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EARTHQUAKES IN NORTHERN CALIFORNIA

AND

THE REGISTRATION OF EARTHQUAKES

AT

BERKELEY—MOUNT HAMILTON—PALO ALTO
SAN FRANCISCO

FROM

OCTOBER 1, 1932, TO MARCH 31, 1933

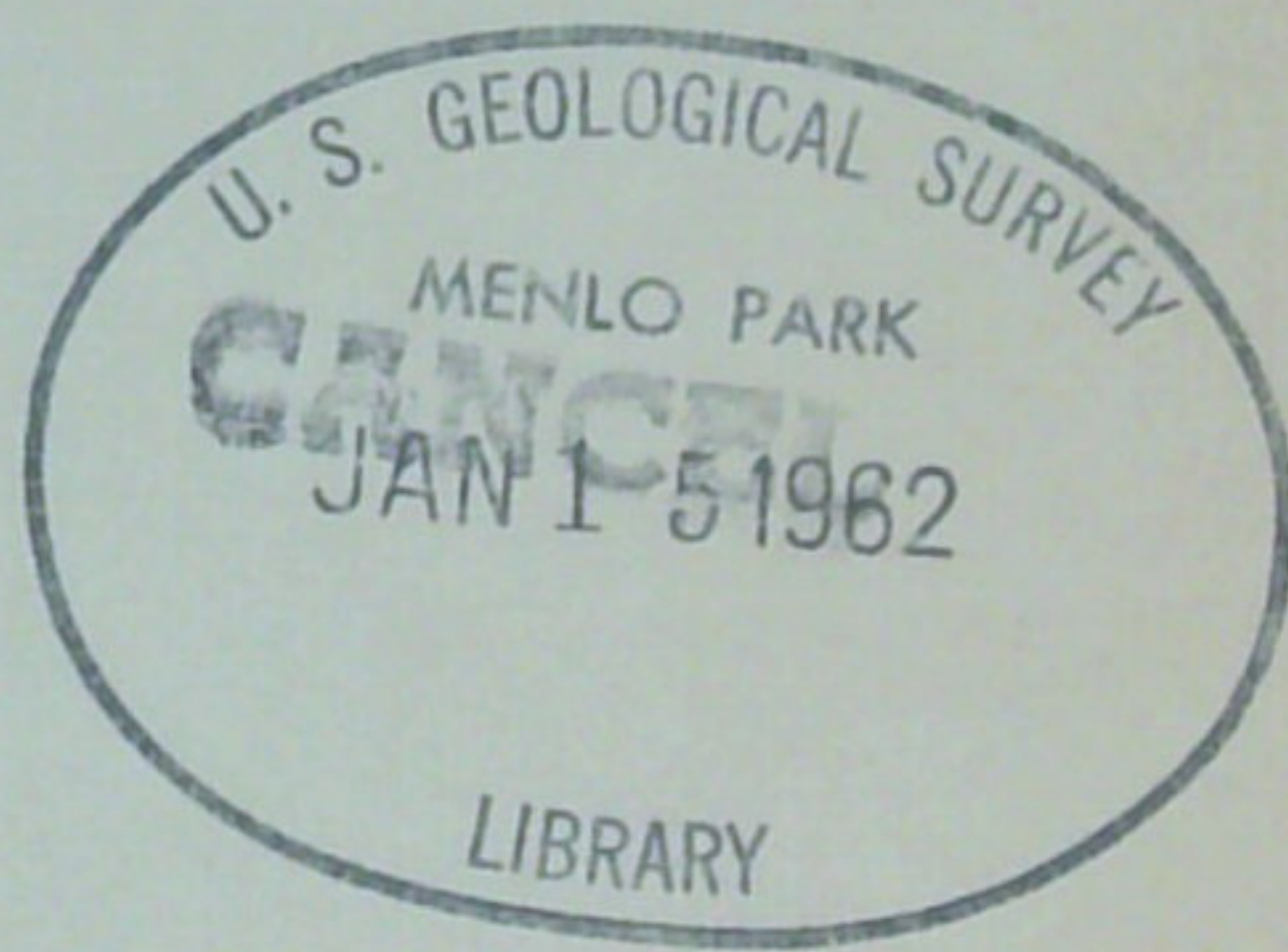
BY

PERRY BYERLY

AND

NEIL R. SPARKS

Bulletin of the Seismographic Stations.



✓
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CONTENTS

	PAGE
EARTHQUAKES IN NORTHERN CALIFORNIA	151
THE REGISTRATION OF EARTHQUAKES	159
Symbols and Notations Employed	160
BERKELEY	161
Constants	161
Tabulation of Shocks	162
MOUNT HAMILTON	187
Constants	187
Tabulation of Shocks	188
PALO ALTO	217
Constants	217
Tabulation of Shocks	218
SAN FRANCISCO	235
Constants	235
Tabulation of Shocks	236

THE ROSSI-FOREL SCALE OF EARTHQUAKE INTENSITIES

1. *Microseismic shock*: the shock felt by an experienced observer.
2. *Extremely feeble shock*: felt by a small number of persons at rest.
3. *Very feeble shock*: felt by several persons at rest; strong enough for the direction or duration to be appreciated.
4. *Feeble shock*: felt by persons in motion; disturbances of movable objects, doors, windows; creaking of ceilings and walls.
5. *Shock of moderate intensity*: felt generally by everyone; disturbance of furniture, beds, etc.; ringing of swinging bells.
6. *Fairly strong shock*: general awakening of persons asleep; general ringing of swinging bells; oscillation of chandeliers; stopping of pendulum clocks; visible agitation of trees and shrubs; some startled persons leave their dwellings.
7. *Strong shock*: overthrow of movable objects; fall of plaster; ringing of church bells; general panic, without damage to buildings.
8. *Very strong shock*: fall of chimneys, cracks in walls of buildings.
9. *Extremely strong shock*: partial or total destruction of some buildings.
10. *Shock of extreme intensity*: disturbance of the strata; fissures in the ground; rock-falls from mountains; landslides; buildings ruined.

EARTHQUAKES IN NORTHERN CALIFORNIA

1932—PACIFIC STANDARD TIME

- October 3, 4^h 18^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- October 3, 5^h 41^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 5 miles from Palo Alto station.
- October 3, 5^h 42^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 5 miles from Palo Alto station.
- October 5, 10^h 14^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 or 15 miles from Palo Alto station.
- October 5, 4^h 36^m, P.M. Recorded at Berkeley and Palo Alto; according to reports the Rossi-Forel intensity was IV at Ferndale, Fortuna, and I-II at Whitlow.
- October 11, 12^h 05^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 5 or 10 miles from Palo Alto station.
- October 11, 6^h 20^m, P.M. Recorded at Berkeley and poorly at Palo Alto; not reported felt; focus about 15 miles from Berkeley station.
- October 12, 2^h 58^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- October 16, 6^h 17^m, A.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; according to reports the Rossi-Forel intensities were IV at Aptos, 5 miles west of Gilroy, Hollister, Santa Cruz, Watsonville, III at Spreckels, I-II at Pacific Grove; epicenter was between Watsonville and Moss Landing.
- October 19, 6^h 51^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- October 19, 8^h 40^m, A.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; according to reports the Rossi-Forel intensities were VII at Soledad, IV at Del Monte, Hollister, Jamesburg, Metz, Monterey, Paraiso Hot Springs, Santa Cruz, Soquel, Spreckels; epicenter was between Big Sur and Soledad; on the Arroya Seco road cracks were opened; large sections of the high river-banks were shaken down.
- October 19, 6^h 04^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- October 20, 12^h 59^m, P.M. Recorded at Berkeley only; not reported felt; focus about 10 miles from the University campus.
- October 20, 1^h 31^m, P.M. Recorded at Berkeley and Palo Alto; reported felt at Watsonville, Rossi-Forel intensity IV; epicenter probably between Gilroy and Morgan Hill.
- October 22, 7^h 37^m, A.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; not reported felt; epicenter near Spreckels.

- October 24, 7^h 01^m, A.M. Recorded at Palo Alto; not reported felt; focus about 10 miles from Palo Alto station.
- October 24, 5^h 07^m, P.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; according to reports the Rossi-Forel intensity was IV at Agnew, Alviso, Aptos, Berkeley, Carquinez Strait Light Station, Centerville, Colma, Gilroy, Hollister, Monterey, Niles, Oakland, Patterson, Redwood City, San Anselmo, San Francisco, San Jose, Santa Clara, Santa Cruz, Soquel, Sunol, Watsonville, III at Half Moon Bay, II at Corte Madera, Richmond; the epicenter was near Gilroy Hot Springs.
- October 24, 7^h 28^m, P.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; not reported felt; epicenter probably in Mono County.
- October 25, 2^h 01^m, A.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; not reported felt; epicenter near Gilroy Hot Springs.
- October 25, 10^h 42^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- October 26, 8^h 49^m, A.M. Recorded at Berkeley and Palo Alto; not recorded at Mount Hamilton because electric power failed; epicenter probably near Corralitos.
- October 27, 5^h 43^m, P.M. Recorded at Mount Hamilton only; not reported felt; epicenter about 30 miles from Lick Observatory.
- October 28, 10^h 33^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.
- October 28, 7^h 42^m, P.M. Recorded at Berkeley on Galitzin seismographs only; not reported felt; epicenter about 150 miles from Berkeley.
- October 31, 3^h 11^m, A.M. Recorded at Mount Hamilton only; focus about 6 miles from Lick Observatory.
- October 31, 7^h 01^m, A.M. Recorded weakly at Berkeley, Mount Hamilton, and Palo Alto; according to reports the Rossi-Forel intensity was IV at Cloverdale, Hopland, Kelseyville, Lakeport, Ukiah, Upper Lake; the seismograms were not sufficiently well recorded to permit a determination of the epicenter.
- November 2, 3^h 00^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- November 2, 5^h 50^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- November 2, 7^h 07^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- November 2, 9^h 57^m, P.M. Recorded at Palo Alto only; Rossi-Forel intensity III at Spreckels.
- November 3, 10^h 55^m, A.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; according to reports the Rossi-Forel intensity was V at Olympia, Saratoga, IV at Boulder Creek, Cupertino, Los Gatos, Oakland, Pigeon Point, Redwood City, San Anselmo, San Francisco, San Jose, Santa Cruz, III at Agnew, Alviso, Aptos, Centerville, Colma, Half Moon Bay, Hay-

ward, Mount Hermon, Niles, II at Bonita Point, Soquel, Spreckels, Stockton, Watsonville; the epicenter was near Saratoga.

November 3, 11^h 23^m, A.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; not reported felt; epicenter probably some 5 miles west of Saratoga; this earthquake came from a different origin than that at 10^h 55^m.

November 3, 11^h 50^m, A.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; not reported felt; this was an aftershock of the earthquake at 10^h 55^m and emanated from the same source.

November 7, 6^h 42^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 12 miles from Palo Alto station.

November 9, 0^h 33^m, A.M. Recorded at Mount Hamilton and Palo Alto; not reported felt; epicenter near Paicines.

November 10, 6^h 56^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.

November 11, 11^h 10^m, P.M. Recorded at Mount Hamilton and Palo Alto; not reported felt; epicenter near Wrights.

November 11, 11^h 17^m, P.M. Recorded at Mount Hamilton and Palo Alto; not reported felt; epicenter near Wrights.

November 12, 5^h 49^m, A.M. Recorded at Mount Hamilton and poorly at Palo Alto; not reported felt; epicenter probably same as for two shocks on November 11.

November 12, 6^h 47^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

November 14, 8^h 02^m, A.M. Recorded at Mount Hamilton and Palo Alto (Wood-Anderson records being changed at Berkeley); not reported felt; epicenter between Big Sur and Soledad, probably same as shock of October 19.

November 14, 9^h 47^m, A.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter near Wrights.

November 15, 8^h 32^m, A.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter appears to have been between Merced and Dos Palos.

November 16, 2^h 27^m, A.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; not reported felt; epicenter between Big Sur and Soledad.

November 19, 6^h 53^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.

November 21, 8^h 59^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.

November 21, 10^h 03^m, P.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; not reported felt; epicenter about 7 miles northwest of Mount Hamilton.

November 22, 11^h 18^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.



- November 23, 9^h 56^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- November 24, 1^h 16^m, A.M. Recorded at Mount Hamilton and Palo Alto; not reported felt; epicenter near Wrights.
- November 24, 8^h 58^m, P.M. Recorded at Mount Hamilton and poorly at Palo Alto; not reported felt; focus probably about 7 miles from Lick Observatory.
- November 29, 9^h 37^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 7 miles from Palo Alto.
- November 30, 1^h 54^m, A.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; not reported felt; epicenter about 10 miles southeast of Pleasanton.
- November 30, 4^h 58^m, A.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; not reported felt; epicenter about 10 miles northeast of Lick Observatory.
- December 5, 4^h 01^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- December 6, 5^h 14^m, A.M. Recorded at Palo Alto and poorly at Mount Hamilton and Berkeley; not reported felt; epicenter about 100 km. from Palo Alto, probably southerly.
- December 7, 1^h 01^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- December 8, 3^h 38^m, P.M. Recorded poorly at Mount Hamilton and Palo Alto; not reported felt; epicenter appears to have been about 60 miles from Mount Hamilton.
- December 11, 4^h 20^m, P.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; Rossi-Forel intensity IV reported at Hollister; epicenter probably near Llanada.
- December 11, 4^h 22^m, P.M. Recorded at Mount Hamilton and Palo Alto; same epicenter as that of shock at 4^h 20^m, P.M.
- December 13, 8^h 56^m, P.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter between Gonzales and Paicines.
- December 14, 10^h 32^m, A.M. Recorded at Mount Hamilton, Palo Alto, and poorly at Berkeley; not reported felt; epicenter near San Juan.
- December 15, 1^h 33^m, P.M. Recorded at Palo Alto only; not reported felt; focus probably about 5 miles from Palo Alto station.
- December 16, 5^h 33^m, P.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; Rossi-Forel intensity IV reported at Cowell, Martinez, III at Richmond; epicenter near Bay Point.
- December 18, 8^h 21^m 06^s, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- December 18, 8^h 21^m 13^s, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.





December 20, 10^h 10^m 08^s, P.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco. This was the great Nevada earthquake. The epicenter was at 38° 48' north latitude, 117° 59' west longitude. This epicenter was located by a study of seismograms from stations throughout the world. The earthquake attained Rossi-Forel intensity IX or X in the epicentral area, which is sparsely inhabited. The following California towns reported the shock: Rossi-Forel intensities IV to V: Aberdeen, Antioch, Atwater, Bakersfield, Bass Lake, Bayles, Big Creek, Bigpine, Brooks, Brown, Byron, Carquinez Strait Light House, Chico, Coalinga, Colma, Corcoran, Dinuba, Dos Palos, Douglas Flat, Ducor, El Nido, El Portal, Fillmore, Forest, Fowler, Fresno, Georgetown, Graeagle, Greenville, Gustine, Haiwee, Hollister, Huntington Beach, Independence, Inyokern, Isleton, Jamestown, Jamesville, Keeler, Kernville, Knights Landing, Lancaster, Laws, Le Grand, Lemoore, Livermore, Lodi, Lone Pine, Los Banos, Ludlow, McFarland, Manteca, Martell, Mendota, Mentone, Merced, Meridian, Milton, Modesto, Mossdale Bridge, Napa, Newman, Oakland, Olancho, Omo Ranch, Onyx, Oroville, Owenyo, Oxnard, Pittsburg, Placerville, Prattville, Rio Vista, Robbins, Rosamond, Roseville, Sacramento, San Francisco, Sanger, San Jose, Sattley, Selma, Sequoia National Park, Spreckels, Stockton, Suisun, Sutter Creek, Tahoe, Tracy, Tulare, Vallejo, Visalia, Volcanoville, Waterford, Wheatland, Woodland, Yolo; II to III: Agnew, Alameda, Alcatraz, Antioch, Auburn, Avenal, Benicia, Bethany, Biggs, Blythe, Byron, Fair Oaks, Fullerton, Hollister, Kernville, Long Beach, Manteca, Newman, Oakland, Petaluma, Quincy, Rosendale, St. Helena, San Diego, Santa Monica, Szuan Valley, Tahoe Pines, Taylorsville, Ventura, Woodlake.

December 25, 3^h 08^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.

December 29, 10^h 33^m, P.M. Recorded at Berkeley and San Francisco; not reported felt; focus about 5 miles from the University of California, probably on the Hayward fault southeast of the campus.

1933—PACIFIC STANDARD TIME

January 3, 7^h 54^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

January 4, 2^h 09^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 15 miles from Palo Alto station.

January 5, 3^h 39^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.

January 9, 1^h 26^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus probably about 5 miles from Lick Observatory.

January 12, 10^h 20^m, P.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; Rossi-Forel intensity was IV at Ben Lomond, Boulder Creek, Felton, Mount Hermon, Olympia, Santa Cruz, Saratoga, Soquel, Wrights, III at Moss Landing, Oakland, San Francisco, San Jose; epicenter was near Wrights.



January 12, 11^h 49^m, P.M. Recorded at Mount Hamilton only; not reported felt; epicenter about 20 miles from Lick Observatory.

January 13, 0^h 45^m, A.M. Recorded at Mount Hamilton and poorly at Berkeley; not reported felt; epicenter probably a little more than 100 miles from Lick Observatory.

January 13, 7^h 25^m, P.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; not reported felt; epicenter near Gilroy Hot Springs.

January 13, 8^h 49^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.

January 14, 0^h 47^m, A.M. Recorded at Palo Alto only; not reported felt; epicenter about 15 miles from Palo Alto station.

January 14, 12^h 49^m, P.M. Recorded at Palo Alto only; not reported felt; focus between 10 and 15 miles from Palo Alto station.

January 15, 8^h 59^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 15 miles from Lick Observatory.

January 15, 4^h 40^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 15 miles from Lick Observatory.

January 16, 3^h 26^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.

January 19, 4^h 20^m, P.M. Not recorded at Bay stations; Rossi-Forel intensity IV reported at Kernville.

January 20, 9^h 47^m, P.M. Recorded at Mount Hamilton and poorly at Berkeley and Palo Alto; not reported felt; epicenter probably about 100 miles from Lick Observatory.

January 26, 4^h 34^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

January 27, 10^h 38^m, P.M. Recorded at Berkeley and Palo Alto; reported from Santa Cruz only, Rossi-Forel intensity III; epicenter between Paicines and San Benito.

January 30, 4^h 47^m, P.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; not reported felt; epicenter between Los Gatos and Wrights.

February 2, 7^h 25^m, P.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; Rossi-Forel intensity IV at Benton, Big Creek, Big-pine, Bishop, Deep Springs, Laws, Mocalno, The Pines, Shaver Lake; I-III at Naveleneia, Squaw Valley, Visalia, Woodlake; the epicenter may not be located from records of San Francisco Bay stations alone, since they all lie in approximately the same direction from it.

February 4, 5^h 09^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 12 miles from Lick Observatory.

February 6, 4^h 15^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.

February 7, 6^h 35^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.



- February 8, 3^h 39^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 15 miles from Lick Observatory.
- February 8, 5^h 40^m, P.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter about 15 miles southeast of Lick Observatory.
- February 13, 2^h 15^m, P.M. A shock of Rossi-Forel intensity IV reported from Benton and Nevada points. Probably this was one of the shocks recorded at the Bay stations near that hour.
- February 19, 5^h 43^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 5 miles from Lick Observatory.
- February 21, 11^h 41^m, P.M. Recorded at Berkeley only; not reported felt; focus probably about 2 miles from the University campus.
- February 23, 4^h 27^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- February 26, 1^h 35^m, A.M. Recorded at Berkeley, Mount Hamilton, Palo Alto, and San Francisco; Rossi-Forel intensity IV at Hollister, Salinas, Spreckels; epicenter near San Juan.
- February 28, 11^h 54^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 15 miles from Lick Observatory.
- March 3, 6^h 59^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto.
- March 3, 7^h 01^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 5 miles from Palo Alto.
- March 4, 7^h 23^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 5 miles from Palo Alto.
- March 5, 2^h 10^m, P.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter near San Juan.
- March 8, 0^h 32^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 12 miles from Lick Observatory.
- March 8, 3^h 27^m, A.M. Recorded at Mount Hamilton only; not reported felt; focus about 10 miles from Lick Observatory.
- March 11, 8^h 42^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- March 18, 11^h 05^m, A.M. Recorded at Palo Alto only; not reported felt; focus about 7 miles from Palo Alto station.
- March 18, 11^h 33^m, A.M. Recorded at Palo Alto only; not reported felt; focus probably about 7 miles from Palo Alto station.
- March 21, 3^h 46^m, P.M. Recorded at Mount Hamilton only; not reported felt; focus about 7 miles from Lick Observatory.
- March 22, 3^h 23^m, P.M. Recorded at Palo Alto only; not reported felt; focus about 10 miles from Palo Alto station.
- March 22, 9^h 49^m, P.M. Recorded at Berkeley only; not reported felt; epicenter about 20 miles from the University campus.

March 25, 2^h 37^m, P.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter probably near San Juan.

March 27, 2^h 45^m, A.M. Recorded poorly at Berkeley and Palo Alto; Rossi-Forel intensity II at Auberry, Candelaria (Nevada), Laws, Mocalno.

March 27, 2^h 45^m, A.M. An earthquake was recorded at Lassen National Park at this time; the epicenter was placed at about 25 miles from Mineral. It was reported as Rossi-Forel intensity IV at Mineral, Paynes Creek, Redding; III at Manton. It is presumed that this was not the earthquake recorded at the San Francisco Bay stations, since the small shocks centering in the Mount Lassen region have not previously been recorded at these stations.

March 27, 5^h 02^m, A.M. Recorded poorly at Berkeley, Mount Hamilton; Rossi-Forel intensity IV at Benton, Big Creek, Candelaria (Nevada), Knowles, Oakhurst, Pineridge; II at Auberry, Laws, Mocalno.

March 27, 5^h 07^m, A.M. Recorded at Berkeley, Mount Hamilton, and Palo Alto; felt at same places as earthquake at 5^h 02^m.

March 27, 2^h 39^m, P.M. Recorded at Berkeley only; not reported felt; focus about 5 miles from the University campus.

March 30, 11^h 43^m, P.M. Recorded at Mount Hamilton and Palo Alto and poorly at Berkeley; not reported felt; epicenter probably near San Benito.



THE REGISTRATION OF EARTHQUAKES

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:

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

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

Latitude and longitude of the center of the seismographic room:

$\varphi = 37^{\circ} 52' 15''$ N Lat.

$\lambda = 122^{\circ} 15' 36''$ W from Greenwich

Time.—All determinations are reduced to Universal Time.

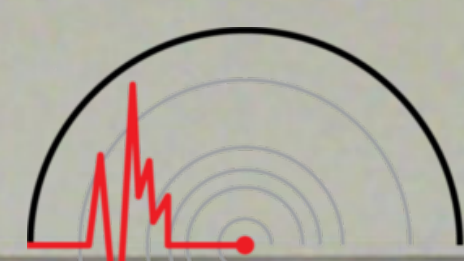
Altitude.—85 meters (279 feet) above mean sea level.

CONSTANTS OF THE SEISMOGRAPHS

Apparatus	Component	V	T_0	ϵ	$\frac{r}{T_0^2}$
Bosch-Omori 100 kg.....	E	45	14	10	0.001
	N	50	14	10	0.001
Wiechert 80 kg.....	Z	44	4	5	0.005
Wood-Anderson.....	E	3000	0.9	15	
	N	3000	0.9	15	
Galitzin.....		K	T	T_1	μ_2
	E	126	12	12	0
	N	125	12	12.1	0
	Z	121	12	11.8	0

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

BERKELEY

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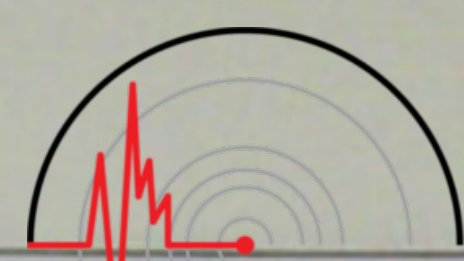
No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
1	1932 Oct. 2	IIr	e _E i _Z e _N e _N F	A 3 06 58 G 3 06 59 A 3 06 59 G 3 07 03 4 08					Compression U. S. C. & G. S. Epi- center: 12° N, 86° W
2	Oct. 6	Id	iP _{EN} F	A 0 03 48.5 0 03.9					S-P=1 sec. See discussion, p. 151
3	Oct. 6	Iv	e _N e _E e _{ENZ} F	A 0 36 24 A 0 36 31 G 0 36 37 0 41					Very small See discussion, p. 151
4	Oct. 9	I	e _{ENZ} F	G 1 01.0 1 23±					
5	Oct. 11	I	eP _E iP _N e _{ENZ} i _N F	A 15 43 31 A 15 43 33 G 15 44.0 A 15 44 14 15 49	0.5 0.5 0.5	-0.2 -0.5	+0.2 		
6	Oct. 11	Ir	e _{ENZ} F	G 19 15 17 19 36±					U. S. C. & G. S. Epi- center: 24° N, 110° W
7	Oct. 12	Id	iP _{EN} F	A 2 19 59 2 21±					S-P=3.2 sec. See discussion, p. 151
8	Oct. 16	IIr	eP _N eP _E iP _Z eP _{EN} eS _{EN} iL _E F	A 12 14 16 A 12 14 17 G 12 14 17 G 12 14 17 G 12 19 19 G 12 22.3 14 13±	24	-18			U. S. C. & G. S. Epi- center: 54° N, 158° W
9	Oct. 16	IIv	eP _{ENZ} eP _{EN} i _{EN} i _N eS _{EN} iS _{EN} i _N F	G 14 17 09 A 14 17 09.0 A 14 17 10.5 A 14 17 12.5 G 14 17 24 A 14 17 25.0 A 14 17 26.0 14 30.2	0.4 0.6 0.5 0.5 0.5	-0.2 +0.4 +1.2	+0.2 -0.7 -0.6 +1.0 +5.0		See discussion, p. 151
10	Oct. 17	I	e _{ENZ} F	G 14 03± 15 13±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
11	1932 Oct. 19	IIv	eP _{EN} eP _N eP _Z i _E i _Z eS _{NZ} e _E iS _N F	A 16 40 07 G 16 40 08 G 16 40 09 A 16 40 11 G 16 40 14 G 16 40 29 A 16 40 29 A 16 40 32 16 50±					See discussion, p. 151
12	Oct. 20	I	e _{ENZ} F	G 18 03± 18 43±					
13	Oct. 20	Id	eP _{EN} F	A 20 58 52					S-P=2 sec. See discussion, p. 151
14	Oct. 20	Iv	eP _{EN} F	A 21 30 47 21 31±					S-P=14.5 sec. See discussion, p. 151
15	Oct. 20	I	e _{EN} F	A 23 48.8 23 50±					
16	Oct. 22	Iv	e _{EN} F	A 15 37.4 15 38±					May begin earlier See discussion, p. 151
17	Oct. 25	IIv	iP _{EZ} iP _{EN} i _E iS _{EZ} eS _N iS _E F	G 1 07 38 A 1 07 38 A 1 07 39 G 1 07 52 A 1 07 52 A 1 07 52.5 1 13±	2 0.5 0.5 3 1	-3.5 +0.5 +5.5 +8 -15	+2	+4.5 +14	See discussion, p. 152
18	Oct. 25	Iv	eP _{EN} F	A 3 28 28 3 31±					Very weak, S-P= 32 sec. (ca.) See discussion, p. 152
19	Oct. 25	Id	eP _{EN} F	A 10 00 59 10 02±					S-P=13.5 sec. See discussion, p. 152
20	Oct. 26	I	e _{ENZ} F	G 1 26.0 1 54±					
21	Oct. 26	Id	eP _{EN} F	A 16 49 30 16 51±					S-P=13.5 sec. See discussion, p. 152
22	Oct. 29	Iv	iP _Z eS _{EN} F	G 3 41 59 G 3 46 50 4 19±					U. S. C. & G. S. Epi- center:19°N,105°W

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No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
23	Oct. 30	IIr	iP _Z	G 18 53 11	5			-1.5	U. S. C. & G. S. Epi- center: 54°N, 156°W
			eP _N	G 18 53 12	5		+1		
			eP _E	G 18 53 13	5	-2			
			iS _E	G 18 58 14	11	+8			
			eL _Z	G 19 01.1	24			-6	
			eL _E	G 19 01.3	24	-9			
			e _{EN} F	A 20 53.2 22 14±					
24	Oct. 31	Iv	eP _{EN}	A 15 00 41.5					See discussion, p. 152
			e _N	A 15 00 51.5					
			eS _E	A 15 00 56					
			F	15 03 38					
25	Nov. 2	I	iP _Z	G 11 13 41					Rarefaction U. S. C. & G. S. Epi- center: 23°S, 111°W
			eP _N	G 11 13 41					
			i _E	G 11 22 08					
			F	12 34±					
26	Nov. 3	IIIId	iP _{ENZ}	G 18 55 18	2	+3	-8	-6.5	See discussion, p. 152
			iP _{EN}	A 18 55 18.0	0.5	-2.0	-8.0		
			iS _{EN}	A 18 55 26.5					
			iS _E	G 18 55 27	8	-37			
			F	19 01±					
27	Nov. 3	Id	eP _{EN}	A 19 49 52					S-P=8.5 sec. See discussion, p. 153
			F	19 51±					
28	Nov. 3	I	e _{EN}	A 19 54 54					
			F	19 57±					
29	Nov. 12	I	e _{ENZ}	G 13 51.9					
			F	14 04±					
30	Nov. 13	IIu	iP _{ENZ}	G 4 57 49	5	+11	-9	+32	
			iP _E	A 4 57 49	2	+ 1.2			
			eS _E	A 5 06 43	2	- 0.5			
			iS _E	G 5 06 43	6	- 9.5			
			iS _Z	G 5 06 43	3			+0.8	
			iS _N	G 5 06 44	6		+7		
			F	7 04±					
31	Nov. 13	I	e _{EZ}	G 16 13.9					
			F	17 19±					
32	Nov. 14	Iv	e _E	A 17 47 43					P probably lost See discussion, p. 153
			eS _E	A 17 47 46.0					
			F	17 48±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
33	Nov. 16	Iv	eP _{EN} F	A 4 32.2 4 33.5					May not be P See discussion, p. 153
34	Nov. 16	Iv	eP _{EN} F	A 10 27 28 10 30±					S-P=22 sec. See discussion, p. 153
35	Nov. 17	I	eP _E iP _Z eP _N F	G 6 08 20 G 6 08 20 G 6 08 20 7 34±					Rarefaction Epicenter: 20° N, 104° E
36	Nov. 18	I	e _{ENZ} F	G 1 17.6 1 28±					
37	Nov. 22	Id	eP _{EN} F	A 6 02 58 6 04±					S-P=9 sec. See discussion, p. 153
38	Nov. 29	I	e _{ENZ} F	G 2 25.3 3 04±					Surface waves ?
39	Nov. 29	Iu	e _{ENZ} F	G 11 33.3 12 14±					U. S. C. & G. S. Epi- center: 32° S, 72° W
40	Nov. 30	I	eP _{EN} F	A 9 54 28 9 55±					
41	Nov. 30	Id	eP _{EN} F	A 12 58 18 12 59±					S-P=10 sec. (ca.) See discussion, p. 154
42	Dec. 4	Ir	eP _{EZ} i _E iS _E iS _Z F	G 8 30 16 G 8 36 26 G 8 39 31 G 8 39 31 11 04±	14 18 16 13	+2 +5 +7		+2 +2	
43	Dec. 6	I	e _{EN} F	A 13 14 44 13 15±					
44	Dec. 7	IIr	iP _{ENZ} iP _{EN} iS _E eS _E F	G 16 27 35 A 16 27 35 G 16 32 19 A 16 32 19 18 35±	5 3.5	-15 - 0.6	+15 + 0.6	+22	U.S.C.&G.S.Epicen- ter: 18° N, 103°5 W Felt in Guadalajara and Mexico D. F.
45	Dec. 9	I	e _{ENZ} F	G 9 25± 9 50±					U.S.C.&G.S.Epicen- ter: 14° S, 74°±W
46	Dec. 10	I	e _{ENZ} F	G 10 55.6 11 35±					Surface waves ?

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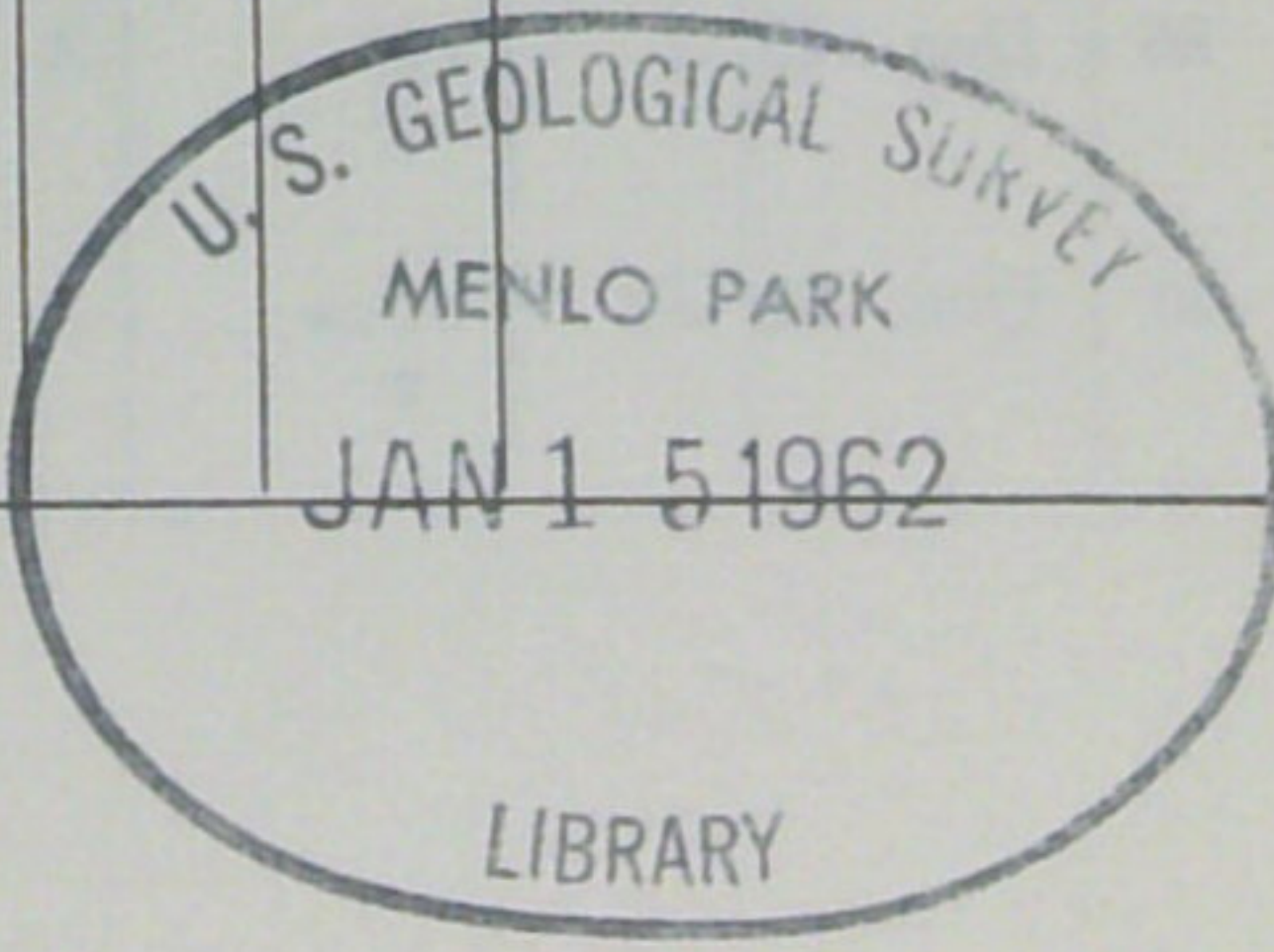
No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
47	Dec. 12	Iv	eP _{EN} F	A 0 20 07 0 24±					S-P=23 sec. (ca.) See discussion, p. 154
48	Dec. 14	Iv	e _E F	A 4 56 34 4 57±					See discussion, p. 154
49	Dec. 14	Iv	e _{EN} F	A 18 32.2 18 33±					See discussion, p. 154
50	Dec. 17	IIId	eP _{ENZ} iP _{EN} iS _{EN} F	G 1 33 13 A 1 33 14 G 1 33 17 1 36±					See discussion, p. 154 S-P=3.5 sec.
51	Dec. 17	I	e _{EN} F	A 7 19.8 7 21±					
52	Dec. 19	Ir	eP _{EZ} F	G 6 35 47 7 20					
53	Dec. 20	Iv	eP _{EN} F	A 11 30 51 11 33±					S-P=28 sec. (ca.)
54	Dec. 21	IIIv	eP _{EN} iP _Z eP _{EN} i _{EN} i _E i _{EN} i _N iS _Z iS _E F	A 6 10 59 G 6 11 00 G 6 11 00 G 6 11 04 A 6 11 10 A 6 11 13 A 6 11 20 W 6 11 53 B 6 11 55	5 5	-1	-2	+4	See discussion, p. 155 Lost in next quake
55	Dec. 21	Iv	e _{EN} F	A 7 10 15 7 14					
56	Dec. 21	Iv	eP _{EN} F	A 7 15 45 7 18±					S-P=50 sec.
57	Dec. 21	IIv	eP _{EN} i _N i _Z i _N iS _E iS _Z iS _N F	A 7 41 54 A 7 42 00 W 7 42 00 A 7 42 03 B 7 42 44 W 7 42 44 A 7 42 45 7 52	2			+1	

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E mm.	A _N mm.	A _Z mm.	
58	1932 Dec. 21	Iv	eP _N	A h. m. s. 8 49 35	s.				
			eS _N	A 8 50 14					
			F	8 54±					
59	Dec. 21	Iv	eP _{EN}	A 9 34 25					S-P=48 sec.
			F	9 36±					
60	Dec. 21	IIv	eP _N	A 11 34 25					
			eP _Z	G 11 34 25					
			eP _E	G 11 34 26					
			e _N	G 11 34 31					
			eS _{EZ}	G 11 35 12					
			iS _N	G 11 35 12					
			F	11 45±					
61	Dec. 21	Iv	eP _{EN}	A 12 40 05					S-P=47 sec.
			F	13 13					
62	Dec. 21	Iv	eP _Z	W 14 05 52					S-P=50 sec.
			eP _{EN}	A 14 05 53					
			eS _E	B 14 06 39					
			F	14 12±					
63	Dec. 21	Iv	eP _{EN}	A 14 40 07					S-P=45 sec.
			eS _E	B 14 40 53					
			eS _Z	W 14 40 53					
			F	14 45±					
64	Dec. 21	I	e _{EN}	A 16 42.7					
			F	16 45.4					
65	Dec. 21	I	e _{EN}	A 16 53.4					
			F	16 54.4					
66	Dec. 21	Iv	eP _{EN}	A 17 04 42					S-P=47 sec.
			F	17 07±					
67	Dec. 21	Iv	eP _{EN}	A 17 34 12					S-P=47 sec.
			F	17 37					
68	Dec. 21	I	eP _{EN}	A 19 19 46					
			F	19 23±					
69	Dec. 21	I	e _{EN}	A 19 23.4					
			F	19 25±					
70	Dec. 21	I	e _{EN}	A 19 26.6					
			F	19 28±					

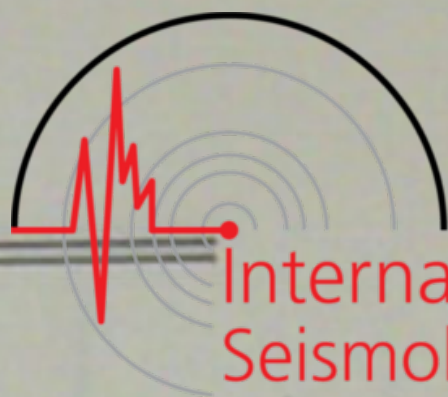


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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
71	Dec. 21	I	e _{EN} F	A 19 36.5 19 38.4					
72	Dec. 21	I	e _{EN} F	A 19 39.9 19 41±					
73	Dec. 21	I	e _{EN} F	A 20 09.9 20 11.4					
74	Dec. 21	I	e _{EN} F	A 20 12.5 20 14±					
75	Dec. 21	I	e _{EN} F	A 21 33.9 21 35±					
76	Dec. 21	Iv	eP _{EN} F	A 21 56 31 21 59±					S-P=49 sec.
77	Dec. 21	I	e _{EN} F	A 21 59.5 22 00±					
78	Dec. 21	I	e _{EN} F	A 22 02.7 22 04±					
79	Dec. 21	I	e _{EN} F	A 22 22.3 22 23.4					
80	Dec. 21	I	e _{EN} F	A 22 24.3 22 26±					
81	Dec. 21	I	e _{EN} F	A 22 33.0 22 34±					
82	Dec. 21	I	e _{EN} F	A 22 39.9 22 41±					
83	Dec. 21	I	e _{EN} F	A 22 47.5 22 49±					
84	Dec. 21	I	e _{EN} F	A 22 51.6 22 52.4					
85	Dec. 22	I	e _{EN} F	A 0 17.2 0 20±					
86	Dec. 22	I	e _{EN} F	A 0 48.9 0 50±					
87	Dec. 22	Iv	eP _{EN} F	A 1 20 33 1 23±					S-P=42 sec. (ca.)

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
88	Dec. 22	I	e _{EN} F	A 4 03.9 4 06±					
89	Dec. 22	Iv	eP _{EN} F	A 4 30 14 4 32±					S-P=46 sec.
90	Dec. 22	I	e _{EN} F	A 4 54.9 57±					
91	Dec. 22	I	e _{EN} F	A 4 57.2 5 00±					
92	Dec. 22	I	e _{EN} F	A 5 18.9 5 20±					
93	Dec. 22	I	e _{EN} F	A 6 43.9 6 45±					
94	Dec. 22	I	e _{EN} F	A 7 20.9 7 22±					
95	Dec. 22	I	e _{EN} F	A 7 49.9 7 53±					
96	Dec. 22	I	e _{EN} F	A 9 51.9 9 55±					
97	Dec. 22	I	e _{EN} F	A 10 35.7 10 41±					
98	Dec. 22	I	e _{EN} F	A 11 41.9 11 44±					
99	Dec. 22	I	e _{EN} F	A 12 58.4 13 00±					
100	Dec. 22	I	e _{EN} F	A 15 00.4 15 03±					
101	Dec. 22	I	e _{EN} F	A 15 15.9 15 18±					
102	Dec. 22	I	e _{EN} F	A 15 48.9 15 51±					
103	Dec. 22	I	e _{EN} F	A 16 09.2 16 11±					
104	Dec. 22	I	e _{EN} F	A 17 54.9 17 56±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
105	Dec. 22	I	e _{EN} F	A 19 25.9 19 27±					
106	Dec. 22	I	e _{EN} F	A 20 17.6 20 20±					
107	Dec. 22	I	e _{EN} F	A 20 30.9 20 33±					
108	Dec. 22	I	e _{EN} F	A 21 19.9 21 21±					
109	Dec. 22	I	e _{EN} F	A 22 56.4 22 59±					
110	Dec. 22	Iv	eP _{EN} F	A 23 53 47 23 58±					S-P=46 sec.
111	Dec. 23	I	e _{EN} F	A 2 17.0 2 19±					
112	Dec. 23	I	e _{EN} F	A 2 56.5 2 58±					
113	Dec. 23	I	e _{EN} F	A 5 43.3 5 46±					
114	Dec. 23	I	e _{EN} F	A 6 28.2 6 30±					
115	Dec. 23	I	e _{EN} F	A 9 00.0 9 01±					
116	Dec. 23	I	e _{EN} F	A 12 29.5 12 31±					
117	Dec. 23	I	e _{EN} F	A 14 11.0 14 13±					
118	Dec. 23	I	e _{EN} F	A 17 53.9 17 54.5					
119	Dec. 23	I	e _{EN} F	A 18 09.0 18 11±					
120	Dec. 23	I	e _{EN} F	A 20 06.0 20 09±					
121	Dec. 24	I	e _{EN} F	A 3 03.0 3 05±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
122	Dec. 24	I	e _{EN} F	A 12 41.3 12 46±					
123	Dec. 24	I	e _{EN} F	A 13 59.0 14 01±					
124	Dec. 24	I	e _{EN} F	A 16 54.5 16 56.5					
125	Dec. 24	I	e _{EN} F	A 17 14.0 17 15±					
126	Dec. 24	I	e _{EN} F	A 21 51.5 53±					
127	Dec. 24	I	e _{EN} F	A 22 34.9 22 37±					
128	Dec. 25	IIIu	e _{ENZ} i _{ENZ} e _{EN} F	G 2 17 51 G 2 17 57 A 2 18 06					U.S.C.&G.S.Epicen- ter: 38° N, 96°5 E Lost in next quake
129	Dec. 25	I	eP _{EN} e _{EN} i _{EN} F	A 3 55 13 A 3 55 21 A 3 56 06 4 02±					
130	Dec. 25	I	e _{EN} F	A 7 46.2 7 48±					
131	Dec. 25	I	e _{EN} F	A 8 07.9 8 10±					
132	Dec. 25	I	e _{EN} F	A 10 05.8 10 07±					
133	Dec. 25	I	e _{EN} F	A 17 44.0 17 46±					
134	Dec. 25	I	e _{EN} F	A 18 37.0 18 41±					
135	Dec. 25	I	e _{EN} F	A 22 29.3 22 32±					
136	Dec. 26	I	e _{EN} F	A 1 09.2 1 12±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
137	Dec. 26	I	e _{EN} F	A 4 06.0 07±					
138	Dec. 26	I	e _{EN} F	A 4 15.6 4 17±					
139	Dec. 26	IIv	eP _N eP _E iP _E eP _Z eP _N i _Z i _{EN} F	A 5 03 42 A 5 03 43 G 5 03 43 G 5 03 43 G 5 03 44 G 5 03 45 A 5 04 32 5 23±	1+ 6? 2 6 1±	+0.3 +2 +3.5	 +0.2 -3.5	Very weak Weak +2	
140	Dec. 26	I	e _{EN} F	A 5 27.0 5 29±					
141	Dec. 26	I	e _{EN} F	A 5 41.0 5 44±					
142	Dec. 26	I	e _{EN} F	A 8 24.5 8 25±					
143	Dec. 26	I	e _{EN} F	A 8 54.0 8 56±					
144	Dec. 26	I	e _{EN} F	A 12 09.8 12 11±					
145	Dec. 26	Iv	eP _{EN} F	A 12 54 01 12 57±					S-P=45 sec.
146	Dec. 26	I	e _{EN} F	A 17 12.0 17 13±					
147	Dec. 26	I	e _{EN} F	A 20 18.7 20 20±					
148	Dec. 26	I	e _{EN} F	A 20 38.3 40±					
149	Dec. 26	I	e _{EN} F	A 21 42.7 21 44±					
150	Dec. 27	I	e _{EN} F	A 4 48.0 4 49±					
151	Dec. 27	I	e _{EN} F	A 11 12.0 11 13±					



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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
152	Dec. 27	I	e _{EN} F	A 11 19.0 21±					
153	Dec. 28	I	e _{EN} F	A 2 51.8 2 54±					
154	Dec. 28	Iv	eP _{EN} F	A 3 08 26 3 11±					S-P=51 sec. (ca.)
155	Dec. 28	I	e _{EN} F	A 10 02.1 10 03±					
156	Dec. 28	I	e _{EN} F	A 12 24.1 12 25±					
157	Dec. 28	I	e _{EN} F	A 16 10.3 16 12±					
158	Dec. 28	I	e _{EN} F	A 23 53.9 23 56±					
159	Dec. 29	I	e _{EN} F	A 5 15.8 5 17±					
160	Dec. 29	I	e _{EN} F	A 6 15.8 6 16±					
161	Dec. 29	I	e _{EN} F	A 6 18.5 6 20±					
162	Dec. 29	II	eP _{EN} eP _{ENZ} F	A 6 21 35 G 6 21.6 6 29					S-P=50 sec. (ca.)
163	Dec. 29	II	eP _{EN} eP _{ENZ} F	A 6 39 06 G 6 39.1 6 45±					S-P=47 sec.
164	Dec. 29	II	eP _{EN} eP _{ENZ} F	A 6 46 11 G 6 46 13 6 55±					S-P=45 sec.
165	Dec. 30	I	e _{EN} F	A 0 42.2 0 44±					
166	Dec. 30	Iv	eP _{EN} F	A 4 18 58 4 23±					S-P=45 sec. (ca.)
167	Dec. 30	IIId	iP _{EN} F	A 6 33 24.5 6 34.1					S-P=1.0 sec. See discussion, p. 155

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
168	Dec. 30	Iv	eP _{EN} F	A 16 04 21 16 07±					S-P=47 sec.
169	Dec. 31	I	e _{EN} F	A 1 23.1 1 24.6					
170	Dec. 31	I	e _{EN} F	A 1 28.9 1 29.6					
171	Dec. 31	I	e _{EN} F	A 14 34.0 14 36±					
172	Dec. 31	I	e _{EN} F	A 17 15.6 17 17.6					
173	Dec. 31	I	e _{EN} F	A 17 30.1 17 33±					
174	Dec. 31	I	e _{EN} F	A 19 56.4 59±					
	1933								
175	Jan. 1	I	e _{EN} F	A 1 07.8 09.6					
176	Jan. 1	Iv	eP _{EN} F	A 1 41 59 1 44±					S-P=48 sec. (ca.)
177	Jan. 1	I	e _{EN} F	A 5 19.7 5 20.6					
178	Jan. 1	I	e _{EN} F	A 6 48.5 6 50±					
179	Jan. 1	I	e _N e _{EN} F	G 8 58.2 A 9 01.1 10 35±					Distant quake ?
180	Jan. 2	Iv	eP _{EN} F	A 3 35 04 3 42±					S-P=45 sec.
181	Jan. 2	Iv	eP _{EN} F	A 12 21 50 25±					S-P=47 sec. (ca.)
182	Jan. 2	I	e _{EN} F	A 15 08.8 15 11±					
183	Jan. 2	I	e _{EN} F	A 15 45.4 15 48±					

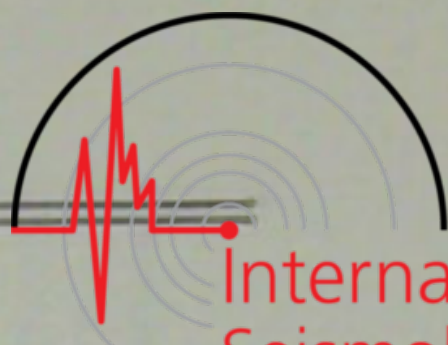
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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
168	1932 Dec. 30	Iv	eP _{EN} F	A 16 04 21 16 07±					S-P=47 sec.
169	Dec. 31	I	e _{EN} F	A 1 23.1 1 24.6					
170	Dec. 31	I	e _{EN} F	A 1 28.9 1 29.6					
171	Dec. 31	I	e _{EN} F	A 14 34.0 14 36±					
172	Dec. 31	I	e _{EN} F	A 17 15.6 17 17.6					
173	Dec. 31	I	e _{EN} F	A 17 30.1 17 33±					
174	Dec. 31	I	e _{EN} F	A 19 56.4 59±					
	1933								
175	Jan. 1	I	e _{EN} F	A 1 07.8 09.6					
176	Jan. 1	Iv	eP _{EN} F	A 1 41 59 1 44±					S-P=48 sec. (ca.)
177	Jan. 1	I	e _{EN} F	A 5 19.7 5 20.6					
178	Jan. 1	I	e _{EN} F	A 6 48.5 6 50±					
179	Jan. 1	I	e _N e _{EN} F	G 8 58.2 A 9 01.1 10 35±					Distant quake ?
180	Jan. 2	Iv	eP _{EN} F	A 3 35 04 3 42±					S-P=45 sec.
181	Jan. 2	Iv	eP _{EN} F	A 12 21 50 25±					S-P=47 sec. (ca.)
182	Jan. 2	I	e _{EN} F	A 15 08.8 15 11±					
183	Jan. 2	I	e _{EN} F	A 15 45.4 15 48±					

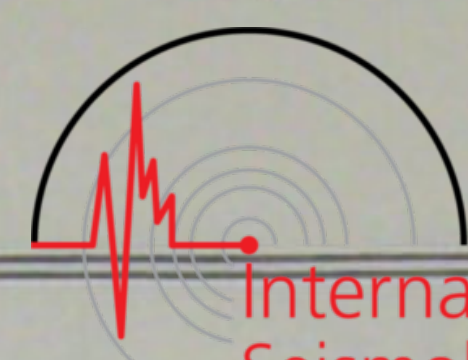
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No.	Date		Charac- ter	Phase	Time U. T.		Amplitude			Remarks
							A _E	A _N	A _Z	
	1933				h. m. s.	s.	mm.	mm.	mm.	
184	Jan.	2	I	e _{EN} F	A 17 07.8 17 14±					Probably two quakes
185	Jan.	2	I	e _{EN} F	A 17 49.1 17 52±					
186	Jan.	3	I	e _{EN} F	A 8 36.9 8 38±					
187	Jan.	3	I	e _{EN} F	A 10 39.9 10 41±					
188	Jan.	3	I	e _{EN} F	A 14 49.2 14 50±					
189	Jan.	4	IIv	eP _{EN} e _{ENZ} F	A 1 02 12 G 1 02.7 1 06±					S-P=46 sec. (ca.)
190	Jan.	4	I	e _{EN} F	A 1 36.7 38±					
191	Jan.	4	I	e _{ENZ} e _{EN} F	G 4 05± A 4 05.2 5 10±					U. S. C. & G. S. Epi- center:62°N,148°W
192	Jan.	4	I	e _{EN} F	A 10 36.2 10 38±					
193	Jan.	4	Iv	eP _{EN} F	A 10 55 28 10 58±					S-P=48 sec. (ca.)
194	Jan.	4	I	e _{EN} F	A 11 05.9 11 08±					
195	Jan.	4	I	e _{EN} F	A 11 10.2 11 11±					
196	Jan.	4	II	eP _{EN} eP _{ENZ} i _E F	A 21 13 13 G 21 13 20 G 21 15 11 21 35±					
197	Jan.	5	I	e _{EN} F	A 3 55.2 3 58±					
198	Jan.	5	Iv	eP _{EN} F	A 5 15 23 5 18±					S-P=48 sec. (ca.)

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
199	Jan.	5	IIv	iP _{EZ} eP _{EN} iS _E F	G A G	-3		+3.5	S-P=45 sec. (ca.) There appears to be another quake su- perimposed on the surface waves of this one
				6 51 16 6 51 16 6 52 06 7 25±	3				
200	Jan.	5	Iv	eP _{EN} F	A				S-P=45
				7 44 23 7 48±					
201	Jan.	5	I	e _{EN} F	A				
				7 58.4 8 00±					
202	Jan.	5	I	e _{ENZ} e _{EN} F	G A				
				9 13 02 9 13 04 9 20±					
203	Jan.	5	Iv	eP _{EN} e _{ENZ} F	A G				S-P=43 sec. (ca.)
				10 06 02 10 06.0 10 12±					
204	Jan.	5	I	e _{EN} F	A				
				21 26.7 21 29±					
205	Jan.	6	I	e _{EN} F	A				
				5 49.2 5 50±					
206	Jan.	6	IIv	eP _{ENZ} eP _{EN} F	G A				S-P=51 sec.
				13 06 30 13 06 34 13 14±					
207	Jan.	6	I	e _{EN} F	A				
				13 34.5 13 37					
208	Jan.	6	I	e _{EN} F	A				
				16 10.5 16 14±					
209	Jan.	6	I	e _{EN} F	A				
				16 18.8 16 19.8					
210	Jan.	6	Iv	eP _{EN} F	A				S-P=33 sec. (ca.)
				23 45 40 23 48±					
211	Jan.	7	I	e _{EN} F	A				
				2 01.5 2 03±					
212	Jan.	7	I	e _{EN} F	A				
				3 18.0 3 19.5					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E mm.	A _N mm.	A _Z mm.	
	1933			h. m. s.	s.				
213	Jan. 7	I	i _E F	G 4 27 00 6 35±					Very weakly re- corded on N & Z
214	Jan. 7	I	e _{EN} F	A 8 11.8 8 14±					
215	Jan. 10	I	e _{EN} F	A 0 07 15 0 09±					
216	Jan. 10	I	e _{EN} F	A 1 04.3 1 06±					
217	Jan. 10	I	e _{EN} F	A 5 54.3 5 56±					
218	Jan. 10	I	e _{EN} F	A 15 55.2 15 57±					
219	Jan. 10	I	e _{EN} F	A 17 34.5 17 38±					
220	Jan. 11	I	e _{EN} F	A 17 28.4 29±					
221	Jan. 11	Iv	eP _{EN} eP _{EZ} eS _E F	A 17 30 01 G 17 30 01 G 17 30 47 17 37					S-P=46 sec. (ca.)
222	Jan. 12	Iv	eP _{EN} F	A 1 49 22 1 52±					S-P=45 sec. (ca.)
223	Jan. 13	I	e _{EN} F	A 5 36.7 5 38±					
224	Jan. 13	IIId	eP _{ENZ} iP _{EN} iS _N iS _E F	G 6 19 54 A 6 19 54 A 6 20 06 A 6 20 07 6 22±	0.5 0.5 0.5	+0.5 -10	-0.5 -2.0		See discussion, p. 155
225	Jan. 13	I	e _N e _N e _N F	A 8 45 49 A 8 45 54.5 A 8 46 14 8 47 17					See discussion, p. 156
226	Jan. 14	I	e _{EN} F	A 2 46.9 2 48±					

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No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
227	Jan. 14	Iv	iP _{EN} F	A 3 25 14 3 26±					S-P=13.5 sec. See discussion, p. 156
228	Jan. 15	I	e _{EN} F	A 2 49.8 2 50.9					
229	Jan. 15	I	e _{ENZ} e _{EN} F	G 7 59.4 A 7 59.9 8 13±					Might be two quakes
230	Jan. 15	I	e _{EN} F	A 8 22.4 8 24±					
231	Jan. 15	Iv	e _{EN} F	A 13 08 01 13 10±					S-P=42 sec. (ca.)
232	Jan. 17	Iv	eP _{EN} eP _{ENZ} iS _{ENZ} F	A 1 02 42 G 1 02 43 G 1 03 30 1 08±					S-P=46 sec. (ca.)
233	Jan. 17	Iv	eP _{EN} F	A 2 35 26 2 38±					S-P=43 sec. (ca.)
234	Jan. 17	I	e _{EN} F	A 19 01.5 19 03±					
235	Jan. 18	I	e _{EN} F	A 17 07.5 17 08±					
236	Jan. 20	I	e _{EN} F	A 1 43.0 1 45±					
237	Jan. 21	Iv	e _N e _E e _E e _N F	A 5 47 30 A 5 47 35.5 A 5 47 53 A 5 47 57 5 48.5					Small See discussion, p. 156
238	Jan. 21	I	e _{EN} F	A 6 08.4 6 11±					
239	Jan. 21	IIu	iP _Z eP _Z e _{EN} i _Z iP _E i _E e _Z	G 19 41 23 W 19 41 23 A 19 41.5 G 19 41 27 G 19 41 29 G 19 41 43 G 19 46 54	6 3 6 6 4 4	 +1 -2		+3 +0.1 -13 -5	

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E mm.	A _N mm.	A _Z mm.	
239	1933 Jan. 21 (contd.)	IIu	i _{EZ}	G 19 46 58	5			-33	
			e _Z	W 19 46 58	5			- 0.5	
			i _E	G 19 48 38					
			F	22 56±					
240	Jan. 22	I	e _{EN} F	A 3 51.2 3 53.1					
241	Jan. 22	Iv	eP _{EN} F	A 13 30 16 13 33±					S-P=40 sec.
242	Jan. 22	I	e _{EN} F	A 13 44.3 13 46±					
243	Jan. 23	I	e _{EN} F	A 21 32.9 21 35±					
244	Jan. 24	I	e _{EN} F	A 0 08.3 0 10±					
245	Jan. 25	I	e _{EN} F	A 0 59.3 1 01±					
246	Jan. 25	Iv	eP _{EN}	A 20 57 30 21 03±					S-P=50 sec.
247	Jan. 27	I	eP _{EN} F	A 22 47 56 0 36±					U. S. C. & G. S. Epi- center: 14°S, 171°W Felt in Samoan Islands
248	Jan. 28	I	e _{EN} e _{EN} e _{EN} e _E F	A 6 38 03 6 38 06.5 6 38 26 6 38 28.5 6 40±					See discussion, p. 156
249	Jan. 28	I	e _{EN} F	A 19 35.7 19 38±					
250	Jan. 29	I	eP _{EN} F	A 13 45 53. 13 49±					
251	Jan. 29	Iv	eP _{EN} F	A 13 52 13 13 58±					S-P=50 sec. (ca.)
252	Jan. 31	Id	eP _{EN} F	A 0 46 52 0 48±					S-P=11 sec. (ca.) See discussion, p. 156
253	Feb. 3	I	e _{EN} F	A 1 47.8 1 50±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E mm.	A _N mm.	A _Z mm.	
254	1933 Feb. 3	IIv	eP _{EN}	A h. m. s. 3 26 02	s.				
			eP _{ENZ}	G 3 26 03					
			i _{EN}	A 3 26 04					
			e _{ENZ}	G 3 26 41					
			e _{EN}	A 3 26 46					
			F	3 33±					
255	Feb. 3	I	e _{EN} F	A 8 12.8 8 14±					
256	Feb. 3	I	e _{EN} F	A 12 58.5 13 01±					
257	Feb. 3	I	i _{ENZ} F	G 22 22 00 23 31±					Compression
258	Feb. 6	I	e _{EN} F	A 4 47.8 4 50±					
259	Feb. 6	I	e _{EN} F	A 6 53.3 6 55±					
260	Feb. 6	I	e _{EN} F	A 18 15.9 18 17±					
261	Feb. 8	I	e _{EN} F	A 7 45.5 7 48±					
262	Feb. 9	Id	e _{EN} F	A 1 40.8 42±					See discussion, p. 157
263	Feb. 9	I	e _{EN} F	A 13 57.5 14 00±					
264	Feb. 9	I	e _{EN} F	A 14 01.0 14 02±					
265	Feb. 11	I	e _{EN} F	A 8 25.8 27±					
266	Feb. 13	I	e _{EN} F	A 6 09.9 6 11±					
267	Feb. 13	I	e _{EN} F	A 18 17.8 18 20±					
268	Feb. 13	IIv	eP _{EN}	A 22 09 58					See discussion, p. 157
			e _{ENZ}	G 22 10 06					
			i _{EN}	A 22 10 06.5					

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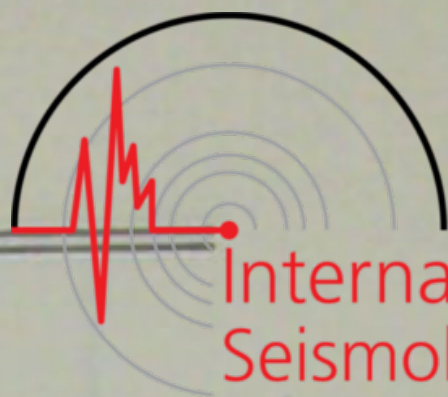
No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
268	Feb. 13 (contd.)	IIv	i _{EN} eS _{ENZ} i _E F	A 22 10 09 G 22 10 51 A 22 10 52.5 22 20±					
269	Feb. 13	I	e _{EN} F	A 22 32.2 22 35±					
270	Feb. 13	I	e _{EN} F	A 22 39.9 22 41±					
271	Feb. 14	I	e _{EN} F	A 11 32.0 11 34±					
272	Feb. 15	I	e _{EN} F	A 23 18.0 23 18.5					
273	Feb. 19	I	e _{ENZ} F	G 9 11.1 10 11±					
274	Feb. 21	Iv	eP _{EN} F	A 11 49 03 11 51±					S-P=48 sec.
275	Feb. 22	Id	eP _{EN} F	A 7 41 28 7 41 50					Very small S-P=0.5 sec. (ca.) See discussion, p. 157
276	Feb. 23	IIu	iP _{NZ} eP _{EN} iS _{NZ} eS _N e _E F	G 8 21 03 A 8 21 03 G 8 30 46 A 8 30 47 A 8 30 49 10 11±					Compression U. S. C. & G. S. Epi- center: 19° S, 69° W
277	Feb. 26	I	e _{EN} F	A 6 55.8 6 58±					
278	Feb. 26	Iv	iP _{EN} i _N iS _N F	A 9 34 56 A 9 34 58 A 9 35 18 9 38±					
279	Feb. 27	Iv	eP _{EN} F	A 10 53 28 10 56±					S-P=48 sec. (ca.)
280	Feb. 28	I	e _{EN} F	A 7 01.1 7 03±					
281	Mar. 2	Iv	eP _{EN} iS _{EN} F	A 0 52 38 0 53 28 0 55±					S-P=50 sec.

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
282	Mar. 2	IIIu	eP _{EN}	A 17 42 06	3	-0.5	+0.5		Rarefaction (Z) Amplitudes on Galit- zin records so large as to make identi- fication of later phases difficult Destructive in north- ern Japan U.S.C.&G.S.Epicen- ter: 39°5 N, 143°5 E
			iP _{EZ}	G 17 42 07					
			iP _{EZ}	BW 17 42 07	4	-0.2		-0.5	
			i _{EZ}	BW 17 42 24	12	+3		+3	
			e _E	B 17 51 14					
			eS _E	A 17 51 24	10	-2			
			eS _N	A 17 51 24	6		-1		
			iS _E	B 17 51 26	15	-9			
			eS _Z	W 17 51 29					
			i _E	B 17 59 15	20	+4			
			F	23 46±					
283	Mar. 5	Iv	eP _{EN} F	A 11 00 17 12 03±					S-P=46 sec.
284	Mar. 5	I	eP _{EN} F	A 22 10.4 22 11±					Very small See discussion, p. 157
285	Mar. 7	I	e _{EN} F	A 22 45.5 22 47±					
286	Mar. 9	I	e _{EN} F	A 6 45.1 6 46±					
287	Mar. 11	IIIv	eP _N	A 1 55 31	0.5		-0.1		The LongBeachearth- quake.Wood's epi- center near New- port Beach There may be several aftershocksrecord- ed in the surface waves of the main shock as evidenced by the short period superpositions iP on Galitzin is rarefaction
			eP _E	A 1 55 32	0.5	+0.1			
			iP _{ENZ}	G 1 55 33					
			i _N F	A 1 55 34 3 07±	1		+0.6		
288	Mar. 11	I	eP _{EN} F	A 3 11.5 3 16±					
289	Mar. 11	I	eP _{EN} F	A 3 25.0 31±					
290	Mar. 11	I	eP _{EN} F	A 4 38.3 4 46±					
291	Mar. 11	II	eP _{EN} F	A 5 11.8 5 19±					

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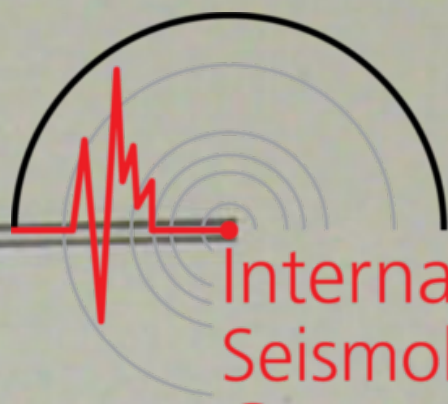
No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
292	Mar. 11	II	eP _{EN} F	A 5 19.5 5 27±					
293	Mar. 11	I	e _{EN} F	A 6 13.5 6 17±					
294	Mar. 11	I	e _{EN} F	A 6 31.5 6 35					
295	Mar. 11	II	eP _{EN} F	A 6 59.5 7 09±					
296	Mar. 11	I	eP _{EN} F	A 8 56.5 9 04±					
297	Mar. 11	I	eP _{EN} F	A 9 11.7 9 17±					
298	Mar. 11	I	e _{EN} F	A 12 51.5 12 55±					
299	Mar. 11	I	e _{EN} F	A 13 52.0 13 55±					
300	Mar. 11	I	e _{EN} F	A 14 27.0 14 32±					
301	Mar. 11	I	eP _{EN} F	A 14 58.3 15 03±					
302	Mar. 11	I	e _{EN} F	A 15 11.5 15 14±					
303	Mar. 11	IIu	iP _{ENZ} eP _{EN} iS _{ENZ} e _{EN} F	G 19 43 59 A 19 43 59 G 19 53 17 A 19 53 17 21 07±					Compression
304	Mar. 12	IIv	eP _{EN} eP _{ENZ} eS _{ENZ} F	A 20 45 32 G 20 45 32 G 20 46 18 21 01±					S-P=46 sec. (ca.)
305	Mar. 13	I	e _{EN} eP _{ENZ} F	A 13 18.9 G 13 19 16 13 37±					
306	Mar. 14	I	e _{EN} F	A 12 20.6 12 25±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
307	Mar. 14	I	eP _{ENZ} F	G 19 03 14 19 17±					
308	Mar. 15	I	e _{ENZ} F	G 5 19.6 6 37±					
309	Mar. 15	I	eP _{ENZ} F	G 11 15 14 11 26±					
310	Mar. 15	Iv	eP _{EN} eS _{EN} F	A 16 33 16 A 16 34 22 16 37±					
311	Mar. 16	I	e _{EN} F	A 16 24.1 16 26±					
312	Mar. 17	Iv	e _{EN} F	A 0 16 41 0 20±					S-P=49 sec. (ca.)
313	Mar. 17	IIr	eP _{EZ} iS _E F	G 16 04 39 G 16 12 07 17 37±					U.S.C.&G.S.Epicen- ter: 55°4 N, 162° E
314	Mar. 17	I	e _{EZ} F	G 19 51± 21 32±					
315	Mar. 18	Iv	eP _{EN} F	A 11 06 54 11 10±					S-P=44 sec. (ca.) ?
316	Mar. 20	I	e _{EN} F	A 16 33.7 16 37					
317	Mar. 22	Iv	eP _{EN} F	A 13 20 43 13 26±					S-P=46 sec. (ca.)
318	Mar. 23	Id	eP _{EN} F	A 5 49 28 5 49.7					S-P=4.5 sec. (ca.) See discussion, p. 157
319	Mar. 23	I	e _{EN} F	A 5 50.8 5 51.1					
320	Mar. 25	Iv	e _E F	22 37 44 22 38.3					See discussion, p. 158
321	Mar. 26	I	eP _{EN} F	A 4 25.4 4 28±					
322	Mar. 26	I	eP _{ENZ} F	G 19 07 36 19 25±					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E mm.	A _N mm.	A _Z mm.	
323	1933 Mar. 27	I	e _{EN} F	A h. m. s. 10 44.7 10 47±	s.				See discussion, p. 158
324	Mar. 27	Iv	eP _{EN} F	A 13 02 19 13 05					See discussion, p. 158
325	Mar. 27	I	eP _{EN} F	A 13 07.0 09±					See discussion, p. 158
326	Mar. 27	I	eP _{EN} F	A 20 40.3 20 43±					
327	Mar. 27	II d	iP _{EN} F	A 22 39 04.5 22 39.8					S - P = 1 sec. See discussion, p. 158
328	Mar. 31	I	e _{EN} F	A 5 26.9 5 28±					
329	Mar. 31	I	eP _{EN} F	A 7 43.8 7 46±					

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:

$\varphi = 37^{\circ} 20' 24''.5$ N Lat.

$\lambda = 121^{\circ} 38' 34''$ W from Greenwich

Time.—All determinations are reduced to Universal Time.

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

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

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
1	1932 Oct. 2	I	e _{EN} F	3 06 56 3 43±					
2	Oct. 6	I	e _{EN} F	0 36 44 0 40±					
3	Oct. 11	Iv	eP _{EN} F	15 43 43 15 49±					S-P=50 sec. ?
4	Oct. 16	I	e _{EN} F	12 14.5 12 48±					
5	Oct. 16	IIId	iP _{EN} eP _E F	14 16 59 14 16 59 14 21±	0.5 0.5	+1.0	-5.0		S-P=8 sec. (ca.) See discussion, p. 151
6	Oct. 19	IIv	iP _{EN} i _{EN} iS _{EN} F	16 40 00 16 40 01.5 16 40 14 16 48±	0.5	+0.5	-1.2		See discussion, p. 151
7	Oct. 20	Id	eP _{EN} F	2 03 52 2 04 06					S-P=1 sec. (ca.) See discussion, p. 151
8	Oct. 22	Id	eP _{EN} F	15 36 59 15 38.3					S-P=11 sec. (ca.) See discussion, p. 151
9	Oct. 25	IIIv	iP _{EN} F	1 07 25 1 13±					Motion very rapid S-P=15 sec. (ca.) See discussion, p. 152
10	Oct. 25	Iv	eP _E iP _N i _N iS _{EN} F	3 28 20 3 28 20 3 28 27 3 28 49 3 31±	0.5 0.5 0.5 1	+0.2	+0.2 -0.3 +1.5		See discussion, p. 152
11	Oct. 25	Id	iP _{EN} F	10 00 46 10 02.3	0.5	+0.2	-0.5		S-P=4.5 sec. See discussion, p. 152
12	Oct. 28	Id	eP _{EN} F	1 43 19 1 44.0					S-P=6.5 sec. See discussion, p. 152
13	Oct. 28	Id	iP _{EN} F	18 33 03 18 33.4					S-P=1.5 sec. See discussion, p. 152
14	Oct. 30	Ir	eP _{EN}	20 53.3 21 18±					

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
15	1932 Oct. 31	Id	eP _E eP _N F	11	11	00 00.5 11					S-P=1.3 sec. See discussion, p. 152
16	Oct. 31	Iv	eP _{EN} F	15	00	52 03±					See discussion, p. 152
17	Nov. 2	I	e _{EN} F	11	13.6	11 18±					
18	Nov. 2	Id	eP _{EN} F	12	00	21 37					S-P=1 sec. (ca.) See discussion, p. 152
19	Nov. 2	Id	eP _{EN} F	13	50	19 32					S-P=1 sec. (ca.) See discussion, p. 152
20	Nov. 3	IIIId	iP _E F	18	55	12.5 01±	0.5	-12			S-P=6 sec. (ca.) See discussion, p. 152
21	Nov. 3	Id	eP _E F	19	23	11 23.5					S-P=4 sec. (ca.) ? See discussion, p. 153
22	Nov. 3	Id	iP _E F	19	49	46 50.4					S-P=5 sec. See discussion, p. 153
23	Nov. 3	I	e _E F	19	54	57 57					
24	Nov. 9	Id	eP _{EN} eS _{EN} F	8	32	57 08 34.4					See discussion, p. 153
25	Nov. 12	Id	iP _{EN} F	7	10	19 11.7					S-P=5 sec. See discussion, p. 153
26	Nov. 12	Id	eP _{EN} F	7	16	57 18.0					S-P=4 sec. See discussion, p. 153
27	Nov. 12	Id	eP _{EN} i _{EN} i _{EN} F	13	48	44 49 51 49.6					This may be two quakes See discussion, p. 153
28	Nov. 12	I	e _{EN} F	13	50.1	13 50.3					Very small
29	Nov. 12	Id	eP _{EN} F	14	47	30 48.0					S-P=1.5 sec. (ca.) See discussion, p. 153

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
30	1932 Nov. 13	Iu	iP _{EN}	4	57	53.5	2	+1	-1		
			eS _{EN}	5	06	51.5	4	-0.2	+0.5		
			F	5	18±						
31	Nov. 14	Id	eP _{EN}	16	02	03					S-P=14.5 sec.
			F	16	03.3						See discussion, p. 153
32	Nov. 14	Id	eP _{EN}	17	47	26					S-P=4 sec.
			F	17	48.5						See discussion, p. 153
33	Nov. 16	Id	eP _{EN}	4	31	58					S-P=11.5 sec.
			F	4	33.5						See discussion, p. 153
34	Nov. 16	IIId	iP _N	10	27	14	0.5		-0.5		See discussion, p. 153
			eP _E	10	27	14	0.5	+0.2			
			iS _{EN}	10	27	26	0.6	+2.5	-1.0		
			i _N	10	27	27	0.5		-4		
			F	10	30.2						
35	Nov. 17	I	eP _E	6	08	11					
			F	6	33±						
36	Nov. 22	Id	eP _{EN}	4	59	13.0					S-P=2.0 sec.
			F	4	59.6						See discussion, p. 153
37	Nov. 22	IIId	iP _{EN}	6	02	46.0	0.5	+2	-2.5		Very rapid motion
			F	6	04.5						S-P=2 sec. See discussion, p. 153
38	Nov. 22	Id	eP _{EN}	19	18	28					S-P=1.5 sec. (ca.)
			F	19	18	47					See discussion, p. 153
39	Nov. 24	Id	eP _E	9	16	24					S-P=5 sec.
			eS _N	9	16	29					See discussion, p. 154
40	Nov. 25	Id	iP _{EN}	4	57	49					Beginning is largest amplitude on rec- ord. S-P=1.5 sec. (ca.) See discussion, p. 154
			F	4	58.5						
41	Nov. 26	I	e _{EN}	4	35	02					
			F	4	41±						
42	Nov. 28	I	e _{EN}	11	23	28					
			F	11	40±						
43	Nov. 30	Id	eP _{EN}	9	54	21					S-P=3.5 sec.
			F	9	55.1						See discussion, p. 154



MOUNT HAMILTON

No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
44	1932 Nov. 30	Id	iP _{EN} F	12	58	07 12 59.5					S-P=2 sec. (ca.) See discussion, p. 154
45	Dec. 5	Id	eP _{EN} F	12	00	51 12 01 00					S-P=1 sec. (ca.) See discussion, p. 154
46	Dec. 6	Id	eP _{EN} eS _{EN} F	13	14	31 13 14 45 13 15.6					Beginning doubtful because of micro- seisms See discussion, p. 154
47	Dec. 7	Ir	iP _{EN} eS _E F	16	27	27 16 32 03 17 03±	3.5	-0.6	+0.6		
48	Dec. 7	Id	iP _{EN} F	21	01	05 21 01 33					S-P=1.2 sec. See discussion, p. 154
49	Dec. 8	Id	eP _{EN} F	23	38	12 23 39.1					S-P=12.5 sec. See discussion, p. 154
50	Dec. 12	IId	iP _{EN} i _N iS _{EN} i _N F	0	19	56.5 0 19 59.5 0 20 08.0 0 20 09.0 0 22+	0.5 0.6 0.6 0.5	+0.3 +5.0	-0.5 +1.5 -3.0 -8		See discussion, p. 154 Runs into next quake
51	Dec. 12	Id	eP _{EN} F	0	22	27 0 23.5					S-P=11.5 sec. See discussion, p. 154
52	Dec. 14	Id	eP _{EN} eS eS _E eS _N F	4	56	18.5 4 56 29.5 4 56 30 4 56 31 57.5					See discussion, p. 154
53	Dec. 14	Id	iP _N eP _E F	18	31	45.5 18 31 46 18 32.9	0.5 0.5	-0.1	-0.3		S-P=8 sec. See discussion, p. 154
54	Dec. 16	I	e _{EN} F	18	25.8	18 26.9					Very small
55	Dec. 17	Id	iP _{EN} iS _{EN} F	1	33	22 1 33 43 1 35.4	0.5 0.7	-0.2 -1.2	+0.2 2.5		See discussion, p. 154
56	Dec. 19	Id	iP _{EN} F	4	21	06.5					S-P=1.2 sec. Lost in next quake See discussion, p. 154

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Amplitude			Remarks
							A _E	A _N	A _Z	
				h.	m.	s.	mm.	mm.	mm.	
57	1932 Dec. 19	Id	iP _{EN} F	4	21	13.5 46				S-P=1.2 sec. See discussion, p. 154
58	Dec. 20	Iv	eP _{EN} F	11	30	48 33.0				S-P=38 sec. (ca.)
59	Dec. 21	IIIv	eP _E eP _N i _E i _{EN} F	6	10	56 57 00 05				S lost because of fast motion F lost in aftershocks
60	Dec. 21	I	e _{EN} F	7	10	08 14				
61	Dec. 21	I	e _{EN} F	7	15	31 18±				
62	Dec. 21	IIv	eP _{EN} F	7	41	48 51±				S-P=50 sec.
63	Dec. 21	Iv	eP _{EN} F	8	49	26 54±				S-P=40 sec.
64	Dec. 21	Iv	eP _{EN} F	9	34	23 38±				S-P=45 sec.
65	Dec. 21	IIv	eP _{EN} F	11	34	20 44±				S-P=50 sec.
66	Dec. 21	Iv	eP _{EN} F	12	40	01 43±				S-P=45 sec.
67	Dec. 21	Iv	eP _{EN} F	14	05	49 10±				S-P=45 sec.
68	Dec. 21	Iv	eP _{EN} F	14	40	04 43±				S-P=45 sec.
69	Dec. 21	Iv	eP _{EN} F	16	27	00 31				S-P=47 sec. Note: Many smaller quakes too numer- ous to measure
70	Dec. 21	Iv	eP _{EN}	21	33.5	35.0				S-P=39 sec.
71	Dec. 21	Iv	eP _{EN} F	21	56	27 58.5				S-P=43 sec. ?

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
	1932			h.	m.	s.	s.	mm.	mm.	mm.	
72	Dec. 21	I	e _{EN} F	21	58.9						
				22	00.5						
73	Dec. 21	I	e _{EN} F	22	22.2						
				22	23.5						
74	Dec. 21	I	e _{EN} F	22	24.1						
				22	25.5						
75	Dec. 21	Iv	eP _{EN} F	22	32.5						S-P=45 sec. (ca.)
				22	34.5						
76	Dec. 21	I	eP _{EN} F	22	47 26						
				22	48.9						
77	Dec. 21	I	e _{EN} F	22	51.7						
				22	52.5						
78	Dec. 22	I	e _{EN} F	0	01.0						
				0	02.0						
79	Dec. 22	Iv	eP _{EN} F	0	17 11						S-P=40 sec. (ca.)
					19.0						
80	Dec. 22	I	e _{EN} F	0	29.2						
				0	30.3						
81	Dec. 22	Id	eP _{EN} F	0	35 32						S-P=2 sec.
				0	35.9						
82	Dec. 22	Iv	eP _{EN} F	0	41.5						S-P=38 sec. (ca.)
				0	44						
83	Dec. 22	Iv	eP _{EN} F	0	48.5						S-P=38 sec.
				0	50.2						
84	Dec. 22	I	e _{EN} F	1	13.5						
				1	14.5						
85	Dec. 22	Iv	eP _{EN} F	1	20 22						S-P=44 sec. (ca.)
				1	23.0						
86	Dec. 22	I	e _{EN} F	4	03.6						
					05.0						
87	Dec. 22	Iv	eP _{EN} F	4	30 10						S-P=43 sec.
				4	33±						
88	Dec. 22	I	eP _{EN} F	4	54 58						
				4	56.5						

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
89	Dec. 22	Iv	eP _{EN} F	4 57 18 5 00±					S-P=44 sec.
90	Dec. 22	I	e _{EN} F	5 18.8 5 20.2					
91	Dec. 22	I	e _{EN} F	5 31.9 5 33.5					
92	Dec. 22	Iv	eP _{EN} F	6 43.5 6 45.5					S-P=44 sec.
93	Dec. 22	I	e _{EN} F	7 49.6 7 54					
94	Dec. 22	I	e _{EN} F	8 12.5 8 14.0					
95	Dec. 22	I	e _{EN} F	8 41.2 8 42.0					
96	Dec. 22	I	e _{EN} F	8 42.6 8 44.5					
97	Dec. 22	I	e _{EN} F	8 46.9 8 47.8					
98	Dec. 22	I	e _{EN} F	9 32.5 9 33.5					
99	Dec. 22	I	e _{EN} F	9 42.5 9 44.5					
100	Dec. 22	Iv	eP _{EN} F	9 51 47 9 53.5					S-P=45 sec. (ca.)
101	Dec. 22	I	e _{EN} F	10 35.5 10 43±					
102	Dec. 22	I	e _{EN} F	11 02.5 11 04.0					
103	Dec. 22	I	e _{EN} F	11 30.9 11 33					
104	Dec. 22	I	e _{EN} F	11 41.7 11 45					
105	Dec. 22	Iv	eP _{EN} F	12 58.2 13 01					S-P=44 sec. (ca.)

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
106	1932 Dec. 22	I	e _{EN} F	15	00.5						
				15	02.5						
107	Dec. 22	I	e _{EN} F	15	15.8						
				15	19±						
108	Dec. 22	I	e _{EN} F	15	48.9						
				15	51						
109	Dec. 22	Iv	eP _{EN} F	15	57.0						S-P=44 sec. (ca.)
				16	00±						
110	Dec. 22	I	e _{EN} F	16	09.0						
				16	11.0						
111	Dec. 22	I	e _{EN} F	17	54.2						
				17	57.5						
112	Dec. 22	Iv	eP _{EN} F	20	17 40						S-P=44 sec. (ca.)
				20	20.5						
113	Dec. 22	I	e _{EN} F	21	19.4						
				21	21.1						
114	Dec. 22	Iv	eP _{EN} F	23	53 43						S-P=46 sec.
				23	58±						
115	Dec. 23	I	e _{EN} F	1	59.7						
				2	01.2						
116	Dec. 23	I	e _{EN} F	2	10.3						
				2	11.1						
117	Dec. 23	Iv	eP _{EN} F	2	16 45						S-P=46 sec. (ca.)
				2	20±						
118	Dec. 23	I	e _{EN} F	2	55.8						
				2	57.5						
119	Dec. 23	I	e _{EN} F	4	09.5						
				4	10.1						
120	Dec. 23	I	e _{EN} F	4	12.4						
				4	13.0						
121	Dec. 23	I	e _{EN} F	4	43.1						
					43.8						
122	Dec. 23	I	eP _{EN} F	5	43.1						
				5	45.5						

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
				h.	m.	s.		A _E	A _N	A _Z	
	1932						s.	mm.	mm.	mm.	
123	Dec. 23	Iv	eP _{EN} F	6	28	03					S-P=43 sec.
				6	30.5						
124	Dec. 23	I	e _{EN} F	6	41.5						
				6	42.5						
125	Dec. 23	I	e _{EN} F	8	59.6						
				9	01.6						
126	Dec. 23	Iv	eP _{EN} F	12	29	22					S-P=42 sec. (ca.)
				12	32±						
127	Dec. 23	Iv	eP _{EN} F	14	10	54					S-P=45 sec.
				14	12.6						
128	Dec. 23	I	e _{EN} F	17	25.6						
				17	28±						
129	Dec. 23	I	e _{EN} F	17	53.6						
				17	54.6						
130	Dec. 23	Iv	eP _{EN} F	18	09	04					S-P=44 sec.
				18	12±						
131	Dec. 23	I	eP _{EN} F	18	17	06					
				18	20±						
132	Dec. 23	Iv	eP _{EN} F	20	05	47					S-P=44 sec.
				20	08.6						
133	Dec. 24	I	eP _{EN} F	3	02	53					
				3	05.1						
134	Dec. 24	I	e _{EN} F	3	31.4						
				3	32.6						
135	Dec. 24	Iv	eP _{EN} F	12	41	18					S-P=42 sec.
				12	46±						
136	Dec. 24	Iv	eP _{EN} F	13	58.6						S-P=44 sec. (ca.)
				14	01						
137	Dec. 24	I	e _{EN} F	14	48.4						
				14	50±						
138	Dec. 24	I	eP _{EN} F	16	54.4						
				16	57						
139	Dec. 24	I	e _{EN} F	17	48.6						
				17	51±						

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.			Amplitude			Remarks
							A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.		
140	Dec. 24	I	e _{EN} F	20 47.6 20 49±						
141	Dec. 24	I	e _{EN} F	21 51.2 21 54±						
142	Dec. 24	I	e _{EN} F	22 21.4 22 23±						
143	Dec. 24	I	e _{EN} F	23 34.6 23 38±						
144	Dec. 25	I	e _{EN} F	0 11.9 0 14±						
145	Dec. 25	I	e _{EN} F	0 18.6 0 21±						
146	Dec. 25	I	eP _{EN} F	0 24 18 0 26±						
147	Dec. 25	I	e _{EN} F	2 17.6 3 54±						
148	Dec. 25	Iv	eP _{EN} e _{EN} i _{EN} F	3 55 09 3 55 18 3 55 59 4 01±						S (?)
149	Dec. 25	I	e _{EN} F	7 45.9 7 49±						
150	Dec. 25	I	eP _{EN} F	8 07 51 8 10±						
151	Dec. 25	I	e _{EN} F	10 05.6 10 07±						
152	Dec. 25	I	e _{EN} F	10 50.9 10 53±						
153	Dec. 25	Id	eP _{EN} F	11 08 29 11 08.7						S-P=2 sec. See discussion, p. 155
154	Dec. 25	I	e _{EN} F	12 05.3 12 07±						
155	Dec. 25	I	e _{EN} F	13 19.7 21±						

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.			Amplitude			Remarks
							A _E	A _N	A _Z	
				h.	m.	s.	mm.	mm.	mm.	
156	1932 Dec. 25	I	e _{EN} F	15	00.7					
				15	02.2					
157	Dec. 25	I	e _{EN} F	15	31.3					
					33±					
158	Dec. 25	I	e _{EN} F	17	44.0					
					46±					
159	Dec. 25	I	e _{EN} F	18	37.0					
				18	40±					
160	Dec. 25	Iv	eP _{EN} F	22	29	20				S-P=44 sec. (ca.)
				22	32.2					
161	Dec. 26	I	eP _{EN} F	1	09	10				
				1	11.3					
162	Dec. 26	Iv	eP _{EN} F	4	05.7					S-P=44 sec. (ca.) ?
				4	07.2					
163	Dec. 26	IIv	eP _{EN} F	5	03	23				S-P=44 sec. (ca.) ?
				5	15±					
164	Dec. 26	I	eP _{EN} F	5	27.2					
				5	29.2					
165	Dec. 26	I	eP _{EN} F	5	41.0					
				5	44					
166	Dec. 26	I	e _{EN} F	5	48.2					
				5	50±					
167	Dec. 26	I	e _{EN} F	8	24.2					
				8	26±					
168	Dec. 26	I	e _{EN} F	8	54.0					
				8	56±					
169	Dec. 26	I	e _{EN} F	12	09.6					
				12	12±					
170	Dec. 26	Iv	eP _{EN} F	12	53	52				S-P=44 sec.
				12	58±					
171	Dec. 26	I	e _{EN} F	20	18.7					
				20	21±					
172	Dec. 27	I	e _{EN} F	4	24.4					
				4	26±					

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
173	1932 Dec. 27	I	e _{EN} F	11	11.6						
				11	14±						
174	Dec. 27	I	eP _{EN} F	11	18.7						
				11	21±						
175	Dec. 28	I	e _{EN} F	2	51.0						May be two quakes
				2	54.8						
176	Dec. 28	Iv	eP _{EN} F	3	08	23					S-P=44 sec.
				3	11.1						
177	Dec. 28	Iv	eP _E F	10	01	41					S-P=44 sec. (ca.)
				10	05±						
178	Dec. 28	I	e _{EN} F	12	23.8						
				12	26±						
179	Dec. 28	I	e _{EN} F	15	18.1						
				15	19.5						
180	Dec. 28	I	eP _{EN} F	16	10.1						
				16	12.3						
181	Dec. 28	Iv	eP _{EN} F	23	53.8						S-P=40 sec. (ca.)
				23	56.3						
182	Dec. 29	I	e _{EN} F	6	17.8						
				6	20±						
183	Dec. 29	I	eP _{EN} F	6	21.6						
				6	27±						
184	Dec. 29	Iv	eP _{EN} F	6	39	00					S-P=47 sec. (ca.)
				6	44±						
185	Dec. 29	Iv	eP _{EN} F	6	46	08					S-P=45 sec.
				6	52±						
186	Dec. 29	I	e _{EN} F	11	51.3						
				11	52.3						
187	Dec. 29	I	e _{EN} F	15	33.8						
				15	35±						
188	Dec. 30	I	e _N F	0	42.6						
				0	44±						
189	Dec. 30	Iv	eP _N F	4	18	54					S-P=44 sec.
				4	22±						

MOUNT HAMILTON

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No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
190	1932 Dec. 30	Iv	eP _N F	16	04	17					S-P=46 sec. (ca.)
				16	07						
191	Dec. 31	Iv	eP _{EN} F	14	33.9						S-P=45 sec. (ca.)
				14	36±						
192	Dec. 31	I	e _{EN} F	17	15.7						
				17	18±						
193	Dec. 31	Iv	eP _{EN} F	17	30	06					S-P=46 sec. (ca.)
				17	33±						
194	Dec. 31	I	eP _{EN} F	19	56.5						
				19	59±						
195	1933 Jan. 1	Iv	eP _{EN} F	1	41.9						S-P=44 sec. (ca.)
				1	44.4						
196	Jan. 1	I	e _{EN} F	5	19.6						
				5	21±						
197	Jan. 1	I	e _{EN} F	6	48.9						
				6	49.4						
198	Jan. 2	I	eP _{EN} F	3	35	01					
				3	41±						
199	Jan. 2	I	e _{EN} F	9	20.6						
				9	22						
200	Jan. 2	Iv	eP _{EN} F	12	21	49					S-P=41 sec.
				12	24.5						
201	Jan. 2	I	eP _{EN} F	15	08.8						
				15	11±						
202	Jan. 2	Iv	eP _{EN} F	15	45	20					S-P=47 sec. (ca.)
				15	48±						
203	Jan. 2	Iv	eP _{EN} F	17	07	43					S-P=45 sec. (ca.) May be two quakes
				17	13±						
204	Jan. 2	Iv	eP _{EN} F	17	49.1						S-P=45 sec. (ca.)
				17	51.5						
205	Jan. 3	I	e _{EN} F	13	29.0						Small
				13	30.5						



MOUNT HAMILTON

No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
206	1933 Jan.	3	I	e _{EN} F	14	49.0 51±					
207	Jan.	3	Id	iP _{EN} F	15	54 01 54 19					S - P = 1.5 sec. See discussion, p. 155
208	Jan.	3	I	e _{EN} F	21	05.8 07.5					
209	Jan.	3	I	e _{EN} F	22	35.0 36.5					
210	Jan.	4	Iv	eP _{EN} F	1	02 04 06					S - P = 43 sec. (ca.)
211	Jan.	4	I	e _{EN} F	1	36.8 39					
212	Jan.	4	I	e _{EN} F	4	05.5 25±					
213	Jan.	4	I	e _{EN} F	4	55.0 56.5					
214	Jan.	4	I	eP _{EN} F	10	36.2 38.7					
215	Jan.	4	Iv	eP _{EN} F	10	55 24 58±					S - P = 44 sec. (ca.)
216	Jan.	4	Iv	eP _{EN} F	11	05 49 08					S - P = 44 sec.
217	Jan.	4	Iv	eP _{EN} F	11	09 48 11.7					S - P = 45 sec. (ca.)
218	Jan.	5	I	eP _{EN} F	5	15 25 18±					
219	Jan.	5	IIv	eP _{EN} F	6	51 12 7 09±					S - P = 42 sec. There appear to be two quakes super- imposed on the sur- face waves of this quake
220	Jan.	5	I	e _{EN} F	7	25.5 26.5					

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
221	Jan. 5	I	e _{EN} F	7 31.0 7 34±					
222	Jan. 5	Iv	eP _{EN} F	7 44 14 7 48±					S-P=43 sec.
223	Jan. 5	I	e _{EN} F	8 16.0 8 19±					
224	Jan. 5	Iv	eP _{EN} F	9 12 56 9 19±					S-P=40 sec.
225	Jan. 5	Iv	eP _{EN} F	10 05 55 10 11±					S-P=42 sec.
226	Jan. 5	I	e _{EN} F	10 17.9 10 20±					
227	Jan. 5	I	e _{EN} F	12 47.4 12 49.5					
228	Jan. 5	I	e _{EN} F	13 36.6 13 38±					
229	Jan. 5	I	e _{EN} F	13 55.0 13 57±					
230	Jan. 5	I	e _{EN} F	20 48.7 20 50±					
231	Jan. 5	Id	iP _{EN} F	23 38 43 23 39.0					S-P=2 sec. See discussion, p. 155
232	Jan. 6	I	e _{EN} F	1 17.3 1 18.6					
233	Jan. 6	I	e _{EN} F	4 02.5 4 04±					
234	Jan. 6	I	e _{EN} F	4 26.8 4 28.5					
235	Jan. 6	I	e _{EN} F	5 49.0 5 51±					
236	Jan. 6	IIv	eP _{EN} F	13 06 26 13 13±					S-P=50 sec. (ca.) ?
237	Jan. 6	I	eP _{EN} F	13 34.0 13 37.5					

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
238	1933 Jan. 6	Iv	eP _{EN} F	16 10 23 16 14±					S-P=39 sec. (ca.)
239	Jan. 6	I	e _{EN} F	16 18.5 16 20±					
240	Jan. 6	I	e _{EN} F	17 57.0 17 58.5					
241	Jan. 6	Iv	iP _{EN} i _{EN} iS _E iS _N F	23 45 33 23 45 35.5 23 45 56 23 45 57 23 48±					This may be two quakes
242	Jan. 7	I	eP _{EN} F	2 01.1 2 03±					
243	Jan. 7	I	eP _{EN} F	3 17.5 3 19.6					
244	Jan. 7	Iv	eP _{EN} F	8 11 38 8 14±					S-P=46 sec. (ca.) ?
245	Jan. 7	I	e _{EN} F	12 00.6 02±					
246	Jan. 8	I	e _{EN} F	6 17.2 6 19					
247	Jan. 8	I	e _{EN} F	6 34.0 6 35.6					
248	Jan. 8	I	e _{EN} F	9 23.0 9 24±					
249	Jan. 8	I	e _{EN} F	9 27.8 9 28.9					
250	Jan. 8	I	e _{EN} F	11 33.7 11 36±					
251	Jan. 9	I	e _{EN} F	2 19.2 2 34±					
252	Jan. 9	Iv	eP _{EN} F	14 34 09 14 36					S-P=40 sec. (ca.)
253	Jan. 9	Id	eP _{EN} F	21 25 32 21 25 46					S-P=1 sec. (ca.) ? See discussion, p. 155

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
254	1933 Jan. 9	Iv	eP _{EN} F	21	54	29					S-P=42 sec. (ca.)
				21	57						
255	Jan. 10	Iv	eP _{EN} F	0	17	09					S-P=40 sec. (ca.)
				0	19±						
256	Jan. 10	I	e _{EN} F	3	28.0						
				3	29						
257	Jan. 10	I	e _{EN} F	5	54.2						
				5	56						
258	Jan. 10	I	e _{EN} F	15	55.2						
				15	57±						
259	Jan. 11	Iv	eP _{EN} F	5	56	41					S-P=43 sec.
				5	59±						
260	Jan. 11	Iv	eP _{EN} F	17	28	04					S-P=44 sec.
				17	29.5						
261	Jan. 11	Iv	eP _{EN} F	17	29	51					S-P=50 sec. (ca.)
				17	35±						
262	Jan. 11	I	eP _{EN} F	18	50	38					
				19	33						
263	Jan. 12	Iv	eP _{EN} F	1	49	12					S-P=43 sec. (ca.)
				1	53±						
264	Jan. 13	I	eP _{EN} F	5	36.5						
				5	38.7						
265	Jan. 13	IIId	iP _{EN} F	6	19	45	0.5	-1.5	-2.0		S-P=5.5 sec. See discussion, p. 155
				6	22.2						
266	Jan. 13	Id	iP _{EN} F	7	49	20.5					S-P=4.5 sec. See discussion, p. 156
				7	49	42					
267	Jan. 13	Id	eP _{EN} F	8	45	40					S-P=22 sec. See discussion, p. 156
				8	47.8						
268	Jan. 14	I	e _{EN} F	2	46.9						
				2	49±						
269	Jan. 14	I	e _{EN} F	2	55.3						
				2	56.9						
270	Jan. 14	IIId	iP _{EN} F	3	25	01	0.5	+1.0	-1.0		S-P=4 sec. See discussion, p. 156
				3	26.8						

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
271	Jan. 14	Id	iP _{EN} F	4 49 03 4 49.7					S-P=2 sec. See discussion, p. 156
272	Jan. 15	Iv	eP _{EN} F	2 49.3 2 51					S-P=40 sec. (ca.)
273	Jan. 15	I	e _{EN} F	3 43.7 3 44.8					
274	Jan. 15	I	eP _{EN} F	8 00 08 8 06±					
275	Jan. 15	I	e _{EN} F	12 58.5 12 59.8					
276	Jan. 15	Iv	eP _{EN} F	13 07 53 13 10±					S-P=38 sec. (ca.)
277	Jan. 15	I	e _{EN} F	13 14.3 13 15.8					
278	Jan. 15	Id	eP _{EN} F	16 59 22 16 59 44					S-P=3 sec. See discussion, p. 156
279	Jan. 16	Id	eP _{EN} F	0 39 39 0 40 09					S-P=3 sec. See discussion, p. 156
280	Jan. 16	I	e _{EN} F	1 35.0 1 36±					
281	Jan. 16	Id	eP _{EN} F	11 26 18 11 26 30					S-P=2 sec. See discussion, p. 156
282	Jan. 16	Iv	eP _{EN} F	13 37 05 13 39.8					S-P=44 sec.
283	Jan. 17	Iv	eP _{EN} F	1 02 35 1 07±					S-P=47 sec. (ca.)
284	Jan. 17	Iv	eP _{EN} F	2 35 21 2 39					S-P=44 sec. (ca.)
285	Jan. 18	I	e _{EN} F	17 06.9 17 08±					
286	Jan. 20	Iv	eP _{EN} F	1 42 47 1 44.9					S-P=46 sec.
287	Jan. 21	Iv	eP _{EN} F	5 47 18 5 48±					S-P=21 sec. See discussion, p. 156

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
288	1933 Jan. 21	I	e _{EN} F	6 08.2 6 10					
289	Jan. 22	I	e _{PE} F	3 51 14 3 53.0					
290	Jan. 22	I	e _E F	13 02 00 13 03±					
291	Jan. 22	Iv	e _{PE} F	13 30 10 13 34					S-P=38 sec. (ca.) ?
292	Jan. 22	I	e _E F	13 44.1 13 46					
293	Jan. 25	Iv	e _{PEN} F	10 33 39 10 35.6					S-P=40 sec.
294	Jan. 25	Iv	e _{PEN} F	20 57 25 21 02±					S-P=47 sec.
295	Jan. 26	Id	i _{PEN} F	12 33 51 34 21					S-P=1.5 sec. See discussion, p. 156
296	Jan. 27	I	e _{EN} F	22 47.7 23 20±					
297	Jan. 29	Iv	e _{PEN} F	13 45 42 13 49±					S-P=37 sec. (ca.) ?
298	Jan. 29	I	e _{PEN} F	13 52 07 13 58±					
299	Jan. 31	Id	e _{PEN} F	0 46 44.0 0 47.6					S-P=5 sec. See discussion, p. 156
300	Feb. 3	IIv	e _{PEN} i _{EN} i _E i _{SN} F	3 25 56.5 3 25 58.0 3 26 29 3 26 35 3 31±	0.5 1 1 (ca.)	-0.2 +1.4 +1	-0.2 -1.5		See discussion, p. 156
301	Feb. 5	Id	i _{PEN} F	1 09 18 1 09 54					S-P=2.5 sec. See discussion, p. 156
302	Feb. 6	I	e _{PEN} F	4 47.8 4 49.4					
303	Feb. 6	I	e _{PEN} F	6 53.1 6 55					

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
304	1933 Feb. 6	I	e _{EN} F	9	07	30 52					
305	Feb. 6	I	e _{EN} F	9	23.9	25±					
306	Feb. 6	Id	iP _{EN} F	12	15	03 15.6					S-P=1.5 sec. See discussion, p. 156 0.5 sec. T. micro- seisms from 2 ^h -14 ^h Feb. 7
307	Feb. 7	Id	eP _{EN} F	14	35	04 24					S-P=1 sec. See discussion, p. 156
308	Feb. 8	Iv	eP _{EN} F	3	57	54 00±					S-P=44 sec.
309	Feb. 8	Iv	eP _{EN} F	7	45	26 47.7					S-P=40 sec. (ca.) ?
310	Feb. 8	IId	iP _{EN} F	11	39	14 40 06					S-P=3.0 sec. See discussion, p. 157
311	Feb. 9	IId	iP _{EN} F	1	40	34.0 41 23					S-P=3.0 sec. See discussion, p. 157
312	Feb. 9	I	e _{EN} F	9	49.2	50.7					
313	Feb. 9	Iv	eP _{EN} F	13	57	23 14 00					S-P=45 sec. (ca.)
314	Feb. 9	I	e _{EN} F	14	00.4	01.9					
315	Feb. 13	IIv	eP _{EN} i _{EN} iS _{EN} F	22	09	55 10 03 10 47 16					
316	Feb. 13	Iv	eP _{EN} F	22	32	13 34±					S-P=44 sec.
317	Feb. 13	I	e _{EN} F	22	47.0	48±					
318	Feb. 14	I	e _{EN} F	11	31.7	33±					

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
319	Feb. 19	Id	eP _{EN} F	13 42 58 13 43 26					S-P=1 sec. See discussion, p. 157
320	Feb. 21	Iv	eP _{EN} F	11 48 57 11 52±					S-P=44 sec. (ca.) ?
321	Feb. 22	I	e _{EN} F	9 51.4 9 53±					
322	Feb. 22	I	e _{EN} F	12 06.3 12 08±					
323	Feb. 23	I	e _{EN} F	8 20 58 9 26±					
324	Feb. 25	I	e _{EN} F	0 35 25 0 37±					
325	Feb. 25	I	e _{EN} F	5 21 40 5 21.8					
326	Feb. 26	I	e _{EN} F	6 55 32 6 58±					
327	Feb. 26	IIId	iP _{EN} F	9 34 46.5 9 38±	0.5	+1.2	-2.5		S-P=9 sec. (ca.) See discussion, p. 157
328	Feb. 27	Iv	eP _{EN} F	10 53 23 10 56±					S-P=42 sec. (ca.)
329	Feb. 28	I	e _{EN} F	7 01.0 7 03.4					
330	Feb. 28	Id	eP _{EN} F	19 54 30 19 55 13					S-P=3 sec. See discussion, p. 157
331	Mar. 2	I	e _{EN} F	0 52 34 0 55±					
332	Mar. 2	I	e _{EN} F	3 03.2 3 05±					
333	Mar. 2	I	e _{EN} F	16 33.1 16 34.3					
334	Mar. 2	IIu	eP _{EN} eS _N F	17 42 11 17 51 27 21 26±	3 5	-0.5	+0.5 +1		



MOUNT HAMILTON

No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
335	1933 Mar. 5	Iv	eP _{EN} F	11 00 08 11 03±					S-P=50 sec. (ca.)
336	Mar. 5	Id	eP _{EN} eS _N F	22 10 12 22 10 22 22 11.0					S-P=10 sec. (ca.) See discussion, p. 157
337	Mar. 7	Iv	eP _{EN} F	22 45.4 22 47±					S-P=42 sec. (ca.) ?
338	Mar. 8	Id	iP _{EN} F	8 32 06 8 32 34					S-P=2.5 sec. See discussion, p. 157
339	Mar. 8	Id	iP _{EN} F	11 27 17 11 27 54					S-P=2 sec. See discussion, p. 157
340	Mar. 9	I	e _{EN} F	6 44.6 6 46±					
341	Mar. 9	I	e _{EN} F	14 30.7 14 31.7					
342	Mar. 10	I	e _{EN} F	10 34.6 10 37.5					
343	Mar. 10	I	e _{EN} F	11 01.8 11 03±					
344	Mar. 10	I	e _{EN} F	11 20.8 11 21.9					
345	Mar. 10	I	e _{EN} F	12 18 11 12 18 22					
346	Mar. 11	IIIv	eP _{EN} F	1 55 21 3 06±	1 (ca.)	-0.1	-1		The Long Beach earth- quake Amplitude too large for later phases to be measured
347	Mar. 11	I	eP _{EN} F	2 10.6 2 15.8					Superimposed on sur- face waves of main quake
348	Mar. 11	I	eP _{EN} F	2 18 03 2 22±					Superimposed on sur- face waves of main quake
349	Mar. 11	I	eP _{EN} F	2 28.9 2 37±					Superimposed on sur- face waves of main quake

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
350	Mar. 11	I	eP _{EN} F	2 59.3 3 04±					
351	Mar. 11	I	eP _{EN} F	3 07.1 3 10±					
352	Mar. 11	I	e _{EN} F	3 10.9 3 15±					
353	Mar. 11	I	eP _{EN} F	3 24.8 3 31±					
354	Mar. 11	I	e _{EN} F	3 35.2 3 37±					
355	Mar. 11	I	e _{EN} F	3 41.2 3 43±					
356	Mar. 11	I	e _{EN} F	3 49.1 3 51±					
357	Mar. 11	I	eP _{EN} F	4 38.1 4 46±					
358	Mar. 11	I	eP _{EN} F	5 11.6 5 18.8					
359	Mar. 11	I	eP _{EN} F	5 19.3 5 28±					
360	Mar. 11	I	e _{EN} F	5 56.1 5 59±					
361	Mar. 11	I	eP _{EN} F	6 13.3 6 16±					
362	Mar. 11	I	e _{EN} F	6 19.7 6 22±					
363	Mar. 11	I	e _{EN} F	6 30.9 6 34±					
364	Mar. 11	II	eP _{EN} F	6 59.3 7 11±					
365	Mar. 11	I	e _{EN} F	7 52.5 7 55±					
366	Mar. 11	I	e _{EN} F	8 00.5 8 03±					

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
				h.	m.	s.		A _E	A _N	A _Z	
	1933						s.	mm.	mm.	mm.	
367	Mar. 11	I	eP _{EN} F	8	09.8						
				8	14±						
368	Mar. 11	I	eP _{EN} F	8	33.3						
				8	36±						
369	Mar. 11	I	e _{EN} F	8	38.8						
				8	41±						
370	Mar. 11	I	eP _{EN} F	8	55.4						
				9	06±						
371	Mar. 11	I	eP _{EN} F	9	11.5						
				9	19±						
372	Mar. 11	I	e _{EN} F	9	28.3						
				9	30±						
373	Mar. 11	I	e _{EN} F	10	26.9						
				10	28±						
374	Mar. 11	I	e _{EN} F	10	33.1						
				10	35±						
375	Mar. 11	I	e _{EN} F	10	46.8						
				10	49±						
376	Mar. 11	I	e _{EN} F	11	01.7						
					04±						
377	Mar. 11	I	e _{EN} F	11	05.2						
				11	09±						
378	Mar. 11	I	e _{EN} F	11	30.4						
				11	33±						
379	Mar. 11	I	eP _{EN} F	11	43.2						
				11	46±						
380	Mar. 11	I	e _{EN} F	11	48.3						
				11	51.8						
381	Mar. 11	I	e _{EN} F	12	51.4						
				12	55±						
382	Mar. 11	I	e _{EN} F	13	01.3						
				13	03±						
383	Mar. 11	I	eP _{EN} F	13	51.9						
				13	55±						

MOUNT HAMILTON



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
384	1933 Mar. 11	I	eP _{EN} F	14 26.9 14 32±					
385	Mar. 11	I	e _{EN} F	14 48.9 14 52±					
386	Mar. 11	I	eP _{EN} F	14 58.1 15 02±					
387	Mar. 11	I	e _{EN} F	15 11.1 15 15±					
388	Mar. 11	I	e _{EN} F	16 55.0 17 02±					
389	Mar. 11	I	eP _{EN} F	19 44 02 20 00±					May be two quakes
390	Mar. 11	I	eP _{EN} F	22 01.3 22 04					
391	Mar. 11	I	e _{EN} F	22 32.7 22 36±					
392	Mar. 11	I	eP _{EN} F	22 41.8 22 44±					
393	Mar. 11	I	e _{EN} F	23 06.6 23 10±					
394	Mar. 12	I	e _{EN} F	0 28.7 0 32±					
395	Mar. 12	I	e _{EN} F	0 36.2 0 38±					
396	Mar. 12	I	eP _{EN} F	5 47.9 5 50±					
397	Mar. 12	I	eP _{EN} F	6 02.3 6 05±					
398	Mar. 12	I	e _{EN} F	6 17.4 6 21±					
399	Mar. 12	I	eP _{EN} F	15 03.6 15 06±					



MOUNT HAMILTON

No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
	1933			h.	m.	s.	s.	mm.	mm.	mm.	
400	Mar. 12	IIv	eP _N	20	45	21					
			i _N	20	45	30					
			iS _N	20	46	12					
			F	20	51±						
401	Mar. 12	I	eP _N	23	55	11					
			F	23	59±						
402	Mar. 13	I	eP _N	4	33.9						
			F	4	37±						
403	Mar. 13	I	eP _N	6	18.7						
			F	6	21±						
404	Mar. 13	II	eP _N	13	18	42					
			F	13	31±						
405	Mar. 13	I	e _N	19	31.2						
			F	19	33±						
406	Mar. 14	I	eP _{EN}	0	37.4						
			F	0	41±						
407	Mar. 14	I	eP _{EN}	12	20.3						
			F	12	24						
408	Mar. 14	II	eP _{EN}	19	03	05					
			F	19	14±						
409	Mar. 14	I	e _{EN}	22	43.8						
			F	22	46±						
410	Mar. 15	I	e _{EN}	0	44.2						
			F	0	44.9						
411	Mar. 15	I	e _{EN}	2	10.2						
			F	2	12±						
412	Mar. 15	I	e _{EN}	5	41.6						
			F	5	44±						
413	Mar. 15	II	eP _{EN}	11	14	48					
			F	11	28						
414	Mar. 15	I	iP _{EN}	16	33	10					May be two quakes
			i _{EN}	16	33	13					
			F	16	37±						
415	Mar. 16	I	eP _{EN}	0	54.8						
			F	0	57±						

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
416	1933 Mar. 16	I	e _{CEN} F	1 12.7 1 13±					
417	Mar. 16	I	e _{PEN} F	13 02.1 13 05±					
418	Mar. 16	I	e _{CEN} F	15 30.4 15 34±					
419	Mar. 16	I	e _{PEN} F	16 24.0 16 26±					
420	Mar. 17	Iv	e _{PEN} F	0 16 33 0 19±					S-P=48 sec.
421	Mar. 17	I	e _{CEN} F	16 04 45 16 08±					
422	Mar. 18	Iv	e _{PEN} F	11 06 45 11 11±					S-P=48 sec.
423	Mar. 20	I	e _{CEN} F	14 00.4 14 03±					
424	Mar. 20	Iv	e _{PEN} F	16 33 48 16 37±					S-P=37 sec. (ca.)
425	Mar. 21	I	e _{CEN} F	3 28.3 3 31±					
426	Mar. 21	I	e _{CEN} F	8 59.8 9 02±					
427	Mar. 21	Id	i _{PEN} F	23 46 28.5 23 46 52					S-P=1.5 sec. See discussion, p. 157
428	Mar. 22	I	e _{CEN} F	11 40.3 11 42±					
429	Mar. 22	Iv	e _{PEN} F	13 20.5 13 27±					S-P=46 sec.
430	Mar. 25	Iv	e _{PEN} F	18 36.9 18 39±					S-P=50 sec. (ca.) ?
431	Mar. 25	Id	e _{PEN} F	22 37.3 22 39±					S-P=9 sec. See discussion, p. 158
432	Mar. 26	I	e _{PEN} F	4 25.4 4 27±					

MOUNT HAMILTON



No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
433	Mar. 26	I	e _{EN} F	19 07.8 19 10±					
434	Mar. 27	I	e _N F	10 44 34 10 46					
435	Mar. 27	Iv	eP _{EN} F	13 02.1 13 05±					S-P=29 sec. See discussion, p. 158
436	Mar. 27	Iv	eP _{EN} F	13 06.9 13 09±					S-P=29 sec. See discussion, p. 158
437	Mar. 30	I	e _{EN} F	9 31.9 9 34±					
438	Mar. 31	I	e _{EN} F	5 26.9 5 28±					
439	Mar. 31	Id	eP _{EN} F	7 43 37 7 46±					S-P=13 sec. See discussion, p. 158

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY
PALO ALTO, CALIFORNIA

CONSTANTS

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Latitude and longitude of the seismographic station:

$\varphi = 37^{\circ} 25' \text{ N Lat.}$
 $\lambda = 122^{\circ} 11' \text{ W from Greenwich}$

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 ₀	ϵ
Wood-Anderson.....	E	3000	1	15
	N	3000	1	15

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
1	Oct.	2	I	e _{EN} F	3 07 00 3 48±				
2	Oct.	4	Id	iP _{EN} i _N i _N F	0 17 39.0 0 17 40.5 0 17 41.0 0 18 09				See discussion, p. 151
3	Oct.	4	Id	eP _{EN} F	1 41 23 1 41 29				S-P=1 sec. (ca.) ? See discussion, p. 151
4	Oct.	4	Id	eP _{EN} F	1 42 12 1 42 19				S-P=1 sec. (ca.) ? See discussion, p. 151
5	Oct.	5	Id	eP _{EN} F	18 14 22 18 14 50				S-P=2 or 3 sec. ? See discussion, p. 151
6	Oct.	6	Iv	eP _{EN} i _N F	0 36 37 0 36 54 0 40±	0.5 2	-0.4 +0.3 -0.8		See discussion, p. 151
7	Oct.	9	I	e _{EN} F	22 54.9 22 58±				
8	Oct.	11	I	e _{EN} F	15 43 38 15 48±				
9	Oct.	11	Id	eP _{EN} F	20 05 04 20 05 24				S-P=1 sec. (ca.) See discussion, p. 151
10	Oct.	12	I	e _{EN} F	2 20 06 2 21.1				May begin earlier
11	Oct.	12	Id	iP _{EN} F	22 58 12 22 58 39				S-P=2 sec. See discussion, p. 151
12	Oct.	16	I	e _{EN} F	12 14 21 12 38±				
13	Oct.	16	IIId	eP _{EN} i _{EN} iS _E iS _N F	14 17 02.5 14 17 03.5 14 17 13 14 17 15 14 20.1	0.7	+1.2 -1.0		Very small Record dim, fast motion See discussion, p. 151
14	Oct.	19	Id	eP _{EN} F	14 51 06 14 52±				Begins in min. mark S-P=2 sec. (ca.) See discussion, p. 151

PALO ALTO



No.	Date	Character	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
	1932			h.	m.	s.	s.	mm.	mm.	mm.	
15	Oct. 19	IIIv	iP* _{EN}	16	40	03	0.5	+1.5	+0.5		See discussion, p. 151
			iP _{EN}	16	40	05					
			iS*	16	40	20					
			iS _{EN}	16	40	26					
			F	16	48±						
16	Oct. 20	Id	eP _E	21	30	40					S-P=9 sec. (ca.) See discussion, p. 151
			F	21	32±						
17	Oct. 22	Iv	eP _{EN}	15	37	05					S-P=14 sec. (ca.) See discussion, p. 151
			F	15	39±						
18	Oct. 24	Id	eP _{EN}	15	00	52					S-P=2 sec. (ca.) See discussion, p. 152
			F	15	01	13					
19	Oct. 25	IIIv	iP _{EN}	1	07	33					Motion very rapid See discussion, p. 152
			F	1	14±						
20	Oct. 25	Iv	iP _{EN}	3	28	27					S-P=33 sec. (ca.) See discussion, p. 152
			F	3	32±						
21	Oct. 25	Id	iP _{EN}	10	00	53					S-P=9.5 sec. (ca.) See discussion, p. 152
			F	10	04±						
22	Oct. 25	Id	eP _{EN}	18	41	43					S-P=2 sec. (ca.) See discussion, p. 152
			F	18	42	07					
23	Oct. 26	I	eP _{EN}	1	24	32					
				1	30.5						
24	Oct. 26	I	e _{EN}	3	58	07					
			F	3	59.5						
25	Oct. 26	I	eP _{EN}	9	45	07					An earthquake of R.- F. IV was reported from Colma only at 1 A.M. P.S.T. (9 ^h U.T.)
			F	9	47.5						
26	Oct. 26	Id	eP _{EN}	16	49	22					S-P=11 sec. (ca.) (S comes in minute mark) See discussion, p. 152
			F	16	52±						
27	Oct. 28	I	e _{EN}	10	08	21					
			F	10	11.0						
28	Oct. 31	Iv	eP _{EN}	15	00	54					See discussion, p. 152
			F	15	03.5						

PALO ALTO



No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
29	1932 Nov. 2	Id	eP _{EN} F	15 07 06 15 07.4					S-P=2 sec. (ca.) See discussion, p. 153
30	Nov. 3	Id	eP _{EN} i _{EN} F	5 57 08 5 57 11 5 57.9					See discussion, p. 153
31	Nov. 3	IIIId	iP _E iP _N F	18 55 10.5 18 55 10.5 19 00.4	1 0.8	+2.5	-4.5		Record goes blank after P See discussion, p. 152
32	Nov. 3	Id	eP _{EN} F	19 23 07 19 23.8					S-P=3 sec. (ca.) See discussion, p. 153
33	Nov. 3	Id	iP _{EN} F	19 49 44 19 50.9					S-P=3.5 sec. See discussion, p. 153
34	Nov. 3	I	e _{EN} F	19 54 56 19 56.4					
35	Nov. 6	I	e _{EN} F	7 55 25 7 56.4					
36	Nov. 7	Id	iP _N F	14 41 42 42.1					S-P=2 sec. See discussion, p. 153
37	Nov. 9	I	eP _N F	8 33 03 8 34.0					See discussion, p. 153
38	Nov. 10	Id	iP _E F	14 56 01.5 14 56.6					S-P=2 sec. See discussion, p. 153
39	Nov. 12	Id	iP _E F	7 10.3 7 11.8					S-P=5.0 sec. See discussion, p. 153
40	Nov. 12	Id	iP _E F	7 16.8 7 17.8					S-P=5.0 sec. See discussion, p. 153
41	Nov. 12	I	eP _E F	13 48 13 49					See discussion, p. 153
42	Nov. 13	Iu	iP _{EN} iS _N F	4 57 51 5 06 46 5 32±	1.5 4	+1	-2 +1		
43	Nov. 14	Id	eP _{EN} F	16 02 07 16 02.5					S-P=15 sec. (?) See discussion, p. 153

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
44	Nov. 14	I	eP _{EN} F	17 47 27 17 48±					S-P=5 sec. See discussion, p. 153
45	Nov. 16	Id	iP _{EN} iS _N iS _E F	4 32 04 4 32 22 4 32 24 4 33.3	0.5 0.7 0.7	-0.3 +1.0	-0.1 +1.0		See discussion, p. 153
46	Nov. 16	IIId	eP _{EN} i _{EN} iS _E iS _N F	10 27 20 10 27 21 10 27 33 10 27 38 10 29.9	0.5 0.5 0.5 1.0	+0.1 -1.0 -1.5	-0.1 -1.0 +4.0		See discussion, p. 153
47	Nov. 17	I	e _{EN} F	6 08.3 6 27±					
48	Nov. 19	Id	iP _{EN} F	14 52 57.0 14 53 26					S-P=2 sec. See discussion, p. 153
49	Nov. 22	Id	iP _{EN} F	6 02 52 6 04.8					See discussion, p. 153
50	Nov. 23	IIId	iP _{EN} F	17 56 30 17 57±					S-P=2 sec. See discussion, p. 154
51	Nov. 24	Id	eP _{EN} F	9 16 25 9 17.4					S-P=5 sec. See discussion, p. 154
52	Nov. 25	I	e _{EN} F	4 58 00 4 58.9					
53	Nov. 26	I	e _{EN} F	4 35 02 4 37.8					
54	Nov. 30	Id	eP _{EN} F	5 37 02 5 37.7					S-P=1.5 sec. See discussion, p. 154
55	Nov. 30	Id	eP _{EN} F	9 54 25 9 55±					S-P=6.0 sec. See discussion, p. 154
56	Nov. 30	Id	iP _N F	12 58 15 12 59.5					S-P=6 sec. See discussion, p. 154
57	Dec. 6	I	eP _{EN} F	13 14 35 13 15.7					S-P=15 sec. See discussion, p. 154

PALO ALTO



No.	Date	Character	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
58	1932 Dec. 7		e _{EN}	16 28					About 8:30 P.M., P.S. T., Dec. 7, there was probably a quake. Time mark- er eclipsed light most of time, so only a few of last vibrations were re- corded
59	Dec. 8	I	e _{EN} F	23 38.2 23 39.7					
60	Dec. 12	II _d	iP _N F	0 20 02 22.2	0.6		-0.6		S-P=19 sec. (ca.) See discussion, p. 154
61	Dec. 12	Id	eP _N F	0 22 32 0 23.7					S-P=19 sec. (ca.) See discussion, p. 154
62	Dec. 14	Iv	eP _{EN} F	4 56 24 57.7					S-P=15 sec. (ca.) See discussion, p. 154
63	Dec. 14	Id	eP _{EN} F	18 31 51 18 33.0					S-P=12 sec. (ca.) See discussion, p. 154
64	Dec. 15	Id	eP _{EN} F	21 32 50 21 33.3					S-P=1 sec. (?) See discussion, p. 154
65	Dec. 17	Id	eP _E F	1 33 20 1 34.9					See discussion, p. 154
66	Dec. 20	Iv	eP _{EN} F	11 30.9 11 32.3					
67	Dec. 20	I	eP _{EN} F	14 03.6 14 04.8					
68	Dec. 21	III _v	eP _{EN} F	6 11 02 7 39					S lost because of fast motion
69	Dec. 21	I	e _{EN} F	7 09 52 7 14					
70	Dec. 21	II	eP _{EN} F	7 41 59 7 54±					S lost because of fast motion
71	Dec. 21	Iv	eP _{EN} F	8 49 32 8 53±					S-P=39 sec.

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
	1932			h.	m.	s.	s.	mm.	mm.	mm.	
72	Dec. 21	Iv	eP _{EN} F	9	34	32					S-P=45 sec.
				9	37±						
73	Dec. 21	IIv	eP _{EN} F	11	34	31					S-P=48 sec.
				11	41±						
74	Dec. 21	Iv	eP _{EN} F	12	40	10					S-P=47 sec.
				12	43±						
75	Dec. 21	Iv	eP _{EN} F	14	05	57					S-P=48 sec.
				14	09±						
76	Dec. 21	Iv	eP _{EN} F	14	40	11					S-P=49 sec.
				14	43						
77	Dec. 21	Iv	eP _{EN} F	16	27	06					S-P=49 sec.
				16	30±						
78	Dec. 21	I	e _{EN} F	17	34.3						
				17	35.9						
79	Dec. 21	I	e _{EN} F	19	19.9						
				19	23±						
80	Dec. 22	I	e _{EN} F	4	30.3						
				4	32.8						
81	Dec. 22	I	e _{EN} F	4	57.5						
				4	59.5						
82	Dec. 22	I	e _{EN} F	7	50.3						
				7	52.8						
83	Dec. 22	I	e _{EN} F	10	35.9						
					40.3						
84	Dec. 22	I	e _{EN} F	10	42.0						
				10	44.0						
85	Dec. 22	I	e _{EN} F	12	58.4						
				13	00.3						
86	Dec. 22	I	e _{EN} F	15	00.7						
					03.3						
87	Dec. 22	I	eP _{EN} F	20	17.8						
				20	19.8						
88	Dec. 22	I	eP _{EN} F	23	53.8						
				23	56.3						

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.	
89	Dec. 23	I	eP _{EN} F	6 28.5 6 30.3					
90	Dec. 24	Iv	eP _{EN} iS _{EN} F	12 41 26 12 42 13 12 44.8					
91	Dec. 24	I	e _{EN} F	22 35.0 22 37.3					
92	Dec. 25	I	e _{EN} F	2 17.8 3 34					Probably distant
93	Dec. 25	IIv	eP _{EN} iS _{EN} F	3 55 23 3 56 11 4 00.8					
94	Dec. 25	I	eP _{EN} F	7 46.1 7 47.8					
95	Dec. 25	I	eP _{EN} F	8 07.8 8 10.3					
96	Dec. 25	I	e _{EN} F	12 05.1 12 06.8					
97	Dec. 25	I	e _{EN} F	13 19.7 13 20.8					
98	Dec. 25	I	eP _{EN} F	17 44.0 17 46.3					
99	Dec. 25	I	e _{EN} F	18 37.1 18 39.3					
100	Dec. 25	Iv	eP _{EN} F	22 29.4 32.8					S-P=45 sec. (ca.)
101	Dec. 26	I	e _{EN} F	1 09.3 1 16.8					
102	Dec. 26	I	e _{EN} F	4 15.5 17.3					
103	Dec. 26	IIv	eP _{EN} F	5 03 44 5 14±					S-P=50 sec. (ca.)
104	Dec. 26	I	e _{EN} F	5 27.3 5 29.3					

PALO ALTO



No.	Date	Character	Phase	Time U. T.			Amplitude			Remarks
							A _E	A _N	A _Z	
	1932			h. m. s.	s.	mm.	mm.	mm.		
105	Dec. 26	I	e _{EN} F	5 41.0 5 43.0						
106	Dec. 26	Iv	eP _{EN} F	12 53.9 12 57.3						S-P=52 sec. (ca.)
107	Dec. 26	I	e _{EN} F	22 42 48 22 44±						
108	Dec. 27	I	e _{EN} F	11 11.8 11 13.3						
109	Dec. 28	I	e _{EN} F	2 51.8 2 54±						
110	Dec. 28	Iv	eP _{EN} F	3 08 29 3 10.9						S-P=51 sec. (ca.)
111	Dec. 29	Iv	eP _{EN} F	6 21 40 6 28±						S-P=50 sec. (ca.)
112	Dec. 29	Iv	eP _{EN} F	6 39 12 6 44±						S-P=46 sec.
113	Dec. 29	Iv	eP _{EN} F	6 46 13 6 51±						S-P=50 sec.
114	Dec. 30	I	e _{EN} F	4 19 01 4 21.9						
115	Dec. 30	Iv	eP _{EN} F	16 04 25 16 06±						S-P=50 sec. (ca.)
116	Dec. 31	I	e _{EN} F	14 33 56 14 36.9						
117	Dec. 31	Iv	eP _{EN} F	17 30 11 17 33.4						S-P=43 sec. (ca.)
	1933									
118	Jan. 2	Iv	eP _{EN} i _E i _N i _N iS _E F	3 35 06 3 35 15 3 35 22 3 35 55 3 36 00 3 41±						
119	Jan. 2	I	e _{EN} F	15 45.5 15 48±						

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
120	Jan.	2	Iv	eP _N F	17 07 55 17 12.5				S-P=50 sec.
121	Jan.	2	Iv	eP _{EN} F	17 49 12 17 51±				S-P=48 sec.
122	Jan.	4	Iv	eP _N F	1 02 13 1 06±				S-P=51 sec.
123	Jan.	4	I	e _N F	4 05.7 4 08±				
124	Jan.	4	I	e _N F	10 55.2 10 58.0				
125	Jan.	4	I	e _{EN} F	21 13 11 21 26±				
126	Jan.	4	Id	eP _{EN} F	22 09 26 22 10.0				S-P=3 sec. (ca.) See discussion, p. 155
127	Jan.	5	Iv	eP _{EN} F	5 15 29 5 17±				S-P=50 sec. (ca.)
128	Jan.	5	III	iP _E	6 51 19	2	-0.6		Builds up gradually to S
				eP _N	6 51 19	2		-0.2	
				i _E	6 51 25	2	+2.5		
				i _N F	6 51 29	1.5		-2	
									Runs into another quake
129	Jan.	5	I	e _{EN} F	6 57.3 7 09±				P obscured by pre- vious quake
130	Jan.	5	I ₂	eP _{EN} F	7 44.4 7 47±				S-P=48 sec. (ca.)
131	Jan.	5	I	e _{EN} F	9 13 06 9 18±				
132	Jan.	5	Iv	eP _{EN} F	10 06 07 10 10±				S-P=42 (ca.)
133	Jan.	6	Iv	eP _{EN} F	13 06 39 13 11±				S-P=48 sec.
134	Jan.	6	I	e _{EN} F	13 34.5 13 37.0				

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
135	Jan. 6	I	e _{EN} F	16 10.5 16 13.5					
136	Jan. 6	IIv	iP _{EN} i _N i _N iS _E iS _N F	23 45 34 23 45 40 23 45 51 23 46 01 23 46 06 23 49					
137	Jan. 7	I	e _{EN} F	2 01.5 2 03.5					
138	Jan. 10	I	e _{EN} F	0 07.5 0 10					
139	Jan. 11	Iv	eP _E F	17 30 05 17 33.6					S-P=49 sec.
140	Jan. 11	I	eP _{EN} F	18 50.8 18 52.6					
141	Jan. 12	I	eP _E F	1 49.4 1 53.1					
142	Jan. 13	I	eP _E F	5 36.6 5 39±					
143	Jan. 13	II	iP _E F	6 19 47 6 23±					See discussion, p. 155
144	Jan. 14	I	e _N F	3 22.4 3 23.0					See discussion, p. 156
145	Jan. 14	Id	iP _N F	3 25 07.0 3 27.1					S-P=10 sec. (ca.) See discussion, p. 156
146	Jan. 14	I	eP _N F	8 47 25 8 48.1					S-P=3.5 sec. See discussion, p. 156
147	Jan. 14	Id	iP _{EN} F	20 48 52 20 49 17					S-P=2 or 3 sec. See discussion, p. 156
148	Jan. 15	Iv	eP _{EN} iS _N F	8 00 01 8 00 55 8 05±					Begins in hour mark
149	Jan. 15	I	e _{EN} F	13 07 58 13 10.6					

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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
150	1933 Jan. 17	I	eP _{EN} F	1 02 42 1 09±					S-P=55 sec. (ca.)
151	Jan. 17	I	eP _{EN} F	2 35.4 2 38.1					
152	Jan. 21	I	e _N e _E i _N i _E eL _E eL _N F	5 47 19 5 47 21 5 47 24 5 47 29 5 47 46 5 47 47 5 48.7	0.4 2 2	 -0.3 	+0.2 +0.5		
153	Jan. 21	I	e _E e _N e _{EN} F	6 08 22 6 08 33 6 09 04 6 10±	0.5				Very small
154	Jan. 22	I	e _{EN} F	13 02 06 13 03.2					
155	Jan. 22	I	e _{EN} F	13 30 15 13 33.2					
156	Jan. 22	I	e _{EN} F	13 44.7 13 46.2					
157	Jan. 25	I	eP _{EN} F	10 33.7 10 36.2					
158	Jan. 25	I	e _{EN} F	20 57 30 21 01					
159	Jan. 28	Id	iP _{EN} F	6 37 58 6 39.7					S-P=16 sec. See discussion, p. 156
160	Jan. 29	I	e _{EN} F	13 45 46 13 48.2					
161	Jan. 29	Iv	eP _{EN} F	13 52 14 13 57±					S-P=45 sec. (ca.)
162	Jan. 31	Id	iP _N F	0 46 44 0 48.2					S-P=5.0 sec. See discussion, p. 156
163	Feb. 2	I	e _{EN} F	12 58.7 13 01.2					

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
164	Feb. 3	I	e _{EN} F	1 47.9 1 50.4					
165	Feb. 3	II	eP _{EN} i _{EN} F	3 26 02 3 26 03.5 3 33	0.2 0.5	-0.1 -0.4	+0.2 -0.5		Motion builds up gradually to S
166	Feb. 4	I	e _{EN} F	6 29 13 6 30.3					
167	Feb. 6	I	e _{EN} F	6 53.7 6 55.3					
168	Feb. 6	I	e _{EN} F	9 24.4 9 25.8					
169	Feb. 8	Iv	eP _E F	3 58 03 4 01±					S-P=47 sec. (ca.)
170	Feb. 9	Id	eP _{EN} F	1 40 42 1 42±					S-P=9.5 sec. See discussion, p. 157
171	Feb. 9	Iv	eP _{EN} iS _N F	13 57 30 13 58 18 14 00±					
172	Feb. 13	I	eP _{EN} F	20 17.9 20 19.9					
173	Feb. 13	IIv	eP _{EN} i _{EN} iS _{EN} F	22 10.0 22 10 10 22 10 59 22 17±	1 2	+1 +5	+0.6 +4		
174	Feb. 13	I	eP _{EN} F	22 32.4 22 35					
175	Feb. 14	I	eP _{EN} F	11 32.0 11 33.9					
176	Feb. 21	I	eP _{EN} F	11 49 07 11 51±					
177	Feb. 23	I	eP _{EN} i _N F	8 21 00 8 30 42 8 37±	6		+1.5		
178	Feb. 24	Id	eP _{EN} F	0 27 11 0 28±					S-P=2 sec. See discussion, p. 157

PALO ALTO



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No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
179	Feb. 26	I	e _{EN} F	6 55.6 6 58.0					
180	Feb. 26	IIId	iP _N iP _E i _N iS _N F	9 34 51.0 9 34 51.0 9 35 00.0 9 35 03.0 9 38	1 0.5 1	-0.2	-0.7 +6	See discussion, p. 157	
181	Feb. 27	I	e _{EN} F	10 53.5 10 55.5					
182	Mar. 2	I	e _{EN} F	0 52.6 0 55±					
183	Mar. 2	II	eP _{EN} e _N i _N i _E i _N i _N eG _N F	17 42 06 17 42 09 17 42 12.5 17 42 32 17 42 32 17 52 05 17 59.1 21 10±	1 1.5 2 1.5 2.5 16 40	+0.1 +3	-0.1 +0.8 +1 +5 +5 +2	Builds up to larger amplitude with same period	
184	Mar. 3	Id	eP _{EN} F	14 58 47 14 59 15					S-P=2 sec. See discussion, p. 157
185	Mar. 3	Id	eP _{EN} F	15 00 57 15 01.1					S-P=1 sec. (ca.) See discussion, p. 157
186	Mar. 4	Id	iP _{EN} F	15 22 42.5 15 23.1					S-P=2 sec. See discussion, p. 157
187	Mar. 5	Iv	eP _{EN} F	11 00 20 11 03.6					S-P=58 sec. (ca.)
188	Mar. 5	Id	eP _{EN} e _E e _E eS _E ? e _E F	22 10 17 22 10 20 22 10 29 22 10 30 22 10 31.5 22 11.6				See discussion, p. 157	
189	Mar. 11	IIIv	iP _{EN} i _{EN} i _{EN} F	1 55 26 1 55 28 1 55 30 3±	0.8 0.6 0.7	+0.4 -0.8 +1.2	+0.5 -1.5 +3	The Long Beach earth- quake. Motion too fast to determine other phases Aftershocks are superimposed on surface waves of main shock	

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
				h. m. s.	s.	mm.	mm.	mm.	
190	1933 Mar. 11	I	eP _{EN} F	2 10.6 2 17±					On surface waves of main quake
191	Mar. 11	I	eP _{EN} F	2 18.0 2 22±					On surface waves of main quake
192	Mar. 11	I	eP _{EN} F	2 28.9 2 37±					On surface waves of main quake Probably two shocks close together
193	Mar. 11	I	e _{EN} F	3 00.2 3 04±					
194	Mar. 11	I	e _{EN} F	3 07.7 3 10±					
195	Mar. 11	I	e _{EN} F	3 11.2 3 14±					
196	Mar. 11	II	eP _{EN} F	3 22.0 3 33±					
197	Mar. 11	I	eP _{EN} F	4 38.2 4 46±					
198	Mar. 11	II	eP _{EN} F	5 11 38 5 18.7					
199	Mar. 11	II	eP _{EN} F	5 19 23 5 27					
200	Mar. 11	I	eP _{EN} F	6 13.2 6 16±					
201	Mar. 11	II	eP _{EN} F	6 59 21 6 10±					
202	Mar. 11	I	eP _{EN} F	8 09.9 8 13.7					
203	Mar. 11	I	e _{EN} F	8 33.6 8 36±					
204	Mar. 11	II	eP _{EN} F	8 56.2 9 04±					
205	Mar. 11	I	eP _{EN} F	9 11.6 9 18±					

PALO ALTO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _Z	
	1933			h. m. s.	s.	mm.	mm.	mm.	
206	Mar. 11	I	e _{EN} F	11 05.2 11 09±					
207	Mar. 11	I	e _{EN} F	11 48.7 11 51					
208	Mar. 11	I	e _{EN} F	12 51.4 12 56±					
209	Mar. 11	I	e _{EN} F	13 52.2 13 55±					
210	Mar. 11	I	e _{EN} F	14 26.9 14 31					
211	Mar. 11	I	e _{EN} F	14 58.2 15 02±					
212	Mar. 11	I	e _{EN} F	15 11.2 15 14±					
213	Mar. 11	Id	eP _{EN} F	16 42 23 16 42.7					S-P=2 sec. (ca.) See discussion, p. 157
214	Mar. 11	I	e _{EN} F	16 55.2 17 00±					During radio signal
215	Mar. 11	I	eP _{EN} F	19 44.0 19 57±					May be two quakes
216	Mar. 12	I	e _{EN} F	0 28.7 0 31±					
217	Mar. 12	I	eP _{EN} F	20 45 28 20 52±					
218	Mar. 13	II	eP _{EN} F	13 18 48 13 30±					
219	Mar. 14	I	eP _{EN} F	12 20 33 12 24±					
220	Mar. 14	I	eP _{EN} F	19 03 10 19 15±					
221	Mar. 15	I	eP _{EN} F	11 14.8 11 22±					
222	Mar. 15	I	eP _{EN} F	16 33 08 16 36±					

PALO ALTO



International
Seismological
Centre

No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
223	1933 Mar. 17	I	e _{EN} F	0	16.8						
				0	19±						
224	Mar. 18	Iv	eP _{EN} F	11	06	55					S-P=48 sec. (ca.)
				11	10±						
225	Mar. 18	I	eP _{EN} F	16	03	04					
				16	03.7						
226	Mar. 18	Id	iP _{EN} F	19	04	42					S-P=1.5 sec. (ca.)
				19	05.2						
227	Mar. 18	Id	eP _{EN} F	19	32	54					S-P=1.5 sec. (ca.)
				19	33.2						
228	Mar. 19	I	e _{EN} F	16	34.0						
				16	36±						
229	Mar. 22	Iv	eP _{EN} iS _{EN} F	13	20	45					
				13	21	31					
				13	24.8						
230	Mar. 22	Id	iP _{EN} F	23	23	03					S-P=2 sec. (ca.)
				23	23	27					
231	Mar. 25	Id	eP _N eP _E eS _{EN} F	22	37	27					See discussion, p. 158
				22	37	27.5					
				22	37	40					
				22	39±						
232	Mar. 26	I	eP _{EN} F	19	07	44					
				19	09.3						
233	Mar. 27	I	e _{EN} F	10	44.7						See discussion, p. 158
				10	46.3						
234	Mar. 27	I	e _{EN} F	13	02	14					See discussion, p. 158
				13	04.3						
235	Mar. 27	I	e _{EN} F	13	06	57					See discussion, p. 158
				13	09						
236	Mar. 30	I	e _{EN} F	12	26.6						
				12	28.9						
237	Mar. 31	I	eP _{EN} F	7	43	43					See discussion, p. 158
				7	46.4						

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:

$\varphi = 37^{\circ} 46' \text{ N Lat.}$

$\lambda = 122^{\circ} 28' \text{ W from Greenwich}$

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_0	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.

SAN FRANCISCO



No.	Date	Charac- ter	Phase	Time U. T.	Period	Amplitude			Remarks
						A _E	A _N	A _S	
	1932			h. m. s.	s.	mm.	mm.	mm.	
1	Oct. 16	IIv	iP _{EN} i _{EN} iS _{EN} F	14 17 08 14 17 09 14 17 24 14 19±					See discussion, p. 151
2	Oct. 19	IIv	eP _{EN} i _{EN} iS _{EN} F	16 40 11 16 40 14 16 40 35 16 48±					See discussion, p. 151
3	Nov. 16	Iv	eP _{EN} eS _{EN} F	10 27 26 10 27 47 10 30±					
4	Nov. 22	Iv	eP _N F	6 02 58 6 04±					S-P=10 sec.
5	Nov. 30	Id	eP _{EN} F	9 54 34 9 56					S-P=9.5 sec. (ca.) See discussion, p. 154
6	Nov. 30	Id	eP _{EN} F	12 58 23 13 00					S-P=11 sec. See discussion, p. 154
7	Dec. 21	IIIv	eP _{EN} F	6 11 (ca.) 7 13±					Amplitude too large to permit measure- ment of later phases
8	Dec. 21	IIv	eP _{EN} F	7 42 (ca.) 7 48					S-P=51 sec.
9	Dec. 21	IIv	eP _{EN} F	8 49.6 8 52±					S-P=49 sec.
10	Dec. 21	IIv	eP _{EN} F	11 34.5 11 39±					S-P=50 sec. (ca.)
11	Dec. 21	Iv	eP _{EN} F	14 40.2 43±					S-P=48 sec. (ca.)
12	Dec. 21	Iv	e _{EN} F	19 24.8 19 27±					Small
13	Dec. 22	Iv	eP _{EN} F	10 36 56 10 40±					S-P=50 sec. (ca.)?
14	Dec. 25	Iv	eP _{EN} F	3 55 23 3 59±					S-P=45 sec.
15	Dec. 26	Iv	eP _{EN} F	5 03 48 5 12±					S-P=48 sec. (ca.)

SAN FRANCISCO



No.	Date	Character	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
16	1932 Dec. 26	Iv	eP _{EN} F	12	53	58					S-P=49 sec.
				12	57						
17	Dec. 29	Iv	eP _{EN} F	6	21	36					S-P=50 sec. (ca.)
				6	25±						
18	Dec. 29	Iv	eP _{EN} F	6	39	11					S-P=50 sec. (ca.)
				6	42±						
19	Dec. 29	I	eP _{EN} F	6	46.4						
				6	49±						
20	Dec. 30	I	e _{EN} F	4	19.1						
				4	22±						
21	Dec. 30	Id	eP _{EN} F	6	33.6						S-P=2.5 sec. ? See discussion, p. 155
				6	34.1						
22	1933 Jan. 2	Iv	eP _{EN} F	3	35.2						S-P=50 sec. (ca.)
				3	40±						
23	Jan. 2	Iv	eP _{EN} F	12	21	52					S-P=48 sec.
				12	26±						
24	Jan. 4	Iv	eP _{EN} F	1	02.4						
				1	04±						
25	Jan. 4	I	e _{EN} F	10	55.5						Very small
				10	58±						
26	Jan. 5	IIv	iP _E eP _N i _{EN} iS _{EN} F	6	51	21	0.5	-1.0			
				6	51	21	0.5		+0.5		
				6	51	25					
				6	52	05					
				7	05±						
27	Jan. 5	Iv	eP _{EN} F	7	44	25					S-P=46 sec.
				7	47						
28	Jan. 5	I	e _{EN} F	9	13.1						
				9	17±						
29	Jan. 5	Iv	eP _{EN} F	10	06	06					S-P=43 sec.
				10	12±						
30	Jan. 6	Iv	eP _{EN} F	13	06	43					S-P=49 sec.
				13	10±						

SAN FRANCISCO



No.	Date	Charac- ter	Phase	Time U. T.			Period	Amplitude			Remarks
								A _E	A _N	A _Z	
				h.	m.	s.	s.	mm.	mm.	mm.	
31	1933 Jan. 11	Iv	eP _{EN} F	17	30	05					S-P=50 sec.
				17	33±						
32	Jan. 13	IIv	iP _{EN} F	6	19	54					S-P=12.0 sec. See discussion, p. 156
				6	22±						
33	Jan. 14	Iv	eP _{EN} F	3	25	14					Too much extra vi- bration S-P=15 sec. ? See discussion, p. 156
				3	26±						
34	Jan. 22	Iv	eP _{EN} F	13	30	18					S-P=43 sec.
				13	33±						
35	Jan. 29	Iv	iP _E F	13	52.3						S-P=49 sec. (ca).
				13	58±						
36	Feb. 3	Iv	eP _{EN} F	3	26.1						
				3	29±						
37	Feb. 13	Iv	eP _N F	22	10.1						
				22	14±						
38	Feb. 26	IIv	eP _{EN} i _{EN} eS _{EN} F	9	34	56					
				9	34	58					
				9	35	14					
				9	38±						
39	Mar. 5	Iv	eP _{EN} F	11	00	19					
				11	03±						
40	Mar. 11	IIIv	eP _{EN} F	1	55	29					The Long Beach earth- quake. Other phases indeterminable
				2	46±						
41	Mar. 12	Iv	eP _{EN} F	20	45	36					S-P=48 sec. (ca.)
				20	49±						
42	Mar. 22	Iv	eP _{EN} F	13	20	46					S-P=47 sec. (ca.)
				13	24±						



BULLETIN OF THE SEISMOGRAPHIC STATIONS

BERKELEY

THE BERKELEY STATION, UNIVERSITY OF CALIFORNIA

BERKELEY, CALIFORNIA

MOUNT HAMILTON

THE LICK OBSERVATORY STATION, UNIVERSITY OF CALIFORNIA

MOUNT HAMILTON, CALIFORNIA

PALO ALTO

THE BRANNER STATION, STANFORD UNIVERSITY

PALO ALTO, CALIFORNIA

SAN FRANCISCO

THE SAN FRANCISCO STATION, CALIFORNIA ACADEMY OF SCIENCES

SAN FRANCISCO, CALIFORNIA

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Beginning in January, 1912, the records of the seismographic stations at Berkeley and at Mount Hamilton have been published for two six-month periods of a year, namely, April 1 to September 30, and October 1 to March 31. Beginning in 1933, the records of the seismographic stations at Palo Alto (covering as the first period, October 1, 1931, to March 31, 1932) and at San Francisco (covering as the first period, April 1, 1932, to September 30, 1932) have been included. A list is here printed as a guide to the *Bulletin* covering each respective period since the records have been kept.

VOLUME 1. 1912-1924

Records from October, 1910, to September, 1920, inclusive



THE REGISTRATION OF EARTHQUAKES—

AT BERKELEY:

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

AT MOUNT HAMILTON:

- No. 2 (*also*). From May 23 to September 30, 1911.

AT BERKELEY AND MOUNT HAMILTON:

- No. 3. From October 1, 1911, to March 31, 1912.
- No. 4. From April 1, 1912, to September 30, 1912.
- No. 5. From October 1, 1912, to March 31, 1913.
- No. 6. From April 1, 1913, to September 30, 1913.
- No. 7. From October 1, 1913, to March 31, 1914.
- No. 8. From April 1, 1914, to September 30, 1914.
- No. 9. From October 1, 1914, to March 31, 1915.
- No. 10. From April 1, 1915, to September 30, 1915.
- No. 11. From October 1, 1915, to March 31, 1916.
- No. 12. From April 1, 1916, to September 30, 1916.
- No. 13. From October 1, 1916, to March 31, 1917.
- No. 14. From April 1, 1917, to September 30, 1917.
- No. 15. From October 1, 1917, to March 31, 1918.
- No. 16. From April 1, 1918, to September 30, 1918.
- No. 17. From October 1, 1918, to March 31, 1919.
- No. 18. From April 1, 1919, to September 30, 1919.
- No. 19. From October 1, 1919, to March 31, 1920.
- No. 20. From April 1, 1920, to September 30, 1920.



VOLUME 2. 1924-1931

Records from October, 1920, to March, 1931, inclusive

THE REGISTRATION OF EARTHQUAKES—

AT BERKELEY AND MOUNT HAMILTON:

- No. 1. From October 1, 1920, to March 31, 1921.
- No. 2. From April 1, 1921, to September 30, 1921.
- No. 3. From October 1, 1921, to March 31, 1922. (*Out of print.*)
- No. 4. From April 1, 1922, to September 30, 1922.
- No. 5. From October 1, 1922, to March 31, 1923.
- No. 6. From April 1, 1923, to September 30, 1923.
- No. 7. From October 1, 1923, to March 31, 1924.
- No. 8. From April 1, 1924, to September 30, 1924.
- No. 9. From October 1, 1924, to March 31, 1925.
- No. 10. From April 1, 1925, to September 30, 1925.
- No. 11. From October 1, 1925, to March 31, 1926.
- No. 12. From April 1, 1926, to September 30, 1926.
- No. 13. From October 1, 1926, to March 31, 1927.
- No. 14. From April 1, 1927, to September 30, 1927.
- No. 15. From October 1, 1927, to March 31, 1928.
- No. 16. From April 1, 1928, to September 30, 1928.
- No. 17. From October 1, 1928, to March 31, 1929.
- No. 18. From April 1, 1929, to September 30, 1929.
- No. 19. From October 1, 1929, to March 31, 1930.
- No. 20. From April 1, 1930, to September 30, 1930.
- No. 21. From October 1, 1930, to March 31, 1931.

VOLUME 3. 1932-

Records from April, 1931-

THE REGISTRATION OF EARTHQUAKES—

AT BERKELEY AND MOUNT HAMILTON:

- No. 1. From April 1, 1931, to September 30, 1931.
Issued September 24, 1932

EARTHQUAKES IN NORTHERN CALIFORNIA

AND

THE REGISTRATION OF EARTHQUAKES—

AT BERKELEY—MOUNT HAMILTON—PALO ALTO:

- No. 2. From October 1, 1931, to March 31, 1932.
Issued June, 1933

AT BERKELEY—MOUNT HAMILTON—PALO ALTO—SAN FRANCISCO:

- No. 3. From April 1, 1932, to September 30, 1932.
Issued September, 1933
- No. 4. From October 1, 1932, to March 31, 1933.
Issued January, 1935