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EARTHQUAKES IN NORTHERN CALIFORNIA

AND

THE REGISTRATION OF EARTHQUAKES

AT

BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE

FROM

April 1, 1935, to June 30, 1935

BY

JAMES T. WILSON

AND

WILBERT ANNIS

BULLETIN OF THE SEISMOGRAPHIC STATIONS

VOLUME 5, NO. 1

U. S. GEOLOGICAL SURVEY
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EARTHQUAKE INTENSITY SCALE

Criteria of the Rossi-Forel Scale which were used to rate the intensities the earthquakes registered were:

Intensity

I-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-VI	Disturbance of movable objects; plaster cracked.
VII	Overthrow of movable objects; cracking of chimneys and other brickwork.
VIII	Fall of some chimneys; some damage to buildings.

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EARTHQUAKES IN NORTHERN CALIFORNIA

(All intensities given on Rossi-Forel Scale)

1935 -- PACIFIC STANDARD TIME

April 1, 1h 31m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 5 miles northwest of Lick Observatory. See map, epicenter 1.

April 1, 2h 47m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

April 3, 4h 22m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

April 6, 00h 38m, a.m. Recorded at Mount Hamilton and poorly at Palo Alto; not reported felt; focus about 55 miles from Lick Observatory.

April 6, 6h 14m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 4 miles from Lick Observatory.

April 7, 9h 29m, p.m. Recorded at Ferndale only; not reported felt; focus about 4 miles from Ferndale Station.

April 13, 11h 16m, a.m. Recorded at Berkeley only; not reported felt; focus about 4 miles from the University campus.

April 14, 2h 56m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 50 miles from Lick Observatory.

April 15, 7h 42m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto. Intensities:

IV. Belden and Caribou.

III. Canyon Dam and Prattville; epicenter near Caribou.

April 18, 1h 57m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 20 miles from Lick Observatory.

April 21, 10h 07m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 9 miles from Lick Observatory.

April 21, 10h 09m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

April 23, 4h 03m, p.m. Recorded at Berkeley only; not reported felt; focus about 4 miles from the University campus.

April 23, 12h 37m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 20 miles from Lick Observatory.

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April 24, 3h 45m, p.m. Recorded at Palo Alto only; not reported felt; focus about 6 miles from Palo Alto station.

April 24, 5h 45m, p.m. Recorded at Berkeley only; not reported felt; focus about 7 miles from the University campus.

April 25, 2h 51m, p.m. Recorded at Palo Alto only; not reported felt; focus about 7 miles from Palo Alto station.

April 26, 1h 30m, p.m. Recorded at Berkeley only; not reported felt; focus about 8 miles from the University campus.

April 26, 7h 33m, a.m. Recorded at Ferndale only; III at Ferndale; focus about 25 miles from Ferndale station.

April 26, 11h 42m, p.m. Recorded at Berkeley only; not reported felt; focus about 9 miles from the University campus.

April 27, 1h 59m, a.m. Recorded at Berkeley only; not reported felt; focus about 25 miles from the University campus.

April 29, 8h 59m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 6 miles from Lick Observatory.

April 30, 5h 12m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

May 2, 4h 44m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.

May 2, 5h 03m, a.m. Recorded at Mount Hamilton; not reported felt; focus about 10 miles from Lick Observatory.

May 2, 10h 49m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 20 miles southeast of Livermore. See map, epicenter 2.

May 3, 7h 19m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 8 miles from Lick Observatory.

May 3, 6h 09m, p.m. Recorded at Berkeley only; not reported felt; focus about 8 miles from the University campus.

May 4, 12h 02m, p.m. Recorded at Palo Alto only; not reported felt; focus about 3 miles from Palo Alto station.

May 4, 4h 11m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 10 miles south of Gilroy. See map, epicenter 3.

May 4, 4h 38m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 10 miles south of Gilroy. See map, epicenter 4.

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ay 5, 11h 09m, a.m. Recorded at Berkeley only; not reported felt; focus about 7 miles from the University campus.

ay 6, 11h 50m, a.m. Recorded at Mount Hamilton, Palo Alto; not reported felt; epicenter about 10 miles south of Gilroy. See map, epicenter 5.

ay 9, 3h 44m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 8 miles from Lick Observatory.

ay 9, 2h 34m, p.m. Recorded at Berkeley only; not reported felt; focus about 7 miles from the University campus.

ay 13, 3h 18m, p.m. Recorded at Berkeley only; not reported felt; focus about 12 miles from the University campus.

ay 14, 2h 41m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter near Lake Merced. See map, epicenter 6.

ay 15, 8h 50m, a.m. Recorded at Palo Alto only; II at Mountain View; focus about 6 miles from Palo Alto station.

ay 15, 9h 39m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 25 miles from Lick Observatory.

ay 15, 7h 25m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; IV at Benton, Big Creek, Huntington Lake; epicenter northeast of Mono Lake.

ay 19, 5h 06m, p.m. Recorded at Palo Alto only; not reported felt; focus about 6 miles from Palo Alto station.

ay 28, 0h 03m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

une 8, 7h 33m, a.m. Recorded at Mount Hamilton, Palo Alto; not reported felt; epicenter near Spreckels. See map, epicenter 7.

une 8, 8h 59m, p.m. Recorded at Palo Alto only; not reported felt; focus about 11 miles from Palo Alto station.

une 9, 5h 22m, a.m. Recorded at Palo Alto only; not reported felt; focus about 4 miles from Palo Alto station.

une 14, 10h 42m, a.m. Recorded at Mount Hamilton, Palo Alto; not reported felt; epicenter about 9 miles west of Hollister. See map, epicenter 8.

une 14, 9h 21m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 35 miles from Lick Observatory.

une 14, 10h 27m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

une 15, 1h 02m, p.m. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.

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June 16, 4h 54m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 4 miles from Lick Observatory.

June 17, 8h 13m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 3 miles southeast of Gilroy. See map, epicenter 9.

June 17, 8h 15m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; IV at Hollister; epicenter 2 miles southeast of Gilroy. See map, epicenter 10.

June 19, 1h 55m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto. Intensities:

IV. Big Pine, Bishop, Bowles, Burrel, Delpiedra, Dinuba, Firebaugh, Fresno, Friant, Hanford, Huntington Lake, Lakeshore, Laws, Miramonte, Mountain View, North Fork, Sanger, Selma, Sequoia National Park, Shaver Lake, Stratford, Tulare, Visalia.

III. Big Creek, Del Rey, Laton, Orange Cove..

I-II. Bass Lake, Coalinga, Corcoran, Dunlap, Earlimart, Kaweah, Lemon Cove; epicenter in northern Owens Valley.

June 21, 7h 44m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 6 miles from Lick Observatory.

June 22, 7h 51m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 8 miles from Lick Observatory.

June 24, 2h 26m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 16 miles from Lick Observatory.

June 26, 1h 08m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 50 miles from Lick Observatory.

June 27, 3h 44m, a.m. Recorded at Berkeley only; III in north Oakland and Berkeley; focus about 4 miles from the University campus.

June 30, 7h 25m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto, San Francisco; IV at Niles and East Oakland; epicenter about 2 miles northeast of Niles. See map, epicenter 11.

June 30, 11h 48m, a.m. Recorded at Berkeley and Palo Alto; not reported felt; epicenter about 70 miles from Palo Alto station, probably southeast.

June 30, 3h 28m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; III at Hollister; epicenter probably a few miles southeast of Salinas.

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Epicenters located in the preceding list are plotted on the accompanying map. A number and a letter are given beside each epicenter. The number is that assigned to the earthquake in the preceding 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.

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San Francisco
Berkeley
Lake Merced
6C
Alameda
Hayward
Concord
Walnut Creek
Livermore
Vernalillo
2B
Mt. Hamilton
Santa Cruz
Gilroy
10 B
9C
8C
3C
4C
5C
Hollister
Pacines
Sprecklels
11d
Station
Epicenter

10.
International
Seismological
Centre

THE REGISTRATION OF EARTHQUAKES

International Seismological Centre

SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Earthquake--

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

d (terrae motus domesticus) Local shock (origin less than 100 kilometers distant).

v (terrae motus vicinus) Near shock (origin from 100 to 1,000 kilometers distant).

r (terrae motus remotus) Distant shock (origin from 1,000 to 5,000 kilometers distant).

u (terrae motus ultimus) Very distant shock or teleseism (origin more than 5,000 kilometers distant).

2. Phases of the Seismogram--

P (undae primae) Normal first phase, or first preliminary tremors (longitudinal).

P' First preliminary tremors which have penetrated the core of the earth.

PR_n Waves n times reflected at the earth's surface.

S (undae secundae) Second phase, or second preliminary tremors (transverse).

SR_n Waves n times reflected at the earth's surface.

PS Waves changed from longitudinal to transverse oscillation or vice versa through reflection at the earth's surface.

PPS Waves twice reflected at the earth's surface, having been longitudinal on two branches of the path and transverse on one branch.

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

$\overline{S_cP_cS}$ Waves which have penetrated the core, having been transverse before entering and after leaving the core, and longitudinal within the core.

$\overline{P_cP_c}$ $\overline{P_cP}$ Waves refracted at the core boundary into the core, reflected once at this boundary while within the core and again refracted out of the core, having remained longitudinal on all branches of the path.

L (undae longae) Long waves of surface phase preceding M.

M (undae maximae) Shorter and more regular waves of large amplitude in the surface phase.

M_n Greatest motion in the surface phase.

C (coda) Tail or end portion.

F (finis) End of discernible movement.

For local earthquakes a special notation is used:

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

$\overline{S}$ The transverse wave which has traveled its whole path in the surface layer of the earth.

P* The longitudinal wave which has traveled the horizontal portion of its path in the intermediate layer.

S* The corresponding transverse wave.

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. Nature of the Motion--

i (impetus)	Sudden beginning of the motion.
e (emersio)	Gradual beginning of the motion.
T (period)	Time of one complete oscillation.
A	Trace amplitude measured from the media line, + earth motion toward east, north, or zenith, - toward west, south, or nadir.
A_E	E-W component of A.
A_N	N-S component of A.
A_Z	Vertical component of A.

. Time--

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

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BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic room:

φ = 37° 52' 15" N. Lat.
λ = 122° 15' 36" W. from Greenwich.

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

Altitude.--85 meters (279 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T_o	ϵ	$\frac{r}{T_o^2}$
Bosch-Omori 100 kg. ...	E	45	14	10	0.001
	N	45	9.5	10	0.001
Wiechert 80 kg.	Z	44	4	5	0.005
Wood-Anderson	E	3,000	0.9	15	
	N	3,000	0.9	15	

		K	T	T_1	μ_2
Galitzin	E	126	12	12	0
	N	125	12	12.1	0
	Z	121	12	11.8	0

		V	Coupled Period	ϵ
Benioff	Z	100,000(Ca)	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	Character	Phase	Time U.T.			Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h.	m.	s.	s.	mm.	mm.	mm.	
1	Apr. 1	Id	$e\overline{P}_Z$	H	21	31 24.2					See discussion, p. 5
			e_N	A	21	31 32.5					
			e_E	A	21	31 32.7					
			$e\overline{S}_E$	A	21	31 34.7					
			$e\overline{S}_Z$	H	21	31 34.6					
			eS_N	A	21	31 34.8					
2	Apr. 5	I	iP_Z	H	10	13 50.0					
			e_E	A	10	13 59.5					
			i_Z	H	10	14 00.0					
			e_E	A	10	14 19.5					
			e_N	A	10	14 20.5					
			e_E	A	10	13 59.5					
			F	Z	10	16					
3	Apr. 11	II	eP_Z	G	23	32 33.0					
			eP_{EN}	G	23	32 39.0					
			i_N	G	23	35 02.0					
			i_Z	G	23	35 07.0					
			iE	G	23	35 59.0					
			iE	G	23	39 15.0					
			i_{EN}	G	23	42 07.0					
			i_Z	G	23	43 03.0					
			iE	G	00	08 27.0					
			iG_E	G	00	08 41.0					
			F		02	59					
4	Apr. 13	Id	$e\overline{P}_Z$	H	19	16 07.4					See discussion, p. 5
			$i\overline{S}_Z$	H	19	16 08.2					
			F		19	17					
5	Apr. 16	Iv	iP_Z	H	03	43 28.4					See discussion, p. 5
			eP_N	A	03	42 29.9					
			eP_E	A	03	42 31.9					
			eS_{EN}	A	03	42 56.9					
			iS_Z	H	03	42 56.9					
			F		03	44					
6	Apr. 17	Iv	eP_N	A	06	08 38.3					
			eP_Z	H	06	08 38.4					
			e_E	A	06	08 42.8					
			eS_E	A	06	09 23.3					
			eS_Z	H	06	09 23.3					
			F		06	11					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
7	Apr. 19	IIu	eP_Z	G 15 37 23.0					
			eP_E	G 15 37 28.0					U.S.C. & G.S. epicenter 28°N, 12°E
			ePR_{1EZ}	G 15 41 03.0					
			iPR_{2EZ}	G 15 43 18.0					
			ePR_{ZN}	G 15 43 23.0					
			iS_Z	G 15 49 13.0					
			iPS_Z	G 15 50 08.0					
			i_N	G 15 50 28.0					
			eS_E	G 15 49 06.0					
8	Apr. 24	Id	$i\overline{P}_Z$	H 00 03 10.9					See discussion, p. 5
			$i\overline{S}_Z$	H 00 03 11.4					
			F	H 00 04					
9	Apr. 25	Id	$i\overline{P}_Z$	H 01 45 14.6					See discussion, p. 6
			$i\overline{S}_Z$	H 01 45 16.0					
			F	H 01 46					
10	Apr. 26	Id	$i\overline{P}_Z$	H 21 29 50.6					See discussion, p. 6
			$i\overline{S}_Z$	H 21 29 52.4					
			F	21 31					
11	Apr. 27	Id	$e\overline{P}_Z$	H 07 41 41.6					See discussion, p. 6
			$e\overline{S}_Z$	H 07 41 44.3					
			e_N	A 07 41 44.7					
			e_E	A 07 41 45.0					
			F	07 42					
12	Apr. 27	I	e_Z	H 09 08 48.9					
			e_Z	H 09 09 10.9					
			e_N	A 09 09 11.9					
			e_E	A 09 09 12.4					
			F	09 11					
13	Apr. 27	Id	$e\overline{P}_Z$	H 09 59 11.9					See discussion, p. 6
			i_{EN}	A 09 59 16.9					
			eS_Z	H 09 59 17.4					
			F	10 00					
14	Apr. 29	I	e_Z	G 20 11 52.0					
			e_E	G 20 12 02.0					
			e_N	G 20 12 07.0					
			i_N	G 20 12 38.0					
			i_E	G 20 12 40.0					
			e_Z	G 20 13 27.0					
			i_N	G 20 13 32.0					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
4	Apr. 29 (contd)	I	i_N	G 20 14 34.0					
			i_E	G 20 14 47.0					
			e_Z	G 20 14 48.0					
			F	G 20 20					
5	May 2	Id	$e\overline{P}_N$	A 18 49 26.3					See discussion, p. 6
			$e\overline{P}_E$	A 18 49 26.5					
			$i\underline{N}$	A 18 49 28.1					
			eS_N	A 18 49 34.8					
			eE	A 18 49 37.5					
			eN	A 18 49 38.2					
			F	18 50					
6	May 2	I	eP_{EN}	A 21 12 34.0					
			iP_Z	H 21 12 34.0					
			eP_E	G 21 12 37.0					
			iZ	H 21 12 42.0					
			iZ	H 21 13 29.0					
			iZ	H 21 13 33.0					
			iZ	G 21 14 02.0					
			iE	G 21 14 12.0					
			iZ	G 21 14 42.0					
			iE	G 21 15 37.0					
			iE	G 21 16 10.0					
			F	21 39					
7	May 2	I	iP_Z	H 23 05 46.0					
			i_Z	H 23 05 51.0					
			i_Z	H 23 06 38.5					
			i_Z	H 23 06 44.0					
			F	23 08					
8	May 4	Id	$e\overline{P}_N$	A 02 09 12.6					See discussion, p. 6
			$i\overline{P}_Z$	H 02 09 12.6					
			$i\overline{S}_{EN}$	A 02 09 14.8					
			$i\overline{S}_Z$	H 02 09 14.9					
			F	02 10					
9	May 5	Id	eP_Z	H 00 11 29.4					See discussion, p. 6
			iS_Z	H 00 11 45.8					
			F	00 12					
0	May 5	Iv	$i\overline{P}_Z$	H 00 38 34.5					See discussion, p. 6
			$e\overline{P}_{NE}$	A 00 38 34.5					
			$e\overline{S}_N$	A 00 38 51.2					
			$i\overline{S}_Z$	A 00 38 51.3					
			eS_E	A 00 38 51.5					
			F	00 40					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	May 5	Id	$e\overline{P}_Z$	H 19 08 54.4					See discussion, p. 7
			$e\overline{S}_Z$	H 19 08 56.0					
			F	19 10					
2	May 9	Id	$e\overline{P}_E$	A 22 34 32.5					See discussion, p. 7
			$i\overline{P}_N$	A 22 34 32.7					
			$i\overline{P}_Z$	H 22 34 32.8					
			$i\overline{S}_E$	A 22 34 34.0					
			$e\overline{S}_N$	A 22 34 34.2					
			$i\overline{S}_Z$	H 22 34 34.4					
			F	22 35					
3	May 13	Id	$e\overline{P}_Z$	H 23 17 40.5					See discussion, p. 7
			$e\overline{S}_Z$	H 23 17 42.9					
			F	23 18					
4	May 14	I	e_N	G 00 17 13.0					
			i_E	G 00 17 21.0					
			i_{NE}	G 00 19 31.0					
			e_N	G 00 22 26.0					
			i_N	G 00 24 06.0					
			i_E	G 00 24 31.0					
			F	00 58					
5	May 14	Id	$i\overline{P}_N$	A 22 40 46.6					See discussion, p. 7
			$i\overline{P}_E$	A 22 40 46.8					
			$i\overline{P}_Z$	H 22 40 46.8					
			$i\overline{S}_{NE}$	A 22 40 51.0					
			$i\overline{S}_Z$	H 22 40 51.0					
			F	22 42					
6	May 14	I	eP_Z	H 23 41 47.5					
			e_E	A 23 41 58.0					
			e_Z	H 23 42 02.5					
			e_Z	H 23 42 12.0					
			e_Z	G 23 43 21.0					
			e_N	G 23 43 36.0					
			e_E	G 23 43 47.0					
			i_Z	G 23 45 13.0					
			e_Z	H 23 45 21.0					
			e_N	G 23 45 45.0					
			i_N	G 23 56 01.0					
			i_E	G 23 56 30.0					
			i_{EN}	G 00 00 31.0					
			i_E	G 00 01 30.0					
			F	01 17					
7	May 15	Id	$e\overline{P}_{NE}$	A 16 50 19.5					
			$i\overline{S}_{NE}$	A 16 50 21.5					
			F	16 52					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
28	May 16	Iv	iP_Z	H 03 25 33.5					See discussion, p. 7
			eP_N	A 03 25 33.5					
			eP_E	A 03 25 34.0					
			eS_Z	H 03 26 14.2					
			iS_N	A 03 26 14.3					
			iS_E	A 03 26 14.5					
			i_E	A 03 26 24.5					
			F	03 29					
29	May 16	I	i_{NE}	G 21 06 01.0					
			i_Z	G 21 06 11.0					
			i_Z	G 21 07 16.0					
			e_E	G 21 12 09.0					
			i_N	G 21 12 43.0					
			i_Z	G 21 13 41.0					
			e_E	G 21 20 31.0					
			F	22 57					
30	May 20	I	eP_Z	H 08 32 57.7					
			e_E	A 08 33 03.7					
			e_Z	H 08 33 05.2					
			e_N	A 08 33 07.7					
			e_Z	H 08 33 22.7					
			e_N	A 08 33 31.2					
			e_E	A 08 33 53.7					
			e_Z	H 08 33 55.7					
			F	08 36					
31	May 21	I	i_Z	G 07 05 01.0					
			e_E	G 07 08 51.0					
			i_Z	G 07 08 51.0					
			i_Z	G 07 17 31.0					
			i_E	G 07 17 46.0					
			F	08 12					
32	May 24	I	e_N	G 05 51 21.0					
			e_Z	G 05 51 33.0					
			i_Z	G 05 53 41.0					
			i_Z	G 06 06 13.0					
			e_N	G 06 06 36.0					
			i_N	G 06 13 51.0					
			F	07 57					
3	May 27	I	i_N	G 03 34 26.0					
			i_E	G 03 34 31.0					
			i_N	G 03 39 37.0					
			i_E	G 03 49 37.0					
			i_N	G 03 49 45.0					
			F	04 57					

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No.	Date	Character	Phase		Time U.T. h. m. s.	Period s.	Amplitude A_E mm.	A_N mm.	A_Z mm.	Remarks
	1935									
34	May 30	IIIu	iP_E	G	21 52 17.0		+1			
			iP_Z	G	21 52 19.0				-5	
			eP_N	G	21 52 19.0			+1		
			iPR_{1Z}	G	21 56 33.0					
			iPR_{2N}	G	21 59 36.0					
			iPR_{2Z}	G	21 59 41.0					
			ePR_{2E}	G	21 59 41.0					
			$eS_cP_cP_cS_Z$	G	22 03 41.0					
			iS_N	G	22 04 36.0					
			eS_Z	G	22 05 11.0					
			iS_E	G	22 05 13.0					
			F		23 00					
35	June 18	Iv	$e\overline{P}_Z$	H	04 13 31.7					See discussion, p. 8
			$i\overline{S}_Z$	H	04 13 50.0					
			F		04 15					
36	June 18	Iv	$i\overline{P}_Z$	H	04 15 38.5					See discussion, p. 8
			i_Z	H	04 15 53.1					
			i_N	A	04 15 55.1					
			i_Z	H	04 15 55.1					
			F		04 18					
37	June 18	I	i_E	G	11 52 07.0					
			e_E	G	12 00 18.0					
			F		13 40					
38	June 19	Iv	iP_Z	H	09 56 13.9					See discussion, p. 8
			eP_{NE}	A	09 56 13.9					
			eS_{NE}	A	09 56 52.9					
			eS_Z	H	09 56 53.9					
39	June 19	Iv	iP_Z	H	10 08 36.3					See discussion, p. 8
			i_Z	H	10 09 15.1					
			F		10 11					
40	June 24	IIu	eP_E	A	23 35 34.0					
			iP_N	G	23 35 34.0					
			iP_Z	G	23 35 35.0					
			eP_N	A	23 35 36.0					
			iS_N	G	23 46 49.0					
			F		02 08					
41	June 27	IId	$i\overline{P}_{NE}$	A	11 44 25.1	0.1	-1.1	+1.5		See discussion, p. 8
			$i\overline{S}_{NE}$	A	11 44 25.9					
			F		11 45					
42	June 28	I	i_Z	G	02 13 08.0					
			F		02 33					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
43	June 28	I	e_E	G 19 43 29.0					
			F	21 08					
44	June 28	I	e_Z	H 20 11 36.0					
			e_N	A 20 11 42.2					
			i_Z	H 20 11 46.2					
			i_{NE}	A 20 11 50.2					
			i_Z	H 20 11 50.2					
			i_N	A 20 11 53.7					
			F	20 13					
45	June 29	IIr	iP_{NEZ}	G 6 54 22.0	6	-8	+5.5	+10	
			iS_Z	G 6 59 38.0					
			iS_E	G 6 59 46.0					
			F	9 33					
46	June 30	Id	$i\overline{P}_Z$	H 15 24 47.3					See discussion, p. 8
			$i\overline{P}_N$	A 15 24 47.3					
			$i\overline{P}_E$	A 15 24 47.5					
			$i\overline{S}_{NE}$	A 15 24 52.7					
			$i\overline{S}_Z$	H 15 24 52.7					
			F	15 27					
47	June 30	I	eP_N	A 19 48 27.3					See discussion, p. 8
			eP_Z	H 19 48 27.8					
			eP_E	A 19 48 27.8					
			e_Z	H 19 48 52.3					
			e_N	A 19 48 52.3					
			e_E	A 19 48 53.3					
			F	19 51					
48	June 30	Iv	iP_Z	H 23 28 57.8					See discussion, p. 8
			eP_{NE}	A 23 28 57.8					
			iS_E	A 23 29 17.5					
			iS_Z	H 23 29 18.5					
			iS_N	A 23 29 18.5					
			F	23 31					

International Seismological Centre

MOUNT HAMILTON

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

CONSTANTS

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Latitude and longitude of the center of the seismographic room:

φ = 37° 20' 24.5" N Lat.
λ = 121° 38' 34" W from Greenwich.

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_o	ϵ
Wood-Anderson	E	3000	1	15
	N	3000	1	15

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MOUNT HAMILTON

No.	Date	Character	Phase	Time U.T.	Period	AMPLITUDE A_E	AMPLITUDE A_N	AMPLITUDE A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Apr. 1	Id	$i\bar{P}_N$	21 31 13.2					See discussion, p. 5
			$i\bar{P}_E$	21 31 13.3					
			eS_{EN}	21 31 15.1					
			F	21 33					
2	Apr. 1	Id	$e\bar{P}_N$	22 47 10.0					See discussion, p. 5
			$e\bar{P}_E$	22 47 10.1					
			$e\bar{S}_{EN}$	22 47 11.3					
			F	22 49					
3	Apr. 3	Iv	$e\bar{P}_N$	12 22 05.3					See discussion, p. 5
			$e\bar{P}_E$	12 22 05.8					
			$e\bar{S}_N$	12 22 18.8					
			$e\bar{S}_E$	12 22 19.3					
			F	12 24					
4	Apr. 5	I	eP_{EN}	10 13 47.4					
			i_{EN}	10 13 55.9					
			e_N	10 14 17.4					
			F	10 17					
5	Apr. 6	Id	$e\bar{P}_N$	08 37 55.2					See discussion, p. 5
			$e\bar{P}_E$	08 37 55.4					
			$i\bar{S}_N$	08 38 07.3					
			$i\bar{S}_E$	08 38 07.5					
			F	08 40					
6	Apr. 7	Id	$e\bar{P}_E$	02 14 08.2					See discussion, p. 5
			$i\bar{P}_N$	02 14 08.5					
			$i\bar{S}_{EN}$	02 14 09.9					
			F	02 15					
7	Apr. 14	Id	$e\bar{P}_N$	22 56 16.1					See discussion, p. 5
			$e\bar{P}_E$	22 56 16.2					
			$e\bar{S}_N$	22 56 17.3					
			$e\bar{S}_E$	22 56 17.4					
			F	22 58					
8	Apr. 16	Iv	eP_N	03 43±					See discussion, p. 5
			F	03 47					S-P = 36 sec.
									No time marks
9	Apr. 18	Iv	eP_N	09 56 55.4					See discussion, p. 5
			eP_E	09 56 55.9					
			eS_E	09 57 11.9					
			eS_N	09 57 11.2					
			F	09 59					

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o.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
0	Apr. 19	II	eP_N	15 40 12.6					U.S.C. & G.S. epicenter 28° N., 12° E.
			eP_E	15 40 22.6					
			F	17 13					
1	Apr. 21	Id	$e\overline{P}_E$	18 07 26.5					See discussion, p. 5
			$e\overline{P}_N$	18 07 26.6					
			$e\overline{S}_{EN}$	18 07 28.3					
			F	18 08					
2	Apr. 21	Id	$e\overline{P}_E$	18 09 15.9					See discussion, p. 5
			$i\overline{P}_N$	18 09 16.0					
			$e\overline{S}_E$	18 09 17.4					
			$i\overline{S}_N$	18 09 17.6					
			F	18 10					
3	Apr. 23	Id	$e\overline{P}_E$	20 36 42.4					See discussion, p. 5
			$e\overline{P}_N$	20 36 42.5					
			$e\overline{S}_N$	20 36 47.7					
			$i\overline{S}_E$	20 36 47.7					
			F	20 37					
4	Apr. 27	I	i_N	09 09 36.3					
			e_E	09 09 36.5					
			i_E	09 09 49.0					
			e_N	09 09 48.6					
			F	09 11					
5	Apr. 29	I	eP_N	22 09 57.4					12th hour to 13th hour not on E-W record
			F	22 18					
6	Apr. 30	Id	$i\overline{P}_{EN}$	04 59 20.3					See discussion, p. 6
			$i\overline{S}_{EN}$	04 59 21.6					
			F	05 00					
7	Apr. 30	Id	$e\overline{P}_{NE}$	13 12 30.7					See discussion, p. 6
			$e\overline{S}_E$	13 12 32.0					
			$e\overline{S}_N$	13 12 32.1					
			F	13 13					
8	May 2	Id	$i\overline{P}_N$	12 44 34.3					See discussion, p. 6
			$e\overline{P}_E$	12 44 34.4					
			$i\overline{S}_E$	12 44 35.4					
			$e\overline{S}_N$	12 44 36.5					
			F	12 46					
9	May 2	Id	$i\overline{P}_N$	13 03 17.9					See discussion, p. 6
			$e\overline{P}_E$	13 03 18.0					
			$e\overline{S}_{EN}$	13 03 20.0					
			F	13 04					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
20	May 2	Id	$e\overline{P}_{EN}$	18 49 20.1					See discussion, p. 6
			$i\overline{S}_{EN}$	18 49 24.2					
			F	18 50					
21	May 2	Iv	$e\overline{P}_{E}$	21 12 44.3					
			$e\overline{P}_{N}$	21 12 44.8					
			$e\overline{S}_{E}$	21 13 44.3					
			$e\overline{S}_{N}$	21 13 45.3					
			F	21 20					
22	May 2	I	eP_E	23 05 57.4					
			iP_N	23 05 57.5					
			iS_E	23 06 56.3					
			iS_N	23 06 56.4					
			F	23 08					
23	May 3	Id	$i\overline{P}_{N}$	15 19 29.7					See discussion, p. 6
			$e\overline{P}_{E}$	15 19 29.7					
			$i\overline{S}_{EN}$	15 19 31.6					
			F	15 20					
24	May 5	Id	$e\overline{P}_{N}$	00 11 16.8					See discussion, p. 6
			$e\overline{P}_{E}$	00 11 17.1					
			$e\overline{S}_{E}$	00 11 24.8					
			$i\overline{S}_{N}$	00 11 24.9					
			F	00 13					
25	May 5	Id	$i\overline{P}_{N}$	00 38 22.7					See discussion, p. 6
			$e\overline{P}_{E}$	00 38 23.0					
			iS_N	00 38 30.8					
			$e\overline{S}_{E}$	00 38 30.8					
			F	00 41					
26	May 6	Id	$e\overline{P}_{E}$	19 50 22.3					See discussion, p. 7
			$i\overline{P}_{N}$	19 50 22.8					
			$i\overline{S}_{E}$	19 50 30.3					
			iS_N	19 50 30.8					S-P = 8 sec.
			F	19 52					
27	May 9	Id	$e\overline{P}_{E}$	11 43 57.5					See discussion, p. 7
			$e\overline{P}_{N}$	11 43 58.0					
			$i\overline{S}_{E}$	11 43 59.7					
			iS_N	11 43 59.8					S-P = 1.8 sec.
			F	11 45					
28	May 11	Iv	eP_N	06 32±					No time marks.
			F	06 35					S-P = 50 sec. on N.S.
									S-P = 47 sec. on E.W.

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
29	May 14	Id	eP_{EN}	22 41±					See discussion, p. 7
			F	22 43					No time marks. S-P = 11.5 sec.
30	May 15	Id	$e\overline{P}_N$	17 39±					No time marks.
			F	17 40					S-P = 6.0 sec.
31	May 16	Iv	eP_N	03 25±					See discussion, p. 7
			F	03 31					No time marks. S-P = 30.5 sec.
32	May 16	I	eP_{NE}	10 15±					No time marks.
			F	10 16					
33	May 20	I	eP_{NE}	07 59±					No time marks.
			F	08 03					
34	May 28	Id	$i\overline{P}_{EN}$	08 03±					See discussion, p. 7
			F	08 04					S-P = 1.2 sec. No time marks.
35	June 8	Id	$e\overline{P}_{EN}$	15 33 35.0					See discussion, p. 7
			$i\overline{S}_{EN}$	15 33 47.0					
			i_{EN}	15 33 48.5					
			F	15 36					
36	June 11	I	eP_{EN}	16 21 36.6					
			i_N	16 22 18.3					
			iS_E	16 22 26.6					
			iS_N	16 22 26.9					
			F	16 25					
37	June 11	I	eP_{EN}	18 11 32.8					
			e_E	18 12 38.8					
			i_E	18 12 40.8					
			F	18 15					
38	June 14	Id	$i\overline{P}_N$	18 42 17.1					See discussion, p. 7
			$i\overline{P}_E$	18 42 17.1					
			i_N	18 42 19.9					
			iS_N	18 42 24.9					
			i_E	18 42 25.1					
			i_N	18 42 27.9					
			i_E	18 42 28.1					
			F	18 45					
39	June 15	Id	$e\overline{P}_{EN}$	05 21 11.8					See discussion, p. 7
			$i\overline{S}_{EN}$	05 21 19.8					
			F	05 23					

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MOUNT HAMILTON

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
40	June 15	Id	$i\overline{P}_{EN}$	06 26 59.7					See discussion, p. 7
			$i\overline{S}_N$	06 27 01.3					
			$i\overline{S}_E$	06 27 01.5					
			F	06 28					
41	June 17	Id	$i\overline{P}_{EN}$	00 54 01.5					See discussion, p. 8
			$i\overline{S}_E$	00 54 02.7					
			$i\overline{S}_N$	00 54 02.8					
			F	00 55					
42	June 18	Id	$e\overline{P}_N$	04 13 18.8					See discussion, p. 8
			$e\overline{P}_E$	04 13 19.3					
			$e\overline{S}_E$	04 13 25.5					
			$e\overline{S}_N$	04 13 25.2					
			F	04 16					
43	June 18	Id	$e\overline{P}_N$	04 15 25.6					See discussion, p. 8
			$i\overline{P}_E$	04 15 25.8					
			$i\overline{S}_N$	04 15 31.8					
			$i\overline{S}_E$	04 15 32.0					
			F	04 19					
44	June 19	Iv	eP_{EN}	09 56 05.0					See discussion, p. 8
			iS_{EN}	09 56 43.0					
			i_N	09 56 09.3					
			F	10 01					
45	June 19	Iv	eP_N	10 08 28.2					
			eP_E	10 08 28.5					
			iS_N	10 09 05.7					
			iS_E	10 09 06.0					
			F	10 11					
46	June 19	I	eP_{EN}	11 18 25.3					
			i_{NE}	11 18 36.3					
			i_{EN}	11 18 45.3					
			i_N	11 19 23.3					
			i_E	11 19 31.3					
			i_N	11 19 32.3					
			i_E	11 19 48.3					
			F	11 23					
47	June 20	I	eP_N	10 56 40.2					
			e_N	10 47 04.2					
			i_N	10 47 34.2					
			F	10 50					

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MOUNT HAMILTON

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
48	June 21	I	eP_{EN}	17 39 45.6					
			i_{NE}	17 40 04.6					
			i_{EN}	17 40 08.6					
			i_N	17 40 33.6					
			i_E	17 40 34.6					
			F	17 43					
49	June 22	Id	$i\overline{P}_{EN}$	03 44 02.0					See discussion, p. 8
			$i\overline{S}_{EN}$	03 44 03.4					
			F	03 45					
50	June 22	Id	$i\overline{P}_{EN}$	15 50 54.2					See discussion, p. 8
			$i\overline{S}_{EN}$	15 50 57.0					
			F	15 52					
51	June 24	Id	$i\overline{P}_{EN}$	22 25 45.3					See discussion, p. 8
			$i\overline{S}_E$	22 25 49.0					
			$i\overline{S}_N$	22 25 49.3					
			F	22 28					
52	June 26	Id	$e\overline{P}_{EN}$	21 07 52.9					See discussion, p. 8
			$e\overline{S}_{EN}$	21 08 04.4					
			F	21 10					
53	June 28	I	e_N	20 11 39.8					
			e_E	20 11 43.3					
			e_N	20 11 56.3					
			e_N	20 11 59.3					
			i_E	20 12 04.8					
			e_N	20 12 05.3					
			i_E	20 12 11.8					
			i_E	20 12 14.8					
			i_E	20 12 17.8					
			i_E	20 12 19.3					
			e_N	20 12 19.8					
			i_E	20 12 21.3					
			i_E	20 12 23.3					
			e_N	20 12 23.8					
			F	20 15					
54	June 28	Iu	iP_N	06 54 15.3					
			eP_E	06 54 15.3					
			F	07 42					
55	June 30	IId	$i\overline{P}_{EN}$	15 24 48.5					See discussion, p. 8
			$i\overline{S}_{EN}$	15 24 54.0					
			F	15 29					

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MOUNT HAMILTON

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
56	June 30	Id	$i\bar{P}_{EN}$	23 28 49.6					See discussion, p. 8
			iS_N	23 29 01.1					
			iS_E	23 29 01.3					
			F	23 32					

International Seismological Centre

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the seismographic station:

φ = 37°25' N Lat.
λ = 122°11' W from Greenwich.

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_o	ϵ
Wood-Anderson	E	3000	1	15
	N	3000	1	15

International Seismological Centre

PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Apr. 1	Id	$e\overline{P}_E$	21 31 18.0					See discussion, p. 5
			$e\overline{S}_E$	21 31 23.8					
			F	21 33					
2	Apr. 5	Iv	eP_E	10 13 48.0					No time marks on N-S.
			iS_E	10 14 20.5					S-P = 32.5 sec.
			F	10 16					
3	Apr. 6	Id	$e\overline{P}_E$	08 37 56.4					No time marks on N-S.
			$e\overline{S}_E$	08 38 02.9					See discussion, p. 5
			F	08 40					
4	Apr. 16	Iv	iP_E	03 42 36.6					See discussion, p. 5
			iS_E	03 43 10.1					No time marks on N-S.
			F	03 46					S-P = 33.5 sec.
5	Apr. 24	Id	$e\overline{P}_N$	23 45 08.4					See discussion, p. 6
			$e\overline{P}_E$	23 45 08.4					
			iS_N	23 45 09.7					
			$e\overline{S}_E$	23 45 09.7					
			F	23 47					
6	Apr. 25	Id	$i\overline{P}_N$	22 50 59.2					See discussion, p. 6
			eP_E	22 50 59.2					
			iS_{EN}	22 51 00.7					
			F	22 52					
7	Apr. 27	Iv	i_{EN}	09 09 11.2					
			i_{EN}	09 09 24.7					
			F	09 11					
8	Apr. 29	I	eP_E	20 10 02.3					
			eP_N	20 10 02.8					
			e_N	20 14 17.3					
			F	20 16					
9	May 2	Id	$i\overline{P}_E$	18 49 29.1					See discussion, p. 6
			e_N	18 49 31.1					
			e_E	18 49 31.6					
			iS_E	18 49 32.6					
			e_{EN}	18 49 40.1					
			F	18 51					
10	May 2	I	eP_{EN}	21 12 40.1					
			iS_{EN}	21 13 36.1					
			F	21 16					

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PALO ALTO

o.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	May 2	Iv	eP_{EN}	23 05 50.8					
			i_{EN}	23 06 45.8					
			F	23 09					
2	May 4	IId	iP_E	20 02 00.2					No time marks on N-S.
			F	20 03					S-P = 0.7 sec. on N-S.
									See discussion, p. 6
3	May 5	Id	$i\overline{P}_E$	00 11 22.5					
			iS_E	00 11 32.9					See discussion, p. 6
			F	00 12					No time mark on N-S.
4	May 5	Id	$e\overline{P}_E$	00 38 28.3					See discussion, p. 6
			eS_E	00 38 39.5					S-P = 11.2 sec. on N-S
			F	00 40					No time marks on N-S.
5	May 6	Id	$e\overline{P}_E$	19 50 27.6					See discussion, p. 7
			iS_E	19 50 39.9					S-P = 12.5 sec.
			F	19 52					No time marks on N-S.
6	May 11	I	eP_N	06 31 08.7					
			e_E	06 32 10.7					
			e_N	06 31 28.7					
			e_N	06 31 32.2					
			e_E	06 31 54.5					
			i_N	06 32 06.7					
			F	06 33					
7	May 14	Id	$e\overline{P}_{EN}$	22 40 50.1					See discussion, p. 7
			iS^*_N	22 40 55.1					
			iS^*_E	22 40 55.4					
			i_{EN}	22 40 57.9					
			F	22 42					
8	May 14	I	eP_E	23 41 56.9					
			eP_N	23 41 57.1					
			e_N	23 42 27.9					
			i_E	23 42 47.4					
			e_N	23 43 44.4					
			e_N	23 44 36.9					
			F	23 50					
9	May 15	Id	$e\overline{P}_{NE}$	16 51 18.8					See discussion, p. 7
			iS_{NE}	16 51 21.1					
			F	16 53					

International Seismological Centre

PALO ALTO

o.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
0	May 16	Iv	iP_{EN}	03 25 33.2					
			i_{EN}	03 25 48.0					
			i_N	03 26 08.0					
			e_E	03 26 08.2					
			i_{EN}	03 26 18.7					
			F	03 28					
21	May 20	IId	$i\overline{P}_{EN}$	01 06 28.3					See discussion, p. 7
			$i\overline{S}_{EN}$	01 06 30.2					
			F	01 07					
22	May 22	I	iP_{EN}	01 30 13.5					
			i_N	01 30 29.2					
			i_E	01 30 26.8					
			i_N	01 30 48.5					
			i_E	01 31 06.2					
			F	01 32					
23	June 8	Iv	eP_N	15 33 09.7					No time marks on E-W.
			iS_N	15 33 24.2					S-P = 14.5 sec.
			F	15 35					
24	June 9	Id	iP_N	04 58 44.6					See discussion, p. 7
			iP_E	04 58 45.1					
			i_N	04 58 46.6					
			i_N	04 58 47.1					
			F	04 59					
25	June 9	Id	$i\overline{P}_N$	13 22 04.0					See discussion, p. 7
			$i\overline{P}_E$	13 22 04.1					
			i_N	13 22 05.1					
			iS_N	13 22 06.2					
			F	13 23					
26	June 14	Id	$i\overline{P}_{EN}$	18 42 23.1					See discussion, p. 7
			$i\overline{S}_{EN}$	18 42 34.9					
			i_E	18 42 36.1					
			i_N	18 42 36.6					
			i_E	18 42 38.3					
			i_N	18 42 38.6					
			F	18 45					
27	June 15	Id	$i\overline{P}_N$	21 02 22.2					See discussion, p. 7
			$i\overline{P}_E$	21 02 22.3					
			i_N	21 02 23.4					
			i_E	21 02 23.7					
			iS_E	21 02 24.5					
			iS_N	21 02 24.5					
			F	21 03					

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PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
28	June 18	Id	$e\overline{P}_N$	04 13 25.6					See discussion, p. 8
			$e\overline{P}_E$	04 13 25.9					
			$i\underline{E}$	04 13 36.6					
			$e\overline{S}_E$	04 13 32.8					
			F	04 14					
29	June 18	Id	$e\overline{P}_N$	04 15 32.4					See discussion, p. 8
			$e\overline{P}_E$	04 15 32.4					
			$i\overline{S}_E$	04 15 42.9					
			$i\overline{S}_N$	04 15 44.7					
			F	04 17					
30	June 19	I	iP_{EN}	09 56 12.7					See discussion, p. 8
			i_E	09 56 25.2					
			i_E	09 56 50.7					
			i_N	09 56 52.7					
			F	09 59					
31	June 24	I	eP_{EN}	23 35 35.2					
			e_{EN}	23 36 09.2					
			e_E	23 38 44.7					
			e_E	23 38 52.2					
			F	00 05					
32	June 28	I	e_N	20 11 42.8					
			e_E	20 11 42.8					
			e_N	20 11 51.2					
			i_N	20 11 58.0					
			e_E	20 11 41.0					
			i_E	20 11 58.3					
			i_N	20 12 07.0					
			i_N	20 12 08.0					
			F	20 14					
33	June 29	I	eP_N	06 54 18.8					
			eP_E	06 54 19.3					
			F	07 10					
34	June 30	Id	$i\overline{P}_N$	15 24 44.9					See discussion, p. 8
			$i\overline{P}_E$	15 24 45.1					
			i_N	15 24 46.6					
			iS_N	15 24 53.1					
			iS_E	15 24 52.6					
			F	15 27					

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PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
35	June 30	Iv	eP_{EN}	19 48 22.1					See discussion, p. 8
			iS_E	19 48 38.8					
			F	19 51					
36	June 30	I	$i\overline{P}_N$	23 28 53.0					See discussion, p. 8
			$i\overline{S}_N$	23 29 10.5					
			F	23 35					

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SAN FRANCISCO

THE SAN FRANCISCO STATION, CALIFORNIA ACADEMY OF SCIENCES SAN FRANCISCO, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic room:

φ = 37° 46' N Lat.
λ = 122° 28' W from Greenwich.

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

Altitude.--67 meters (220 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T_o	ϵ
Wood-Anderson	N 75° E	1500	1	15
	N	3000	1	15

The instruments at the San Francisco station are much agitated by street traffic throughout the day, and therefore it is only occasionally that an earthquake is sufficiently well recorded there for accurate measurements to be taken. This explains the small number of measurements made for the station.

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SAN FRANCISCO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Apr. 5	I	ePE_N	10 13 58.2					
			e_{NE}	10 14 05.2					
			F	10 16					
2	May 2	I	e_E	21 12 36.2					
			i_E	21 13 26.5					
			F	21 20					
3	June 28	I	ePE	20 11 47.5					
			e_E	20 11 49.5					
			F	20 13					
4	June 28	I	$e\overline{P}_E$	20 11 47.5					
			e_E	20 11 49.5					
			e_N	20 11 49.5					
			iS_N	20 11 52.5					
			$i\overline{S}_E$	20 11 54.0					
5	June 30	Id	$i\overline{P}_{EN}$	15 24 48.2					See discussion, p. 8
			$i\overline{S}_E$	15 24 53.9					
			iS_N	15 24 54.4					
			F	15 26					

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FERNDALE

THE FERNDALE STATION
FERNDALE, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic station:

φ = 40° 34' N. Lat.
λ = 124° 16' W. from Greenwich.

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

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

The seismograph is a Bosch-Omori 25-kgm. horizontal pendulum. It is oriented to record E-W motion. The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.

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FERNDALE

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Apr. 8	Id	$e\overline{P}_E$	5 29 23					See discussion, p. 5
			$i\overline{S}_E$	5 29 24					
			F	5 30					
2	Apr. 26	Id	$e\overline{P}_E$	15 33 14					See discussion, p. 6
			$i\overline{S}_E$	15 33 20					
			F	15 34					

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EARTHQUAKES IN NORTHERN CALIFORNIA

AND

THE REGISTRATION OF EARTHQUAKES

AT

BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE

FROM

July 1, 1935 to September 30, 1935

BY

PERRY BYERLY

AND

WILBERT ANNIS

BULLETIN OF THE SEISMOGRAPHIC STATIONS

VOLUME 5, NO. 2

U. S. GEOLOGICAL SURVEY
MENLO PARK
JAN 15 1962
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EARTHQUAKE INTENSITY SCALE

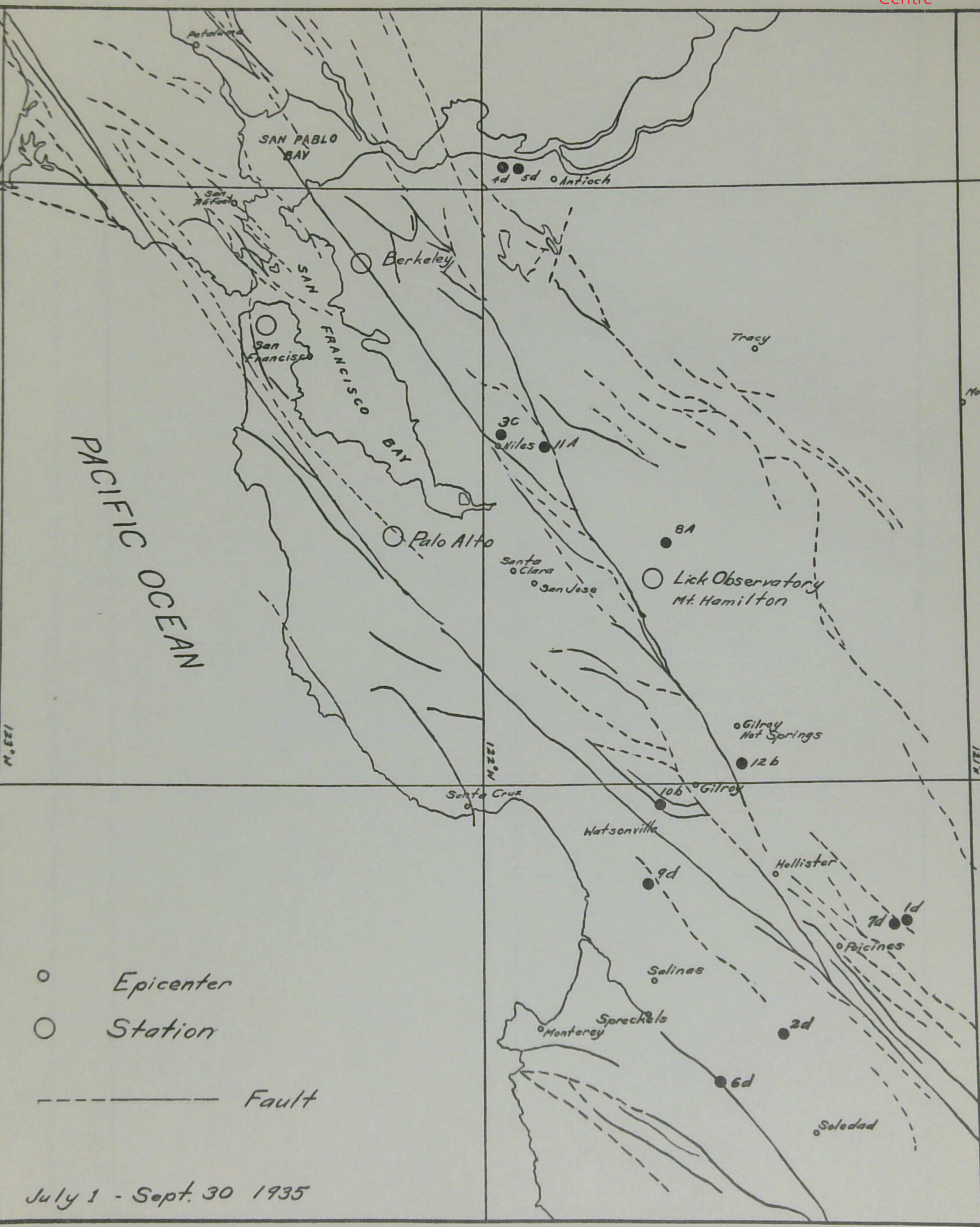
Criteria of the Rossi-Forel Scale which were used to rate the intensities of the earthquakes registered were:

Intensity

I-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-VI	Disturbance of movable objects; plaster cracked.
VII	Overthrow of movable objects; cracking of chimneys and other brickwork.
VIII	Fall of some chimneys; some damage to buildings.

Epicenters located in the following list are plotted on the accompanying map. A number and a letter are given beside each epicenter. The number is that assigned to the earthquake in the 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.

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Map showing epicenters, July 1, 1935–September 30, 1935, inclusive.

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EARTHQUAKES IN NORTHERN CALIFORNIA

(All intensities are given on the Rossi-Forel Scale)

1935 -- PACIFIC STANDARD TIME

July 4, 2h 49m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 9 miles from Lick Observatory.

July 5, 11h 46m, a.m. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.

July 8, 10h 59m, p.m. Recorded at Palo Alto and Mount Hamilton; not reported felt; epicenter about 7 miles east of Paicines. See map, epicenter no. 1.

July 10, 10h 25m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 6 miles from Lick Observatory.

July 10, 12h 02m, p.m. Recorded at Berkeley only; not reported felt; focus about 4 miles from the University campus. (Blast?)

July 11, 00h 58m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 9 miles north of Soledad. See map, epicenter no. 2.

July 11, 8h 20m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter very near Niles. See map, epicenter no. 3.

July 11, 10h 26m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

July 11, 3h 08m, p.m. Recorded at Berkeley only; not reported felt; focus about 18 miles from the University campus. Probably a small aftershock of the earthquake of October 2, 1934.

July 11, 4h 04m, p.m. Recorded at Ferndale only. Intensities:

IV Forest Glen, Scotia, Whitlow.

III Briceland, Fortuna; felt also at Ferndale, Petrolia, Upper Mattole; epicenter about 30 miles from Ferndale.

July 12, 1h 32m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto, San Francisco; not reported felt; epicenter doubtfully placed about 5 miles west of Antioch. See map, epicenter no. 4.

July 12, 3h 52m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto, San Francisco; not reported felt; epicenter probably same as that of previous shock. See map, epicenter no. 5.

July 13, 4h 01m, p.m. Recorded at Berkeley only; not reported felt; focus about 3 miles from University campus. Very probably a quarry blast.

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July 17, 4h 09m, p.m. Recorded at Berkeley only; not reported felt; focus about 5 miles from University campus.

July 18, 5h 22m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; felt throughout Plumas County. Intensities:

VI Keddie, Paxton.

V-VI Quincy and Taylorsville; epicenter very probably near Keddie. (Reno reports epicentral distance of 60 miles.)

July 20, 6h 13, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about halfway between Soledad and Spreckels. See map, epicenter no. 6.

July 23, 1h 20m, p.m. Recorded at Palo Alto only; not reported felt; focus about 13 miles from Palo Alto station.

July 23, 4h 24m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

July 24, 8h 16m, p.m. Recorded at Mount Hamilton and Palo Alto; V-VI at Parkfield; records too faint for location of epicenter.

July 26, 3h 07m, p.m. Recorded at Berkeley, Mount Hamilton and Palo Alto; felt sharply at Mulberry; epicenter about 5 miles east of Paicines. See map, epicenter no. 7.

July 27, 10h 00m, p.m. Recorded at Berkeley, Mount Hamilton and Palo Alto; III at King City; epicenter probably not far from Priest Valley.

July 29, 2h 34m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter 4 miles north of Lick Observatory. See map, epicenter no. 8.

August 3, 2h 16m, p.m. Recorded at Ferndale only; not reported felt; focus about 37 miles from the Ferndale station.

August 4, 4h 31m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 6 miles from Lick Observatory.

August 6, 11h 06m, a.m. Recorded at Palo Alto only; not reported felt; focus about 18 miles from Palo Alto station.

August 6, 8h 07m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

August 7, 11h 40m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

August 9, 9h 14m, a.m. Recorded at Mount Hamilton and Palo Alto; felt in King City and Priest Valley; epicenter probably not far from Priest Valley.

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ugust 9, 9h 08m, p.m. Recorded at Berkeley only; not reported felt; focus less than a mile from the Berkeley station.

ugust 10, 6h 32m, a.m. Recorded at Palo Alto only; not reported felt; focus about 12 miles from Palo Alto station.

ugust 10, 6h 38m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

ugust 12, 12h 34m, p.m. Recorded at Berkeley only; not reported felt; focus about 8 miles from the University campus.

ugust 19, 9h 34m, p.m. Recorded at Berkeley only; not reported felt; focus about 9 miles from the University campus.

ugust 20, 2h 42m, p.m. Recorded at Ferndale only; not reported felt; focus about 53 miles from the Ferndale station.

ugust 21, 1h 49m, p.m. Recorded at Berkeley only; not reported felt; focus about 5 miles from the University campus. (Blast?)

ugust 22, 8h 47m, a.m. Recorded at Berkeley only; not reported felt; focus about 4 miles from the University campus.

ugust 23, 2h 12m, p.m. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.

ugust 23, 3h 54m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter 10 miles west of Hollister. See map, epicenter no. 9.

ugust 26, 1h 16m, a.m. Recorded at Ferndale only; not reported felt; focus about 37 miles from the Ferndale station.

ugust 30, 2h 16m, p.m. Recorded at Berkeley only; not reported felt; focus about 5 miles from the University campus. (Blast?)

eptember 1, 1h 16m, p.m. Recorded at Berkeley, Palo Alto; not reported felt; epicenter about 4 miles southwest of Gilroy. See map, epicenter no. 10.

eptember 2, 10h 27m, a.m. Recorded at Palo Alto only; not reported felt; focus about 6 miles from Palo Alto station.

eptember 5, 3h 24m, p.m. Recorded at Berkeley only; not reported felt; focus about 5 miles from the University campus. (Blast?)

eptember 8, 8h 18m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 5 miles east of Niles. See map, epicenter no. 11.

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September 10, 3h 55m, p.m. Recorded at Berkeley, Mount Hamilton, San Francisco.
Intensities:

V-VI Berkeley, (in a few cases objects were thrown from shelves).

IV Corte Madera, Sunnyvale.

III Hercules, Rodeo, San Francisco.

I-II Alameda, Lafayette, Moraga, Mt. Eden, Oakland, Port Costa, Rockaway Beach, Tiburon, Woodacre; focus about 4 miles from the University of California campus northwest and down, probably on the Hayward Fault.

September 10, 7h 43m, p.m. Recorded at Berkeley only; not reported felt; focus about 5 miles from the University campus. (Blast?)

September 11, 3h 04m, a.m. Recorded at Berkeley only; not reported felt; focus about 4 miles from the University campus; probably aftershock of the quake of September 10, 3h 55m, p.m.

September 11, 6h 19m, a.m. Recorded at Ferndale only; not reported felt; focus about 15 miles from the Ferndale station.

September 12, 3h 51m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 16 miles from Lick Observatory.

September 19, 4h 43m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 6 miles from Lick Observatory.

September 22, 3h 57m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 8 miles from Lick Observatory.

September 23, 8h 27m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 17 miles from Lick Observatory.

September 24, 1h 12m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 6 miles south of Gilroy Hot Springs. See map, epicenter no. 12.

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THE REGISTRATION OF EARTHQUAKES

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SYMBOLS AND NOTATIONS EMPLOYED

. Character of the Earthquake--

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

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

. Phases of the Seismogram--

P (undae primae)	Normal first phase, or first preliminary tremors (longitudinal).
P'	First preliminary tremors which have penetrated the core of the earth.
PR_n	Waves n times reflected at the earth's surface.
S (undae secundae)	Second phase, or second preliminary tremors (transverse).
SR_n	Waves n times reflected at the earth's surface.
PS	Waves changed from longitudinal to transverse oscillation or vice versa through reflection at the earth's surface.
PPS	Waves twice reflected at the earth's surface, having been longitudinal on two branches of the path and transverse on one branch.

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

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

For local earthquakes a special notation is used:

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

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3. Nature of the Motion--

i (impetus)	Sudden beginning of the motion.
e (emersio)	Gradual beginning of the motion.
T (period)	Time of one complete oscillation.
A	Trace amplitude measured from the media line, + earth motion toward east, north, or zenith, - toward west, south, or nadir.
A_E	E-W component of A.
A_N	N-S component of A.
A_Z	Vertical component of A.

4. Time--

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

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BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic room:

φ = 37° 52' 15" N. Lat.
λ = 122° 15' 36" W. from Greenwich.

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

Altitude.--85 meters (279 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T_o	ϵ	$\frac{r}{T_o 2}$
Bosch-Omori 100 kg. ...	E	45	16	10	0.001
	N	45	12	10	0.001
Wiechert 80 kg.	Z	44	4	5	0.005
Wood-Anderson	E	3,000	0.9	15	
	N	3,000	0.9	15	

		K	T	T_1	μ_2
Galitzin	E	126	12	12	0
	N	125	12	12.1	0
	Z	121	12	11.8	0

		V	Coupled Period	ϵ
Benioff	Z	100,000(Ca)	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	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	July 3	Iv	i_Z	H 5 05 19.5					
			i_Z	H 5 05 24.5					
			i_Z	H 5 05 26.0					
			F	5 06					
2	July 6	I	e_E	G 18 44 14.0					
			e_E	G 18 49 17.0					
			e_N	G 18 49 33.0					
			e_N	G 18 57 33.0					
			i_E	G 18 58 59.0					
			F	19 17					
3	July 9	I	e_N	G 12 59 11.0					
			e_N	G 13 11 19.0					
			F	13 47					
4	July 10	I	e_{EN}	G 9 51 10.0					
			i_E	G 9 56 17.0					
			i_E	G 9 57 38.0					
			F	9 59					
5	July 10	Id	$\overline{iP}_Z$	H 20 02 11.5					See discussion, p. 43
			$\overline{iS}_Z$	H 20 02 13.1					
			F	20 03					
6	July 11	I	e_Z	H 8 36 40.2					
			F	8 38					
7	July 11	Iv	$e\overline{P}_Z$	H 8 58 05.5					See discussion, p. 43
			$i\overline{P}_Z$	H 8 58 08.1					
			eS_N	A 8 58 26.5					
			$\overline{iS}_Z$	H 8 58 26.5					
			eS_N	A 8 58 28.5					
			eL_N	A 8 58 34.0					
			iL_Z	H 8 58 34.0					
			F	8 59					
8	July 11	I	e_N	G 13 42 01.0					
			i_N	G 13 43 53.0					
			F	14 16					
9	July 11	Id	$e\overline{P}_E$	A 16 19 47.7					See discussion, p. 43
			$e\overline{S}_E$	A 16 19 53.7					
			eS_N	A 16 19 54.2					
			eL_E	A 16 19 58.7					
			eL_N	A 16 19 59.2					
			F	16 21					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
10	July 11	Id	$i\overline{P}_Z$	H 23 07 37.0					See discussion, p. 4
			iS^*_Z	H 23 07 40.4					
			$i\overline{S}_Z$	H 23 07 41.1					
			F	23 08					
11	July 12	Iv	iP_Z	H 0 04 50.5					
			e_{EN}	A 0 04 51.0					
			i_Z	H 0 05 12.7					
			i_Z	H 0 05 18.5					
			i_E	A 0 05 22.0					
			i_N	A 0 05 23.0					
			i_Z	H 0 05 23.3					
			F	0 07					
12	July 12	I	e_Z	H 18 54 14.7					
			i_Z	H 18 54 22.7					
			i_Z	H 18 54 38.7					
			i_Z	H 18 54 50.0					
			i_Z	H 18 55 03.7					
			i_Z	H 18 55 10.7					
			i_Z	H 18 55 20.7					
			i_Z	H 18 55 58.7					
			i_Z	H 18 56 22.7					
			i_Z	H 18 56 54.7					
			i_Z	H 18 57 13.2					
			i_Z	H 18 57 19.2					
			F	18 58					
13	July 12	Id	$i\overline{P}_Z$	H 21 32 10.5					See discussion, p. 43
			e_E	A 21 32 13.8					
			iS_Z	H 21 32 14.8					
			$e\overline{S}_E$	A 21 32 16.3					
			$i\overline{S}_Z$	H 21 32 16.3					
			$e\overline{S}_N$	A 21 32 16.8					
			F	21 33					
14	July 12	Id	$e\overline{P}_E$	A 23 51 46.4					See discussion, p. 43
			$i\overline{P}_Z$	H 23 51 46.4					
			e_N	A 23 51 46.9					
			$i\overline{S}_E$	A 23 51 52.0					
			$e\overline{S}_N$	A 23 51 52.2					
			F	23 53					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
15	July 13	Iv	iP_Z	H 10 55 32.9					Felt in southern California
			e_E	A 10 55 34.0					
			e_N	A 10 55 39.0					
			i_Z	H 10 55 43.3					
			e_N	A 10 56 34.0					
			i_Z	H 10 57 05.7					
			F	10 59					
16	July 14	Id	$i\overline{P}_Z$	H 0 01 20.7					See discussion, p. 4
			$i\overline{S}_Z$	H 0 01 22.0	0.4			+1.5	
			F	0 02					
17	July 15	I	iP_E	G 15 33 56.0	1.7	+3.5			
			eP_Z	G 15 33 58.0					
			i_E	G 15 34 16.0					
			i_E	G 15 37 23.0					
			F	15 43					
18	July 17	I	e_E	G 0 35 45.0					
			i_E	G 0 41 58.0					
			F	1 48					
19	July 18	Id	$i\overline{P}_Z$	H 0 09 08.5					See discussion, p. 4
			$i\overline{S}_Z$	H 0 09 10.2					
			F	0 10					
20	July 18	I	e_E	G 22 01 17.0					
			e_E	G 22 10 37.0					
			i_E	G 22 10 48.0					
			i_E	G 22 22 59.0					
			F	23 58					
21	July 19	Iv	e_Z	H 1 01 15.0					
			i_E	A 1 01 16.0					
			i_N	A 1 01 19.0					
			i_Z	H 1 01 20.5	1.3			+1	
			i_Z	H 1 01 30.0					
			F	1 04					
22	July 19	Iv	iP_Z	H 1 22 05.3					See discussion, p. 4
			iP_Z	H 1 22 06.0					
			eP_N	A 1 22 06.2					
			eP_E	A 1 22 07.2					
			eS_N	A 1 22 35.2					
			eS_E	A 1 22 36.4					
			iS_Z	H 1 22 36.7					
			F	1 25					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
23	July 21	Iv	e_Z	H 2 13 30.0					See discussion, p. 44
			F	2 14.8					
24	July 21	I	e_E	G 2 20 10.0					
			i_E	G 2 23 00.0					
			F	3 14					
25	July 26	I	e_Z	H 4 51 57.0					
			F	4 54.3					
26	July 26	I	e_Z	H 8 13 30.0					
			i_Z	H 8 13 31.0					
			F	8 16					
27	July 26	Iv	e_Z	H 23 07 54.3					See discussion, p. 44
			F	23 09					
28	July 28	Iv	eP_Z	H 6 00 50.0					See discussion, p. 44
			e_Z	H 6 00 52.5					
			iP_Z	H 6 00 53.5					
			e_E	A 6 00 59.0					
			e_N	A 6 01 02.7					
			i_E	A 6 01 30.0					
			iS_Z	H 6 01 30.0					
			i_Z	H 6 01 34.0					
			i_E	A 6 01 34.3					
			i_N	A 6 01 34.5					
			F	6 03					
29	July 29	Iu	eP_Z	H 7 50 06.3					U.S.C. & G.S. Epicenter: 23°S, 178°W Depth of focus about 500 km.
			e_N	A 7 50 06.5					
			eP_E	A 7 50 09.5					
			eP_E	G 7 50 10.0					
			iP_Z	H 7 50 11.0	1			+4.5	
			iP_{EN}	A 7 50 11.5	1.4	-1	-1		Fiji Islands
			eP_N	G 7 50 12.0					
			iP_E	G 7 50 12.0					
			i_Z	H 7 50 13.8					
			iP_N	G 7 50 15.0	3		+12		
			iPR_{1N}	G 7 53 22.0					
			eS_E	A 7 59 28.5					
			eS_N	A 7 59 31.0					
			iS_E	G 7 59 32.0					
			iS_N	G 7 59 33.0					
			i_E	G 8 02 37.0					
			i_E	G 8 22 28.0					
			i_E	G 8 27 44.0					
			i_E	G 8 29 31.0					
			F	9 30					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
30	July 29	Id	$i\overline{P}_Z$	H 22 34 16.2					See discussion, p. 44
			$i\overline{S}_Z$	H 22 34 27.0					
			i_Z	H 22 34 28.1					
			F	22 35					
31	Aug. 1	I	e_N	G 16 17 29.0					U.S.C. & G.S. Epicenter: 10°N, 86°W.
			e_N	G 16 23 31.0					
			i_N	G 16 32 15.0					
			i_N	G 16 35 28.0					Central America
			F	17 08					
32	Aug. 3	Iu	e_N	G 1 33 32.0					U.S.C. & G.S. Epicenter: 5°N, 96°E.
			iL_N	G 2 20 35.0					
			F	3 33					Sumatra
33	Aug. 4	I	e_N	G 2 39 36.0					
			i_N	G 2 44 06.0					
			F	2 50					
34	Aug. 7	I	eP_{EN}	G 9 12±					U.S.C. & G.S. Epicenter: 1°N, 77°W. Columbia, South Americ
35	Aug. 10	Id	$i\overline{P}_Z$	H 5 07 53.3					See discussion, p. 45
			F	5 08					
36	Aug. 12	Id	$i\overline{P}_Z$	H 20 33 34.1					See discussion, p. 45
			$i\overline{S}_Z$	H 20 33 35.8					
			F	20 34					
37	Aug. 17	Iu	eP_{ENZ}	A-G 1 58±					U.S.C. & G.S. Epicenter: 20°S, 172°E New Hebrides
38	Aug. 20	Id	iP_Z	H 5 34 25.5					See discussion, p. 45
			eP_N	A 5 34 25.7					
			eP_E	A 5 34 26.0					
			eS_N	A 5 34 27.5					
			iS_Z	H 5 34 27.5					
			iS_E	A 5 34 27.6					
			F	5 35					
39	Aug. 21	Iv	i_Z	H 14 00 00.8					
			F	14 02					
40	Aug. 21	Id	$i\overline{P}_N$	A 21 48 06.9					
			$e\overline{P}_E$	A 21 49 07.0					See discussion, p. 45
			$i\overline{P}_Z$	H 21 49 07.0					
			$i\overline{S}_E$	A 21 49 08.6					
			F	21 50					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
41	Aug. 22	Id	$e\overline{P}_E$	A 14 47 12.4					See discussion, p. 45
			$e\overline{S}_N$	A 14 47 13.2					
			$i\overline{S}_E$	A 14 47 13.3					
			F	14 48					
42	Aug. 22	Ir	eP_Z	H 20 38 58.0					U.S.C. & G.S. Epi-
			e_N	A 20 38 59.0					center: 73°.5 N, 66°
			e_E	A 20 39 01.0					Baffin's Bay
			e_{EN}	A 20 52 45.0					
			e_E	A 20 53 32.0					
			e_N	A 20 53 36.0					
			e_E	A 20 55 14.0					
			e_N	A 20 57 18.0					
			e_E	A 20 57 27.0					
			F	21 09					
43	Aug. 23	Iv	$e\overline{P}_{EN}$	A 23 54 20.8					See discussion, p. 45
			$e\overline{S}_N$	A 23 54 37.8					
			$i\overline{S}_E$	A 23 54 37.8					
			F	23 56					
44	Aug. 30	Id	$e\overline{P}_N$	A 22 15 35.0					See discussion, p. 45
			$i\overline{P}_Z$	H 22 15 35.1					
			e_E	A 22 15 36.3					
			$i\overline{S}_Z$	H 22 15 36.8					
			i_N	A 22 15 37.3					
			i_Z	H 22 15 37.4					
			F	22 16					
45	Sept. 1	Iv	iP_Z	H 21 15 59.6					See discussion, p. 45
			e_N	A 21 16 11.7					
			iS_Z	H 21 16 14.5					
			e_E	A 21 16 15.2					
			i_Z	H 21 16 25.4					
			F	21 17					
46	Sept. 4	Iu	e_E	A 1 34 09.0					U.S.C. & G.S. Epi-
			eP_Z	H 1 34 09.0					center: 65°N, 152°W
			iP_Z	H 1 34 10.0					Alaska
			iP_Z	G 1 34 13.0					
			i_Z	H 1 35 32.5					
			i_Z	G 1 47 52.0					
			e_E	A 2 00 20.0					
			F	3 14					
47	Sept. 5	Id	$i\overline{P}_Z$	H 23 24 06.3					See discussion, p. 45
			$i\overline{S}_Z$	H 23 24 07.9					
			F	23 25					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
48	Sept. 9	Id	$i\bar{P}_Z$	H 4 17 43.2					See discussion, p. 45
			$e\bar{S}_N$	A 4 17 50.0					
			$i\bar{S}_Z$	H 4 17 50.0					
			F	4 19					
49	Sept. 9	Ir	eP_Z	G 6 23 50.0					
			iS_Z	G 6 29 47.0					
			F	7 54					
50	Sept. 9	I	iP_Z	H 9 12 15.5	1.3			-1	
			e_E	A 9 12 16.0					
			F	9 14					
51	Sept.10	I	i_Z	H 6 24 51.0					
			e_E	A 6 24 58.5					
			F	6 27					
52	Sept.10	I	eP_Z	H 6 30 41.0					
			e_E	A 6 30 45.5					
			e_E	A 6 41 17.5					
			F	7 44					
53	Sept.10	IIId	$i\bar{P}_N$	A 23 55 18.6					See discussion, p. 46
			$i\bar{P}_{EZ}$	A 23 55 18.7					
			i_N	G 23 55 19.5					
			$i\bar{S}_{EN}$	A 23 55 19.6					
			i_N	A 23 55 29.0					
			i_E	A 23 55 29.4					
			F	23 57					
54	Sept.11	Id	$e\bar{P}_E$	A 2 36 51.1					See discussion, p. 46
			$e\bar{P}_N$	A 2 36 51.3					
			$i\bar{P}_Z$	H 2 36 51.3					
			$i\bar{S}_Z$	H 2 36 52.5					
			$i\bar{S}_E$	A 2 36 52.6					
			$i\bar{S}_N$	A 2 36 52.7					
			F	2 37					
55	Sept.11	Id	$i\bar{P}_Z$	H 11 04 17.4					See discussion, p. 46
			$i\bar{S}_Z$	H 11 04 18.4					
			F	11 05					
56	Sept.11	I	iP_Z	H 11 57 07.5	1			-1	
			F	11 59					
57	Sept.11	I	eP_N	G 12 08 50.0					
			e_N	G 12 24 08.0					
			F	13 04					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
58	Sept.11	Iu	eP_{EN}	A 14 14 46.5					U.S.C. & G.S. Epi-
			iP_Z	H 14 14 46.5	1.4			-4	center: 45°N, 146°
			iP_N	G 14 14 47.0					Japan
			iP_E	A 14 14 48.5					
			iP_N	A 14 14 49.0					
			i_Z	H 14 15 01.0					
			i_Z	H 14 17 17.0					
			e_E	A 14 23 32.5					
			e_N	A 14 23 34.5	8			+1.5	
			iS_N	G 14 23 36.0					
			e_Z	H 14 23 38.5					
			e_E	A 14 33 18.5					
			e_Z	H 14 43 16.5					
			F	17 14					
59	Sept.12	I	iP_Z	H 16 12 28.5					
			F	16 13					
60	Sept.15	I	eP_Z	H 11 28 25.5					
			iP_Z	H 11 28 26.5					
			e_N	A 11 28 28.0					
			e_E	A 11 28 29.0					
			e_N	A 11 38 57.0					
			e_N	A 11 39 14.0					
			F	12 23					
61	Sept.15	Iu	eP_Z	H 14 19 42.0					U.S.C. & G.S. Epi-
			e_N	A 14 19 43.0					center: 29°S, 114°W
			e_E	A 14 19 43.5					South Pacific, M.
			iP_Z	H 14 19 44.5					Easter Is.
			e_E	A 14 28 29.5					
			e_N	A 14 28 40.5					
			e_E	A 14 38 21.5					
			e_N	A 14 39 07.5					
			F	15 33					
62	Sept.20	IIu	eP_{EZ}	A 2 00 07.0					U.S.C. & G.S. Epi-
			e_N	A 2 00 11.0					center: 1°5 S, 142°
			i_Z	H 2 00 38.0					New Guinea
			e_Z	H 2 04 08.0					
			e_E	A 2 04 09.0					
			e_E	A 2 10 44.0					
			e_N	A 2 10 45.0					
			e_E	A 2 13 07.0					
			e_E	A 2 15 23.0					
			e_N	A 2 27 08.0					
			eL_E	A 2 30 27.0					
			eL_Z	H 2 31 14.0					
			F	4 23					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
63	Sept.20	I	e_Z	H 5 36 35.0					
			e_E	A 5 36 37.0					
			e_N	A 5 36 39.0					
			e_E	A 5 40 28.0					
			eL_E	A 6 06 18.0					
			F	6 53					
64	Sept.23	Iu	iP_Z	G 9 31 43.0					U.S.C. & G.S. Epi-
			e_Z	H 9 31 44.5					center: 1°5 S, 142
			e_E	A 9 31 47.0					New Guinea
			e_N	A 9 31 48.5					
			e_E	G 9 33 45.0					
			iPR_{1E}	G 9 35 37.0					
			iPR_{1Z}	G 9 35 38.0					
			e_N	A 9 36 48.0					
			eS_E	A 9 42 23.0					
			iS_E	G 9 42 24.0					
			eS_N	A 9 42 25.0					
			iE	G 9 43 27.0					
			iE	G 9 49 41.0					
			eZ	H 10 01 42.0					
			eL_E	A 10 01 51.0					
			iL_E	G 10 01 57.0					
			eL_Z	G 10 02 15.0					
			F	11 30					
65	Sept.24	Iv	eP_Z	H 9 12 24.2					See discussion, p. 46
			eP_E	A 9 12 24.4					
			eP_N	A 9 12 24.6					
			iP_Z	H 9 12 24.6					
			iS_N	A 9 12 39.1					
			iS_E	A 9 12 39.2					
			eS_Z	H 9 12 39.4					
			iS_Z	H 9 12 40.2					
			e_N	A 9 13 22.9					
			e_E	A 9 13 23.4					
			i_Z	H 9 13 24.4					
			F	9 14					
66	Sept.24	IIr	e_N	A 22 15 25.0					U.S.C. & G.S. Epi-
			e_E	A 22 15 25.5					center: 50°N, 130°W
			eP_{EN}	G 22 15 26.0					North Vancouver Islan
			e_Z	H 22 15 26.0					
			iP_Z	G 22 15 27.0					
			iP_N	G 22 15 28.0					
			eS_E	A 22 17 59.0					
			iS_E	G 22 17 59.0					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
66	Sept.24 (contd)	IIr	iS_Z	G 22 18 01.0					
			iS_N	G 22 18 03.0	2.5		-11		
			e_N	A 22 18 17.5					
			e_E	A 22 19 38.0					
			F	24 33					
67	Sept.26	I	e_N	G 2 49 45.0					
			e_E	G 2 50 35.0					
			e_E	G 2 52 55.0					
			i_N	G 2 54 00.0					
			i_E	G 2 54 03.0					
			i_Z	G 2 54 13.0					
			F	3 33					
68	Sept.26	I	e_E	G 22 56 27.0					
			e_Z	G 23 00 16.0					
			e_N	G 23 00 17.0					
			e_E	G 23 02 23.0					
			F	23 57					

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MOUNT HAMILTON

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

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic room:

φ = 37° 20' 24.5" N Lat.
λ = 121° 38' 34" W from Greenwich.

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_o	ϵ
Wood-Anderson	E	3000	1	15
	N	3000	1	15

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	July 3	Iv	eP_E	5 05 29.0					
			i_N	5 05 29.5					
			F	5 06					
2	July 4	Id	$i\overline{P}_{EN}$	22 49 03.7					See discussion, p. 43
			$i\overline{S}_E$	22 49 05.5					
			$i\overline{S}_N$	22 49 05.7					
			F	22 50					
3	July 6	I	e_N	4 44 31.9					
			e_E	4 44 42.9					
			i_N	4 45 18.9					
			F	4 46					
4	July 9	Id	$e\overline{P}_N$	6 59 37.0					See discussion, p. 43
			$e\overline{S}_N$	6 59 46.6					
			$e\overline{S}_E$	6 59 47.0					
			F	7 01					
5	July 10	Id	$i\overline{P}_E$	18 25 24.1					See discussion, p. 43
			$e\overline{P}_N$	18 25 24.3					
			$i\overline{S}_E$	18 25 25.4					
			$i\overline{S}_N$	18 25 25.7					
			F	18 26					
6	July 11	Id	$i\overline{P}_N$	8 57 56.2					See discussion, p. 43
			e_E	8 57 57.2					
			$i\overline{S}_{EN}$	8 58 07.7					
			i_E	8 58 10.7					
			F	9 00					
7	July 11	Id	$e\overline{P}_N$	16 19 47.2					See discussion, p. 43
			e_N	16 19 48.7					
			e_E	16 19 49.2					
			$e\overline{S}_E$	16 19 51.3					
			$e\overline{S}_N$	16 19 51.4					
			F	16 21					
8	July 11	Id	$e\overline{P}_E$	18 26 21.5					See discussion, p. 43
			$i\overline{P}_N$	18 26 21.7					
			$e\overline{S}_E$	18 26 24.0					
			$i\overline{S}_N$	18 26 24.4					
			F	18 27					
9	July 12	Iv	e_{EN}	0 05 01.5					
			i_E	0 05 40.5					
			i_N	0 05 41.0					
			F	0 08					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
10	July 12	Id	e_N	21 32 21.6					See discussion, p. 43
			e_E	21 32 26.5					
			i_N	21 32 28.0					
			e_E	21 32 30.8					
			iS_N	21 32 32.0					
			F	21 33					
11	July 12	Id	$e\overline{P}_N$	23 51 55.7					See discussion, p. 43
			e_E	23 51 58.7					
			eS_E	23 52 06.7					
			i_N	23 52 08.2					
			F	23 53					
12	July 13	Iv	e_E	10 55 23.9					Felt in So. Calif.
			e_N	10 55 25.4					
			eS_E	10 56 38.4					
			eS_N	10 56 40.4					
			F	10 59					
13	July 19	Iv	eP_N	1 22 14.9					See discussion, p. 44
			eP_E	1 22 16.4					
			eS_E	1 23 52.4					
			iS_N	1 23 52.9					
			F	1 25					
14	July 21	Id	$e\overline{P}_{EN}$	2 13 19.2					See discussion, p. 44
			$e\overline{S}_N$	2 13 31.0					
			$e\overline{S}_E$	2 13 31.2					
			$i\overline{S}_N$	2 13 32.2					
			F	2 15					
15	July 24	Id	$e\overline{P}_E$	0 23 48.5					See discussion, p. 44
			$e\overline{P}_N$	0 23 48.6					
			$e\overline{S}_E$	0 23 50.0					
			$e\overline{S}_N$	0 23 50.3					
			F	0 25					
16	July 25	I	e_E	4 16 32.9					See discussion, p. 44
			e_N	4 16 39.9					
			i_E	4 17 03.9					
			F	4 18					
17	July 26	Id	$e\overline{P}_{EN}$	23 07 32.3					See discussion, p. 44
			i_N	23 07 43.3					
			i_E	23 07 43.8					
			iS_N	23 07 44.8					
			F	23 09					

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o.	Date	Char-acter	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
8	July 28	Iv	$ePEN$	6 00 43.5					See discussion, p. 44
			eE	6 00 45.5					
			iN	6 00 47.5					
			iEN	6 00 53.0					
			$iSEN$	6 00 59.0					
			iN	6 01 03.5					
			F	6 03					
9	July 29	Iu	e_E	7 50 06.0					U.S.C. & G.S. Epi-center: 23°S, 178°W.
			e_N	7 50 07.0					
			i_{EN}	7 50 10.5					
			e_N	7 59 31.0					
			e_E	7 59 33.0					
			F	8 08					
0	July 29	Id	$i\bar{P}_N$	22 34 03.3					See discussion, p. 44
			$i\bar{P}_E$	22 34 03.4					
			$i\bar{S}_N$	22 34 04.5					
			F	22 35					
1	Aug. 1	Iu	e_E	16 16 13.0					U.S.C. & G.S. Epi-center: 10°N, 86°W.
			e_N	16 16 14.0					
			F	16 19					
2	Aug. 5	Id	$e\bar{P}_N$	0 30 38.1					See discussion, p. 44
			$i\bar{S}_E$	0 30 39.3					
			$i\bar{S}_N$	0 30 39.5					
			F	0 31					
3	Aug. 7	Id	$e\bar{P}_{EN}$	4 07 24.9					See discussion, p. 44
			$i\bar{S}_{EN}$	4 07 26.4					
			F	4 08					
4	Aug. 7	Iu	e_E	9 11 46.0					U.S.C. & G.S. Epi-center: 1°N, 77°W.
			e_N	9 11 42.0					
			F	9 15					
5	Aug. 8	Id	$e\bar{P}_N$	7 40 15.9					See discussion, p. 44
			$e\bar{P}_E$	7 40 16.0					
			$i\bar{S}_N$	7 40 17.3					
			$i\bar{S}_E$	7 40 17.5					
			i_N	7 40 18.7					
			F	7 41					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
6	Aug. 9	Iv	e_{EN}	17 14 09.0					See discussion, p. 44
			i_N	17 14 10.5					
			i_E	17 14 12.5					
			eS_{EN}	17 14 30.0					
			i_N	17 14 32.5					
			i_E	17 14 36.5					
			F	17 17					
7	Aug. 11	Id	$e\overline{P}_N$	2 38 15.1					See discussion, p. 45
			$i\overline{S}_N$	2 38 16.1					
			F	2 39					
8	Aug. 17	Iu	e_{EN}	1 57 16.9					U.S.C. & G.S. Epicenter: 20°S, 172°E.
			e_E	2 07 30.9					
			e_N	2 08 01.9					
			e_E	2 08 03.9					
			eL_N	2 24 55.9					
			eL_E	2 25 06.9					
			F	3 00					
9	Aug. 21	Iv	e_E	14 00 01.3					
			e_N	14 00 01.8					
			F	14 02					
0	Aug. 22	I	e_N	20 39 02.0					U.S.C. & G.S. Epicenter: 73°.5 N, 66°W
			eP_E	20 39 02.3					
			i_N	20 39 03.5					
			e_N	20 44 51.0					
			e_N	20 52 42.5					
			e_E	20 53 39.0					
			e_N	20 53 44.0					
			F	21 09					
1	Aug. 23	Id	$i\overline{P}_N$	23 54 09.4					See discussion, p. 45
			$e\overline{P}_E$	23 54 10.0					
			iS^*_N	23 54 15.4					
			$i\overline{S}_E$	23 54 17.2					
			i_N	23 54 17.6					
			i_E	23 54 23.4					
			F	23 55					
2	Aug. 28	I	e_N	1 17 57.0					
			e_E	1 18 07.0					
			i_N	1 18 09.7					
			F	1 19					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
33	Sept. 3	I	e_N	6 48 27.0					
			e_E	6 48 28.0					
			i_N	6 49 20.5					
			e_E	6 49 21.5					
			F	6 52					
34	Sept. 4	Iu	eP_N	1 34 15.5					U.S.C. & G.S. Epi-
			eP_E	1 34 16.0					center: 65°N, 152°W
			e_N	1 46 44.0					
			e_E	1 49 21.0					
			F	2 00					
35	Sept. 8	I	e_N	14 42 16.5					
			e_E	14 42 20.5					
			e_N	14 43 52.5					
			e_E	14 43 53.0					
			F	14 46					
36	Sept. 8	I	e_N	17 05 53.5					
			e_N	17 07 32.5					
			e_E	17 07 33.0					
			F	17 10					
37	Sept. 9	Id	$e\overline{P}_N$	4 17 40.0					See discussion, p. 45
			iS_{EN}	4 17 45.0					
			F	4 19					
38	Sept. 9	I	e_N	6 25 06.0					
			e_N	6 30 56.0					
			e_N	6 41 21.0					
			e_N	6 41 49.0					
			F	7 30					
39	Sept.10	Id	$e\overline{P}_{EN}$	23 55 32.6					See discussion, p. 46
			i_{EN}	23 55 45.2					
			iS_E	23 55 46.2					
			iS_N	23 55 46.5					
			F	23 57					
40	Sept.11	IIu	eP_N	14 14 51.8					U.S.C. & G.S. Epi-
			iP_N	14 14 55.0	1.0		-1.0		center: 45°N, 146°E
			eS_N	14 23 42.8	8.5		+1.5		
			e_N	14 31 54.3					
			F	15 30					
41	Sept.12	I	e_E	16 12 29.5					
			eP_N	16 12 30.2					
			iP_N	16 12 32.0					
			F	16 14					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E.	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
42	Sept.12	Id	$e\overline{P}_N$	23 51 23.0					See discussion, p. 46
			e_E	23 51 24.0					
			iS_N	23 51 27.0					
			F	23 52					
43	Sept.15	Iu	eP_N	14 19 38.5					U.S.C. & G.S. Epicenter: 29°S, 114°W
			e_E	14 19 42.0					
			e_N	14 36 12.0					
			e_E	14 37 53.0					
			e_N	14 39 04.0					
			F	15 30					
44	Sept.18	I	e_{EN}	5 07 10.5					
			F	5 11					
45	Sept.19	I	e_{EN}	10 06 49.0					
			i_N	10 06 52.5					
			F	10 09					
46	Sept.19	Id	$e\overline{P}_{EN}$	12 43 15.2					See discussion, p. 46
			$i\overline{S}_{EN}$	12 43 16.7					
			F	12 44					
47	Sept.20	IIu	e_E	2 00 19.0					U.S.C. & G.S. Epicenter 19?5S, 142°E.
			e_N	2 00 21.0					
			e_N	2 00 44.5					
			e_E	2 04 22.0					
			e_N	2 04 24.0					
			e_E	2 04 29.0					
			e_N	2 10 54.0					
			e_E	2 20 46.0					
			e_N	2 25 33.0					
			e_N	2 30 15.0					
			eLe	2 30 38.0	29	2.5			
			F	4 30					
48	Sept.20	Iu	e_N	5 36 44.0					
			e_N	6 03 17.0					
			eLe	6 06 58.0					
			F	6 40					
49	Sept.22	Id	$e\overline{P}_N$	11 57 34.5					See discussion, p. 46
			$i\overline{S}_N$	11 57 36.5					
			e_E	11 57 35.5					
			F	11 58					

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o.	Date	Char-acter	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
0	Sept.23	Iu	e_N	9 31 57.0					U.S.C. & G.S. Epi-
			e_E	9 31 59.0					center: 1°.5 S, 142°E
			e_E	9 47 29.0					
			F	10 40					
1	Sept.23	Id	$e\bar{P}_{EN}$	16 27 04.9					See discussion, p. 46
			$i\bar{S}_E$	16 27 07.9					
			$i\bar{S}_N$	16 27 08.1					
			i_E	16 27 09.6					
			F	16 28					
2	Sept.24	Id	$e\bar{P}_E$	9 12 11.2					See discussion, p. 46
			$i\bar{P}_N$	9 12 11.3	0.5		-.5		
			$i\bar{S}_{EN}$	9 12 16.6					
			i_E	9 13 00.4					
			i_N	9 13 00.9					
			F	9 14					
3	Sept.24	Ir	eP_{EN}	22 15 34.5					U.S.C. & G.S. Epi-
			e_E	22 15 38.0					center 50°N, 130°W.
			iP_N	22 15 44.0					
			e_E	22 18 14.5					
			e_N	22 18 15.5					
			e_N	22 19 40.5					
			e_E	22 19 56.5					
			e_E	22 20 32.5					
			F	23 11					

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PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the seismographic station:

φ = 37°25' N Lat.
λ = 122°11' W from Greenwich.

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_o	ϵ
Wood-Anderson	E	3000	1	15
	N	3000	1	15

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	July 3	Iv	i_{EN}	5 05 23.9					
			i_E	5 05 28.1					
			i_E	5 06 22.5					
			i_N	5 06 23.1					
			F	5 07					
2	July 5	Id	$\bar{i}P_E$	19 46 18.9					See discussion, p. 43
			$\bar{i}P_N$	19 46 19.1					
			$\bar{i}S_E$	19 46 21.2					
			$\bar{i}S_N$	19 46 21.4					
			F	19 47					
3	July 9	Iv	eP_E	6 59 43.4					See discussion, p. 43
			eS_{EN}	6 59 57.1					
			F	7 01					
4	July 11	Iv	$\bar{e}P_N$	8 58 01.5					See discussion, p. 43
			$\bar{e}P_E$	8 58 02.0					
			i_{EN}	8 58 16.3					
			$\bar{i}S_{EN}$	8 58 17.0					
			F	9 00					
5	July 11	Id	$\bar{e}P_N$	16 19 45.7					See discussion, p. 43
			$\bar{i}S_N$	16 19 49.7					
			F	16 21					
6	July 12	Iv	eP_E	00 04 56.5					
			eP_N	00 04 57.0					
			eS_E	00 05 29.5					
			eS_N	00 05 30.0					
			F	01 07					
7	July 12	Id	$\bar{e}P_E$	21 32 18.0					See discussion, p. 43
			$\bar{e}P_N$	21 32 19.0					
			$\bar{i}S_E$	21 32 28.1					
			i_N	21 32 28.3					
			i_N	21 32 29.0					
			F	21 33					
8	July 12	Id	$\bar{e}P_E$	23 51 53.9					See discussion, p. 43
			$\bar{e}P_N$	23 51 54.5					
			$\bar{i}S_{EN}$	23 52 04.2					
			F	23 52					
9	July 13	Iv	eP_{EN}	10 55 29.0					Felt in Southern California
			e_N	10 56 18.5					
			e_N	10 56 39.3					
			e_E	10 56 41.0					
			F	11 00					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
10	July 19	Iv	eP_{EN}	1 22 16.5					See discussion, p. 44
			iS_{EN}	1 22 54.0					
			F	1 25					
11	July 21	Iv	eP_{EN}	2 13 24.0					See discussion, p. 44
			iS_E	2 13 39.4					
			iS_E	2 13 40.5					
			iS_N	2 13 41.0					
			i_N	2 13 44.0					
			i_E	2 13 45.0					
			F	2 15					
12	July 23	Id	$e\bar{P}_E$	21 20 09.2					See discussion, p. 44
			eP_N	21 20 09.3					
			i_N	21 20 10.6					
			i_N	21 20 12.0					
			$i\bar{S}_E$	21 20 13.2					
			$i\bar{S}_N$	21 20 13.3					
			F	21 21					
13	July 25	I	e_{EN}	4 16 38.0					See discussion, p. 44
			e_E	4 17 10.0					
			F	4 18					
14	July 26	Iv	eP_{EN}	23 07 39.8					See discussion, p. 44
			iS_E	23 07 55.3					
			eS_N	23 07 56.3					
			F	23 08.6					
15	July 28	Iv	eP_E	6 00 48.0					See discussion, p. 44
			eP_N	6 00 50.5					
			i_N	6 01 09.5					
			e_E	6 01 09.5					
			i_{EN}	6 01 14.0					
			i_{EN}	6 01 17.5					
			i_N	6 01 24.0					
			i_N	6 01 29.0					
			F	6 03					
16	July 29	Iu	e_{EN}	7 50 08.0					U.S.C. & G.S. Epicenter: 23°S, 178°W
			i_E	7 50 11.5					
			i_N	7 50 12.0					
			i_E	7 50 20.5					
			i_N	7 50 22.0					
			F	8 05					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	sm	mm.	mm.	mm.	
17	July 29	Id	$e\bar{P}_N$	22 34 11.2					See discussion, p. 44
			$e\bar{P}_E$	22 34 11.5					
			e_E	22 34 14.5					
			eS^*_{EN}	22 34 16.7					
			F	22 36					
18	Aug. 6	Id	$e\bar{P}_E$	19 06 15.9					See discussion, p. 44
			$e\bar{P}_N$	19 06 16.1					
			$i\bar{S}_{EN}$	19 06 20.1					
			F	19 07					
19	Aug. 9	Iv	eP_{EN}	17 14 15.0					See discussion, p. 44
			i_N	17 14 38.0					
			i_E	17 14 39.0					
			i_E	17 14 47.5					
			i_N	17 14 49.0					
			F	17 16					
20	Aug. 10	Id	$i\bar{P}_{EN}$	14 31 50.5					See discussion, p. 45
			$i\bar{S}_E$	14 31 53.1					
			$i\bar{S}_N$	14 31 53.2					
			F	14 32					
21	Aug. 17	Iv	$e\bar{P}_E$	1 57 17.0					U.S.C. & G.S. Epicenter: 20°S, 172°E.
			eP_N	1 57 17.5					
			i_E	1 57 43.5					
			i_E	1 57 53.0					
			F	2 40					
22	Aug. 21	Iv	e_{EN}	14 00 00.6					
			i_{EN}	14 00 01.6					
			i_N	14 00 31.6					
			F	14 02					
23	Aug. 22	I	e_{EN}	20 39 05.0					U.S.C. & G.S. Epicenter 73?5 N, 66°W.
			F	21 00					
24	Aug. 23	Id	$e\bar{P}_E$	22 12 13.9					See discussion, p. 45
			$i\bar{P}_N$	22 12 15.3					
			$i\bar{S}_E$	22 12 16.2					
			$i\bar{S}_N$	22 12 17.2					
			F	22 13					
25	Aug. 23	Id	$e\bar{P}_E$	23 54 15.6					See discussion, p. 45
			e_N	23 54 17.1					
			$i\bar{S}^*_E$	23 54 25.6					
			$i\bar{S}_N$	23 54 27.8					
			F	23 55.5					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
26	Aug. 28	I	e_E	1 18 08.0					
			e_{EN}	1 18 19.0					
			F	1 19					
27	Sept. 1	Id	$e\overline{P}_{EN}$	21 15 54.2					See discussion, p. 45
			i_E	21 16 02.7					
			$i\overline{S}_{EN}$	21 16 05.2					
			i_N	21 16 06.4					
			F	21 17					
28	Sept. 2	Id	$i\overline{P}_N$	18 26 53.7					See discussion, p. 45
			$i\overline{P}_E$	18 26 53.8					
			$i\overline{S}_{EN}$	18 26 55.9					
			F	18 27					
29	Sept. 9	Id	$e\overline{P}_E$	4 17 40.1					See discussion, p. 45
			$e\overline{P}_N$	4 17 40.3					
			$i\overline{S}_{EN}$	4 17 44.7					
			F	4 18					
30	Sept. 9	I	e_N	6 30 47.5					
			F	7 10					
31	Sept.11	I	e_N	14 14 57.5					U.S.C. & G.S. Epi-center: 45°N, 146°E.
			i_N	14 15 00.0					
			i_N	14 15 02.0					
			F	15 45					
32	Sept.12	I	e_E	16 12 28.2					
			e_N	16 12 29.0					
			F	16 13.5					
33	Sept.15	Iu	e_N	14 19 33.0					U.S.C. & G.S. Epi-center: 29°S, 114°W
			F	15 15					
34	Sept.20	IIu	e_E	2 00 17.5					U.S.C. & G.S. Epi-center 1°.5 S, 142°E
			e_N	2 00 18.5					
			e_N	2 04 07.5					
			e_E	2 04 09.0					
			e_N	2 04 23.5					
			e_N	2 04 37.5					
			eL_N	2 30 03.5					
			F	3 45					
35	Sept.24	Id	$e\overline{P}_{EN}$	9 12 18.0					See discussion, p.46
			$i\overline{S}_{EN}$	9 12 29.0					
			i_N	9 12 32.0					
			F	9 15					

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PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
36	Sept.24	Ir	e_E	22 15 33.0					U.S.C. & G.S. Epi-
			e_N	22 15 36.0					center: 50°N, 130°W.
			e_N	22 16 00.5					
			e_E	22 16 06.5					
			e_E	22 16 19.5					
			e_N	22 16 21.0					
			F	22 48					

International Seismological Centre

SAN FRANCISCO

THE SAN FRANCISCO STATION, CALIFORNIA ACADEMY OF SCIENCES SAN FRANCISCO, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the seismographic station:

φ = 37° 46' N. Lat.
λ = 122° 28' W. from Greenwich

Time.--All determinations are reduced to Universal Time.
Altitude.--67 meters (220 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

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

The instruments at the San Francisco station are much agitated by street traffic throughout the day, and therefore it is only occasionally that an earthquake is sufficiently well recorded there for accurate measurements to be taken. This explains the small number of measurements made for the station.

This station was dismantled on September 20, 1935. The new location of the instruments is at the University of San Francisco. Readings from the new station will appear in the next number of this Bulletin.

International Seismological Centre

SAN FRANCISCO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	July 12	Id	e_E	21 32 18.2					See discussion, p. 43
			e_E	21 32 19.7					
			e_E	21 32 21.2					
			F	21 33					
2	July 12	Id	e_E	23 51 54.0					See discussion, p. 43
			iS_N	23 51 58.0					
			iS_E	23 51 58.5					
			F	23 52.2					
3	July 29	I	e_E	7 47 09.0					
			e_N	7 47 10.0					
			e_N	7 56 32.0					
			e_E	7 56 48.0					
			F	8 04					

International Seismological Centre

FERNDALE

THE FERNDALE STATION
FERNDALE, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic station:

$\varphi = 40^{\circ}\ 34'$ N. Lat.
$\lambda = 124^{\circ}\ 16'$ W. from Greenwich.

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

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

The seismograph is a Bosch-Omori 25-kgm. horizontal pendulum. It is oriented to record E-W motion. The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.

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FERNDALE

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	July 6	Iv	eP_E	7 22 24.0					
			i_E	7 22 32.0					
			i_E	7 22 37.0					
			i_E	7 22 39.0					
			F	7 26					
2	July 12	Id	eP_E	0 40 18.0					See discussion, p. 43
			iS_E	0 40 25.0					
			F	0 44					
3	Aug. 10	Id	eP_E	22 15 44.0					See discussion, p. 44
			iS_E	22 15 51.5					
			F	22 17					
4	Aug. 20	Id	eP_E	22 42 03.0					See discussion, p. 45
			iS_E	22 42 14.0					
			F	22 43					
5	Aug. 22	I	e_E	20 51 32.0					
			e_E	20 52 50.0					
			e_E	20 53 14.0					
			e_E	20 53 30.0					
			F	20 56					
6	Aug. 26	Id	eP_E	9 15 43.0					See discussion, p. 45
			iP_E	9 15 44.0					
			iS_E	9 15 50.5					
			F	9 18					
7	Sept. 4	Iu	e_E	1 34					Approximately
			F	1 50					
8	Sept.11	I	e_E	14 14 33.0					
			F	14 45					
9	Sept.11	Id	eP_E	14 18 36.0					Blurred by distant quake.
			iP_E	14 18 37.0					
			iS_E	14 18 39.0					See discussion, p. 46
			F	14 19					
0	Sept.26	I	e_E	0 51 00.0					
			e_E	0 52 31.5					
			e_E	0 53 07.0					
			e_E	0 55 03.0					
			F	1 15					

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EARTHQUAKES IN NORTHERN CALIFORNIA

AND

THE REGISTRATION OF EARTHQUAKES

AT

BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO—FERNDALE

FROM

October 1, 1935, to December 31, 1935

BY

PERRY BYERLY

AND

WILBERT ANNIS

BULLETIN OF THE SEISMOGRAPHIC STATIONS

VOLUME 5, NO. 3

U. S. GEOLOGICAL SURVEY
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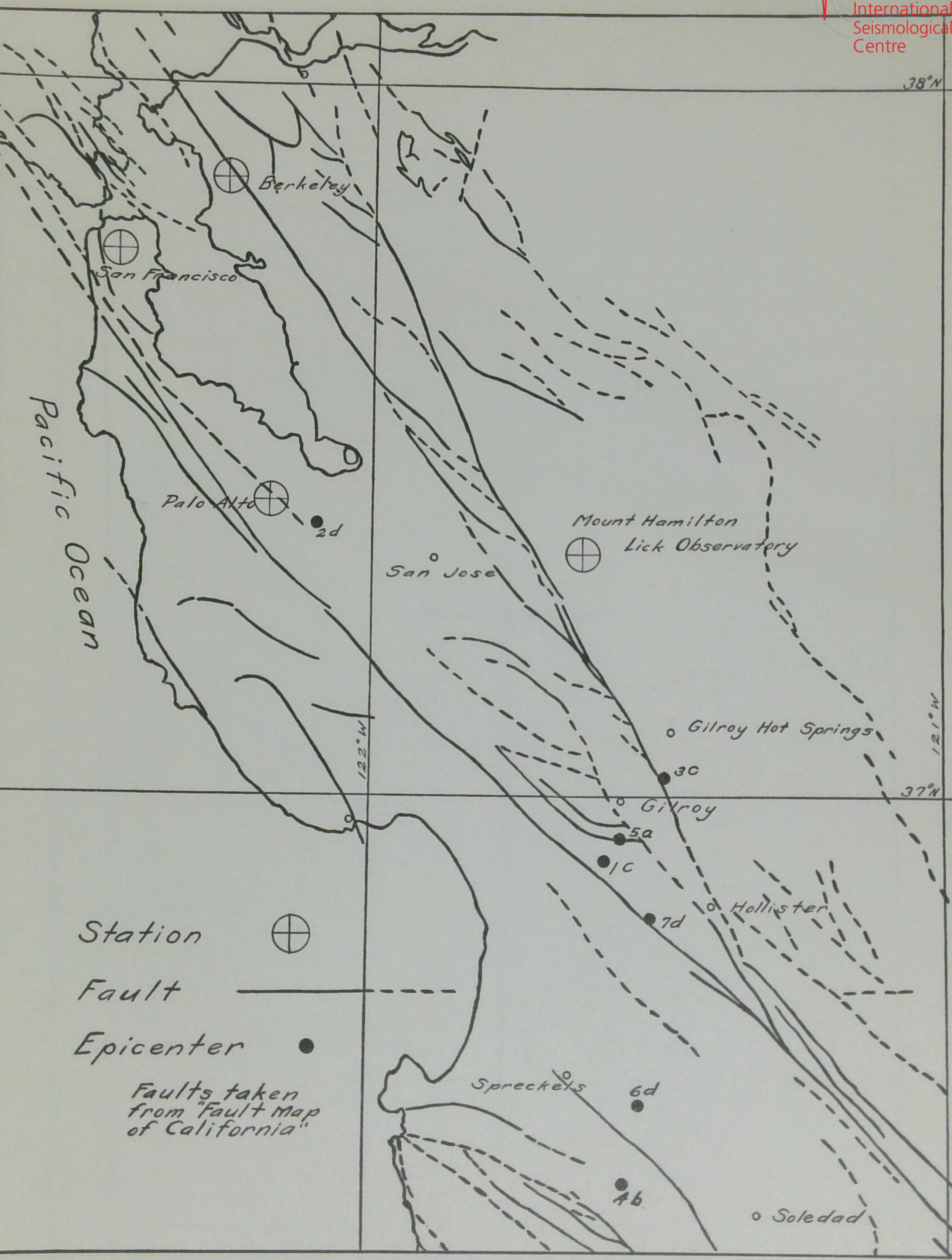
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Map showing epicenters, October 1, 1935–December 31, 1935.

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EARTHQUAKES IN NORTHERN CALIFORNIA

(All intensities are given on the Rossi-Forel Scale)

1935 -- PACIFIC STANDARD TIME

October 1, 6h 01m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 3 miles east of Watsonville. See map, epicenter no. 1.

October 5, 8h 05m, p.m. Recorded at Mount Hamilton only; not reported felt; epicenter about 25 miles from Lick Observatory, probably southeast.

October 8, 00h 05m, a.m. Recorded at Berkeley only; not reported felt; focus about 10 miles from the University campus.

October 8, 05h 05m, a.m. Recorded at Berkeley only; not reported felt; focus about 13 miles from the University campus.

October 10, 01h 18m, p.m. Recorded at Berkeley, Palo Alto; not reported felt; epicenter about 60 miles southerly from Palo Alto.

October 15, 01h 40m, p.m. Recorded at Berkeley, Palo Alto; not reported felt; epicenter probably about 5 miles southwest of Palo Alto station. See map, epicenter no. 2.

October 18, 1h 24m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; IV at Parkfield; probably an aftershock of earthquakes of June 7, 1934 which centered a few miles north of Parkfield.

October 18, 10h 27m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto, San Francisco; not reported felt; epicenter about 6 miles south of Gilroy Hot Springs. See map, epicenter no. 3.

October 19, 11h 43m, a.m. Recorded at Palo Alto only; not reported felt; focus 5 to 15 miles from Palo Alto station.

October 22, 10h 38m, a.m. Recorded at Mount Hamilton, Palo Alto; IV at Parkfield; epicenter may not be located but records are consistent with one near Parkfield.

October 24, 4h 42m, a.m. Recorded at Berkeley only; not reported felt; focus about 9 miles from the University campus.

October 24, 4h 46m, a.m. Recorded at Berkeley only; not reported felt; focus about 9 miles from the University campus.

October 24, 4h 49m, a.m. Recorded at Berkeley only; not reported felt; focus about 9 miles from the University campus.

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October 24, 10h 23m, a.m. Recorded at Palo Alto and faintly at Mount Hamilton; not reported felt; epicenter was possibly about 4 miles southeast of Hollister. This location is based on assumption that Palo Alto recorded $\overline{S}$ and $\overline{P}$, but Mount Hamilton recorded only $\overline{S}$. Since there is no check, this epicenter is not plotted on the map.

October 24, 07h 50m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 3 miles from Lick Observatory.

October 25, 07h 18m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 3 miles from Lick Observatory.

October 25, 11h 43m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; IV at San Benito; epicenter about 13 miles west of Soledad. See map, epicenter no. 4.

October 25, 12h 44m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; felt "mildly" at Gilroy; foreshock of earthquake of October 25, 12h 56m, p.m. See map, epicenter no. 5.

October 25, 12h 56m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto. Intensities:

IV Aptos, Gilroy, Hollister, Morgan Hill, San Francisco Appraisers Building, San Jose, Saratoga, Watsonville.

III Coyote, Hayward, Mountain View, Soquel.

I-II Castroville, Colma, Daly City, Los Gatos, Redwood City, San Juan Bautista, Santa Cruz; epicenter about 4 miles south of Gilroy. See map, epicenter no. 5.

October 25, 1h 41m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; aftershock of earthquake of October 25, 12h 56m, p.m. See map, epicenter no. 5.

October 26, 2h 46m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; Hollister reports shock at 3 a.m. according to Associated Press; aftershock of earthquake of October 25, 12h 56m, p.m. See map, epicenter no. 5.

October 26, 3h 27m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; aftershock of earthquake of October 25, 12h 56m, p.m. See map, epicenter no. 5.

October 28, 11h 48m, a.m. Recorded at Mount Hamilton only; not reported felt; probably an aftershock of earthquake of October 25, 12h 56m, p.m. See map, epicenter no. 5.

October 31, 8h 19m, a.m. Recorded at Palo Alto only; not reported felt; focus about 5 miles from Palo Alto station.

October 31, 10h 22m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 6 miles from Lick Observatory.

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November 7, 2h 14m, a.m. Recorded at Berkeley only; not reported felt; focus about 4 miles from the University campus.

November 9, 12h 52m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 3 miles from Lick Observatory.

November 10, 11h 05m, a.m. Recorded at Berkeley only; not reported felt; focus about 7 miles from the University campus.

November 21, 00h 40m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 3 miles from Lick Observatory.

November 26, 1h 02m, p.m. Recorded at Berkeley, Mount Hamilton; not reported felt; these records were consistent with the epicenter located by the Pasadena station in the Sierra west of Bishop.

November 26, 6h 29m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

December 3, 1h 5m, p.m. Recorded at Berkeley only; not reported felt; focus about 5 miles from the University campus.

December 10, 10h 57m, a.m. Recorded at Palo Alto only; not reported felt; focus about 6 miles from Palo Alto station.

December 16, 12h 01m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 6 miles southeast of Spreckels. See map, epicenter no. 6.

December 17, 8h 49m, p.m. Recorded at Mount Hamilton Only; not reported felt; focus about 6 miles from Lick Observatory.

December 18, 7h 32m, a.m. Recorded at Berkeley, Palo Alto, Mount Hamilton; not reported felt; aftershock of earthquake of December 16. See map, epicenter no. 6.

December 22, 1h 19m, a.m. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.

December 22, 6h 04m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; epicenter about 6 miles west of Hollister. See map, epicenter no. 7.

December 22, 9h 22m, p.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; probably an aftershock of earthquake at 6h 04m p.m. See map, epicenter no. 7.

December 23, 4h 23m, a.m. Recorded at Berkeley, Mount Hamilton, Palo Alto; not reported felt; probably an aftershock of December 22 earthquakes. See map, epicenter no. 7.

December 23, 9h 32m, a.m. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.

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December 26, 3h 05m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 4 miles from Lick Observatory.

December 26, 3h 16m, p.m. Recorded at Mount Hamilton only; not reported felt; focus about 4 miles from Lick Observatory.

Epicenters located in the preceding list are plotted on the accompanying map. A number and a letter are given beside each epicenter. The number is that assigned to the earthquake in the preceding 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.

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THE REGISTRATION OF EARTHQUAKES

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SYMBOLS AND NOTATIONS EMPLOYED

1. Character of the Earthquake--

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

2. Phases of the Seismogram--

P (undae primae)	Normal first phase, or first preliminary tremors (longitudinal).
P'	First preliminary tremors which have penetrated the core of the earth.
PR_n	Waves n times reflected at the earth's surface.
S (undae secundae)	Second phase, or second preliminary tremors (transverse).
SR_n	Waves n times reflected at the earth's surface.
PS	Waves changed from longitudinal to transverse oscillation or vice versa through reflection at the earth's surface.
PPS	Waves twice reflected at the earth's surface, having been longitudinal on two branches of the path and transverse on one branch.

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

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

For local earthquakes a special notation is used:

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

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3. Nature of the Motion--

i (impetus)	Sudden beginning of the motion.
e (emersio)	Gradual beginning of the motion.
T (period)	Time of one complete oscillation.
A	Trace amplitude measured from the media line, + earth motion toward east, north, or zenith, - toward west, south, or nadir.
A_E	E-W component of A.
A_N	N-S component of A.
A_Z	Vertical component of A.

4. Time--

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

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BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic room:

φ = 37° 52' 15" N. Lat.
λ = 122° 15' 36" W. from Greenwich.

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

Altitude.--85 meters (279 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T_o	ϵ	$\frac{r}{T_o 2}$
Bosch-Omori 100 kg. ..	E	45	14	10	0.001
	N	45	9.5	10	0.001
Wiechert 80 kg.	Z	44	4	5	0.005
Wood-Anderson	E	3,000	0.9	15	
	N	3,000	0.9	15	

		K	T	T_1	μ_2	A_1 (cm.)	l
Galitzin	E	126	12	12	0	115	11.27
	N	125	12	12.1	0	115	11.16
	Z	121	12	11.8	0	115	14.94

		V	Coupled Period	ϵ
Benioff	Z	100,000(Ca)	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	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Oct. 2	Iv	eP_Z	H 2 01 42.4					See discussion, p. 8
			eP_Z	H 2 01 43.7					
			eP_{EN}	A 2 01 43.9					
			eS_{EN}	A 2 01 59.6					
			iS_Z	H 2 02 00.9					
			F	2 04					
2	Oct. 2	I	e_{EN}	A 5 43 42					
			iP_Z	H 5 43 42					
			e_N	A 5 52 26					
			e_E	A 5 52 30					
			F	6 07					
3	Oct. 8	Id	iP_Z	H 8 05 10.6					See discussion, p. 8
			iS_Z	H 8 05 13.9					
			F	8 06					
4	Oct. 8	Id	iP_Z	H 13 04 45.0					See discussion, p. 8
			iS_Z	H 13 04 48.7					
			F	13 05					
5	Oct. 9	I	e_E	G 22 38 34					
			e_N	G 22 38 36					
			i_E	G 22 40 32					
			i_N	G 22 45 37					
			F	23 00					
6	Oct. 10	I	e_Z	H 21 18 53					See discussion, p. 8
			e_N	A 21 18 55					
			F	21 19					
7	Oct. 11	I	eP_E	G 22 39 48					
			i_E	G 22 41 46					
			e_Z	G 22 41 50					
			e_N	G 22 42 08					
			i_E	G 22 47 16					
			e_Z	G 22 59 00					
			iL_E	G 22 59 08					
			F	0 10					
8	Oct. 12	I	e_N	A 7 56 08					
			e_E	G 7 56 32					
			e_Z	G 7 57 07					
			i_E	G 7 57 13					
			F	8 08					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
9	Oct. 12	I	eP_Z	G 16 56 42					
			eP_E	G 16 56 43					
			e_N	G 16 56 49					
			i_N	G 17 05 47					
			i_E	G 17 05 49					
			i_Z	G 17 05 59					
			F	19 20					
10	Oct. 15	Id	eP_Z	H 21 40 46.5					See discussion, p. 8
			eS_E	A 21 40 53.0					
			eS_{NZ}	A 21 40 53.5					
			iS_{ENZ}	A 21 40 54.5					
			F	21 41					
11	Oct. 18	I	eP_{ENZ}	G 0 23 12					
			i_N	G 0 32 16					
			i_E	G 0 32 17					
			e_Z	G 0 32 21					
			i_E	G 0 41 28					
			F	3 40					
12	Oct. 18	Iv	e_Z	H 9 24 21.5					See discussion, p. 8
			i_Z	H 9 24 30.5					
			F	9 26					
13	Oct. 18	I	iP_Z	G 11 18 11					
			iP_E	G 11 18 12					
			iP_N	G 11 18 18					
			e_E	G 11 28 05					
			i_E	G 11 28 31					
			i_N	G 11 29 53					
			i_E	G 11 30 00					
			F	13 10					
14	Oct. 18	Iv	eP^*_{EN}	A 18 26 43.5					See discussion, p. 8
			iP^*_Z	H 18 26 43.5					
			$i\overline{P}_Z$	H 18 26 47.5					
			eS^*_N	A 18 26 57.5					
			iS^*_Z	H 18 26 57.5					
			$i\overline{S}_Z$	H 18 26 59.0					
			$i\overline{S}_N$	A 18 26 59.5					
			i_E	A 18 27 01.5					
			F	18 28					
15	Oct. 19	IIr	eP_{EZ}	G 4 50 52					U.S.C. & G.S. Epicenter: 46°6 N, 112°
			eP_N	A 4 50 54					
			eP_{EZ}	A 4 50 56					Destructive in
			eP_N	G 4 50 56					Helena, Montana
			i_Z	G 4 51 04					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
15	Oct. 19 (Contd)	IIr	i_N	G 4 53 04					
			e_Z	H 4 53 09					
			e_N	A 4 53 10					
			i_Z	G 4 53 10					
			iS_E	G 4 53 12					
			eS_E	A 4 53 18					
			eS_N	A 4 53 19					
			iS_N	G 4 53 20					
			i_Z	G 4 53 36					
			i_N	G 4 54 06					
			e_E	A 4 54 07					
			i_N	A 4 54 08					
			e_Z	H 4 54 12					
			i_E	G 4 54 20					
			i_Z	G 4 54 28					
			i_N	G 4 54 32					
			eL_E	A 4 54 48					
			eL_{NZ}	A 4 54 52					
			i_Z	G 4 55 30					
			F	6 15					
16	Oct. 24	Id	$e\bar{P}_E$	A 12 42 10.8					See discussion, p. 8
			$e\bar{P}_N$	A 12 42 10.9					
			$i\bar{P}_Z$	H 12 42 11.0					
			$i\bar{S}_E$	A 12 42 13.2					
			$i\bar{S}_{NZ}$	A 12 42 13.3					
			F	12 43					
17	Oct. 24	Id	$e\bar{P}_{EN}$	A 12 43 40.0					See discussion, p. 8
			$e\bar{P}_Z$	H 12 43 40.1					
			$i\bar{S}_Z$	H 12 43 42.0					
			$i\bar{S}_{EN}$	A 12 43 42.7					
			F	12 44					
18	Oct. 24	Id	$e\bar{P}_E$	A 12 45 41.0					See discussion, p. 8
			$e\bar{P}_N$	A 12 45 41.1					
			$i\bar{P}_Z$	H 12 45 41.2					
			$i\bar{S}_E$	A 12 45 43.5					
			$i\bar{S}_N$	A 12 45 43.6					
			$i\bar{S}_Z$	H 12 45 44.0					
			F	12 46					
19	Oct. 24	I	eP_{NZ}	A 14 49 34.5					Felt widely in South-
			eP_E	A 14 49 36.0					ern California.
			i_N	A 14 50 56.5					Pasadena reports foc
			i_N	A 14 51 08.5					on Mill Creek fault.
			i_E	A 14 51 11.0					
			i_E	A 14 51 18.5					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
19	Oct. 24 (Contd)	I	i_Z	H 14 51 19.0					
			i_N	A 14 51 19.5					
			i_Z	H 14 51 29.5					
			i_E	A 14 51 32.0					
			F	14 56					
20	Oct. 25	Iv	iP_Z	H 19 43 59.6					See discussion, p. 84
			iP_Z	H 19 44 00.5					
			iS_Z	H 19 44 24.0					
			F	19 46					
21	Oct. 25	Iv	iP_Z	H 20 44 21.6					See discussion, p. 84
			eP_N	A 20 44 21.8					
			iZ	H 20 44 22.4					
			eE	A 20 44 22.8					
			eN	A 20 44 25.3					
			eN	A 20 44 34.0					
			eS_E	A 20 44 34.5					
			iZ	H 20 44 34.8					
			eS_N	A 20 44 36.3					
			F	20 47					
22	Oct. 25	IIv	iP_{NZ}	A 20 56 39.9					See discussion, p. 84
			eP_E	A 20 56 40.3					
			iP_N	A 20 56 41.4					
			iS_E	A 20 56 55.1					
			iS_N	A 20 56 55.3					
			F	21 01.5					
23	Oct. 25	Iv	eP_Z	H 21 41 41.6					See discussion p. 84
			eP_N	A 21 41 41.8					
			iP_Z	H 21 41 42.0					
			eE	A 21 41 46.3					
			eE	A 21 41 54.8					
			eS_E	A 21 41 56.3					
			iS_N	A 21 41 56.3					
			F	21 43					
24	Oct. 26	Iv	eP_Z	H 10 46 37.4					See discussion, p. 84
			eP_E	A 10 46 37.6					
			iP_Z	H 10 46 37.7					
			eP_N	A 10 46 37.9					
			eN	A 10 46 48.4					
			eS_N	A 10 46 52.4					
			iS_E	A 10 46 53.4					
			F	10 49					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
25	Oct. 26	Iv	eP_N	A 11 26 51.4					See discussion, p. 8
			eS_{EN}	A 11 27 05.9					
			iS_N	A 11 27 06.9					
			F	11 28					
26	Oct. 29	I	e_N	A 10 19 50.0					Pasadena reports "off
			e_E	A 10 20 00.0					coast of Lower Cali-
			e_E	A 10 22 03.0					fornia."
			e_N	A 10 23 06.5					
			F	10 31					
27	Oct. 31	I	eP_Z	H 18 40 41.5					Severe in Helena,
			eP_{EN}	A 18 40 42.0					Montana.
			eP_Z	G 18 40 44.0					
			eP_{EN}	G 18 40 52.0					
			e_E	A 18 41 00.5					
			e_N	A 18 41 03.0					
			i_N	G 18 41 22.0					
			i_Z	G 18 41 49.0					
			i_E	G 18 42 04.0					
			i_E	G 18 42 54.0					
			i_Z	G 18 42 59.0					
			e_N	A 18 43 02.0					
			e_E	A 18 43 06.0					
			iS_Z	G 18 43 21.0					
			i_N	G 18 43 32.0					
			e_N	A 18 43 52.0					
			i_{EN}	G 18 43 58.0					
			i_Z	H 18 44 00.0					
			i_E	A 18 44 00.5					
			i_N	A 18 44 02.0					
			i_N	A 18 44 12.0					
			i_Z	G 18 44 12.0					
			i_E	A 18 44 22.0					
			i_Z	H 18 44 30.5					
			i_N	G 18 44 50.0					
			e_E	A 18 45 02.0					
			e_N	A 18 45 05.0					
			i_Z	G 18 45 10.0					
			F	19 20					
28	Nov. 2	I	eP_Z	G 6 10 12					
			e_{EZ}	A 6 10 13					
			eP_E	G 6 10 14					
			e_N	A 6 10 14					
			i_E	G 6 15 16					
			e_N	G 6 15 34					
			e_E	G 6 16 02					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
28	Nov. 2 (Contd)	I	e_N	G 6 16 19					
			i_N	G 6 17 46					
			i_E	G 6 18 06					
			e_Z	G 6 19 43					
			i_N	G 6 20 14					
			i_E	G 6 21 02					
			i_{NZ}	G 6 21 12					
			e_N	A 6 21 27					
			i_N	G 6 21 28					
			i_E	G 6 23 01					
			i_Z	G 6 23 44					
			e_E	A 6 23 56					
			F	7 10					
29	Nov. 4	I	eP_Z	H 3 57 28.0					
			eP_N	A 3 57 28.5					
			e_E	A 3 57 31.0					
			e_N	A 3 58 40.0					
			e_E	A 3 59 10.0					
			e_N	A 3 59 22.0					
			F	4 08					
30	Nov. 4	I	eP_{EZ}	A 13 57 09.5					
			eP_N	A 13 57 10.0					
			i_{EZ}	A 13 57 13.5					
			i_N	A 13 57 14.0					
			e_Z	H 14 05 11.5					
			e_N	A 14 05 12.0					
			e_E	A 14 05 14.0					
			i_Z	H 14 05 19.5					
			F	14 08					
31	Nov. 7	Id	iP_Z	H 10 13 43.2					See discussion, p. 8
			e_E	A 10 13 44.0					
			i_N	A 10 13 44.4					
			i_Z	A 10 13 44.5					
			F	10 14					
32	Nov. 10	I	e_Z	H 18 37 21.5					
			e_E	A 18 37 27.5					
			e_N	A 18 37 28.5					
			F	19 06					
33	Nov. 10	I	e_N	G 18 50 47					
			i_N	G 18 56 31					
			i_E	G 18 57 03					
			F	19 29					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
34	Nov. 10	Id	iP_Z	H 19 05 36.3					See discussion, p. 8
			e_E	A 19 05 38.9					
			i_N	A 19 05 39.1					
			iS_Z	H 19 05 39.2					
			F	19 06					
35	Nov. 13	I	iP_Z	H 21 49 40.3					
			i_Z	H 21 49 41.6					
			F	21 50					
36	Nov. 14	I	e_{EN}	A 20 09 14.4					
			i_Z	H 20 09 14.4					
			i_Z	H 20 09 15.9					
			e_Z	H 20 09 40.5					
			F	20 25					
37	Nov. 17	I	e_{ENZ}	A 7 53 13.5					
			F	7 56					
38	Nov. 23	Ir	eP_Z	H 8 01 29.0					U.S.C. & G.S. Epicenter: 1°N, 86°W.
			$eP'_1P'_{1Z}$	H 8 33 15.5					
			$iP'_2P'_{2Z}$	H 8 33 35.7					
			F	8 34					
39	Nov. 26	I	eP_Z	H 21 02 42.5					See discussion, p. 8
			i_Z	H 21 03 22.5					
			F	21 04					
40	Nov. 28	I	e_N	A 14 45 29					Felt in Helena.
			e_E	A 14 45 44					
			e_Z	H 14 48 00					
			e_E	A 14 48 02					
			e_N	A 14 48 03					
			F	14 52					
41	Nov. 30	I	eP_Z	H 3 48 22					Felt in Panama.
			e_E	A 3 48 23					
			e_N	A 3 48 24					
			e_E	G 3 48 27					
			e_N	A 3 55 18					
			i_{EN}	G 3 55 19					
			F	5 06					
42	Dec. 3	Id	eP_Z	H 21 51 08.1					See discussion, p. 8
			iP_Z	H 21 51 08.6					
			iS_Z	H 21 51 10.1					
			e_{EN}	A 21 51 10.3					
			F	21 52					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
43	Dec. 14	I	iP_Z	H 1 41 09.7					
			iP_N	H 1 41 11.1					
			eP_E	A 1 41 11.4					
			i_N	A 1 41 13.2					
			i_E	A 1 41 13.7					
			i_N	A 1 41 16.0					
			i_N	A 1 41 22.2					
			e_N	A 1 49 18.7					
			e_E	A 1 49 19.7					
			e_Z	H 1 49 21.2					
			i_N	A 1 49 23.7					
			F	2 02					
44	Dec. 14	I	eP_Z	H 12 59 17.1					
			e_E	A 12 59 19.0					
			e_N	A 12 59 19.5					
			F	13 12					
45	Dec. 14	Iu	eP_Z	H 22 12 13.0					
			eP_E	A 22 12 14.0					
			e_N	A 22 12 16.5					
			e_E	A 22 17 51.0					
			e_N	A 22 17 53.0					
			e_N	A 22 21 59.0					
			e_E	A 22 22 00.0					
			F	23 20					
46	Dec. 15	I	eP_Z	H 7 20 31.0					
			e_E	A 7 20 32.5					
			iP_Z	H 7 20 33.0					
			e_N	A 7 20 36.0					
			e_N	A 7 31 07.0					
			e_N	A 7 31 26.5					
			e_E	A 7 31 27.0					
			e_N	A 7 45 13.0					
			e_E	A 7 49 57.0					
			F	8 37					
47	Dec. 16	I	eP_Z	H 17 07 19.0					
			e_{EN}	A 17 07 20.0					
			iP_Z	H 17 07 20.0					
			e_N	A 17 15 28.0					
			e_E	A 17 15 28.5					
			F	17 22					
48	Dec. 16	I	e_Z	H 20 01 29.5					See discussion, p. 8
			eS_Z	H 20 01 52.5					
			F	20 02.4					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
49	Dec. 18	I	eP_Z	H 15 32 33.6					See discussion, p. 85
			e_Z	H 15 32 41.8					
			e_Z	H 15 32 43.1					
			F	15 35					
50	Dec. 19	I	e_Z	H 10 02 26.0					
			i_Z	H 10 02 30.5					
			F	10 05					
51	Dec. 19	I	eP_Z	H 22 41 03.2					
			e_N	H 22 41 06.0					
			e_E	A 22 41 08.0					
			e_E	A 22 41 50.0					
			i_N	A 22 41 53.5					
			F	22 43					
52	Dec. 20	I	e_Z	H 7 47 23.5					
			e_E	A 7 47 39.5					
			e_N	A 7 47 40.5					
			e_N	A 7 49 30.0					
			e_E	A 7 49 34.5					
			e_Z	A 7 49 36.0					
			e_N	A 7 51 04.5					
			F	8 02					
53	Dec. 20	I	i_Z	H 18 49 40.0					
			e_E	A 18 49 40.5					
			e_N	A 18 49 43.0					
			F	18 52					
54	Dec. 23	Iv	eP_Z	H 2 03 59.3					See discussion, p. 85
			e_N	A 2 03 59.8					
			e_E	A 2 04 00.3					
			e_Z	H 2 04 15.3					
			i_N	A 2 04 16.8					
			F	2 05					
55	Dec. 23	Iv	iP_Z	H 5 22 37.9					See discussion, p. 85
			F	5 24					
56	Dec. 23	Iv	iP_Z	H 12 23 09.5					See discussion, p. 85
			F	12 24					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
57	Dec. 24	I	eP_Z	H 12 33 26.0					
			e_E	A 12 33 26.5					
			e_N	A 12 33 31.5					
			iP_{EZ}	G 12 33 32.0					
			i_E	G 12 41 04.0					
			i_N	G 12 41 18.0					
			i_E	G 12 51 12.0					
			e_Z	G 12 51 34.0					
			F	13 52					
58	Dec. 28	I	e_Z	H 2 54 30					
			e_E	A 2 54 48					
			e_N	A 2 54 50					
			F	5 42					
59	Dec. 28	I	eP_{EN}	A 5 00 47					
			iP_Z	H 5 00 47					
			F	5 02					

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MOUNT HAMILTON

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

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic room:

φ = 37° 20' 24.5" N Lat.
λ = 121° 38' 34" W from Greenwich.

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_o	ϵ
Wood-Anderson	E	3000	1	15
	N	3000	1	15

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Oct. 2	Id	eP_{EN}	2 01 32.2					See discussion, p. 8
			i_N	2 01 34.1					
			iS_E	2 01 40.5					
			iS_N	2 01 40.8					
			F	2 03					
2	Oct. 2	Iu	eP_{EN}	5 43 46.0					
			e_N	5 52 36.5					
			F	6 21					
3	Oct. 6	I	e_N	4 05 14.7					See discussion, p. 8
			i_N	4 05 20.7					
			F	4 06					
4	Oct. 7	I	e_N	2 23 39.1					
			i_N	2 34 23.6					
			F	2 36					
5	Oct. 7	I	e_N	2 42 58.1					
			i_N	2 43 40.1					
			F	2 45					
6	Oct. 8	I	e_N	17 57 27.4					
			i_N	17 57 45.4					
			F	17 59					
7	Oct. 11	I	e_E	14 09 13.7					Pasadena places epi-
			e_E	14 09 32.7					center near Holtvill
			F	14 11					
8	Oct. 11	I	e_E	22 59 25.9					Surface waves.
			F	23 16					
9	Oct. 12	I	e_{EN}	7 56 24.0					
			e_E	7 56 48.5					
			F	8 15					
10	Oct. 12	I	e_E	16 57 48.6					
			F	18 01					
11	Oct. 18	I	e_E	0 23 14.5					
			e_N	0 32 26.0					
			F	1 46					
12	Oct. 18	I	e_{EN}	9 24 16.2					See discussion, p. 8
			F	9 26					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
13	Oct. 18	Id	eP^*EN	18 26 30.5					See discussion, p. 8
			$i\bar{P}EN$	18 26 31.7					
			$i\bar{S}EN$	18 26 36.8					
			F	18 28					
14	Oct. 19	Ir	eP_{EN}	4 50 56.5					U.S.C. & G.S. epi-
			i_{EN}	4 54 19.5					center: 46°6N, 112°W
			F	5 11					Destructive in
									Helena, Montana.
15	Oct. 22	I	eP_N	18 38 22.2					See discussion, p. 8
			i_N	18 38 47.2					
			F	18 41					
16	Oct. 24	Iv	eP_N	14 49 25.8					Felt widely in South
			e_E	14 49 29.3					ern California.
			i_E	14 50 53.8					Pasadena reports foc
			i_N	14 50 50.8					on Mill Creek fault.
			F	15 02					
17	Oct. 24	I	e_N	15 29 51.3					
			e_E	15 30 09.3					
			i_N	15 30 46.8					
			F	15 32					
18	Oct. 24	I	$e\bar{S}_{EN}$	18 22 41.8					See discussion, p. 8
			F	18 23.5					
19	Oct. 25	Id	eP_{EN}	3 50 25.4					See discussion, p. 8
			eS_{EN}	3 50 26.7					
			F	3 51					
20	Oct. 25	Id	eP_E	15 17 44.8					See discussion, p. 8
			eP_N	15 17 45.1					
			iS_E	15 17 46.2					
			eS_N	15 17 46.5					
			F	15 18					
21	Oct. 25	Id	$i\bar{P}_{EN}$	19 43 47.0					See discussion, p. 8
			$i\bar{S}_{EN}$	19 44 00.5					
			F	19 45					
22	Oct. 25	Id	$e\bar{P}_N$	20 44 09.6					See discussion, p. 8
			eP_{EN}	20 44 10.4					
			$i\bar{S}_N$	20 44 16.0					
			F	20 46					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
23	Oct. 25	IId	$i\overline{P}_{EN}$	20 56 28.1					See discussion, p. 8
			i_{EN}	20 56 28.5					
			i_N	20 56 34.1					
			iS_E	20 56 34.6					
			F	21 01					
24	Oct. 25	Id	eP_{EN}	21 41 30.0					See discussion, p. 8
			iS_{EN}	21 41 36.2					
			i_E	21 41 47.8					
			F	21 43					
25	Oct. 26	Id	$e\overline{P}_{EN}$	10 46 24.7					See discussion, p. 8
			iS_{EN}	10 46 31.1					
			F	10 48					
26	Oct. 26	Id	$e\overline{P}_N$	11 26 38.5					See discussion, p. 8
			$e\overline{P}_E$	11 26 39.0					
			$e\overline{S}_{EN}$	11 26 44.3					
			F	11 28					
27	Oct. 26	I	e_E	13 35 28.3					
			e_{EN}	13 35 29.7					
			F	13 36					
28	Oct. 28	Id	eP_N	19 48 18.0					See discussion, p. 8
			e_E	19 48 19.0					
			eS_N	19 48 23.5					
			eS_E	19 48 24.0					
			F	19 49					
29	Oct. 29	I	e_E	10 19 23.3					Pasadena reports, "c coast of Lower California."
			F	10 29					
30	Oct. 31	I	eP_N	18 40 32.4					Severe in Helena, Montana.
			e_E	18 43 56.9					
			F	19 02					
31	Nov. 1	I	e_{EN}	6 10 12.3					
			F	6 35					
32	Nov. 1	Id	eP_{EN}	6 22 26.6					See discussion, p. 8
			iS_{EN}	6 22 28.8					
			F	6 23					
33	Nov. 4	I	eP_E	3 57 20					
			i_N	3 58 56					
			F	4 07					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
34	Nov. 9	Id	eP_N	20 52 23.9					See discussion, p. 8
			iS_N	20 52 25.0					
			F	20 53					
35	Nov. 13	I	e_N	23 53 35.5					
			F	23 54					
36	Nov. 21	Id	iP_{EN}	8 40 27.0					See discussion, p. 8
			iS_{EN}	8 40 28.0					
			F	8 41					
37	Nov. 23	Ir	$eP_1'P_{1E}'$	8 33 07.0					U.S.C. & G.S. epicenter: 1°N, 86°W.
			$eP_2'P_{2E}'$	8 33 13.5					
			e_N	8 33 19.7					
			F	8 34					
38	Nov. 26	Iv	eP_E	21 02 36.3					See discussion, p. 8
			eP_N	21 02 37.1					
			iS_N	21 03 09.8					
			eS_E	21 03 10.3					
			F	21 04					
39	Nov. 27	Id	eP_E	2 29 02.4					See discussion, p. 8
			eP_N	2 29 02.9					
			eS_{EN}	2 29 04.5					
			F	2 30					
40	Nov. 28	I	e_N	14 44 57.3					Felt in Helena, Montana.
			e_N	14 48 00.3					
			F	14 59					
41	Nov. 30	I	e_E	3 48 19.0					Felt in Panama.
			e_N	3 55 14.5					
			F	4 39					
42	Dec. 5	I	e_N	3 28 48.5					
			i_{EN}	3 28 51.5					
			F	3 30					
43	Dec. 5	I	e_N	21 27 25.5					
			e_N	21 29 03.0					
			F	21 34					
44	Dec. 11	I	e_N	16 21 40.5					
			i_{EN}	16 21 52.5					
			F	16 23					

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No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.		mm.	mm.	mm.	
45	Dec. 14	I	e_N	1 41 07.0					
			e_E	1 49 12.5					
			F	1 56					
46	Dec. 14	I	e_N	12 59 22.0					
			i_E	12 59 25.5					
			F	13 01					
47	Dec. 14	Iu	eP_N	22 12 09.0					
			e_E	22 17 41.0					
			F	23 35					
48	Dec. 15	Iu	eP_E	7 20 32					
			e_N	7 31 27					
			e_E	7 45 36					
			F	9 10					
49	Dec. 16	I	eP_{EN}	17 07 15.5					
			i_E	17 07 16.7					
			e_N	17 15 19.5					
			e_E	17 15 21.0					
			F	17 21					
50	Dec. 16	Id	$e\overline{P}_N$	20 01 17.3					See discussion, p. 85
			eS_N	20 01 29.5					
			F	20 02					
51	Dec. 18	Id	iP_{EN}	4 49 15.8					See discussion, p. 85
			iS_{EN}	4 49 17.8					
			F	4 50					
52	Dec. 18	Id	$e\overline{P}_N$	15 32 21.5					See discussion, p. 85
			eP_E	15 32 22.0					
			$i\overline{S}_N$	15 32 33.5					
			eS_E	15 32 34.5					
			F	15 34					
53	Dec. 18	I	e_N	17 42 31					
			F	17 44					
54	Dec. 20	I	eP_N	7 47 28.0					
			eP_E	7 47 29.0					
			i_N	7 49 15.5					
			F	8 06					
55	Dec. 22	Id	iP_N	9 19 09.9					See discussion, p. 8
			iS_N	9 19 11.8					
			F	9 20					

International Seismological Centre

MOUNT HAMILTON

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
56	Dec. 23	Id	iP_N	2 03 48.0					See discussion, p.
			i_N	2 03 56.0					
			iS_N	2 03 58.7					
			F	2 05					
57	Dec. 23	Id	iP_N	5 22 25.6					See discussion, p.
			eS_{EN}	5 22 33.3					
			F	5 23					
58	Dec. 23	Id	eP_N	12 22 57.2					See discussion, p.
			iS_{EN}	12 23 05.5					
			F	12 24					
59	Dec. 24	I	e_N	12 33 24					
			e_E	12 40 54					
			F	13 01					
60	Dec. 26	Id	eP_N	23 05 35.3					See discussion, p. 8
			iS_{EN}	23 05 36.8					
			F	23 06					
61	Dec. 26	Id	iP_N	23 15 42.0					See discussion, p. 8
			iS_{EN}	23 15 44.5					
			F	23 16					
62	Dec. 28	Iu	e_N	2 54 47					
			e_N	2 56 55					
			eL_N	3 14 13					
			F	4 56					
63	Dec. 28	I	iP_N	5 00 43.5					
			F	5 02					

International Seismological Centre

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the seismographic station:

φ = 37°25' N Lat.
λ = 122°11' W from Greenwich.

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_o	ϵ
Wood-Anderson	E	3000	1	15
	N	3000	1	15

International Seismological Centre

PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Oct. 2	Id	eP_{EN}	2 01 37.6					See discussion, p.
			i_{EN}	2 01 48.6					
			F	2 03					
2	Oct. 2	I	e_E	5 43 14.8					
			e_N	5 43 15.3					
			F	5 46					
3	Oct. 10	Id	eP_E	21 18 47.8					See discussion, p.
			eP_N	21 18 48.3					
			iS_{EN}	21 19 02.3					
			F	21 20					
4	Oct. 12	I	e_{EN}	7 57 05.5					
			F	8 00					
5	Oct. 15	Id	eP_N	21 40 38.2					See discussion, p. 8
			iS_N	21 40 39.9					
			F	21 41					
6	Oct. 18	I	e_E	0 23 16					
			e_E	0 23 39					
			F	0 25					
7	Oct. 18	Iv	e_E	9 24 18.5					See discussion, p. 8
			e_N	9 24 19.5					
			e_E	9 24 24.5					
			e_N	9 24 38.0					
			i_{EN}	9 24 52.5					
			F	9 26					
8	Oct. 18	Id	iP^*_{EN}	18 26 36.9					See discussion, p. 8
			iP_E	18 26 38.1					
			eS_{EN}	18 26 46.8					
			eS_N	18 26 49.0					
			F	18 27					
9	Oct. 19	Ir	eP_{EN}	4 51 03.0					U.S.C. & G.S. epi-
			i_E	4 51 07.0					center: 46°6N, 112°W
			i_N	4 42 06.0					Destructive in Helen
			eS_E	4 53 29.0					Montana.
			eS_N	4 53 31.5					
			i_{EN}	4 54 17.0					
			F	5 10					

International Seismological Centre

PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
10	Oct. 19	Id	eP_{EN}	19 43 05.9					See discussion, p. 8
			eS_{EN}	19 43 07.2					
			iS_{EN}	19 43 09.9					
			F	19 44					
11	Oct. 22	I	eP_N	18 38 26.5					See discussion, p. 8
			eP_E	18 38 27.0					
			i_E	18 38 58.0					
			i_N	18 38 58.5					
			F	18 40					
12	Oct. 24	Iv	eP_E	14 49 34.0					Felt widely in South-
			eP_N	14 48 36.5					ern California.
			i_{EN}	14 50 52.0					Pasadena reports foc
			i_{EN}	14 51 04.0					on Mill Creek fault.
			i_{EN}	14 51 14.5					
			F	15 00					
13	Oct. 24	Iv	$e\overline{P}_{EN}$	18 22 39.9					See discussion, p. 8
			$e\overline{S}_{EN}$	18 22 51.9					
			F	18 23.5					
14	Oct. 25	Iv	$e\overline{P}_{EN}$	19 43 51.7					See discussion, p. 8
			$i\overline{S}_N$	19 44 06.5					
			eS_E	19 44 09.0					
			F	19 45					
15	Oct. 25	Iv	$e\overline{P}_N$	20 44 15.8					See discussion, p. 8
			eP_E	20 44 16.2					
			$i\overline{S}_N$	20 44 26.3					
			i_E	20 44 28.3					
			F	20 45					
16	Oct. 25	IId	$i\overline{P}_{EN}$	20 56 34.3					See discussion, p. 8
			i_N	20 56 47.8					
			F	21 00					
17	Oct. 25	Id	$i\overline{P}_{EN}$	21 41 36.3					See discussion, p. 8
			$i\overline{S}_N$	21 41 49.0					
			$i\overline{S}_E$	21 41 49.4					
			F	21 43.5					
18	Oct. 26	Id	$i\overline{P}_{EN}$	10 46 31.8					See discussion, p. 8
			$i\overline{S}_{EN}$	10 46 44.0					
			F	10 48					

International Seismological Centre

PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
19	Oct. 26	Id	$e\overline{P}_{EN}$	11 26 45.0					See discussion, p. 84
			$i\overline{S}_{EN}$	11 26 59.0					
			F	11 28					
20	Oct. 29	I	e_E	10 19 14.5					Pasadena reports "off coast of Lower California."
			i_N	10 21 46.0					
			i_{EN}	10 22 18.5					
			F	10 26					
21	Oct. 31	Id	ePE_N	16 19 29.1					See discussion, p. 84
			i_N	16 19 30.5					
			iS_N	16 19 31.5					
			i_N	16 19 32.5					
			F	16 20					
22	Oct. 31	I	e_N	18 39 25.5					Severe in Helena, Montana.
			e_E	18 39 29.0					
			i_E	18 40 29.0					
			e_{EN}	18 42 24.5					
			i_{EN}	18 42 41.0					
			F	18 58					
23	Nov. 1	Iu	e_{EN}	6 08 51					
			e_N	6 13 51					
			e_N	6 20 15					
			e_N	6 23 10					
			F	6 44					
24	Nov. 4	I	e_{EN}	3 55 57.5					
			e_N	3 57 39.0					
			e_E	3 57 46.5					
			e_N	3 58 25.5					
			F	4 06					
25	Nov. 4	I	e_{EN}	13 55 38.0					
			F	14 00					
26	Nov. 17	I	e_N	7 53 12.0					
			e_E	7 53 13.5					
			e_N	7 53 41.0					
			F	7 54					
27	Nov. 23	Ir	$eP_1'P_1'E$	8 33 08.5					U.S.C. & G.S. epicenter: 1°N, 86°W.
			i_{EN}	8 33 22.5					
			F	8 34					
28	Nov. 28	I	e_E	14 48 05					Felt in Helena.
			e_N	14 48 07					
			F	14 52					

International Seismological Centre

PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
29	Nov. 30	I	e_E	3 48 22.5					Felt in Panama.
			e_N	3 48 25.0					
			e_{EN}	3 55 16.0					
			F	3 58					
30	Dec. 5	I	e_E	3 58 20.5					
			e_{EN}	3 58 26.5					
			F	3 59.5					
31	Dec. 10	Id	eP_E	18 56 33.6					See discussion, p. 8
			iP_E	18 56 34.8					
			iP_N	18 56 35.2					
			iS_E	18 56 35.8					
			iS_N	18 56 36.2					
			F	18 57					
32	Dec. 14	Ir	iP_{EN}	1 41 10.5					
			iP_{EN}	1 41 12.5					
			eS_{EN}	1 49 18.5					
			F	1 55					
33	Dec. 14	I	i_{EN}	12 59 20					
			F	13 02					
34	Dec. 14	Ir	eP_{EN}	22 12 17.5					Felt in Guatemala
			e_E	22 14 20.0					
			e_N	22 17 45.0					
			e_E	22 17 47.0					
			eL_N	22 21 56.0					
			e_E	22 22 03.0					
			F	22 52					
35	Dec. 15	Iu	eP_{EN}	7 20 33					Epicenter near the Solomon Islands.
			eS_{EN}	7 31 25					
			eL_N	7 45 34					
			eL_E	7 46 10					
			F	8 52					
36	Dec. 16	I	eP	17 07 17					
			F	17 09					
37	Dec. 16	Iv	$e\overline{P}_E$	20 01 22.5					See discussion, p. 8
			$e\overline{P}_N$	20 01 23.0					
			eS_{EN}	20 01 38.0					
			e_E	20 01 41.5					
			F	20 03					

International Seismological Centre

PALO ALTO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
38	Dec. 18	Iv	$e\bar{P}_N$	15 32 25.2					See discussion, p. 85
			eP_E	15 32 27.5					
			$i\underline{E}$	15 32 42.7					
			$i\bar{S}_N$	15 32 47.0					
			F	15 35					
39	Dec. 20	I	eP_{EN}	7 47 38.0					
			e_N	7 49 07.5					
			e_E	7 49 36.5					
			F	8 00					
40	Dec. 23	Id	iP_{EN}	2 03 53.6					See discussion, p. 85
			iS_{EN}	2 04 02.1					
			F	2 06					
41	Dec. 23	Id	e_E	5 22 32.5					See discussion, p. 85
			e_E	5 22 41.7					
			F	5 24					
42	Dec. 23	Id	eP_E	12 23 03.7					See discussion, p. 85
			e_{EN}	12 23 11.7					
			iS_{EN}	12 23 13.2					
			F	12 24					
43	Dec. 23	Id	iP_{EN}	17 31 47.6					See discussion, p. 85
			i_N	17 31 49.1					
			iS_{EN}	17 31 50.0					
			iM_{EN}	17 31 50.9					
			F	17 33					

International Seismological Centre

SAN FRANCISCO

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

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the seismographic station:

φ = 37° 46' N Lat.
λ = 122° 27' W from Greenwich.

Time.--All determinations are reduced to Universal Time.
Altitude.--100 meters (328 ft.) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

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

During the period covered by this bulletin the San Francisco station was moved from the California Academy of Sciences to the University of San Francisco.

International Seismological Centre

SAN FRANCISCO

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Oct. 18	Iv	iP*EN	18 26 43.0					See discussion, p. 83
			iS*EN	18 26 58.0					
			iE	18 27 00.5					
			F	18 28					
2	Oct. 24	I	eN	15 56 27±					
			eEN	15 56 55±					
			F	15 59±					
3	Nov. 4	I	eEN	13 57 12.5					
			eE	14 05 20.5					
			F	14 08					
4	Dec. 14	I	eEN	12 59 18					
			F	13 01					
5	Dec. 14	IIu	eEN	22 12 17					
			eLEN	22 17 49					
			F	23 00					

International Seismological Centre

THE FERNDALE STATION
FERNDALE, CALIFORNIA

CONSTANTS

CONSTANTS OF THE STATION

Latitude and longitude of the center of the seismographic station:

φ = 40° 34' N. Lat.
λ = 124° 16' W. from Greenwich.

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

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

The seismograph is a Bosch-Omori 25-kgm. horizontal pendulum. It is oriented to record E-W motion. The station is operated by Mr. Joseph Bognuda, of Ferndale, in cooperation with the University of California.

International Seismological Centre

FERNDALE

No.	Date	Character	Phase	Time U.T.	Period	Amplitude A_E	Amplitude A_N	Amplitude A_Z	Remarks
	1935			h. m. s.	s.	mm.	mm.	mm.	
1	Oct. 31	I	e_E	18 40 40					
			F	19 05					
2	Nov. 18	Id	eP_E	19 56 44					
			eS_E	19 56 45					
			F	11 57					
3	Nov. 26	I	e_E	14 33 22					
			i_E	14 34 30					
			F	14 45					
4	Dec. 14	I	e_E	14 18 45					
			e_E	14 21 38					
			F	14 50					
5	Dec. 15	I	e_E	17 34 44					
			F	17 36					
6	Dec. 19	I	e_E	10 02 00					
			i_E	10 02 10					
			F	10 04					