadena: Approx. 44° N, 148° E
19	Nov. 13	Id	iPNE iSNE F	23 56 13.2 13 40 16.4 23 57	See list, p. 122
20	Nov. 14	Iv	ePE iN iE F	18 28 17.8 53.3 22 53 54.8 18 31	Foreshock U.S.C.G.S.: 41°N, 96°E

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
21	Nov. 14	Iv	iPNE iN iN F	22 02 39.2 59.4 03 10.8 22 06	Foreshock
22	Nov. 15	Iv	ePNE ePN ePE iNE iN iSN F	05 37 00.5 07.5 22 57 08.0 16.9 58 20.3 22 00 32.2 05 43	See list, p. 121 <i>Paradise: 36.3°N, 120.5°W</i>
23	Nov. 15	Iv	iPNE F	06 55 14 06 57	Aftershock <i>U.S.C.G.S.: 20.2°N, 68.1°W 100 km.</i>
24	Nov. 16	Iv	ePNE iPNE iNE iSNE F	06 15 57.0 16 00.0 08.0 23.6 06 21	See list, p. 121 Large aftershock
25	Nov. 16	Iv	iPN iPE iE iN iE F	18 20 33.2 03 35.2 57.7 58.9 21 08.5 18 23	Aftershock <i>See list, p. 122</i>
26	Nov. 16	IIId	iPN iNE iSE F	21 38 54.0 58.0 39 02.2 21 42	See list, p. 121 Foreshock
27	Nov. 16	Id	iPN iPE iSNE F	22 42 51.5 52.0 56.5 22 44	Aftershock <i>Near Hinomaha</i>
28	Nov. 17	Iv	iPN iE iE F	07 11 56.7 12 22.1 32.8 07 14	Aftershock of Nov. 16, 1943 at 06 15 GCT.
29	Nov. 23	Id	iPE ePN iSNE F	13 40 45.1 45.5 50.9 13 42	See list, p. 122 <i>See list, p. 122</i>
30	Nov. 26	Iu	eE eE F	22 52 34 23 05 10 23 52	U.S.C.G.S.: 41°N, 36°E

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
31	Nov. 26	Id	iPE iSE F	23 27	14.3 17.7		See list, p. 122
32	Nov. 27 Dec. 22	Id Iv	iPE F	19 03 19 04	26.7 02		NS...S-P̄ = 1.1 sec. Pasadena: 34° 20' N, 115° 48' W
33	Nov. 30 Dec. 22	Iv Id	ePE iPE iSE F	21 57 18 26	39 41 04.3		Pasadena: 36.3°N, 120.5°W
34	Dec. 1 Dec. 23	Iu Iu	ePE eSE F	10 46 10 59	28 08 10.6		U.S.C.G.S.: 20.2°S, 68.1°W h = about 100 km. U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E
35	Dec. 4	Iv	ePNE iE iN iS*N iSE	20 14 20 36 20 40 20 38	13.0 25.5 31.7 40.6		See list, p. 122
36	Dec. 8	Iv	iP _n LONE iNE iPNE eS _n LOE iN F	03 43	06.8 07.7 11.2 20.1 21.8		See list, p. 122
37	Dec. 17	Iv	ePE ePN iN F	00 20 00 22 00 22	20 22 08.7		Foreshock
38	Dec. 17	Iv	iPE iPN iSE F	04 38 04 39	51.8 52.8 40.8		Near Tinemaha
39	Dec. 17	Id	iPNE iSN iSE F	23 07 23 07	14.8 18.2 18.7 07.5		
40	Dec. 19	Id	iPNE iSNE F	01 52 01 55	36.5 41.7		See list, p. 122

PALO ALTO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
41	Dec. 20	Id	iPE iE iN F	00	57	25.8 28.5 29.2	See list, p. 122
42	Dec. 22	Iv	ePNE F	15	51	02 56	Pasadena: 34° 20' N, 115° 48' W
43	Dec. 22	Id	iPE ePN iSN iSE F	18	26	39.8 40 42.5 42.9	
44	Dec. 23	Iu	iPNE eSKSE eSKSN eN eLE F	19	13	10.6 23 10 51 36 40 40 37	U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km.
45	Dec. 31	Iv	iPNE iSE F	17	17	54.5ca 18 34.0ca 17 20	

Apparatus	Component	V	T ₀	ε
Wood-Anderson	E 15° S	1500	1	15
	N	3000	1	15

SAN FRANCISCO

THE SAN FRANCISCO STATION, UNIVERSITY OF CALIFORNIA
 SAN FRANCISCO, CALIFORNIA

1	Oct. 2	Iv	ePNS F	06 57 59 07 01	See list, p. 121
2	Oct. 14	Iv	ePN eN eE F	05 50 47.5 55.5 57.5 59.0	See list, p. 121

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 37^{\circ} 46' 14'' \text{ N.}$$

$$\lambda = 122^{\circ} 27' 12'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 100 meters (328 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Wood-Anderson	E 15° S	1500	1	15
	N	3000	1	15

8	Nov. 16	Iv	ePN eN F	06 25 55.0 56.6 06 28	See list, p. 121 Large aftershock
9	Nov. 26	IIIa	ePNS eN F	21 38 51.9 55.1 21 41	See list, p. 121
10	Nov. 26	Ia	ePN eN eLN eLE F	22 38 35 40 17 23 07 26 08 26 00 03	U.S.C.G.S.: 41°N, 36°E

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time	Remarks
				(U.T.)	
	1943			h. m. s.	
1	Oct. 2	Iv	ePNE F	06 57 59 07 01 13.5	See list, p. 121
2	Oct. 14	Iv	ePE ePN eN eE F	05 50 43.5 20 14 55.5 57.5 59.0 05 53	See list, p. 121 See list, p. 121
3	Oct. 14	Iv	ePN ePE ePN F	22 26 52.0 56.0 57.0 22 31	See list, p. 121 See list, p. 121
4	Oct. 26	IIv	iPE iE iE F	04 50 47.0 51 11.2 32.4 05 00	See list, p. 121 See list, p. 121
5	Oct. 26	Iv	iPE iE iE F	11 59 20.7 34.2 49.0 12 04	See list, p. 121 S - P = 1.5 sec.
6	Oct. 30	Id	ePE iSE F	13 08 40 45 13 10	See list, p. 121 U.S.C.G.S.: 6°N, 153°E h = 50 km.
7	Nov. 15	Iv	ePN ePE ePN eN eE iN iN F	05 36 54.5 57.5 59.5 37 05.0 05.6 07.0 24.3 05 41	See list, p. 121
8	Nov. 16	Iv	ePE ePN F	06 15 55.0 56.6 06 18	See list, p. 121 Large aftershock
9	Nov. 16	IIId	iPNE iE F	21 38 51.9 55.1 21 41	See list, p. 121
10	Nov. 26	Iu	ePPN eE eLN eLE F	22 38 35 40 17 23 07 26 08 26 00 03	U.S.C.G.S.: 41°N, 36°E

SAN FRANCISCO

No.	Date	Char-acter	Phase	Time (U.T.)		Remarks
				h.	m. s.	
	1943					
11	Nov. 27	Id	iPNE iSNE F	00 03 00 04	11.6 13.5	
12	Dec. 4	Id	ePN ePE iSNE iSE iSN F	20 14 20 18	11.5 12.0 21.9 26.3 27.3	See list, p. 122
13	Dec. 19	Id	iPNE iSE F	01 52 01 55	44 ca 52 ca	See list, p.122 S - P = 8.1 sec.
14	Dec. 20	Id	ePN F	00 57 00 59	29.0	See list, p. 122
15	Dec. 21	Id	iPN iSNE F	06 11 06 12	27 ca 28.5ca	See list, p. 122 S - P = 1.5 sec.
16	Dec. 23	Iu	ePE eLE F	19 13 41 20 29	12	U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km.

Apparatus	Component	V	T ₀	E
Dorsch-Oscill. 25 kg.	E	12	11	5
	N	12	9	6

The station is operated by Mr. Joseph Bograda, of Ferndale, in cooperation with the University of California.

FERNDALE

THE FERNDAL STATION
FERNDAL, CALIFORNIA

1 Oct. 2 Id. 17h 05 56 52 See list, p. 121
17h 56
18h 57 30

2 Oct. 5 Id. 17h 20 33 37 Felt at Ferndale.

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude:

$$\phi = 40^{\circ} 34' \text{ N.}$$

$$\lambda = 124^{\circ} 16' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 17 meters (55 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	ε
Bosch-Omori 25 kg.	E	12	11	5
	N	12	8	6

The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.

11 Nov. 3 Id. 17h 11 38 10 U.S.G.C.S.: 62°N, 151°W
17h 42 38
18h 45 15
19h 48 30

FERNDALE

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
1	Oct. 2	Id	iPN iPE iSNE F	06	56	52 56 02 02	See list, p. 121
2	Oct. 5	Id	iPN iSNE F	20	18	33 36	Felt at Ferndale.
3	Oct. 5	Id	iPNE F	20	23	27 27	Felt along coast from Petaluma toureka.
4	Oct. 7	Id	iPE iSN F	07	02	31 33	
5	Oct. 7	Id	iPE iE F	20	01	27.4 32.0	
6	Oct. 14	Id	iPNE F	23	51	29	Felt at Petrolia, Humboldt County, Calif.
7	Oct. 21	Iu	eSN eLE eLN F	23	29	30 ca 20 ca 36 ca	U.S.C.G.S.: 16.5°S, 178°E
8	Oct. 23	Id	iPNE F	12	48	35 49	
9	Oct. 26	Iv	iPE iSE F	04	51	42 52 01	See list, p. 121
10	Oct. 26	Iv	iPN iPE iSN iSE F	11	59	28 31 55 58	See list, p. 121 Pasadena: 5.5°S, 151.5°E h = 50 km.
11	Nov. 3	Iir	ePE ePN eSNE eLE eLN F	14	38	10 11 38 18 20	U.S.C.G.S.: 62°N, 151°W

FERNDALE

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks						
	1943			h. m. s.							
12	Nov. 6	Ilu	ePN ePE eSKSE eLE eLN F	08 46 06 14 56 48 09 19 23 11 04	U.S.C.G.S.: 5.5°S, 134°E						
13	Nov. 11	IId	iPE iPN iSE iSN F	10 07 25 26 31 32 10 10	Felt along coast from Petrolia to Eureka.						
14	Nov. 26	Id	iPE iSN iSE F	22 14 33 36 37 22 15							
15	Nov. 26	Iu	eE eN F	22 46 48 00 30	U.S.C.G.S.: 41°N, 36°E						
16	Dec. 8	Ir	eN eE F	19 56 20 59 20 10	Mexico						
17	Dec. 8	Id	iPE iSN iSE F	22 34 00 04 05 22 35	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>V</td> <td>T₀</td> <td>E</td> </tr> <tr> <td>3000</td> <td>0.9</td> <td>15</td> </tr> </table>	V	T ₀	E	3000	0.9	15
V	T ₀	E									
3000	0.9	15									
18	Dec. 23	Id	iPE iSN F	08 18 50 54 08 19							
19	Dec. 23	Iu	eE eN eNE F	19 23 46 47 19 40 21 07	U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km.						
20	Dec. 25	Ir	eLN eLE F	08 25.5 29 08 41	Pasadena: Roughly 22° N, 109° W						

FRESNO

THE FRESNO STATION, FRESNO STATE COLLEGE
FRESNO, CALIFORNIA

No.	Date	Time	Lat	Long	Remarks
1	Oct. 3.	Ir	07 58 05	07 34	See list, p. 121
2	Oct. 9	Id	09 05		

CONSTANTS

CONSTANTS OF THE STATION

Latitude and Longitude:

$$\phi = 36^{\circ} 46' 11'' \text{ N.}$$

$$\lambda = 119^{\circ} 47' 18'' \text{ W.}$$

Time -- All determinations are reduced to Universal Time.

Altitude -- 88.4 meters (290 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T ₀	E
Wood-Anderson	N	3000	0.9	15

7	Oct. 10	Ir	02.0		
		Ir	03.6		
		Ir	09.6		
		Ir	22.7		
		Ir	05 07		
9	Oct. 26	Ir	11 59 50		See list, p. 121
		Ir	12 05		
10	Oct. 31	Ir	13 13 25.8		Felt at Indio and Thermal.
		Ir	14 21.1		
		Ir	13 17		
11	Oct. 31	Ir	17 50 27.5		Pasadena: 35.0°N, 120.5°W
		Ir	17 59 39.7		
		Ir	17 59		
12	Nov. 2	Ir	17 52 12.2		Pasadena: 32° 58' N,
		Ir	53 18.0		116° 00' W
		Ir	18 02		

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
1	Oct. 2.	Iv	ePN F	06 58 05 07 04	See list, p. 121
2	Oct. 9	Id	iPN iSN F	09 06 23.4 24.1 09 08	On train track.
3	Oct. 13	Ir	ePN F	04 48 03 05 03	Pasadena: Near 26°N, 108°W
4	Oct. 14	Iv	ePN eN eN F	05 51 20.7 47.0 52 00.9 05 55	See list, p. 121
5	Oct. 14	Iv	iPN iN iSN F	14 29 46.4 30 21.8 29.1 14 35	Pasadena: 34° 20' N, 116° 53' W
6	Oct. 14	Iv	ePN iPN eSN iSN F	22 27 26.0 28.7 28 03.0 05.4 22 33	See list, p. 121
7	Oct. 15	Iv	iPN iSN F	16 51 04.4 46.6 16 57	Pasadena: 34° 21' N, 116° 52' W
8	Oct. 26	IIv	eP _{n10} N	04 51 01.9	See list, p. 121
			iPN	02.8	
			iPN	03.6	
			iN	09.6	
			iSN	22.7	
			F	05 07	
9	Oct. 26	Iv	ePN F	11 59 54 12 05	See list, p. 121
10	Oct. 31	Iv	iPN iSN F	13 13 25.8 14 21.1 13 17	Felt at Indio and Thermal.
11	Oct. 31	Id	iPN iSN F	17 54 27.5 39.7 17 59	Pasadena: 35.8°N, 120.8°W
12	Nov. 2	Iv	iPN	17 52 12.2	Pasadena: 32° 58' N,
			iSN	53 18.0	116° 00' W
			F	18 02	

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
13	Nov. 3	Iv	iPN iSN F	04 19	13.0 27.8		Aftershock of Nov. 15, 1943
14	Nov. 3	II?	iN iN iN F	04 23 24	40.7 02.9 16.6		On train trace.
15	Nov. 3	Ir	iPN eN F	14 38 40	00.2 09		U.S.C.G.S.: 62°N, 151°W
16	Nov. 6	Iu	ePN ePPN F	08 46 50	17 33		U.S.C.G.S.: 5.5°S, 134°E Pasadena: 34.3°N, 120.5°W
17	Nov. 8	Iv	iPN iN iN F	11 34	00.3 12.0 14.4		
18	Nov. 9	Iu	ePN F	11 57 12	24 07		U.S.C.G.S.: 20.2°S, 68.1°W Pasadena: Approx. 44° N, 148°E
19	Nov. 14	Iv	iPN iSN F	18 28 29	46.9 23.9		See list, p. 122 Foreshock
20	Nov. 14	Iv	iPN iSN F	22 03 22	09.7 48.7		Foreshock See list, p. 122
21	Nov. 15	Iv	ePN ePN iSN F	05 37 00	20 30.0 09.8		See list, p. 121 Foreshock Also 4 smaller foreshocks were recorded.
22	Nov. 15	Iv	ePN iN iN F	06 55 56	43 15.2 24.2		Aftershock
23	Nov. 16	Iv	ePN ePN eSN iSN F	06 16 06	17.0 24.0 59 10.1		See list, p. 121 Large aftershock
24	Nov. 16	Iv	ePN iSN F	18 21 18	02 39.2		Pasadena: 34° 20' N, 115° 48' W Aftershock

FRESNO

No.	Date	Char-acter	Phase	Time (U.T.)			Remarks
				h.	m.	s.	
	1943						
25	Nov. 17	Iv	ePN ePN F	07	12	20 36.5 15	Aftershock of Nov. 16, 1943 at 06 16 GCT. h = 50 km.
26	Nov. 17	Iv	ePN iN iSN F	11	29	40 50.8 37.8 35	Pasadena: Roughly 22° N, 103° W
27	Nov. 26	Iu	ePN eSKSN eN F	22	34	37.6 20 09 48	U.S.C.G.S.: 41°N, 36°E
28	Nov. 30	IIId	iPN iSN F	21	57	34.8 45.0 01	Pasadena: 36.3°N, 120.5°W
29	Nov. 30	Id	iN F	22	03	56.0 05	
30	Dec. 1	Iu	ePN F	10	46	18 ca	U.S.C.G.S.: 20.2°S, 68.1°W h = 100 km.
31	Dec. 4	Iv	ePN ePN iN iSN iSN F	20	14	34 45.0 46.8 19.4 27.2 25	See list, p. 122
32	Dec. 8	Iv	ePN iSN F	03	43	13.4 27.8 47	See list, p. 122
33	Dec. 17	IIv	iPN iSN F	00	19	48.9 04.9 23	Foreshock Also 4 smaller foreshocks were recorded.
34	Dec. 17	Iv	iPN iSN F	03	54	59.7 15.1 57	Foreshock
35	Dec. 17	IIv	iPN iSN F	04	38	21.9 38.1 43	Near Tinemaha
36	Dec. 22	Id	iPN iSN F	15	51	30.7 42.1 00	Pasadena: 34° 20' N, 115° 48' W

FRESNO

No.	Date	Char- acter	Phase	Time (U.T.)	Remarks
	1943			h. m. s.	
37	Dec. 23	Iu	eN F	19 28 20 20 25	U.S.C.G.S.: 6°S, 152°E Pasadena: 5.5°S, 153.5°E h = 50 km.
38	Dec. 25	Ir	ePN eSN F	08 23 26 38 08 40	Pasadena: Roughly 22° N, 109° W
39	Dec. 31	Iv	iPN iSN F	17 18 18.8 19 10.6 17 21	