

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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The International Seismological Summary. 1941 October, November, December.

INTERNATIONAL GEODETIC AND GEOPHYSICAL UNION.
ASSOCIATION OF SEISMOLOGY.
FORMERLY THE BULLETIN OF
THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The Director of the I.S.S. wishes to express his thanks to U.N.E.S.C.O. and H.M. Treasury for financial support, which has covered the cost and preparation of this volume.

This last quarter of 1941 contains 97 Epicentres, of which 57 are repetitions from previous determinations.

Cases of abnormal focal depth are noticed as below :—

| | | | | |
|-----------|-----------|---------|---------|----------------|
| October | 15d. 9h. | 15°1S. | 73°9W. | 0·005 |
| | 30d. 7h. | 30°6N. | 139°7E. | 0·060 |
| November | 4d. 2h. | 17°8S. | 178°8W. | 0·070 |
| | 5d. 11h. | 22°0S. | 171°7E. | Suggested Deep |
| | 5d. 13h. | 22°0S. | 171°7E. | Suggested Deep |
| | 8d. 23h. | 0°1N. | 122°7E. | Suggested Deep |
| | 10d. 9h. | 21°5S. | 66°5W. | 0·010 |
| | 14d. 6h. | 45°0N. | 148°0E. | 0·025 |
| | 15d. 0h. | 6°6S. | 107°0E. | 0·040 |
| | 15d. 4h. | 59°5S. | 27°5W. | 0·010 |
| | 16d. 9h. | 13°3N. | 88°7W. | Suggested Deep |
| | 18d. 22h. | 23°7S. | 65°7W. | 0·015 |
| | 24d. 21h. | 28°2S. | 177°7W. | Suggested Deep |
| 27d. 8h. | 6°6S. | 121°1E. | 0·060 | |
| 28d. 12h. | 37°0N. | 70°5E. | 0·030 | |
| December | 31d. 17h. | 20°5S. | 179°0W. | 0·100 |

Thanks are also due to the Director of the Meteorological Office and the Superintendent of Kew Observatory for hospitality extended to the staff, and assistance with administration.

July, 1952.

KEW OBSERVATORY,
RICHMOND, SURREY.

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1941

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1941 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. 19h. 49m. 33s. Epicentre 49°·2N. 130°·5W. (as given by J.S.A.).

Scale V at Quetta frequent after shocks occurring till October 15d.
Gov. of India Seismological Bulletin, 1941, p. 86.

A = -·4251, B = -·4978, C = +·7559; δ = -10; h = -6;
D = -·760, E = +·649; G = -·491, H = -·575, K = -·655.

| | Δ | Az. | P. | | O - C. | S. | | O - C. | Supp. | | L. | | |
|----------------|----------|-----|------|-----|--------|------|-----|--------|-------|-----|-------|--------|--------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | | |
| Seattle | 5·7 | 105 | — | — | — | e 2 | 9 | -26 | — | — | e 3·9 | | |
| Ukiah | 11·4 | 150 | e 2 | 48 | + 1 | e 4 | 55 | - 1 | e 3 | 9 | PPP | e 6·1 | |
| Butte | 12·5 | 98 | — | — | — | e 5 | 48 | SSS | — | — | — | e 6·7 | |
| Santa Clara | E. 13·5 | 149 | — | — | — | e 5 | 40 | - 7 | — | — | — | — | |
| Bozeman | 13·7 | 99 | e 3 | 13 | - 5 | e 5 | 43 | - 9 | 3 | 30 | PP | e 7·2 | |
| Logan | 15·1 | 113 | 3 | 37 | + 1 | e 6 | 29 | + 4 | e 6 | 36 | SS | 8·5 | |
| Tinemaha | 15·1 | 140 | e 3 | 37 | + 1 | — | — | — | — | — | — | — | |
| Saskatoon | 15·4 | 70 | e 3 | 39? | - 1 | — | — | — | — | — | — | 8·5 | |
| Salt Lake City | 15·7 | 116 | e 3 | 46 | + 2 | e 6 | 37 | - 2 | — | — | — | e 8·3 | |
| Halwee | 16·0 | 140 | e 3 | 49 | + 1 | — | — | — | — | — | — | — | |
| Santa Barbara | Z. 16·8 | 148 | e 4 | 2 | + 4 | — | — | — | — | — | — | — | |
| Mount Wilson | 17·7 | 144 | i 4 | 8 | - 2 | — | — | — | — | — | — | — | |
| Pasadena | 17·7 | 144 | e 4 | 8 | - 2 | — | — | — | — | — | — | e 9·0 | |
| College | 18·1 | 337 | e 4 | 33 | PP | e 8 | 9 | SS | — | — | — | e 9·6 | |
| Riverside | 18·1 | 144 | e 4 | 14 | 0 | — | — | — | — | — | — | — | |
| Palomar | Z. 18·9 | 142 | e 4 | 25 | + 1 | — | — | — | — | — | — | — | |
| La Jolla | 19·2 | 144 | e 4 | 26 | - 2 | — | — | — | — | — | — | — | |
| Tucson | 22·5 | 131 | 1 | 5 | 3 | + 1 | e 9 | 4 | - 1 | i 5 | 43 | PP | 1 10·3 |
| Lincoln | 25·2 | 95 | e 5 | 30 | + 1 | e 9 | 54 | + 2 | 6 | 35 | PPP | e 14·1 | |
| Florissant | E. 30·4 | 95 | e 6 | 16 | 0 | e 11 | 22 | + 6 | — | — | — | — | |
| Toronto | 35·1 | 79 | — | — | — | e 16 | 15? | ? | — | — | — | 18·5 | |
| Honolulu | 35·4 | 227 | e 8 | 31 | PPP | — | — | — | — | — | — | e 14·7 | |
| Ottawa | 36·6 | 74 | e 7 | 11 | + 1 | e 12 | 57 | + 4 | — | — | — | e 18·5 | |
| San Juan | 59·6 | 96 | e 10 | 43 | +35 | — | — | — | — | — | — | e 33·9 | |

Additional readings:—

Tucson i = +5m.16s., e = +5m.59s., eS = +10m.16s.

Lincoln i = +10m.7s.

Florissant eE = +10m.25s., +10m.40s., and +11m.16s.

San Juan e = +14m.40s. and +16m.24s.

Long waves were also recorded at Kew, Uccle, De Bilt, and other American stations.

Oct. 1d. Readings also at 1h. (Riverview, Wellington, and Christchurch), 2h. (Bombay), 3h. (Sofia), 5h. (Bombay), 8h. (Bombay, Vladivostok, Irkutsk, Medan, Tashkent, Sverdlovsk, and Calcutta), 9h. (De Bilt, Potsdam, Kew, Uccle, Bergen, Prague, Warsaw, and Upsala), 11h. (Batavia), 13h. (La Paz, Helwan, and Clermont-Ferrand), 14h. (Ksara, Huancayo, Potsdam, De Bilt, Sverdlovsk, Riverside, and Mount Wilson), 15h. (East Machias), 16h. (La Plata), 18h. (Riverside, Mount Wilson, Pasadena, Tinemaha, Halwee, and near Tucson (2)), 19h. (Bombay and Berkeley), 20h. (near Stalinabad), 22h. (Calcutta and Bombay).

Oct. 2d. Readings at 3h. (near Stalinabad, Frunse, and Tchinkent), 7h. (near Lick and Bombay), 11h. (near Lick), 14h. (Balboa Heights), 16h. (San Francisco).

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Oct. 3d. 14h. 17m. 18s. Epicentre 5°·5S. 104°·5E.

Intensity V in the south of Sumatra in the district of Lampong and Palembang, strong at Telok-Betong. Epicentre 5°·5S. 104°·5E. (Batavia.)
 Meteorologische en Geophysische Dienst te Batavia, Serie A, No. 44, Aardbevingen in Ned.-Indië Waargenomen gedurende het jaar 1941, p. 22.

A = -·2493, B = +·9638, C = -·0952; δ = +12; h = +6;
 D = +·968, E = +·250; G = +·024, H = -·092, K = -·996.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-------------|----|----------|-----|---------------------|------|---------|------|--------|-------------------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Batavia | | 2·4 | 106 | i 0 44 | + 3 | i 1 19 | + 7 | — | — |
| Medan | | 10·7 | 328 | 2 47 | + 9 | — | — | — | i 5·5 |
| Kodaikanal | E. | 31·1 | 301 | i 6 25 _a | + 3 | e 11 28 | 0 | — | — |
| Calcutta | N. | 32·0 | 332 | e 7 12 | PP | i 13 41 | SS | e 9 6 | P _c P i 16·6 |
| Bombay | | 39·5 | 309 | e 7 37 | + 3 | e 13 28 | - 9 | e 9 12 | PP |
| Agra | E. | 41·3 | 324 | e 7 38 | -11 | e 14 5 | + 1 | — | — |
| Riverview | Z. | 51·6 | 129 | e 8 59 | -11 | — | — | — | — |
| Vladivostok | | 54·4 | 25 | e 9 24 | - 7 | e 17 35 | PPS | — | — |
| Andijan | | 54·7 | 330 | e 9 42 | + 9 | — | — | — | — |
| Tashkent | | 56·6 | 328 | e 9 43 | - 4 | e 17 46 | + 8 | — | — |
| Irkutsk | | 57·5 | 358 | — | — | 18 5 | +15 | — | — |
| Helwan | Z. | 78·3 | 302 | 12 0 | - 3 | — | — | — | — |

Additional readings:—

Batavia iPEN = +0m.47s.

Bombay iP_cPE = +9m.17s., iE = +10m.10s., eN = +10m.14s., iS?N = +13m.42s.,

eEN = +16m.43s.

Helwan iZ = +12m.30s.

Long waves were also recorded at Potsdam and De Bilt.

Oct. 3d. 16h. 13m. 9s. Epicentre 40°·6N. 124°·6W.

Scale VII at Eureka; VI at Ferndale.

Epicentre in the sea near Cap Mendocino 40°·6N. 124°·6W.

Macroseismic area 12,000 square miles. Magnitude 6.

F. Neumann, United States Earthquakes, 1941, Washington, 1943, p. 14-15, chart p. 8.

A = -·4324, B = -·6268, C = +·6482; δ = +1; h = -2;
 D = -·823, E = +·568; G = -·368, H = -·534, K = -·762.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------|----|----------|-----|--------|----------------|--------|----------------|--------|----------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Ferndale | | 0·2 | 98 | i 0 11 | + 1 | — | — | — | — |
| Ukiah | | 1·8 | 144 | i 0 33 | + 1 | i 1 5 | S _r | — | i 1·2 |
| Berkeley | | 3·3 | 145 | i 0 52 | - 1 | i 1 33 | - 2 | i 1 29 | ? |
| San Francisco | | 3·3 | 147 | e 0 51 | - 2 | i 1 26 | - 9 | i 1 5 | P _r |
| Branner | E. | 3·7 | 148 | i 0 59 | - 1 | e 1 39 | - 6 | — | — |
| Santa Clara | | 3·8 | 147 | i 1 1 | 0 | i 1 27 | -20 | i 1 4 | P* |
| Lick | | 4·0 | 143 | e 1 2 | - 2 | i 1 53 | + 1 | — | i 2·7 |
| Fresno | N. | 5·4 | 134 | i 1 25 | + 1 | i 4 10 | ? | — | — |
| Tinemaha | | 6·0 | 125 | e 1 36 | + 4 | i 3 6 | S* | — | — |
| Halwee | | 6·9 | 128 | i 1 47 | + 2 | i 3 31 | S* | — | — |
| Santa Barbara | | 7·2 | 146 | i 1 49 | 0 | i 3 11 | - 2 | — | — |
| Seattle | | 7·3 | 12 | e 2 19 | P _r | e 3 33 | S* | — | e 3·9 |
| Victoria | | 8·0 | 5 | 1 58 | - 2 | — | — | — | 2·9 |
| Mount Wilson | | 8·2 | 138 | e 2 2 | - 1 | e 3 41 | + 3 | — | — |
| Pasadena | | 8·2 | 138 | i 2 2 | - 1 | i 3 36 | - 2 | — | e 3·9 |
| Riverside | | 8·7 | 136 | i 2 11 | + 1 | — | — | — | e 4·3 |
| Spokane | | 8·8 | 33 | i 2 21 | +10 | — | — | i 2 42 | PPP |
| Palomar | Z. | 9·5 | 137 | i 2 22 | + 2 | — | — | — | — |
| La Jolla | | 9·7 | 140 | e 2 29 | + 7 | — | — | — | e 4·6 |
| Logan | | 9·7 | 79 | i 2 29 | + 7 | i 4 40 | SSS | i 2 43 | PPP |

Continued on next page.

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | |
|--------------------|----------|-----|------|-----------------|------|-------|-----|------|-------|-----|-----|--------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | |
| Salt Lake City | 9.7 | 85 | i 2 | 26 | + 4 | i 4 | 23 | + 8 | 4 | 35 | SS | i 5.3 |
| Butte | 10.3 | 54 | i 2 | 35 | + 3 | i 4 | 35 | + 5 | — | — | — | i 6.7 |
| Bozeman | 11.2 | 57 | i 2 | 45 | + 1 | i 4 | 54 | + 2 | i 2 | 53 | PP | i 5.4 |
| Tucson | 13.9 | 123 | i 3 | 24 | + 3 | i 5 | 56 | - 1 | i 6 | 13 | SS | i 7.1 |
| Saskatoon | 16.9 | 41 | 4 | 0 | + 1 | 7 | 17 | +10 | — | — | — | 8.9 |
| Sitka | 18.3 | 342 | e 4 | 7 | -10 | e 7 | 44 | + 5 | — | — | — | e 9.1 |
| Lincoln | 21.2 | 80 | i 4 | 45 | - 4 | i 8 | 17 | -24 | i 8 | 52 | SS | i 12.8 |
| Florissant | 26.3 | 83 | i 5 | 38 | - 1 | 10 | 18 | + 7 | i 5 | 59 | PP | 14.3 |
| St. Louis | 26.5 | 83 | e 5 | 40 | - 1 | i 10 | 20 | + 6 | — | — | — | — |
| Guadalajara | N. 26.9 | 132 | — | — | — | e 11 | 23 | SS | — | — | — | — |
| Cape Girardeau | E. 27.4 | 85 | e 5 | 48 | - 1 | e 10 | 37 | + 9 | e 12 | 2 | SS | — |
| Chicago J.S.A. | 27.7 | 75 | i 5 | 53 | + 1 | e 10 | 47 | +14 | — | — | — | — |
| Chicago U.S.C.G.S. | 27.7 | 75 | i 5 | 52 | 0 | i 10 | 33 | 0 | e 6 | 37 | PP | e 11.5 |
| College | 27.7 | 339 | e 5 | 55 | + 3 | e 10 | 29 | - 4 | e 6 | 36 | PP | e 13.2 |
| Tacubaya | E. 30.3 | 126 | e 6 | 23 | + 8 | — | — | — | — | — | — | — |
| Toronto | 33.3 | 69 | 6 | 45 | + 4 | 12 | 8 | + 6 | — | — | — | 16.9 |
| Pittsburgh | 33.7 | 75 | e 6 | 43 | - 2 | i 12 | 7 | - 1 | i 6 | 55 | PP | — |
| Honolulu | 34.1 | 246 | e 6 | 44 | - 4 | e 12 | 7 | - 7 | e 8 | 16 | PPP | e 13.9 |
| Columbia | 35.0 | 86 | e 6 | 54 | - 2 | e 12 | 14 | -14 | e 8 | 23 | PPP | e 15.2 |
| Pennsylvania | 35.1 | 74 | i 6 | 59 | + 2 | — | — | — | — | — | — | e 16.1 |
| Ottawa | 35.6 | 65 | 7 | 2 | + 1 | 12 | 44 | + 6 | 15 | 27? | SSS | e 17.9 |
| Georgetown | 36.2 | 76 | i 7 | 6 | 0 | e 12 | 46 | - 1 | e 8 | 21 | PP | — |
| Philadelphia | 37.3 | 74 | i 7 | 16 | 0 | e 13 | 10 | + 6 | 8 | 41 | PP | e 15.6 |
| Shawinigan Falls | 37.5 | 62 | 7 | 19 | + 2 | 13 | 19 | +12 | 17 | 3? | ? | 18.9 |
| Vermont | 37.6 | 66 | e 7 | 8 | -10 | e 13 | 0 | - 8 | — | — | — | e 15.4 |
| Fordham | 38.0 | 72 | i 7 | 24 | + 3 | i 13 | 22 | + 8 | i 8 | 47 | PP | i 20.3 |
| Seven Falls | 38.7 | 61 | 7 | 28 | + 1 | 13 | 31 | + 6 | 8 | 51? | PP | e 17.9 |
| Harvard | 39.2 | 69 | i 7 | 32 | + 1 | i 13 | 40 | + 8 | i 8 | 59 | PP | e 19.4 |
| Weston | 39.4 | 69 | i 7 | 34 | + 1 | i 13 | 40 | + 5 | 9 | 4 | PP | 18.6 |
| East Machias | 41.5 | 64 | e 7 | 50 | 0 | i 14 | 12 | + 5 | e 9 | 24 | PP | e 18.2 |
| Halifax | 44.2 | 63 | 8 | 14 | + 2 | 14 | 51? | + 5 | 18 | 21? | SSS | 21.9 |
| Kingston | 46.7 | 105 | i 8 | 36 | + 4 | e 15 | 30 | + 8 | — | — | — | — |
| Bermuda | 48.0 | 80 | i 8 | 37 | - 6 | e 15 | 32 | - 9 | e 10 | 31 | PP | e 19.8 |
| Ivigut | 49.2 | 39 | 8 | 51 ^a | - 1 | 15 | 56 | - 2 | 10 | 44 | PP | 22.9 |
| San Juan | 54.5 | 96 | i 9 | 31 | - 1 | i 17 | 13 | + 3 | 12 | 5 | PP | e 22.2 |
| Huancayo | 69.4 | 128 | e 11 | 13 | + 1 | i 20 | 25 | + 7 | — | — | — | e 28.4 |
| Aberdeen | 71.3 | 29 | i 20 | 34 | S | (i 20 | 34) | - 7 | 28 | 48 | SSS | 37.2 |
| Bergen | 71.3 | 24 | i 11 | 22 | - 1 | — | — | — | — | — | — | e 33.9 |
| Edinburgh | 71.8 | 31 | — | — | — | 20 | 51 | + 5 | — | — | — | — |
| Vladivostok | 71.9 | 311 | i 11 | 21 | - 6 | i 20 | 40 | - 8 | — | — | — | — |
| Stonyhurst | 73.6 | 32 | e 20 | 58 | PS | i 25 | 58 | SS | i 29 | 25 | SSS | 35.0 |
| Upsala | 75.2 | 19 | e 21 | 22 | PS | e 26 | 23? | SS | 29 | 27? | SSS | 32.9 |
| Oxford | 75.7 | 33 | — | — | — | i 21 | 30 | 0 | 26 | 26 | SS | e 31.9 |
| Kew | 76.3 | 33 | i 11 | 52 ^a | 0 | i 21 | 40 | + 3 | e 14 | 48 | PP | e 36.4 |
| La Paz | 77.3 | 125 | 11 | 59 | + 1 | i 21 | 49 | + 1 | i 27 | 1 | SS | 40.9 |
| Copenhagen | 77.4 | 23 | e 11 | 57 | - 1 | 21 | 52 | + 3 | 30 | 48 | SSS | — |
| De Bilt | 77.9 | 29 | i 12 | 2 ^a | + 1 | i 21 | 58 | + 4 | e 26 | 51? | SS | e 32.9 |
| Irkutsk | 78.2 | 332 | 12 | 4 | + 1 | 21 | 53 | - 4 | — | — | — | — |
| Uccle | 78.6 | 31 | i 12 | 4 ^a | - 1 | i 22 | 3 | + 1 | i 15 | 10 | PP | e 34.9 |
| Paris | 79.5 | 33 | e 11 | 51 | -19 | 22 | 13 | + 2 | e 15 | 5 | PP | e 34.9 |
| Potsdam | 80.4 | 25 | e 12 | 3 | -12 | i 22 | 21 | 0 | i 15 | 24 | PP | 38.9 |
| Coimbra | 80.8 | 44 | 12 | 14 | - 3 | i 22 | 24 | - 1 | — | — | — | 36.6 |
| Jena | 81.1 | 27 | e 12 | 17 | - 1 | e 22 | 27? | - 1 | — | — | — | e 31.9 |
| Lisbon | 81.5 | 46 | 12 | 22 | + 1 | 22 | 33 | + 1 | — | — | — | 35.8 |
| Besançon | 82.1 | 32 | e 11 | 32 | -52 | e 27 | 25 | SS | — | — | — | e 34.9 |
| Clermont-Ferrand | 82.1 | 35 | e 12 | 24 | 0 | e 23 | 17 | PS | e 15 | 17 | PP | e 42.5 |
| Stuttgart | 82.1 | 29 | e 12 | 22 | - 2 | e 22 | 38 | 0 | i 15 | 35 | PP | e 33.9 |
| Basel | 82.5 | 30 | e 12 | 23 | - 3 | — | — | — | — | — | — | e 33.9 |
| Neuchatel | 82.7 | 31 | e 12 | 25 | - 2 | — | — | — | — | — | — | — |
| Prague | 82.8 | 26 | e 11 | 12 | ? | e 23 | 3? | +18 | — | — | — | e 32.9 |

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----|----------|-----|----------------------|------|----------------------|-------|---------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Warsaw | | 82.8 | 21 | e 12 27 _a | 0 | e 22 48 | + 3 | — | e 33.9 |
| Sverdlovsk | | 82.8 | 357 | — | — | i 22 43 | - 2 | i 28 7 | SS |
| Zurich | | 83.0 | 31 | e 12 27 _k | - 1 | e 22 43 | - 4 | — | — |
| Toledo | | 83.3 | 43 | i 12 30 | 0 | e 22 56 | + 6 | — | 35.6 |
| San Fernando | E. | 84.7 | 47 | — | — | e 23 7 | + 3 | — | e 38.9 |
| Granada | | 85.6 | 44 | i 12 44 | + 3 | i 23 11 | - 2 | 12 54 | pP |
| Almeria | | 86.4 | 44 | i 12 45 | 0 | i 23 20 | - 1 | 13 0 | pP |
| Triest | | 86.4 | 28 | i 12 46 | + 1 | i 23 23 | + 2 | e 28 52 | SS |
| Algiers | | 89.2 | 40 | e 9 51 _? | ? | e 23 51 _? | + 4 | — | e 43.9 |
| Belgrade | | 89.4 | 24 | e 14 6 | ? | — | — | — | e 31.8 |
| Sofia | | 92.2 | 24 | e 13 31 | +18 | 23 43 | [- 2] | 16 59 | PP |
| Tashkent | | 97.5 | 350 | 13 40 | + 3 | 24 15 | [+ 1] | 26 29 | PS |
| Andijan | | 97.6 | 347 | — | — | e 24 17 | [+ 3] | 31 24 | SS |
| Wellington | | 98.3 | 222 | — | — | 31 51 _? | SS | — | 40.9 |
| Baku | | 99.2 | 5 | 20 33 | PPP | 25 18 | + 4 | 26 44 | PS |
| Christchurch | | 101.0 | 221 | 32 40 _a | SS | — | — | 39 29 | Q |
| Ksara | | 103.8 | 17 | e 17 17 | ? | 27 53 | PS | e 18 29 | PP |
| Helwan | Z. | 106.4 | 22 | 17 24 | ? | 29 39 | ? | i 18 48 | PP |
| Riverview | | 107.2 | 240 | e 17 15 _? | ? | 33 58 | SS | — | e 44.7 |
| Agra | E. | 109.4 | 338 | e 19 2 | PP | 26 43 | {+42} | — | — |
| Calcutta | N. | 110.1 | 326 | e 13 33 | P | e 24 47 | [-26] | — | e 44.0 |
| Bombay | | 118.6 | 341 | i 20 4 | PP | — | — | e 29 44 | PS |
| Kodalkanal | E. | 125.5 | 333 | — | — | e 37 47 | SS | e 45 33 | ? |

Additional readings:—

- San Francisco iEN = +1m.20s.
- Spokane iE = +2m.58s.
- Salt Lake City i = +3m.9s.
- Butte i = +3m.46s.
- Bozeman i = +3m.32s.
- Tucson i = +3m.59s., +4m.24s., +4m.56s., +6m.21s., and +6m.29s.
- Florissant iPZ = +5m.43s., iE = +10m.42s.
- Cape Girardeau iE = +6m.6s., eE = +10m.56s., +13m.54s., and +14m.54s.
- Chicago U.S.C.G.S. ePPP = +7m.8s., i = +10m.39s.
- College ePcP = +8m.15s., e = +10m.10s.
- Pittsburgh iS = +12m.25s.
- Honolulu e = +6m.55s., +7m.34s., and +12m.29s.
- Georgetown i = +8m.33s.
- Philadelphia i = +7m.27s., e = +12m.42s., +12m.50s., and +15m.16s.
- Vermont e = +7m.23s., i = +13m.15s.
- Fordham iSSS = +16m.16s.
- Harvard iZ = +7m.55s., eE = +14m.28s., and +15m.2s., eSSN = +16m.21s., eE = +16m.48s., eSSSEN = +17m.16s.
- Weston SS = +16m.25s.
- East Machias iP = +7m.53s., e = +16m.22s.
- Bermuda e = +10m.43s., i = +15m.47s., eScS = +18m.36s.
- Ivgtut ? = +19m.27s.?
- San Juan e = +10m.54s., +14m.4s., +18m.15s., and eSS = +21m.9s.
- Huancayo i = +11m.34s., +12m.42s., e = +14m.11s., i = +21m.9s., +23m.21s., +25m.34s.
- Aberdeen eEN = +32m.19s.
- Bergen eZ = +27m.51s.
- Stonyhurst i = +21m.6s.
- Kew ePcPZ = +12m.3s., iPPPNZ = +16m.36s., eSKSEN = +21m.54s., ePSEN = +22m.16s., eNZ = +22m.34s., eSSZ = +25m.58s., eSSEN = +26m.34s., eSSS = +30m.21s.
- La Paz iPZ = +12m.8s.
- Copenhagen ? = +26m.48s.
- Uccle SSN = +26m.46s.
- Paris P_cP = +12m.10s., eSS = +27m.18s., eSSS = +30m.51s.?
- Potsdam iPZ = +12m.12s., iZ = +12m.15s., iP_cPZ = +12m.22s., iP_cPN = +12m.28s., i = +12m.51s.?, iE = +12m.58s., iSKSN = +22m.35s., iSKSN = +22m.39s., iN = +32m.1s., and +32m.18s.
- Coimbra ? = +20m.34s., iSN = +22m.28s.
- Jena eP = +12m.21s.?, eSE = +22m.32s.
- Lisbon ?N = +11m.54s. and +11m.57s.
- Stuttgart i = +12m.32s., eN = +27m.17s., eSSN = +28m.11s.
- Warsaw eZ = +20m.26s., eS?N = +22m.51s.
- Granada PP = +15m.59s., SKS = +22m.32s., sS = +24m.30s., sS = +29m.13s.
- Almeria PP = +16m.14s., PPP = +18m.8s., SS = +29m.5s., SSS = +32m.41s.
- Triest ePP = +18m.25s., iS = +23m.40s., i = +24m.34s. and +25m.42s.
- Belgrade e = +22m.29s., e = +27m.52s.

Continued on next page.

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Sofia iPSN = +25m.29s.
 Tashkent S = +25m.2s.
 Baku SKS = +24m.40s.
 Helwan iZ = +19m.9s., +20m.39s., and +30m.12s.
 Riverview eZ = +34m.7s.
 Calcutta iPS = +25m.55s., eSS = +30m.54s.
 Bombay eE = +25m.59s.
 Long waves were also recorded at Oaxaca, Colombo, and Tananarive.

Oct. 3d. Readings also at 2h. (Harvard), 6h. (near Lick), 10h. (near Algiers), 13h. (near Ksara), 14h. (Colombo), 16h. (Manila, near Mizusawa, Medan, and near Batavia), 17h. (near Batavia), 20h. (Oaxaca, Ksara, Medan and near Batavia), 22h. (near San Juan, Harvard, Weston, and near Batavia), 23h. (near San Juan and La Paz).

Oct. 4d. Readings at 1h. (near Berkeley, Branner and Lick), 3h. (Batavia and near Granada), 6h. (near Lick (2)), 10h. (Balboa Heights), 17h. (near Harvard), 19h. (near Florissant and St. Louis), 21h. (Batavia (2)).

Oct. 5d. 7h. 4m. 38s. Epicentre 46°·0S. 36°·0E.

A = +·5640, B = +·4097, C = -·7170; $\delta = +4$; $h = -4$;
 D = +·588, E = -·809; G = -·580, H = -·421, K = -·697.

Approximate Epicentre.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|----------|-------|----------------|------|--------------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Tananarive | 28·7 | 23 | e 5 52 | - 9 | e 10 42 | - 8 | 11 57 SS | 13·6 |
| Colombo | E. 65·6 | 50 | 11 10 | +22 | 19 34 | + 1 | — | 26·9 |
| Kodaikanal | E. 67·2 | 46 | 10 58 | 0 | i 19 54 | + 2 | i 27 22? ? | — |
| Bombay | E. 72·7 | 37 | e 11 29 | - 3 | e 20 49 | - 8 | e 13 42 PP | 31·7 |
| Hyderabad | N. 73·9 | 43 | e 11 42 | + 3 | 21 9 | - 1 | — | 35·0 |
| Helwan | Z. 75·6 | 357 | e 11 46 | - 2 | 22 2 | +33 | 14 31 PP | — |
| Ksara | 79·4 | 1 | e 12 21 | +12 | e 22 17 | + 7 | — | e 36·4 |
| Agra | E. 82·2 | 38 | e 12 25 | + 1 | e 22 31 | - 8 | — | — |
| Wellington | 85·6 | 150 | — | — | 23 12 | - 1 | — | 41·4 |
| Baku | 86·9 | 11 | 13 56 | +68 | 23 20 | - 6 | 24 12 PS | — |
| La Paz | 87·8 | 249 | e 12 54 | + 2 | i 23 32 | - 2 | — | 38·4 |
| Sofia | 89·0 | 351 | e 13 34? | +36 | e 23 22? [- 5] | — | — | e 29·4 |
| Almeria | 89·4 | 330 | 13 5 | + 5 | 24 5 | +16 | 16 49 PP | 40·4 |
| Granada | 90·1 | 329 | 13 2 | - 1 | e 23 46 | - 9 | 16 21 PP | 39·0 |
| Belgrade | 91·5 | 349 | — | — | e 34 3 | SSS | — | e 57·0 |
| Tashkent | 91·9 | 24 | 13 5 | - 6 | e 23 45 [+ 1] | — | 17 13 PP | — |
| Toledo | 92·7 | 330 | e 13 19 | + 4 | e 24 22 | + 4 | — | 38·5 |
| Triest | 93·3 | 344 | e 13 46 | +28 | i 25 35 | PS | e 17 58 PP | — |
| Coimbra | 94·6 | 327 | e 13 58 | +34 | e 26 22 | PPS | — | e 48·0 |
| Clermont-Ferrand | 95·9 | 337 | e 13 38? | + 8 | — | — | e 17 14? PP | e 48·5 |
| Stuttgart | 97·2 | 343 | e 13 39 | + 3 | — | — | e 31 22? SS | e 48·0 |
| Potsdam | N. 100·0 | 346 | e 17 22? | PP | i 26 50 | PS | — | e 45·4 |
| Uccle | 100·2 | 340 | e 17 46 | PP | e 24 29 [+ 1] | — | — | e 44·4 |
| De Bilt | 101·3 | 341 | i 17 56 | PP | e 24 37 [+ 4] | — | e 19 52 PPP | e 45·4 |
| Kew | 102·0 | 338 | e 18 4 | PP | e 24 40 [+ 3] | — | e 27 8 PS | e 43·9 |
| Sverdlovsk | 104·5 | 14 | 18 20 | PP | 24 54 [+ 6] | — | 25 51 S | — |
| Upsala | 106·6 | 350 | — | — | e 25 22? [+24] | — | e 28 22? PPS | e 56·4 |
| Tucson | 151·1 | 254 | i 19 54 | [+ 5] | — | — | — | — |
| Palomar | Z. 155·7 | 248 | e 20 24 | [+29] | — | — | — | — |
| Riverside | Z. 156·4 | 248 | e 20 19 | [+23] | — | — | — | — |
| Pasadena | Z. 157·1 | 248 | e 20 24 | [+27] | — | — | — | — |
| Tinemaha | Z. 158·8 | 254 | e 20 18 | [+19] | — | — | — | — |

Additional readings:—

Bombay ePcPEN = +11m.53s., eSN = +20m.52s., eScSE = +21m.34s., SS?E = +24m.49s.

Helwan iZ = +12m.22s. and +14m.1s.

Almeria PPP = +19m.1s., PS = +25m.37s., PPS = +26m.5s., SS = +30m.29s., and SSS = +34m.21s.

Continued on next page.

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Granada $i = +20m.22s.$, $iS = +24m.6s.$, and $ePS = +26m.7s.$
 Tashkent SS = +29m.16s.?
 Trieste $i = +30m.15s.$
 Coimbra eSE = +27m.40s.
 Stuttgart e = +36m.29s.
 Potsdam eZ = +17m.46s., eN = +20m.22s.?, and eE = +26m.56s.
 Uccle eN = +27m.7s., and eEN = +32m.7s.
 De Bilt ePS? = +27m.2s., and eSS? = +31m.52s.
 Kew ePPSZ = +27m.44s., eZ = +29m.51s., eSSZ = +30m.56s., eSSEN = +32m.40s.,
 eSSSEZ = +34m.52s., eSSSN = +35m.52s.
 Sverdlovsk SS = +33m.10s.
 Upsala eN = +33m.22s.?, eE = +48m.22s.?, and eN = +51m.22s.?
 Tucson $i = +20m.5s.$ and $+21m.0s.$, eL = +21m.28s.
 Tinemaha eZ = +21m.0s.
 Long waves were also recorded at Huancayo and other European stations.

Oct. 5d. 10h. 11m. 11s. Epicentre $14^{\circ}9S$. $173^{\circ}3W$. (as on 1940, August 11d.).

A = -.9599, B = -.1128, C = -.2569; $\delta = +13$; $h = +6$;
 D = -.117, E = +.993; G = +.255, H = +.030, K = -.967.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|----------|------|----------|-------|---------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Apia | 1.9 | 54 | i 0 32 | - 2 | i 0 55 | - 4 | — | — |
| Auckland | 24.2 | 204 | 5 24? | + 5 | i 9 24 | -11 | 10 19 | i 10.8 |
| Arapuni | 25.0 | 202 | 5 37? | +10 | 10 13 | +24 | 5 55? | pP 12.8 |
| New Plymouth | 26.4 | 203 | 5 41 | + 1 | — | — | — | — |
| Wellington | 28.2 | 199 | 5 49 | - 7 | 10 47 | + 6 | 6 5 | pP 14.3 |
| Christchurch | 30.9 | 199 | 6 16a | - 4 | 11 44 | +20 | 13 18 | Q 15.7 |
| Brisbane | 33.6 | 242 | i 8 2 | PP | — | — | — | 14.4 |
| Sydney | 37.1 | 233 | e 8 7? | +53 | e 13 19? | +18 | — | — |
| Riverview | 37.2 | 233 | i 7 11 | - 4 | e 12 44 | -18 | i 8 43 | PP e 17.7 |
| Honolulu | 39.1 | 24 | e 7 38 | + 7 | e 13 29 | - 2 | e 8 44 | PP 16.2 |
| Adelaide | 47.4 | 235 | e 13 4 | ? | i 18 53 | SS | — | i 29.8 |
| Yokohama | 67.1 | 319 | e 11 13 | +16 | — | — | — | — |
| Sendai | 68.2 | 323 | e 11 5 | + 1 | 20 5 | + 1 | — | — |
| Kobe | 69.5 | 317 | e 11 15 | + 3 | 20 12 | - 8 | — | — |
| Santa Barbara | 70.8 | 45 | i 11 16k | - 4 | — | — | — | — |
| Santa Clara | 71.0 | 41 | — | — | i 20 47 | +10 | — | e 32.2 |
| Berkeley | 71.1 | 41 | e 11 47 | +25 | i 20 48 | +10 | — | e 31.3 |
| Manila | 71.3 | 291 | i 11 25 | + 2 | i 21 1 | +20 | — | — |
| Ukiah | 71.3 | 39 | e 11 37 | +14 | e 20 46 | + 5 | e 21 25 | PP e 30.0 |
| La Jolla | 71.6 | 47 | i 11 27 | + 2 | — | — | — | — |
| Pasadena | 71.7 | 46 | i 11 27k | + 1 | i 20 47 | + 2 | — | e 29.5 |
| Mount Wilson | 71.8 | 46 | i 11 28k | + 2 | — | — | — | — |
| Palomar | 72.1 | 47 | i 11 29k | + 1 | — | — | — | — |
| Riverside | 72.1 | 46 | i 11 29k | + 1 | e 20 52 | + 2 | — | — |
| Haiwee | 72.9 | 44 | i 11 36 | + 3 | e 20 59 | 0 | — | — |
| Tinemaha | 73.2 | 43 | i 11 36k | + 1 | e 21 6 | + 4 | — | — |
| Taikyu | 74.6 | 314 | e 11 43 | 0 | 19 30 | ? | — | — |
| Tucson | 76.0 | 51 | i 11 52 | + 1 | i 21 36 | + 2 | e 14 57 | PP i 34.6 |
| Victoria | 77.2 | 32 | e 11 55? | - 2 | i 21 47 | 0 | 26 55? | SS 34.8 |
| Batavia | 78.7 | 267 | 12 21 | +15 | e 22 10 | + 7 | (22 41) | PS — |
| Salt Lake City | 79.4 | 43 | e 12 12 | + 3 | e 22 10 | 0 | e 15 33 | PP e 37.0 |
| Logan | 79.9 | 42 | i 12 15 | + 3 | i 22 16 | 0 | — | e 36.4 |
| Butte | 81.7 | 38 | e 12 20 | - 2 | i 22 33 | - 1 | e 15 7 | PP e 38.1 |
| College | 81.9 | 11 | i 12 20 | - 3 | i 22 32 | - 4 | e 15 28 | PP e 34.6 |
| Bozeman | 82.4 | 39 | i 12 27 | + 2 | i 22 42 | + 1 | e 27 29 | SS e 34.2 |
| Medan | 89.0 | 274 | 12 49? | - 9 | — | — | — | — |
| Lincoln | 89.9 | 48 | e 13 17 | +15 | e 23 33 | [+ 1] | e 18 17 | PPP e 42.9 |
| Florissant | 93.9 | 52 | e 13 22 | + 1 | i 23 56 | [+ 1] | i 25 52 | PS — |
| St. Louis | 93.9 | 52 | i 13 25 | + 4 | e 23 58 | [+ 3] | — | e 44.1 |
| Cape Girardeau | 94.1 | 52 | e 13 26 | + 4 | e 23 53 | [- 3] | e 27 3 | PPS — |
| Huancayo | 94.5 | 104 | i 13 26 | + 3 | i 24 3 | [+ 5] | e 17 50 | PP e 38.6 |
| Chicago U.S.C.G.S. | 96.7 | 49 | — | — | e 24 7 | [- 3] | e 31 19 | SS e 45.4 |
| Irkutsk | 97.1 | 322 | e 13 37 | + 2 | 25 10 | +14 | 17 41 | PP — |
| La Paz | 99.8 | 110 | e 13 49? | + 2 | i 25 29 | +10 | 32 25 | SSP 42.5 |
| Columbia | 100.1 | 58 | — | — | e 24 29 | [+ 2] | — | e 45.1 |

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|----------------------|-------|-----------|-------|----------|-------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Pittsburgh | 102.1 | 51 | i 16 22 | ? | i 24 35 | [- 2] | — | — |
| Philadelphia | 105.6 | 53 | e 18 41 | PP | e 24 55 | [+ 2] | e 27 50 | PS e 46.5 |
| Ottawa | 105.8 | 46 | — | — | e 24 51 | [- 3] | e 33 25? | SS e 48.8 |
| Fordham | 106.7 | 51 | e 14 35 | P | i 25 3 | [+ 5] | e 18 45 | PP |
| Colombo | E. 108.0 | 272 | e 18 49? | PP | — | — | — | — |
| Seven Falls | 109.3 | 44 | — | — | e 25 15 | [+ 6] | e 28 33 | PS 49.8 |
| San Juan | 110.6 | 75 | — | — | e 25 15 | [+ 1] | e 34 21 | SS e 44.9 |
| East Machias | 111.7 | 48 | — | — | e 34 49 | SS | — | e 56.3 |
| Agra | E. 113.1 | 293 | e 19 26 | PP | — | — | — | — |
| Bombay | 117.0 | 284 | e 14 46 | P | — | — | e 19 58 | PP |
| Rio de Janeiro | 118.3 | 127 | e 25 49 | SKS | (e 25 49) | [+ 5] | — | — |
| Tashkent | 120.3 | 310 | 18 55 | [+ 2] | e 25 49 | [- 2] | 20 35 | PP |
| Sverdlovsk | 121.8 | 329 | 15 33 | P | i 25 57 | [+ 1] | i 20 31 | PP |
| Upsala | 134.5 | 353 | e 22 41? | PKS | 26 35 | [+ 5] | e 44 49? | SSS e 63.8 |
| Bergen | 134.6 | 0 | e 21 49? | PP | — | — | — | e 68.8 |
| Baku | 134.8 | 313 | 19 28 | [+ 7] | 28 52 | {+ 2} | 40 26 | SSP |
| Aberdeen | 137.4 | 7 | i 22 23 | PP | i 29 6 | {+ 1} | i 40 21 | SS e 66.6 |
| Copenhagen | 139.1 | 354 | 19 34 | [+ 5] | — | — | 22 34 | PP |
| Stonyhurst | 140.6 | 8 | e 19 49? | [+17] | — | — | e 22 49? | PP e 65.8 |
| Potsdam | 142.4 | 354 | e 19 35 _a | [0] | i 29 35 | {- 1} | i 33 6 | PS e 67.8 |
| De Bilt | 143.0 | 1 | e 19 36 | [0] | — | — | e 40 49? | SS e 65.8 |
| Kew | 143.2 | 6 | i 19 41 _k | [+ 5] | 26 23 | [-21] | i 20 3 | pPKP e 67.3 |
| Jena | 143.9 | 353 | i 19 37 | [0] | — | — | e 22 5 | PP e 68.8 |
| Uccle | 144.2 | 3 | i 19 39 _a | [+ 1] | i 29 44 | {- 1} | i 19 51 | pPKP e 60.8 |
| Paris | 146.1 | 4 | e 19 46 | [+ 5] | e 30 49 | {+52} | e 23 16? | PKS e 70.8 |
| Stuttgart | 146.3 | 356 | e 19 43 _a | [+ 2] | e 29 59 | {+ 1} | e 42 49? | SSP e 68.8 |
| Bucharest | 146.4 | 334 | e 19 31 | [-10] | — | — | — | 80.1 |
| Zurich | 147.3 | 358 | e 19 45 _a | [+ 2] | — | — | — | — |
| Basle | 147.5 | 358 | e 19 48 | [+ 5] | — | — | — | — |
| Ksara | 147.6 | 310 | e 20 47 | [+68] | — | — | e 22 56 | PP |
| Belgrade | 148.1 | 341 | i 19 26 | [-18] | — | — | — | e 71.8 |
| Neuchatel | 148.1 | 358 | e 19 47 | [+ 3] | — | — | — | — |
| Sofia | 148.9 | 335 | e 19 55 | [+10] | e 33 57 | PS | — | 78.8 |
| Triest | 148.9 | 349 | e 20 34 | [+49] | — | — | — | e 74.8 |
| Clermont-Ferrand | 149.1 | 5 | e 19 50 | [+ 4] | — | — | — | e 72.4 |
| Coimbra | 151.6 | 24 | 20 10 | [+21] | 34 26 | ? | 23 46 | PP 68.5 |
| Lisbon | 152.5 | 26 | 19 57 | [+ 6] | — | — | 20 27 | PKP 71.7 |
| Helwan | 152.9 | 307 | i 19 54 _k | [+ 2] | — | — | 23 25 | PKS |
| Toledo | 153.5 | 18 | i 19 56 | [+ 4] | — | — | i 20 30 | pPKP 72.1 |
| San Fernando | N. 155.7 | 27 | e 20 18 | [+23] | e 34 46 | ? | — | 70.8 |
| Granada | 156.1 | 20 | i 19 59 | [+ 3] | 31 13 | {+21} | 20 43 | pPKP e 75.4 |
| Almeria | 156.8 | 18 | 19 49 | [- 8] | 26 44 | [-17] | 20 11 | pPKP 62.8 |
| Algiers | 158.0 | 7 | e 22 31 | ? | e 37 34 | PPS | — | — |

Additional readings:—

Arapuni Q = +11m.43s. ?
 Wellington PPZ = +6m.46s., PPPZ = +7m.5s., iZ = +7m.34s., +8m.10s., +8m.37s.,
 and +9m.45s., i = +11m.6s., Q = +12m.47s.
 Riverview iEZ = +7m.30s., i = 8m.57s., eN = +15m.43s.
 Honolulu eP_cP = +9m.19s., e = +13m.13s. and +13m.39s.
 Adelaide i = +14m.21s., SSN = +21m.25s., i = +21m.43s.
 Berkeley iSN = +20m.51s.
 Pasadena iZ = +11m.40s.
 Tucson i = +13m.7s., +15m.15s., and +17m.52s., iPS = +22m.18s., eSS = +26m.37s.,
 e = +27m.31s.
 Batavia PS given as S.
 Salt Lake City iS = +22m.14s., i = +22m.41s.
 Butte e = +12m.49s., +22m.52s., and +27m.20s.
 College e = +12m.24s.
 Bozeman i = +23m.39s.
 Lincoln eS = +24m.5s.
 Florissant iZ = +13m.26s., +13m.33s., and +13m.39s., iSKKSE = +24m.19s., iSE =
 +24m.35s., iPPS?E = +26m.13s.
 St. Louis eSEN = +24m.36s.
 Cape Girardeau eE = +13m.34s., eSKKSE = +24m.19s., eSE = +24m.36s.
 Huancayo e = +15m.25s., iS = +24m.48s., iPS = +26m.2s., i = +26m.18s., e =
 +30m.23s., iSS = +31m.13s., e = +37m.48s.
 Chicago U.S.C.G.S. e = +26m.25s. and +29m.23s.

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Irkutsk SS = +31m.41s.
 Philadelphia eS = +26m.12s., e = +26m.34s. and +33m.0s., eSS = +33m.36s., eSSS = +37m.25s.
 Ottawa eN = +26m.16s., eE = +27m.58s.
 Fordham iS? = +26m.20s., iPS = +28m.5s., e = +29m.25s.
 Seven Falls e = +34m.34s.
 San Juan eS = +26m.49s., iS = +26m.53s., e = +29m.19s. and +34m.3s.
 Sverdlovsk iPKP = +18m.57s.
 Upsala eE = +22m.49s.?, eN = +33m.49s.?, eE = +41m.49s.?, eN = +56m.49s.?
 Copenhagen ? = +23m.4s., +23m.18s., and +23m.29s.
 Potsdam ePE = +19m.40s., iZ = eN = +19m.46s., eE = +22m.36s., iZ = +22m.50s., iPKSNZ = +23m.3s., iE = +23m.39s., iPPZ = +26m.3s.?, iE = +28m.10s., iZ = +34m.17s., iSSPN = +41m.58s.
 Kew iPP = +23m.2s., iPKS = +23m.25s., ePPPEZ = +26m.1s., SKKSZ = +28m.3s., SKKP = +31m.18s., PS = +33m.1s., eSS = +40m.13s., eSSS = +46m.49s.?
 Jena e = +20m.3s.
 Uccle iSKPZ = +23m.6s., ePSKSN = +33m.8s., eSSN = +40m.43s.
 Paris ePPP? = +27m.49s.?
 Stuttgart e = +19m.54s., i = +19m.58s., iZ = +20m.8s., ePSKSN = +33m.19s.
 Bucharest eEN = +19m.49s.
 Zurich e = +19m.48s.
 Belgrade i = +19m.55s., e = +21m.6s.
 Trieste e = +22m.13s.
 Clermont-Ferrand iPKP = +19m.55s.
 Coimbra PPP = +27m.34s., SS = +41m.57s.
 Lisbon PPN = +23m.30s.?, PPE = +23m.50s., PPZ = +23m.57s.
 Helwan PKKPZ = +20m.22s., PPZ = +23m.58s., iZ = +24m.34s., +33m.19s., and +39m.1s.
 Granada sP = +21m.10s., iPP = +24m.3s., pPP = +24m.15s., sPP = +24m.33s., sSKKS = +32m.47s., SKSP = +33m.54s., SS = +41m.50s., sSS = +45m.10s.
 Almeria PKS = +23m.19s., PP = +23m.56s., PPP = +27m.33s., SKKS = +30m.41s., PPS = +37m.5s., SS = +44m.37s., SSS = +49m.33s.
 Long waves were also recorded at Tananarive, Prague, and Harvard.

Oct. 5d. Readings also at oh. (near Batavia), 7h. (Algiers and near Lick), 9h. (Kodaikanal), 10h. (near Lick), 12h. (Tucson), 13h. (Amboina), 15h. (Frunse, Tashkent, and Tchimbkent), 16h. (near Tchimbkent), 17h. (near Apia), 20h. (Helwan, Ksara, and near Mizusawa), 23h. (Sverdlovsk).

Oct. 6d. 6h. 58m. 59s. Epicentre 40°·6N. 124°·6W. (as on 3d.).

A = -·4324, B = -·6268, C = +·6482; $\delta = +1$; $h = -2$.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|----|----------|-----|--------------------|----------------|---------|----------------|--------|----------------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Ferndale | E. | 0·2 | 98 | i 0 11 | + 1 | i 0 19 | + 3 | — | — |
| Ukiah | | 1·8 | 144 | e 0 34 | + 2 | i 1 15 | +19 | e 0 38 | P _g i 2·0 |
| Berkeley | | 3·3 | 145 | i 0 51 | - 2 | i 1 34 | - 1 | i 0 59 | P _g — |
| San Francisco | | 3·3 | 147 | e 0 51 | - 2 | e 1 20 | -15 | — | — |
| Branner | | 3·7 | 148 | i 0 57 | - 3 | i 1 42 | - 3 | — | — |
| Santa Clara | | 3·8 | 147 | i 1 6 | + 5 | i 2 5 | S _g | — | — |
| Lick | | 4·0 | 143 | e 1 2 | - 2 | e 1 54 | + 2 | e 1 17 | P _g — |
| Tinemaha | | 6·0 | 125 | i 1 36 | + 4 | — | — | — | — |
| Haiwee | | 6·9 | 128 | i 1 46 | + 1 | — | — | — | — |
| Santa Barbara | Z. | 7·2 | 146 | i 1 51 | + 2 | — | — | — | — |
| Seattle | | 7·3 | 12 | e 2 39 | P _g | — | — | — | e 4·2 |
| Victoria | | 8·0 | 5 | e 1 31? | -29 | — | — | — | 4·0 |
| Mount Wilson | | 8·2 | 138 | i 2 1 | - 2 | — | — | — | — |
| Pasadena | | 8·2 | 138 | i 2 1 _a | - 2 | — | — | — | — |
| Riverside | | 8·7 | 136 | i 2 9 | - 1 | — | — | — | — |
| Palomar | Z. | 9·5 | 137 | i 2 16 | - 4 | — | — | — | — |
| Logan | | 9·7 | 79 | e 2 27 | + 5 | e 4 36 | SS | e 5 19 | S _g 5·7 |
| Salt Lake City | | 9·7 | 85 | e 2 27 | + 5 | — | — | i 2 46 | PPP i 5·6 |
| Butte | | 10·3 | 54 | i 2 35 | + 3 | e 4 40 | SS | — | e 5·6 |
| Bozeman | | 11·2 | 57 | e 2 59 | PP | e 5 35 | SSS | e 3 9 | PPP e 6·1 |
| Tucson | | 13·9 | 123 | i 3 22 | + 1 | 4 59 | -58 | i 3 32 | PP e 6·8 |
| Lincoln | | 21·2 | 80 | — | — | e 8 47 | + 6 | — | e 12·8 |
| Florissant | | 26·3 | 83 | e 5 38 | - 1 | e 10 46 | SS | — | 14·5 |
| St. Louis | | 26·5 | 83 | i 5 42 | + 1 | — | — | — | e 16·0 |
| College | | 27·7 | 339 | e 6 28 | PP | — | — | — | e 12·6 |

Continued on next page.

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1941

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| | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. |
|----------|----------|-----|--------|--------|---------|--------|-------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Ottawa | 35.6 | 65 | e 6 59 | - 2 | e 17 17 | ? | — | 19.0 |
| San Juan | 54.5 | 96 | e 9 34 | + 2 | e 17 21 | +11 | — | e 30.9 |
| De Bilt | 77.9 | 29 | — | — | e 21 17 | -53 | — | — |
| Potsdam | 80.4 | 24 | e 3 1 | ? | — | — | — | e 42.0 |
| Warsaw | 82.8 | 21 | e 4 17 | ? | — | — | — | e 18.0 |

Additional readings:—

Berkeley iN = +1m.8s., iE = +1m.14s., iSN = +1m.31s., eN = +2m.0s., eE = +2m.6s.,
iE = +2m.9s.

San Francisco eSN = +1m.24s.

Lick e = +2m.48s.

Logan e = +2m.35s. and +5m.25s.

Salt Lake City iP = +2m.29s., i = +5m.28s.

Butte e = +3m.4s.

Bozeman e = +3m.29s. and +5m.40s.

Tucson e = +3m.37s. and +6m.19s.

Long waves were also recorded at East Machias, Philadelphia, Columbia, Chicago U.S.C.G.S., Honolulu, Kew, Weston, and Harvard.

Oct. 6d. 23h. Local Japanese shock.

Tokyo Imperial University gives Epicentre 36°·29N. 140°·71E.

Tokyo Imp. Univ. P = 47m.49s., S = 48m.3s.

Kamakura P = 47m.52s., S = 48m.8s.

Koyama P = 47m.52s., S = 48m.14s.

Mitaka P = 47m.52s., S = 48m.8s.

Susaki P = 47m.52s., S = 48m.20s.

Titibu P = 47m.52s., S = 48m.7s.

Togane P = 47m.52s., S = 48m.5s.

Tukubasan P = 47m.52s., S = 48m.0s.

Komaba P = 47m.53s., S = 48m.7s.

Mizusawa ePE = 48m.13s., iS = 48m.45s.

Oct. 6d. Readings also at 0h. (La Paz and near Branner), 1h. (near La Paz), 3h. (Wellington), 5h. (near Harvard and Apia), 6h. (Tinemaha (2), Mount Wilson (2), Pasadena, Palomar, Tucson, and Honolulu), 7h. (near Ferndale (3)), 9h. (Tucson, Palomar, Pasadena, and Tinemaha), 11h. (near Lick), 12h. (Lick (3), Apia, and Seattle), 14h. (Paris and near La Paz), 16h. (Pasadena, near Ottawa, Tinemaha, Mount Wilson, Harvard, Riverside, Tucson, near Shawinigan Falls, and Seven Falls), 17h. (Seattle), 18h. (Seattle), 22h. (near Berkeley), 23h. (Ksara and Helwan).

Oct. 7d. 11h. Probably South-east Europe.

Triest eP = 13m.19s., eS = 14m.2s.

Sofia ePEN = 13m.46s., eEN = 15m.24s.

Zurich eP = (13m.58s.), eS = (15m.18s.).

Basle eP = (14m.20s.), e = (16m.29s.).

Neuchatel eP = (14m.22s.).

Stuttgart eP? = 14m.25s., eP_s = 15m.7s., eSNW = 15m.39s., iS*? = 15m.46s.
and 16m.0s., S_s?EN = 16m.11s.

Zurich, Basle, and Neuchatel records are for 10h.

Later readings, probably long waves, were recorded at other European stations.

Oct. 7d. Readings also at 3h. (near Almeria, Granada, and Toledo), 5h. (Bucharest), 6h. (Huancayo, La Paz, Haiwee, Mount Wilson, Palomar, Tinemaha, Tucson, and near Sofia), 9h. (near Sofia), 10h. (Bucharest, Belgrade, Sofia, Triest, and Potsdam), 12h. (Belgrade), 14h. (Helwan), 16h. (La Paz), 19h. (Bucharest, Sofia, and near Almata), 20h. (Lick), 22h. (near Baku), 23h. (Philadelphia).

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1941

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Oct. 8d. 4h. 22m. 13s. Epicentre 10°·4N. 85°·7W.

A = +·0738, B = -·9810, C = +·1794; $\delta = -1$; $h = +6$;
D = -·997, E = -·075; G = +·013, H = -·179, K = -·984.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|---------|------|----------|------|---------|-------------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Balboa Heights | 6·2 | 104 | e 1 47? | P* | — | — | — | — |
| Merida | 11·1 | 341 | e 2 45 | + 2 | — | — | — | — |
| San Juan | 20·5 | 66 | e 4 47 | + 5 | e 8 44 | +17 | e 5 10 | PP e 11·1 |
| Columbia | 23·0 | 9 | e 5 16 | + 9 | e 9 10 | - 4 | e 9 48 | SS e 12·1 |
| Huancayo | 24·6 | 157 | e 5 25 | + 2 | i 9 56 | +14 | — | i 11·3 |
| Florissant | 28·6 | 353 | i 5 58 | - 2 | e 11 0 | +12 | e 6 43 | PP — |
| Bermuda | 29·1 | 40 | e 6 4 | 0 | e 10 43 | -13 | e 6 46 | PP e 13·1 |
| Chicago U.S.C.G.S. | 31·3 | 357 | e 7 25 | PP | e 12 9 | +38 | — | e 13·1 |
| Tucson | 31·8 | 317 | i 6 27 | - 1 | e 11 43 | + 5 | i 7 27 | PP e 13·3 |
| La Paz | 31·9 | 147 | 7 2 | +33 | i 13 11 | SS | 7 49 | PPP 16·1 |
| Ottawa | 35·9 | 12 | 7 3 | - 1 | 12 56 | +14 | 8 28 | PP e 18·8 |
| La Jolla | 36·6 | 313 | e 7 8 | - 2 | — | — | — | — |
| Riverside | 37·3 | 314 | e 7 45 | +29 | — | — | e 9 37 | P _c P — |
| East Machias | 37·7 | 22 | e 8 13 | PP | — | — | — | e 21·0 |
| Mount Wilson | 37·9 | 314 | i 7 20 | 0 | e 13 43 | +30 | — | — |
| Pasadena | 38·0 | 314 | i 7 20 | - 1 | i 13 29 | +15 | e 9 37 | P _c P e 20·8 |
| Salt Lake City | 38·1 | 328 | e 7 18 | - 4 | — | — | e 9 1 | PP e 16·5 |
| Seven Falls | 38·7 | 17 | e 9 17? | PPP | — | — | — | 16·8 |
| Haiwee | 38·9 | 317 | e 7 28 | - 1 | — | — | — | — |
| Santa Barbara | 39·2 | 313 | e 7 33 | + 2 | — | — | — | — |
| Tinemaha | 39·6 | 318 | e 7 34 | - 1 | — | — | i 9 45 | P _c P — |
| Bozeman | 41·3 | 334 | e 9 54 | PPP | e 14 10 | + 6 | — | e 18·1 |
| Santa Clara | 42·2 | 316 | e 7 58 | + 2 | e 14 30 | +13 | — | e 23·7 |
| Berkeley | 42·7 | 316 | — | — | e 14 24 | 0 | — | e 24·3 |
| Ukiah | 44·0 | 317 | — | — | e 14 52 | + 9 | — | e 25·0 |
| Victoria | 49·4 | 328 | — | — | e 16 17? | +17 | — | 28·8 |
| Toledo | 77·0 | 52 | e 11 49 | - 7 | — | — | — | 37·8 |
| Uccle | 82·1 | 40 | — | — | e 22 42 | + 4 | e 23 35 | PS 37·8 |
| De Bilt | 82·4 | 38 | e 12 22 | - 3 | e 22 52 | +11 | e 23 47 | PS e 37·8 |

Additional readings:—

San Juan e = +5m.54s. and +8m.54s.

Huancayo e = +6m.35s., i = +10m.8s.

Florissant iN = +6m.7s., ePPPN = +7m.7s., eE = +11m.53s.

Tucson e = +6m.37s., iPPP = +7m.38s.

Bozeman e = +12m.50s.

Berkeley eSE = +14m.27s.

Uccle eSSE = +28m.24s., eSSSE = +31m.41s.

Long waves were also recorded at Stonyhurst, Harvard, Warsaw, Potsdam, Logan, College, Butte, Kew, Zurich, and Clermont-Ferrand.

Oct. 8d. 5h. 24m. 15s. Epicentre 29°·0N., 143°·0E.

A = -·6996, B = +·5272, C = +·4823; $\delta = -1$; $h = +2$;
D = +·602, E = +·799; G = -·385, H = +·290, K = -·876.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|----------|------|---------|------|---------|--------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Mizusawa | 10·2 | 352 | e 2 43 | PP | i 4 22 | - 5 | — | — |
| Amboina | 35·5 | 206 | 6 44 | -16 | 12 15 | -21 | — | — |
| Irkutsk | 36·8 | 320 | i 7 15 | + 4 | — | — | — | — |
| Medan | 49·0 | 248 | 8 45 | - 5 | 15 47 | - 8 | — | — |
| Calcutta | 49·3 | 276 | e 8 59 | + 6 | e 16 14 | +15 | i 18 49 | SS i 24·7 |
| Batavia | 49·3 | 231 | 8 33 | -20 | — | — | — | — |
| Honolulu | 53·6 | 84 | e 8 50 | -35 | i 17 6 | + 8 | — | e 25·5 |
| Almata | 53·9 | 305 | 9 28 | + 1 | — | — | — | — |
| College | 56·0 | 30 | e 9 50 | + 7 | e 17 29 | - 1 | — | e 26·1 |
| Agra | 56·7 | 284 | 9 36 | -12 | 17 26 | -14 | — | — |
| Andijan | 57·7 | 302 | e 9 57 | + 2 | e 18 1 | + 8 | — | — |
| Hyderabad | 59·8 | 274 | e 10 4 | - 5 | e 18 16 | - 4 | 19 50 | S _c S — |
| Tashkent | 59·8 | 303 | e 10 14 | + 5 | e 18 24 | + 4 | — | — |
| Sverdlovsk | 62·2 | 323 | i 10 23 | - 3 | i 18 49 | - 2 | — | — |
| Riverview | 63·0 | 173 | e 10 45? | +14 | i 18 54 | - 7 | — | e 30·2 |

Continued on next page.

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1941

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|--------------------|----|----------|-----|----------------------|-------|----------|-------|----------|------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Kodaikanal | E. | 63.8 | 268 | i 10 51 _a | +15 | i 19 25 | +14 | 20 50 | PS | 32.8 |
| Bombay | | 64.1 | 278 | i 10 32 | - 6 | e 19 5 | - 9 | 23 23 | SS | 30.8 |
| Victoria | | 71.1 | 45 | 11 15? | - 7 | 20 41 | + 3 | — | — | 32.8 |
| Arapuni | | 73.4 | 154 | — | — | 20 45? | -20 | — | — | 39.8 |
| Baku | | 74.0 | 308 | 11 40 | + 1 | i 21 12 | + 1 | — | — | — |
| Ukiah | | 75.0 | 54 | e 12 15 | +30 | e 21 25 | + 2 | — | — | e 34.1 |
| Wellington | | 75.9 | 156 | — | — | 21 25 | - 7 | 30 7 | SSS | 39.8 |
| Berkeley | | 76.3 | 55 | i 14 36 | PP | i 21 41 | + 4 | — | — | e 34.1 |
| Santa Clara | | 76.7 | 55 | e 12 2 | + 7 | e 21 43 | + 2 | — | — | e 35.7 |
| Christchurch | | 77.1 | 159 | 21 38 | S | (21 38) | - 8 | 38 42 | Q | 42.9 |
| Butte | | 78.8 | 44 | e 12 16 | +10 | e 22 4 | 0 | e 14 26 | PP | e 37.0 |
| Tinemaha | | 79.4 | 54 | i 12 12 | + 3 | — | — | — | — | — |
| Santa Barbara | | 79.6 | 57 | i 12 14 | + 4 | — | — | — | — | — |
| Bozeman | | 79.9 | 44 | e 15 56 | PP | e 22 18 | + 2 | — | — | e 36.3 |
| Haiwee | | 80.1 | 54 | e 12 14 | + 1 | — | — | — | — | — |
| Upsala | | 80.8 | 336 | — | — | e 22 20 | - 5 | e 27 16 | SS | e 42.8 |
| Pasadena | | 80.9 | 57 | i 12 18 | + 1 | e 22 26 | 0 | — | — | e 36.8 |
| Mount Wilson | | 81.0 | 57 | i 12 18 | 0 | — | — | — | — | — |
| Logan | | 81.5 | 47 | — | — | e 22 41 | + 9 | — | — | 38.3 |
| Riverside | z. | 81.6 | 57 | e 12 21 | 0 | — | — | — | — | — |
| Salt Lake City | | 82.0 | 49 | e 12 36 | +13 | e 22 41 | + 4 | — | — | e 37.2 |
| La Jolla | | 82.2 | 57 | e 12 27 | + 3 | — | — | — | — | — |
| Bergen | | 84.4 | 341 | — | — | e 23 4 | + 3 | — | — | e 41.8 |
| Warsaw | | 84.5 | 329 | e 12 18 | -18 | e 23 4 | + 2 | — | — | e 42.8 |
| Copenhagen | | 85.7 | 335 | e 12 42 | 0 | 23 5 | [- 1] | — | — | 44.8 |
| Ksara | | 87.0 | 307 | e 13 11 | +23 | 23 29 | + 2 | — | — | — |
| Tucson | | 87.2 | 55 | e 12 51 | + 2 | e 23 18 | [+ 3] | e 16 15 | PP | e 37.3 |
| Potsdam | | 87.9 | 333 | i 12 52 _k | - 1 | — | — | — | — | e 44.8 |
| Prague | | 89.0 | 330 | — | — | e 23 45? | 0 | — | — | e 46.8 |
| Sofia | | 89.6 | 320 | — | — | e 23 35 | [+ 5] | — | — | — |
| Belgrade | | 89.8 | 323 | — | — | e 23 53 | 0 | — | — | e 48.5 |
| De Bilt | | 91.2 | 335 | i 13 10 _k | + 2 | i 23 45 | [+ 5] | e 16 35 | PP | e 47.8 |
| Stonyhurst | | 92.2 | 340 | — | — | i 23 46 | [+ 1] | e 30 30 | SS | e 46.8 |
| Helwan | z. | 92.3 | 306 | 13 12 | - 1 | 23 45 | [- 1] | 18 45 | PPP | — |
| Triest | | 92.6 | 327 | — | — | i 23 45 | [- 3] | — | — | e 47.8 |
| Uccle | | 92.6 | 335 | e 13 36 | +21 | e 23 50 | [+ 2] | — | — | — |
| Kew | | 93.6 | 338 | i 13 41 | +22 | e 24 30 | + 4 | e 25 44 | PS | e 47.8 |
| Zurich | | 93.6 | 331 | — | — | e 39 45 | ? | — | — | — |
| Chicago U.S.C.G.S. | | 95.5 | 35 | — | — | e 24 2 | [- 2] | — | — | e 40.0 |
| Florissant | | 96.2 | 39 | — | — | e 24 8 | [0] | — | — | — |
| Clermont-Ferrand | | 97.2 | 332 | e 17 32 | PP | — | — | — | — | e 57.3 |
| Ottawa | | 98.0 | 26 | — | — | e 24 15? | [- 2] | e 31 45? | SS | e 46.8 |
| Seven Falls | | 98.3 | 22 | — | — | e 25 9? | + 3 | — | — | 49.8 |
| Columbia | | 104.8 | 36 | — | — | e 24 51 | [+ 1] | e 34 58 | ? | — |
| Toledo | z. | 104.9 | 334 | e 18 33 | PP | — | — | — | — | — |
| Coimbra | | 106.2 | 337 | e 16 15 | ? | — | — | — | — | 58.2 |
| Granada | | 107.1 | 333 | e 19 14 | PP | 27 33 | PS | e 21 2 | PPP | e 62.1 |
| San Juan | | 125.1 | 34 | e 20 49 | PP | e 37 18 | SS | e 40 3 | P'P' | e 59.2 |
| La Paz | | 148.8 | 73 | 19 51 | [+ 6] | 26 51 | [- 1] | i 21 2 | pPKP | 76.8 |

Additional readings:—

Calcutta iPPN = +10m.49s., eSS = +19m.36s.

Wellington SSS? = +32m.55s.

Salt Lake City e = +13m.35s.

Warsaw eZ = +15m.56s.

Copenhagen ? = +23m.16s.

Ksara S = +24m.0s.

Tucson ePPP = +18m.21s., e = +23m.24s., and ePPS = +25m.10s.

Potsdam eN = +13m.3s., iZ = +13m.14s.

Stonyhurst i = +24m.22s.

Helwan iZ = +13m.22s. and +13m.39s.

Kew iPPZ = +22m.4s., ePPSZ = +26m.28s., eSS = +30m.48s., eQ = +39m.0s.

Florissant eE = +24m.29s., eSE = +24m.47s.

Columbia e = +37m.57s.

Coimbra e = +47m.15s.

Granada iPPP = +23m.28s., S = +29m.11s., eSS = +35m.57s., and eSSS = +39m.26s.

San Juan e = +21m.33s.

La Paz iPKPZ = +19m.54s.a, iPKP₂Z = +20m.23s., iSKPZ = +23m.33s., SSN = +43m.51s.

Long waves were also recorded at Almeria, Stuttgart, Huancayo, Harvard, Lincoln and East Machias,

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1941

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Oct. 8d. 7h. Undetermined shock.

Ksara eP = 1m.46s., eS? = 3m.20s.
 Sofia ePEN = 1m.54s.?, eEN = 3m.25s.
 Helwan PZ = 2m.0s., PPZ = 2m.7s., iZ = 3m.26s., SZ = 4m.39s., SSZ = 5m.4s.
 Bucharest ePN = 2m.30s., eEN = 2m.56s., eSEN = 3m.44s., eE = 3m.56s., LEN = 4.7m.
 Warsaw eZ = 3m.54s., eEN = 7m.0s.?, eZ = 9m.29s., eE = 10m.33s., eL = 11.0m.
 Prague e = 4m.0s?
 Trieste e? = 4m.6s., i = 7m.11s.
 Stuttgart e = 4m.24s., eEN = 8m.0s.
 Potsdam iZ = 4m.28s.a, eE = 4m.32s., eN = 4m.36s., eLE = 9.0m.
 Belgrade e = 4m.36s., 5m.29s., and 6m.38s.
 Clermont-Ferrand e = 4m.56s.
 Copenhagen eP = 4m.58s., S = 9m.0s., L = 14.0m.
 De Bilt e = 10m.0s.
 Upsala eN = 13m.0s., eE = 13m.30s.

Oct. 8d. 15h. 24m. 16s. Epicentre 31°·7N. 102°·6E.

A = -·1859, B = +·8319, C = +·5229; $\delta = +4$; $h = +1$;
 D = +·976, E = +·218; G = -·114, H = +·510, K = -·852.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|------------------|----|----------|-----|----------|-------|---------|------|---------|----|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Calcutta | N. | 15.6 | 238 | i 3 44k | + 1 | i 6 54 | +17 | i 7 9 | SS | i 8.2 |
| Dairen | | 17.1 | 60 | e 6 19 | ? | — | — | — | — | — |
| Karenko | | 18.4 | 109 | 4 9 | - 9 | 9 48 | L | — | — | (9.8) |
| Irkutsk | | 20.6 | 3 | i 4 45 | + 2 | — | — | — | — | — |
| Zinsen | | 20.6 | 68 | e 4 48 | + 5 | 10 30 | L | — | — | (10.5) |
| Dehra Dun | N. | 21.1 | 273 | e 5 25 | PPP | e 8 55 | SS | — | — | e 11.9 |
| Agra | | 21.9 | 265 | e 4 51 | - 6 | i 8 58 | + 4 | 4 55 | pP | — |
| Almata | | 23.3 | 309 | e 5 14 | + 4 | — | — | — | — | — |
| Hukuoka | | 23.5 | 78 | e 5 16 | + 4 | 11 57 | L | — | — | (11.9) |
| Sempalatinsk | | 25.0 | 327 | e 5 25 | - 2 | — | — | — | — | — |
| Vladivostok | | 25.8 | 56 | e 5 25 | - 9 | e 9 52 | -10 | — | — | — |
| Andijan | | 25.9 | 300 | e 5 46 | +11 | — | — | — | — | — |
| Hyderabad | | 26.1 | 243 | 5 37 | 0 | 10 45 | +38 | 12 23 | ? | 14.1 |
| Osaka | | 27.6 | 75 | 5 54 | + 3 | 9 49 | -43 | — | — | — |
| Medan | | 28.2 | 189 | 5 59 | + 3 | i 10 53 | +12 | i 11 59 | SS | — |
| Bombay | | 29.7 | 252 | e 6 10 | 0 | e 11 10 | + 4 | — | — | i 16.0 |
| Kodaikanal | | 31.6 | 234 | i 6 24 | - 2 | — | — | — | — | — |
| Sendai | | 31.9 | 67 | 6 14 | -15 | — | — | — | — | — |
| Batavia | | 37.9 | 173 | 7 29 | + 9 | i 13 24 | +11 | — | — | i 20.6 |
| Sverdlovsk | | 38.3 | 325 | i 7 22 | - 2 | 13 17 | - 2 | — | — | — |
| Baku | | 42.9 | 298 | 8 9 | + 7 | — | — | — | — | — |
| Copenhagen | | 64.6 | 322 | e 10 38 | - 3 | — | — | — | — | 32.7 |
| Potsdam | | 65.3 | 319 | — | — | e 27 44 | ? | — | — | e 29.7 |
| Jena | | 66.7 | 317 | e 10 56 | + 1 | — | — | — | — | e 33.7 |
| Stuttgart | | 69.0 | 315 | e 11 4 | - 5 | — | — | — | — | — |
| Zurich | | 69.9 | 314 | e 11 11k | - 4 | — | — | — | — | — |
| Basle | | 70.5 | 314 | e 11 17 | - 1 | — | — | — | — | — |
| Uccle | | 70.9 | 319 | e 11 24 | + 3 | — | — | — | — | e 33.7 |
| Clermont-Ferrand | | 74.0 | 314 | e 11 39 | 0 | — | — | — | — | — |
| Toledo | | 81.6 | 312 | i 12 16 | - 5 | i 22 35 | + 2 | — | — | 40.0 |
| Almeria | | 82.3 | 309 | e 11 42 | -43 | — | — | e 16 7 | PP | 41.7 |
| Granada | | 82.8 | 310 | e 9 14 | ? | e 19 36 | ? | — | — | e 45.0 |
| Coimbra | | 84.2 | 315 | e 6 12 | ? | e 23 14 | +15 | — | — | e 44.2 |
| La Paz | | 162.7 | 329 | 20 4 | [+ 1] | — | — | — | — | — |

Additional readings:—

Calcutta IPPN = +3m.52s., IPcPN = +8m.30s.
 Agra ePN = +4m.54s., sS? = +9m.3s., ssE = +9m.45s.
 Osaka +9m.21s.
 Jena eN = +11m.14s.?
 Stuttgart IP? = +11m.10s.
 Granada PS = +20m.13s.
 Coimbra eN = +9m.56s., eE = +11m.32s., e = +20m.12s.

Long waves were also recorded at stations in America, Europe, and New Zealand.

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Oct. 8d. 19h. 11m. 4s. Epicentre 3°·0N. 97°·0E. (as on 1940, March 29d.).

A = -·1217, B = +·9912, C = +·0520; δ = -1; h = +7;
D = +·993, E = +·122; G = -·006, H = +·052, K = -·999.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----|----------|-----|---------|-------|-----------|-------|-------------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Kodaikanal | | 20·7 | 293 | 1 4 42 | - 2 | i 8 25 | - 6 | — | 9·9 |
| Calcutta | N. | 21·2 | 338 | e 4 52 | + 3 | i 8 52 | +11 | i 9 30 SSS | i 11·1 |
| Hyderabad | | 23·2 | 10 | e 5 13 | + 4 | 9 13 | - 5 | 16 27 ScS | 11·7 |
| Bombay | | 28·4 | 305 | i 5 58 | 0 | i 10 40 | - 5 | — | 14·4 |
| Agra | E. | 30·1 | 326 | e 6 11 | - 2 | 11 5 | - 7 | 13 29 SSS | — |
| Andijan | | 43·7 | 332 | e 8 19 | +11 | — | — | — | — |
| Almata | | 43·9 | 340 | e 8 19 | + 9 | — | — | — | — |
| Tashkent | | 45·6 | 331 | i 8 26 | + 2 | i 15 8 | + 2 | — | — |
| Irkutsk | | 49·5 | 7 | e 8 44 | -10 | 16 10 | + 8 | — | — |
| Vladivostok | | 50·6 | 34 | e 9 12 | +10 | — | — | — | — |
| Baku | | 56·4 | 319 | — | — | e 17 35 | - 1 | — | — |
| Sverdlovsk | | 61·0 | 339 | i 10 20 | + 2 | 18 35 | 0 | — | — |
| Ksara | | 64·5 | 306 | — | — | e 19 22 | + 3 | — | — |
| Helwan | E. | 67·5 | 302 | — | — | e 21 8 | PPS | — | — |
| Zurich | | 86·7 | 317 | e 23 12 | SKS | (e 23 12) | [0] | — | — |
| Uccle | N. | 89·4 | 320 | — | — | e 23 46 | - 3 | e 29 50 SS | e 49·9 |
| Mount Wilson | Z. | 130·4 | 39 | e 19 22 | [+ 9] | — | — | e 22 44 PKS | — |
| Pasadena | | 130·4 | 39 | e 19 20 | [+ 7] | e 26 53 | [+32] | e 22 43 PKS | — |
| Riverside | | 131·0 | 39 | e 19 20 | [+ 6] | — | — | e 22 43 PKS | — |
| Tucson | | 136·1 | 35 | e 19 25 | [+ 2] | — | — | — | — |
| La Paz | | 160·2 | 227 | e 20 23 | [+22] | — | — | — | 81·9 |

Calcutta also gives eN = +6m.37s.

Tucson e = +19m.37s.

Long waves were also recorded at Kew, De Bilt, Potsdam, Tananarive, Huancayo, College, and Riverview.

Oct. 8d. Readings also at 0h. (Sverdlovsk, Tucson, Haiwee, near Mizusawa, Andijan, Pasadena, Mount Wilson, Riverside, and Tinemaha), 1h. (De Bilt, Potsdam, and La Paz), 2h. (Bucharest and Sofia (2)), 3h. (Tucson, near Huancayo, near La Paz, La Jolla, Pasadena, Mount Wilson, and Riverside), 4h. (Zurich, near Lick, and near Andijan), 6h. (Amboina), 7h. (near Florissant), 10h. (near Almata), 14h. (near Andijan), 15h. (Tinemaha, Mount Wilson, Pasadena, Riverside, Tucson, La Jolla, Tsai, and Wellington), 16h. (Copenhagen and La Paz), 19h. (Medan and Batavia).

Oct. 9d. 23h. 57m. 28s. Epicentre 35°·0N. 140°·2E. (as on 1937, Sept. 27d.).

A = -·6308, B = +·5255, C = +·5710; δ = +10; h = 0;

See Seismometrical Report Earthquake Research Institute of Imperial University of Tokyo.

| | Δ | Az. | P. | O-C. | S. | O-C. |
|------------------|----------|-----|-------|------|-------|------|
| | ° | ° | m. s. | s. | m. s. | s. |
| Kamakura | 0·6 | 301 | 0 18 | + 3 | 0 31 | + 5 |
| Komaba | 0·8 | 327 | 0 20 | + 2 | 0 34 | + 3 |
| Tokyo Imp. Univ. | 0·8 | 333 | 0 19 | + 1 | 0 34 | + 3 |
| Mitaka | 0·9 | 322 | 0 18 | - 2 | 0 34 | 0 |
| Susaki | 1·1 | 252 | 0 21 | - 1 | 0 34 | - 5 |
| Tukubasan | 1·2 | 356 | 0 18 | - 6 | 0 37 | - 4 |
| Titibu | 1·4 | 317 | 0 18 | - 9 | 0 36 | -10 |

Oct. 9d. Readings also at 0h. (near Berkeley), 1h. (Sofia), 4h. (Haiwee, Mount Wilson, Riverside, and Tinemaha), 6h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and near Mizusawa), 9h. (near Lick and near Algiers), 10h. (De Bilt and Kew), 14h. (Harvard, and near Lick), 18h. (Apia, Tucson, Mount Wilson, Pasadena, Riverside, and Tinemaha), 19h. (Cape Girardeau, and near Frunse), 20h. (Lick), 21h. (Harvard), 22h. (Batavia).

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Oct. 10d. Readings at 1h. (Haiwee, Pasadena, Palomar, Tinemaha, Tucson, and near Mizusawa), 2h. (Tacubaya), 3h. (near Medan), 5h. (Tacubaya), 7h. (near Auckland, Arapuni, Wellington, Riverview, La Plata, Haiwee (2), Mount Wilson (2), Pasadena, Palomar, Riverside (2), Tinemaha (2), and Tucson (2)), 8h. (near Coimbra, near Almeria, Granada, and near Toledo), 9h. (Tacubaya), 11h. (near Lick and Tacubaya), 12h. (Harvard), 13h. (near Amboina), 14h. (near Batavia), 15h. (Granada, La Paz, and Riverview), 17h. (Harvard, near Branner, Lick, and San Francisco), 19h. (near Batavia and Lick), 20h. (Mount Wilson, Pasadena, Riverside, Tucson, and Tinemaha), 21h. (near Mizusawa), 23h. (near Berkeley).

Oct. 11d. 9h. 14m. 20s. Epicentre 2°·0N. 100°·0E.

Intensity VII at Tarotoeng and Tapanoeli and Northern Sumatra.

Epicentre 0°·6N. 97°·6E. (Batavia).

Meteorologische en Geophysische Dienst te Batavia, Serie A, No. 44, Aardbevingen in Ned.-Indie Waargenomen gedurende het jaar, 1941, p. 23.

$$A = -.1735, B = +.9842, C = +.0347; \quad \delta = -4; \quad h = +7;$$

$$D = +.985, E = +.174; \quad G = -.006, H = +.034, K = -.999.$$

| | | Δ | Az. | P. | O-C. | S. | O-C. | L. |
|-----------|----|----------|-----|---------|------|---------|------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. |
| Medan | N. | 2.1 | 320 | i 0 37 | 0 | — | — | — |
| Batavia | | 10.6 | 140 | 2 37 | + 1 | — | — | i 6.3 |
| Colombo | E. | 20.6 | 284 | 4 42 | - 1 | 8 25 | - 4 | 10.8 |
| Calcutta | N. | 23.3 | 333 | — | — | i 9 21 | + 1 | — |
| Kodakanal | E. | 23.8 | 293 | i 5 14k | - 1 | i 9 25 | - 3 | 11.4 |
| Bombay | | 31.5 | 304 | e 6 25 | - 1 | i 11 29 | - 5 | i 14.0 |

Additional readings:—

Medan PE = +40s., iPE = +43s.

Batavia iN = +6m.22s.

Calcutta iN = +9m.49s.

Long waves were also recorded at Agra.

Oct. 11d. 21h. 13m. 20s. Epicentre 30°·0S. 61°·0E.

$$A = +.4206, B = +.7587, C = -.4975; \quad \delta = +4; \quad h = +2;$$

$$D = +.875, E = -.485; \quad G = -.241, H = -.435, K = -.868.$$

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----|----------|-----|---------|-------|----------|------|--------------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Tananarive | | 16.5 | 306 | 3 55 | + 1 | 6 52 | - 6 | 4 2 PP | 7.2 |
| Colombo | E. | 40.9 | 29 | e 6 0 | ? | 14 0 | + 2 | — | — |
| Bombay | | 49.9 | 14 | e 8 59 | + 2 | e 16 8 | + 1 | — | — |
| Agra | E. | 59.1 | 18 | e 9 59 | - 5 | 18 4 | - 7 | — | — |
| Andijan | | 71.2 | 9 | 11 28 | + 5 | — | — | — | — |
| Tashkent | | 71.4 | 6 | e 11 18 | - 6 | e 20 41 | - 1 | — | — |
| Sverdlovsk | | 86.5 | 0 | — | — | e 23 16 | - 6 | 24 18 PS | — |
| Almeria | | 89.2 | 314 | e 13 5 | + 6 | (26 40?) | ? | — | 26.7 |
| Granada | | 90.1 | 314 | e 13 0 | - 3 | — | — | — | 56.1 |
| Toledo | z. | 92.1 | 316 | i 13 17 | + 5 | — | — | — | — |
| Tucson | | 172.7 | 290 | i 20 19 | [+ 8] | — | — | (e 26 14) PP | e 26.2 |
| Mount Wilson | z. | 175.7 | 352 | i 20 21 | [+ 9] | — | — | — | — |
| Pasadena | | 175.8 | 352 | i 20 19 | [+ 7] | — | — | — | — |
| Riverside | z. | 175.8 | 344 | e 20 20 | [+ 8] | — | — | — | — |
| Palomar | z. | 176.2 | 332 | e 20 21 | [+ 9] | — | — | — | — |

Additional readings:—

Sverdlovsk SS = +29m.4s. ?

Almeria e = +13m.45s.

Granada PP = +13m.45s.

Tucson e = +20m.34s., i = +21m.43s.

Riverside eZ = +21m.53s.

Oct. 11d. Readings also at 5h. (Paris), 7h. (near Apia), 8h. (La Paz and near Harvard), 15h. (Huancayo), 18h. and 19h. (La Paz), 20h. (Florissant), 21h. (Tananarive and near Mizusawa), 22h. (near Berkeley and Lick), 23h. (near Lick and Branner).

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Oct. 12d. Readings at 1h. (Prague), 2h. (near Medan), 3h. (Berkeley), 4h. (near La Paz), 6h. (near Medan), 8h. (Bucharest and near Sofia), 15h. (near Agra and Bombay), 18h. (Balboa Heights), 20h. (Harvard, Ottawa, Seven Falls, and Shawinigan Falls), 21h. (Bombay, Agra, Colombo, Kodalkanal (2), Tashkent, and Ksara), 22h. (Calcutta).

Oct. 13d. Readings at 1h. (Palomar, Tucson, Pasadena, and Riverside), 2h. (near Andijan, Stalinabad, Tashkent, and Tchikment), 3h. (near Lick), 4h. (near Huancayo), 7h. (Colombo and near Lick), 9h. (Ksara), 10h. (Tucson), 13h. (La Paz and near Huancayo), 16h. (Berkeley), 19h. (near Lick), 21h. (near Lick).

Oct. 14d. Readings at 6h. (near La Paz), 7h. (La Paz, Tucson (2), Haiwee, Palomar, Pasadena (2), Mount Wilson (2), Tinemaha, and Riverside (2)), 9h. (near Mizusawa and near Lick), 10h. (Huancayo, Tucson, Cape Girardeau, Oaxaca, Vera Cruz, St. Louis, Merida, Florissant, Riverside, Palomar, Tinemaha, Mount Wilson, and Pasadena), 15h. (near Lick (2)), 16h. (Tucson, College, near Lick (2), San Francisco (2), Branner, Berkeley, Palomar, Pasadena, Mount Wilson, Tinemaha, and Riverside), 20h. (Salt Lake City, Agra, Mount Wilson, Riverside, Tucson, and Pasadena).

Oct. 15d. 9h. 35m. 17s. Epicentre 15°-1S. 73°-9W. Depth of focus 0.005.

A = +.2679, B = -.9280, C = -.2589; $\delta = -2$; $h = +6$;
D = -.961, E = -.277; G = -.072, H = +.249, K = -.966.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|----------|-----|--------------------|------|----------|------|---------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Huancayo | 3.3 | 336 | 10 56 | + 5 | — | — | — | i 1.9 |
| La Paz | 5.7 | 105 | 11 27 _a | + 3 | i 2 29 | 0 | i 2 35 | sS 2.9 |
| Balboa Heights | 24.5 | 347 | e 4 43? | -31 | — | — | — | — |
| Rio de Janeiro | 30.0 | 108 | i 11 1 | S | (i 11 1) | + 4 | — | — |
| San Juan | 34.1 | 13 | i 7 20 | +40 | e 11 47 | -14 | e 8 16 | PPP e 14.3 |
| St. Louis | 55.6 | 345 | 19 30 | - 1 | e 17 7 | - 3 | i 9 55 | pP — |
| Fordham | 55.7 | 1 | 19 29 | - 3 | e 17 5 | - 7 | e 17 50 | sS e 26.9 |
| Florissant | 55.8 | 345 | e 9 30 | - 3 | e 17 8 | - 5 | i 9 55 | pP — |
| Weston | 57.2 | 3 | 19 42 | - 1 | — | — | — | — |
| Tucson | 58.9 | 323 | 19 55 | 0 | — | — | i 10 21 | pP — |
| Ottawa | 60.2 | 358 | e 10 1 | - 3 | e 18 7 | - 4 | — | — 28.7 |
| Palomar | z. 63.3 | 320 | 110 23 | - 1 | — | — | i 10 48 | pP — |
| Riverside | z. 64.0 | 320 | e 10 28 | - 1 | — | — | i 10 54 | pP — |
| Mount Wilson | 64.6 | 320 | 110 34 | + 1 | — | — | i 11 0 | pP — |
| Pasadena | 64.6 | 320 | 110 34 | + 1 | — | — | i 11 0 | pP — |
| Tinemaha | 66.6 | 322 | 110 47 | + 1 | — | — | i 11 13 | pP — |
| Coimbra | 81.9 | 44 | e 11 36? | -38 | e 18 32? | ? | — | — |
| Granada | 84.0 | 49 | 112 25 | 0 | 22 56 | sS | 12 54 | pP e 33.8 |
| Almeria | 84.7 | 50 | e 12 29 | + 1 | 22 53 | + 4 | 16 3 | PP 37.7 |
| Toledo | 84.8 | 46 | e 12 27 | - 2 | 18 3 | PPP | i 12 55 | pP — |

Additional readings:—

Huancayo i = +1m.11s. and +1m.16s.

San Juan e = +8m.24s.

St. Louis esSN = +17m.53s., eE = +21m.1s.

Florissant esSEN = +17m.56s., eZ = +18m.0s., eN = +18m.5s.

Tucson i = +10m.37s., e = +10m.47s. and +12m.11s.

Riverside eZ = +11m.12s., iZ = +11m.19s.

Mount Wilson iZ = +11m.14s. and +11m.36s., ePKP,PKPZ = +39m.38s.

Pasadena iZ = +11m.14s. and +11m.36s., ePKP,PKPZ = +39m.38s.

Tinemaha iZ = +11m.35s.

Granada sP? = +13m.33s.

Almeria PPP = +18m.3s., SS = +29m.11s.

Oct. 15d. Readings also at 0h. (Toledo, Pasadena, Mount Wilson, Riverside, Tinemaha, San Juan, La Paz, Huancayo, Rio de Janeiro, and Tucson), 1h. (Lick, Bombay, Auckland, Sverdlovsk, Mizusawa, Granada, Vladivostok, Medan, Riverview, Tashkent, Batavia, and Wellington), 2h. (Kew), 4h. (Lick), 5h. (La Paz), 6h. (Andijan, and Sverdlovsk), 21h. (Tucson), 23h. (near Berkeley (2)).

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Oct. 16d. 4h. Epicentre near Samoa.

Apia iP = 42m.13s., iS = 42m.34s.
 Riverview e?E = 50m.21s., eZ = 50m.31s., eLZ = 59.4m.
 Auckland P = 52m.30s. ?, i = 52m.50s., ? = 53m.20s., S? = 57m.5s., L = 59.5m.
 Santa Barbara eP = 53m.1s.
 Berkeley ePZ = 53m.2s., eLEN = 73.9m.
 La Jolla ePZ = 53m.4s.
 Pasadena iP = 53m.4s.k, iP = 53m.26s., eLEZ = 73.9m.
 Riverside iPZ = 53m.5s.
 Mount Wilson iPZ = 53m.5s.k, iPZ = 53m.26s.
 Palomar ePZ = 53m.8s.
 Haiwee iPZ = 53m.12s.
 Tinemaha iP = 53m.14s.k, iPZ = 53m.34s.
 Tucson iP = 53m.31s., i = 53m.59s., e = 54m.36s., e = 58m.30s., eL = 76m.0s.
 Florissant ePN = 55m.0s., iP_cP?N = 55m.26s., iSE = 65m.34s.
 Neuchatel eP = 61m.15s.
 Almeria PKP = 61m.26s., PP = 64m.41s., PPP = 67m.43s.
 Uccle eZ = 61m.29s. ?
 Clermont-Ferrand ePKP = 61m.29s., eL = 120m.54s.
 Zurich e = 61m.38s.
 Toledo ePZ = 61m.47s.
 Granada PKP = 62m.1s., pPKP = 62m.20s., IPP = 65m.44s., pPP = 65m.55s., eSKKS = 74m.26s.
 Salt Lake City eS = 63m.49s., eL = 78m.52s.
 Long waves were also recorded at Wellington, College, Ukiah, Warsaw, De Bilt, Kew, and Potsdam.

Oct. 16d. 15h. 10m. 24s. Epicentre 18° 08. 167° 7E. (as on 1940, Nov. 8d.).

A = - .9299, B = + .2027, C = - .3071 ; $\delta = +11$; $h = +5$;
 D = + .213, E = + .977 ; G = + .300, H = - .065, K = - .952.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----|----------|-----|--------------------|-------|-----------|-------|---------|-----------------------|
| | N. | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Brisbane | N. | 16.5 | 232 | i 4 0 | PP | i 7 29 | SS | — | e 8.3 |
| Auckland | | 19.8 | 162 | 4 31? | - 4 | 8 16 | + 3 | i 8 31 | SS 11.4 |
| Riverview | | 21.6 | 219 | i 5 0 _a | + 6 | i 9 4 | +15 | 5 22 | PP e 10.6 |
| Sydney | | 21.6 | 219 | e 4 42? | -12 | e 9 6? | +17 | — | — |
| Wellington | | 24.0 | 167 | 5 21 | + 4 | 9 48 | +16 | i 5 47 | PP 12.6 |
| Christchurch | | 25.8 | 171 | 5 45 _a | +11 | 9 58 | - 4 | 10 26 | Q 12.6 |
| Adelaide | | 30.9 | 230 | i 11 28 | S | (i 11 28) | + 4 | i 13 47 | P _c P — |
| Honolulu | | 51.6 | 43 | e 13 51 | ? | i 17 30 | ? | — | e 22.5 |
| Ukiah | | 85.9 | 47 | — | — | e 24 21 | PS | — | e 40.5 |
| Berkeley | | 86.0 | 48 | — | — | i 24 21 | PS | — | e 39.3 |
| Pasadena | | 87.5 | 53 | e 12 52 | + 1 | — | — | — | e 39.5 |
| Mount Wilson | z. | 87.6 | 53 | e 12 47 | - 4 | — | — | — | — |
| Riverside | z. | 88.0 | 53 | e 12 49 | - 4 | — | — | — | — |
| Palomar | z. | 88.1 | 54 | i 12 52 | - 2 | — | — | — | — |
| Tinemaha | z. | 88.6 | 50 | i 12 53 | - 3 | — | — | — | — |
| Colombo | E. | 90.1 | 277 | 12 40 | -23 | 23 33 | [0] | — | — |
| Tucson | | 92.5 | 56 | e 13 12 | - 2 | — | — | — | e 48.9 |
| Kodaikanal | | 93.3 | 279 | — | — | e 23 51 | [- 1] | — | — |
| Salt Lake City | | 94.6 | 48 | — | — | e 25 21 | PS | — | e 45.6 |
| Bombay | | 100.1 | 286 | — | — | i 24 25 | [- 2] | — | — |
| Huancayo | | 111.0 | 110 | e 22 25 | PKS | e 35 3 | SSP | — | e 53.0 |
| Helwan | z. | 138.6 | 295 | e 19 30 | [+ 2] | — | — | e 22 27 | PP — |
| Potsdam | | 140.3 | 336 | e 19 24 | [- 7] | — | — | e 24 24 | ? e 71.6 |
| Uccle | z. | 144.7 | 343 | e 19 42 | [+ 4] | — | — | — | — |
| Stuttgart | | 145.7 | 335 | e 19 36 | [- 4] | — | — | — | — |
| Zurich | | 146.0 | 335 | e 19 40 | [- 1] | — | — | — | — |
| Basle | | 146.3 | 335 | e 19 41 | [0] | — | — | — | — |
| Clermont-Ferrand | | 149.5 | 338 | i 19 51 | [+ 4] | — | — | — | — |
| Toledo | | 157.1 | 343 | e 20 25 | [+28] | — | — | — | — |
| Almeria | | 159.3 | 337 | 20 18 | [+18] | 27 22 | [+18] | 21 2 | PKP ₂ 89.6 |
| Granada | | 159.4 | 340 | e 20 4 | [+ 4] | e 45 39 | SSP | 23 40 | SKP ₂ 87.6 |
| | | | | | | | | | 90.9 |

Additional readings:—

Brisbane iPE = +5m.21s.
 Auckland i = +5m.41s., Q = +10m.36s.
 Riverview iEN = +5m.4s., iZ = +9m.13s., SSE = +9m.34s.
 Christchurch SS = +10m.33s.
 Adelaide i = +11m.50s., and +15m.6s., iSN = +17m.26s., iSS = +19m.56s.

Continued on next page.

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Berkeley iE = +24m.30s.
 Mount Wilson eZ = +12m.57s.
 Almeria PKS = +23m.48s., PP = +24m.41s., PPP = +28m.22s., SKKS = +31m.26s.
 Granada iPP = +24m.35s., PP ($\Delta > 180^\circ$) = +27m.55s., PPP = +28m.34s.
 Long waves were also recorded at Medan, East Machias, Chicago U.S.C.G.S., Bozeman, La Paz, De Bilt, Tananarive, Harvard, Arapuni, Warsaw and Kew.

Oct. 16d. Readings also at 3h. (Amboina), 10h. (near Apia), 14h. (Auckland, Arapuni, Wellington, Riverview, Pasadena, Mount Wilson, Riverside, Palomar, and Tinemaha).

Oct. 17d. Readings at 3h. (La Paz, near Algiers, near Tchimkent, Huancayo, and San Juan), 5h. (near Stalinabad, Tashkent and Tchimkent), 11h. (Auckland), 13h. (near Clermont-Ferrand), 14h. (La Paz), 17h. (near Clermont-Ferrand), 18h. (La Paz (2)).

Oct. 18d. 23h. Pacific shock. Pasadena suggests deep.

Auckland P = 9m.35s.?, S = 11m.10s., i = 11m.25s., and Q = 11m.45s.
 Wellington P? = 10m.55s.?, S = 13m.6s., L = 15m.30s.
 Riverview eN = 19m.24s.?, eLE = +20.8m.
 Santa Barbara iPZ = 20m.2s., ipPZ = 20m.18s.
 Pasadena iP = 20m.4s., ipPZ = 20m.21s., eZ = 23m.33s., eLZ = 46m.
 La Jolla iPZ = 20m.5s.
 Mount Wilson iP = 20m.5s.k, ipPZ = 20m.22s., isPZ = 20m.36s.
 Riverside iP = 20m.7s., iZ = 20m.38s., eZ = 23m.36s.
 Tinemaha iP = 20m.15s., ipPZ = 20m.31s.
 Tucson iP = 20m.23s., i = 20m.33s., 21m.12s., eL = 21m.56s.
 Copenhagen iP = 27m.29s.
 Granada eP = 27m.52s., PP = 28m.33s., ePPP = 29m.13s., iS = 32m.47s., and L = 39.6m.
 Long waves were also recorded at Arapuni, Sydney, La Paz, and Salt Lake City.

Oct. 18d. Readings also at 0h. (Berkeley and near Mizusawa), 5h. (near Amboina), 6h. (La Paz), 7h. (Florissant), 8h. (Tinemaha and Tucson), 10h. (Berkeley and Lick), 12h. (near Amboina), 13h. (Lick), 16h. (Sofia (2), Bucharest, Ksara, Helwan, Triest, and Warsaw), 17h. (Sofia, Bucharest, Ksara, and Helwan), 18h. (Warsaw).

Oct. 19d. Readings at 0h. (Tucson, Kodalkanal, Bombay, Berkeley, Pasadena, Mount Wilson and Riverside), 2h. (near Mizusawa), 3h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Tucson, and Haiwee), 4h. (near Toledo, Almeria, and Granada), 6h. (near La Paz, near Lick, and Huancayo), 8h. (Prague), 10h. (near Mizusawa), 11h. (near Medan), 14h. (Tacubaya and Oaxaca), 15h. (near Mizusawa), 19h. (San Juan, La Paz, Huancayo, Riverview, near Berkeley Branner, Lick, Tucson, Pasadena, Mount Wilson), 20h. (Bombay), 21h. (near Andijan).

Oct. 20d. 21h. 18m. 8s. Epicentre $43^\circ 6'N$. $29^\circ 2'W$. (as on 1940, July 1d.).

Doubtful.

A = +.6342, B = -.3544, C = +.6872; $\delta = +5$; $h = -3$;
 D = -.488, E = -.873; G = +.600, H = -.335, K = -.726.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|---------|------|---------|------|-------------------|-----------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Coimbra | 15.8 | 95 | e 0 39 | ? | e 7 42 | L | 4 35 [†] | PPP (e 7.7) |
| Lisbon | 15.9 | 101 | — | — | — | — | 7 27 | SSS 7.8 |
| Toledo | z. 19.1 | 92 | e 4 30 | + 3 | — | — | — | — |
| Granada | 20.5 | 100 | i 4 47 | + 5 | 8 46 | +19 | e 7 52 | ? e 13.2 |
| Kew | 20.9 | 58 | i 4 43k | - 3 | i 8 32 | - 3 | i 4 55 | PP e 9.8 |
| Almeria | 21.4 | 99 | 4 40 | -11 | 8 30 | -15 | 16 2 | S _c S 12.9 |
| Clermont-Ferrand | 23.0 | 73 | e 5 9 | + 2 | — | — | — | — e 11.0 |
| Uccle | 23.8 | 60 | e 5 16 | + 1 | 9 24 | - 4 | — | — e 11.4 |
| Stuttgart | 26.9 | 65 | e 5 47 | + 2 | — | — | — | — e 13.6 |
| St. Louis | 45.3 | 287 | i 9 39 | PP | e 11 40 | ? | — | — |
| Tacubaya | z. 62.5 | 271 | 12 50 | PP | — | — | — | — |
| Tucson | 63.0 | 290 | e 15 32 | ? | — | — | — | — |
| Guadalajara | z. 64.7 | 275 | 12 28 | PP | — | — | — | — |

Additional readings:—

Almeria PcP = +8m.46s., PcS = +12m.16s.
 Tucson i = +15m.42s., e = +18m.1s., +20m.10s.
 Long waves were also recorded at other European and American stations.

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Oct. 20d. 21h. 35m. 7s. Epicentre 43°·6N. 29°·2W. (as at 21h. 18m.).

$$A = +.6342, B = -.3544, C = +.6872; \quad \delta = +5; \quad h = -3.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|--------|------|--------|------|--------|-----------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Lisbon | 15·9 | 101 | 6 53 | S | (6 53) | + 9 | — | — |
| Toledo | 19·1 | 92 | e 4 29 | + 2 | — | — | — | 8·6 |
| Granada | 20·5 | 100 | i 4 49 | + 7 | i 8 49 | +22 | 5 36 | PPP i 11·6 |
| Kew | 20·9 | 58 | i 4 42 | - 4 | i 8 34 | - 1 | i 4 53 | PP e 9·6 |
| Almeria | 21·4 | 99 | 4 47 | - 4 | 8 39 | - 6 | 8 51 | P _c P 11·7 |
| Clermont-Ferrand | 23·0 | 73 | e 5 8 | + 1 | — | — | — | — e 11·0 |
| Uccle | 23·8 | 60 | e 5 16 | + 1 | 9 22 | - 6 | — | — e 11·3 |
| Stuttgart | 26·9 | 65 | e 5 44 | - 1 | 9 43 | -37 | — | — |

Additional readings:—

Lisbon E = +7m.5s.

Granada PcP = +7m.42s., PcS = +10m.6s.

Almeria PcS = +12m.25s., ScS = +16m.3s.

Long waves were also recorded at other European stations.

Oct. 20d. Readings also at 1h. (Helwan, Ksara, and Tacubaya), 2h. (Granada), 9h. (near Andijan), 17h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Tucson, East Machias, Auckland, and Wellington), 20h. (Tucson), 21h. (Clermont-Ferrand), 22h. (Tashkent, Almata, Batavia, Colombo, Amboina, Medan, Riverview, Brisbane, Bombay, Wellington, Auckland, Clermont-Ferrand, Granada, Almeria, Toledo, Potsdam, Kew, Uccle, and De Bilt), 23h. (Clermont-Ferrand, and Kew).

Oct. 21d. Readings at 2h. (Harvard, St. Louis, Tucson, near Medan and Batavia), 3h. (Tucson, Clermont-Ferrand, Pasadena, Mount Wilson, Riverside, Palomar and Haiwee), 4h. (near Mizusawa), 5h. (near Triest and Harvard), 6h. (near Harvard, Shawinigan Falls, Ottawa and near Amboina), 16h. (near St. Louis, Florissant, and Cape Girardeau), 18h. (Harvard), 22h. (near Lick, Berkeley (2) and San Francisco).

Oct. 22d. 6h. 57m. 16s. Epicentre 33°·8N. 118°·1W. (as on 1939, December 27d.).

Intensity VII at Compton, Gardena, Keystone and Moneta.

Epicentre 33°49'N. 118°13'W. (district of Gardena). Macro seismic area 2000 sq. m.

F. Neumann.

United States earthquakes 1941. Washington 1943, p. 15.

Kenneth M. Bravinder.

"Los Angeles Basin Earthquake of October 21, 1941, and its effect on certain producing wells in Dominguez Field, Los Angeles County, California." Bulletin, American Association of Petroleum Geologists, Vol. 26, No. 3, p 388-399. 6 fig. Tulsa, March 1942.

$$A = -.3922, B = -.7345, C = +.5537; \quad \delta = -11; \quad h = +1; \\ D = -.882, E = +471; \quad G = -.261, H = -.488, K = -.833.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|----------|-----|---------------------|------|--------|------|----------|-------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Pasadena | 0·3 | 350 | i 0 10 _a | - 1 | — | — | — | — |
| Mount Wilson | 0·4 | 5 | i 0 12 | - 1 | — | — | — | — |
| Riverside | 0·6 | 72 | i 0 18 _a | + 3 | — | — | — | — |
| Palomar | z. 1·1 | 114 | i 0 27 | + 5 | — | — | — | — |
| La Jolla | 1·2 | 143 | i 0 26 | + 2 | — | — | — | — |
| Haiwee | 2·3 | 3 | e 0 32 | - 8 | — | — | — | — |
| Lick | 4·6 | 322 | i 1 14 | + 2 | 1 2 9 | + 2 | (1 1 40) | Pg |
| Santa Clara | 4·8 | 319 | i 1 52 | +37 | 1 2 40 | Sg | — | — |
| Branner | 4·9 | 319 | i 1 13 | - 4 | e 2 12 | - 3 | — | — |
| San Francisco | 5·3 | 320 | e 1 30 | + 8 | — | — | e 1 34 | Pg |
| Berkeley | 5·3 | 321 | e 1 20 | - 2 | 1 2 22 | - 3 | i 1 55 | Pg |
| Tucson | 6·3 | 102 | i 1 43 | + 7 | — | — | i 2 9 | Pg |
| Salt Lake City | 8·5 | 33 | i 2 49 | PPP | e 4 46 | Sg | — | e 6·1 |
| Logan | 9·4 | 30 | e 3 2 | +44 | — | — | — | 5·0 |

Additional readings:—

Lick Pg given as S.

Branner iSN = +2m.15s.

Berkeley eN = +1m.24s., eZ = +2m.11s., iN = +2m.58s., iE = +3m.8s.

Tucson e = +1m.58s., i = +2m.17s.

Logan e = +3m.7s.

Long waves were also recorded at Chicago U.S.C.G.S., Ukiah, Butte, Bozeman and Florissant.

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Oct. 22d. Readings also at 0h. (Ksara), 3h. (near Sofia and Trieste), 10h. (Tucson, and near Berkeley), 11h. (near Stuttgart, Jena and Ukiah), 22h. (La Paz), 23h. (near Lick and Berkeley).

Oct. 23d. 6h. Local Japanese shock. Tokyo Imperial University gives Epicentre: $34^{\circ}89'N$, $139^{\circ}57'E$.

Kamakura P = 48m.13s., S = 48m.25s.

Komaba P = 48m.13s., S = 48m.27s.

Koyana P = 48m.13s., S = 48m.27s.

Mitaka P = 48m.13s., S = 48m.28s.

Susaki P = 48m.13s., S = 48m.26s.

Titibu P = 48m.13s., S = 48m.29s.

Togane P = 48m.13s., S = 49m.29s.

Tokyo Imperial University P = 48m.13s., S = 48m.27s.

Tukubasan P = 48m.13s., S = 48m.32s.

Oct. 23d. 7h. 47m. 34s. Epicentre $38^{\circ}2'N$, $71^{\circ}0'E$. (as on 1937, July 2d.).

A = +.2565, B = +.7449, C = +.6159; $\delta = 0$; $h = -1$;
D = +.946, E = -.326; G = +.201, H = +.582, K = -.788.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|--------|------|--------|------|-------|----------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Andijan | 2.7 | 22 | 1 0 45 | 0 | 1 1 9 | -10 | — | — |
| Tashkent | 3.3 | 342 | 1 0 56 | + 3 | 1 1 37 | + 2 | 1 9 | P _g |
| Almata | 6.8 | 40 | 1 44 | 0 | 2 56 | - 7 | 2 9 | P _g |
| Agra | E. 12.5 | 150 | — | — | e 5 55 | SSS | — | — |
| Baku | 16.5 | 285 | e 4 11 | PP | — | — | — | — |
| Sverdlovsk | 19.9 | 344 | 1 4 34 | - 2 | 1 8 10 | - 5 | — | — |

Almata also gives S_g = +3m.18s.

Long waves were also recorded at Kew.

Oct. 23d. 21h. 2m. 39s. Epicentre $12^{\circ}4'N$, $92^{\circ}5'E$. (as on 1941, August 30d.).

A = -.0426, B = +.9761, C = +.2134; $\delta = +13$; $h = +6$;
D = +.999, E = +.044; G = -.009, H = +.213, K = -.977.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|---------------------|-------|---------|------|--------|-----|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Medan | 10.7 | 144 | e 2 31 | - 7 | 4 1 | -38 | — | — |
| Calcutta | N. 10.8 | 339 | i 2 41 _a | + 2 | i 4 20 | -22 | 1 4 54 | SS |
| Colombo | E. 13.6 | 248 | 3 26 | + 9 | 6 1 | -49 | — | 7.4 |
| Hyderabad | 14.4 | 292 | 3 35 | + 8 | e 7 18 | ? | — | 8.5 |
| Kodaikanal | E. 14.9 | 264 | i 3 33 _k | - 1 | — | — | — | — |
| Agra | E. 20.0 | 320 | 4 31 | - 6 | 8 11 | - 6 | 8 33 | SS |
| Bombay | 20.0 | 292 | e 4 40 | + 3 | e 8 30 | +13 | 4 59 | PP |
| Andijan | 33.3 | 332 | 6 39 | - 2 | — | — | — | — |
| Tashkent | 35.2 | 329 | e 6 55 | - 3 | e 12 24 | - 7 | — | — |
| Baku | 46.6 | 314 | e 8 5 | -27 | e 14 19 | -62 | — | — |
| Sverdlovsk | 50.6 | 338 | 8 57 | - 5 | 16 7 | -10 | — | — |
| Riverside | z. 125.8 | 31 | e 19 2 | [- 2] | — | — | — | — |
| Tucson | 130.7 | 26 | i 19 13 | [0] | — | — | — | — |

Additional readings:—

Medan iS₁EN = +5m.6s.

Calcutta iS₂N = +5m.18s.

Long waves were also recorded at De Bilt and Kew.

Oct. 23d. Readings also at 1h. (Berkeley), 2h. (College and Balboa Heights), 5h. (near Mizusawa), 6h. (near Mizusawa), 9h. (near Andijan, Almata, and Tashkent), 11h. (Basle), 12h. (near Batavia and Andijan), 13h. (La Paz), 14h. (La Paz), 15h. (Kodaikanal, La Plata, Pasadena, Riverside, and Mount Wilson), 18h. (near Branner and near Mizusawa), 20h. (Lick, La Paz, and Berkeley), 21h. (La Paz), 22h. (near Amboina (2) and near Berkeley), 23h. (Almeria, Tucson, Salt Lake City, Columbia, Chicago U.S.C.G.S., Butte, Bozeman, College, Berkeley, Riverside, and Mount Wilson).

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Oct. 24d. Readings at 3h. (near Amboina), 4h. (near Mizusawa, Huancayo, and La Paz), 5h. (Tucson, Oaxaca, Puebla, Tacubaya, and Vera Cruz), 10h. (Tucson, Mount Wilson, Oaxaca, Puebla, Tacubaya, and Vera Cruz), 14h. (near Shawinigan Falls, Ottawa, and Seven Falls), 17h. (near Lick, Berkeley, and Branner), 19h. (Berkeley), 23h. (near Branner).

Oct. 25d. Readings at 0h. (Auckland, Bombay, Bozeman, Tucson, Tinemaha, Mount Wilson, Riverside, Pasadena, Wellington, and Riverview), 2h. (near Mizusawa), 5h. (Sofia), 7h. (near Berkeley, Lick, and Branner), 9h. (near Lick, Mount Wilson, Riverside, Pasadena, Riverview, and Balboa Heights), 12h. (near Mizusawa), 13h. (Almeria), 20h. (Branner), 21h. (near Branner), 23h. (near Berkeley).

Oct. 26d. Readings at 1h. (near Berkeley), 5h. (Coimbra (2), Almeria (2), Lisbon (2), near Granada (2), and near Toledo (2)), 9h. (near Berkeley and San Francisco), 14h. (near Berkeley, Branner, and Lick), 15h. (Irkutsk, Baku, Tchinkent, Tashkent, Sverdlovsk, Calcutta, Bombay, Hyderabad, Medan, La Paz, Kew, Jena, Belgrade, Tucson, Mount Wilson, and near Apia), 16h. (Warsaw, Potsdam, Paris, Aberdeen, Uccle, De Bilt, and Upsala), 19h. (La Paz, Huancayo, and Tucson), 20h. (Almeria), 22h. (La Paz and Tucson).

Oct. 27d. Readings at 0h. (Lick), 2h. (near Andijan, Almata, and Tashkent), 3h. (Helwan and Cape Girardeau), 5h. (Branner, near Berkeley (2), and Lick (2)), 7h. (Haiwee, La Jolla, Ottawa, College, Tucson, Riverside, Pasadena, Mount Wilson, and Tinemaha), 8h. (Tucson, Riverside (2), Pasadena (2), Huancayo, and Mount Wilson (2)), 12h. (Santa Clara, Riverside, Pasadena, Mount Wilson, Tinemaha, Ferndale, Berkeley (2), Lick, Tucson, Seattle, Salt Lake City, Butte, Bozeman, and Ukiah), 14h. (La Paz), 15h. (Agra), 17h. (Bucharest, Bombay, and near Apia), 19h. (La Paz, Tucson, Riverside, Pasadena, and Mount Wilson).

Oct. 28d. 10h. Undetermined American shock.

Ferndale ePN = 34m.36s., iPE = 34m.42s., iN = 35m.12s., iEN = 36m.18s.
 Berkeley iPZ = 34m.44s., eE = 34m.49s., iEN = 35m.59s., iZ = 36m.34s., eN = 37m.36s., eZ = 37m.39s.
 Lick ePEN = 34m.54s., eLEN = 38.0m.
 Ukiah eS = 35m.7s., eL = 35.6m.
 Haiwee eP = 35m.40s., eS = 37m.47s.
 Tinemaha ePEN = 35m.53s.
 Pasadena iP = 35m.54s., eLEZ = 38.9m.
 Mount Wilson iP = 35m.55s.
 Riverside eP = 36m.0s.
 Santa Clara e = 36m.4s.
 Bozeman eP = 36m.14s., e = 36m.19s., eL = 39.5m.
 Tucson eP = 37m.6s., i = 37m.40s. and 38m.13s., e = 38m.42s. and 40m.36s., eL = 42.9m.
 Florissant eE = 49m.23s.
 Long waves were also recorded at Seattle, Salt Lake City, Chicago U.S.C.G.S., and Butte.

Oct. 28d. Readings also at 5h. (Tucson and Riverside), 6h. (San Juan), 11h. (Tucson and Ferndale), 12h. (near Andijan), 15h. (Calcutta, Warsaw, and Potsdam), 16h. (San Fernando), 19h. (Lick), 21h. (near Trieste).

Oct. 29d. 0h. 57m. 25s. Epicentre 0°·0 98°·0E. (as on 1937, May 12d.).

A = -·1392, B = +·9903, C = -0000; $\delta = +7$; $h = +7$;
 D = +·990, E = +·139; G = ·000, H = ·000, K = -1·000.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|--------|------|---------|----------------|--------|-------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Medan | 3·6 | 8 | i 1 2 | + 4 | i 2 3 | S _g | — | — |
| Batavia | 10·7 | 125 | 2 9 | -29 | i 4 13 | -26 | — | i 5·6 |
| Colombo | E. 19·3 | 290 | 4 28 | - 1 | 8 3 | + 1 | — | 9·2 |
| Kodaikanal | E. 22·8 | 298 | e 5 8 | + 3 | i 9 18 | + 7 | — | 11·3 |
| Calcutta | N. 24·3 | 337 | i 5 24 | + 4 | i 9 48 | +11 | e 5 57 | PP |
| Hyderabad | E. 25·9 | 313 | e 6 32 | PPP | 10 2 | - 2 | 10 21 | SS |
| Bombay | 31·0 | 308 | e 6 23 | + 2 | i 11 27 | + 1 | — | 15·2 |
| Agra | E. 33·1 | 326 | e 7 18 | +38 | 11 57 | - 2 | — | — |
| Almata | 47·0 | 339 | e 8 42 | + 7 | — | — | — | — |
| Tashkent | 48·7 | 331 | e 8 45 | - 3 | e 15 44 | - 6 | — | — |

Continued on next page.

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----------|-----|----------|-------|---------|------|---------|---------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Vladivostok | 52.6 | 31 | e 10 15 | +57 | i 18 30 | ? | — | — |
| Baku | 59.3 | 318 | e 9 58 | - 8 | — | — | — | — |
| Sverdlovsk | 63.5 | 338 | i 10 34 | 0 | i 19 9 | + 2 | — | — |
| Ksara | 67.1 | 306 | e 11 19? | +22 | e 19 54 | + 3 | — | — |
| Haiwee | z. 130.9 | 38 | i 19 19 | [+ 5] | — | — | — | — |
| Pasadena | z. 132.0 | 41 | i 19 21 | [+ 5] | — | — | — | — |
| Mount Wilson | z. 132.1 | 41 | e 19 12 | [- 4] | — | — | — | — |
| Tucson | 137.9 | 37 | e 19 21 | [- 6] | — | — | i 19 34 | ? |
| La Paz | 158.7 | 219 | e 19 55 | [- 4] | 44 5 | SS | 24 13 | PP 77.6 |

Additional readings :—

Batavia PE = +2m.13s.

Calcutta eP_cPN = +9m.4s.

La Paz ePKP = +20m.12s.

Long waves were also recorded at Potsdam, Huancayo, Riverview, and Tananarive.

Oct. 29d. 7h. 43m. 10s. Epicentre 25°·3N. 63°·5E.

A = +·4039, B = +·8101, C = +·4250 ; $\delta = +2$; $h = +3$;

D = +·895, E = -·446 ; G = +·190, H = +·380, K = -·905.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----------|-----|---------------------|-------|---------|------|---------|------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Bombay | 10.7 | 125 | e 2 33 | - 5 | i 4 54 | +15 | — | i 5.5 |
| Agra | E. 13.2 | 79 | 3 9 | - 2 | 5 31 | - 9 | 7 5 | S _g ? |
| Dehra Dun | N. 13.8 | 65 | e 3 45? | PP | e 6 59 | SSS | — | e 10.1 |
| Stalinabad | 14.0 | 17 | 3 38 | PP | — | — | — | — |
| Hyderabad | 16.0 | 117 | — | — | 6 57 | +11 | — | 10.1 |
| Tashkent | 16.7 | 15 | e 3 59 | + 2 | — | — | — | — |
| Baku | 18.9 | 327 | e 4 25 | + 1 | 8 1 | + 8 | — | — |
| Frunse | 19.7 | 25 | e 4 37 | + 3 | e 8 40 | SS | — | — |
| Kodaikanal | E. 20.0 | 136 | i 4 39 ^k | + 2 | i 8 28 | +11 | — | 10.2 |
| Calcutta | N. 22.9 | 92 | e 4 52 | -14 | i 9 28 | +15 | e 10 32 | SS e 12.3 |
| Colombo | E. 24.1 | 138 | 5 20 | + 2 | 9 40 | + 6 | — | 12.8 |
| Ksara | 25.4 | 295 | e 5 36? | + 5 | e 10 15 | +19 | — | — |
| Helwan | 28.8 | 286 | e 6 2 | 0 | 11 17 | +26 | e 12 20 | SS |
| Sverdlovsk | 31.6 | 357 | i 6 28 | + 2 | 11 54 | +19 | — | — |
| Irkutsk | 40.9 | 38 | e 7 47 | + 1 | e 14 15 | +17 | — | — |
| Mount Wilson | 120.8 | 1 | e 20 18 | PP | — | — | — | — |
| Pasadena | 120.9 | 1 | e 20 20 | PP | — | — | — | — |
| Tucson | 122.5 | 353 | i 19 1 | [+ 3] | — | — | i 20 55 | PP |
| La Paz | 134.2 | 271 | i 23 0 | PKS | — | — | — | 79.8 |

Additional readings :—

Agra S*E = +6m.20s.

Helwan eZ = +6m.19s.

Long waves were also recorded at De Bilt, Huancayo, and Upsala.

Oct. 29d. 22h. 40m. 23s. Epicentre 25°·3N. 63°·5E. (as at 7h.).

A = +·4039, B = +·8101, C = +·4250 ; $\delta = +2$; $h = +3$.

| | Δ | Az. | P. | O-C. | S. | O-C. | L. |
|------------|----------|-----|--------|------|----------|------|---------|
| | ° | ° | m. s. | s. | m. s. | s. | m. |
| Bombay | 10.7 | 125 | e 1 44 | -54 | — | — | — |
| Agra | E. 13.2 | 79 | e 5 34 | S | (e 5 34) | - 6 | (e 7.8) |
| Tashkent | 16.7 | 15 | 3 59 | + 2 | — | — | — |
| Tchimkent | 17.7 | 15 | 4 14 | + 4 | — | — | — |
| Baku | 18.9 | 327 | e 4 27 | + 3 | 8 15 | SS | — |
| Frunse | 19.7 | 25 | e 4 37 | + 3 | — | — | — |
| Kodaikanal | E. 20.0 | 136 | e 3 24 | -73 | — | — | — |
| Calcutta | N. 22.9 | 92 | — | — | i 9 21 | + 8 | i 12.4 |
| Colombo | E. 24.1 | 138 | e 5 7 | -11 | — | — | — |
| Sverdlovsk | 31.6 | 357 | i 6 28 | + 2 | 11 59 | +24 | — |

Additional readings :—

Bombay eN = +2m.37s.

Agra L given as S.

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Oct. 29d. Readings also at 0h. (near Branner and near Mizusawa), 9h. (near Mizusawa, Tucson, Mount Wilson, Pasadena, Haiwee, and Riverside), 16h. (near Spokane), 22h. (Bergen).

Oct. 30d. 7h. 10m. 8s. Epicentre $30^{\circ}6'N$. $139^{\circ}7'E$. Depth of focus 0.060.

Intensity IV at Kakioka; II-III at Tukupasan and Utunomiya. Macroseismic radius 200-300km. Depth=300km. Epicentre $30^{\circ}6'N$. $139^{\circ}7'E$.
See Seismological Bulletin of the Central Meteorological Observatory, Japan, 1941, Tokyo, 1950.

A = - .6576, B = + .5577, C = + .5065; $\delta = +1$; $h = +1$;
D = + .647, E = + .763; G = - .386, H = + .328, K = - .862.

| | Δ | Az. | P. | | O-C. | S. | | O-C. |
|---------------------|----------|-----|------|-----------------|------|----|----|------|
| | ° | ° | m. | s. | s. | m. | s. | s. |
| Hatidyozima | 2.5 | 3 | 1 | 2 | + 1 | 1 | 40 | - 9 |
| Osima | 4.2 | 357 | 1 | 14 | - 1 | 2 | 11 | - 3 |
| Titizima | 4.2 | 147 | 1 | 21 | + 6 | 2 | 20 | + 6 |
| Mera | 4.3 | 2 | 1 | 16 | 0 | 2 | 16 | 0 |
| Hamamatu | 4.4 | 339 | 1 | 3 | -14 | — | — | — |
| Slomisaki | 4.4 | 311 | 1 | 16 _a | - 1 | 2 | 12 | - 6 |
| Misima | 4.6 | 352 | 1 | 19 | 0 | 2 | 18 | - 4 |
| Owase | 4.6 | 320 | 1 | 16 | - 3 | 2 | 14 | - 8 |
| Yokohama | 4.8 | 359 | 1 | 22 | + 1 | 2 | 24 | - 1 |
| Hunatu | 4.9 | 351 | 1 | 22 | 0 | 2 | 22 | - 5 |
| Kameyama | 5.0 | 328 | 1 | 23 | 0 | 2 | 25 | - 4 |
| Kohu | 5.1 | 350 | 1 | 25 | + 1 | 2 | 30 | 0 |
| Nagoya | 5.1 | 334 | 1 | 23 | - 1 | 2 | 26 | - 4 |
| Tokyo Cen. Met. Ob. | 5.1 | 1 | 1 | 25 | + 1 | 2 | 25 | - 5 |
| Tyosi | 5.2 | 11 | 1 | 28 | + 3 | 2 | 34 | + 2 |
| Wakeyama | 5.3 | 315 | 1 | 22 _a | - 4 | 2 | 21 | -13 |
| Muroto | 5.4 | 301 | 1 | 22 | - 5 | — | — | — |
| Osaka | 5.4 | 320 | 1 | 24 | - 3 | 2 | 30 | - 6 |
| Hikone | 5.5 | 329 | 1 | 21 | - 7 | 2 | 23 | -15 |
| Sumoto | 5.5 | 314 | 1 | 24 _a | - 4 | 2 | 30 | - 8 |
| Kakioka | 5.6 | 4 | 1 | 30 | 0 | 2 | 38 | - 2 |
| Kobe | 5.6 | 318 | 1 | 30 _a | 0 | 2 | 38 | - 2 |
| Tukupasan | 5.6 | 4 | 1 | 28 | - 2 | 2 | 38 | - 2 |
| Mito | 5.8 | 6 | 1 | 32 | 0 | 2 | 42 | - 2 |
| Utunomiya | 5.9 | 2 | 1 | 32 | - 1 | — | — | — |
| Nagano | 6.2 | 349 | 1 | 35 | - 1 | 2 | 49 | - 2 |
| Onahama | 6.4 | 9 | 1 | 55 | P* | 3 | 9 | S* |
| Toyama | 6.4 | 342 | 1 | 40 | + 2 | 2 | 58 | + 3 |
| Toyooka | 6.4 | 322 | 1 | 34 | - 4 | 2 | 46 | - 9 |
| Matuyama | 6.7 | 300 | 1 | 36 _a | - 5 | — | — | — |
| Hukusima | 7.1 | 5 | 1 | 48 _k | + 2 | 3 | 9 | - 1 |
| Hirosima | 7.2 | 304 | 1 | 42 | - 5 | 3 | 1 | -11 |
| Hamada | 7.5 | 305 | 1 | 49 _a | - 1 | 3 | 14 | - 4 |
| Sendai | 7.7 | 7 | 1 | 54 | + 1 | 3 | 20 | - 2 |
| Kagosima | 7.9 | 279 | 1 | 49 | - 6 | — | — | — |
| Kumamoto | 8.0 | 288 | 1 | 50 | - 6 | 3 | 13 | -15 |
| Mizusawa | 8.6 | 8 | 2 | 4 | + 1 | 3 | 40 | 0 |
| Akita | 9.1 | 2 | 2 | 6 | - 3 | 3 | 51 | - 1 |
| Miyako | 9.2 | 11 | 1 | 59 | -11 | 3 | 43 | - 9 |
| Husan | 10.0 | 299 | 2 | 11 | - 8 | 3 | 57 | -12 |
| Mori | 11.5 | 3 | 2 | 41 | + 5 | 4 | 40 | 0 |
| Berkeley | z. 77.6 | 54 | i 11 | 19 | + 6 | — | — | — |
| Mount Wilson | z. 82.4 | 55 | i 11 | 44 _a | + 6 | — | — | — |
| Pasadena | z. 82.4 | 55 | i 11 | 44 _a | + 6 | — | — | — |
| Riverside | z. 83.0 | 55 | i 11 | 46 _a | + 5 | — | — | — |
| Tucson | 88.5 | 53 | e 12 | 14 | + 6 | — | — | — |

Mizusawa also gives iSN = + 3m.43s.
Long waves were also recorded at Scoresby Sund.

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Oct. 30d. Readings also at 0h. (near Branner), 4h. (near Mizusawa), 10h. (Bucharest), 15h. (Prague and near La Paz), 16h. (Riverview, Wellington, Auckland, and Arapuni), 17h. (Medan), 20h. (near Apia and near Berkeley), 22h. (Berkeley and Tucson (2)).

Oct. 31d. 6h. 31m. 4s. Epicentre 25°·8N. 98°·4E. (as on 1941, May 14d.).

A = -·1317, B = +·8918, C = +·4329; $\delta = +5$; $h = +3$;
D = +·989, E = +·146; G = -·062, H = +·428, K = -·902.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|---------------|----|----------|-----|----------------------|------|-----------|------|---------|------------------|----------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Calcutta | N. | 9·7 | 253 | i 2 20 _k | - 2 | i 3 55 | -20 | 4 50 | S* | — |
| Agra | E. | 18·3 | 278 | i 4 9 _a | - 8 | i 7 39 | 0 | 8 7 | SS | 9·3 |
| Dehra Dun | N. | 18·5 | 290 | e 4 20 | + 1 | e 7 38 | - 6 | — | — | i 10·1 |
| Hyderabad | | 20·3 | 250 | 4 37 | - 3 | 8 16 | - 7 | 9 9 | P _c P | 10·0 |
| Medan | | 22·1 | 180 | 4 52 | - 7 | 11 45 | L | — | — | (11·7) |
| Bombay | E. | 24·6 | 259 | i 5 20 | - 3 | i 9 44 | + 2 | 10 29 | SS | 12·5 |
| Almata | | 24·7 | 320 | 5 28 | + 4 | — | — | — | — | — |
| Kodaikanal | E. | 25·1 | 237 | i 5 26 | - 2 | e 9 52 | + 1 | — | — | — |
| Andijan | | 26·3 | 310 | 5 42 | + 3 | — | — | — | — | — |
| Zinsen | | 26·6 | 57 | e 10 13 | S | (e 10 13) | - 3 | — | — | 14·3 |
| Semipalatinsk | | 28·3 | 335 | e 5 52 | - 5 | 10 46 | + 3 | — | — | — |
| Tashkent | | 28·6 | 310 | e 6 0 | 0 | e 10 42 | - 6 | — | — | — |
| Tchimkent | | 28·8 | 313 | i 6 4 | + 2 | — | — | — | — | — |
| Vladivostok | | 32·3 | 49 | e 6 36 | + 3 | e 11 48 | + 2 | — | — | — |
| Batavia | | 32·8 | 164 | 6 1 | -36 | i 17 18 | L | 8 26 | PPP | (i 17·3) |
| Sapporo | | 38·9 | 51 | 15 10 | ? | — | — | — | — | 16·5 |
| Sverdlovsk | | 41·1 | 329 | 1·7 47 | 0 | i 14 2 | + 1 | — | — | — |
| Baku | | 42·6 | 303 | 8 6 | + 7 | — | — | — | — | — |
| Ksara | | 54·1 | 294 | e 9 33? | + 4 | e 17 10 | + 5 | — | — | — |
| Helwan | | 58·7 | 290 | e 10 3 _k | + 1 | e 18 8 | + 2 | e 13 32 | PPP | — |
| Warsaw | | 62·4 | 317 | e 14 18 _a | PPP | e 19 2 | + 9 | — | — | e 32·9 |
| Upsala | | 63·5 | 326 | e 18 56 | PS | e 19 11 | + 4 | e 26 10 | SSS | e 32·9 |
| Tananarive | E. | 66·5 | 233 | — | — | 25 15 | ? | — | — | 33·5 |
| Copenhagen | | 66·9 | 322 | — | — | 19 48 | - 1 | 21 2? | S _c S | 34·9 |
| Prague | | 66·9 | 316 | e 24 36 | ? | e 32 28 | ? | — | — | e 35·9 |
| Potsdam | | 67·2 | 319 | e 10 56? | - 2 | i 19 55 | + 3 | i 20 1 | PS | e 29·9 |
| Bergen | | 69·4 | 329 | — | — | e 27 56? | SSS | — | — | — |
| Stuttgart | | 70·6 | 315 | e 11 28 | + 9 | — | — | — | — | e 38·9 |
| Mount Wilson | z. | 111·0 | 31 | — | — | i 23 44 | PKS | — | — | — |
| Pasadena | | 111·0 | 31 | — | — | i 23 43 | PKS | — | — | e 36·5 |
| Tucson | | 115·9 | 28 | i 19 29 | PP | i 24 19 | ? | i 22 7 | PKS | — |

Additional readings:—

Calcutta iS*N = +4m.27s.

Hyderabad SSN = +8m.33s.

Bombay ePN = +5m.24s.

Batavia P?Z = +6m.18s., S?E = +18m.4s.

Helwan eZ = +10m.44s.

Warsaw eN = +20m.29s.

Upsala eN = +30m.32s.

Long waves were also recorded at Ottawa, Lisbon, Huancayo, East Machias, College, Chicago U.S.C.G.S., Bozeman, San Juan, Taihoku, Osaka, Tokyo Cen. Met. Ob., Harvard, Uccle, La Paz, De Bilt, Aberdeen, and Jena.

Oct. 31d. 12h. 41m. 2s. Epicentre 43°·6N. 128°·0W. (as on 1938, August 3d.).

A = -·4473, B = -·5725, C = +·6872; $\delta = +8$; $h = -3$;
D = -·788, E = +·616; G = -·423, H = -·542, K = -·727.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|----------|--|----------|-----|--------|----------------|--------|----------------|--------|----|-------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Ferndale | | 4·1 | 136 | e 1 33 | P _g | i 3 1 | ? | e 1 37 | ? | — |
| Seattle | | 5·7 | 42 | — | — | e 3 3 | S _g | — | — | e 4·0 |
| Ukiah | | 5·7 | 139 | e 1 27 | - 1 | — | — | 1 34 | P* | e 2·5 |
| Berkeley | | 7·2 | 141 | i 1 46 | - 3 | i 3 16 | + 3 | — | — | i 3·3 |
| Branner | | 7·6 | 142 | i 1 52 | - 3 | — | — | — | — | e 4·3 |

Continued on next page.

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| | Δ ° | Az. ° | P. m. s. | O - C. s. | S. m. s. | O - C. s. | Supp. m. s. | L. m. |
|--------------------|---------------|----------|-------------|--------------|-------------|--------------|----------------|----------|
| Santa Clara | 7.7 | 141 | e 2 17 | P* | e 3 54 | S* | — | — |
| Lick | 7.9 | 140 | i 1 58 | - 1 | — | — | — | e 5.0 |
| Spokane | 8.5 | 57 | i 2 10 | + 3 | — | — | — | — |
| Tinemaha | 9.9 | 127 | e 2 38 | +13 | — | — | — | — |
| Haiwee | 10.7 | 130 | i 2 38 | 0 | — | — | — | — |
| Santa Barbara | 11.2 | 142 | i 2 25 | -19 | — | — | — | — |
| Butte | 11.3 | 72 | e 2 50 | + 4 | e 5 16 | +22 | — | e 6.8 |
| Logan | 12.0 | 90 | 3 55 | +60 | — | — | — | 6.2 |
| Mount Wilson | 12.1 | 137 | i 2 54k | - 3 | — | — | i 3 5 | PP |
| Pasadena | 12.1 | 138 | i 2 56 | - 1 | (e 5 28) | SS | — | e 5.5 |
| Bozeman | 12.2 | 75 | e 2 57 | - 1 | e 5 46 | SSS | — | e 6.5 |
| Salt Lake City | 12.3 | 97 | — | — | e 5 21 | + 3 | — | e 6.3 |
| Riverside | 12.6 | 135 | i 3 3k | 0 | — | — | — | — |
| Tucson | 17.6 | 124 | i 4 9 | + 1 | e 7 29 | + 6 | i 4 54 | PPP |
| Lincoln | 23.3 | 87 | e 5 11 | + 1 | e 9 26 | + 6 | — | e 13.5 |
| Florissant | 28.5 | 87 | e 6 3 | + 4 | i 11 7 | +21 | — | e 14.5 |
| St. Louis | 28.7 | 87 | e 6 0 | - 1 | e 11 11 | +21 | 12 59 | SSS |
| Chicago U.S.C.G.S. | 29.5 | 79 | e 9 18 | ? | e 11 2 | 0 | — | e 15.5 |
| Ottawa | 36.8 | 68 | 7 12 | + 1 | 12 58 | + 2 | 8 36 | PP |
| Philadelphia | 39.0 | 76 | e 8 48 | PP | — | — | — | e 14.8 |
| Seven Falls | 39.6 | 64 | e 11 40? | ? | — | — | — | 22.0 |

Additional readings :—

Berkeley iPE = +1m.51s.

Tucson e = +5m.29s., i = +5m.38s., e = +7m.40s.

St. Louis eZ = +6m.5s., eE = +10m.42s.

Long waves were also recorded at Honolulu, De Bilt, Columbia, East Machias, and Harvard.

Oct. 31d. 16h. Undetermined shock.

Tuai S? = 55m.41s. ?

Auckland S? = 55m.45s. ?, Q? = 57m.20s., R = 57m.42s.

Arapuni S? = 56m.30s.

Sydney e = 56m.36s. and 62m.6s. ?

Wellington S = 56m.45s., Q = 57m.45s., R = 59.0m.

Brisbane iE = 56m.46s., eN = 56m.51s., iE = 59m.17s., iN = 62m.16s.

Riverview ePEZ = 57m.4s., iE = 58m.0s., eS?E = 62m.4s., eZ = 62m.14s., eLN = 63.9m.

Colombo eE = 61m.30s.

Berkeley ePN = 63m.23s., eZ = 63m.37s., iSN = 73m.21s., eLE = 89.7m.

Mount Wilson iPZ = 63m.45s., iZ = 64m.0s.

Pasadena iP = 63m.46s., iZ = 63m.59s., eN = 74m.13s., eL = 89.2m.

Riverside ePZ = 63m.46s., iZ = 64m.1s.

Haiwee iPZ = 63m.52s., iZ = 64m.5s.

Tinemaha ePEN = 63m.56s.

Tucson eP = 64m.3s., i = 64m.21s., 64m.50s., e = 66m.29s., eS = 75m.45s., e = 79m.2s., 82m.59s., eL = 91.5m.

Sverdlovsk P = 70m.24s., PP = 73m.50s.

Baku eP = 70m.40s., PP = 74m.25s., PS = 82m.36s.

Bombay eE = 70m.54s., eN = 73m.12s.

Warsaw eZ = 71m.5s.k, eN = 85m.0s. ?, eLZ = 130.0m.

Potsdam eZ = 71m.7s., iZ = 71m.34s., eZ = 75m.8s., eLZ = 128.0m.

De Bilt eZ = 71m.12s. and 75m.0s., eZ = 84m.0s., eL = 135.0m.

Huancayo eS = 75m.10s., e = 77m.3s., 82m.5s., 82m.25s., eL = 95.5m.

Agra eE = 77m.0s. ?

Long waves were also recorded at Salt Lake City, East Machias, and La Paz.

Oct. 31d. Readings also at 0h. (La Paz, San Juan, and Berkeley), 1h. (Balboa Heights), 5h. (Medan, La Paz, and near Algiers), 6h. (Mizusawa, Amboina, Tucson, Pasadena, Mount Wilson, Riverside, and Haiwee), 11h. (near Lick (2), Tucson, Mount Wilson, and Riverside), 18h. (near Berkeley), 19h. (Kew), 21h. (San Juan and Berkeley), 23h. (near Berkeley).

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Nov. 1d. Readings at 2h. (La Paz), 3h. (near Mizusawa), 4h. (near Mizusawa), 7h. (Scoresby Sund), 13h. (Balboa Heights, Amboina, and Scoresby Sund), 14h. (Tucson), 16h. (Batavia), 19h. (near Mizusawa), 22h. (Ksara).

Nov. 2d. Readings at 5h. (Frunse, Stalinabad, and Tchinkent), 8h. (near Mizusawa), 9h. (Oaxaca), 14h. (Tchinkent), 15h. (La Paz and near Huancayo).

Nov. 3d. 20h. 44m. 8s. Epicentre 43°·0N. 12°·6E.

Intensity VII at Deruta. Epicentre 43°·0N. 12°·6E. ±0°·2. Radius of macroseismic area 40 to 50km.

Giulio Genevois.

Il terremoto di Deruta del 3 November, 1941-XX Estratto dal "Bollettino della Società Sismologica Italiana," Vol. XI, N.1-2, Anno 1942, et Public de l'Institut Géophysique de Rome No. 87. Isoseismic chart p. 4.

$$A = +.7159, B = +.1600, C = +.6795; \quad \delta = -17; \quad h = -2;$$

$$D = +.218, E = -.976; \quad G = +.663, H = +.148, K = -.734.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|--------|----------------|--------|------|--------|----------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Triest | 2.8 | 17 | e 0 52 | P _r | e 1 27 | + 5 | — | — |
| Ravensburg | 5.3 | 337 | e 1 45 | P _r | e 2 27 | + 2 | e 2 38 | S* e 2.7 |
| Zurich | 5.3 | 328 | e 1 22 | 0 | — | — | — | — |
| Neuchatel | 5.7 | 317 | e 1 28 | 0 | — | — | — | — |
| Basle | 5.8 | 324 | e 1 25 | - 4 | e 2 35 | - 3 | — | — |
| Stuttgart | 6.3 | 339 | e 1 37 | + 1 | i 2 45 | - 5 | i 2 6 | P* e 3.1 |
| Jena | N. 8.0 | 355 | e 2 52 | P _r | e 4 0 | S* | — | e 5.2 |
| Potsdam | 9.4 | 2 | — | — | e 4 52 | S* | e 5 6 | S _r i 5.6 |

Additional readings:—

Triest e = +1m.6s.

Stuttgart iS = +2m.9s., i = +2m.18s., +2m.25s., and +2m.55s.

Nov. 3d. Readings also at 1h. (Lick), 2h. (near Triest), 3h. (Auckland, Riverview, and Wellington), 5h. and 7h. (Bozeman), 8h. (Amboina), 9h. (Balboa Heights), 16h. (near Mizusawa), 20h. (near Branner).

Nov. 4d. 2h. 26m. 42s. Epicentre 17°·8S. 178°·8W. Depth of focus 0.070.
(as on 1941, May 8d.).

$$A = -.9526, B = -.0199, C = -.3038; \quad \delta = +14; \quad h = +5;$$

$$D = -.021, E = +1.000; \quad G = +.304, H = +.006, K = -.953.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------|----------|-----|----------|------|---------|------|---------|--------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Apia | 7.9 | 60 | i 2 1 | + 5 | i 3 42 | sS | — | — |
| Auckland | 19.8 | 195 | i 5 43 | ? | i 7 3 | - 8 | 7 45 | sS — |
| Tual | 21.2 | 187 | 4 13 | + 1 | 7 23 | -11 | 14 22 | S _c S — |
| New Plymouth | 22.1 | 194 | — | — | 7 46 | - 3 | — | — |
| Wellington | 24.0 | 192 | 4 37 | 0 | 8 13 | - 7 | 8 28 | P _c P — |
| Christchurch | 26.7 | 193 | — | — | 8 54 | - 9 | — | — |
| Brisbane | 27.7 | 245 | i 5 12 | + 2 | i 9 14 | - 4 | i 12 12 | SSS — |
| Riverview | 31.2 | 233 | i 5 43k | + 3 | i 10 9 | - 4 | — | i 15.2 |
| Honolulu | 44.0 | 29 | e 7 26 | + 1 | — | — | e 9 31 | PP e 19.9 |
| Amboina | 53.7 | 279 | 8 35 | - 3 | i 15 34 | - 1 | — | — |
| Sendai | 67.4 | 327 | 10 8 | - 2 | 18 18 | - 8 | — | — |
| Kobe | 68.1 | 321 | e 10 12 | - 1 | 18 31 | - 3 | — | — |
| Batavia | 73.3 | 269 | i 10 12k | -31 | i 18 57 | -36 | — | — |
| Branner | 76.5 | 43 | i 11 1 | 0 | e 20 2 | - 5 | i 13 2 | pP — |
| Santa Barbara | 76.5 | 47 | i 11 0 | - 1 | — | — | e 12 59 | pP — |
| Berkeley | 76.7 | 44 | i 11 1 | - 1 | — | — | i 13 2 | pP — |
| Lick | N. 76.8 | 43 | i 11 3 | 0 | — | — | — | — |
| La Jolla | Z. 77.4 | 50 | i 11 6 | 0 | — | — | e 13 5 | pP — |
| Pasadena | 77.4 | 48 | i 11 6k | 0 | e 20 14 | - 3 | i 13 5 | pP — |
| Mount Wilson | 77.5 | 48 | i 11 6k | - 1 | — | — | i 13 6 | pP — |

Continued on next page.

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|------------|------------|----------|-------|---------|------|---------|------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Palomar | z. 77.9 | 50 | i 11 10 | + 1 | — | — | i 13 10 | pP |
| Riverside | 77.9 | 48 | i 11 7k | - 2 | e 20 30 | + 8 | e 13 7 | pP |
| Haiwee | 78.6 | 46 | i 11 12k | 0 | — | — | i 13 12 | pP |
| Tinemaha | 78.9 | 45 | e 11 14 | 0 | — | — | — | — |
| Tucson | 81.9 | 52 | i 11 29 | - 1 | e 21 0 | - 3 | i 13 26 | pP |
| Medan | 84.0 | 275 | 11 50 | +10 | 21 19 | - 4 | — | — |
| Copenhagen | 141.2 | 350 | e 18 30 | [- 6] | — | — | — | — |
| Ksara | 145.1 | 303 | e 18 45 | [+ 3] | e 26 52 | ? | e 29 43 | ? |
| Jena | 145.9 | 348 | e 18 43 | [0] | — | — | — | — |
| Uccle | 147.0 | 357 | e 18 47 | [+ 1] | — | — | e 20 59 | pPKP |
| Stuttgart | 148.4 | 352 | e 18 46k | [- 1] | — | — | — | — |
| Basle | 149.9 | 351 | e 18 49 | [0] | — | — | — | — |
| Zurich | 149.9 | 351 | e 18 48k | [- 1] | — | — | — | — |
| Neuchatel | 150.5 | 352 | e 18 50 | [0] | — | — | — | — |
| Clermont-Ferrand | 152.1 | 356 | e 18 53 | [+ 1] | — | — | 19 0 | PKP, |
| Coimbra | 156.2 | 18 | e 19 25 | [+27] | e 29 28 | SKKS | — | — |
| Toledo | 157.6 | 10 | i 19 1 | [+ 1] | — | — | i 19 36 | pP |
| Granada | 160.2 | 11 | i 21 53 | pPKP | 29 24 | SKKS | 23 10 | PP |
| Almeria | 160.8 | 9 | e 19 2 | [- 2] | — | — | e 23 52 | PP |

Additional readings :—

Auckland i = +7m.54s.
 New Plymouth e = +10m.31s.
 Wellington i = +7m.38s., $S_eS = +14m.33s.$, $sS_eS = +18m.38s.$
 Honolulu e = +15m.0s.
 Branner eSE = +19m.34s.
 Pasadena isPZ = +14m.9s.
 Mount Wilson isPZ = +14m.3s.
 Haiwee ePKP, PKP = +38m.10s.
 Tucson i = +12m.2s., ePP = +14m.34s., e = +17m.5s. and +25m.1s.
 Jena iE = +18m.46s., e = +19m.7s.
 Stuttgart i = +18m.52s. and +19m.25s.
 Basle e = +19m.1s.
 Zurich i = +18m.54s.
 Coimbra e = +21m.28s. and +22m.25s.
 Toledo PP = +21m.45s.
 Granada iPP = +25m.38s., iSKS = +28m.0s.
 Almeria e = +21m.18s.

Nov. 4d. 13h. 58m. 20s. Epicentre $36^{\circ}1N$. $141^{\circ}2E$.

Scale V at Kakioka, Tyosi; IV at Mito, Tokyo, Tukubasan, Yokohama; II-III at Onahama, Kohu, Hokusima, and Miyako. Macroseismic radius 200-300km.

Seismological Bulletin of Cen. Met. Ob., Japan, 1941, Tokyo, 1950, pp. 38-39. Epicentre as adopted. Shallow.

A = -0.6312, B = +0.5075, C = +0.5866; $\delta = +7$; $h = 0$;
 D = +0.627, E = +0.779; G = -0.457, H = +0.368, K = -0.810.

| | Δ | Az. | P. | O-C. | S. | O-C. |
|----------------------|------------|------------|-------|------|-------|------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. |
| Tyosi | 0.4 | 216 | 0 6k | - 7 | 0 9 | -12 |
| Mito | 0.7 | 296 | 0 14a | - 3 | 0 23 | - 5 |
| Kakioka | 0.8 | 279 | 0 15a | - 3 | 0 25 | - 6 |
| Onahama | 0.9 | 344 | 0 26 | + 6 | 0 37 | + 3 |
| Togane | 0.9 | 232 | 0 24 | + 4 | 0 33 | - 1 |
| Tukubasan | 0.9 | 277 | 0 17a | - 3 | 0 28 | - 6 |
| Tokyo, Cen. Met. Ob. | 1.2 | 251 | 0 20a | - 4 | 0 34 | - 7 |
| Tokyo, Imp. Univ. | 1.2 | 251 | 0 20 | - 4 | 0 35 | - 6 |
| Utanomiya | 1.2 | 293 | 0 23 | - 1 | 0 37 | - 4 |
| Komaba | 1.3 | 250 | 0 20 | - 5 | 0 35 | - 9 |
| Mitaka | 1.4 | 252 | 0 24 | - 3 | 0 41 | - 5 |
| Yokohama | 1.4 | 242 | 0 23a | - 4 | 0 40 | - 6 |
| Kamakura | 1.6 | 240 | 0 24 | - 6 | 0 42 | - 9 |
| Mera | 1.6 | 223 | 0 25 | - 5 | 0 41 | -10 |
| Titibu | 1.7 | 266 | 0 24 | - 7 | 0 45 | - 9 |
| Hokusima | 1.8 | 340 | 0 37k | + 5 | 1 4 | + 8 |
| Maebasi | 1.8 | 280 | 0 29a | - 3 | 0 58 | + 2 |
| Hunatu | 2.0 | 253 | 0 34 | - 1 | 0 59 | - 3 |
| Osima | 2.0 | 228 | 0 30 | - 5 | 0 52 | -10 |
| Kohu | 2.1 | 258 | 0 36 | - 1 | 1 8 | + 4 |

Continued on next page.

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| | Δ ° | Az. ° | P. | | O - C. | S. | | O - C. |
|-------------|---------------|----------|-----|-----------------|--------|-----|----|--------|
| | | | m. | s. | s. | m. | s. | s. |
| Misima | 2.1 | 242 | 0 | 33 | - 4 | 0 | 58 | - 6 |
| Sendai | 2.2 | 354 | 0 | 44 ^k | + 6 | 1 | 15 | + 9 |
| Susaki | 2.3 | 232 | 0 | 35 | - 5 | 1 | 3 | - 6 |
| Nagano | 2.5 | 283 | 0 | 41 | - 2 | 1 | 18 | + 4 |
| Shizuoka | 2.6 | 244 | 0 | 40 | - 4 | 1 | 8 | - 9 |
| Mizusawa | 3.0 | 359 | e 0 | 56 | + 6 | i 1 | 36 | + 9 |
| Aikawa | 3.1 | 309 | 0 | 52 | + 1 | 1 | 35 | + 6 |
| Hamamatu | 3.2 | 244 | 0 | 50 ^k | - 2 | 1 | 20 | -12 |
| Hatidyozima | 3.2 | 201 | 0 | 53 | + 1 | 1 | 28 | - 4 |
| Toyama | 3.3 | 280 | 0 | 56 | + 3 | 1 | 48 | +13 |
| Miyako | 3.6 | 11 | 1 | 2 | + 4 | 1 | 48 | + 6 |
| Nagoya | 3.6 | 256 | 1 | 2 | + 4 | 1 | 51 | S* |
| Akita | 3.7 | 347 | 1 | 7 | P* | 2 | 6 | S* |
| Wazima | 3.7 | 292 | 0 | 59 | - 1 | 1 | 58 | S* |
| Hikone | 4.1 | 260 | 1 | 11 | P* | 2 | 6 | S* |
| Kameyama | 4.1 | 253 | 1 | 2 | - 3 | 1 | 58 | + 3 |
| Hatinohe | 4.4 | 4 | 1 | 14 | + 4 | 2 | 14 | S* |
| Kyoto | 4.6 | 258 | 1 | 11 | - 1 | 2 | 25 | S* |
| Oiwase | 4.6 | 245 | 1 | 10 | - 2 | 2 | 19 | S* |
| Aomori | 4.7 | 356 | 1 | 21 ^a | + 7 | 2 | 22 | S* |
| Osaka | 4.9 | 254 | 1 | 12 | - 5 | — | — | — |
| Kobe | 5.1 | 256 | 1 | 29 | + 9 | 2 | 22 | + 2 |
| Siomisaki | 5.2 | 241 | 2 | 0 | ? | — | — | — |
| Toyooka | 5.2 | 266 | 1 | 16 | - 5 | 2 | 31 | + 9 |
| Wakayama | 5.3 | 251 | 1 | 3 | ? | 2 | 30 | + 5 |
| Muroto | 6.4 | 246 | 1 | 39 | + 1 | 2 | 32 | -21 |
| Kotl | 6.8 | 250 | 1 | 55 | P* | 3 | 7 | + 4 |
| Sapporo | 7.0 | 1 | 2 | 9 | P* | — | — | — |
| Nemuro | 8.0 | 24 | 2 | 28 | P* | — | — | — |
| Kumamoto | 9.3 | 252 | 2 | 24 | + 7 | 4 | 45 | S* |

Nov. 4d. Readings also at 2h. (near Lick, Berkeley, Fresno, Branner, and Mizusawa), 4h. (Lick), 8h. (near Andijan), 11h. (Pasadena), 12h. (Pasadena and Palomar), 14h. (near Granada), 15h. (Pasadena, La Paz, Riverside, and Mount Wilson), 19h. (Wellington), 22h. (Riverview), 23h. (near Lick, Berkeley, and Branner).

Nov. 5d. 11h. 5m. 19s. Epicentre 22°·0S, 171°·7E. (as on 1940, September, 3d.).

Pasadena suggests deep focus.

A = -·9184, B = +·1340, C = -·3724; δ = +10; h = +4;
D = +·144, E = +·990; G = +·368, H = -·054, K = -·928.

| | Δ ° | Az. ° | P. | | O - C. | S. | | O - C. | Supp. | L. | |
|--------------|---------------|----------|------|-----------------|--------|------|----|--------|--------|----|--------|
| | | | m. | s. | s. | m. | s. | s. | m. | s. | |
| Auckland | 15.0 | 171 | 2 | 56 | -39 | 6 | 16 | - 7 | 3 9 | pp | — |
| Arapuni | 16.4 | 169 | — | — | — | 6 | 53 | - 3 | — | — | 8.3 |
| Apia | 17.7 | 66 | 14 | 4 | - 6 | i 7 | 55 | SS | — | — | — |
| Brisbane | 17.8 | 248 | 14 | 10 | - 1 | i 7 | 35 | + 7 | — | — | — |
| Wellington | 19.4 | 174 | 4 | 21 | - 9 | 7 | 56 | - 8 | 14 51 | sP | 9.4 |
| Christchurch | 21.5 | 179 | 5 | 44 ^a | PPP | 8 | 50 | + 3 | 9 2 | Q | 10.5 |
| Riverview | 21.6 | 232 | e 5 | 2 | + 8 | e 8 | 55 | + 6 | e 5 30 | PP | e 10.6 |
| Sydney | 21.6 | 232 | e 4 | 53 | - 1 | e 8 | 35 | -14 | — | — | e 10.7 |
| Adelaide | 31.7 | 238 | 1 | 6 51 | +24 | — | — | — | — | — | i 15.6 |
| Perth | 50.3 | 246 | — | — | — | i 16 | 16 | + 3 | — | — | i 24.9 |
| Batavia | 64.4 | 273 | 10 | 12 | -28 | 18 | 56 | -22 | — | — | — |
| Pasadena | z. 86.9 | 51 | e 12 | 52 | + 4 | — | — | — | — | — | — |
| Mount Wilson | z. 87.1 | 51 | e 12 | 54 | + 5 | — | — | — | — | — | — |
| Riverside | z. 87.4 | 51 | e 12 | 49 | - 1 | — | — | — | — | — | — |
| Agra | E. 102.8 | 294 | — | — | — | e 24 | 35 | [- 5] | — | — | — |
| Bombay | 104.8 | 284 | e 18 | 33 | PKP | e 25 | 47 | -13 | — | — | — |
| Helwan | z. 143.7 | 291 | 19 | 41 | [+ 4] | — | — | — | — | — | — |
| Uccle | z. 149.6 | 345 | e 19 | 54 | [+ 7] | — | — | — | — | — | — |

For Notes see next page.

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NOTES TO NOVEMBER 5d. 11h. 5m. 19s.

Additional readings :—

Auckland sP? = +3m.21s., S = +5m.51s., sS? = +6m.41s., PcP = +7m.18s.

Brisbane iSE = +7m.39s.

Wellington iZ = +5m.25s., i = +5m.51s., iZ = +7m.6s.

Riverview eE = +9m.1s.

Perth i = +22m.36s.

Long waves were also recorded at Kodaikanal, De Bilt, and Huancayo.

Nov. 5d. 13h. 5m. 13s. Epicentre 22°·0S. 171°·7E. (as at 11h.).

Pasadena suggests depth = 100km.

A = -·9184, B = +·1340, C = -·3724; δ = +10; h = +4;
D = +·144, E = +·990; G = +·368, H = -·054, K = -·928.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|--------------------|----------|-----|----------|-------|----------|-------|---------|----|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Auckland | 15·0 | 171 | 2 58 | -37 | 1 6 17 | - 6 | 3 12 | pP | — |
| Arapuni | 16·4 | 169 | 3 53 | 0 | 6 56 | 0 | — | — | 8·4 |
| New Plymouth | 17·1 | 175 | 4 2 | 0 | 7 22 | +10 | 1 5 50 | ? | 7·8 |
| Tuai | 17·4 | 166 | 4 0 | - 6 | 7 12 | - 7 | — | — | — |
| Apia | 17·7 | 66 | 1 4 10 | 0 | e 7 38 | +12 | 1 4 22 | pP | 1 9·0 |
| Brisbane | 17·8 | 248 | 1 4 9 | - 2 | 1 7 22 | - 6 | 1 4 30 | PP | — |
| Wellington | 19·4 | 174 | 4 19 | PcP | 7 59 | - 5 | 4 46 | pP | — |
| Christchurch | 21·5 | 179 | 4 43k | - 9 | 8 48 | + 1 | 9 12 | Q | 10·1 |
| Riverview | 21·6 | 232 | 1 4 57k | + 3 | 1 8 49 | 0 | 1 5 16 | PP | e 9·9 |
| Sydney | 21·6 | 232 | e 4 57 | + 3 | 1 8 47 | - 2 | — | — | e 10·6 |
| Adelaide | 31·7 | 238 | 1 6 45 | +18 | 1 11 31 | - 6 | 7 34 | PP | 15·4 |
| Perth | 50·3 | 246 | 16 12 | S | (16 12) | - 1 | — | — | 23·2 |
| Honolulu | 52·3 | 37 | — | — | e 20 17 | SS | — | — | e 27·9 |
| Batavia | 64·4 | 273 | 10 8 | -32 | — | — | — | — | 34·8 |
| Medan | 75·7 | 279 | e 11 51 | + 2 | — | — | — | — | — |
| Berkeley | 86·0 | 47 | e 12 48 | + 5 | — | — | 1 36 17 | Q | e 40·0 |
| Santa Barbara | z. 86·0 | 50 | e 12 47 | + 4 | — | — | — | — | — |
| Pasadena | 86·9 | 51 | e 12 51 | + 3 | e 23 41 | +15 | e 16 2 | PP | e 26·3 |
| La Jolla | z. 87·0 | 53 | e 12 49 | + 1 | — | — | — | — | — |
| Mount Wilson | z. 87·1 | 51 | e 12 49 | 0 | — | — | — | — | — |
| Riverside | z. 87·4 | 51 | e 12 51 | + 1 | — | — | — | — | — |
| Palomar | z. 87·5 | 53 | e 12 52 | + 1 | — | — | — | — | — |
| Tucson | 91·6 | 56 | e 13 10 | 0 | e 26 2 | PPS | 1 13 44 | pP | e 42·5 |
| Calcutta | N. 92·5 | 293 | — | — | 1 24 43 | +26 | — | — | — |
| Colombo | E. 94·2 | 275 | — | — | e 24 47? | +16 | — | — | — |
| Irkutsk | 94·3 | 325 | 16 6 | PKP | 27 53 | ? | — | — | — |
| Salt Lake City | 94·4 | 48 | — | — | e 24 51 | +18 | — | — | e 45·4 |
| Kodaikanal | E. 97·6 | 278 | e 14 47? | ? | — | — | — | — | — |
| Agra | E. 102·8 | 294 | e 18 39 | PP | — | — | — | — | — |
| Bombay | 104·8 | 284 | e 14 41 | +31 | — | — | 1 18 35 | PP | — |
| Huancayo | 106·1 | 110 | e 27 57 | PS | e 26 21 | +10 | e 33 44 | SS | e 49·5 |
| La Paz | 110·0 | 118 | — | — | e 27 18 | ? | 1 34 36 | SS | 51·8 |
| Chicago U.S.C.G.S. | 112·1 | 52 | — | — | e 41 14 | ? | — | — | e 58·0 |
| San Juan | 125·9 | 82 | e 22 11 | ? | 32 26 | PPS | — | — | e 56·0 |
| Ksara | 139·5 | 296 | e 19 53 | [+23] | — | — | 23 19 | PP | — |
| Warsaw | 142·3 | 329 | e 19 47? | [+12] | 33 47? | PS | — | — | e 73·8 |
| Copenhagen | 143·0 | 340 | e 19 38 | [+ 2] | — | — | — | — | — |
| Helwan | z. 143·7 | 291 | 1 19 38k | [+ 1] | 23 8 | SKP | 22 56 | PP | — |
| Potsdam | 145·5 | 338 | e 19 36 | [- 4] | — | — | — | — | e 68·8 |
| De Bilt | 148·2 | 344 | e 19 47 | [+ 3] | — | — | — | — | e 67·8 |
| Uccle | 149·6 | 345 | e 19 52 | [+ 5] | e 23 28 | SKP | — | — | e 68·8 |
| Lisbon | 163·3 | 3 | 32 33 | ? | — | — | — | — | 81·3 |
| Almeria | 164·4 | 342 | e 20 9 | [+ 4] | 31 33 | {- 2} | 25 0 | PP | 74·8 |

Additional readings :—

Auckland sP? = +3m.28s., i = +4m.7s., S = +5m.53s., sS? = +6m.32s., PcP = +7m.22s.

Tuai e = +6m.26s.

Apia i = +5m.1s. and +6m.46s.

Brisbane eSE = +7m.42s.

Wellington i = +5m.7s., iZ = +5m.22s. and +6m.50s., PcPZ = +8m.15s., sS? = +8m.41s.

Continued on next page.

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Riverview iE = +5m.5s. and +9m.0s.
 Adelaide iSS = +12m.49s., Q = +14m.6s.
 Perth PPP = +16m.57s., i = +17m.22s., S = +20m.37s., SS = +21m.34s. All phases
 wrongly identified.
 Honolulu eSS = +22m.29s.
 Medan eN = +12m.8s.
 Tucson ePP = +17m.41s., e = +20m.5s.
 Calcutta i = +28m.3s. and +29m.31s.
 Irkutsk SS = +36m.17s.
 Bombay eN = +15m.52s., iN = +21m.9s.
 Huancayo eSP = +29m.13s.
 San Juan e = +24m.32s. and +28m.6s.
 Warsaw eZ = +24m.24s. and +28m.43s., eN = +30m.47s. ?
 Helwan iZ = +20m.29s.
 Potsdam iZ = +19m.42s., eN = +19m.47s., iZ = +20m.26s. and +21m.7s.
 Uccle eZ = +22m.17s.
 Almeria PKP₁ = +21m.21s., PKS = +23m.28s., SKS = +26m.57s., SSS = +50m.57s.
 Long waves were also recorded at Tananarive and other American and European stations.

Nov. 5d. 17h. 38m. 44s. Epicentre 12°·5N. 123°·5E. (as on 1939, May 25d.).

Intensity VI in the province of Albay (South of Lucon). Much damage.

Epicentre: 12°·5N. 122°·5E. (Strasbourg).

13°·0N. 121°·0E. (Pasadena).

13°·0N. 124°·0E. (Bombay).

Seismological Notes, Bulletin of the Seismological Society of America, Vol. 32, 1942, p. 63.

A = -·5390, B = +·8144, C = +·2151; δ = +4; h = +6;
 D = +·834, E = +·552; G = -·119, H = +·179, K = -·977.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------------|------|-----|---------|------|---------|------|---------|----------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Taihoku | 12·6 | 352 | e 3 2 | - 1 | 5 36 | +10 | — | — |
| Naha | 14·2 | 15 | 3 19 | - 5 | 6 11 | + 7 | — | — |
| Amboina | 16·7 | 163 | 4 4 | + 7 | i 7 26 | SS | 7 42 | SSS |
| Miyazaki | 20·6 | 21 | e 4 38 | - 5 | i 8 22 | - 7 | i 4 42 | PP |
| Hukuoka | 22·2 | 16 | e 4 51 | - 9 | e 8 54 | - 6 | — | — |
| Titizima | 22·7 | 48 | e 5 7 | + 3 | 9 24 | SS | — | — |
| Koti | 22·9 | 22 | e 5 5 | - 1 | 9 12 | - 1 | — | — |
| Hamada | 23·6 | 18 | 5 13 | 0 | 9 20 | - 5 | — | — |
| Kobe | 24·5 | 25 | e 5 20 | - 2 | 9 46 | + 6 | — | — |
| Batavia | 24·9 | 224 | i 4 58 | -28 | i 9 36 | -11 | — | 12·3 |
| Zinsen | 25·0 | 5 | e 5 26 | - 1 | 9 49 | 0 | — | — |
| Nagoya | 25·6 | 26 | e 5 33 | + 1 | 10 3 | + 4 | — | — |
| Medan | 26·1 | 254 | 5 41 | + 4 | i 10 13 | + 6 | i 11 47 | SS |
| Dairen | 26·3 | 356 | e 5 39 | 0 | 10 18 | + 7 | — | — |
| Yokohama | 27·1 | 30 | e 5 59 | +13 | e 11 16 | SS | — | e 13·2 |
| Tokyo, Cen. Met. Ob. | 27·4 | 30 | e 4 33 | ? | 10 49 | +21 | 5 34 | P |
| Nagano | 27·7 | 26 | e 5 48 | - 4 | 10 47 | +14 | — | — |
| Mizusawa | 30·8 | 28 | e 6 18 | - 2 | 11 17 | - 6 | — | — |
| Mori | 33·0 | 24 | e 6 36 | - 3 | i 11 56 | - 1 | — | — |
| Sapporo | 34·2 | 23 | e 6 51 | + 2 | (12 12) | - 4 | — | 12·2 |
| Calcutta | 34·9 | 292 | i 7 11 | +16 | 12 46 | +19 | e 8 24 | PP |
| Irkutsk | 42·6 | 343 | i 7 58 | - 1 | i 15 7 | +44 | — | i 17·0 |
| Colombo | 43·3 | 267 | 8 5 | 0 | 14 32 | - 1 | — | 26·4 |
| Hyderabad | 43·7 | 283 | 8 8 | 0 | 14 36 | - 3 | 9 48 | PP |
| Perth | 44·8 | 189 | 8 19 | + 2 | 14 59 | + 4 | 10 36 | PPP |
| Agra | 45·0 | 297 | i 8 17k | - 2 | 14 52 | - 6 | 10 4 | PP |
| Kodaikanal | 45·1 | 273 | i 8 16a | - 4 | i 15 3 | + 4 | 10 12 | PP |
| Dehra Dun | 45·5 | 300 | e 8 26 | + 3 | e 14 56 | - 9 | e 18 16 | SS |
| Brisbane | 49·0 | 146 | i 8 48 | - 2 | e 15 58 | + 3 | — | e 21·6 |
| Bombay | 49·1 | 285 | i 8 49 | - 2 | i 15 58 | + 2 | i 10 46 | PP |
| Adelaide | 49·3 | 164 | i 8 56 | + 3 | i 16 6 | + 7 | i 10 49 | PP |
| Almata | 50·4 | 318 | 9 1 | 0 | 16 16 | + 2 | — | i 30·9 |
| Semipalatinsk | 51·6 | 328 | e 9 12 | + 2 | e 16 24 | - 7 | — | — |
| Andijan | 52·7 | 313 | 9 22 | + 4 | — | — | — | — |
| Riverview | 53·1 | 152 | i 9 25k | + 4 | i 17 5 | +14 | i 16 10 | ? e 26·8 |

Continued on next page.

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|--------------------|------------|------------|------|-----------------|-------|-------|-----|-------|-------|-----|--------|
| | $^{\circ}$ | $^{\circ}$ | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Sydney | 53.1 | 152 | e 9 | 16 | - 5 | e 17 | 13 | +22 | — | — | — |
| Tashkent | 55.1 | 312 | i 9 | 37 | + 1 | e 17 | 22 | + 4 | — | — | — |
| Sverdlovsk | 64.9 | 328 | i 10 | 40 | - 3 | e 19 | 16 | - 8 | — | — | — |
| Auckland | 68.8 | 138 | e 9 | 26 | ? | e 19 | 51 | -20 | 14 | 56 | PPP |
| Baku | 69.5 | 309 | 11 | 6 | - 6 | e 20 | 17 | - 3 | — | — | — |
| Wellington | 71.4 | 142 | — | — | — | e 20 | 16? | -26 | 29 | 31 | Q |
| Christchurch | 71.5 | 145 | 11 | 26 _a | + 2 | e 21 | 1 | PS | 31 | 15 | Q |
| Honolulu | 75.1 | 72 | e 11 | 56 | +10 | e 21 | 29 | + 5 | 22 | 28 | PPS |
| College | 78.2 | 27 | e 14 | 51 | PP | e 21 | 55 | - 2 | 22 | 31 | PS |
| Tananarive | 81.1 | 249 | 12 | 21 | + 3 | e 22 | 30 | + 2 | 15 | 23 | PP |
| Ksara | 81.2 | 303 | e 12 | 21 | + 2 | e 22 | 33 | + 4 | — | — | — |
| Helwan | 85.7 | 300 | i 12 | 40 _a | - 2 | e 23 | 4 | [- 2] | 23 | 53 | PS |
| Bucharest | 86.6 | 316 | e 12 | 50 | + 4 | e 23 | 15 | [+ 3] | e 16 | 15 | PP |
| Upsala | 87.1 | 331 | e 12 | 47 | - 2 | e 23 | 14 | [- 1] | e 29 | 58? | SS |
| Warsaw | 87.7 | 324 | i 12 | 50 _a | - 2 | e 23 | 21 | [+ 3] | e 25 | 17 | PPS |
| Sofia | 89.0 | 314 | e 13 | 2 | + 4 | e 23 | 27 | [0] | i 16 | 24 | PP |
| Belgrade | 90.3 | 316 | e 11 | 58 | ? | e 23 | 34 | [- 1] | e 16 | 28 | PP |
| Copenhagen | 91.2 | 329 | e 13 | 8 | 0 | e 23 | 40 | [0] | e 16 | 45 | PP |
| Potsdam | 92.2 | 326 | i 13 | 11 _a | - 2 | i 23 | 47 | [+ 1] | i 16 | 53 | PP |
| Bergen | 92.4 | 334 | i 13 | 15 | + 1 | e 24 | 16 | 0 | — | — | — |
| Prague | 92.4 | 324 | e 13 | 45 | +31 | e 24 | 16 | 0 | — | — | e 42.3 |
| Jena | 93.7 | 323 | e 13 | 16 | - 4 | e 24 | 16 | -11 | e 17 | 4 | PP |
| Triest | 94.5 | 319 | — | — | — | e 23 | 53 | [- 5] | — | — | e 44.3 |
| Victoria | 95.4 | 38 | — | — | — | e 24 | 16? | [+13] | 30 | 52 | SS |
| Stuttgart | 96.0 | 323 | e 13 | 31 | + 1 | e 24 | 3 | [- 4] | e 17 | 28 | PP |
| Chur | 96.7 | 321 | e 13 | 31 | - 2 | — | — | — | e 17 | 31 | PP |
| De Bilt | 96.7 | 326 | e 13 | 35 _a | + 2 | e 24 | 6 | [- 4] | e 17 | 30 | PP |
| Zurich | 97.0 | 321 | e 13 | 37 | + 2 | e 24 | 15 | [+ 3] | e 17 | 29 | PP |
| Aberdeen | 97.4 | 333 | 16 | 47 | ? | i 24 | 10 | [- 4] | 26 | 7 | PS |
| Basle | 97.5 | 322 | e 13 | 40 | + 3 | e 24 | 17 | [+ 3] | e 17 | 39 | PP |
| Uccle | 97.8 | 326 | e 13 | 38 | 0 | i 24 | 19 | [+ 3] | e 17 | 38 | PP |
| Neuchatel | 98.2 | 321 | e 17 | 43 | PP | — | — | — | — | — | — |
| Edinburgh | 98.7 | 332 | — | — | — | 24 | 16 | [- 5] | — | — | — |
| Ukiah | 99.5 | 46 | e 18 | 28 | ? | e 25 | 14 | - 2 | e 25 | 55 | PS |
| Stonyhurst | 99.6 | 331 | e 17 | 16? | PP | i 24 | 26 | [+ 1] | — | — | e 39.7 |
| Kew | 99.9 | 328 | e 13 | 43 | - 5 | e 24 | 25 | [- 2] | e 17 | 53 | PP |
| Paris | 99.9 | 325 | — | — | — | e 24 | 26 | [- 1] | — | — | e 48.3 |
| Oxford | 100.2 | 329 | — | — | — | i 24 | 24 | [- 4] | — | — | e 50.3 |
| Berkeley | 100.7 | 47 | e 27 | 34 | PPS | i 32 | 40 | SS | — | — | e 43.3 |
| Clermont-Ferrand | 101.1 | 322 | e 18 | 4 _a | PP | — | — | — | — | — | e 45.9 |
| Santa Clara | E. 101.2 | 47 | — | — | — | e 31 | 24 | ? | e 32 | 29 | SS |
| Bozeman | 104.1 | 36 | e 19 | 12 | PP | e 24 | 46 | [0] | e 32 | 30 | SS |
| Pasadena | 105.3 | 49 | e 14 | 17 | + 5 | i 24 | 52 | [0] | e 18 | 32 | PP |
| Mount Wilson | z. 105.4 | 49 | e 14 | 15 | + 2 | — | — | — | e 18 | 32 | PP |
| Algiers | 105.6 | 314 | e 21 | 16? | PPP | e 24 | 53 | [0] | e 28 | 46 | PPS |
| Logan | 105.9 | 39 | — | — | — | i 24 | 57 | [+ 2] | e 25 | 42 | ? |
| Riverside | z. 106.0 | 49 | e 18 | 36 | PP | — | — | — | — | — | e 49.5 |
| Salt Lake City | 106.4 | 40 | e 18 | 49 | PP | 24 | 55 | [- 2] | 32 | 35 | SS |
| Palomar | z. 106.8 | 49 | i 18 | 45 | PP | — | — | — | e 30 | 2 | PKKP |
| Almeria | 109.4 | 316 | i 19 | 4 | PP | 25 | 47 | [-14] | 29 | 30 | PPS |
| Granada | 109.9 | 317 | e 19 | 0 _a | PP | e 26 | 27 | [+23] | 28 | 28 | PS |
| Coimbra | 111.2 | 322 | 19 | 18 | PP | e 25 | 16 | [- 1] | 28 | 16? | PS |
| Tucson | 111.6 | 47 | e 17 | 38 | ? | e 25 | 19 | [0] | e 19 | 19 | PP |
| San Fernando | 112.1 | 318 | e 19 | 26 | PP | e 35 | 30 | SS | — | — | e 47.0 |
| Lisbon | 112.6 | 321 | 19 | 26 | PP | 26 | 8? | [-15] | 35 | 14 | SS |
| Chicago U.S.C.G.S. | 118.8 | 26 | e 22 | 0 | ? | 26 | 10 | [+24] | 29 | 47 | PS |
| Seven Falls | 119.3 | 10 | e 28 | 2 | ? | e 36 | 31 | SS | e 40 | 40 | SSS |
| Ottawa | 119.8 | 15 | e 20 | 16 | PP | 30 | 16 | PS | 36 | 46 | SS |
| Florissant | 120.0 | 30 | e 20 | 12 | PP | e 36 | 12 | SS | 30 | 5 | PS |
| St. Louis | 120.1 | 30 | e 19 | 32 | [+39] | e 25 | 54 | [+ 4] | e 30 | 8 | PS |
| Toronto | 120.3 | 18 | e 20 | 19 | PP | e 30 | 16 | PS | e 37 | 28 | SSP |
| East Machias | 122.1 | 8 | e 20 | 34 | PP | e 30 | 44 | PS | 37 | 18 | SS |
| Harvard | z. 123.5 | 12 | e 19 | 0 | [0] | (e 37 | 16) | SS | e 20 | 41 | PP |
| Philadelphia | 125.0 | 16 | e 20 | 52 | PP | e 30 | 51 | PS | e 38 | 3 | SS |
| Columbia | 128.2 | 25 | e 30 | 30 | ? | e 39 | 5 | SSP | e 43 | 8 | SSS |

Continued on next page.

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|----------------|----------|-----|---------|-------|---------|-------|---------|-----|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Bermuda | 134.7 | 9 | e 21 47 | PP | e 41 30 | ? | 44 39 | SSS | — |
| San Juan | 147.9 | 16 | 1 19 49 | [+ 5] | 48 4 | SSS | 1 23 44 | PP | e 63.1 |
| Balboa Heights | 148.7 | 46 | (19 54) | [+ 9] | — | — | — | — | — |
| La Plata | E. 157.7 | 176 | 20 11 | [+13] | — | — | 24 10 | PP | 78.3 |
| | N. 157.7 | 176 | 19 58 | [0] | — | — | 24 28 | PP | — |
| Huancayo | 161.6 | 92 | e 20 7 | [+ 5] | e 27 4 | [- 2] | 24 36 | PP | e 68.5 |
| Río de Janeiro | 163.7 | 229 | e 20 16 | [+12] | — | — | — | — | — |
| La Paz | 168.1 | 111 | 1 20 12 | [+ 4] | 26 46 | [-24] | 1 22 44 | sP | 80.3 |

Additional readings :—

Batavia iPEN = +5m.1s., iS = +9m.40s.
 Medan iSE = +10m.43s.
 Mizusawa SN = +11m.12s.
 Mori iE = +10m.24s. and +13m.6s.
 Calcutta iP_cP = +9m.45s., eSSN = +14m.54s., eS_cS = +17m.33s.
 Hyderabad SSE = +17m.25s., S_cSE = +18m.15s.
 Perth SSS = +18m.38s.
 Agra ePN = +8m.23s., PPPE = +10m.54s., PSE = +15m.8s., SSE = +18m.15s.,
 eSSN = +18m.21s., SSSE = +19m.1s.
 Kodalkanal iSSE = +18m.16s.
 Brisbane iN = +8m.51s.
 Bombay SSN = +24m.31s., SSE = +24m.34s.
 Auckland i = +21m.24s., Q = +30m.16s.
 Christchurch SS = +26m.23s.
 Honolulu e = +26m.16s.
 College eSS = +26m.49s.
 Tananarive SS = +27m.54s.
 Helwan eZ = +13m.46s., eE = +14m.58s.
 Bucharest eN = +18m.0s., eSN = +23m.25s., ePSN = +24m.8s., eSSE = +29m.1s.
 Upsala eN = +23m.1s. and +27m.16s.?, e = +35m.16s.?
 Warsaw eZ = +13m.51s. and +14m.11s., eN = +23m.35s., eZ = +24m.25s.
 Sofia iE = +18m.28s.
 Belgrade e = +16m.8s., ePPP = +18m.48s., e = +28m.39s.
 Copenhagen e = +13m.11s., +18m.40s., and +25m.5s.
 Potsdam ePN = +13m.16s., iEZ = +18m.42s., iN = +19m.52s., iSKKS = +24m.8s.,
 iSEZ = +24m.17s., iZ = +24m.58s., iEN = +25m.16s., iPPSZ = +26m.19s., iZ =
 +26m.39s., iE = +28m.19s., iN = +28m.53s. and +33m.7s., iZ = +33m.45s.
 Jena eN = +25m.4s. and +27m.30s.
 Stuttgart i = 13m.36s., eSN = +25m.26s., ePSN = +26m.3s., eSSSEN = +35m.58s.
 Zurich ePP = +18m.28s.
 Uccle eZ = +17m.6s., eSN = +25m.43s., eSSN = +28m.11s.
 Ukiah e = +24m.10s., e = +26m.44s., eSS = +32m.27s.
 Kew ePPPZ = +20m.27s., eSKKS = +24m.57s., eSN = +25m.41s., eSZ = +26m.5s.,
 ePSEZ = +26m.45s., ePPS = +27m.38s., eZ = +28m.53s., ePKKPEZ = +29m.43s.,
 eSSE = +31m.9s., eSSZ = +31m.55s., eSSS = +36m.16s.?, eQEN = +41.3m.
 Berkeley eN = +27m.45s., iSSZ = +32m.46s.
 Pasadena ePKKPZ = +30m.10s.
 Mount Wilson ePKKPZ = +30m.10s.
 Salt Lake City e = +25m.15s., eSKKS = +26m.21s.
 Almeria PP = +23m.30s., PKS = +26m.29s., SKKS = +30m.28s., SS = +38m.40s.,
 SSS = +42m.50s.
 Granada iPP = +19m.26s.
 Coimbra PP = +23m.38s., PPP = +25m.8s., S? = +30m.28s., PPS = +34m.52s.
 Tucson ePPP = +21m.45s., e = +22m.44s., +24m.38s., and +28m.49s., ePS =
 +29m.10s., e = +29m.42s., eSS = +35m.31s.
 Lisbon PPE = +19m.29s., Z = +21m.54s., E = +22m.30s., N = +27m.4s.?
 Chicago U.S.C.G.S. eSS = +36m.55s.
 Ottawa eN = +41m.16s.
 Florissant ePPPZ = +23m.38s., eSSSE = +41m.21s.
 St. Louis eNZ = +19m.38s., eEN = +21m.26s., ePPEN = +24m.46s., ePPSN =
 +36m.14s., eN = +50m.8s.
 East Machias e = +47m.16s.
 Harvard iZ = +19m.6s.
 Philadelphia e = +28m.59s.
 San Juan iSPP = +24m.34s., e = +28m.37s. and +44m.57s.
 Balboa Heights reading has been reduced by 1 hour.
 La Plata PZ = +20m.6s., PPE = +20m.34s., PPN = +20m.58s., SKS? = +22m.58s.,
 SKSN = +23m.28s., SKKS?E = +25m.16s.?, SKSPN = +30m.58s., SKSPEN =
 +35m.10s., SS?N = +38m.40s., SS?E = +39m.22s., PSSN = +42m.4s., PSSE =
 +42m.40s., SSSE = +47m.46s., SSSN = +48m.58s., N = +51m.28s.
 Huancayo iSPP = +25m.35s., i = +35m.5s., e = +39m.47s., eSS = +44m.49s., e =
 +45m.47s.
 La Paz iPKP₂Z = +20m.52s., iPKP₂N = +21m.2s., iPPZ = +25m.10s., PPPZ =
 +29m.14s., iPSKS? = +35m.8s., iNZ = +36m.12s., SSN = +46m.40s., SSSN =
 +52m.54s.

Long waves were also recorded at Ivigtut and Besançon.

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Nov. 5d. Readings also at 1h. (Pasadena, Palomar, Haiwee, and near Algiers), 4h. (Amboina and Huancayo), 5h. (Tucson (2)), 11h. (near Algiers and near Lick), 14h. (Wellington), 15h. (Harvard, Belgrade, near Sofia, and Bucharest), 16h. (Mount Wilson, Palomar, and Haiwee), 18h. (near St. Louis), 20h. (Berkeley and near Amboina), 21h. (Bombay), 22h. (near Calcutta), 23h. (De Bilt, Bombay, and Potsdam).

Nov. 6d. 7h. 6m. 1s. Epicentre 6°·3S. 148°·2E.

A = -·8449, B = +·5238, C = -·1090 ; $\delta = +10$; $h = +7$;
D = +·527, E = +·850 ; G = +·093, H = -·057, K = -·994.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------------|----------|-----|---------|-------|----------|-------|----------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Amboina | 20·1 | 277 | i 4 35 | - 3 | i 8 8 | -11 | — | — |
| Brisbane | 21·5 | 170 | i 4 46 | - 6 | i 8 38 | - 9 | — | — |
| Riverview | 27·5 | 175 | e 5 52 | + 2 | e 10 8 | -22 | 10 51 | SS e 12·0 |
| Sydney | 27·6 | 175 | — | — | e 9 59 | -33 | — | e 14·9 |
| Adelaide | 29·8 | 196 | i 6 3 | - 8 | i 10 47 | -20 | 7 10 | PP 17·8 |
| Auckland | 38·9 | 145 | 7 59? | +30 | 12 59? | -29 | — | — 16·0 |
| Perth | 39·5 | 226 | 7 39 | + 5 | i 13 22 | -15 | 9 24 | PPP — |
| Karenko | 39·7 | 321 | e 6 33 | -63 | — | — | — | — |
| Arapuni | 40·2 | 146 | — | — | 14 11 | +23 | 18 5 | ? 21·0 |
| Batavia | 41·1 | 268 | i 7 10 | -37 | 12 54 | ? | — | e 20·0 |
| Miyazaki | 41·2 | 339 | 7 46 | - 2 | i 14 0 | - 2 | — | — 19·0 |
| Koti | 42·0 | 342 | e 7 57 | + 3 | 14 8 | - 6 | — | — |
| Wellington | 42·1 | 150 | 7 59? | + 4 | 14 9 | - 7 | 17 32 | SSS 24·0 |
| Yokohama | 42·3 | 350 | 7 59 | + 2 | e 14 16 | - 3 | — | — |
| Tokyo, Cen. Met. Ob. | 42·5 | 351 | 8 1 | + 2 | i 14 19 | - 3 | i 8 36 | PP — |
| Kobe | 42·6 | 346 | e 8 1 | + 2 | 14 21 | - 2 | — | — |
| Christchurch | 42·8 | 154 | — | — | 14 16 | -10 | 17 55 | SeS 22·8 |
| Nagano | 43·8 | 350 | e 8 8 | - 1 | 14 39 | - 1 | — | — |
| Sendai | 44·8 | 353 | 8 16 | - 1 | 14 53 | - 2 | — | — 18·8 |
| Husan | 45·0 | 338 | e 8 40 | +21 | — | — | — | — |
| Mizusawa | E. 45·7 | 353 | e 8 17 | - 7 | 15 6 | - 2 | — | — |
| | N. 45·7 | 353 | e 8 14 | -10 | e 15 0 | - 8 | — | — |
| Mori | 48·7 | 354 | e 8 20 | -28 | e 15 49 | - 1 | — | — |
| Medan | 50·4 | 281 | 8 47 | ? | i 15 59 | -15 | — | — |
| Honolulu | 59·6 | 62 | e 9 51 | -17 | e 19 21 | +64 | — | e 28·1 |
| Colombo | E. 69·4 | 280 | 11 16 | + 4 | 20 1 | -17 | — | — 35·7 |
| Kodalkanal | E. 72·3 | 283 | i 11 33 | + 4 | i 21 13 | +21 | i 11 57 | PcP 34·0 |
| Hyderabad | 72·8 | 291 | e 11 25 | - 7 | 20 45 | -13 | 21 21 | PS 34·4 |
| Agra | E. 75·5 | 301 | e 11 46 | - 2 | i 21 12 | -16 | 21 44 | PS — |
| Bombay | 78·3 | 291 | i 12 2 | - 1 | i 21 45 | -14 | 14 44 | PP 35·2 |
| College | 85·0 | 23 | — | — | e 22 54 | [- 7] | — | — e 35·1 |
| Tchimkent | 85·8 | 313 | i 12 41 | - 1 | i 23 7 | [+ 1] | — | — |
| Tashkent | 85·9 | 312 | 12 42 | - 1 | 22 58 | [- 9] | — | — |
| Victoria | 93·6 | 42 | — | — | e 26 29 | PPS | — | — 39·0 |
| Santa Clara | E. 93·7 | 53 | — | — | e 26 20 | PPS | — | — |
| Sverdlovsk | 93·9 | 326 | 13 17 | - 4 | 23 41 | [-14] | — | — |
| Santa Barbara | z. 95·2 | 56 | e 13 27 | 0 | — | — | — | — |
| Pasadena | 96·5 | 56 | i 13 32 | 0 | — | — | — | — e 39·9 |
| Mount Wilson | z. 96·6 | 56 | i 13 33 | 0 | — | — | — | — |
| Tinemaha | 96·6 | 53 | e 13 36 | + 3 | — | — | — | — |
| Haiwee | 96·8 | 54 | i 13 34 | 0 | — | — | — | — |
| Riverside | z. 97·1 | 56 | i 13 35 | 0 | — | — | — | — |
| Palomar | z. 97·5 | 57 | i 13 38 | + 1 | — | — | — | — |
| Tananarive | 98·0 | 250 | — | — | 24 34 | [+17] | e 31 58 | SS e 45·8 |
| Salt Lake City | 101·6 | 49 | — | — | e 24 35 | [0] | e 29 55 | ? e 42·9 |
| Bozeman | 102·0 | 45 | — | — | e 24 36 | [- 1] | e 27 26 | PS e 43·4 |
| Tucson | 102·6 | 58 | e 14 1 | + 1 | — | — | e 18 47 | PP e 45·7 |
| Ksara | 112·0 | 303 | e 11 36 | ? | — | — | e 22 30 | ? — |
| Helwan | 116·4 | 299 | e 19 7 | [+21] | e 25 32 | [- 5] | i 20 9 | PP — |
| Copenhagen | 119·6 | 333 | e 18 52 | [0] | — | — | — | — |
| Potsdam | 121·2 | 330 | e 19 17 | [+22] | 26 59 | [-22] | e 20 40 | PP e 57·0 |
| Ottawa | 125·6 | 36 | e 19 0 | [- 3] | e 27 59? | [+ 8] | e 34 59? | ? 51·0 |
| Uccle | 126·4 | 333 | i 19 3 | [- 2] | — | — | e 38 35 | SSP e 55·0 |
| Columbia | 126·9 | 51 | e 22 27 | PKS | e 25 20 | [-51] | — | — e 61·5 |
| Philadelphia | 128·7 | 42 | e 22 31 | PKS | e 30 1 | ? | — | — e 61·7 |

Continued on next page.

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1941

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|---------|-------|---------|-------|---------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Fordham | 129.1 | 40 | i 19 11 | [+ 1] | e 30 17 | ? | e 22 26 | PKS e 56.3 |
| Harvard | z. 129.7 | 37 | i 19 11 | [0] | — | — | i 22 28 | PKS e 64.0 |
| Weston | 129.9 | 37 | e 19 14 | [+ 2] | — | — | i 22 29 | PKS — |
| Clermont-Ferrand | 130.4 | 328 | e 19 14 | [+ 1] | — | — | i 22 31 | SKP e 64.3 |
| Balboa Heights | 132.6 | 83 | 21 51 | PP | — | — | — | — |
| Huancayo | 133.0 | 113 | e 19 21 | [+ 3] | — | — | e 22 51 | PKS — |
| La Paz | 137.5 | 123 | 19 32 | [+ 6] | — | — | — | 77.0 |
| Coimbra | 140.4 | 332 | e 10 49 | ? | 35 59 | PPS | 24 37 | ? |
| Lisbon | 141.8 | 331 | 23 9 | PP | 47 47 | SSS | — | e 49.0 |
| San Juan | 144.5 | 67 | i 19 38 | [0] | e 29 38 | {- 9} | i 22 4 | PP e 55.1 |

Additional readings:—

Brisbane iSN = +8m.43s.

Riverview SS?N = +10m.43s.

Adelaide Q = +15m.39s.

Perth SS = +15m.46s.

Wellington ScP?Z = +10m.9s., i = +13m.49s. and +14m.18s., Q = +18m.26s.

Christchurch Q = +20m.26s., PcS = +21m.14s.

Batavia S?N = +13m.13s.

Medan PN = +9m.9s.

Kodaikanal iSSE = +21m.59s.

Agra SSE = +26m.8s.

Bombay iSN = +21m.49s., SSE = +25m.57s.

Sverdlovsk S = +24m.14s.

Tucson e = +15m.6s. and +17m.15s.

Helwan iZ = +29m.26s.

Potsdam eE = +28m.59s., eQN = +48.0m.

Clermont-Ferrand e = +19m.37s.

Coimbra PPP = +15m.59s.

San Juan e = +34m.22s., +35m.28s., and +43m.48s.

Long waves were also recorded at Lincoln, Kew, East Machias, Prague, Warsaw, San Fernando, De Bilt, Upsala, Berkeley, and Scoresby Sund.

Nov. 6d. 12h. 29m. 48s. Epicentre 54°3N. 161°5W. (as on 1940, Feb. 12d.).

A = -0.5559, B = -0.1860, C = +0.8102; $\delta = +4$; $h = -7$;
D = -0.317, E = +0.948; G = -0.768, H = -0.257, K = -0.586.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|----------|-----|--------|------|---------|------|---------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| College | 12.6 | 28 | e 3 3 | 0 | e 5 26 | 0 | i 3 13 | PP e 6.0 |
| Sitka | 14.9 | 69 | e 3 52 | PP | e 6 20 | 0 | — | e 7.4 |
| Victoria | 24.3 | 88 | 5 30 | +10 | 9 40 | + 3 | 10 48 | SSS 12.2 |
| Spokane | N. 28.2 | 86 | e 6 13 | +17 | e 10 54 | +13 | — | — |
| Ukiah | 29.9 | 104 | e 6 25 | +13 | e 11 11 | + 2 | e 7 4 | PP e 13.2 |
| Berkeley | 31.3 | 105 | i 6 25 | + 1 | i 11 32 | + 1 | — | — |
| Branner | 31.6 | 106 | i 6 27 | + 1 | i 11 38 | + 3 | — | 1 14.9 |
| Santa Clara | E. 31.8 | 105 | e 7 1 | +33 | i 11 40 | + 2 | — | e 14.8 |
| Butte | 31.9 | 83 | e 6 40 | +11 | e 11 33 | - 7 | — | e 14.3 |
| Saskatoon | 32.2 | 71 | — | — | e 11 40 | - 5 | — | 14.2 |
| Bozeman | 32.9 | 84 | e 6 44 | + 6 | e 11 49 | - 7 | e 7 48 | PP e 14.0 |
| Honolulu | 33.0 | 173 | e 7 31 | PP | e 11 49 | - 8 | — | e 14.1 |
| Tinemaha | 34.1 | 102 | e 6 52 | + 4 | — | — | — | — |
| Logan | 34.8 | 88 | 6 59 | + 5 | 12 27 | + 2 | e 8 19 | PP e 14.8 |
| Haiwee | 35.0 | 102 | i 6 56 | 0 | e 12 24 | - 4 | i 9 27 | PcP — |
| Santa Barbara | z. 35.2 | 106 | e 7 0 | + 2 | — | — | e 13 13 | ScP — |
| Salt Lake City | 35.4 | 90 | e 8 54 | PPP | e 12 35 | + 1 | — | e 15.3 |
| Mount Wilson | 36.3 | 104 | i 7 7 | 0 | e 12 45 | - 3 | i 13 15 | ScP — |
| Pasadena | 36.3 | 104 | i 7 7 | 0 | e 12 38 | -10 | i 8 28 | PcP e 14.2 |
| Riverside | z. 36.8 | 104 | e 7 11 | 0 | — | — | i 13 16 | ScP — |
| Palomar | z. 37.6 | 105 | i 7 17 | - 1 | — | — | i 13 20 | ScP — |
| La Jolla | 37.7 | 106 | e 7 19 | 0 | — | — | — | — |
| Tucson | 41.8 | 100 | i 7 53 | 0 | e 14 9 | - 2 | e 9 30 | PP 1 17.4 |
| Vladivostok | 43.8 | 283 | 8 5 | - 4 | e 13 54 | -46 | — | — |
| Lincoln | 44.2 | 78 | e 8 18 | + 6 | e 14 40 | - 6 | — | e 18.4 |

Continued on next page.

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1941

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|----------------------|------|----------------------|-------|---------|-------------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Chicago U.S.C.G.S. | 48.7 | 73 | — | — | i 15 42 | - 8 | e 19 29 | SS e 25.0 |
| Florissant | 49.2 | 78 | i 8 48 | - 4 | i 15 47 | -11 | e 19 26 | SS e 22.1 |
| St. Louis | 49.4 | 77 | e 8 51 | - 2 | i 15 52 | - 8 | i 10 46 | PP e 22.6 |
| Cape Girardeau E. | 50.7 | 80 | — | — | e 16 9 | - 9 | — | e 23.2 |
| Scoresby Sund | 52.2 | 17 | — | — | e 16 29 | -10 | e 19 6 | S _c S e 21.0 |
| Ottawa | 52.8 | 62 | 9 14 | - 5 | 16 38 | - 9 | 20 24 | SS e 25.2 |
| Ivigtut | 53.4 | 34 | 9 20 | - 4 | 16 47 | - 8 | — | — |
| Pittsburgh | 53.9 | 69 | e 9 23 | - 4 | e 17 37 | PPS | — | — |
| Seven Falls | 54.1 | 57 | 9 28 | - 1 | 16 54 | -11 | 21 0 | SS e 24.2 |
| Vermont | 54.7 | 61 | — | — | e 16 51 | -22 | e 19 33 | S _c S e 24.9 |
| Georgetown | 56.5 | 68 | e 9 56 | +10 | e 17 29 | - 8 | 21 21 | SS — |
| Philadelphia | 56.8 | 67 | e 10 8 | +20 | e 17 30 | -11 | e 21 18 | SS e 24.6 |
| Harvard | 56.9 | 62 | e 9 45 | - 4 | i 17 34 | - 8 | — | e 27.2 |
| Fordham | 56.9 | 65 | i 9 46 | - 3 | i 17 34 | - 8 | 18 11 | PPS — |
| East Machias | 57.4 | 58 | — | — | e 17 40 | - 9 | — | e 30.8 |
| Columbia | 57.9 | 75 | — | — | e 17 46 | - 9 | e 19 40 | S _c S e 28.3 |
| Halifax | 59.3 | 56 | — | — | e 18 4 | -10 | — | 30.2 |
| Sverdlovsk | 64.0 | 336 | e 10 34 | - 4 | 19 14 | + 1 | — | — |
| Upsala | 66.2 | 2 | — | — | e 19 12 [†] | -28 | — | e 29.2 |
| Oxford | 73.0 | 13 | — | — | i 21 0 | 0 | — | — |
| De Bilt | 73.4 | 8 | i 11 35 _a | - 1 | e 20 57 | - 8 | i 11 50 | pP e 32.2 |
| Kew | 73.4 | 12 | e 11 25 | -11 | e 20 33 | -32 | e 21 9 | PS e 36.7 |
| Potsdam | 73.6 | 4 | i 11 36 _k | - 1 | i 21 15 | + 8 | i 11 50 | P _c P e 25.2 |
| Tchikent | 74.3 | 323 | i 11 38 | - 3 | — | — | — | — |
| Uccle | 74.6 | 11 | e 11 41 | - 2 | e 21 12 | - 6 | i 26 11 | SS e 37.2 |
| Jena N. | 75.0 | 5 | i 11 43 | - 2 | — | — | — | — |
| Tashkent | 75.3 | 323 | 11 45 | - 2 | — | — | — | — |
| Paris | 76.4 | 12 | — | — | e 21 12 [†] | -26 | — | e 33.2 |
| Stuttgart | 77.0 | 7 | i 11 54 _a | - 2 | e 21 42 | - 3 | — | e 41.2 |
| Basle | 78.1 | 9 | e 12 1 | - 1 | — | — | — | — |
| Zurich | 78.4 | 8 | e 12 3 _a | - 1 | — | — | — | — |
| Neuchatel | 78.6 | 9 | e 12 4 | - 1 | — | — | — | — |
| Clermont-Ferrand | 79.5 | 10 | e 12 9 | - 1 | — | — | — | e 41.5 |
| Triest | 80.4 | 4 | — | — | e 22 6 | -15 | — | — |
| Bucharest | 81.5 | 355 | e 22 29 | S | (e 22 29) | - 3 | — | 44.2 |
| Coimbra | 83.1 | 14 | e 5 32 | ? | e 22 49 | + 1 | — | 40.2 |
| Sofia | 83.3 | 356 | e 12 33 | + 3 | — | — | — | — |
| Agra E. | 84.1 | 309 | 12 34 | 0 | i 23 31 | PS | — | — |
| Lisbon | 84.3 | 338 | 12 36 | + 1 | i 22 58 | - 2 | 23 13 | S _c S 40.4 |
| Granada | 86.9 | 18 | 13 19 _k | +31 | 23 42 | +16 | — | e 39.7 |
| San Fernando N. | 87.1 | 20 | — | — | e 23 34 | + 6 | — | 42.2 |
| Almeria | 87.4 | 17 | 13 24 | +34 | 24 4 | PS | 16 49 | PP 37.2 |
| Algiers | 88.3 | 12 | — | — | e 22 33 | [-49] | — | 49.2 |
| Ksara | 91.0 | 346 | e 13 17 | +10 | e 24 13 | +10 | — | — |
| Auckland | 93.1 | 199 | — | — | 25 32 | PS | — | 29.2 |
| Bombay | 93.6 | 309 | e 13 20 | + 1 | i 24 12 | -14 | — | — |
| Arapuni | 94.1 | 198 | — | — | e 30 12 [†] | SS | — | 45.2 |
| Helwan | 95.5 | 348 | e 13 27 | - 1 | 25 0 | +18 | 17 18 | PP — |
| Riverview | 96.8 | 218 | — | — | e 28 56 | ? | — | e 33.6 |
| Huancayo | 97.4 | 100 | e 17 32 | PP | e 24 6 | [- 8] | e 27 45 | PPS 42.0 |
| Wellington | 97.4 | 198 | — | — | e 32 12 [†] | SSP | — | e 51.2 |
| Kodaikanal E. | 98.9 | 302 | — | — | e 23 12 [†] | ? | — | — |
| Christchurch | 99.9 | 199 | — | — | 32 12 [†] | SS | — | 43.2 |
| La Paz | 105.2 | 96 | — | — | i 24 50 | [- 1] | 33 43 | SS 52.2 |

Additional readings:—

College e = +3m.32s.
 Ukiah e = +11m.4s.
 Branner eN = +11m.45s.
 Bozeman e = +6m.53s.
 Logan e = +8m.26s. and +11m.43s.
 Santa Barbara iZ = +7m.17s.
 Salt Lake City e = +12m.11s.
 Pasadena iZ = +7m.18s., iEN = +12m.48s., iS_cPZ = +13m.15s.
 Tucson i = +8m.47s., iPPP = +10m.5s., i = +14m.39s.
 Florissant iE = +16m.37s. and +17m.7s.

Continued on next page.

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St. Louis iSPEN = +16m.27s., iSSN = +18m.53s.
 Georgetown eS = +17m.49s.
 Philadelphia e = +17m.20s., eSS = +21m.58s.
 Columbia e = +21m.46s.
 De Bilt iSS = +21m.19s., eSS = +25m.42s., eSSS = +29m.12s. †
 Kew eSE = +21m.0s., eSKSEN = +21m.25s., eE = +21m.55s., eSSE = +25m.19s.,
 eQEN = +30m.34s.
 Potsdam ePN = +11m.42s., eZ = +20m.37s., iPPSN = +22m.0s., iPPSE = +22m.6s.
 Uccle eSN = +21m.18s., eN = +24m.54s.
 Jena iE = +11m.48s., i = +11m.52s.
 Stuttgart i = +11m.57s., e = +13m.51s. and +15m.24s., eSSN = +27m.42s.
 Bucharest eN = +24m.39s., eE = +25m.53s.
 Coimbra † = +12m.45s.
 Almeria PPP = +18m.48s., PS = +25m.0s., PPS = +25m.32s., SS = +29m.28s., SSS =
 +33m.9s.
 Huancayo ePP = +17m.42s., SS = +31m.27s., e = +31m.44s., eSSS = +35m.48s.,
 e = +36m.18s.
 Wellington e = +46m.12s. †
 La Paz SSSN = +38m.25s.
 Long waves were also recorded at Colombo, Prague, Seattle, San Juan, and Warsaw.

Nov. 6d. 17h. 32m. 2s. Epicentre 49°·0N. 129°·0W. (as on 1937, Feb. 4d.).

A = -·4145, B = -·5118, C = +·7525; $\delta = +1$; $h = -5$;
 D = -·777, E = +·629; G = -·474, H = -·585, K = -·659.

| | Δ ° | Az. ° | P. m. s. | O-C. s. | S. m. s. | O-C. s. | Supp. m. s. | L. m. |
|----------------|---------------|----------|-------------|------------|--------------|------------|----------------|----------|
| Sitka | 9·4 | 339 | — | — | (e 4 20) +13 | — | — | e 4·3 |
| Berkeley | 12·1 | 154 | e 2 50 | - 7 | 1 5 28 | SS | 1 5 36 | SSS |
| Tinemaha | 14·2 | 143 | e 3 33 | PP | — | — | — | — |
| Salt Lake City | 14·6 | 118 | e 3 53 | PPP | e 6 34 | SS | — | e 8·7 |
| Haiwee | 15·2 | 144 | e 3 38 | 0 | — | — | — | — |
| Santa Barbara | 16·1 | 151 | e 3 55 | + 6 | — | — | — | — |
| Mount Wilson | z. 16·8 | 147 | i 3 59 | + 1 | — | — | — | — |
| Pasadena | z. 16·9 | 148 | i 3 59 | 0 | — | — | — | — |
| Riverside | 17·3 | 146 | e 4 2 | - 2 | — | — | — | — |
| Palomar | z. 18·1 | 146 | i 4 14 | 0 | — | — | — | — |
| College | 18·8 | 336 | e 4 8 | -15 | e 7 49 | - 1 | — | e 9·2 |
| Tucson | 21·6 | 134 | i 4 51 | - 3 | — | — | 1 5 34 | PPP |
| Lincoln | 24·2 | 97 | e 5 33 | +14 | e 10 0 | +25 | — | e 13·3 |
| Florissant | 29·4 | 96 | e 6 4 | - 3 | e 10 48 | -13 | — | — |

Additional readings:—

Berkeley iN = +5m.46s.

Tucson i = +5m.44s., e = +6m.37s. and +6m.48s.

Long waves were also recorded at Philadelphia, Ukiah, Bozeman, Seattle, East Machias, Honolulu, and Butte.

Nov. 6d. 18h. 11m. 25s. Epicentre 49°·0N. 129°·0W. (as at 17h.).

A = -·4145, B = -·5118, C = +·7525; $\delta = +1$; $h = -5$;
 D = -·777, E = +·629; G = -·474, H = -·585, K = -·659.

| | Δ ° | Az. ° | P. m. s. | O-C. s. | S. m. s. | O-C. s. | Supp. m. s. | L. m. |
|----------------|---------------|----------|-------------|------------|-------------|------------|----------------|----------|
| Victoria | 3·7 | 97 | e 0 41 | -19 | — | — | — | 2·6 |
| Tinemaha | 14·2 | 143 | e 3 25 | + 1 | — | — | — | — |
| Sale Lake City | 14·6 | 118 | e 3 39 | + 9 | — | — | — | e 6·6 |
| Haiwee | 15·2 | 144 | e 3 39 | + 1 | — | — | — | — |
| Santa Barbara | 16·1 | 151 | e 3 50 | + 1 | — | — | — | — |
| Mount Wilson | 16·8 | 147 | e 3 58 | 0 | — | — | — | — |
| Pasadena | 16·9 | 148 | e 3 58 | - 1 | — | — | — | — |
| Riverside | z. 17·3 | 146 | e 4 3 | - 1 | — | — | — | — |
| Palomar | z. 18·1 | 146 | i 4 14 | 0 | — | — | — | — |
| College | 18·8 | 336 | — | — | e 7 45 | - 5 | — | e 10·2 |
| Tucson | 21·6 | 134 | i 4 51 | - 3 | — | — | 1 5 42 | PPP |
| Lincoln | 24·2 | 97 | — | — | e 10 0 | +25 | — | e 13·4 |
| Florissant | N. 29·4 | 96 | e 6 5 | - 2 | — | — | — | e 13·3 |

Tucson also gives i = +5m.3s.

Long waves were also recorded at Butte, East Machias, Seattle, Bozeman, Ukiah, Philadelphia, and Sitka.

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Nov. 6d. Readings also at 0h. (Riverside, La Paz, Huancayo, Palomar, Pasadena, Mount Wilson, and near Branner), 3h. (Colombo, Kodaikanal, and Bombay), 4h. (La Paz), 7h. (Mito, Hamada, Rio de Janeiro, San Juan, La Plata, Amboina, Tucson, La Paz, Mount Wilson, Pasadena, Palomar, Huancayo, and Haiwee), 8h. (Ksara), 10h. (Ferndale, Berkeley, Mount Wilson, Pasadena, Palomar, Riverside, and Branner), 11h. (near Fresno, Lick, Berkeley, and Branner), 12h. (near Medan), 13h. (Riverside, Palomar, Pasadena, and Mount Wilson), 16h. (Aberdeen), 17h. (Tacubaya), 18h. (near Toledo), 21h. (Palomar), 23h. (Palomar, Mount Wilson, Pasadena, Riverside, Berkeley, Haiwee, La Plata, and La Paz).

Nov. 7d. Readings at 0h. (Merida, Oaxaca, and Tacubaya), 1h. (Puebla, Tucson, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, and near Tchinkent), 5h. (near Mizusawa), 8h. (near Triest), 10h. (La Paz), 12h. (near Tananarive), 13h. (La Paz), 15h. (near Tananarive), 19h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, College, Tucson, and Neuchatel), 22h. (Oaxaca).

Nov. 8d. 4h. Local Japanese shock.

Tokyo Imperial University gives Epicentre $35^{\circ}98N$. $140^{\circ}08E$.

Tokyo Imp. Univ. P = 10m.54s., S = 11m.3s.
 Komaba P = 10m.55s., S = 11m.4s.
 Tukubasan P = 10m.56s., S = 11m.4s.
 Togane P = 10m.56s., S = 11m.5s.
 Mitaka P = 10m.56s., S = 11m.6s.
 Kamakura P = 10m.56s., S = 11m.8s.
 Susaki P = 11m.8s., S = 11m.26s.
 Mizusawa ePE = 11m.32s., iSE = 12m.11s.

November 8d. 23h. 37m. 20s. Epicentre $0^{\circ}1N$., $122^{\circ}7E$. (as on 1941 September 17d.).

Felt in northern Celebes and N.E. Borneo. Intensity IX in the district of Telaga. Much damage in Northern Celebes near Gorontalo; damage at Paleleh and Tibawa. Epicentre $1^{\circ}4S$., $121^{\circ}1E$. Depth = 50km. (Batavia).

Meteorologische en Geophysische Dienst te Batavia, Serie A., No. 44., Aardbevingen in Ned-Indië waargenomen gedurende het jaar 1941, p.8.

A = -0.5402, B = +0.8415, C = +0.0017; $\delta = -6$, $h = +7$;
 D = +0.842, E = +0.540; G = -0.001, H = +0.001, K = -1.000.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------------|----------|-----|---------|------|---------|------|--------|------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Palau | 13.8 | 58 | 3 17 | - 2 | 5 42 | -14 | — | — |
| Manila | 14.5 | 353 | i 2 48 | -40 | i 5 32 | -39 | — | — |
| Batavia | 17.1 | 248 | i 3 33 | -29 | i 6 28 | -44 | — | — |
| Medan | 24.2 | 279 | i 5 23 | + 4 | i 9 21 | -14 | i 9 43 | SS |
| Taihoku | 24.8 | 357 | i 5 23 | - 2 | 9 49 | + 3 | — | — |
| Phu-Lien | 24.9 | 325 | i 5 35 | + 9 | i 10 8 | +21 | — | — |
| Naha | 26.4 | 9 | 5 42 | + 2 | 11 2 | SS | — | — |
| Zi-ka-wei | 31.0 | 359 | i 6 26 | + 5 | i 11 27 | + 1 | — | — |
| Titizima | 32.7 | 34 | 6 35 | - 1 | 11 38 | -14 | — | — |
| Hukuoka | 34.1 | 13 | 6 43 | - 5 | 11 59 | -15 | — | — |
| Kotl | 34.8 | 16 | 6 50 | - 4 | 12 14 | -11 | — | — |
| Hamada | 35.7 | 13 | i 6 58 | - 4 | 12 53 | +14 | — | — |
| Kôbe | 36.4 | 18 | e 7 4 | - 4 | 13 43 | +53 | — | — |
| Nagoya | 37.3 | 20 | e 7 34 | +18 | 12 46 | -18 | — | — |
| Zinsen | 37.4 | 4 | 7 14 | - 2 | 12 51 | -14 | — | — |
| Adelaide | 37.9 | 159 | i 3 23 | ? | 12 40 | -33 | — | — |
| Dairen | 38.6 | 358 | 7 23 | - 3 | 13 22 | - 1 | — | — |
| Yokohama | 38.6 | 23 | e 7 21 | - 5 | e 12 29 | -54 | e 8 38 | PP |
| Tokyo Cen. Met. Ob. | 38.8 | 23 | 6 27 | -61 | 12 42 | -44 | i 9 24 | PPP |
| Nagano | 39.1 | 20 | 7 22 | - 9 | 13 16 | -15 | — | — |
| Brisbane | E. 40.0 | 136 | i 7 40 | + 2 | i 15 18 | ? | — | — |
| Calcutta | N. 40.2 | 307 | i 7 39 | - 1 | i 13 25 | -23 | i 10 6 | P _c P |
| Sendai | 41.5 | 22 | 7 47 | - 3 | 13 52 | -15 | — | — |
| Mizusawa | 42.4 | 21 | i 7 55 | - 3 | i 14 9 | -11 | — | — |
| Riverview | 43.1 | 144 | i 8 11k | + 7 | i 14 36 | + 6 | i 9 53 | PP e 19.7 |

Continued on next page.

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| | | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|------------------|----|----------|-----|------|-----------------|------|------|----|-------|-------|----|------------|
| | | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Sydney | | 43.1 | 144 | i 8 | 7 | + 3 | i 14 | 37 | + 7 | e 17 | 55 | SSS e 22.7 |
| Colombo | E. | 43.3 | 280 | i 8 | 6 | + 1 | 14 | 39 | + 6 | — | — | 20.7 |
| Vladivostok | | 43.6 | 10 | i 8 | 5 | - 3 | 14 | 23 | -15 | — | — | — |
| Mori | | 44.8 | 18 | 8 | 18 | + 1 | 14 | 43 | -12 | i 12 | 21 | ? |
| Sapporo | | 45.9 | 19 | 8 | 24 | - 2 | 14 | 59 | -12 | — | — | 19.5 |
| Kodaikanal | E. | 46.1 | 285 | i 8 | 37 | + 9 | i 15 | 3 | -11 | — | — | 21.0 |
| Hyderabad | | 46.8 | 295 | 8 | 32 | - 1 | 15 | 18 | - 6 | 10 | 11 | PP 22.8 |
| Agra | | 50.6 | 307 | i 9 | 0 _a | - 2 | i 16 | 9 | - 8 | 10 | 41 | PP 24.3 |
| Dehra Dun | N. | 52.0 | 310 | e 8 | 43 | -30 | i 15 | 54 | -42 | i 22 | 54 | SSS † 28.5 |
| Bombay | | 52.4 | 294 | i 9 | 15 | - 1 | i 16 | 35 | - 7 | i 11 | 16 | PP 22.7 |
| Irkutsk | | 54.2 | 346 | i 9 | 29 | 0 | i 16 | 57 | - 9 | — | — | — |
| Almata | | 59.3 | 323 | e 10 | 4 | - 2 | — | — | — | — | — | — |
| Auckland | | 60.8 | 134 | 8 | 48 | ? | 17 | 0 | ? | 8 | 58 | pP 26.7 |
| New Plymouth | | 61.0 | 136 | 10 | 25 | + 7 | — | — | — | i 13 | 27 | PPP 20.2? |
| Arapuni | | 61.7 | 134 | 10 | 52 | +30 | 19 | 22 | +38 | 20 | 40 | SeS 26.7 |
| Semipalatinsk | | 61.8 | 331 | e 10 | 22 | - 1 | — | — | — | — | — | — |
| Christchurch | | 62.1 | 142 | 10 | 28 | + 3 | 18 | 57 | + 8 | 26 | 14 | Q 30.3 |
| Wellington | | 62.5 | 138 | 10 | 30 | + 2 | 18 | 55 | + 1 | 10 | 55 | sP 27.7 |
| Tuai | | 63.0 | 135 | 10 | 35 | + 4 | 19 | 3 | + 2 | — | — | — |
| Tashkent | | 63.3 | 317 | (10 | 37) | + 4 | (19 | 0) | - 4 | (11 | 5) | pP — |
| Apia | | 66.3 | 106 | i 10 | 53 | + 1 | e 19 | 30 | -12 | i 13 | 24 | PP 27.7 |
| Sverdlovsk | | 75.0 | 331 | i 11 | 42 | - 3 | i 21 | 2 | -21 | i 12 | 23 | sP — |
| Tananarive | | 76.0 | 251 | 11 | 51 | 0 | i 21 | 33 | - 1 | 14 | 54 | PP 36.2 |
| Baku | | 76.9 | 312 | i 11 | 52 | - 1 | i 21 | 31 | -13 | — | — | — |
| Honolulu | | 80.2 | 68 | i 12 | 17 | + 3 | i 22 | 11 | - 8 | e 15 | 21 | PP e 33.1 |
| Ksara | | 87.3 | 304 | e 12 | 53 | + 3 | 23 | 10 | [- 7] | 29 | 23 | SS 42.7 |
| College | | 89.7 | 25 | e 12 | 59 | - 2 | e 23 | 38 | [+ 7] | e 16 | 29 | PP e 37.4 |
| Helwan | | 91.1 | 299 | i 13 | 7 _k | - 1 | 23 | 28 | [-11] | 16 | 42 | PP 44.1 |
| Bucharest | | 94.7 | 314 | e 13 | 27 | + 3 | i 23 | 54 | [- 5] | e 17 | 15 | PP 43.7 |
| Sitka | | 96.3 | 32 | e 13 | 32 | 0 | e 24 | 0 | [- 8] | e 17 | 25 | PP e 45.2 |
| Sofia | | 96.8 | 312 | e 13 | 38 | + 4 | i 24 | 4 | [- 7] | e 17 | 15 | PP 31.2 |
| Warsaw | | 97.1 | 322 | 13 | 37 _k | + 2 | i 24 | 4 | [- 8] | i 17 | 13 | PP e 39.7 |
| Upsala | | 97.5 | 331 | 13 | 32 | - 5 | 24 | 1 | [-13] | 31 | 12 | SS 38.7 |
| Belgrade | | 98.6 | 315 | e 13 | 30 | -12 | e 23 | 47 | [-33] | e 17 | 29 | PP e 46.3 |
| Copenhagen | | 101.2 | 326 | i 13 | 52 | - 2 | 24 | 23 | [-10] | 17 | 46 | PP 40.7 |
| Prague | | 101.6 | 321 | e 13 | 56 | 0 | 24 | 26 | [- 9] | e 32 | 40 | SS e 41.7 |
| Potsdam | | 101.8 | 324 | e 13 | 58 _k | + 2 | i 24 | 28 | [- 8] | i 18 | 8 | PP e 42.7 |
| Bergen | | 103.1 | 333 | e 17 | 50 | PKP | e 24 | 31 | [-11] | — | — | e 41.7 |
| Jena | | 103.1 | 321 | i 14 | 4 | + 2 | e 25 | 40 | - 6 | i 18 | 12 | PP e 42.7 |
| Triest | | 103.1 | 316 | e 14 | 9 | + 7 | i 24 | 35 | [- 7] | i 18 | 9 | PP e 47.7 |
| Stuttgart | | 105.2 | 321 | e 14 | 12 _e | P | i 24 | 43 | [- 9] | e 18 | 30 | PP e 46.4 |
| Victoria | | 105.5 | 39 | e 14 | 22 | P | i 24 | 54 | [+ 1] | 18 | 36 | PP 48.7 |
| Chur | | 105.6 | 319 | e 14 | 8 | P | e 24 | 45 | [- 8] | e 18 | 39 | PP — |
| Scoresby Sund | | 105.8 | 349 | e 18 | 30 | PP | e 25 | 12 | [+18] | e 20 | 57 | PPP e 43.8 |
| Zurich | | 106.1 | 320 | e 14 | 6 | P | e 24 | 45 | [-10] | e 17 | 56 | PKP — |
| De Bilt | | 106.5 | 325 | i 18 | 45 | PP | i 24 | 53 | [- 4] | i 28 | 35 | PPS e 47.7 |
| Seattle | | 106.5 | 39 | e 15 | 4 | P | e 24 | 56 | [- 1] | e 19 | 10 | PP? e 45.1 |
| Basle | | 106.6 | 320 | e 14 | 26 | ? | e 24 | 50 | [- 7] | e 18 | 39 | PP — |
| Neuchatel | | 107.2 | 320 | e 17 | 40 | PKP | — | — | — | — | — | — |
| Ferndale | | 107.3 | 47 | e 18 | 58 | ? | i 25 | 3 | [+ 2] | e 19 | 18 | ? |
| Uccle | | 107.5 | 324 | e 14 | 22 | P | i 24 | 54 | [- 8] | e 18 | 40 | PP 47.7 |
| Besançon | | 107.8 | 320 | e 18 | 51 | PP | e 25 | 44 | [- 6] | e 34 | 6 | SS 49.7 |
| Aberdeen | | 108.0 | 332 | e 18 | 19 | PKP | i 33 | 46 | SS | i 18 | 54 | PP 49.4 |
| Ukiah | | 108.5 | 48 | e 18 | 2 | PKP | e 25 | 33 | [+27] | e 19 | 1 | PP e 46.8 |
| Edinburgh | | 109.1 | 331 | — | — | — | 26 | 8 | [+ 9] | — | — | — |
| Berkeley | | 109.4 | 49 | e 14 | 34 | P | i 28 | 20 | PS | e 19 | 2 | PP e 49.9 |
| Paris | | 109.4 | 323 | 19 | 5 | PP | i 25 | 5 | [- 5] | e 34 | 29 | SS 49.7 |
| Marseilles | | 109.5 | 316 | c 18 | 58 | PP | e 25 | 7 | [- 3] | e 34 | 20 | SS 50.7 |
| Spokane | N. | 109.6 | 38 | — | — | — | e 25 | 23 | [+13] | i 28 | 29 | PS — |
| Branner | | 109.7 | 50 | e 18 | 55 | PP | e 25 | 13 | [+ 2] | e 28 | 22 | PS e 50.6 |
| Kew | | 109.8 | 326 | e 19 | 9 | PP | i 25 | 2 | [- 9] | e 27 | 45 | PS e 42.2 |
| Santa Clara | | 109.9 | 50 | e 19 | 2 | PP | e 25 | 2 | [-10] | e 28 | 27 | PS e 50.3 |
| Stonyhurst | | 109.9 | 329 | e 19 | 28 | PP | i 29 | 10 | PPS | 34 | 22 | SS 50.0 |
| Clermont-Ferrand | | 110.2 | 319 | e 14 | 35 | P | — | — | — | i 28 | 31 | PS e 53.6 |
| Oxford | | 110.2 | 327 | i 19 | 13 | PP | i 24 | 59 | [-14] | — | — | e 32.7 |

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----|----------|---------|----------|-------|---------|-------|---------|------|
| | | \circ | \circ | m. s. | s. | m. s. | s. | m. s. | m. |
| Santa Barbara | z. | 112.4 | 52 | e 15 10 | P | — | — | — | — |
| Tinemaha | z. | 112.8 | 49 | e 14 53 | P | e 29 38 | PPS | e 28 56 | PKKP |
| Haiwee | | 113.3 | 50 | i 15 27 | P | — | — | e 29 2 | PKKP |
| Butte | | 113.3 | 37 | e 18 47 | [+ 7] | e 25 51 | [+25] | e 19 30 | PP |
| Algiers | | 113.4 | 310 | e 18 40 | [0] | e 25 23 | [- 3] | e 29 18 | PS |
| Saskatoon | | 113.6 | 30 | e 19 16 | PP | e 27 6 | {+36} | e 29 17 | PS |
| Mount Wilson | | 113.8 | 52 | e 15 1 | P | — | — | e 29 34 | PKKP |
| Pasadena | | 113.8 | 52 | e 15 1 | P | i 29 3 | PS | i 19 43 | PP |
| Bozentan | | 114.4 | 37 | e 18 57 | [+16] | e 25 26 | [- 4] | i 19 36 | PP |
| Riverside | z. | 114.4 | 52 | e 15 3 | P | — | — | i 29 30 | PKKP |
| Palomar | z. | 115.0 | 53 | e 15 12 | P | — | — | i 29 30 | PKKP |
| Logan | | 115.7 | 41 | e 18 51 | [+ 7] | e 25 29 | [- 5] | e 29 12 | PS |
| Salt Lake City | | 116.1 | 43 | e 18 50 | [+ 5] | e 25 31 | [- 5] | e 19 45 | PP |
| Toledo | | 117.3 | 316 | e 18 43 | [- 4] | — | — | 23 16 | ? |
| Almeria | | 117.4 | 312 | i 18 53 | [+ 6] | i 25 35 | [- 6] | 20 6 | PP |
| Granada | | 118.1 | 313 | i 15 24 | P | 25 46 | [+ 3] | i 20 17 | PP |
| Ivigtut | | 118.5 | 354 | 20 1 | PP | 27 35 | {+32} | 36 28 | SS |
| Coimbra | | 120.2 | 318 | e 18 42 | [-11] | 26 6 | [+15] | e 20 16 | PP |
| Tucson | | 120.2 | 51 | e 15 32 | P | i 26 3 | [+12] | i 20 21 | PP |
| San Fernando | N. | 120.4 | 314 | 21 30 | ? | 26 4 | [+13] | 36 39 | SS |
| Lisbon | | 121.4 | 316 | 19 2k | [+ 7] | 25 51 | [- 3] | 20 31 | PP |
| Lincoln | | 125.7 | 35 | e 20 54 | PP | e 25 17 | [-51] | 28 12 | SKKS |
| Chicago U.S.C.G.S. | | 130.0 | 29 | e 19 43 | [+31] | i 26 10 | [-10] | e 21 22 | PP |
| Florissant | | 130.8 | 34 | e 16 6 | P | i 26 16 | [- 6] | e 16 31 | pP |
| St. Louis | | 131.0 | 34 | i 19 17 | [+ 3] | i 26 10 | [-12] | i 19 34 | pPKP |
| Seven Falls | | 131.5 | 11 | 19 21 | [+ 6] | 30 9 | ? | 22 39 | SKP |
| Shawinigan Falls | | 131.6 | 13 | 19 18 | [+ 3] | 28 53 | {+23} | 21 40 | PP |
| Ottawa | | 131.9 | 17 | 19 18 | [+ 2] | 28 48 | {+17} | 21 35 | PP |
| Cape Girardeau | N. | 132.7 | 33 | e 19 24 | [+ 7] | 22 38 | SKP | e 21 34 | PP |
| Vermont | | 133.4 | 15 | e 21 30 | PP | 26 37 | [+ 9] | i 22 50 | SKP |
| East Machias | | 134.4 | 10 | e 19 18 | [- 2] | e 39 24 | SS | e 21 44 | PP |
| Tacubaya | z. | 134.6 | 62 | e 19 9? | [-12] | — | — | — | — |
| Pittsburgh | | 134.7 | 24 | e 19 21 | [0] | i 28 37 | [-12] | i 22 2 | PP |
| Halifax | | 135.1 | 5 | e 21 58 | PP | e 39 46 | SS | e 22 58 | PKS |
| Harvard | | 135.7 | 14 | e 19 19 | [- 3] | e 39 40 | SS | i 21 53 | PP |
| Weston | | 135.9 | 14 | e 19 18 | [- 5] | — | — | i 21 46 | PP |
| Fordham | | 136.6 | 16 | i 19 30 | [+ 6] | 40 32 | SSP | i 19 55 | pPKP |
| Philadelphia | | 136.9 | 19 | e 19 28 | [+ 3] | e 40 0 | SS | e 22 4 | PP |
| Georgetown | | 137.2 | 21 | i 19 38 | [+13] | 26 47 | [+13] | 22 1 | PP |
| Columbia | | 139.4 | 30 | e 19 40 | [+11] | e 29 43 | [+26] | e 23 20 | PP |
| Merida | N. | 142.1 | 53 | e 20 0 | [+26] | — | — | — | — |
| La Plata | E. | 145.3 | 179 | 19 20 | [-20] | 41 28 | SS | — | — |
| | N. | 145.3 | 179 | 19 44 | [+ 4] | 26 58 | [+11] | 23 28 | PP |
| | z. | 145.3 | 179 | 19 45 | [+ 5] | — | — | — | — |
| Bermuda | | 147.0 | 11 | 19 41 | [- 2] | e 33 42 | PS | e 41 57 | SS |
| Balboa Heights | | 156.0 | 66 | e 19 40? | [-16] | — | — | — | — |
| Rio de Janeiro | | 153.5 | 210 | e 20 19 | [+27] | i 30 30 | [- 7] | — | — |
| Huancayo | | 158.5 | 124 | e 20 5 | [+ 6] | i 31 50 | {+46} | i 24 27 | PP |
| San Juan | | 159.7 | 24 | e 20 3 | [+ 3] | e 26 56 | [- 8] | e 24 11 | PP |
| La Paz | | 160.5 | 147 | i 20 16 | [+15] | i 26 50 | [-15] | i 21 28 | pPKP |

Additional readings:—

Tokyo Cent. Met. Obs. i = +7m.17s.
 Calcutta eSSN = +15m.45s.
 Riverview i = +8m.15s., 1E = +14m.45s., +15m.9s., +17m.39s., iN = +17m.54s., iZ = +18m.1s.
 Hyderabad PSN = +15m.50s., S_eSN = +18m.58s.
 Agra PPP = +11m.25s., sS = +16m.19s., PSE = +16m.39s., SSE = +19m.54s., SSN = +20m.15s., sSSE = +20m.19s., SSSE = +21m.4s.
 Bombay iSE = +16m.41s., SSE = +20m.4s., iSSN = +20m.25s.
 Auckland pPcP = +9m.40s., PP? = +11m.4s., PPP? = +12m.40s., i = +13m.10s., +15m.10s., sS = +17m.35s., ScS = +18m.34s., i = +22m.25s. and +23m.50s.
 New Plymouth i = +10m.35s.
 Wellington pPcPZ = +11m.25s., iZ = +12m.19s., PPZ = +12m.46s., i = +15m.45s., sS = +19m.20s., ScS = +20m.20s., i = 20m.50s., SSS = +26m.10s.
 Tashkent, all readings increased by 1m.
 Apia i = +11m.5s., SS? = +23m.50s.

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Tananarive iPS = +22m.9s., SS = +26m.38s.
Honolulu e = +13m.51s., +17m.34s., and +26m.4s.
Ksara iS = +23m.27s.
College iScS = +24m.7s., i = +24m.35s., eSS = +29m.24s., e = +33m.25s.
Helwan PPPZ = +18m.45s., SEZ = +24m.4s., QE = +37m.49s.
Bucharest eN = +13m.31s., ePPN = +16m.36s., iPSEN = +24m.41s.
Sitka e = +25m.15s., +26m.25s., eSS = +31m.18s.
Sofia ePN = +13m.50s., eN = +17m.40s., eEN = +24m.52s.
Warsaw eZ = +14m.47s., +18m.0s., eE = +19m.36s., eN = +21m.28s., eZ = +21m.31s.,
+22m.18s., SN = +24m.7s., eSZ = +24m.10s., ePSN = +24m.48s., ePSE = +
24m.52s., eZ = +26m.3s., eN = +26m.56s., eZ = +27m.11s., eE = +27m.22s.,
eZ = +31m.7s., eE = +34m.59s.
Upsala eE = +17m.37s., eN = +17m.40s., iSN = +24m.4s., iE = +24m.32s., PSE =
+24m.49s., iE = +25m.21s., eN = +31m.21s.
Belgrade e = +14m.46s., +15m.56s., and +25m.49s.
Copenhagen +18m.6s., +18m.40s., +24m.53s., +25m.33s., +26m.1s., +32m.10s.
Prague e = +25m.34s. and +36m.22s.
Potsdam eN = +14m.17s., iN = +14m.45s., +18m.13s., +18m.32s., iEZ = +18m.44s.,
iPPEZ = +20m.27s., iN = +21m.36s., iSKSN = +24m.31s., iSKKSZ = +25m.13s.,
iSEN = +25m.27s., iZ = +26m.37s., iPSZ = +27m.30s., iE = +27m.43s., and
+29m.2s., iZ = +30m.32s., iN = +30m.39s., iE = +32m.26s., iN = +32m.30s.,
iSSE = +32m.54s., iSSPN = +33m.5s., iN = +33m.54s., iE = +33m.57s., iSSSN =
+36m.39s., iE = +37m.20s., iZ = +38m.17s., iE = +40m.58s., iZ = +42m.34s.
Jena iPZ = +14m.16s., iN = +15m.40s., iEZ = +17m.40s., iN = +18m.15s. and
+18m.20s., eSZ = +25m.48s., eE = +32m.22s., eNZ = +32m.40s., eN = +33m.0s.,
e = +36m.40s.
Stuttgart iPPEN = +18m.33s., iPPPE = +20m.56s., iSN = +26m.7s., ePSE =
+27m.50s., iPKKPZ = +30m.22s., iSSN = +33m.32s., eSSE = +33m.38s., iEN =
+34m.5s., iSSSE = +37m.50s., iSSSN = +38m.0s., iN = +43m.38s.
Victoria PS = +27m.59s., SSE = +33m.4s., SSSE = +36m.52s., e = +42m.40s.
Scoresby Sund e = +19m.57s. and +23m.11s., ePS = +27m.32s., iSSS = +37m.40s.?
Zurich ePP = +18m.51s.
De Bilt iS = +26m.11s., ePPS = +29m.20s., eSS = +33m.40s. ?, eSSS = +37m.40s.?
Seattle e = +19m.57s., ePS = +27m.55s., eSS = +29m.43s.
Ferndale iN = +29m.50s.
Uccle iPP = +18m.51s., iPPPE = +19m.23s., iSN = +26m.20s., iE = +29m.31s., iSSN =
+33m.22s., iN = +34m.25s., iSSN = +37m.50s., iQN = +44m.17s.
Besançon e = +44m.40s.
Aberdeen iN = +26m.54s. and +34m.40s., eE = +37m.54s., Q = +42m.34s.
Ukiah e = +23m.58s., i = +28m.20s., eSS = +33m.51s.
Paris eS = +26m.43s., PPS = +29m.5s., eSSS = +38m.29s., e = +45m.3s.
Berkeley eN = +18m.56s., eE = +25m.6s.
Marseilles eSSS = +38m.46s., e? = +45m.10s.
Spokane eSN = +26m.33s., iN = +29m.48s.
Kew ePPEN = +22m.1s., eE = +23m.17s., iSKKSE = +25m.35s., eSEN = +26m.33s.,
ePPSE = +29m.17s., eSSN = +34m.24s., eSSE = +34m.33s., eSSS = +38m.6s.
Stonyhurst i = +19m.58s., +24m.22s., +31m.10s., and +45m.10s.
Clermont-Ferrand iPP = +18m.42s., iPPS = +29m.48s., e = +39m.42s.
Butte e = +25m.7s. and +26m.48s., ePS = +29m.2s., eSS = +35m.3s., eSSS = +39m.11s.
Algiers e = +20m.12s., eSS? = +34m.10s.
Saskatoon eE = +35m.10s., eN = +46m.22s.
Pasadena iPKP = +18m.43s., iPKKPZ = +29m.35s.
Bozeman e = +20m.36s. and +27m.2s., iPS = +28m.58s., i = +29m.35s., eSS =
+35m.38s., iPKP,PKP = +39m.36s., e = +45m.18s.
Logan iPP = +19m.46s., e = +22m.13s., eSS = +35m.59s., eSSS = +40m.0s.
Salt Lake City e = +22m.18s., ePS = +29m.24s., eSS = +36m.18s., eSSS = +39m.53s.
Almeria i = +21m.47s., PKP = +22m.29s., PP = +23m.34s., PPP = +26m.20s.,
SKKS = +30m.12s., i = +30m.48s., SS = +39m.35s., SSS = +43m.50s.
Granada PKP = +19m.18s., pPP = +20m.36s., sPP = +20m.46s., SKP = +21m.9s.,
PPP = +22m.59s., pSKS = +26m.34s., SKKS = +27m.18s., iS = +28m.9s., sS =
+28m.40s., PS = +29m.33s., PPS = +30m.44s., iSS = +35m.58s., SSP = +36m.22s.,
sSS = +37m.19s., SSS = +40m.50s., Q = +48m.9s.
Coimbra eN = +19m.26s., PP = +21m.24s., PPP = +23m.28s., SKKS = +28m.58s.,
S = +29m.58s., PS = +32m.10s., PPS = +33m.26s., SS = +36m.45s.
Tucson iPKP = +18m.55s., i = +21m.2s., +24m.18s., and +27m.16s., iPKKP =
+29m.8s., iPS = +30m.1s., i = +35m.16s., ePKP,PKP = +39m.58s.
San Fernando SSSN = +40m.16s.
Lisbon PPN = +20m.35s. ?, E = +21m.2s., E = +22m.57s., PS?N = +30m.9s., E =
+32m.4s., SEN = +37m.4s.
Lincoln e = +35m.45s.
Chicago U.S.C.G.S. iPKS = +22m.31s., i = +28m.41s., e = +30m.33s., eSS = +38m.29s.,
eSSS = +43m.0s.
Florissant iPKPZ = +19m.16s., iPKPZ = +19m.38s., iPPZ = +21m.26s., iPPPZ =
+21m.50s., iZ = +21m.55s., iSKPZ = +22m.36s., iPSKPZ = +22m.58s., iSCKPZ =
+23m.18s., iSKKSE = +28m.18s., iE = +28m.49s., eE = +29m.7s., iSE =
+29m.20s., iSPE = +31m.41s., iE = +31m.54s., iSSE = +38m.44s., iE =
+38m.51s.

Continued on next page.

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St. Louis iPPEN = +21m.27s., iPPEN = +21m.54s., iSKPE = +22m.26s., iPPPEN = +24m.28s., ipSKSEN = +26m.38s., iEN = +28m.50s.
 Seven Falls PPS = +34m.36s., SS = +38m.58s., e = +48m.16s.
 Shawinigan Falls SKP = +22m.38s., PPS = +33m.34s., SS = +40m.16s.
 Ottawa SKP = +22m.42s., PPPE = +24m.44s., PPS = +33m.45s., SS = +39m.4s., SSS = +44m.16s., eE = +54m.10s.
 Cape Girardeau eN = +23m.10s.
 Vermont e = +21m.48s. and +28m.36s., eSS = +39m.20s., e = +44m.23s.
 East Machias iPKS = +22m.54s., e = +45m.47s.
 Pittsburgh iNW = +29m.39s., iSSNW = +33m.22s., iNW = +33m.54s., iSS = +36m.0s.
 Harvard iPKPZ = +19m.27s., i = +22m.0s.
 Fordham iPP = +22m.6s., iSKP = +23m.31s.
 Philadelphia e = +20m.21s., ePKS = +22m.59s., ePPS = +34m.30s.
 Georgetown SKP = +23m.8s., SP = +32m.57s.
 Columbia ePKS = +23m.3s., e = +33m.0s. and +34m.56s., eSS = +40m.32s.
 La Plata E +19m.58s. and +30m.40s., SKSP = +33m.4s., SKSP = +37m.40s., SSS? = +51m.4s.
 La Plata N +19m.53s., +20m.10s., +24m.16s., +25m.16s., +27m.34s., +28m.4s., and +28m.40s., SKKS = +29m.52s. and +31m.22s., PPP = +33m.16s., SS = +41m.58s., PSS = +42m.40s. ? and +44m.40s., SSS = +47m.28s. and +51m.10s., Q = +60m.40s.
 La Plata Z +19m.52s., +20m.10s., and +21m.4s.
 Bermuda i = +20m.2s. and +20m.24s., e = +35m.57s., +41m.31s., and +47m.34s., eSSS = +57m.37s., e = +57m.55s. and +60m.13s.
 Huancayo i = +22m.0s. and +26m.4s., e = +46m.7s. and +49m.32s.
 San Juan e = +23m.46s., i = +27m.32s., +34m.56s., and +38m.47s., iSS = +44m.27s., e = +52m.25s.
 La Paz iPKP₂ = +20m.50s., iSKPZ = +23m.45s., iPPZ = +24m.33s., iPPP = +28m.17s., iSKKSZ = +31m.11s., iPSKS = +34m.49s., iPPS? = +37m.55s., SSN = +44m.40s., SSSN = +50m.11s., SSSS = +55m.11s., Q = +67.7m.

Nov. 8d. Readings also at 0h. (Auckland, Wellington, and Tinemaha), 2h. (Tinemaha and Balboa Heights), 4h. (Oaxaca), 7h. (Riverside, Pasadena, Mount Wilson, Bombay, Colombo, Tinemaha, Medan, La Paz, and Riverview), 8h. (near Medan), 10h. (near Tananarive), 11h. (Wellington), 12h. (Palomar and Tinemaha), 13h. (La Paz), 16h. (Wellington, Auckland, La Paz, Riverview, Arapuni and near Amboina), (2), 17h. (Berkeley), 21h. (near Tucson).

Nov. 9d. Readings at 9h. (Palomar and Tinemaha, Calcutta, and near Almata), 10h. (Bombay and Colombo), 11h. (near La Paz), 12h. (Berkeley), 16h. (Berkeley and near Trieste), 22h. (near Tucson).

Nov. 10d. 3h. Local shock, North Italy.

Chur eP_g = 29m.22s., eS_g = 29m.42s.
 Zurich eP? = 29m.31s., eP_g = 29m.38s., eS_g = 30m.9s.
 Trieste eP = 29m.38s., eS = 30m.2s., e = 30m.13s.
 Basle eP_g = +29m.49s., eS_g = 30m.30s.
 Neuchatel eP_g = +29m.49s., eS_g = 30m.30s.
 Ravensburg eN = 29m.52s., eS_gEN = 30m.9s., iE = 30m.12s.
 Stuttgart eP = 29m.57s., i = 30m.10s., e = 30m.36s., iS_g = 30m.48s., i = 30m.52s.

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Nov. 10d. 9h. 44m. 46s. Epicentre 21°·5S. 66°·5W. Depth 0·010.

Felt in Northern Chile. Observatorio astronomico, La Plata, Boletin Sismologico, 1941.

A = +·3713, B = -·8540, C = -·3644; δ = -3; h = +4;
D = -·917, E = -·399; G = -·145, H = +·334, K = -·931.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|----------------------|-------|---------|------|---------|-----------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| La Paz | 5·2 | 341 | i 1 33 _a | pP | i 2 33 | sS | — | 2·9 |
| Huancayo | 12·6 | 316 | i 3 2 | + 5 | i 5 27 | +12 | — | i 6·0 |
| La Plata | 15·4 | 152 | i 3 33 | 0 | 6 13 | - 8 | — | 6·6 |
| Rio de Janeiro | 21·6 | 98 | i 4 46 | + 3 | e 8 40 | + 9 | — | — |
| San Juan | 39·6 | 1 | e 7 24 | + 1 | i 13 13 | - 6 | i 8 19 | pP i 16·4 |
| Philadelphia | 61·7 | 353 | — | — | e 18 10 | -13 | — | e 23·6 |
| Cape Girardeau N. | 62·4 | 341 | i 10 13 | - 2 | e 18 22 | -10 | e 10 57 | pP — |
| Fordham | 62·4 | 355 | i 10 17 | + 2 | i 18 33 | + 1 | i 11 11 | pP — |
| St. Louis | 63·8 | 340 | e 10 17 | - 7 | i 18 42 | - 8 | i 20 1 | sS — |
| Florissant | 64·0 | 340 | e 10 24 | - 1 | i 18 47 | - 5 | e 11 10 | pP — |
| Chicago U.S.C.G.S. | 65·9 | 342 | — | — | e 19 6 | -10 | — | e 29·7 |
| Ottawa | 67·1 | 354 | e 11 7 | pP | e 19 28 | - 2 | e 20 26 | sS — |
| Tucson | 68·2 | 321 | i 10 52 | 0 | e 19 41 | - 2 | e 11 41 | pP e 28·6 |
| Seven Falls | 68·4 | 357 | e 10 59 | + 6 | e 19 48 | + 2 | — | — |
| La Jolla | 72·6 | 317 | e 11 19 | 0 | — | — | — | — |
| Palomar z. | 72·7 | 318 | i 11 19 _k | 0 | — | — | i 12 8 | pP — |
| Riverside | 73·4 | 318 | i 11 22 _k | - 1 | — | — | i 12 11 | pP — |
| Mount Wilson | 74·0 | 318 | i 11 26 _k | - 1 | — | — | i 12 15 | pP — |
| Pasadena | 74·0 | 318 | i 11 26 _k | - 1 | i 20 48 | - 2 | i 12 15 | pP — |
| Haiwee | 75·2 | 320 | i 11 29 | - 5 | e 21 3 | 0 | i 12 16 | pP — |
| Santa Barbara | 75·2 | 317 | i 11 34 | 0 | — | — | — | — |
| Tinemaha | 76·0 | 320 | i 11 37 _k | - 1 | e 21 8 | - 4 | i 12 21 | pP — |
| Bozeman | 78·1 | 330 | e 11 52 | + 2 | e 21 31 | - 4 | e 22 56 | sS e 34·4 |
| Branner | 78·6 | 329 | i 11 54 | + 1 | — | — | — | — |
| Berkeley | 78·9 | 318 | e 11 54 | 0 | — | — | — | — |
| Helwan | 106·9 | 65 | e 18 38 | PP | i 24 35 | [0] | e 19 21 | PPP — |
| Bombay | 141·8 | 87 | e 20 11 | [+50] | — | — | i 22 29 | PP — |

Additional readings:—

Huancayo i = +4m.15s. and +4m.31s.

San Juan e = +7m.52s., ePPP = +9m.50s., isS = +14m.27s.

Philadelphia e = +19m.18s.

Cape Girardeau iSN = +18m.26s., esSN = +19m.44s.

Fordham i = +19m.38s.

Florissant eE = +18m.45s., eE = +19m.0s., isSE = +20m.3s., iE = +20m.9s. and +21m.29s.

Chicago U.S.C.G.S. e = +20m.14s.

Ottawa eZ = +11m.32s.

Tucson iP_cP = +11m.11s., esP = +12m.1s., i = +13m.10s., e = +22m.1s.

Pasadena esPZ = +12m.52s., eEN = +22m.6s.

Haiwee iZ = +12m.56s.

Tinemaha iZ = +13m.0s., eZ = +20m.48s.

Bozeman eSS = +26m.29s.

Helwan eE = +25m.26s. and +29m.14s.

Nov. 10d. Readings also at 0h. (Lick), 1h. (near Apia), 2h. (Haiwee, Auckland, Wellington, Palomar, and Tinemaha), 4h. (Palomar, Tinemaha, Mount Wilson, and near Apia), 7h. (Tchimkent), 9h. (Riverside, Tinemaha, Mount Wilson, and Balboa Heights), 12h. (near Amboina (4)), 15h. (near Medan, near San Juan, Riverside, Tinemaha, and Mount Wilson), 17h. (near Tucson), 19h. (Berkeley), 22h. (near Mizusawa).

Nov. 11d. Readings at 1h. (near Tucson), 4h. (Haiwee, Palomar, Riverside, and Tinemaha), 6h. (Mizusawa), 7h. (Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha), 9h. (near Apia), 13h. (Mount Wilson, Pasadena, Palomar, and Tinemaha), 17h. (Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha), 18h. (Haiwee, Mount Wilson, Pasadena, Palomar, and Tinemaha), 22h. (near Frunse), 23h. (Berkeley and Branner).

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1941

450

Nov. 12d. 6h. 51m. 14s. Epicentre 6°·5N. 93°·5E. (as on 1940, Nov. 13d.).

A = -·0607, B = +·9918; C = +·1125; δ = +1; h = +7;
D = +·998, E = +·061; G = -·007, H = +·112, K = -·994.

| | | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|------------------|----|----------|-----|------|-----------------|-------|------|-----------------|-------|-------|----|------------|
| | | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Medan | | 5·9 | 119 | i 1 | 17 | -14 | — | — | — | — | — | — |
| Colombo | E. | 13·5 | 272 | 3 | 21 | + 6 | 5 | 47 | 0 | — | — | 6·8 |
| Kodalkanal | E. | 16·3 | 284 | i 4 | 4 | PP | i 7 | 8 | SS | — | — | 7·8 |
| Calcutta | N. | 16·7 | 343 | i 4 | 9 _a | PP | i 7 | 24 | SS | i 4 | 18 | PP e 9·1 |
| Batavia | | 18·3 | 135 | 3 | 20 | -57 | 6 | 45 | -54 | — | — | — |
| Hyderabad | E. | 18·3 | 308 | 4 | 19 | + 2 | 7 | 55 | SS | — | — | 9·7 |
| Bombay | | 23·6 | 303 | i 5 | 20 | + 7 | i 9 | 39 | +14 | i 6 | 6 | PPP 11·8 |
| Agra | E. | 25·3 | 328 | i 5 | 31 _k | + 1 | 10 | 13 | +19 | 5 | 46 | pP |
| | N. | 25·3 | 328 | 5 | 34 _k | + 4 | i 10 | 17 | +23 | — | — | — |
| Dehra Dun | N. | 27·8 | 331 | e 5 | 16 _? | -37 | e 9 | 11 _? | ? | — | — | e 11·8 |
| Andijan | | 39·0 | 334 | 7 | 35 | + 5 | — | — | — | — | — | — |
| Semipalatinsk | | 45·1 | 349 | e 8 | 6 | -14 | — | — | — | — | — | — |
| Irkutsk | | 46·5 | 10 | 8 | 30 | - 1 | i 15 | 14 | - 5 | — | — | — |
| Baku | | 51·5 | 318 | — | — | — | i 16 | 31 | + 2 | — | — | — |
| Tananarive | | 51·8 | 241 | e 14 | 23 | ? | e 16 | 55 | +22 | — | — | e 24·7 |
| Mizusawa | E. | 53·7 | 47 | i 9 | 21 | - 5 | e 16 | 16 | -43 | — | — | — |
| | N. | 53·7 | 47 | e 9 | 17 | - 9 | e 16 | 20 | -39 | — | — | — |
| Sverdlovsk | | 56·4 | 339 | i 9 | 45 | 0 | i 17 | 36 | 0 | — | — | — |
| Ksara | | 59·6 | 305 | e 10 | 14 | + 6 | e 18 | 27 | +10 | — | — | — |
| Helwan | | 62·7 | 300 | i 10 | 28 | - 1 | 18 | 55 | - 2 | i 13 | 10 | PP |
| Brisbane | | 66·7 | 124 | — | — | — | i 19 | 22 | -24 | — | — | — |
| Riverview | | 67·7 | 131 | — | — | — | i 19 | 36 | -22 | — | — | e 32·2 |
| Bucharest | | 69·4 | 316 | — | — | — | e 20 | 15 | - 3 | e 20 | 47 | PS |
| Sofia | | 71·1 | 313 | e 11 | 20 | - 2 | e 20 | 35 | - 3 | — | — | — |
| Upsala | | 77·3 | 330 | — | — | — | i 21 | 40 | - 8 | — | — | e 39·8 |
| Potsdam | | 79·0 | 323 | i 12 | 4 | - 3 | i 22 | 1 | - 5 | — | — | — |
| Jena | | 79·9 | 321 | e 12 | 11 | - 1 | — | — | — | — | — | — |
| Chur | | 81·2 | 317 | i 12 | 18 | - 1 | e 22 | 23 | - 6 | — | — | — |
| Stuttgart | | 81·4 | 319 | i 12 | 19 _a | - 1 | e 22 | 27 | - 4 | — | — | — |
| Zurich | | 81·8 | 318 | e 12 | 21 _a | - 1 | e 22 | 29 | - 6 | — | — | — |
| Basle | | 82·5 | 318 | e 12 | 24 | - 2 | e 22 | 36 | - 6 | — | — | — |
| Neuchatel | | 82·9 | 317 | e 12 | 26 | - 2 | — | — | — | — | — | — |
| Clermont-Ferrand | | 85·7 | 315 | e 12 | 41 _k | - 1 | — | — | — | i 13 | 0 | pP |
| Christchurch | N. | 86·6 | 135 | — | — | — | i 23 | 2 | [-10] | — | — | 43·8 |
| Auckland | | 86·9 | 128 | 24 | 26 | PS | 30 | 2 | ? | — | — | 40·8 |
| Wellington | | 87·8 | 133 | e 22 | 1 | ? | e 23 | 11 | [- 8] | — | — | 27·8 |
| College | | 95·9 | 22 | — | — | — | e 24 | 37 | - 8 | — | — | e 52·0 |
| Bozeman | | 123·6 | 20 | — | — | — | e 37 | 22 | SS | — | — | e 61·9 |
| Seven Falls | | 124·8 | 346 | — | — | — | e 37 | 34 | SS | — | — | 57·8 |
| Ottawa | | 127·4 | 350 | e 19 | 2 | [- 5] | e 38 | 10 | SSP | e 21 | 4 | PP 65·8 |
| Tinemaha | | 127·4 | 32 | i 19 | 3 | [- 4] | — | — | — | e 21 | 6 | PP |
| Haiwee | | 128·3 | 32 | i 19 | 5 | [- 4] | — | — | — | — | — | — |
| Santa Barbara | z. | 128·6 | 35 | i 19 | 5 | [- 4] | — | — | — | e 21 | 12 | PP |
| Mount Wilson | z. | 129·7 | 33 | i 18 | 54 | [-17] | — | — | — | — | — | — |
| Pasadena | | 129·7 | 33 | e 18 | 54 | [-17] | — | — | — | e 21 | 9 | PP e 61·8 |
| Palomar | z. | 131·0 | 33 | i 19 | 10 | [- 4] | — | — | — | i 21 | 24 | PP |
| Fordham | | 131·5 | 347 | i 19 | 11 | [- 4] | i 39 | 12 | SS | i 22 | 32 | PKS e 74·8 |
| Tucson | | 135·0 | 29 | e 19 | 3 | [-18] | e 30 | 56 | ? | i 22 | 42 | PKS |
| San Juan | | 148·1 | 321 | e 19 | 48 | [+ 4] | e 41 | 48 | SS | — | — | e 80·1 |
| La Paz | | 159·3 | 239 | i 19 | 57 _a | [- 3] | 33 | 37 | ? | 24 | 42 | PP 69·2 |
| Huancayo | | 167·7 | 243 | i 20 | 7 | [- 1] | — | — | — | e 25 | 23 | PP e 45·2 |

Additional readings:—

Calcutta iSSN = +7m.40s., iPcPN = +8m.50s., eSeSN = +16m.8s.

Hyderabad SS = +8m.7s.

Bombay iN = +8m.8s., iSSN = +11m.1s.

Agra PPE = +6m.12s., sSE = +10m.38s., SSE = +11m.22s.

Helwan iZ = +10m.34s., eZ = +19m.55s.

Potsdam iE = +13m.6s.

Jena i = +12m.25s.

Stuttgart i = +12m.36s.

Tinemaha i2 = +19m.23s.

Continued on next page.

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1941

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Haiwee iZ = +19m.24s.
 Mount Wilson iZ = +19m.7s.
 Pasadena i = +19m.7s.
 Palomar iZ = +19m.29s.
 Tucson i = +23m.15s.
 La Paz iZ = +20m.4s.
 Huancayo e = +35m.49s.
 Long waves were also recorded at Kew and De Bilt.

November 12d. 10h. 4m. 49s. Epicentre 39°·7N. 39°·7E. (as on 1940 May 29d.).

Damage at Erzindjan (Turkey); felt at Van. Epicentre 39°·5N. 39°·0E. (Strasbourg).

J. P. Rothé.

Chronique seismologique, Revue pour l'Etude des Calamités, tome VII No. 21. Geneve 1944, p.51.

A = +·5936, B = +·4928, C = +·6362; $\delta = -4$; $h = -2$;
 D = +·639, E = -·769; G = +·490, H = +·406, K = -·772.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|---------------------|------|----------|------|---------------------|---------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Ksara | 6·6 | 209 | e 1 46 | + 5 | 2 56 | - 2 | 3 35 S _e | — |
| Baku | 7·9 | 81 | i 2 5 | + 6 | i 3 53 | S* | — | — |
| Istanbul | 8·2 | 282 | 2 12 | + 9 | 4 15 | S* | — | e 5·2 |
| Bucharest | 11·1 | 299 | e 2 54 | PP | e 5 8 | SS | — | (6·1) |
| Helwan | 12·0 | 218 | i 2 53k | - 2 | i 5 14 | + 3 | 3 32 PPP | — |
| Sofia | 12·7 | 289 | e 3 6 | + 1 | e 6 22 | SSS | — | (e 6·8) |
| Belgrade | 15·1 | 296 | e 3 48 | PP | e 6 54 | SSS | — | e 8·6 |
| Warsaw | 18·0 | 320 | 4 12 _a | - 1 | 7 35 | + 3 | e 4 22 PP | e 10·2 |
| Triest | 19·9 | 297 | i 4 34 | - 2 | i 8 36 | SS | — | — |
| Prague | 20·6 | 310 | 4 38k | - 5 | 8 29 | 0 | — | e 11·2 |
| Sverdlovsk | 21·9 | 31 | i 4 56 | - 1 | 14 2 | ? | — | — |
| Potsdam | 22·3 | 314 | i 5 0 | - 1 | i 9 12 | +10 | i 5 22 PP | e 12·2 |
| Jena | 22·6 | 309 | e 5 3 | 0 | e 9 4 | - 3 | e 9 23 SS | e 12·2 |
| Chur | 23·0 | 300 | e 5 5 | - 2 | e 9 17 | + 3 | — | — |
| Ravensburg | 23·1 | 299 | e 5 3 | - 5 | i 9 16 | 0 | — | e 12·8 |
| Stuttgart | 23·5 | 304 | e 5 10 | - 2 | e 9 26 | + 3 | i 5 39 PP | e 12·2 |
| Zurich | 23·7 | 300 | e 5 12k | - 2 | e 9 32 | + 5 | — | e 15·4 |
| Copenhagen | 24·1 | 322 | — | — | 9 31 | - 3 | — | — |
| Basle | 24·4 | 300 | e 5 20 | - 1 | e 9 40 | + 1 | — | — |
| Upsala | 24·5 | 333 | 5 25 | + 3 | e 9 40 | 0 | — | e 12·2 |
| Neuchatel | 24·8 | 299 | e 5 22 | - 3 | e 9 52 | + 6 | — | — |
| Andijan | 24·9 | 77 | 5 32 | + 6 | — | — | — | — |
| Besançon | 25·6 | 299 | — | — | e 10 11? | +12 | — | 15·2 |
| De Bilt | 26·8 | 311 | e 5 46 _a | + 2 | i 10 26 | + 7 | — | e 13·2 |
| Uccle | 27·0 | 307 | i 5 45 _a | 0 | e 10 18 | - 4 | — | e 13·2 |
| Clermont-Ferrand | 27·4 | 296 | e 5 50 | + 1 | i 10 47 | +19 | — | e 17·1 |
| Paris | 27·9 | 302 | — | — | e 10 41 | + 4 | — | 16·2 |
| Algiers | 28·8 | 276 | — | — | 10 43 | - 8 | — | 13·7 |
| Stonyhurst | 31·6 | 312 | — | — | i 11 40 | + 5 | — | i 18·8 |
| Dehra Dun | 32·6 | 94 | e 5 13? | ? | e 12 30? | +39 | — | e 19·6 |
| Almeria | 33·0 | 279 | i 6 39 | 0 | 11 43 | -14 | 6 51 pP | 16·2 |
| Granada | 33·8 | 281 | i 6 39k | - 7 | e 12 21 | +11 | i 6 49 pP | e 16·3 |
| Agra | 34·1 | 99 | 6 48 | 0 | 12 21 | + 7 | 14 27 SS | — |
| Bombay | 35·2 | 116 | i 7 2 | + 4 | i 12 43 | +12 | 8 6 PP | 17·8 |
| San Fernando | 36·0 | 280 | e 7 27 | +22 | e 12 7 | -37 | — | 17·2 |
| Coimbra | 36·5 | 287 | e 7 4 | - 5 | 12 20 | -31 | — | 19·3 |
| Lisbon | 37·5 | 284 | 7 17 | 0 | — | — | 8 34? PP | 17·2 |
| Hyderabad | E. 40·2 | 112 | 7 41 | + 1 | 17 0 | SSS | 9 16 PP | 19·9 |
| Calcutta | N. 44·5 | 97 | e 8 33 | +18 | i 15 1 | +10 | e 10 8 PP | i 21·8 |
| Irkutsk | 45·2 | 51 | 8 22 | + 2 | e 15 5 | + 4 | — | — |
| Tananarive | 58·8 | 171 | e 5 38 | ? | — | — | — | 27·1 |
| Medan | 64·1 | 108 | 10 38 | 0 | — | — | — | — |
| Vladivostok | 65·7 | 53 | — | — | i 19 33 | - 1 | — | — |
| East Machias | 73·4 | 315 | e 11 45 | + 9 | e 21 11 | + 6 | — | e 44·4 |
| Seven Falls | 73·7 | 318 | e 11 40 | + 2 | e 21 17 | + 9 | — | 35·2 |

Continued on next page.

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1941

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| | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. |
|------------|----------|-----|---------|--------|---------|--------|---------|-----------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| College | 75.6 | 4 | — | — | e 21 31 | + 2 | — | e 37.6 |
| Harvard | z. 77.2 | 315 | — | — | e 21 52 | + 5 | — | e 38.2 |
| Weston | 77.2 | 314 | e 11 19 | -38 | 21 49 | + 2 | — | — |
| Ottawa | 77.4 | 319 | e 12 1 | + 3 | e 21 41 | - 8 | — | 38.2 |
| Bermuda | 80.0 | 303 | e 12 16 | + 3 | e 22 11 | - 6 | e 15 11 | PP e 39.9 |
| Florissant | 89.5 | 323 | i 12 59 | - 1 | e 23 27 | [- 3] | e 24 53 | PS — |
| San Juan | 90.0 | 294 | e 13 11 | + 8 | e 23 32 | [- 1] | e 16 34 | PP e 40.9 |
| Bozeman | 91.0 | 340 | e 13 45 | +38 | e 23 41 | [+ 2] | e 25 0 | PS e 42.7 |
| Victoria | 91.0 | 348 | — | — | e 23 59 | - 4 | — | 41.2 |
| Tinemaha | 100.9 | 342 | e 13 57 | + 5 | — | — | — | — |
| Tucson | 103.6 | 312 | e 14 8 | + 4 | — | — | e 18 19 | PP e 52.5 |
| La Paz | 114.0 | 268 | e 19 36 | PP | — | — | — | 62.2 |

Additional Readings:—

Istanbul PP = +2m.39s.

Bucharest L given as S.

Helwan iZ = +4m.50s., SE = +7m.8s., SSE = +8m.3s.

Sofia L given as S.

Belgrade e = +4m.51s.

Warsaw eSS?E = +7m.59s.

Potsdam iPE = +5m.6s., iPPPE = +5m.37s., iZ = +5m.,55s., iN = +6m.25s., iZ = +7m.15s., iN = +7m.40s., iSE = +9m.15s., iSN = +9m.20s., iN = +10m.32s., iZ = +10m.39s., iE = +10m.54s.

Jena eN = +10m.3s., eE = +10m.21s.

Ravensburg iSN = +9m.31s., eSSN = +10m.39s.

Stuttgart i = +5m.15s., +5m.25s., +6m.33s., eSN = +9m.31s., eSSN = +10m.46s.

Upsala iSE = +9m.46s.

Uccle iSE = +10m.31s.

Clermont-Ferrand e = +6m.1s.

Almeria PcP = +9m.41s., PcS = +13m.27s., ScS = +17m.23s.

Granada iPP = +7m.31s., sPP = +8m.6s.

Agra SSS = +14m.51s.

Bombay iN = +8m.29s., SSE = +14m.33s., eSSN = +14m.37s.

Coimbra eSE = +12m.24s.

Hyderabad PcP = +9m.49s., SE = +13m.56s.

Calcutta ePcPN = +10m.26s., iSSN = +17m.53s., iScS = +18m.34s.

East Machias e = +13m.32s. and +39m.40s.

Bermuda e = +14m.41s. and +25m.38s.

Florissant eEN = +23m.38s., eSEN = +23m.51s., eN = +24m.56s.

San Juan es = +23m.52s., ePS = +24m.58s., e = +28m.16s.

Long waves were also recorded at Berkeley, Aberdeen, Bergen, Chicago U.S.C.G.S., Butte, Huancayo, Pasadena and Riverview.

November 12d. 14h. 52m. 12s. Epicentre 52°·0N. 158°·7E. (as on 1940 June 25d.).

A = -·5760, B = +·2246, C = +·7860; δ = +2; h = -6;
D = +·363, E = +·932; G = -·732, H = +·286, K = -·618.

| | Δ | Az. | P. | O - C. | S. | O - C. | L. |
|---------------|----------|-----|----------------------|--------|---------|--------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. |
| College | 29.8 | 44 | — | — | e 11 20 | +13 | e 20.0 |
| Sverdlovsk | 52.5 | 316 | i 9 16 | - 1 | e 16 39 | - 4 | — |
| Andijan | 57.2 | 295 | e 9 48 | - 3 | — | — | — |
| Tinemaha | 57.9 | 69 | e 9 57 _a | + 1 | — | — | — |
| Haiwee | 58.7 | 70 | i 10 3 _a | + 1 | — | — | — |
| Santa Barbara | z. 58.8 | 73 | i 10 5 | + 3 | — | — | — |
| Mount Wilson | z. 60.0 | 71 | i 10 12 _a | + 1 | — | — | — |
| Pasadena | 60.0 | 71 | i 10 11 _a | 0 | — | — | — |
| Palomar | 61.3 | 72 | i 10 21 _a | + 1 | — | — | — |
| La Jolla | z. 61.4 | 72 | e 9 38 | -42 | — | — | — |
| Potsdam | z. 72.0 | 339 | i 11 28 _k | 0 | — | — | — |
| Bombay | 72.8 | 278 | — | — | e 20 46 | -12 | — |
| Jena | 73.7 | 338 | i 11 40 | + 2 | — | — | — |
| Stuttgart | 76.3 | 340 | i 11 54 _a | + 2 | — | — | — |
| Basle | 77.8 | 340 | e 12 2 | + 1 | — | — | — |
| Ksara | 81.0 | 314 | e 12 17 | - 1 | e 22 29 | + 2 | — |
| Helwan | 86.4 | 315 | i 12 44 _k | - 1 | e 23 18 | - 3 | — |

Additional readings:—

Tinemaha iZ = +10m.14s. and +10m.46s.

Haiwee iZ = +10m.21s. and +10m.51s.

Pasadena iZ = +10m.28s.

Helwan eZ = +13m.2s.

Long waves were also recorded at Warsaw and Upsala.

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1941

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November 12d. Readings also at 7h. (St. Louis), 9h. (Palomar, Pasadena, Mount Wilson, and Tinemaha), 12h. (near Lick, Fresno, and Branner), 13h. (near Medan).

November 13d. Readings at 0h. (near Amboina and near La Paz), 1h. (near Triest), 4h. (Agra, Bombay (2), Calcutta, Colombo, Kodaikanal (2), Tananarive and Lick), 5h. (Sverdlovsk), 8h. (Philadelphia), 10h. (Ksara and La Paz), 11h. (Helwan and Ksara), 15h. (near Amboina (2)), 16h. (Andijan, Batavia, Sverdlovsk and near Amboina), 18h. (near Amboina (2)), 19h. (near Mizusawa), 21h. (Agra, Calcutta, near Amboina, near Mizusawa, and near La Paz), 22h. (Bombay, Potsdam, Warsaw, Riverside and Tinemaha), 23h. (Berkeley).

November 14d. 2h. 51m. 33s. Epicentre $3^{\circ}0'N$. $97^{\circ}0'E$. (as on 1941 October 8d.).

$$A = -.1217, B = +.9912, C = +.0520; \quad \delta = -1; \quad h = +7;$$

$$D = +.993, E = +.122; \quad G = -.006, H = +.052, K = -.999.$$

| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|--------------|------------|------------|------|-----|------------------|------|----|------|-------|----|------------|
| | $^{\circ}$ | $^{\circ}$ | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Medan | 1.8 | 71 | i 0 | 39 | + 7 | i 1 | 10 | Sg | — | — | — |
| Batavia | 13.4 | 134 | e 2 | 48 | -26 | 5 | 55 | +10 | — | — | — |
| Kodaikanal | E. 20.7 | 293 | i 4 | 52k | + 8 | i 8 | 40 | + 9 | — | — | 10.4 |
| Calcutta | N. 21.2 | 338 | e 4 | 44 | - 5 | i 8 | 56 | +15 | i 8 | 32 | PcP e 11.8 |
| Bombay | 28.4 | 305 | e 5 | 59 | + 1 | i 10 | 47 | + 2 | — | — | i 13.6 |
| Agra | E. 30.1 | 326 | e 6 | 6 | - 7 | 11 | 4 | - 8 | — | — | — |
| Amboina | 31.9 | 102 | 14 | 34 | ? | — | — | — | — | — | — |
| Andijan | 43.7 | 332 | e 8 | 12 | + 4 | e 14 | 44 | + 5 | — | — | — |
| Tashkent | 45.6 | 331 | 8 | 24 | 0 | 15 | 9 | + 3 | — | — | — |
| Vladivostok | 50.6 | 34 | e 9 | 0 | - 2 | 16 | 38 | +21 | — | — | — |
| Tananarive | 53.3 | 244 | — | — | — | e 16 | 48 | - 6 | — | — | 26.1 |
| Sverdlovsk | 61.0 | 339 | e 10 | 12 | - 6 | — | — | — | — | — | — |
| Ksara | 64.5 | 306 | e 10 | 58 | +17 | e 19 | 15 | - 4 | — | — | — |
| Tinemaha | z. 128.4 | 37 | e 19 | 6 | [- 3] | — | — | — | — | — | — |
| Haiwee | z. 129.2 | 37 | e 19 | 7 | [- 3] | — | — | — | e 22 | 26 | PKS |
| Mount Wilson | z. 130.4 | 39 | e 19 | 7 | [- 6] | — | — | — | e 22 | 43 | PKS |
| Pasadena | 130.4 | 39 | e 19 | 31 | [+18] | — | — | — | e 22 | 44 | PKS |
| La Paz | 160.2 | 226 | 20 | 48 | PKP ₂ | — | — | — | — | — | 82.4 |

Additional readings:—

Batavia ePEN = +2m.51s.

Colombo ($\Delta = 17^{\circ}.5$)PE = +43m.6s., L = 60m.49s.

Calcutta eSSN = +9m.39s., iS_cSN = +16m.0s.

Mount Wilson eZ = +19m.40s. and +21m.45s.

Long waves were also recorded at De Bilt, Riverview, Kew, San Juan, and Balboa Heights.

Nov. 14d. 6h. 49m. 17s. Epicentre $45^{\circ}0'N$. $148^{\circ}0'E$. Depth of focus 0.025.

Intensity V at Nemuro; IV at Kusiro and Kakioka; II-III at Urakawa, Aomori, and Miyako.

Epicentre $43^{\circ}.7'N$. $148^{\circ}.8'E$. Deep. Macro seismic radius greater than 300km.

See Seismological Bulletin of the Central Meteorological Observatory, Japan, 1941, Tokyo, 1950, pp. 39-40. Macro seismic Chart, p. 39.

$$A = -.6017, B = +.3760, C = +.7047; \quad \delta = +2; \quad h = -4;$$

$$D = +.530, E = +.848; \quad G = -.598, H = +.373, K = -.710.$$

| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|----------|------------|------------|-----|-----------------|------|-----|----|------|-------|----|----|
| | $^{\circ}$ | $^{\circ}$ | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Nemuro | 2.4 | 226 | 0 | 37 _a | - 6 | 1 | 6 | -10 | — | — | — |
| Sapporo | 5.2 | 251 | 1 | 15 _k | - 3 | 2 | 14 | - 4 | — | — | — |
| Mori | 6.1 | 245 | 1 | 26 _k | - 3 | 2 | 33 | - 6 | — | — | — |
| Hatinohe | 6.5 | 229 | 1 | 29 | - 6 | 2 | 37 | -11 | — | — | — |
| Aomori | 6.8 | 234 | 1 | 39 _k | + 1 | 2 | 51 | - 4 | — | — | — |
| Miyako | 6.9 | 222 | 1 | 41 | + 1 | 2 | 49 | - 8 | — | — | — |
| Mizusawa | 7.8 | 224 | e 1 | 45 | - 6 | i 3 | 8 | -11 | — | — | — |
| Akita | 7.9 | 231 | 1 | 39 | -14 | 3 | 4 | -17 | — | — | — |
| Sendai | 8.6 | 221 | 1 | 57 | - 5 | 3 | 26 | -11 | — | — | — |
| Hukusima | 9.2 | 221 | 2 | 7 _k | - 3 | 3 | 41 | -10 | — | — | — |

Continued on next page.

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1941

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| | Δ ° | Az. ° | P. | | O-C. s. | S. | | O-C. s. | Supp. | | L. m. |
|----------------------|---------------|----------|------|-----|------------|------|----|------------|-------|----|----------|
| | | | m. | s. | | m. | s. | | m. | s. | |
| Aikawa | 10.1 | 230 | 2 | 17 | - 4 | 3 | 52 | -20 | — | — | — |
| Utunomiya | 10.5 | 219 | 2 | 22 | - 5 | 4 | 12 | - 9 | — | — | — |
| Kakioka | 10.6 | 217 | 2 | 22 | - 6 | 3 | 39 | -45 | — | — | — |
| Tukubasan | 10.6 | 217 | 2 | 27 | - 1 | 4 | 13 | -11 | — | — | — |
| Tyosi | 10.7 | 213 | 2 | 34 | + 5 | 4 | 17 | - 9 | — | — | — |
| Maebasi | 10.9 | 221 | 2 | 29 | - 3 | 4 | 25 | - 6 | — | — | — |
| Nagano | 11.1 | 225 | 2 | 36 | + 2 | 4 | 32 | - 4 | — | — | — |
| Tokyo, Cen. Met. Ob. | 11.2 | 217 | 2 | 31 | - 5 | 4 | 31 | - 7 | — | — | — |
| Wazima | 11.3 | 232 | 2 | 34 | - 3 | 4 | 33 | - 7 | — | — | — |
| Yokohama | 11.5 | 217 | 2 | 51 | +11 | 4 | 39 | - 6 | — | — | — |
| Toyama | 11.6 | 228 | 2 | 39 | - 2 | 4 | 43 | - 4 | — | — | — |
| Hunatu | 11.8 | 220 | 2 | 40 | - 3 | 4 | 46 | - 6 | — | — | — |
| Kohu | 11.8 | 221 | 2 | 44 | + 1 | 4 | 45 | - 7 | — | — | — |
| Vladivostok | 11.8 | 264 | i 2 | 39 | - 4 | i 5 | 1 | + 9 | — | — | — |
| Misima | 12.1 | 219 | 2 | 47 | 0 | 4 | 53 | - 6 | — | — | — |
| Osima | 12.2 | 216 | 4 | 7 | ? | 4 | 53 | - 8 | — | — | — |
| Hamamatu | 12.9 | 221 | 3 | 2 | + 5 | — | — | — | — | — | — |
| Nagoya | 12.9 | 224 | 2 | 52 | - 5 | 5 | 34 | sS | — | — | — |
| Hikone | 13.2 | 227 | 2 | 59 | - 2 | 5 | 21 | - 3 | — | — | — |
| Kameyama | 13.4 | 226 | 3 | 8 | + 4 | 5 | 25 | - 4 | — | — | — |
| Kyoto | 13.7 | 227 | 3 | 5k | - 2 | — | — | — | — | — | — |
| Toyooka | 13.8 | 231 | 3 | 7a | - 2 | 6 | 34 | +56 | — | — | — |
| Osaka | 14.1 | 227 | 3 | 10 | - 2 | 5 | 30 | -14 | — | — | — |
| Kobe | 14.2 | 228 | 3 | 12k | - 2 | 6 | 2 | sS | — | — | — |
| Sumoto | 14.6 | 228 | 3 | 15 | - 4 | 6 | 7 | +11 | — | — | — |
| Wakayama | 14.6 | 227 | 3 | 15 | - 4 | 5 | 54 | - 2 | — | — | — |
| Siomisaki | 14.9 | 222 | 3 | 23 | + 1 | — | — | — | — | — | — |
| Muroto | 15.9 | 227 | 2 | 53 | -42 | — | — | — | — | — | — |
| Hirosima | 16.0 | 234 | 3 | 32k | - 4 | 5 | 25 | -62 | — | — | — |
| Matuyama | 16.2 | 232 | 3 | 36k | - 2 | 6 | 39 | + 7 | — | — | — |
| Taikyu | 17.3 | 246 | 3 | 52 | + 1 | 7 | 1 | + 6 | — | — | — |
| Kelzyo | 17.4 | 252 | 3 | 32 | -20 | — | — | — | — | — | — |
| Husan | 17.5 | 242 | 3 | 53 | 0 | 7 | 9 | + 9 | — | — | — |
| Izuka | 17.5 | 236 | 3 | 57 | + 4 | 7 | 12 | +12 | — | — | — |
| Hukuoka | 17.7 | 236 | 3 | 57 | + 1 | 7 | 10 | + 6 | — | — | — |
| Kumamoto | 18.2 | 235 | (4 | 1) | 0 | — | — | — | — | — | — |
| Titizima | 18.5 | 197 | 5 | 11 | +67 | — | — | — | — | — | — |
| Nagasaki | 18.6 | 236 | 4 | 4 | - 1 | — | — | — | — | — | — |
| Kagosima | 19.1 | 231 | 4 | 9 | - 1 | — | — | — | — | — | — |
| Yakusima | 20.0 | 230 | 5 | 22 | +63 | — | — | — | — | — | — |
| Nake | 22.2 | 228 | 4 | 44k | + 3 | — | — | — | — | — | — |
| College | 39.7 | 37 | e 7 | 14 | - 1 | e 13 | 10 | + 6 | — | — | e 22.5 |
| Sverdlovsk | 52.7 | 316 | i 8 | 43 | -14 | i 15 | 53 | -15 | i 11 | 19 | pPP |
| Tchimkent | 54.7 | 297 | i 9 | 12 | + 1 | — | — | — | — | — | — |
| Tashkent | 55.4 | 296 | i 9 | 19 | + 3 | i 16 | 50 | + 6 | i 9 | 53 | pP |
| Agra | E. 57.6 | 277 | 9 | 28 | - 4 | i 17 | 13 | 0 | — | — | — |
| Bombay | 66.5 | 274 | i 10 | 32 | 0 | i 19 | 9 | + 2 | — | — | — |
| Tinemaha | 67.2 | 60 | i 10 | 37 | + 2 | — | — | — | i 11 | 9 | pP |
| Haiwee | 68.1 | 60 | i 10 | 42 | + 1 | — | — | — | i 11 | 10 | pP |
| Santa Barbara | Z. 68.1 | 64 | i 10 | 42 | + 1 | — | — | — | — | — | — |
| Pasadena | 69.2 | 62 | i 10 | 48a | 0 | e 19 | 44 | + 7 | e 38 | 53 | P'P' |
| Mount Wilson | 69.3 | 62 | i 10 | 48a | 0 | — | — | — | i 11 | 21 | pP |
| Riverside | Z. 69.8 | 62 | i 10 | 51a | 0 | — | — | — | — | — | — |
| Palomar | Z. 70.6 | 62 | i 10 | 59 | + 3 | — | — | — | i 11 | 31 | pP |
| La Jolla | 71.0 | 63 | i 10 | 57 | - 2 | — | — | — | — | — | — |
| Tucson | Z. 75.1 | 60 | i 11 | 23 | 0 | e 20 | 50 | + 7 | i 11 | 55 | pP |
| Uccle | 79.5 | 338 | i 11 | 46 | - 1 | — | — | — | — | — | — |
| Stuttgart | 79.9 | 334 | i 11 | 49a | 0 | 21 | 7 | -28 | — | — | — |
| Ksara | 80.3 | 308 | i 11 | 55 | + 4 | e 21 | 51 | +12 | — | — | — |
| Zurich | 81.3 | 334 | e 11 | 56a | 0 | — | — | — | — | — | — |

Continued on next page.

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1941

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-------------------|------------|------------|---------|------|---------|------|---------|----|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Florissant | 81.4 | 43 | i 11 57 | 0 | e 21 54 | + 4 | e 12 31 | pP |
| Basle | 81.5 | 334 | e 11 57 | 0 | — | — | — | — |
| Neuchatel | 82.2 | 334 | e 12 1 | 0 | — | — | — | — |
| Cape Girardeau N. | 83.0 | 43 | — | — | e 22 0 | - 6 | — | — |
| Clermont-Ferrand | 84.4 | 336 | e 12 14 | + 2 | — | — | — | — |
| Helwan | 85.8 | 309 | i 12 22 | + 3 | 22 40 | + 6 | e 13 1 | pP |
| Fordham | 86.7 | 30 | i 12 23 | 0 | e 22 35 | - 7 | — | — |
| La Paz | 138.5 | 59 | 22 26 | PP | — | — | — | — |

Additional readings:—

Kumamoto P = +2m.15s.; true P is given as S.
 Tashkent isS = +17m.50s.
 Pasadena eZ = +11m.21s.
 Tucson i = +12m.16s., e = +13m.46s.
 Florissant eE = +22m.12s.
 Helwan eZ = +13m.55s., SZ = +23m.1s., eZ = +23m.48s.

Nov. 14d. 8h. 41m. 35s. Epicentre 33°·8N. 118°·1W. (as on 1941, Oct. 22d.).

Intensity VII-VIII at Torrence, Gardena; VII at Huntington Park and Lomita.
 Epicentre 33° 47'N. 118° 15'W. (region of Los Angeles). Macroseismic area=3600 sq. miles.

F. Neumann.

United States Earthquakes, 1941, Washington, 1943, p. 17-18. Chart p. 8.

"Torrence-Gardena Earthquake of November 14, 1941," Earthquake Notes, Vol. 13, No. 3, Washington, 1941.

A = -.3922, B = -.7345, C = +.5537; $\delta = -11$; $h = +1$;
 D = -.882, E = +.471; G = -.261, H = -.488, K = -.833.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|------------|------------|---------------------|----------------|--------|------------------|--------|----------------------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Pasadena | 0.3 | 350 | i 0 9 _a | - 2 | — | — | — | — |
| Mount Wilson | 0.4 | 5 | i 0 11 | - 1 | — | — | — | — |
| Riverside | 0.6 | 72 | i 0 17 _a | + 2 | — | — | — | — |
| Palomar | z. 1.1 | 114 | i 0 25 | + 3 | — | — | — | — |
| La Jolla | 1.2 | 143 | i 0 25 | + 1 | — | — | — | — |
| Santa Barbara | 1.4 | 296 | i 0 27 | 0 | — | — | — | — |
| Haiwee | 2.3 | 3 | i 0 42 | + 2 | — | — | — | — |
| Fresno | N. 3.2 | 335 | i 0 55 | + 3 | i 1 51 | S _e | i 0 59 | P* |
| Tinemaha | 3.3 | 358 | i 0 54 | + 1 | — | — | — | — |
| Lick | N. 4.6 | 322 | e 1 12 | 0 | — | — | — | — |
| Santa Clara | 4.8 | 319 | e 1 34 | P _e | i 2 45 | S _e | — | — |
| Branner | 4.9 | 319 | e 1 16 | - 1 | i 2 50 | S _e | i 1 30 | P* |
| Berkeley | 5.3 | 321 | e 1 31 | P* | i 2 25 | S _e 0 | e 2 32 | S* |
| San Francisco | 5.4 | 320 | e 1 20 | - 4 | i 2 25 | - 3 | — | — |
| Tucson | 6.3 | 102 | e 1 41 | + 5 | i 3 10 | S* | i 2 14 | P _e i 3.5 |
| Ukiah | 6.7 | 325 | — | — | e 2 57 | - 3 | — | e 3.6 |
| Salt Lake City | 8.5 | 33 | e 2 49 | P _e | e 4 11 | S* | — | i 4.9 |
| Logan | 9.4 | 30 | e 2 38 | PPP | — | — | — | e 5.0 |
| Denver | N. 12.1 | 56 | — | — | e 5 47 | SSS | — | e 6.5 |
| Butte | 12.0 | 17 | e 3 32 | PPP | — | — | — | e 7.0 |
| Bozeman | 13.1 | 22 | e 3 16 | + 6 | — | — | — | e 6.9 |
| Spokane | N. 13.9 | 2 | i 3 15 | - 6 | — | — | — | i 7.6 |
| Lincoln | 18.4 | 62 | e 4 41 | PPP | e 7 55 | SS | — | e 10.4 |
| Tacubaya | N. 22.1 | 126 | e 5 10 | +11 | — | — | — | — |
| Florissant | 22.9 | 69 | e 5 15 | + 9 | e 9 51 | SS | e 5 29 | PP i 12.8 |

Additional readings:—

Fresno iN = +1m.6s.
 Branner iN = +1m.41s., iE = +1m.56s., iN = +2m.7s.
 Berkeley i = +1m.53s., iE = +2m.5s., iZ = +2m.21s., iS = 3m.22s.
 San Francisco ePN = +1m.30s., eN = +3m.24s.
 Tucson i = +1m.54s.
 Logan i = +3m.11s.
 Denver eSSN = +6m.5s.
 Bozeman e = +4m.30s.
 Long waves were also recorded at San Juan and other American stations.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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1941

456

Nov. 14d. Readings also at 0h. (La Paz), 1h. (Sofia, Mount Wilson (2), Haiwee, Tinemaha (2), and near Tucson), 2h. (Tinemaha), 4h. (Tacubaya), 6h. (Amboina, Frunse, Tashkent, Tchimkent, Agra, and near Stalinabad), 12h. (Medan), 16h. (La Paz, Tinemaha, Pasadena, Mount Wilson, and Riverside), 18h. (Calcutta, Sverdlovsk, Haiwee, Pasadena, Mount Wilson, Tinemaha, Riverside, Agra, Tashkent, Tchimkent, Kodaikanal, Colombo, Bombay, and Tananarive), 19h. (Palomar, Tananarive, Bombay, Colombo, Kodaikanal, Agra, Haiwee, Riverside, Mount Wilson, Tinemaha, and Pasadena), 22h. (Berkeley and Tinemaha).

Nov. 15d. 0h. 16m. 57s. Epicentre 6°·6S. 107°·0E. Depth 0·040.

Felt intensity V in Southern Sumatra, parts of Talangpadang and in west and central Java. Epicentre 6°·6S. 107°·0E. Depth = 150km. (Batavia).
 Meteorologische en Geophysische Dienst te Batavia, Serie A, No. 44. Aardbevingen in Ned-Indië waargenomen gedurende het jaar 1941. Macroseismic chart Fig. 3, p. 7.

A = -·2905, B = +·9501, C = -·1142; $\delta = +12$; $h = +7$;
 D = +·956, E = +·292; G = +·033, H = -·109, K = -·993.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------|----------|-----|---------|-------|---------|------|---------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Batavia | 0·4 | 338 | i 0 37 | 0 | i 0 55 | -11 | — | — |
| Medan | 13·1 | 319 | 3 18 | pP | 6 14 | +56 | — | — |
| Kodaikanal | E. 33·8 | 300 | e 6 37 | -14 | e 16 37 | ? | — | e 17·1 |
| Calcutta | N. 34·2 | 329 | — | — | e 11 33 | sS | 15 1 | i 17·8 |
| Bombay | 42·2 | 307 | i 7 32 | + 5 | e 13 36 | +11 | — | — |
| Agra | E. 43·7 | 322 | e 7 33 | - 6 | 13 51 | + 5 | — | — |
| Riverview | N. 49·0 | 130 | e 10 9 | PP | i 15 12 | +11 | — | — |
| Vladivostok | 54·4 | 23 | e 8 51 | - 9 | i 16 28 | +14 | 10 4 | sP |
| Sverdlovsk | 73·7 | 336 | i 11 6 | + 2 | i 20 21 | +11 | — | — |
| Ksara | 78·2 | 306 | e 11 39 | +10 | e 21 18 | +19 | — | — |
| Helwan | 81·0 | 301 | e 11 48 | + 4 | e 21 51 | sS | 12 33 | pP |
| Santa Barbara | z. 128·9 | 51 | e 18 42 | [+ 8] | — | — | — | — |
| Tinemaha | z. 128·9 | 47 | e 18 41 | [+ 7] | — | — | — | — |
| Haiwee | 129·5 | 48 | i 18 42 | [+ 7] | — | — | — | — |
| Pasadena | 130·1 | 50 | i 18 43 | [+ 7] | — | — | — | — |
| Mount Wilson | 130·2 | 50 | i 18 44 | [+ 8] | — | — | — | — |
| Riverside | z. 130·8 | 50 | i 18 44 | [+ 6] | — | — | — | — |
| Palomar | z. 131·5 | 50 | i 18 47 | [+ 8] | — | — | — | — |
| Tucson | 136·5 | 48 | i 18 43 | [- 5] | — | — | i 22 10 | PP |
| Florissant | 144·3 | 23 | i 19 6 | [+ 4] | e 23 5 | PKS | — | — |
| St. Louis | z. 144·5 | 23 | i 19 14 | [+12] | — | — | e 22 36 | PP |
| La Paz | z. 156·6 | 192 | 19 48 | [+27] | — | — | — | — |

Additional readings :—

Vladivostok isS = +17m.50s.

Helwan e = +23m.11s.

Pasadena i = +18m.58s.

Tucson e = +21m.33s. and +23m.28s.

La Paz iZ = +20m.31s.

Long waves were also recorded at San Juan.

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1941

457

November 15d. 4h. 20m. 5s. Epicentre 59°·5S. 27°·5W. Depth of focus 0·010.
(as given by U.S.C.G.S.).

A = +·4525, B = -·2355, C = -·8601; $\delta = -1$; $h = -9$;
D = -·462, E = -·887; G = -·763, H = +·397, K = -·510.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|----------------------|-------|---------|-------|---------|-----------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| La Plata | 31·6 | 307 | i 6 17 | + 1 | 11 13 | - 3 | 6 42 | pP 14·5 |
| La Paz | 52·1 | 308 | i 9 4 _a | + 2 | i 17 11 | +54 | 9 34 | pP 25·9 |
| Huancayo | 59·1 | 302 | i 9 52 | 0 | e 17 58 | + 8 | e 21 53 | SS e 23·4 |
| San Juan | 83·8 | 323 | e 12 19 | - 1 | e 22 40 | + 7 | e 15 43 | PP e 34·9 |
| Riverview | 87·0 | 177 | 12 35 | - 1 | i 22 48 | [- 3] | i 13 3 | pP e 48·4 |
| Bermuda | 96·6 | 328 | e 19 55 | PPP | — | — | — | — |
| Toledo | 100·9 | 17 | e 13 40 | 0 | e 25 18 | +12 | — | — |
| Helwan | 101·3 | 49 | 13 41 | 0 | 25 25 | +16 | 17 46 | PP — |
| East Machias | 109·0 | 331 | — | — | e 28 15 | PS | — | — |
| St. Louis | 110·6 | 311 | e 18 13 | [- 8] | e 28 31 | PS | i 19 4 | PP — |
| Florissant | 110·8 | 311 | i 18 56 | PP | e 28 27 | PS | — | — |
| Ottawa | 111·8 | 326 | e 19 6 | PP | (28 55) | PS | — | 28·9 |
| Chicago U.S.C.G.S. | 112·4 | 315 | e 19 8 | PP | e 28 41 | PS | e 34 49 | SS e 49·1 |
| Tucson | 114·0 | 292 | i 18 27 | [- 1] | i 29 9 | PS | e 19 17 | PP — |
| De Bilt | 114·3 | 20 | i 19 21 _a | PP | e 29 0 | PS | — | e 62·9 |
| Palomar | z. 117·8 | 288 | i 18 35 | [- 0] | e 28 54 | PS | — | — |
| Riverside | z. 118·5 | 288 | i 18 35 | [- 2] | e 28 53 | PS | e 19 55 | PP — |
| Mount Wilson | z. 119·1 | 288 | i 18 37 | [- 1] | i 28 51 | PS | i 19 59 | PP — |
| Pasadena | 119·1 | 288 | i 18 36 | [- 2] | i 28 50 | PS | i 19 55 | PP e 57·9 |
| Santa Barbara | z. 120·0 | 287 | i 18 40 | [- 0] | — | — | — | — |
| Haiwee | 120·6 | 290 | i 18 40 | [- 1] | i 28 46 | PS | e 20 7 | PP — |
| Tinemaha | 121·5 | 290 | i 18 42 | [- 1] | i 28 44 | PS | i 20 16 | PP — |
| Lick | n. 123·3 | 288 | i 18 46 | [0] | — | — | — | — |
| Tashkent | 127·7 | 69 | 18 54 | [0] | 27 42 | SKKS | 21 0 | PP — |
| Sverdlovsk | 135·2 | 50 | 19 7 | [- 1] | 31 32 | PS | 21 41 | PP — |

Additional readings:—

La Plata Z = +6m.50s., SN = +11m.16s., SSE = +12m.1s., SSN = +12m.13s., SSS?E = +13m.13s., SSS?N = +13m.19s., N = +14m.13s.

La Paz isPZ = +9m.39s., PPZ = +11m.6s., SS = +21m.7s.

Huancayo e = +13m.6s., i = +14m.7s., +18m.10s., and +18m.30s., e = +18m.53s.

San Juan i = +15m.33s., e = +18m.27s., +23m.54s., +24m.29s., +29m.3s., and +29m.19s., eSSS = +31m.37s.

Riverview iEN = +23m.2s.

Helwan eZ = +18m.19s. and +19m.4s., PSZ = +26m.46s., iZ = +30m.13s.

St. Louis eE = +25m.46s., esSE = +29m.10s., eE = +30m.12s.

Florissant eZ = +19m.36s., ePSN = +29m.5s.

Chicago U.S.C.G.S. e = +22m.13s. and +29m.17s.

Tucson i = +19m.21s., e = 32m.0s. and +32m.30s.

Mount Wilson iZ = +20m.18s.

Tinemaha iZ = +20m.31s.

Tashkent SS = +38m.13s.

Sverdlovsk SS = +39m.19s.

Nov. 15d. Readings also at 0h. (Sverdlovsk, Haiwee, Mount Wilson, Pasadena, Palomar, La Jolla, Riverside, Santa Barbara, and Tinemaha), 6h. (La Paz), 12h. and 14h. (Stuttgart), 16h. (near Berkeley, Branner, Lick, and Fresno), 17h. (Mizusawa and near Algiers), 20h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and near St. Louis).

Nov. 16d. 2h. Local European shock.

Triest eP_g = 16m.27s., iS_g = 16m.40s.

Stuttgart eP = 17m.3s., iP = 17m.7s., iP_g = 17m.14s., eNW = 17m.45s., eS_gNW = 18m.0s.

Zurich eP = 17m.6s., eS_g = 17m.46s.

Basle eP = 17m.10s., eS_g = 17m.54s., eL = 18·2m.

Ravensburg eE = 17m.25s., iS_gE = 17m.32s. eN = 17m.41s.

Jena eEN = 18m.30s., iE = 18m.38s.

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1941

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Nov. 16d. 9h. 39m. 41s. Epicentre 13°·3N. 88°·7W. (as on 1939, Dec. 26d.).

A = +·0221, B = -·9733, C = +·2285; $\delta = +1$; $\lambda = +6$;
D = -1·000, E = -·023; G = +·005, H = -·228, K = -·974.

Pasadena suggests depth 75km.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----|----------|-----|---------|------|---------|------------------|---------|--------------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Guatamala City | | 2·2 | 306 | — | — | i-0 15 | ? | — | — |
| Merida | N. | 7·7 | 353 | i 1 55 | - 1 | — | — | — | — |
| Balboa Heights | | 9·9 | 114 | e 2 27 | + 2 | — | — | — | — |
| Tacubaya | E. | 11·8 | 303 | e 2 59 | + 6 | — | — | — | — |
| San Juan | | 22·3 | 74 | e 4 57 | - 4 | e 8 59 | - 3 | e 9 40 | SS e 10·0 |
| Cape Girardeau | N. | 23·9 | 359 | e 5 17 | + 1 | e 9 28 | - 2 | 1 5 35 | pP — |
| St. Louis | | 25·3 | 357 | i 5 29 | - 1 | i 9 51 | - 3 | 1 5 58 | pP i 13·3 |
| Florissant | | 25·5 | 357 | e 5 31 | - 1 | e 9 52 | - 5 | 1 6 1 | PP 12·2 |
| Tucson | | 27·7 | 318 | i 5 52 | 0 | e 10 29 | - 4 | 1 6 36 | PP e 11·5 |
| Pittsburgh | | 28·1 | 14 | i 5 57 | + 2 | i 10 46 | + 6 | 1 6 47 | PP — |
| Huancayo | | 28·4 | 152 | i 5 58 | 0 | i 11 9 | +24 | — | — e 12·7 |
| Chicago U.S.C.G.S. | | 28·5 | 0 | e 6 40 | PP | e 10 37 | - 9 | — | — e 12·7 |
| Philadelphia | | 29·1 | 22 | e 4 2 | ? | e 6 22 | ? | — | — |
| Fordham | | 30·4 | 23 | e 6 18 | + 2 | i 11 14 | - 2 | 1 7 8 | PP e 15·9 |
| La Jolla | | 32·5 | 312 | i 6 38 | + 2 | — | — | — | — |
| Palomar | z. | 32·5 | 313 | i 6 36 | + 2 | — | — | 1 6 53 | pP — |
| Harvard | | 32·7 | 24 | i 6 35 | - 1 | i 11 49 | - 3 | 1 6 53 | pP e 16·3 |
| Weston | | 32·7 | 24 | i 6 35 | - 1 | i 11 55 | + 3 | — | — |
| Riverside | z. | 33·2 | 314 | i 6 42 | + 2 | — | — | 1 6 58 | pP — |
| Ottawa | | 33·8 | 17 | 6 45 | - 1 | 12 6 | - 4 | e 14 43 | SSS 17·3 |
| Mount Wilson | z. | 33·8 | 314 | i 6 46 | 0 | — | — | 1 7 3 | pP — |
| Pasadena | | 33·8 | 314 | i 6 46 | 0 | i 17 4 | S _c S | 1 7 3 | pP — |
| Salt Lake City | | 34·0 | 328 | e 10 52 | ? | e 11 40 | -33 | — | — e 24·0 |
| Tinemaha | | 35·5 | 317 | e 7 0 | 0 | e 17 10 | S _c S | 1 9 28 | P _c P — |
| La Paz | z. | 35·9 | 143 | i 7 1 | - 3 | 12 25 | -17 | — | — 18·1 |
| East Machias | | 36·3 | 26 | e 7 35 | +28 | e 12 41 | - 7 | e 8 32 | PP e 19·4 |
| Seven Falls | | 36·9 | 20 | e 7 12 | 0 | e 15 49 | SS | e 8 41 | PP e 17·3 |
| Bozeman | | 37·4 | 335 | e 7 31 | +15 | e 13 3 | - 2 | — | — e 24·5 |

Additional readings:—

San Juan e = +6m.22s.

St. Louis IsSN = +10m.37s.

Florissant iNZ = +5m.50s., ePPPN = +6m.17s., iSN = +9m.56s., iN = +10m.41s.

Tucson i = +9m.6s. and +9m.23s.

Huancayo e = +7m.29s. and +10m.7s.

Philadelphia e = +6m.4s. and +6m.47s.

Palomar iZ = +7m.42s., iP_cPZ = +9m.20s., ipP_cPZ = +9m.38s., iS_cPZ = +12m.58s.

Harvard ePPNZ = +7m.47s.

Riverside iZ = +7m.49s., iP_cPZ = +9m.20s., ipP_cPZ = +9m.39s., eS_cPZ = +12m.58s.

Ottawa i = +7m.3s.

Mount Wilson iPPZ = +7m.46s., iP_cPZ = +9m.22s., ipP_cPZ = +9m.40s., iS_cPZ =

+13m.3s.

Pasadena ePP = +7m.49s., eP_cPZ = +9m.22s., epP_cPZ = +9m.40s., iS_cP = +13m.1s.,

esS_cPZ = +13m.37s.

Tinemaha iZ = +9m.45s., iS_cP = +13m.6s.

Long waves were also recorded at Berkeley and Scoresby Sund.

Nov. 16d. Readings also at 0h. (La Plata and Tacubaya (2)), 1h. (Tacubaya (3)), 4h. (Bombay, near Lick, and near Andijan), 7h. (near Andijan), 14h. (near Medan), 16h. (Huancayo), 17h. (Ivigtut), 18h. (La Paz), 20h. (near Medan, Amboina, and near Honolulu), 21h. (Columbia and near Mizusawa).

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1941

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Nov. 17d. 20h. 23m. 10s. Epicentre 11°·7N. 143°·3E. (as on 1941, June 4d.).

$$A = -.7853, B = +.5854, C = +.2015; \quad \delta = -1; \quad h = +6;$$

$$D = +.598, E = +.802; \quad G = -.162, H = +.120, K = -.979.$$

| | Δ | Az. | P. | O-C. | S. | O-C. |
|--------------|----------|-----|--------|------|-------|------|
| | ° | ° | m. s. | s. | m. s. | s. |
| Koti | 23.5 | 339 | e 5 14 | + 2 | — | — |
| Yokohama | 23.9 | 353 | e 5 2 | -14 | 9 6 | -24 |
| Nagoya | 24.0 | 349 | e 5 9 | - 8 | — | — |
| Taikyū | 27.5 | 334 | e 5 52 | + 2 | 10 36 | + 6 |
| Tinemaha | z. 89.7 | 53 | e 13 1 | 0 | — | — |
| Pasadena | z. 90.4 | 56 | i 13 6 | + 2 | — | — |
| Mount Wilson | z. 90.5 | 56 | i 13 7 | + 2 | — | — |
| Riverside | z. 91.0 | 56 | e 13 8 | + 1 | — | — |

Nov. 17d. Readings also at 2h. (Mount Wilson, Pasadena, Tinemaha, and Palomar), 3h. (near Cape Girardeau and St. Louis), 11h. (Bombay, Ksara, near Lick, and Branner), 17h. (Prague), 18h. (Huancayo, and near Balboa Heights), 19h. (near Apia and near Ksara), 23h. (Tucson).

Nov. 18d. 7h. 4m. 50s. Epicentre 4°·5N. 125°·5E. (as on 1940, Dec. 3d.).

Doubtful identification.

$$A = -.5790, B = +.8117, C = +.0779; \quad \delta = +17; \quad h = +7;$$

$$D = +.814, E = +.581; \quad G = -.045, H = +.063, K = -.997.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-------------|----------|-----|----------|------|---------|------|---------|----|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Amboina | 8.4 | 161 | 4 10? | S* | — | — | — | — |
| Osaka | 31.4 | 17 | 6 17 | - 8 | 11 9 | -23 | — | — |
| Nagoya | 32.3 | 19 | e 6 34 | + 1 | — | — | — | — |
| Nagano | 34.1 | 18 | e 6 49 | + 1 | — | — | — | — |
| Sendai | 36.4 | 21 | 7 2 | - 6 | 12 59 | + 9 | — | — |
| Vladivostok | 38.9 | 8 | i 7 38 | + 9 | 13 40 | +12 | — | — |
| Agra | E. 50.5 | 302 | 16 27 | S | (16 27) | +11 | 1 18 54 | SS |
| Bombay | 53.3 | 290 | e 13 25 | ? | i 17 3 | + 9 | — | — |
| Tashkent | 62.0 | 315 | e 10 26 | + 2 | i 19 1 | +13 | — | — |
| Sverdlovsk | 72.7 | 328 | 11 34 | + 2 | 21 5 | + 8 | — | — |
| Baku | 76.1 | 311 | — | — | e 21 46 | +11 | — | — |
| Ksara | 87.2 | 304 | e 21 58? | ? | e 23 41 | +13 | — | — |

Long waves were recorded at Riverview.

Nov. 18d. 10h. 14m. 29s. Epicentre 60°·0S. 49°·0W.

$$A = +.3297, B = -.3792, C = -.8646; \quad \delta = +3; \quad h = -9;$$

$$D = -.755, E = -.656; \quad G = -.567, H = +.653, K = -.502.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|----------|-----|----------------------|------|---------|-------|---------|-------------------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| La Plata | E. 25.8 | 343 | 5 43 | + 9 | 10 7 | + 5 | 6 37 | PPP 14.8 |
| | N. 25.8 | 343 | 5 43 | + 9 | 10 13 | +11 | 6 7 | PP 15.0 |
| | z. 25.8 | 343 | 5 44 | +10 | 10 31 | +29 | 6 7 | PP 15.0 |
| Rio de Janeiro | E. 37.3 | 10 | e 7 14 | - 2 | i 13 1 | - 3 | — | i 15.2 |
| | N. 37.3 | 10 | i 7 17 | + 1 | i 12 31 | -33 | — | — |
| La Paz | 45.6 | 335 | e 8 23 | - 1 | i 15 3 | - 3 | 10 43 | PPP 21.9 |
| Huancayo | 51.7 | 327 | i 9 10 | - 1 | i 16 37 | + 5 | i 10 25 | P _c P 1 21.8 |
| Christchurch | 71.3 | 211 | 11 29 _a | + 6 | 20 41 | 0 | 14 15 | PP 34.0 |
| Wellington | 72.9 | 213 | 11 13 | -20 | 20 1 | -58 | 11 31 | P _c P 34.5 |
| Arapuni | 75.6 | 215 | — | — | 22 1 | PS | 31 31 | Q 35.0 |
| Auckland | 77.0 | 215 | i 11 46 | -10 | 20 6 | ? | 22 3 | PS 34.5 |
| Tananarive | 77.0 | 105 | 12 20 | +24 | e 21 43 | - 2 | 14 33 | PP 32.5 |
| San Juan | 79.3 | 344 | e 12 29 | +20 | e 22 2 | - 7 | e 16 42 | PPP i 32.6 |
| Riverview | 85.0 | 197 | i 12 40 _a | + 2 | i 23 3 | [+ 2] | 23 55 | PS e 38.7 |
| Sydney | 85.0 | 197 | e 22 43 | ? | e 23 7 | [+ 6] | — | — |

Continued on next page.

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1941

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| | | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | |
|--------------------|----|----------|-----|------|-----------------|--------|------|-----|--------|-------|-----|------|--------|
| | | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | |
| Adelaide | | 85.2 | 186 | i 13 | 1 | +22 | i 23 | 1 | [- 1] | 15 | 51 | PP | 42.4 |
| Perth | | 87.5 | 166 | i 16 | 36 | PP | i 23 | 26 | - 5 | i 24 | 51 | PS | 42.6 |
| Brisbane | N. | 91.0 | 199 | e 13 | 6 | - 1 | e 23 | 32 | [- 7] | e 17 | 14 | PP | — |
| Bermuda | | 92.9 | 346 | e 17 | 55 | ? | e 23 | 55 | [+ 6] | e 30 | 35 | SS | e 37.9 |
| Columbia | | 97.3 | 333 | e 18 | 49 | PPP | e 26 | 39 | PS | e 31 | 35 | SS | e 42.0 |
| San Fernando | N. | 102.4 | 33 | — | — | — | 24 | 1 | [- 38] | — | — | — | — |
| Fordham | | 102.6 | 340 | — | — | — | e 24 | 9 | [- 30] | e 28 | 11 | PPS | 48.0 |
| Lisbon | | 103.7 | 30 | — | — | — | 24 | 33 | [- 12] | 27 | 36 | PPS | 51.3 |
| Almeria | | 103.8 | 36 | e 15 | 12 | ? | 27 | 46 | PS | 18 | 41 | PP | 43.0 |
| Granada | | 103.8 | 35 | i 18 | 35 _a | PP | i 26 | 2 | +10 | — | — | — | i 42.5 |
| Tucson | | 105.0 | 308 | i 17 | 57 | PKP | e 27 | 45 | PS | i 18 | 38 | PP | e 48.1 |
| Coimbra | | 105.3 | 30 | e 14 | 51 | P | 25 | 23 | -42 | e 18 | 26 | PP | 43.2 |
| Algiers | | 105.5 | 41 | — | — | — | e 24 | 59 | [+ 6] | 37 | 31 | SSS | 47.5 |
| Chicago U.S.C.G.S. | | 106.3 | 329 | — | — | — | e 24 | 58 | [+ 2] | e 29 | 5 | PPS | e 48.7 |
| Toronto | | 106.3 | 337 | — | — | — | e 24 | 31 | [- 25] | e 33 | 31? | SS | 47.5 |
| Ottawa | | 107.3 | 340 | 18 | 56 | PP | 28 | 15 | PS | 34 | 1 | SS | e 49.5 |
| Mount Wilson | z. | 109.6 | 304 | e 19 | 16 | PP | — | — | — | — | — | — | — |
| Pasadena | | 109.6 | 304 | e 19 | 17 | PP | e 28 | 31 | PS | — | — | — | e 52.5 |
| Helwan | | 110.8 | 65 | e 17 | 49 | ? | 29 | 1 | PS | e 19 | 4 | PP | — |
| Batavia | | 111.3 | 153 | 19 | 16 | PP | 29 | 7 | PS | — | — | — | 52.5 |
| Clermont-Ferrand | | 113.7 | 36 | e 19 | 31? | PP | — | — | — | — | — | — | e 52.5 |
| Berkeley | | 114.5 | 303 | — | — | — | i 28 | 59 | PS | e 35 | 46 | SS | e 54.7 |
| Colombo | E. | 114.6 | 121 | e 18 | 1 | [- 41] | — | — | — | — | — | — | — |
| Ukiah | | 115.9 | 303 | — | — | — | e 26 | 14 | [- 32] | e 29 | 28 | PS | e 55.9 |
| Neuchatel | | 116.0 | 38 | e 19 | 27 | PP | — | — | — | — | — | — | — |
| Ksara | | 116.2 | 67 | e 18 | 13 | [- 32] | e 28 | 1 | ? | — | — | — | — |
| Paris | | 116.2 | 34 | — | — | — | e 25 | 31? | [- 5] | — | — | — | 48.5 |
| Amboina | E. | 116.5 | 76 | e 19 | 52 | PP | — | — | — | — | — | — | e 45.5 |
| Kodaikanal | E. | 116.5 | 116 | 20 | 55 | ? | 27 | 49 | ? | 30 | 37 | PPS | — |
| Basle | | 116.6 | 38 | e 19 | 57 | PP | — | — | — | — | — | — | — |
| Triest | | 117.0 | 44 | e 19 | 52 | PP | i 29 | 49 | PS | — | — | — | — |
| Kew | | 117.8 | 31 | e 21 | 25 | PPP | e 24 | 53 | [- 49] | e 29 | 56 | PS | e 50.0 |
| Sofia | | 118.1 | 52 | e 20 | 23 | ? | e 29 | 55 | PS | — | — | — | 55.5 |
| Stuttgart | | 118.2 | 39 | e 20 | 31 | ? | — | — | — | e 22 | 49 | PPP | e 49.0 |
| Medan | | 118.5 | 142 | e 19 | 19 | [+ 29] | 29 | 14 | PS | — | — | — | 35.5 |
| Uocle | | 118.5 | 34 | e 19 | 31? | [+ 41] | e 25 | 4 | [- 41] | i 21 | 18 | SKP | e 49.5 |
| Belgrade | | 118.8 | 49 | e 20 | 11 | PP | e 26 | 6 | [+ 20] | e 29 | 56 | PS | e 47.1 |
| De Bilt | | 119.9 | 34 | i 20 | 16 _k | PP | e 25 | 7 | [- 43] | i 29 | 31 | PS | e 50.5 |
| Bucharest | | 120.7 | 53 | e 20 | 40 | PP | e 30 | 21 | PS | e 22 | 18 | PPP | 60.5 |
| Bombay | | 121.9 | 108 | 20 | 23 | PP | 25 | 53 | [- 3] | 23 | 12 | PKS | 51.0 |
| Aberdeen | | 122.5 | 27 | — | — | — | i 30 | 36 | PS | i 42 | 0 | SSS | 65.8 |
| Potsdam | | 122.6 | 38 | e 19 | 35 | [+ 37] | i 25 | 59 | [+ 1] | i 30 | 36 | PS | e 50.5 |
| Hyderabad | E. | 123.3 | 114 | e 20 | 46 | PP | 30 | 34 | PS | — | — | — | — |
| Victoria | | 123.8 | 308 | e 21 | 31 | ? | e 29 | 19 | ? | e 42 | 21 | SSS | 53.5 |
| Warsaw | | 125.2 | 44 | e 19 | 9 | [+ 6] | e 30 | 34 | PS | e 23 | 28 | PPP | e 59.5 |
| Bergen | | 127.2 | 29 | — | — | — | e 35 | 31? | ? | — | — | — | e 56.5 |
| Baku | | 128.1 | 72 | 19 | 37 | [+ 29] | 31 | 14 | PS | 21 | 16 | PP | — |
| Upsala | | 130.2 | 36 | e 22 | 32 | ? | e 32 | 6 | PS | e 39 | 7 | SS | e 54.5 |
| Agra | E. | 131.4 | 108 | 18 | 31 | [- 44] | 25 | 29 | ? | 31 | 26 | PS | — |
| Scoresby Sund | | 131.6 | 10 | e 21 | 40 | PP | e 39 | 19 | SS | e 24 | 57 | PPP | e 65.1 |
| Calcutta | N. | 132.1 | 121 | e 21 | 29 | PP | i 28 | 39 | [+ 6] | i 32 | 52 | PS | e 50.2 |
| Tashkent | | 138.4 | 87 | e 19 | 5 | [- 22] | 29 | 53 | PS | 22 | 49 | PP | — |
| College | | 144.6 | 313 | e 19 | 41 | [+ 3] | e 47 | 55 | SSS | e 40 | 57 | P'P' | e 66.8 |
| Sverdlovsk | | 144.6 | 62 | 19 | 32 | [- 6] | — | — | — | 22 | 54 | PP | — |
| Irkutsk | | 163.3 | 106 | 20 | 9 | [+ 5] | — | — | — | — | — | — | — |

Additional readings:—

La Plata E $P_cP = +7m.31s.$?, $S = +10m.31s.$, $SS? = +11m.37s.$, $SSS = +12m.43s.$, $Q = +13m.37s.$

La Plata N $PPP = +6m.31s.$, $P_cP? = +8m.13s.$, $SS = +11m.43s.$

La Plata Z $PPP = +6m.37s.$, $+7m.37s.$, and $+9m.37s.$, $SS = +12m.19s.$

La Paz $SSN = +18m.36s.$, $iE = +18m.50s.$

Huancayo $iPP = +10m.51s.$, $iPPP = +12m.0s.$, $i = +13m.59s.$, $iSS = +20m.16s.$

Christchurch $PS = +21m.31s.$, $SS = +25m.20s.$, $Q = +29m.21s.$

Wellington $pPZ = +11m.46s.$, $sPZ = +12m.6s.$, $PPZ = +13m.53s.$, $PPPZ = +15m.38s.$, $iZ = +16m.43s.$, $sPS = +21m.31s.$, $SS = +24m.49s.$, $Q = +31m.31s.$

Auckland $i? = +13m.21s.$, $SS = +25m.6s.$, $i = +26m.19s.$, $Q = +30m.31s.$

Continued on next page.

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Tananarive PS = +22m.16s., SS = +26m.28s.
 San Juan e = +13m.46s., i = +18m.32s., iS_cS = +22m.49s., iSS = +26m.54s., eSSS = +30m.1s.
 Riverview iNZ = +12m.55s., iE = +13m.5s., eN = +23m.13s., eSS?E = +28m.57s., Q = +35m.25s.
 Adelaide i = +16m.6s., PS = +23m.15s.
 Perth i = +20m.31s., SS = +29m.24s., SSS = +36m.35s.
 Brisbane iE = +23m.54s.
 Fordham i = +33m.7s.
 Almeria P_cP = +15m.27s., S_cS = +26m.38s., PPS = +28m.16s., SS = +32m.47s.
 Granada iPP = +19m.11s., PS = +29m.38s.
 Tucson i = +20m.4s., ePKKP = +30m.7s., eSS = +33m.25s.
 Coimbra eN = +18m.41s., ? = +23m.51s., SE = +25m.27s., e = +28m.51s. and +29m.51s., SSS = +33m.41s.
 Ottawa PPS = +29m.31s.?, eE = +45m.31s.?
 Helwan eZ = +20m.31s., PPZ = +21m.43s., eE = +27m.13s., SEZ = +29m.19s., PSZ = +30m.31s.
 Batavia PE = +19m.28s., PZ = +19m.35s.
 Berkeley eE = +29m.13s., iN = +35m.49s., iZ = +36m.21s., iE = +49m.13s.
 Ukiah ePPS = +31m.44s., eSS = +36m.26s.
 Kodaikanal PPSE = +32m.16s., SSE = +37m.12s.
 Kew eSSEZ = +34m.21s., e = +36m.21s., eSSSNZ = +40m.19s.
 Medan ePEN = +19m.33s.
 Uccle iPSEN = +30m.6s., iPPSN = +31m.21s., iSSN = +36m.34s.
 De Bilt iPPS = +30m.21s., eSS = +36m.11s.
 Bucharest eE = +21m.9s. and +22m.7s., eS?N = +30m.28s.
 Bombay iE = +21m.1s., SKKSE = +27m.16s., PSEN = +30m.23s., PPSE = +31m.35s., SSE = +36m.52s., SS = +37m.8s., iE = +37m.47s., SSS = +41m.38s.
 Aberdeen iN = +32m.50s. and +52m.40s., eN = +62m.0s.
 Potsdam iZ = +20m.11s., eN = +20m.31s., eE = +24m.16s., iZ = +26m.4s., iE = +26m.51s., iZ = +31m.44s. and +36m.58s.
 Warsaw eN = +20m.31s.?, eZ = +20m.55s. and +21m.39s., eE = +22m.23s. and +31m.7s., eN = +31m.10s. and +33m.5s.
 Baku PKS = +22m.39s.
 Upsala eE = +22m.41s. and +32m.43s., eN = +38m.31s.?, e = +46m.31s.?
 Agra PPE = +19m.46s., PPPE = +22m.23s., SSE = +36m.5s.
 Scoresby Sund e = +22m.54s., +30m.57s., and +54m.7s.
 Calcutta PKSN = +22m.37s., iN = +29m.16s. and +35m.44s., iSSN = +39m.54s.
 College e = +20m.3s.
 Long waves were also recorded at Stonyhurst, Butte, Bozeman, Zurich, Salt Lake City, East Machias, and Milan.

Nov. 18d. 16h. 46m. 26s. Epicentre 32°·3N. 132°·4E.

Intensity VII-VIII at Miyazaki; VI at Uwazima, Simidu, Oita; V at Unzendake, Koti, Hirosima, Saga, Hamada; IV at Matsue, Yonago, Tokusima; II-III at Muroto, Sumoto, and Osaka.

Epicentre 32°·3N. 132°·4E. Macroseismic radius over 300km. Shallow.

The tidal wave caused little damage.

See Seismological Bulletin of the Central Meteorological Observatory, Japan, 1941, Tokyo, 1950, pp. 40-41. Macroseismic chart p. 40.

H. Kawasumi.

Epicentre in the Hyuga-Nada. Felt throughout Kyusyu, Sikoku, most parts of Iyugoku, and some parts of Kinki districts. The magnitude was very great. Small tsunami of 1m. double amplitude was noticed at eastern coast of Kyusyu and southern coast of Sikoku.

See Seismology in Japan, 1939-1947, Bulletin of the Seismological Society of America, Vol. 39, 1949, p. 160.

$$A = -.5711, B = +.6254, C = +.5318; \quad \delta = +9; \quad h = +1; \\ D = +.738, E = +.674; \quad G = -.359, H = +.393, K = -.847.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-----------|----------|-----|-------|----------------|-------|----------------|-------|----|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Simidu | 0·7 | 45 | 0 17k | 0 | 0 29 | + 1 | — | — |
| Miyazaki | 0·9 | 245 | 0 12k | - 8 | 0 29 | - 5 | — | — |
| Kumamoto | 1·5 | 290 | 0 22a | - 6 | 0 46 | - 3 | — | — |
| Matuyama | 1·5 | 11 | 0 29a | + 1 | 0 58 | S _s | — | — |
| Koti | 1·6 | 37 | 0 31a | + 1 | 0 56 | + 5 | — | — |
| Kagosima | 1·8 | 245 | 0 29a | - 3 | 0 45 | -11 | — | — |
| Muroto | 1·8 | 58 | 0 39 | P _r | 1 8 | S _s | — | — |
| Unzendake | 1·8 | 283 | 0 23a | - 9 | 0 53 | - 3 | — | — |
| Izuka | 2·0 | 313 | 0 25a | -10 | 0 53 | - 9 | — | — |
| Hirosima | 2·1 | 1 | 0 35a | - 2 | 1 6 | + 2 | — | — |

Continued on next page.

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| 1941 | | 462 | | | | | | | | | |
|-----------|----------|-----|----|-----------------|-----------------|-----|----|------------------|-------|----------|------------------|
| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Hukuoka | 2.1 | 308 | 0 | 33 _a | - 4 | 0 | 53 | -11 | — | — | — |
| Nagasaki | 2.2 | 281 | (0 | 31) | - 7 | (1 | 0) | - 6 | — | — | — |
| Yakusima | 2.5 | 221 | 0 | 36 | - 7 | 0 | 48 | -26 | — | — | — |
| Hamada | 2.7 | 354 | 1 | 0 _a | P _r | 1 | 35 | S _r | — | — | — |
| Sumoto | 2.9 | 45 | 0 | 44 _k | - 4 | 1 | 29 | + 5 | — | — | — |
| Wakayama | 3.0 | 50 | 0 | 49 _k | - 1 | 1 | 40 | S _r | — | — | — |
| Stomisaki | 3.1 | 68 | 0 | 49 | - 2 | 1 | 34 | + 5 | — | — | — |
| Tomie | 3.1 | 276 | 0 | 42 | - 9 | — | — | — | — | — | — |
| Kobe | 3.3 | 44 | 0 | 55 | + 2 | 1 | 42 | + 7 | — | — | — |
| Osaka | 3.5 | 46 | 1 | 0 | + 3 | 2 | 3 | S _r | — | — | — |
| Owase | 3.6 | 60 | 0 | 58 | 0 | 1 | 42 | 0 | — | — | — |
| Toyooka | 3.8 | 31 | 1 | 7 _k | + 6 | 2 | 4 | S _r * | — | — | — |
| Kyoto | 3.9 | 44 | 1 | 5 | + 3 | 2 | 18 | S _r * | — | — | — |
| Husan | 4.0 | 316 | 1 | 6 | + 2 | 2 | 7 | S _r * | — | — | — |
| Kameyama | 4.2 | 52 | 1 | 10 _k | + 3 | 2 | 29 | S _r | — | — | — |
| Hikone | 4.3 | 45 | 1 | 13 _k | + 5 | 2 | 13 | S* | — | — | — |
| Gihu | 4.7 | 48 | 1 | 13 _k | - 1 | 2 | 28 | S* | — | — | — |
| Nagoya | 4.7 | 52 | 1 | 16 | + 2 | 2 | 27 | S* | — | — | — |
| Nake | 4.7 | 214 | 1 | 4 | -10 | 1 | 54 | -16 | — | — | — |
| Taikyu | 4.8 | 319 | 1 | 11 _a | - 4 | — | — | — | — | — | — |
| Hamamatu | 5.0 | 60 | 1 | 20 _k | + 2 | 2 | 28 | S* | — | — | — |
| Toyama | 5.8 | 40 | 1 | 32 | + 3 | 1 | 57 | -41 | — | — | — |
| Kohu | 6.1 | 55 | 1 | 36 | + 2 | 2 | 48 | + 3 | — | — | — |
| Misima | 6.1 | 61 | 1 | 37 _k | + 3 | 3 | 29 | S* | — | — | — |
| Hunatu | 6.2 | 57 | 1 | 38 | + 3 | 3 | 3 | S* | — | — | — |
| Wazima | 6.2 | 34 | 1 | 1 _k | -34 | 2 | 41 | - 7 | — | — | — |
| Osima | 6.3 | 65 | 1 | 35 | - 1 | 3 | 5 | S* | — | — | — |
| Nagano | 6.4 | 45 | 1 | 43 | + 5 | 3 | 12 | S* | — | — | — |
| Mera | 6.7 | 65 | 1 | 42 | 0 | 3 | 9 | + 9 | — | — | — |
| Yokohama | 6.7 | 61 | 1 | 47 _k | + 5 | 3 | 33 | S* | — | — | — |
| Maebasi | 6.8 | 51 | 1 | 47 | + 3 | 3 | 22 | S* | — | — | — |
| Zinsen | 7.0 | 319 | 1 | 47 _a | + 1 | 3 | 13 | + 5 | — | — | — |
| Aikawa | 7.4 | 38 | 1 | 55 | + 3 | 3 | 35 | S* | — | — | — |
| Naha | 7.4 | 216 | 1 | 50 | - 2 | 3 | 32 | S* | — | — | — |
| Tukubasan | 7.4 | 56 | 1 | 55 _k | + 3 | 3 | 37 | S* | — | — | — |
| Kakioka | 7.5 | 56 | 1 | 57 | + 4 | 3 | 38 | S* | — | — | — |
| Utunomiya | 7.5 | 53 | 1 | 53 | 0 | 2 | 55 | S* | — | — | — |
| Mito | 7.8 | 56 | 2 | 0 | + 2 | 3 | 40 | S* | — | — | — |
| Tyosi | 7.8 | 62 | 2 | 1 | + 3 | 3 | 42 | S* | — | — | — |
| Hukusima | 8.5 | 48 | 2 | 15 _a | + 8 | 4 | 37 | S _r | — | — | — |
| Sendai | 9.1 | 47 | 2 | 16 | + 2 | 4 | 15 | +15 | — | — | — |
| Akita | 9.6 | 38 | 2 | 33 | +12 | 5 | 23 | ? | — | — | — |
| Mizusawa | 9.8 | 44 | 2 | 29 | + 5 | 1 | 4 | + 5 | — | — | — |
| Miyako | 10.6 | 44 | 2 | 38 | + 2 | 4 | 43 | + 6 | — | — | — |
| Aomori | 10.8 | 36 | 2 | 48 | + 9 | 5 | 3 | +21 | — | — | — |
| Dairen | 10.9 | 310 | 1 | 36 _a | -64 | 3 | 55 | ? | — | — | — |
| Hatinohe | 11.0 | 39 | 2 | 42 | 0 | 4 | 54 | + 7 | — | — | — |
| Mori | 11.7 | 31 | 2 | 59 _a | + 8 | 5 | 19 | +15 | — | — | — |
| Sapporo | 12.9 | 31 | 3 | 17 _k | +10 | 5 | 47 | +14 | — | — | — |
| Arisan | 13.5 | 233 | 3 | 18 | + 3 | 5 | 48 | + 1 | — | — | — |
| Tainan | 14.2 | 232 | 3 | 29 _k | + 5 | 6 | 9 | + 5 | — | — | — |
| Nemuro | 15.1 | 39 | 3 | 43 | + 7 | 6 | 46 | +21 | — | — | — |
| Irkutsk | 28.5 | 323 | 5 | 57 | - 2 | — | — | — | — | — | — |
| Amboina | 36.0 | 187 | 7 | 1 | - 4 | 1 | 12 | 40 | - 4 | — | 15.6 |
| Calcutta | N. 40.1 | 267 | 1 | 7 | 40 _a | + 1 | 1 | 13 | 59 | +13 | 19 13 PP e 20.1 |
| Medan | 42.6 | 236 | 1 | 7 | 55 | - 4 | 14 | 16 | - 7 | — | 18.6 |
| Batavia | 45.4 | 217 | 1 | 8 | 33 | +11 | 1 | 15 | 15 | +11 | e 20.6 |
| Dehra Dun | N. 46.1 | 283 | e | 8 | 34? | + 6 | e | 15 | 10 | - 4 | 1 18 9 SS i 22.7 |
| Frunse | 46.2 | 301 | e | 8 | 4 | -24 | — | — | — | — | — |
| Agra | E. 47.1 | 279 | e | 8 | 34 | - 1 | 15 | 41 | +13 | 10 26 PP | — |

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|----------------|----------|-----|------|-----------------|------|------|----|-------|-------|-----------------|------------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Tchimkent | 49.9 | 301 | i 9 | 0 | + 3 | i 16 | 28 | +21 | — | — | — |
| Tashkent | 50.3 | 300 | 9 | 0 | 0 | 16 | 33 | +20 | — | — | — |
| Hyderabad | E. 50.6 | 267 | 9 | 0 | - 2 | 16 | 7 | -10 | 10 | 56 | PP 23.9 |
| Stalinabad | 51.3 | 295 | 9 | 6 | - 2 | — | — | — | — | — | — |
| Sverdlovsk | 53.9 | 321 | i 9 | 21 | - 6 | i 17 | 10 | + 8 | — | — | — |
| Bombay | 54.8 | 272 | 9 | 29 | - 5 | i 17 | 7 | - 7 | 11 | 42 | PP i 27.4 |
| Colombo | E. 54.9 | 254 | 9 | 29 | - 6 | 17 | 6 | -10 | 21 | 36 | SS 27.0 |
| Kodaikanal | E. 55.1 | 260 | i 9 | 34 _a | - 2 | e 17 | 34 | +16 | 11 | 34 _? | PP 27.6 |
| College | 57.0 | 31 | e 9 | 49 | - 1 | i 17 | 47 | + 4 | i 21 | 27 | SS e 23.5 |
| Honolulu | 62.3 | 81 | 10 | 45 | +19 | i 18 | 57 | + 5 | e 14 | 11 | PPP e 25.7 |
| Brisbane | 62.6 | 160 | i 10 | 26 | - 2 | i 18 | 47 | - 9 | — | — | e 22.7 |
| Sitka | 64.5 | 38 | e 10 | 40 | - 1 | e 19 | 34 | +15 | e 23 | 44 | SS e 29.1 |
| Baku | 64.7 | 303 | i 10 | 39 | - 3 | 19 | 34 | +12 | — | — | — |
| Perth | 65.8 | 195 | 10 | 49 | 0 | 19 | 34 | - 1 | 13 | 29 | PP 32.6 |
| Adelaide | 67.1 | 175 | i 10 | 54 | - 3 | i 19 | 44 | - 7 | i 13 | 14 | PP 35.7 |
| Riverview | 68.1 | 164 | i 11 | 1 _k | - 3 | e 20 | 1 | - 2 | i 13 | 44 | PP e 29.8 |
| Sydney | 68.1 | 164 | e 11 | 34 | +30 | i 20 | 4 | + 1 | — | — | — |
| Upsala | 73.8 | 332 | i 11 | 34 | - 4 | i 21 | 1 | - 8 | i 14 | 19 | PP e 33.6 |
| Victoria | 75.0 | 43 | 11 | 52 | + 7 | i 21 | 25 | + 2 | 25 | 45 | SS e 32.6 |
| Scoresby Sund | 75.9 | 352 | i 11 | 6 | -44 | i 21 | 32 | 0 | i 14 | 39 | PP i 31.1 |
| Seattle | 76.1 | 43 | e 12 | 25 | +34 | i 21 | 59 | +24 | e 16 | 17 | PPP 32.9 |
| Warsaw | 76.7 | 325 | 11 | 47 _a | - 8 | 21 | 37 | - 4 | e 14 | 43 | PP e 34.6 |
| Ksara | 77.6 | 303 | e 11 | 57 | - 3 | e 22 | 0 | + 9 | e 18 | 3 | ? — |
| Bergen | 78.0 | 337 | 11 | 59 | - 3 | i 21 | 51 | - 4 | e 14 | 52 | PP e 33.6 |
| Bucharest | 78.4 | 316 | e 12 | 4 | 0 | e 21 | 53 | - 7 | e 15 | 0 | PP e 37.6 |
| Copenhagen | 78.5 | 331 | i 12 | 0 | - 4 | 21 | 57 | - 4 | 14 | 58 | PP — |
| Ferndale | N. 78.7 | 50 | — | — | — | e 22 | 12 | + 9 | — | — | e 33.0 |
| Spokane | N. 78.8 | 41 | i 12 | 10 | + 4 | i 22 | 6 | + 2 | i 22 | 34 | sS — |
| Auckland | 79.4 | 148 | 12 | 9 | 0 | 22 | 18 | + 8 | 12 | 29 | pP 38.6 |
| Ukiah | 80.2 | 50 | e 12 | 18 | + 4 | i 22 | 20 | + 1 | e 15 | 24 | PP 33.8 |
| Potsdam | 80.5 | 328 | i 12 | 4 _a | -11 | i 22 | 17 | - 5 | i 15 | 17 | PP 36.6 |
| Arapuni | 80.8 | 147 | e 14 | 34 _? | PP | 22 | 58 | PS | — | — | 36.6 |
| Sofia | 81.1 | 316 | e 12 | 17 | - 1 | i 22 | 25 | - 3 | — | — | 27.4 |
| Prague | 81.3 | 326 | i 12 | 17 _a | - 3 | 22 | 28 | - 2 | e 15 | 29 | PP e 37.6 |
| Saskatoon | 81.4 | 33 | e 12 | 27 | + 7 | e 22 | 40 | + 9 | 27 | 52 | SS e 37.6 |
| Belgrade | 81.5 | 318 | i 12 | 6 | -15 | e 22 | 6 | -26 | e 15 | 1 | PP e 31.1 |
| Berkeley | 81.5 | 51 | e 12 | 18 | - 3 | i 22 | 32 | 0 | — | — | e 34.4 |
| Branner | 81.8 | 51 | e 12 | 29 | + 7 | e 22 | 35 | 0 | — | — | e 34.6 |
| Santa Clara | 82.0 | 51 | i 12 | 25 | + 2 | i 22 | 40 | + 3 | — | — | e 34.5 |
| Jena | 82.1 | 327 | e 12 | 14 | -10 | i 22 | 34 | - 4 | i 15 | 28 | PP e 38.6 |
| Lick | N. 82.2 | 51 | e 12 | 29 | + 5 | e 22 | 48 | + 9 | — | — | e 34.6 |
| Butte | 82.4 | 39 | e 15 | 51 | PP | e 22 | 41 | 0 | e 28 | 6 | SS e 35.4 |
| Aberdeen | 83.0 | 338 | i 12 | 23 | - 5 | i 22 | 42 | - 5 | 15 | 35 | PP — |
| Helwan | 83.0 | 301 | 12 | 19 | - 9 | 22 | 43 | - 4 | 16 | 10 | PP — |
| Wellington | 83.0 | 150 | 12 | 25 _k | - 3 | 22 | 40 | - 7 | 12 | 39 | pP 39.6 |
| Bozeman | 83.5 | 39 | e 12 | 36 | + 5 | i 22 | 53 | + 1 | e 15 | 45 | PP e 33.6 |
| Fresno | N. 83.8 | 51 | e 12 | 36 | + 4 | — | — | — | — | — | — |
| Christchurch | 83.9 | 152 | 12 | 32 | - 1 | 22 | 42 | -14 | 28 | 22 | SS 41.0 |
| De Bilt | 84.1 | 331 | i 12 | 32 _a | - 2 | i 22 | 54 | - 4 | i 15 | 48 | PP e 40.6 |
| Edinburgh | 84.3 | 337 | 12 | 34 | - 1 | 22 | 50 | -10 | — | — | — |
| Tinemaha | Z. 84.5 | 50 | i 12 | 39 | + 3 | — | — | — | — | — | — |
| Triest | 84.6 | 322 | i 12 | 34 | - 2 | i 22 | 52 | -11 | i 15 | 50 | PP e 40.6 |
| Stuttgart | 84.7 | 326 | e 12 | 29 _a | - 8 | i 22 | 56 | - 8 | e 15 | 52 | PP e 41.9 |
| Haiwee | Z. 85.3 | 50 | i 12 | 42 | + 2 | — | — | — | — | — | — |
| Uccle | 85.4 | 331 | e 12 | 26 | -14 | i 23 | 1 | -10 | i 15 | 53 | PP 41.6 |
| Logan | 85.6 | 42 | e 12 | 41 | 0 | i 23 | 15 | + 2 | e 29 | 2 | SS e 31.7 |
| Stonyhurst | 85.7 | 336 | i 15 | 56 | PP | i 23 | 11 | - 3 | i 28 | 34 | SS 29.9 |
| Chur | 85.9 | 325 | e 12 | 38 _a | - 5 | e 23 | 2 | [- 5] | — | — | — |
| Zurich | 86.0 | 326 | e 12 | 36 _a | - 7 | e 23 | 4 | [- 4] | e 15 | 52 | PP — |
| Salt Lake City | 86.2 | 44 | e 12 | 46 | + 2 | e 23 | 5 | [- 3] | e 16 | 28 | PP i 36.2 |
| Basle | 86.4 | 326 | e 12 | 40 | - 5 | e 23 | 6 | [- 4] | e 16 | 3 | PP — |
| Mount Wilson | 86.4 | 52 | e 12 | 43 | - 2 | e 23 | 17 | - 4 | — | — | — |
| Pasadena | 86.4 | 52 | e 12 | 42 | - 3 | e 23 | 13 | [+ 3] | i 16 | 7 | PP i 35.7 |
| Iviglut | 86.8 | 1 | 12 | 59 | +12 | 23 | 17 | [+ 4] | 24 | 37 | PS — |
| Kew | 86.8 | 333 | i 12 | 44 _a | - 3 | i 23 | 18 | [+ 5] | i 15 | 56 | PP 42.1 |

Continued on next page.

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | |
|--------------------|----------|-----|------|--------------------|-------|------|----|-------|-------|----|-----|--------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | |
| Oxford | 86.9 | 334 | i 12 | 44 | - 4 | i 23 | 4 | [- 9] | 16 | 12 | PP | i 44.6 |
| Neuchatel | 87.0 | 326 | e 12 | 44 | - 4 | e 23 | 9 | [- 5] | | | | |
| Riverside | z. 87.0 | 52 | e 12 | 49 | + 1 | | | | e 16 | 20 | PP | |
| Milan | 87.1 | 325 | e 12 | 46 | - 3 | e 23 | 5 | [- 9] | | | | e 42.9 |
| Besançon | 87.3 | 327 | e 13 | 37 | +47 | i 23 | 11 | [- 4] | e 29 | 37 | SS | 42.6 |
| La Jolla | 87.7 | 52 | e 12 | 54 | + 2 | e 23 | 32 | - 1 | | | | |
| Paris | 87.7 | 330 | e 12 | 48 | - 4 | i 23 | 12 | [- 6] | e 16 | 13 | PP | 41.6 |
| Clermont-Ferrand | 89.8 | 327 | i 13 | 8 _a | + 6 | i 29 | 51 | SS | i 16 | 41 | PP | e 43.8 |
| Marseilles | 90.5 | 325 | e 13 | 6 | + 1 | e 23 | 36 | [0] | e 16 | 40 | PP | 43.6 |
| Tucson | 92.3 | 50 | i 13 | 11 | - 2 | i 23 | 41 | [- 5] | e 17 | 13 | PP | i 38.1 |
| Lincoln | 94.3 | 35 | | | | e 24 | 25 | - 7 | e 30 | 53 | SS | 37.1 |
| Tananarive | 95.7 | 252 | | 13 38 | + 9 | 24 | 1 | [- 4] | 17 | 19 | PP | 38.8 |
| Algiers | 96.5 | 321 | e 17 | 21 | PP | i 24 | 6 | [- 3] | e 31 | 18 | SS | 46.6 |
| Chicago U.S.C.G.S. | 97.6 | 30 | e 17 | 39 | PP | i 25 | 0 | | i 31 | 47 | SS | i 39.6 |
| Toledo | 97.6 | 328 | e 13 | 30 | - 8 | | | | 17 | 34 | PP | 47.6 |
| Seven Falls | 98.2 | 15 | 13 | 40 | 0 | 25 | 4 | - 1 | 17 | 40 | PP | e 47.6 |
| Shawinigan Falls | 98.3 | 17 | 13 | 42 | + 1 | 31 | 58 | SS | 17 | 58 | PP | e 50.6 |
| Ottawa | 98.6 | 19 | 13 | 43 | + 1 | 25 | 8 | - 1 | 17 | 52 | PP | 45.6 |
| Toronto | 99.0 | 22 | e 22 | 58 | ? | 24 | 26 | [+ 4] | 32 | 9 | SS | 44.6 |
| St. Louis | 99.1 | 33 | e 13 | 49 | + 5 | e 25 | 10 | - 3 | i 17 | 53 | PP | |
| Almeria | 99.3 | 325 | i 13 | 43 | - 2 | 24 | 19 | [- 4] | 17 | 47 | PP | 49.6 |
| Coimbra | 99.3 | 331 | e 13 | 52 | + 7 | 24 | 25 | [+ 2] | 17 | 51 | PP | 47.9 |
| Granada | 99.6 | 326 | | 13 40 _a | - 6 | i 26 | 46 | PPS | i 18 | 25 | PP | 51.8 |
| Vermont | 100.1 | 17 | c 18 | 7 | PP | e 25 | 25 | + 4 | 32 | 8 | SS | e 41.5 |
| Lisbon | 100.8 | 331 | | 13 49 | - 3 | 24 | 29 | [- 2] | 17 | 56 | PP | 50.2 |
| East Machias | 101.2 | 13 | e 19 | 2 | ? | 25 | 27 | - 3 | e 32 | 35 | SS | e 45.8 |
| San Fernando | n. 101.4 | 327 | e 18 | 8 | PP | i 24 | 32 | [- 2] | e 20 | 20 | PPP | 49.6 |
| Halifax | 102.1 | 11 | 18 | 4 | PP | 25 | 37 | - 1 | 32 | 40 | SS | e 46.6 |
| Harvard | 102.4 | 17 | e 14 | 2 | + 3 | | | | e 18 | 14 | PP | |
| Weston | 102.7 | 17 | i 13 | 54 | - 6 | i 25 | 44 | + 1 | | | | |
| Fordham | 103.3 | 19 | i 14 | 13 | +10 | i 27 | 27 | PS | i 18 | 32 | PP | e 56.6 |
| Philadelphia | 103.8 | 21 | e 18 | 30 | PP | e 27 | 40 | PS | e 33 | 12 | SS | e 47.9 |
| Angra do Heroismo | 106.9 | 344 | e 18 | 51 | PP | | | | | | | i 62.5 |
| Columbia | 106.9 | 29 | e 18 | 46 | PP | e 26 | 36 | +18 | e 33 | 48 | SS | e 49.7 |
| Merida | e. 113.5 | 43 | e 19 | 4 | [+24] | | | | | | | |
| Bermuda | 113.7 | 16 | i 19 | 25 | PP | i 29 | 13 | PS | 35 | 12 | SS | 56.0 |
| San Juan | 126.7 | 22 | e 15 | 55 | P | e 26 | 46 | [+35] | e 21 | 15 | PP | e 53.7 |
| Huancayo | 147.5 | 57 | i 19 | 47 | [+ 4] | e 26 | 49 | [- 1] | e 23 | 32 | PP | e 59.2 |
| La Paz | 155.6 | 53 | i 19 | 56 _k | [+ 1] | i 26 | 48 | [-12] | i 24 | 2 | PP | 73.7 |
| Rio de Janeiro | e. 169.9 | 337 | i 20 | 17 | [+ 8] | i 29 | 12 | ? | i 25 | 14 | PP | 45.9 |
| | n. 169.9 | 337 | i 20 | 14 | [+ 5] | i 29 | 4 | ? | i 25 | 11 | PP | 45.9 |
| La Plata | E. 171.0 | 109 | 21 | 46 _? | ? | 32 | 4 | {- 4} | 25 | 34 | PP | 77.7 |
| | N. 171.0 | 109 | 20 | 28 | [+18] | 31 | 58 | {-10} | 25 | 28 | PP | 71.6 |
| | Z. 171.0 | 109 | 20 | 10 | [0] | 32 | 16 | {+ 8} | 25 | 23 | PP | 79.2 |

Additional readings:—

Nagasaki readings have been diminished by 1 minute.

Calcutta $iP_cPN = +9m.41s.$, $iSSN = +16m.45s.$, $iS_cSN = +17m.45s.$

Batavia $iSEN = +15m.18s.$

Agra $PPPE = +11m.19s.$, $SSE = +18m.48s.$

Hyderabad $S_cS = +18m.50s.$, $SS = +19m.35s.$, $PPPN = +12m.53s.$

Bombay $iP_cS = +14m.31s.$, $iN = +17m.58s.$, $iS_cSN = +19m.18s.$, $iSSN = +21m.2s.$, $iN = +25m.52s.$

Colombo $SSSE = +23m.6s.$

College $i = +18m.14s.$, $iS_cS = +19m.41s.$

Honolulu $e = +11m.11s.$, $eSS = +23m.23s.$

Brisbane $iPE = +10m.31s.$

Sitka $eS_cS = +20m.41s.$

Perth $PPP = +14m.37s.$, $PS = +20m.14s.$, $SS = +24m.34s.$, $SSS = +27m.1s.$

Adelaide $i = +11m.11s.$, $+11m.21s.$, and $+20m.54s.$

Riverview $iZ = +11m.17s.$, $iE = +11m.21s.$, $iSEN = +20m.5s.$, $iZ = +20m.8s.$, $iPSN = +20m.30s.$, $iS_cS?N = +20m.57s.$, $iZ = +21m.11s.$, $iE = +21m.14s.$, $iN = +21m.20s.$, $eSS?N = +24m.28s.$, $iSSE = +24m.39s.$, $iSSSE = +27m.50s.$, $iZ = +28m.1s.$

Upsala $PPP = +16m.8s.$, $eE = +18m.6s.$, $eN = +18m.16s.$, $eE = +19m.59s.$, $S_cSN = +22m.1s.$, $SSE = +25m.35s.?$, $SSN = +25m.55s.$, $eSSSN = +29m.14s.$, $SSSE = +29m.35s.?$

Victoria $e = +29m.34s.$

Continued on next page.

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Scoresby Sund $i = +11m.51s.$ and $+13m.3s.$, $e = +13m.58s.$, $+17m.8s.$, and $+23m.37s.$, $iSS = +26m.16s.$, $i = +30m.33s.$
 Seattle $e = +24m.42s.$, $eSS = +26m.36s.$
 Warsaw $PN = +11m.52s.$, $PPZ = +14m.47s.$, $PPN = +14m.53s.$, $PPPZ = +16m.36s.$,
 $PPPN = +16m.39s.$, $PPPE = +16m.43s.$, $PSN = +22m.7s.$, $PSZ = +22m.10s.$,
 $SSE = +26m.44s.$, $SSN = +26m.51s.$, $SSZ = +27m.7s.$, $SSSE = +30m.30s.$,
 $SSSN = +30m.33s.$, $SSSZ = +30m.45s.$
 Bergen $PPP = +16m.48s.$, $eSS = +26m.55s.$, $eSSS = +30m.39s.$
 Bucharest $ePPN = +14m.52s.$, $ePPPE = +16m.48s.$, $ePSE = +22m.32s.$, $eSSN = +27m.0s.$,
 $eSSE = +27m.8s.$, $eSSSN = +30m.0s.$, $eSSSE = +30m.7s.$
 Copenhagen $+16m.52s.$, $+18m.9s.$, $+22m.46s.$, and $+27m.3s.$
 Ferndale $eSE = +22m.17s.$
 Spokane $iN = +12m.21s.$ and $+12m.51s.$, $iSSN = +26m.54s.$
 Auckland $i = +15m.24s.$, $+18m.4s.$, and $+19m.21s.$, $S = +22m.38s.$, $i = +22m.59s.$,
 $SP? = +24m.19s.$, $SS? = +26m.49s.$, $Q = +33m.34s.$
 Ukiah $e = +15m.47s.$, $iS = +26m.4s.$, $eSS = +27m.49s.$
 Potsdam $iPNZ = +12m.10s.$, $iPE = +12m.14s.$, $iZ = +12m.39s.$, $iN = +12m.43s.$ and
 $+15m.5s.$, $iZ = +15m.12s.$, $iPPPNZ = +17m.14s.$, $iN = +17m.25s.$, $iE = +17m.59s.$
 and $+18m.28s.$, $iZ = +18m.36s.$ and $+19m.23s.$, $iN = +19m.27s.$, $iE = +21m.28s.$,
 $iScSZ = +22m.32s.$, $iPSN = +23m.1s.$, $iPPSZ = +23m.18s.$, $iN = +25m.7s.$,
 $iSSEN = +27m.39s.$, $iZ = +28m.6s.$, $iSSSE = +30m.35s.$, $iEZ = +31m.28s.$, $iZ = +31m.31s.$
 and $+32m.18s.$, $iN = +33m.38s.$, $iZ = +36m.10s.$
 Arapuni $e = +21m.4s.$, $i = +24m.52s.?$
 Sofia $eE = +18m.32s.$
 Prague $ePPP = +17m.22s.$, $ePPPP = +18m.42s.$, $ePS = +23m.10s.$, $eSS = +27m.52s.$,
 $eSSS = +31m.34s.$
 Saskatoon $SSS = +31m.46s.$
 Belgrade $ePcP = +12m.39s.$, $ePP = +14m.18s.$, $eScS = +22m.56s.$, $e = +26m.37s.$,
 $eSS = +27m.35s.$, $eSSS = +31m.54s.$
 Berkeley $iPE = +12m.22s.$, $eN = +12m.25s.$, $iSZ = +21m.32s.$, $iSKSE = +22m.28s.$,
 $eSN = +22m.36s.$
 Branner $eSN = +22m.39s.$
 Jena $ePN = +12m.18s.$, $iP = +12m.31s.$, $iPPPEN = +16m.46s.$, $iPPPE = +17m.28s.$,
 $i = +18m.57s.$, $iPS = +23m.34s.$, $eSSN = +28m.12s.$, $eSSZ = +28m.16s.$,
 $e = +32m.4s.$
 Butte $ePS = +23m.26s.$, $e = +31m.33s.$
 Aberdeen $iN = +18m.58s.$, $iEN = +23m.51s.$, $iE = +28m.15s.$, $iN = +28m.53s.$, $iEN = +31m.53s.$
 Helwan $iEZ = +12m.25s.$, $PPPZ = +18m.10s.$, $SKKSE = +23m.22s.$
 Wellington $sPZ = +12m.52s.$, $iZ = +15m.14s.$ and $+15m.39s.$, $S = +23m.4s.$, $sS = +23m.36s.$,
 $SP? = +24m.19s.$, $SS? = +27m.54s.$, $SSS? = +31m.54s.$, $Q = +35m.4s.$
 Bozeman $e = +22m.26s.$, $iSS = +28m.26s.$, $e = +30m.57s.$
 Christchurch $S = +23m.4s.$, $Q = +35m.45s.$
 De Bilt $ePPP = +17m.34s.$, $iPS = +23m.54s.$, $eSS = +28m.34s.$, $eSSS = +32m.34s.$
 Trieste $i = +19m.21s.$ and $+34m.58s.$
 Stuttgart $i = +12m.33s.$ and $+12m.51s.$, $iZ = +16m.24s.$, $ePPPEN = +17m.55s.$,
 $ePPPE = +19m.14s.$, $eN = +22m.4s.$, $iSSE = +28m.48s.$, $eSSSN = +32m.48s.$,
 $eSSSE = +32m.52s.$
 Uccle $iP = +12m.38s.$, $iPPPEN = +17m.56s.$, $iPPPP = +19m.21s.$, $iPSN = +24m.15s.$,
 $iSSN = +28m.51s.$
 Logan $e = +13m.31s.$ and $+27m.19s.$
 Stonyhurst $iPS = +23m.18s.$
 Zurich $eSS = +29m.3s.$
 Salt Lake City $e = +18m.48s.$, $iS = +23m.23s.$, $e = +24m.18s.$, $eSS = +28m.48s.$, $eSSS = +32m.43s.$
 Pasadena $iZ = +13m.0s.$, $iSSNZ = +29m.12s.$
 Kew $iPPP = +18m.4s.$, $eZ = +20m.7s.$, $PS = +24m.2s.$, $PPSN = +24m.27s.$, $eSS = +28m.52s.$,
 $eSSS = +33m.2s.$
 Paris $ePPP = +18m.17s.$, $SS = +29m.16s.$
 Clermont-Ferrand $iPS = +25m.11s.$
 Marseilles $e = +17m.23s.$ and $+18m.4s.$, $ePS = +25m.4s.$, $eSS = +30m.14s.$
 Tucson $i = +14m.27s.$, $iPPP = +19m.17s.$, $iS = +24m.19s.$, $eScS = +24m.58s.$, $iPS = +25m.27s.$,
 $iSS = +30m.32s.$, $eSSS = +34m.1s.$, $e = +34m.48s.$
 Tananarive $PPP = +19m.28s.$, $SEN = +24m.37s.$, $PS = +26m.4s.$, $SS = +31m.25s.$
 Algiers $i = +21m.10s.$, $e = +22m.34s.$, $ePS = +26m.20s.$
 Chicago $e = +21m.24s.$, $i = +26m.44s.$, $iSSS = +35m.15s.$
 Seven Falls $SS = +32m.7s.$, $e = +43m.40s.$
 Shawinigan Falls $PS = +26m.35s.$
 Ottawa $PPS = +26m.40s.$, $SS = +31m.49s.$, $SSS = +35m.52s.$, $e = +39m.55s.$
 Toronto $e = +26m.50s.$
 St. Louis $eSKSE = +24m.21s.$, $iSE = +25m.18s.$
 Almeria $PPP = +20m.12s.$, $SKKS = +24m.47s.$, $PS = +26m.49s.$, $PPS = +27m.28s.$,
 $SS = +32m.34s.$, $SSS = +37m.19s.$
 Coimbra $iE = +21m.52s.$ and $+23m.32s.$, $PPS = +27m.36s.$, $i = +28m.1s.$, $SS = +32m.51s.$,
 $SSS = +37m.52s.$
 Granada $iPKP = +17m.49s.$, $iPS = +27m.52s.$, $Q = +45m.58s.$
 Vermont $eSKS = +24m.29s.$, $ePS = +27m.6s.$, $e = +30m.42s.$

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Lisbon PE = +13m.56s., PPN = +18m.1s., N = +22m.6s., PSZ = +27m.8s., PSN = +27m.12s., PPSZ = +27m.57s., SSE = +32m.34s., SSN = +32m.58s., E = +36m.51s., +39m.0s., and +47m.46s.
 East Machias e = +27m.2s., eSSS = +36m.18s.
 San Fernando eSKKSN = +25m.8s., iPSN = +27m.8s., iSSN = +36m.36s.
 Halifax PSN = +27m.10s., e = +42m.16s.
 Harvard eZ = +20m.58s. and +23m.48s.
 Fordham iPPS = +28m.23s., e = +47m.4s.
 Philadelphia e = +38m.21s.
 Columbia e = +24m.4s., eSSS = +37m.54s., e = +41m.24s.
 Bermuda e = +21m.20s., iPPP = +21m.50s., e = +28m.48s.
 San Juan ePKP = +19m.27s., eS = +29m.4s., eSS = +37m.54s., e = +42m.43s.
 Huancayo e = +26m.45s., eSKS = +28m.18s., eSKKS = +30m.12s., iSKSP = +33m.49s., i = +42m.12s., eSSS = +48m.35s.
 La Paz iPKP₂ = +20m.27s., iPPPZ = +27m.41s., iSKKS = +30m.32s., PSKS = +34m.16s., PPS = +37m.26s., iSSN = +43m.58s., eSSN = +50m.9s., iN = +56m.38s., Q = +66m.46s.
 Rio de Janeiro iSSN = +35m.48s.
 La Plata E PPP = +31m.22s. and +32m.40s., SKKS = +33m.16s., SKSP? = +35m.52s., SKSP = +37m.16s., +38m.10s., and +39m.10s., PPS? = +40m.10s., +45m.34s., +46m.16s., SS = +47m.34s., PSS? = +51m.10s., SSS = +56m.34s. ?
 La Plata N PPP? = +30m.22s., SKSP = +35m.34s., PPS? = +40m.28s., SS? = +46m.22s., SSS? = +51m.22s.
 La Plata Z +21m.40s., SKSP = +35m.40s., PPS? = +39m.22s. and +43m.40s.

Nov. 18d. 22h. 40m. 45s. Epicentre 23°·7S. 65°·7W. Depth of focus 0·015. (as on 1941, Aug. 14d.).

A = +·3772, B = -·8355, C = -·3996; δ = +2; h = +4;
 D = -·911, E = -·412; G = -·164, H = +·364, K = -·917.

| | | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. |
|---------------|----|----------|-----|----------|--------|---------|--------|----------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| La Paz | z. | 7·5 | 341 | 1 57 | + 9 | 3 24 | +12 | — | 3·8 |
| La Plata | | 13·0 | 151 | 3 5 | + 4 | 5 21 | - 2 | — | 6·1 |
| Huancayo | | 14·8 | 320 | 1 3 25 | + 1 | e 6 8 | + 3 | 1 4 0 PP | 9·0 |
| San Juan | | 41·8 | 0 | — | — | e 13 28 | -18 | — | e 17·0 |
| Tucson | | 70·4 | 321 | i 11 1 | - 1 | — | — | — | e 17·9 |
| Palomar | z. | 74·8 | 318 | i 11 27k | - 1 | — | — | — | — |
| Riverside | z. | 75·5 | 318 | i 11 31k | - 1 | — | — | — | — |
| Pasadena | z. | 76·1 | 318 | i 11 34k | - 1 | — | — | — | — |
| Haiwee | | 77·3 | 320 | i 11 42 | 0 | — | — | — | — |
| Santa Barbara | z. | 77·3 | 317 | e 11 40 | - 2 | — | — | — | — |
| Tinemaha | | 78·1 | 320 | i 11 46k | 0 | — | — | — | — |

Additional readings:—

La Plata PZ = +3m.7s., SE = +5m.33s.
 Huancayo iS = +6m.17s., i = +6m.34s.
 Tucson i = +11m.51s., e = +13m.13s.

Nov. 18d. Readings also at 2h. (near Ferndale), 4h. (Medan), 5h. (near Lick), 7h. (Tashkent, Irkutsk, Sverdlovsk, and Baku), 13h. (near Honolulu, Pasadena, Palomar, Riverside, Tinemaha, and Mount Wilson), 17h. (Mount Wilson and Pasadena), 18h. (Wellington and Fresno), 19h. (Auckland and La Paz), 20h. (Tchimkent), 22h. (La Paz, Riverside, Pasadena, near Medan, Riverview, and Palomar), 23h. (Riverside, Tinemaha, and Ferndale).

Nov. 19d. Readings at 1h. (Huancayo), 2h. (Branner, Berkeley, and Ferndale), 3h. (Branner, Berkeley, near Ferndale (2), Mount Wilson, Lick, Tinemaha, Pasadena, Haiwee, and Riverside), 4h. (Ferndale), 5h. (near Berkeley (2) and Branner), 7h. (San Juan, La Paz (2), and Huancayo), 8h. (Balboa Heights, Pasadena, Tinemaha, Mount Wilson, Stuttgart, and near Apia), 9h. (Batavia, near Lick, and Berkeley), 10h. (Stuttgart and La Paz), 12h. (Sofia), 13h. (near Mizusawa), 15h. (near Tananarive), 17h. (Ottawa and Berkeley), 22h. (Riverview).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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1941

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Nov. 20d. 13h. 23m. 2s. Epicentre 3°·0S. 123°·0E.

Approximate epicentre.

A = -·5439, B = +·8375, C = -·0520; $\delta = -6$; $h = +7$;
D = +·839, E = +·545; G = +·028, H = -·044, K = -·999.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|---------|------|----------|------|----------|-----------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Ambolna | 5·2 | 97 | 1 18 | - 3 | 1 2 6 | -16 | — | — |
| Batavia | 16·4 | 259 | 1 4 7 | PP | 1 9 44 | L | — | (1 9·7) |
| Medan | 25·2 | 286 | e 5 38 | + 9 | e 10 18 | +26 | — | — |
| Riverview | 40·4 | 143 | — | — | e 13 47 | - 3 | e 16 21 | SS e 21·2 |
| Calcutta | N. 42·3 | 309 | e 8 33 | +36 | 1 14 25 | + 6 | — | — |
| Colombo | E. 44·2 | 283 | e 6 28 | ? | — | — | — | — |
| Kodaikanal | E. 47·2 | 287 | e 7 58? | -38 | e 14 58? | -31 | — | — |
| Agra | E. 52·7 | 308 | 9 18 | 0 | 16 48 | + 2 | — | — |
| Bombay | 53·9 | 296 | e 9 19 | - 8 | e 16 48 | -14 | — | — |
| Irkutsk | 57·3 | 347 | — | — | e 17 52 | + 6 | — | — |
| Wellington | 60·0 | 137 | — | — | e 25 58? | ? | e 29 58? | ? |
| Sverdlovsk | 77·8 | 330 | e 11 59 | - 2 | e 21 53 | 0 | — | e 34·0 |

Additional readings:—

Batavia iSE = +10m.5s.

Calcutta iN = +11m.31s.

Long waves were also recorded at Auckland and De Bilt.

Nov. 20d. 15h. 16m. 31s. Epicentre 41°·0S. 42°·0E.

A = +·5625, B = +·5065, C = -·6535; $\delta = +1$; $h = -2$;
D = +·669, E = -·743; G = -·486, H = -·437, K = -·757.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----------|-----|----------|-------|----------|-------|----------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Tananarive | 22·5 | 14 | 1 5 5 | + 3 | e 9 15 | +10 | 5 29 | PP e 11·8 |
| Colombo | E. 59·0 | 45 | e 9 29? | -35 | — | — | — | — |
| Kodaikanal | E. 60·6 | 40 | e 11 29? | ? | 1 18 40 | +10 | 1 25 29 | SSS |
| Bombay | 66·1 | 32 | e 10 49 | - 2 | e 19 40 | + 1 | 1 19 52 | PS |
| Agra | E. 75·6 | 33 | e 13 59 | ? | 21 33 | + 4 | — | — |
| Calcutta | N. 76·6 | 44 | e 12 5 | +11 | 1 21 50 | +10 | — | — |
| Riverview | N. 81·0 | 127 | — | — | e 22 21 | - 6 | e 27 37 | SS e 34·8 |
| Baku | 81·3 | 6 | — | — | 22 37 | + 7 | — | — |
| Tashkent | 85·6 | 20 | 12 43 | + 2 | 23 12 | - 1 | — | — |
| Almeria | 87·5 | 325 | e 12 46 | - 5 | 23 29 | - 2 | 16 21 | PP 43·5 |
| Granada | 88·3 | 324 | e 12 55k | 0 | 23 16 | [- 6] | 29 13 | SS 46·3 |
| Triest | 89·9 | 341 | — | — | 1 30 9 | SSP | — | 51·5 |
| Toledo | 90·8 | 326 | 1 13 17 | +11 | — | — | e 17 10 | PP 47·5 |
| Coimbra | 92·9 | 323 | e 12 42 | -34 | 25 42 | PPS | — | e 49·6 |
| Warsaw | 94·6 | 346 | e 18 29? | PPP | e 31 17 | SSP | e 34 23 | SSS e 52·5 |
| Potsdam | 96·3 | 341 | e 18 52 | PPP | — | — | — | e 47·5 |
| Uccle | 97·2 | 336 | — | — | 1 26 40 | PS | 1 31 51 | SS e 44·5 |
| Kew | 99·2 | 335 | — | — | e 27 7 | PPS | 32 31 | SSP e 48·0 |
| Copenhagen | 99·5 | 343 | — | — | 32 29 | SSP | — | — |
| Huancayo | 101·8 | 242 | — | — | e 24 39 | [+ 3] | e 27 16 | PS e 42·8 |
| Upsala | 102·5 | 347 | — | — | e 32 29? | SS | e 36 29? | SSS e 52·5 |
| Tucson | 156·6 | 251 | e 20 3 | [+ 6] | — | — | e 24 6 | PP |

Additional readings:—

Tananarive PPP = +5m.54s., SE = +9m.21s., SS = +10m.9s.

Almeria PPP = +18m.17s., PS = +24m.41s., SS = +29m.31s., SSS = +32m.45s.

Granada PP = +15m.59s., eSSS = +34m.16s.

Coimbra ? = +21m.12s. and +26m.42s.

Uccle iN = +27m.23s.

Huancayo e = +32m.45s.

Upsala eE = +39m.29s. ?

Kew eN = +35m.59s.

Tucson e = +20m.35s.

Long waves were also recorded at De Bilt, Berkeley, Pasadena, Scoresby Sund, Bozeman, Algiers, and San Fernando.

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Nov. 20d. 19h. 54m. 43s. Epicentre $0^{\circ}5S$. $67^{\circ}0E$.

$A = +.3907$, $B = +.9205$, $C = -.0087$; $\delta = +4$; $h = +7$;
 $D = +.921$, $E = -.391$; $G = -.003$, $H = -.008$, $K = -1.000$.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----|------------|------------|---------------------|-------|---------|------|------------|-------|
| | | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Colombo | E. | 14.8 | 60 | 3 29 | - 3 | 8 12 | L | — | (8.2) |
| Kodaikanal | E. | 14.9 | 44 | i 3 28 _a | - 6 | e 5 49 | -31 | — | 7.2 |
| Bombay | | 20.1 | 16 | i 4 41 | + 3 | i 8 31 | +12 | — | 10.0 |
| Agra | E. | 29.5 | 21 | e 6 4 | - 4 | — | — | — | — |
| Calcutta | N. | 30.9 | 41 | e 6 32 | +12 | i 11 40 | +16 | e 7 30 PPP | 115.4 |
| Tashkent | | 41.7 | 2 | 7 55 | + 3 | 13 8 | -62 | — | — |
| Baku | | 43.6 | 341 | e 8 49 | +41 | e 14 41 | + 3 | — | — |
| Almata | | 44.5 | 11 | e 8 19 | + 4 | — | — | — | — |
| Sverdlovsk | | 57.4 | 356 | i 9 53 | 0 | — | — | — | — |
| Basle | | 70.2 | 322 | e 11 26 | + 9 | — | — | — | — |
| Copenhagen | | 71.3 | 331 | e 11 26 | + 3 | — | — | — | — |
| La Paz | Z. | 132.6 | 247 | 19 31 | [+14] | — | — | — | — |
| Mount Wilson | Z. | 146.1 | 6 | i 19 47 | [+ 6] | — | — | — | — |
| Pasadena | Z. | 146.2 | 6 | i 19 48 | [+ 7] | — | — | — | — |
| Palomar | Z. | 147.1 | 5 | i 19 51 | [+ 8] | — | — | — | — |
| Tucson | | 148.4 | 357 | i 19 53 | [+ 8] | — | — | — | — |

Additional readings:—

Bombay eSN = +8m.40s.

Calcutta eP_cPN = +9m.30s., eSSN = +13m.19s., iS_cSN = +17m.9s.

Mount Wilson iZ = +19m.55s.

Tucson i = +20m.2s. and +20m.38s., eL = +21m.43s.

Long waves were also recorded at Tananarive, Auckland, and Huancayo.

Nov. 20d. Readings also at 2h. (Haiwee, Mount Wilson, Pasadena, Sverdlovsk, Vladivostok, and near Mizusawa), 3h. (near Berkeley, Branner, and Lick), 6h. (near Andijan and Tashkent), 11h. (San Francisco, Berkeley, near Branner, and Lick), 21h. (Berkeley, Mount Wilson, Pasadena, Palomar, Tinemaha, Huancayo, Copenhagen, Apia, Wellington and Riverview), 22h. (near Branner).

Nov. 21d. 12h. 12m. 24s. Epicentre $39^{\circ}7N$. $23^{\circ}8E$. (as given by Strasbourg).

$A = +.7059$, $B = +.3113$, $C = +.6362$; $\delta = -5$; $h = -2$;
 $D = +.404$, $E = -.915$; $G = +.582$, $H = +.257$, $K = -.772$.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-----------|--|------------|------------|--------|------|---------|------|-----------------------|--------|
| | | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Sofia | | 3.0 | 354 | e 0 35 | -15 | i 1 30 | + 3 | — | — |
| Bucharest | | 5.0 | 19 | e 1 19 | + 1 | i 2 21 | + 3 | e 1 42 P _s | — |
| Belgrade | | 5.7 | 335 | e 1 38 | P* | e 2 43 | + 8 | e 3 2 S _s | — |
| Triest | | 9.5 | 312 | e 2 26 | + 6 | i 4 18 | + 8 | i 5 6 S _s | — |
| Prague | | 12.3 | 331 | e 2 52 | - 7 | e 4 59 | -19 | — | e 6.6 |
| Chur | | 12.6 | 310 | e 3 3 | 0 | — | — | — | — |
| Warsaw | | 12.7 | 352 | e 2 52 | -13 | e 5 36? | + 8 | — | e 7.6 |
| Zurich | | 13.4 | 310 | e 3 22 | + 8 | — | — | — | e 6.9 |
| Stuttgart | | 13.8 | 316 | e 3 17 | - 2 | — | — | i 3 29 PP | 7.8 |
| Basle | | 14.1 | 309 | e 3 25 | + 2 | — | — | — | e 7.6 |
| Jena | | 14.1 | 327 | e 3 6 | -17 | — | — | e 3 30 PP | e 7.6 |
| Uccle | | 17.5 | 316 | e 4 11 | + 4 | — | — | — | e 9.6 |
| Kew | | 20.5 | 313 | e 4 45 | + 3 | — | — | — | e 10.1 |

Additional readings:—

Sofia iP_sEN = +53s.

Bucharest eP*E = +1m.33s., eS*EN = +2m.37s.

Belgrade eSS = +3m.31s.

Triest i = +3m.1s.

Warsaw eN = +5m.6s. and +7m.7s., eZ = +7m.11s.

Jena eN = +3m.12s.

Long waves were also recorded at Milan, Potsdam, Bergen, and Upsala.

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Nov. 21d. Readings also at 10h. (Toledo), 11h. (Stuttgart), 13h. (near Branner, Berkeley, and Lick), 14h. (La Paz and near Mizusawa), 15h. (Stuttgart), 16h. (Branner, Tucson, and near Fresno), 17h. (Auckland), 19h. (La Paz), 21h. (La Paz), 23h. (Branner).

Nov. 22d. 5h. 23m. 37s. Epicentre 7°·5N. 80°·1W.

A = +·1705, B = -·9768, C = +·1297; δ = +3; h = +7;
D = -·985, E = -·172; G = +·022, H = -·128, K = -·992.

| | | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | |
|----------------|----|----------|-----|-----|----|------|------|----|------|-------|----|--------|------|
| | | | | m. | s. | s. | m. | s. | m. | s. | m. | | |
| Balboa Heights | | 1·6 | 20 | i 0 | 33 | + 3 | i 0 | 56 | + 5 | — | — | 1·2 | |
| San Juan | | 17·4 | 50 | e 4 | 5 | - 1 | e 7 | 37 | SS | — | — | e 10·4 | |
| Huancayo | | 20·0 | 168 | e 4 | 39 | + 2 | e 8 | 31 | +14 | e 5 | 15 | PP | 10·2 |
| La Paz | z. | 26·6 | 153 | 5 | 43 | + 1 | e 12 | 13 | ? | — | — | — | 15·5 |
| Palomar | z. | 42·6 | 313 | 1 8 | 3 | + 4 | — | — | — | — | — | — | — |
| Riverside | z. | 43·3 | 313 | e 8 | 4 | - 1 | — | — | — | — | — | — | — |
| Mount Wilson | z. | 43·9 | 313 | i 8 | 10 | 0 | — | — | — | — | — | — | — |
| Pasadena | z. | 44·0 | 313 | e 8 | 8 | - 3 | — | — | — | — | — | — | — |
| Haiwee | | 44·8 | 316 | e 8 | 16 | - 1 | — | — | — | — | — | — | — |
| Tinemaha | | 45·5 | 316 | e 8 | 21 | - 2 | — | — | — | — | — | — | — |

Palomar also gives iZ = +8m.20s.

Long waves were also recorded at Chicago U.S.C.G.S.

Nov. 22d. 7h. 31m. 30s. Epicentre 18°·5N. 146°·0E. (as on 1937, Aug. 8d.).

There is no evidence of focal depth in the case of the present repetition.

A = -·7868, B = +·5307, C = +·3154; δ = +17; h = +5;
D = +·559, E = +·829; G = -·261, H = +·176, K = -·949.

| | | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | |
|----------------|----|----------|-----|------|-----------------|-------|------|----|------|-------|----|-----|--------|
| | | | | m. | s. | s. | m. | s. | m. | s. | m. | | |
| Titizima | | 9·3 | 338 | e 2 | 14 | - 3 | 3 | 40 | -25 | — | — | — | |
| Yokohama | | 17·8 | 347 | e 6 | 49 | ? | — | — | — | — | — | — | |
| Gihu | | 18·7 | 337 | 4 | 18 | - 4 | 7 | 39 | - 9 | — | — | — | |
| Miyazaki | | 18·7 | 318 | e 4 | 30 | + 8 | — | — | — | — | — | — | |
| Nagano | | 19·3 | 343 | 4 | 28 | - 1 | 8 | 16 | +14 | — | — | — | |
| Kumamoto | | 19·8 | 321 | e 4 | 26 | - 9 | 8 | 30 | +17 | — | — | — | |
| Sendai | | 20·2 | 349 | 4 | 33 | - 6 | 8 | 2 | -19 | — | — | — | |
| Hamada | | 20·5 | 325 | 4 | 46 | + 4 | 8 | 33 | + 6 | — | — | — | |
| Hukuoka | | 20·5 | 321 | e 4 | 50 | + 8 | — | — | — | — | — | — | |
| Mizusawa | | 21·0 | 350 | e 4 | 45 | - 2 | e 8 | 36 | - 1 | — | — | — | |
| Sapporo | | 24·8 | 352 | 5 | 26 | + 1 | — | — | — | — | — | — | |
| Irkutsk | | 46·8 | 326 | e 9 | 38 | +65 | 16 | 21 | +57 | — | — | — | |
| Riverview | | 52·3 | 175 | e 9 | 48 | +33 | — | — | — | e 12 | 18 | PPP | e 25·6 |
| Auckland | | 61·4 | 154 | — | — | — | e 20 | 30 | ? | — | — | — | 32·5 |
| Agra | E. | 62·6 | 291 | 11 | 27 | +59 | 19 | 52 | +56 | — | — | — | — |
| Bombay | | 68·8 | 283 | — | — | — | i 20 | 29 | +18 | — | — | — | — |
| Sverdlovsk | | 72·2 | 326 | 11 | 34 | + 5 | 20 | 50 | - 1 | — | — | — | — |
| Baku | | 82·7 | 310 | — | — | — | 23 | 2 | +18 | — | — | — | — |
| Santa Barbara | z. | 83·2 | 57 | e 12 | 37 | + 8 | — | — | — | — | — | — | — |
| Tinemaha | | 83·5 | 54 | i 12 | 36 | + 5 | — | — | — | i 16 | 31 | PP | — |
| Haiwee | z. | 84·1 | 54 | e 12 | 41 | + 7 | — | — | — | — | — | — | — |
| Mount Wilson | z. | 84·5 | 56 | e 12 | 41 | + 5 | — | — | — | e 16 | 35 | PP | — |
| Pasadena | | 84·5 | 56 | i 12 | 43 | + 7 | — | — | — | — | — | — | e 41·5 |
| Riverside | z. | 85·2 | 56 | e 12 | 50 | +11 | — | — | — | — | — | — | — |
| Tucson | | 90·9 | 56 | i 13 | 16 | + 9 | — | — | — | e 16 | 44 | PP | e 48·2 |
| Balboa Heights | | 127·4 | 63 | — | — | — | e 43 | 48 | ? | — | — | — | — |
| La Paz | z. | 147·4 | 91 | i 20 | 24 _a | [+41] | — | — | — | — | — | — | — |

Additional readings:—

Mizusawa ePE = +4m.48s.

Tucson i = +13m.46s.

Long waves were also recorded at Wellington, Berkeley, Kodaikanal, De Bilt, Warsaw, Huancayo, Bozeman, and College.

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Nov. 22d. Readings also at 1h. (Medan, Batavia, Auckland, Riverview, and Branner (2)), 4h. (Tucson, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, Tinemaha, Auckland, and near Apia), 5h. (La Paz and near Mizusawa), 9h. (near Granada and Almeria, Balboa Heights, and Stuttgart), 11h. (Stuttgart), 14h. (Oaxaca), 15h. (Tananarive), 16h. (Oaxaca and Riverview), 17h. (Wellington (2) and Riverview), 19h. (near Amboina), 20h. (near Almeria), 23h. (Tucson, Berkeley, Riverview, Tinemaha, Pasadena, Mount Wilson, Riverside, Palomar, Auckland, near Tashkent and Tchinkent).

Nov. 23d. 15h. 58m. 48s. Epicentre $22^{\circ}0S$. $171^{\circ}7E$. (as on 5d.).

$$A = -.9184, B = +.1340, C = -.3724; \quad \delta = +10; \quad h = +4;$$

$$D = +.144, E = +.990; \quad G = +.368, H = -.054, K = -.928.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|------------|------------|---------|------|---------|------|---------|--------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Auckland | 15.1 | 170 | 3 24 | -12 | 6 22 | -3 | — | 7.4 |
| Arapuni | 16.4 | 169 | — | — | 7 18 | SS | — | 9.2 |
| Wellington | 19.4 | 174 | 4 15 | -15 | 7 52 | -12 | 4 27 pP | 10.2 |
| Christchurch | 21.5 | 179 | 4 52 | 0 | 8 47 | 0 | 9 17 Q | 11.6 |
| Riverview | 21.6 | 232 | e 5 0 | + 6 | e 8 59 | +10 | 5 24 PP | e 11.0 |
| Adelaide | 31.7 | 238 | — | — | e 13 40 | SSS | — | — |
| Pasadena | 86.9 | 51 | i 12 49 | + 1 | — | — | — | e 42.2 |
| Mount Wilson | z. 87.1 | 51 | i 12 49 | 0 | — | — | — | — |
| Riverside | z. 87.4 | 51 | e 12 52 | + 2 | — | — | — | — |
| Palomar | z. 87.5 | 53 | i 12 52 | + 1 | — | — | — | — |
| Haiwee | z. 88.0 | 50 | e 12 55 | + 2 | — | — | — | — |
| Tinemaha | z. 88.3 | 49 | e 12 56 | + 1 | — | — | — | — |

Additional readings:—

Wellington PPZ = +4m.47s., iZ = +5m.42s., P_cP = +8m.20s.

Riverview eNZ = +5m.7s., eZ = +9m.7s., SS?Z = +9m.21s.

Long waves were also recorded at Bombay, Berkeley, Bozeman, Kew, and De Bilt.

Nov. 23d. Readings also at 0h. (Haiwee, Mount Wilson, Pasadena (2), Palomar, Riverside (2), Tinemaha (2), Tucson, Riverview, Medan, and Stuttgart (2)), 1h. (Berkeley and Tinemaha), 5h. (near Bucharest and Sofia), 6h. (Triest), 9h. and 10h. (near Stuttgart), 12h. (La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Frunse, near Tashkent, and near Stuttgart), 21h. (Bombay, Calcutta, and Vera Cruz), 22h. (Oaxaca, Mount Wilson, Pasadena, and near Branner), 23h. (La Paz).

Nov. 24d. 0h. 53m. 57s. Epicentre $38^{\circ}2N$. $1^{\circ}7W$.

Intensity V at Cehegin, Calasparra; IV at Cieza, Mula, Caravaca; III at Elche de la Sierra, Ceuti, Hellin; II at Totana, Robledo, Alcaraz. Epicentre $38^{\circ}13'N$. $1^{\circ}45'W$. Radius of macroseismic area = 60km. Maximum intensity 5.5.

A. Rey Pastor.

Estudio sismotectónico de la Region Sureste de España, Madrid, 1951, macroseismic chart Fig. 19.

$$A = +.7875, B = -.0234, C = +.6159; \quad \delta = +4; \quad h = -1;$$

$$D = -.030, E = -1.000; \quad G = +.616, H = -.018, K = -.788.$$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|------------|------------|---------------------|------|--------|------------------|-----------------------|----|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Almeria | 1.5 | 204 | 1 0 29 | + 1 | 0 49 | 0 | 0 32 P _r | — |
| Granada | 1.8 | 236 | 1 0 31 _a | - 1 | 1 0 55 | - 1 | 1 0 37 P _r | — |
| Toledo | 2.5 | 313 | 1 0 43 | 0 | e 1 16 | + 2 | — | — |
| San Fernando | 4.0 | 245 | — | — | e 2 30 | S _r * | — | — |
| Coimbra | 5.6 | 294 | 2 18 | ? | 2 53 | S* | — | — |
| Lisbon | 5.9 | 280 | 2 37 | +66 | 3 4 | S* | 3 14 S _r | — |

Additional readings:—

Granada P_r = +48s., S_r = +1m.5s. and +1m.8s.

Almeria P_r = +36s. and +43s., S_r = +53s. and +56s., PS = +1m.2s., S_r = +1m.14s. and +1m.32s.

Coimbra S = +3m.22s., S_r = +4m.13s.

Lisbon S* = +3m.7s., Z = +3m.44s.

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Nov. 24d. 16h. 37m. 36s. Epicentre 39°·0S. 51°·1E. (as given by Bombay).

A = +4893, B = +6064, C = -6268; $\delta = +1$; $h = -1$;
D = +779, E = -627; G = -394, H = -488, K = -779.

| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | | | |
|------------------|----------|-----|------|----|------|-------|------|------|-------|------|-----|------|-----|--------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | | | |
| Tananarive | 20.3 | 350 | 14 | 28 | -12 | 8 | 20 | -3 | 4 | 49 | PP | 10.1 | | |
| Colombo | E. 52.9 | 37 | 9 | 26 | +6 | 16 | 53 | +5 | | | | 23.4 | | |
| Kodalkanal | E. 54.8 | 33 | e 9 | 41 | +7 | i 17 | 24 | +10 | 20 | 58 | SS | 25.4 | | |
| Batavia | 59.8 | 72 | 10 | 39 | +30 | | | | | | | | | |
| Medan | 61.0 | 57 | 10 | 11 | -7 | 18 | 33 | -2 | | | | | | |
| Bombay | 61.1 | 24 | 1 | 10 | 17 | -1 | 18 | 34 | -3 | 1 | 25 | 38 | SSS | |
| Hyderabad | E. 61.7 | 30 | e 10 | 24 | +2 | 18 | 47 | +3 | | | | | | 29.6 |
| Calcutta | N. 70.4 | 37 | e 11 | 4 | -14 | i 20 | 5 | -25 | 1 | 12 | 2 | | PcP | |
| Ksara | 73.8 | 347 | e 11 | 39 | +1 | e 21 | 12 | +3 | | | | | | |
| Riverview | Z. 76.5 | 123 | 1 | 12 | 19a | +25 | | | | | | | | e 36.8 |
| Baku | 79.0 | 359 | 12 | 10 | +3 | 22 | 4 | -2 | | | | | | |
| Andijan | 81.7 | 16 | e 12 | 23 | +1 | | | | | | | | | |
| Tashkent | 81.7 | 14 | 12 | 25 | +3 | 22 | 34 | 0 | | | | | | |
| Christchurch | 82.3 | 142 | 23 | 11 | PS | | | | 1 | 28 | 32 | | SS | 39.4 |
| Wellington | 85.0 | 141 | 12 | 49 | +11 | 23 | 24 | +17 | | | | | | 41.4 |
| Arapuni | 87.9 | 139 | e 18 | 36 | PPP | | | | | | | | | 40.9 |
| Almeria | 90.2 | 319 | 1 | 12 | 57 | -7 | 23 | 27 | [-7] | 13 | 13 | | pP | 45.4 |
| Triest | 90.7 | 335 | i 23 | 39 | S | (i 23 | 39) | [+2] | e 29 | 51 | | | SS | e 50.9 |
| Granada | 91.0 | 318 | 1 | 13 | 4k | -3 | i 24 | 5 | +2 | 16 | 51 | | PP | e 45.6 |
| San Fernando | 91.8 | 316 | | | | | e 30 | 8 | SS | | | | | 44.4 |
| Toledo | 93.3 | 320 | 1 | 13 | 17 | -1 | e 24 | 26 | +2 | e 17 | 7 | | PP | |
| Warsaw | 94.6 | 341 | | | | | e 24 | 6 | [+7] | e 26 | 8 | | PPS | e 47.4 |
| Clermont-Ferrand | 94.7 | 327 | e 14 | 25 | +61 | | | | | | | | | e 45.4 |
| Lisbon | 95.0 | 316 | | | | | 30 | 55 | SS | | | | | 46.9 |
| Coimbra | 95.8 | 318 | e 12 | 14 | ? | | 22 | 56 | ? | 31 | 24 | | SS | e 47.4 |
| Sverdlovsk | 95.8 | 5 | 1 | 13 | 34 | +5 | e 24 | 8 | [+3] | 17 | 28 | | PP | |
| Uccle | 98.4 | 331 | | | | | e 24 | 17 | [-2] | e 26 | 23 | | PS | e 42.4 |
| De Bilt | 99.1 | 333 | | | | | e 26 | 24 | PS | e 31 | 54 | | SS | e 45.4 |
| Kew | 100.7 | 329 | | | | | e 26 | 54 | PS | e 32 | 20 | | SS | e 48.4 |
| Irkutsk | 102.0 | 31 | | | | | 24 | 37 | [0] | 27 | 5 | | PS | |
| Upsala | 102.3 | 343 | | | | | e 27 | 24? | PS | | | | | e 50.4 |
| Huancayo | 108.8 | 236 | | | | | e 28 | 36 | PS | e 34 | 31 | | SS | e 49.1 |
| Fordham | 138.4 | 291 | e 25 | 30 | PPP | | | | | | | | | |
| Ottawa | 140.7 | 297 | e 19 | 36 | [+4] | | | | | e 23 | 24? | | PKS | 68.4 |
| St. Louis | Z. 150.0 | 281 | 1 | 19 | 44 | [-3] | | | | | | | | |
| Tucson | 163.9 | 251 | 1 | 20 | 13 | [+8] | | | | | | | | |
| Palomar | Z. 168.8 | 244 | e 20 | 17 | [+9] | | | | | | | | | |
| Riverside | Z. 169.5 | 245 | e 20 | 16 | [+7] | | | | | e 25 | 20 | | PP | |
| Pasadena | 170.1 | 243 | 1 | 20 | 18 | [+9] | | | | 1 | 25 | 17 | PP | e 88.5 |
| Haiwee | Z. 170.9 | 254 | e 20 | 19 | [+9] | | | | | | | | | |
| Tinemaha | Z. 171.4 | 259 | e 20 | 17 | [+7] | | | | | | | | | |

Additional readings:—

Tananarive SS = +9m.6s.
 Batavia ePZ = +10m.54s.
 Calcutta ePSN = +20m.35s., ISSN = +24m.29s.
 Christchurch Q = +35m.59s.
 Wellington iZ = +13m.24s., +13m.45s., +14m.48s., PP? = +16m.40s.
 Almeria PP = +16m.42s., PPP = +18m.42s., iS = +23m.55s., PS = +25m.20s., PPS = +25m.49s., SS = +29m.57s., SSS = +33m.33s.
 Granada PPS = +25m.37s.
 Warsaw eE = +24m.38s., eN = +24m.51s., eZ = +26m.11s., eE = +26m.28s.
 Lisbon N = +30m.59s.
 Coimbra PP = +15m.15s., SS = +28m.44s.
 Sverdlovsk eS = +24m.48s.
 Uccle eSE = +25m.13s., ISSN = +31m.52s.
 Irkutsk SSS = +36m.36s.
 Tucson e = +21m.3s., +24m.48s. and +28m.36s.
 Long waves were also recorded at Algiers, Potsdam, Bozeman, Salt Lake City, Ukiah and Berkeley.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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November 24d. 21h. 46m. 18s. Epicentre 28°·2S. 177°·7W. (as on 1939 March 23d.).
Pasadena suggests depth = 75km.

A = -·8819, B = -·0354, C = -·4701; $\delta = -1$; $h = +2$;
D = -·040, E = +·999; G = +·470, H = +·019, K = -·883.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|--------------------|----|----------|-----|----------------------|------|---------|-------|---------|------------------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Arapuni | | 11·3 | 208 | 2 42 | - 4 | 4 48 | - 6 | 10 42 | P _c S | 5·4 |
| Tual | | 11·4 | 201 | 2 38 | - 9 | 4 35 | -21 | 15 44 | S _c S | 5·1 |
| New Plymouth | | 12·8 | 210 | 3 7 | + 1 | 5 20 | -10 | 3 32 | pP | — |
| Wellington | | 14·3 | 203 | 3 28 | + 2 | 5 39 | -27 | 3 54 | pP | 7·7 |
| Apia | | 15·3 | 22 | 1 3 39 | 0 | 1 6 16 | -14 | — | — | — |
| Christchurch | | 17·0 | 204 | 4 5 ^k | + 4 | 6 51 | -19 | 7 14 | Q | 7·9 |
| Brisbane | E. | 25·9 | 265 | 1 5 32 | - 3 | 1 9 56 | - 8 | — | — | i 12·7 |
| | N. | 25·9 | 265 | 1 5 35 | 0 | e 10 35 | +31 | — | — | — |
| Riverview | | 27·1 | 250 | 1 5 47 ^a | + 1 | 1 10 21 | - 3 | 1 6 50 | PPP | e 12·4 |
| Sydney | | 27·1 | 250 | e 5 45 | - 1 | e 11 39 | SS | e 7 0 | PPP | e 14·2 |
| Adelaide | | 37·6 | 248 | 1 8 7 | +49 | 1 13 3 | - 5 | 8 26 | PP | — |
| Honolulu | | 52·8 | 24 | e 9 20 | + 1 | 1 16 49 | + 2 | e 11 38 | PP | e 24·7 |
| Manila | | 73·0 | 297 | 1 11 32 | - 1 | 1 20 23 | -37 | — | — | — |
| Batavia | | 74·3 | 272 | 1 11 46 | + 5 | 1 21 18 | + 3 | — | — | 31·7 |
| Gihu | | 76·5 | 324 | 11 54 | 0 | 21 26 | -13 | — | — | — |
| Nagano | | 76·7 | 325 | 11 57 | + 2 | — | — | — | — | — |
| Kôbe | | 76·8 | 322 | 1 11 55 | 0 | 21 38 | - 4 | — | — | — |
| Kôti | | 76·9 | 319 | e 11 54 | - 2 | 21 43 | 0 | — | — | — |
| Mizusawa | N. | 77·2 | 329 | — | — | 21 17 | -30 | — | — | 33·0 |
| Hamada | | 78·7 | 319 | 12 6 | 0 | 22 3 | 0 | — | — | — |
| Hukuoka | | 78·7 | 318 | e 12 11 | + 5 | — | — | — | — | — |
| Sapporo | | 80·3 | 331 | 12 15 | + 1 | — | — | — | — | — |
| Santa Barbara | | 83·0 | 45 | e 12 27 | - 1 | — | — | — | — | — |
| Branner | | 83·5 | 42 | 1 12 32 | + 1 | e 22 51 | - 1 | — | — | e 38·9 |
| La Jolla | | 83·6 | 47 | e 12 29 | - 2 | — | — | — | — | — |
| Santa Clara | | 83·6 | 42 | e 12 34 | + 3 | e 22 52 | - 1 | — | — | e 38·3 |
| Berkeley | | 83·8 | 42 | 1 12 31 | - 1 | 1 22 49 | - 6 | 1 23 51 | PS | e 38·0 |
| Pasadena | | 83·8 | 46 | 1 12 29 ^a | - 3 | e 22 39 | -16 | 1 12 49 | pP | e 37·7 |
| Mount Wilson | | 83·9 | 46 | e 12 32 | - 1 | e 22 51 | - 5 | — | — | — |
| Palomar | z. | 84·1 | 47 | 1 12 30 ^a | - 4 | — | — | 1 12 52 | pP | — |
| Ukiah | | 84·1 | 40 | e 12 32 | - 2 | e 22 52 | - 6 | e 28 30 | SS | e 35·0 |
| Riverside | | 84·2 | 46 | 1 12 31 | - 3 | e 22 57 | - 2 | — | — | — |
| Ferndale | E. | 84·5 | 38 | e 12 56 | +20 | e 23 18 | +16 | — | — | — |
| | N. | 84·5 | 38 | e 12 46 | +10 | e 23 6 | + 4 | — | — | e 38·2 |
| Fresno | N. | 84·5 | 43 | 1 12 38 | + 2 | — | — | — | — | — |
| Haiwee | | 85·2 | 45 | 1 12 38 | - 1 | e 23 1 | [- 1] | e 38 48 | P'P' | — |
| Tinemaha | | 85·6 | 44 | 1 12 39 | - 2 | e 23 6 | [+ 1] | 1 38 48 | P'P' | — |
| Medan | | 86·1 | 277 | 12 41 | - 3 | 1 23 5 | [- 3] | — | — | e 41·7 |
| Tucson | | 87·5 | 51 | 1 12 48 | - 3 | e 23 28 | - 3 | 1 16 24 | PP | e 39·7 |
| Victoria | | 90·5 | 33 | 13 7 | + 2 | 24 7 | + 8 | 29 48 | SS | e 36·7 |
| Salt Lake City | | 91·8 | 44 | e 13 6 | - 5 | e 23 41 | [- 2] | e 17 11 | PP | e 43·0 |
| Logan | | 92·4 | 42 | 1 13 12 | - 2 | e 23 32 | [-14] | 16 53 | PP | i 43·5 |
| Butte | | 94·5 | 39 | — | — | e 23 50 | [- 8] | — | — | e 44·8 |
| Huancayo | | 95·0 | 106 | 1 13 23 | - 3 | 1 23 58 | [- 3] | e 17 18 | PP | e 44·2 |
| Bozeman | | 95·2 | 40 | e 13 25 | - 2 | e 23 59 | [- 3] | e 19 24 | PPP | e 44·3 |
| La Plata | | 95·3 | 135 | 13 20 | - 7 | 23 53 | [- 9] | 25 54 | PS | 34·5 |
| College | | 95·7 | 12 | e 13 22 | - 7 | e 23 57 | [- 8] | e 17 14 | PP | e 38·2 |
| La Paz | | 98·7 | 114 | 1 13 41 | - 1 | 1 24 16 | [- 4] | 1 25 30 | PS | 40·5 |
| Lincoln | | 101·7 | 50 | — | — | e 24 26 | [- 9] | — | — | e 40·0 |
| Calcutta | N. | 103·6 | 289 | e 13 7 | -57 | 1 24 53 | + 2 | e 17 10 | PP | e 48·0 |
| Colombo | E. | 104·2 | 270 | 17 39 | PP | 27 48 | PS | 33 19 | SS | 49·7 |
| Irkutsk | | 105·0 | 321 | e 14 7 | P | 24 24 | [-27] | 32 42 | SS | — |
| Florissant | | 105·2 | 54 | e 14 11 | P | e 24 47 | [- 5] | e 18 30 | PP | — |
| St. Louis | | 105·2 | 54 | 1 14 9 | P | 1 25 31 | -33 | e 17 25 | PKP | — |
| Chicago U.S.C.G.S. | | 108·3 | 52 | e 18 42 | PP | e 26 16 | S | e 33 50 | SS | e 45·2 |

Continued on next page.

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|----------------------|-------|----------------------|-------|--------------------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Columbia | 110.3 | 61 | e 18 52 | [+18] | e 25 4 | [- 9] | — | e 45.9 |
| Toronto | 114.6 | 51 | — | — | e 27 12 | {+35} | — | 54.7 |
| Georgetown | 114.9 | 57 | e 18 39 | [- 4] | e 25 26 | [- 6] | 19 42 | PP |
| Bombay | 115.5 | 279 | e 14 59 | P | 25 42 | {+ 8} | e 19 42 | PP |
| Tananarive | 115.9 | 228 | — | — | e 25 16 | [-19] | 29 43 | PS |
| Philadelphia | 116.6 | 57 | e 19 37 | PP | e 25 30 | [- 8] | e 29 29 | PS |
| San Juan | 117.1 | 82 | e 18 44 | [- 3] | i 25 33 | [- 7] | e 19 59 | PP |
| Ottawa | 117.6 | 50 | 18 44 | [- 4] | 25 42 | {+ 1} | 29 52 | PS |
| Fordham | 117.8 | 56 | e 18 49 | {+ 1} | e 25 14 | [-28] | e 20 2 | PP |
| Vermont | 119.1 | 52 | e 19 46 | PP | e 25 43 | [- 4] | e 29 47 | PS |
| Almata | 119.5 | 306 | 19 3 | {+11} | — | — | — | — |
| Seven Falls | 121.3 | 49 | 20 18 | PP | 25 48 | [- 6] | 30 12 | PS |
| Andijan | 122.3 | 302 | 18 57 | [0] | — | — | — | — |
| Bermuda | 122.7 | 68 | — | — | e 25 42 | [-17] | 30 32 | PS |
| Tashkent | 124.7 | 303 | 15 43 | P | 26 6 | {+ 1} | 30 42 | PS |
| Sverdlovsk | 130.4 | 323 | 19 8 | [- 5] | 32 7 | PS | 21 10 | PP |
| Baku | 139.3 | 301 | 19 19 | [-10] | 33 54 | PPS | — | — |
| Upsala | 146.7 | 346 | i 19 41 | [- 1] | — | — | 23 5 | PP |
| Bergen | z. 147.7 | 357 | i 19 43 | [- 1] | — | — | — | e 69.7 |
| Ksara | 150.8 | 289 | e 19 57 | {+ 8} | 36 59 | PPS | — | — |
| Copenhagen | 151.7 | 349 | i 19 48 _a | [- 2] | — | — | 23 34 | PP |
| Warsaw | 152.8 | 336 | i 19 49 | [- 2] | e 27 23 | {+26} | e 23 37 | PP |
| Potsdam | 154.6 | 345 | i 20 4 | {+10} | i 30 41 | [- 3] | i 23 49 | PP |
| Bucharest | 155.0 | 317 | e 19 12 | [-42] | e 34 16 | ? | e 23 17 | PP |
| De Bilt | 156.0 | 355 | i 19 54 _a | [- 2] | e 43 42 _? | SS | i 23 59 | PP |
| Jena | 156.2 | 344 | e 19 53 | [- 3] | e 30 42 | [-10] | e 23 56 | PP |
| Prague | 156.3 | 341 | e 24 24 | PP | — | — | — | — |
| Kew | 156.7 | 3 | i 19 54 _a | [- 2] | e 26 52 | [- 9] | i 20 12 | pPKP |
| Uccle | 157.5 | 359 | e 19 49 | [- 9] | i 30 56 | [- 3] | i 20 29 | pPKP |
| Sofia | 157.7 | 316 | e 19 59 | {+ 1} | i 45 42 _? | SSP | i 24 11 | PP |
| Belgrade | 158.0 | 323 | e 19 58 | [0] | e 24 14 | PP | — | e 50.6 |
| Stuttgart | 158.8 | 348 | e 19 55 | [- 4] | e 31 2 | [- 4] | e 24 13 | PP |
| Basle | 160.4 | 349 | e 19 59 | [- 2] | e 27 10 | {+ 5} | e 24 22 | PP |
| Triest | 160.4 | 336 | e 20 3 | {+ 2} | i 31 9 | [- 5] | i 24 20 | PP |
| Zurich | 160.4 | 349 | e 19 58 _k | [- 3] | — | — | e 24 23 | PP |
| Chur | 160.6 | 348 | e 19 58 | [- 3] | — | — | e 24 18 | PP |
| Neuchatel | 160.9 | 349 | e 19 59 | [- 3] | — | — | — | — |
| Milan | 161.9 | 345 | i 19 58 | [- 4] | — | — | — | — |
| Clermont-Ferrand | 162.5 | 359 | i 20 4 _k | {+ 1} | — | — | i 24 6 | PP |
| Coimbra | 165.1 | 34 | 20 3 | [- 3] | — | — | 24 57 | PP |
| Lisbon | 165.8 | 38 | i 20 5 | [- 2] | 45 38 | SS | 24 49 _? | PP |
| Toledo | 167.4 | 22 | i 20 5 | [- 3] | — | — | 21 14 | pPKP |
| San Fernando | 169.1 | 39 | e 20 8 | [- 1] | e 31 12 | [-46] | — | 80.7 |
| Granada | 169.9 | 27 | i 20 10 _k | {+ 1} | i 26 43 | [-28] | 20 28 | pPKP |
| Almeria | 170.5 | 23 | i 20 6 | [- 3] | 27 5 | [- 7] | 23 42 | PKS |
| Algiers | 171.4 | 357 | i 20 10 | [0] | e 32 6 | [- 4] | i 25 22 | PP |

Additional readings :—

Wellington iZ = +5m.19s., +6m.12s., +6m.32s., iP_cS = +12m. 10s., S_cS = +15m.42s.?
 Brisbane iS?E = +10m.30s.
 Riverview iZ = +5m.59s., iN = +8m.23s., eN = +10m.1s., iSN = +10m.25s., eZ = +10m.38s., iE = +10m.55s., iN = +11m.18s.
 Sydney e = +12m.48s. and +13m.30s.
 Adelaide iSS = +15m.55s.
 Honolulu i = +9m.56s., iS_cS = +19m.17s., e = +21m.35s.
 Branner eSN = +22m.54s.
 Berkeley iSKSZ = +22m.54s., eSN = +22m.59s.
 Pasadena IPPZ = +15m.44s., iSEN = +22m.49s., iPKKPZ = +30m.46s., ePKP,PKPZ = +38m.49s.
 Ukiah e = +16m.47s. and +23m.34s.
 Tinemaha i = +12m.42s., iPKKPZ = +29m.43s.
 Tucson e = +19m.17s., ePS = +24m.28s., eSS = +29m.41s.
 Salt Lake City iS = +24m.16s., e = +30m.17s.
 Logan SS = +25m.32s.
 Butte eS = +24m.34s., e = +28m.28s.
 Huancayo i = +14m.56s., +18m.8s., +24m.18s., iS = +24m.42s., ePS = +25m.49s., iSS = +31m.11s., e = +34m.5s., iSSS = +34m.52s., e = +37m.26s.
 Bozeman e = +22m.26s., eS = +24m.39s., ePS = +25m.55s., e = +26m.11s., eSS = +30m.56s.

Continued on next page.

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La Plata PPZ = +15m.30s., PPN = +15m.54s., PPPZ = +16m.48s., E = +25m.42s., SSS?E = +30m.30s.
 College eS = +24m.41s., ePS = +25m.59s.
 La Paz iZ = +18m.26s., iSKKS = +24m.32s., SSZ = +30m.22s.
 Calcutta ePPN = +19m.29s., eSKSN = +23m.39s., iPSN = +26m.13s., iPPSN = +26m.57s., iSSN = +31m.57s.
 Irkutsk PKP = +17m.53s.
 Florissant eZ = +18m.47s., eSKKSE = +25m.31s., eSSE = +33m.4s., eE = +34m.15s., eSSSE = +37m.47s.
 Chicago U.S.C,G.S. e = +27m.11s., and +29m.29s.
 Columbia e = +21m.58s., ePS = +28m.34s.
 Georgetown ePS = +29m.30s.
 Bombay ePKPEN = +17m.59s., SKKSEN = +27m.5s., iPS = +29m.25s., i = +30m.54s., SSEN = +36m.24s.
 Tananarive SKKS = +26m.37s., SS = +36m.22s.
 Philadelphia eSS = +35m.54s.
 San Juan iSKKS = +26m.45s., i = +27m.3s., ePS = +29m.37s., e = +30m.11s., eSS = +36m.2s.
 Ottawa SKKSE = +26m.54s., SN = +27m.55s., SS = +36m.6s.
 Fordham iSKKS = +26m.55s., ePS = +29m.54s., eSS = +36m.4s.,
 Vermont e = +29m.55s., eSS = +36m.39s.
 Seven Falls SS = +37m.24s., e = +45m.12s.
 Bermuda e = +27m.23s., +29m.16s., eSS = +37m.12s.
 Tashkent PKP = +19m.2s.
 Upsala PPE = +24m.37s., eN = +29m.45s., eSKSE = +30m.3s., eE = +33m.13s., eSSE = +41m.42s.?, eN = +47m.42s.
 Copenhagen i = +19m.55s.
 Warsaw eN = +21m.3s., eZ = +21m.17s., eN = +25m.36s., eZ = +33m.32s., eN = +33m.51s., eE = +38m.47s., eN = +38m.53s., and +52m.52s.
 Potsdam iPKP₂E = +20m.48s.
 Bucharest eN = +20m.13s., eE = +20m.23s. and +21m.1s.
 De Bilt iPKP₂ = +20m.24s., iZ = +32m.55s., ePSKS = +34m.22s., iPPS = +37m.26s., eSSS = +48m.42s.?
 Jena ePN = +19m.57s., ePE = +20m.0s., iZ = +20m.5s., +20m.21s., iN = +20m.25s., iE = +20m.29s., eZ = +24m.1s.
 Kew iPKP₂NZ = +20m.27s., iPKP₂Z = +20m.33s., ePKP₂Z = +20m.55s., iPPNZ = +24m.0s., ipPPNZ = +24m.22s., isPPNZ = +24m.42s., ePPPZ = +27m.40s., ipPPPZ = +28m.9s., eSKKSZ = +30m.18s., eSKSPNZ = +34m.20s., epPSZ = +35m.22s., esPPEN = +37m.22s., eSSEN = +43m.42s.?, eSSSN = +48m.42s.?, eSSSE = +50m.12s.
 Uccle i = +19m.55s., eSKPN = +23m.25s., iZ = +24m.4s.
 Sofia PKP₂EN = +20m.34s., iEN = +34m.32s.
 Belgrade i = +20m.32s.
 Stuttgart iPKP = +19m.58s., +20m.10s., iPKP₂ = +20m.36s., eZ = +21m.57s., eEN = +22m.2s., ePSKSN = +34m.37s., eSSN = +44m.26s.
 Basle i = +20m.42s.
 Trieste i = +34m.42s.?
 Zurich e = +20m.40s.
 Chur i = +20m.43s.
 Neuchatel i = +20m.44s.
 Clermont-Ferrand iPKP₂ = +20m.52s.
 Coimbra e = +20m.54s., +21m.7s., PKP₂ = +21m.21s., e = +22m.0s., ? = +28m.32s., PPP = +29m.2s., e = +34m.21s., SKKS = +35m.19s., e = +38m.56s., +40m.21s., SS = +47m.11s.
 Toledo PP = +25m.1s.
 Granada iPKP₂ = +21m.28s., pPKP₂ = +21m.43s., SKP = +23m.8s., pSKP = +23m.55s., iPP = +25m.16s., ipPP = +25m.38s., PPP = +29m.21s., pPPP = +29m.36s., sPPP = +30m.10s., SKKS = +31m.24s., pSKKS = +33m.21s., sSKKS = +34m.11s., SKSP = +35m.53s., iPPS = +39m.33s., eSS = +47m.54s.
 Almeria iPKP = +21m.30s., PP = +25m.16s., PPP = +29m.27s., SKKS = +32m.6s., PPS = +39m.20s., SS = +46m.7s., SSS = +52m.59s.
 Algiers iPKP₂ = +21m.14s., e = +35m.42s.
 Lisbon PKPN = +20m.14s., PKP₂E = +21m.19s., PKP₂Z = +21m.24s., PPZ = +24m.53s., Z = +30m.4s., +33m.41s.
 Long waves were also recorded at Harvard, Paris, Stonyhurst and East Machias.

November 24d. Readings also at 2h. (Balboa Heights), 7h. (Basle), 9h. (near Stuttgart), 10h. (near Ferndale, Tinemaha, Riverside, Berkeley, Branner and Pasadena), 11h. (Medan, Riverside, Pasadena, near Batavia, and near Stuttgart), 13h. (Mizusawa), 14h. (Toledo), 15h. (Spokane), 16h. (La Paz and Sofia), 17h. (Ksara and Mizusawa), 18h. (De Bilt and Uccle), 20h. (near Branner and near Batavia), 21h. (Bozeman), 23h. (La Paz).

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1941

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November 25d. 15h. 19m. 56s. Epicentre 36°·5N. 141°·6E. (as on 1940 January 3d.).

Intensity VI at Mito; V at Kakioka, Shirakawa, Hukusima; IV at Tyosi, Sendai, Tokyo, Maebasi; II-III at Kumagaya, Yokohama, Nagano, and Karuizawa. Epicentre 36°·4N. 141°·8E., shallow. Macroseismic radius 200-300 km. See Seismological Bulletin of the Central Meteorological Observatory, Japan, 1941. Tokyo 1950.

A = -·6315, B = +·5005, C = +·5922; $\delta = -1$; $h = 0$;
D = +·621, E = +·784; G = -·464, H = +·368, k = -·806.

| | Δ ° | Az. ° | P. | | O-C. s. | S. | | O-C. s. | Supp. | | L. m. |
|----------------------|---------------|----------|-----|-----------------|------------|-----|----|----------------|-------|----|----------|
| | | | m. | s. | | m. | s. | | m. | s. | |
| Mito | 0·9 | 263 | 0 | 20k | 0 | 0 | 27 | -7 | — | — | — |
| Tyosi | 1·0 | 218 | 0 | 18k | - | 0 | 29 | -7 | — | — | — |
| Kakioka | 1·2 | 257 | 0 | 23 | - | 0 | 35 | -6 | — | — | — |
| Tukubasan | 1·2 | 257 | 0 | 22k | - | 0 | 38 | -3 | — | — | — |
| Togane | 1·4 | 227 | 0 | 32 | + | 0 | 48 | +2 | — | — | — |
| Utunomiya | 1·4 | 272 | 0 | 26 | - | 0 | 44 | -2 | — | — | — |
| Hukusima | 1·5 | 324 | 0 | 31k | + | 0 | 51 | +2 | — | — | — |
| Tokyo Cen. Met. obs. | 1·7 | 242 | 0 | 29k | - | 0 | 48 | -6 | — | — | — |
| Tokyo Imp. Univ. | 1·7 | 242 | 0 | 29 | - | 0 | 50 | -4 | — | — | — |
| Komaba | 1·8 | 241 | 0 | 33 | + | 0 | 55 | -1 | — | — | — |
| Sendai | 1·8 | 343 | 0 | 35 _a | + | 1 | 2 | +6 | — | — | — |
| Mitaka | 1·9 | 243 | 0 | 32 | - | 0 | 57 | -2 | — | — | — |
| Yokohama | 1·9 | 236 | 0 | 34 | 0 | 1 | 1 | +2 | — | — | — |
| Kamakura | 2·0 | 235 | 0 | 32 | - | 0 | 51 | -11 | — | — | — |
| Maebasi | 2·0 | 267 | 0 | 37k | + | 1 | 2 | 0 | — | — | — |
| Mera | 2·1 | 222 | 0 | 38 | + | 0 | 58 | -6 | — | — | — |
| Kohu | 2·4 | 251 | 0 | 44 | + | 1 | 17 | +5 | — | — | — |
| Koyama | 2·4 | 242 | 0 | 32 | - | 1 | 3 | -9 | — | — | — |
| Hunatu | 2·5 | 246 | 0 | 41 | - | 1 | 19 | +5 | — | — | — |
| Osima | 2·6 | 226 | 0 | 40 | - | 1 | 9 | -8 | — | — | — |
| Misima | 2·6 | 237 | 0 | 44k | 0 | 1 | 22 | +5 | — | — | — |
| Mizusawa | 2·6 | 352 | i 0 | 46 | + | i 1 | 27 | S _s | — | — | — |
| Nagano | 2·7 | 273 | 0 | 48 | + | 1 | 23 | +4 | — | — | — |
| Susaki | 2·8 | 229 | 0 | 45 | - | 1 | 20 | -2 | — | — | — |
| Shizuoka | 3·0 | 239 | 0 | 49 | - | 1 | 25 | -2 | — | — | — |
| Miyako | 3·1 | 6 | 1 | 15 | +24 | — | — | — | — | — | — |
| Akita | 3·4 | 340 | 0 | 55k | 0 | 1 | 47 | S* | — | — | — |
| Hamamatu | 3·6 | 242 | 1 | 1k | + | 1 | 42 | 0 | — | — | — |
| Toyama | 3·6 | 275 | 1 | 0 _a | + | 1 | 54 | S* | — | — | — |
| Hatidyozima | 3·7 | 205 | 1 | 7 | P* | 1 | 42 | -3 | — | — | — |
| Wazima | 3·9 | 286 | 1 | 4 | + | 1 | 59 | S* | — | — | — |
| Hatinohe | 4·0 | 359 | 1 | 4 | 0 | 1 | 52 | 0 | — | — | — |
| Nagoya | 4·0 | 252 | 1 | 7 | + | 2 | 1 | S* | — | — | — |
| Gihu | 4·1 | 256 | 1 | 10 | + | 2 | 0 | +5 | — | — | — |
| Aomori | 4·4 | 352 | 1 | 16 | P* | 2 | 30 | S _s | — | — | — |
| Hikone | 4·5 | 256 | 1 | 14 | + | 2 | 19 | S* | — | — | — |
| Kameyama | 4·5 | 250 | 1 | 14 | + | 2 | 20 | S* | — | — | — |
| Kyoto | 5·0 | 254 | 1 | 16 | - | 2 | 18 | 0 | — | — | — |
| Owase | 5·0 | 244 | 1 | 20 | + | 2 | 34 | S* | — | — | — |
| Osaka | 5·3 | 252 | 1 | 25 | + | 2 | 45 | S* | — | — | — |
| Kôbe | 5·5 | 253 | 1 | 25 | 0 | 2 | 32 | +2 | — | — | — |
| Toyooka | 5·6 | 262 | 1 | 30 | + | 2 | 38 | +5 | — | — | — |
| Mori | 5·7 | 352 | 1 | 28 | 0 | 2 | 43 | +8 | — | — | — |
| Siomisaki | 5·7 | 242 | 1 | 29 | + | 3 | 4 | S _s | — | — | — |
| Wakayama | 5·7 | 248 | 1 | 24 | - | 2 | 41 | +6 | — | — | — |
| Sumoto | 5·9 | 250 | 1 | 26 | - | 3 | 3 | S* | — | — | — |
| Sapporo | 6·6 | 358 | 1 | 41 | 0 | 3 | 3 | -5 | — | — | — |
| Muroto | 6·9 | 244 | 1 | 43 | - | 3 | 43 | S _s | — | — | — |
| Nemuro | 7·5 | 23 | 1 | 52 | - | 3 | 19 | -1 | — | — | — |
| Matuyama | 7·7 | 253 | 1 | 52 | - | 4 | 1 | S* | — | — | — |

Continued on next page.

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1941

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|---------------|----------|-----|------|----|-------|------|----|----------------|-------|----|-----------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Hirosima | 7.8 | 257 | 1 | 2 | -56 | — | — | — | — | — | — |
| Hamada | 7.9 | 261 | 2 | 2 | + 3 | 4 | 2 | S* | — | — | — |
| Izuka | 9.4 | 256 | 2 | 18 | 0 | 5 | 2 | S _c | — | — | — |
| Hukuoka | 9.6 | 256 | 2 | 33 | PP | 5 | 12 | S _c | — | — | — |
| Kumamoto | 9.7 | 251 | 2 | 20 | - 2 | — | — | — | — | — | — |
| Unzendake | 10.1 | 251 | 2 | 30 | + 2 | 5 | 16 | ? | — | — | (5.3) |
| Husan | 10.3 | 266 | 2 | 32 | 0 | 5 | 15 | L | — | — | (5.3) |
| Kagosima | 10.4 | 245 | 2 | 24 | -10 | — | — | — | — | — | — |
| Taikyū | 10.5 | 270 | 2 | 35 | 0 | 6 | 2 | L | — | — | (6.0) |
| Yakusima | 11.1 | 240 | 2 | 39 | - 4 | 5 | 1 | SS | — | — | — |
| Keizyō | 11.8 | 280 | 2 | 53 | 0 | — | — | — | — | — | — |
| Zinsen | 12.0 | 279 | 2 | 53 | - 2 | 5 | 31 | SS | — | — | — |
| Nake | 13.0 | 236 | 2 | 54 | -15 | — | — | — | — | — | — |
| Naha | 15.7 | 233 | 3 | 49 | + 5 | — | — | — | — | — | — |
| Dairen | 16.0 | 284 | 3 | 28 | -20 | 6 | 15 | -31 | — | — | — |
| Irkutsk | 30.6 | 313 | 6 | 16 | - 2 | — | — | — | — | — | — |
| Calcutta | 47.8 | 269 | e 8 | 39 | - 2 | 1 | 15 | 29 | - 9 | — | e 22.8 |
| Almata | 49.0 | 300 | e 8 | 49 | - 1 | — | — | — | — | — | — |
| Medan | 51.3 | 241 | e 9 | 4? | - 4 | 16 | 14 | -12 | — | — | — |
| Andijan | 53.0 | 297 | e 9 | 18 | - 3 | — | — | — | — | — | — |
| Batavia | 53.5 | 225 | 9 | 25 | + 1 | 16 | 56 | - 1 | — | — | — |
| Agra | 54.0 | 279 | 9 | 15 | -13 | 16 | 53 | -10 | 17 | 12 | PS |
| Tashkent | 55.0 | 300 | 9 | 34 | - 1 | 17 | 19 | + 2 | — | — | — |
| Sverdlovsk | 55.6 | 319 | 1 | 9 | 38 | - 2 | 1 | 17 | 39 | PS | — |
| Bombay | 62.2 | 274 | 1 | 10 | 24 | - 2 | 1 | 19 | 10 | PS | — |
| Victoria | 66.7 | 48 | — | — | — | e 19 | 47 | + 1 | — | — | 44.1 |
| Baku | 68.7 | 305 | 11 | 8 | + 1 | 20 | 20 | +10 | — | — | — |
| Riverview | 70.5 | 171 | — | — | — | e 20 | 28 | - 4 | — | — | e 36.6 |
| Berkeley | 72.9 | 56 | — | — | — | i 20 | 58 | - 1 | — | — | e 30.2 |
| Bozeman | 75.3 | 44 | — | — | — | e 21 | 19 | - 7 | — | — | e 42.3 |
| Tinemaha | 76.0 | 54 | 1 | 11 | 50 | - 1 | — | — | — | — | — |
| Santa Barbara | 76.5 | 57 | e 11 | 58 | + 4 | — | — | — | — | — | — |
| Pasadena | 77.7 | 57 | e 12 | 2 | + 2 | e 22 | 37 | PS | — | — | e 36.0 |
| Mount Wilson | z. 77.8 | 57 | e 11 | 59 | - 2 | — | — | — | — | — | — |
| Riverside | z. 78.4 | 57 | e 12 | 11 | + 7 | — | — | — | — | — | — |
| Copenhagen | 78.5 | 334 | e 12 | 3 | - 1 | — | — | — | — | — | 40.1 |
| Palomar | z. 79.1 | 57 | e 12 | 19 | +11 | — | — | — | — | — | — |
| Jena | 82.5 | 331 | e 12 | 16 | -10 | — | — | — | — | — | e 46.1 |
| Sofia | 83.2 | 319 | e 12 | 4 | -25 | e 22 | 12 | -37 | — | — | — |
| Tucson | 83.8 | 54 | e 12 | 30 | - 2 | — | — | — | e 15 | 7 | PP e 40.2 |
| Stuttgart | 85.1 | 331 | 1 | 12 | 38k | - 1 | — | — | — | — | 46.1 |
| Uccle | 85.3 | 335 | e 12 | 50 | +10 | e 23 | 8 | - 2 | — | — | e 43.1 |
| Ottawa | 91.8 | 25 | e 13 | 4 | - 7 | — | — | — | — | — | 46.1 |
| Toledo | 97.7 | 334 | e 13 | 50 | +12 | — | — | — | — | — | 51.1 |
| Almeria | 99.8 | 331 | e 15 | 10 | ? | — | — | — | e 18 | 46 | PP 53.1 |
| La Paz | z. 147.0 | 61 | 19 | 47 | [+ 4] | — | — | — | — | — | 71.1 |

Additional readings:—

Batavia PN = +9m.30s.

Jena eZ = +12m.25s., +12m.35s., and +12m.41s., eEN = +13m.22s.

Tucson i = +13m.11s.

Stuttgart i = +12m.49s.

Uccle eN = +22m.12s.

Long waves were also recorded at San Fernando, Warsaw, Wellington, Potsdam, Kew, De Bilt, Stonyhurst, Upsala, Clermont-Ferrand, Arapuni and Auckland.

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1941

477

November 25d. 18h. 3m. 54s. Epicentre 37°·4N. 19°·0W.

Intensity VII at Madeira, VI in the Azores, and in Portugal, V in Casablanca, Berrechid, Mazagan, Safi, IV at Fedala, Ouled Saïd, Sidi Ben Nour, Mogador III at Port-Lyautey, Rabat, Mehdia, Ksiba and Marrakesh.

J. P. Rothé.

Chronique séismologique, Revue pour l'Etude de Calamités, tome VII, No. 21 Geneva, 1944, p.60. Epicentre 39°·8N. 18°·7W. (Strasbourg). Magnitude 8½.

J. Debrach.

Les tremblements de terre du 25 novembre et du 27 décembre 1941. Comptes-rendus des séances mensuelles de la Société des Sciences Naturelles du Maroc, Janvier 1942, p 6-9, Casablanca 1942. Note complémentaire sur les séismes du 25 novembre et du 27 décembre 1941. Comptes-rendus des séances mensuelles de la Société des Sciences Naturelles du Maroc 1942, No. 3, p. 24.

Di Filippo (D)

Il terremoto delle Azzorre del 25 Nov. 1941. (Annali di Geofisica Vol II, 1949, pp. 400-405). Carte macrosismique fig. 1, p. 401. Epicentre calculé 37°25'N., 19°01'W.

A = +·7530, B = -·2593, C = +·6048 ; δ = +3 ; h = -1 ;
D = -·326, E = -·946 ; G = +·572, H = -·197, K = -·796.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-------------------|------|-----|---------------------|------|---------------------|------|--------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Angra do Heroismo | 6·6 | 283 | i 1 40 | - 1 | 2 41 | -17 | — | — |
| Lisbon | 7·9 | 78 | 1 54 | - 5 | 3 17 | -13 | 2 15 | P* |
| Coimbra | 8·7 | 68 | i 2 3 | - 7 | i 3 30 | -20 | — | — |
| San Fernando | 10·3 | 92 | i 2 30 | - 2 | — | — | — | — |
| Toledo | 11·9 | 73 | i 2 49 | - 5 | 1 5 3 | - 6 | — | — |
| Granada | 12·2 | 86 | i 2 56 _k | - 2 | 1 5 0 | -16 | 3 3 | pP |
| Almeria | 13·2 | 88 | i 3 8 | - 3 | 1 5 39 | - 1 | 3 14 | pP |
| Algiers | 17·6 | 87 | 4 6 | - 2 | 7 23 | - 1 | — | — |
| Clermont-Ferrand | 18·5 | 57 | i 4 18 _a | - 1 | — | — | — | — |
| Oxford | 19·0 | 36 | i 4 20 | - 6 | — | — | — | — |
| Kew | 19·3 | 38 | i 4 6 _a | -23 | 1 7 24 | -38 | — | — |
| Paris | 19·3 | 47 | i 4 29 | 0 | 8 10 | + 8 | — | e 9·5 |
| Marseilles | 19·5 | 66 | i 4 35 | + 4 | 1 8 6 | 0 | 1 4 45 | PP |
| Stonyhurst | 20·0 | 29 | i 4 42 | + 5 | 1 8 42 _f | SS | — | — |
| Besançon | 20·9 | 55 | i 4 44 | - 2 | 1 8 39 | + 4 | — | — |
| Uccle | 21·3 | 45 | i 4 50 _a | 0 | 1 8 50 | + 7 | 1 5 22 | PPP |
| Neuchatel | 21·4 | 55 | i 4 52 | + 1 | e 10 2 | ? | — | — |
| Brig | 21·9 | 56 | e 5 4 | + 7 | e 9 3 | + 9 | — | — |
| Basle | 22·0 | 54 | i 4 58 | 0 | — | — | — | — |
| De Bilt | 22·4 | 41 | i 5 5 _a | + 3 | 1 9 6 | + 2 | — | — |
| Milan | 22·5 | 60 | i 5 4 | + 2 | 1 8 46 | -19 | — | — |
| Zurich | 22·6 | 55 | i 5 5 _a | + 2 | 1 9 12 | + 5 | — | e 11·8 |
| Aberdeen | 22·7 | 24 | i 5 2 | - 2 | 1 9 6 | - 3 | 1 5 22 | PP |
| Chur | 23·1 | 55 | i 5 10 | + 2 | 1 9 23 | + 7 | — | — |
| Ebingen | 23·1 | 54 | i 5 8 _a | 0 | 1 9 25 | + 9 | — | e 11·3 |
| Ravensburg | 23·3 | 55 | i 5 13 | + 3 | e 9 29 | + 9 | — | — |
| Stuttgart | 23·4 | 52 | i 5 12 _a | + 1 | e 9 4 | -17 | — | e 11·3 |
| Jena | 25·6 | 49 | i 5 32 | 0 | 1 10 6 | + 7 | — | e 12·1 |
| Triest | 25·7 | 60 | i 5 32 | - 1 | — | — | — | 12·1 |
| Potsdam | 26·9 | 46 | i 5 44 | - 1 | — | — | 6 48 | PPP |
| Prague | 27·0 | 51 | i 5 46 _a | + 1 | e 10 6 | -16 | — | e 11·1 |
| Bergen | 27·7 | 26 | i 5 49 | - 3 | 1 10 11 | -22 | — | e 13·1 |
| Copenhagen | 28·0 | 38 | i 5 53 _a | - 2 | 10 40 | + 2 | 11 15 | SS |
| Ivigtut | 30·0 | 331 | i 6 11 _k | - 1 | 1 11 14 | + 4 | — | — |
| Belgrade | 30·4 | 64 | i 6 15 _a | - 1 | 1 10 34 | -42 | 1 6 56 | PP |
| Warsaw | 31·6 | 49 | i 6 27 _a | + 1 | 1 12 17 | +42 | — | e 14·1 |
| Upsala | 32·4 | 34 | i 6 31 | - 3 | 11 38 | -10 | 7 51 | PPP |
| Sofia | 32·6 | 68 | e 6 37 | + 2 | 1 11 52 | + 1 | — | i 13·7 |
| Scoresby Sund | 33·2 | 357 | i 6 41 | + 1 | 1 12 3 | + 3 | — | i 14·5 |
| Halifax | 34·1 | 296 | 6 46 | - 2 | 12 4 | -10 | — | e 14·1 |

Continued on next page.

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1941

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|--------------------|----|----------|-----|----------------------|------|---------|------------------|---------|------------------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Bucharest | | 34.4 | 64 | i 6 53 _a | + 2 | i 12 19 | 0 | 8 0 | PP | — |
| East Machias | | 36.7 | 297 | i 7 11 | + 1 | i 12 33 | -21 | i 8 35 | PP | i 17.1 |
| Istanbul | | 37.0 | 69 | 7 20 | + 7 | 13 9 | +10 | 8 51 | PPP | e 23.1 |
| Bermuda | | 37.5 | 276 | i 7 27 | +10 | e 14 6 | +59 | i 15 46 | SS | — |
| Seven Falls | | 38.9 | 301 | 7 27 | - 2 | e 13 25 | - 3 | — | — | e 18.1 |
| Weston | | 39.9 | 294 | i 7 37 | 0 | i 13 32 | S _c P | — | — | — |
| Harvard | | 40.1 | 294 | i 7 38 | - 1 | i 13 44 | - 2 | — | — | — |
| Shawinigan Falls | | 40.3 | 301 | 7 43 | + 3 | 13 52 | + 3 | 9 42 | PPP | 19.1 |
| Vermont | | 40.9 | 297 | i 7 47 | + 1 | i 13 56 | - 2 | i 9 31 | PP | i 17.0 |
| Williamstown | | 41.2 | 295 | e 7 48 | 0 | e 13 57 | - 5 | i 9 57 | P _c P | e 19.8 |
| Fordham | | 42.1 | 292 | i 7 55 | 0 | i 14 1 | S _c P | i 9 28 | PP | — |
| Ottawa | | 42.5 | 300 | i 7 59 | 0 | i 14 20 | - 2 | 9 54 | PPP | e 20.1 |
| Philadelphia | | 43.3 | 291 | i 8 5 | 0 | 14 31 | - 2 | — | — | — |
| Ksara | | 44.2 | 79 | e 8 15 | + 3 | 14 52 | + 6 | — | — | — |
| Georgetown | | 45.0 | 291 | i 8 19 | 0 | i 15 5 | + 7 | i 10 6 | PP | — |
| San Juan | | 45.2 | 259 | i 8 20 | 0 | i 14 55 | - 6 | i 11 5 | PPP | i 21.4 |
| Toronto | | 45.4 | 298 | 8 22 | 0 | 15 3 | - 1 | 19 42 | SSS | 21.1 |
| Pittsburgh | | 46.7 | 294 | i 8 33 | + 1 | i 15 32 | +10 | — | — | — |
| Ann Arbor | | 48.9 | 297 | i 8 48 | - 2 | i 16 0 | + 7 | 10 48 | PP | — |
| Columbia | | 49.7 | 286 | i 8 55 | - 1 | i 16 4 | 0 | e 11 0 | PP | i 21.1 |
| Chicago U.S.C.G.S. | | 51.8 | 298 | i 9 11 | - 1 | i 16 31 | - 2 | e 11 24 | PP | 25.2 |
| Chicago J.S.A. | | 51.9 | 290 | i 9 10 | - 2 | i 16 45 | +10 | i 11 15 | PP | i 24.3 |
| Baku | | 52.5 | 65 | i 9 20 | + 3 | — | — | — | — | — |
| Sverdlovsk | | 54.3 | 42 | i 9 30 | 0 | — | — | — | — | — |
| Florissant | | 54.8 | 295 | i 9 32 | - 2 | i 17 12 | - 2 | i 17 27 | PS | — |
| St. Louis | | 54.8 | 295 | i 9 31 | - 3 | i 17 15 | + 1 | i 17 36 | PS | — |
| Mobile | | 56.4 | 286 | i 9 49 | + 4 | i 17 42 | + 6 | — | — | — |
| Lincoln | | 58.5 | 300 | i 9 56 | - 4 | i 18 7 | + 4 | i 11 56 | PP | i 28.6 |
| Saskatoon | | 60.2 | 315 | 10 17 | + 5 | i 18 42 | +17 | 12 32 | PP | e 27.1 |
| Balboa Heights | | 61.3 | 259 | e 10 21 | + 1 | e 18 43 | + 4 | — | — | — |
| Merida | N. | 62.5 | 276 | i 10 12 | -16 | — | — | — | — | — |
| Rio de Janeiro | E. | 64.2 | 205 | i 10 39 | 0 | i 19 18 | + 2 | — | — | i 25.4 |
| | N. | 64.2 | 205 | i 10 35 | - 4 | i 19 24 | + 8 | — | — | i 25.5 |
| Denver | | 64.7 | 301 | e 10 37 | - 5 | i 19 26 | + 4 | i 23 30 | SS | e 28.1 |
| Tashkent | | 65.4 | 56 | 10 46 | - 1 | — | — | — | — | — |
| Bozeman | | 65.7 | 310 | i 10 48 | 0 | e 19 2 | -32 | i 13 3 | PP | i 27.2 |
| Butte | | 66.5 | 311 | i 10 58 | + 4 | i 19 41 | - 3 | i 13 32 | PP | i 27.4 |
| Semipalatinsk | | 67.5 | 43 | i 11 16 | +16 | — | — | — | — | — |
| Andijan | | 67.7 | 56 | i 11 7 | + 6 | i 18 49 | -69 | — | — | — |
| Logan | | 68.1 | 307 | i 11 6 | + 2 | i 20 2 | - 1 | i 24 17 | SS | i 32.2 |
| Spokane | | 68.4 | 314 | i 11 5 | - 1 | e 20 5 | - 2 | i 13 40 | PP | — |
| Vera Cruz | Z. | 68.5 | 278 | i 11 13 | + 7 | — | — | — | — | — |
| Salt Lake City | | 68.7 | 309 | i 11 6 | - 1 | i 20 9 | - 1 | i 13 45 | PP | i 33.2 |
| Almata | | 69.3 | 51 | 11 16 | + 5 | — | — | — | — | — |
| Oaxaca | E. | 70.3 | 277 | i 11 4 | -13 | — | — | — | — | — |
| College | | 70.5 | 340 | i 11 21 | + 3 | i 20 32 | 0 | i 13 58 | PP | i 28.1 |
| La Paz | | 70.8 | 230 | i 11 21 _a | + 1 | i 20 36 | + 1 | 14 5 | PP | 33.6 |
| Tacubaya | N. | 70.9 | 280 | i 11 18 | - 3 | — | — | — | — | — |
| Seattle | | 71.2 | 316 | i 11 43 | +20 | e 20 35 | - 5 | i 21 19 | PS | 35.3 |
| Victoria | | 71.3 | 317 | 11 23 | 0 | 20 57 | +16 | 25 45 | SS | e 34.1 |
| Huancayo | | 72.2 | 239 | i 11 30 | + 1 | i 20 45 | - 6 | i 14 11 | PP | i 30.3 |
| Tucson | | 72.6 | 298 | i 11 30 | - 1 | i 20 38 | -18 | i 14 1 | PP | i 29.2 |
| Guadalajara | N. | 73.4 | 283 | e 11 18 | -18 | — | — | — | — | — |
| Mazatlan | N. | 74.3 | 287 | e 11 29 | -12 | — | — | — | — | — |
| Tinemaha | | 74.9 | 305 | i 11 45 | + 1 | — | — | — | — | — |
| Manzanillo | N. | 75.1 | 283 | e 11 33 | -13 | — | — | — | — | — |
| Haiwee | | 75.2 | 304 | i 11 47 | + 1 | — | — | — | — | — |
| Fresno | N. | 76.1 | 306 | i 11 51 | 0 | i 21 58 | +23 | — | — | — |
| Palomar | Z. | 76.1 | 301 | i 11 51 | 0 | — | — | — | — | — |
| Riverside | | 76.1 | 303 | i 11 51 | 0 | — | — | — | — | — |
| Mount Wilson | Z. | 76.3 | 303 | i 11 53 | + 1 | — | — | e 39 4 | P'P' | — |
| Pasadena | | 76.5 | 303 | i 11 54 _a | 0 | e 21 44 | + 5 | e 38 56 | P'P' | e 30.4 |
| Ferndale | E. | 76.6 | 311 | i 12 12 | +18 | i 21 46 | + 6 | — | — | e 36.6 |
| | N. | 76.6 | 311 | i 12 0 | + 6 | i 21 52 | +12 | — | — | e 35.6 |
| La Jolla | | 76.7 | 301 | i 11 56 | + 1 | — | — | — | — | — |

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------------|----|----------|-----|----------------------|------------------|---------|--------|---------|-----------------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Ukiah | | 76.8 | 309 | e 11 55 | 0 | e 21 48 | + 6 | i 14 39 | PP e 36.9 |
| Berkeley | | 77.0 | 307 | i 11 52 | - 4 | e 22 6 | +21 | e 14 34 | PP e 36.4 |
| Santa Clara | | 77.1 | 307 | i 11 57 | 0 | i 22 35 | PPS | — | e 38.7 |
| Branner | | 77.2 | 307 | e 11 59 | + 2 | e 21 54 | + 7 | — | e 39.2 |
| Johannesburg | | 77.2 | 138 | i 12 0 | + 3 | e 21 42 | - 5 | e 14 48 | PP 38.1 |
| Dehra Dun | N. | 77.3 | 62 | e 12 6 | + 8 | i 21 46 | - 2 | i 26 23 | SS i 33.6 |
| Santa Barbara | Z. | 77.3 | 303 | e 11 59 | + 1 | — | — | — | — |
| Irkutsk | | 78.0 | 32 | 12 3 | + 1 | — | — | — | — |
| Agra | | 79.2 | 64 | e 12 9 | + 1 | i 22 4 | - 4 | 12 24 | pP — |
| Bombay | | 80.2 | 74 | i 12 20 | + 6 | i 22 14 | - 5 | 15 6 | PP — |
| La Plata | E. | 80.5 | 212 | e 12 17 | + 2 | 22 18 | - 4 | 13 0 | P _c P 35.9 |
| | N. | 80.5 | 212 | e 12 15 | 0 | 22 6 | -16 | 13 0 | P _c P 35.4 |
| | Z. | 80.5 | 212 | 12 18 | + 3 | 22 18 | - 4 | 13 0 | P _c P 38.0 |
| Tananarive | | 84.0 | 119 | e 12 38 | + 4 | 23 2 | + 5 | 15 59 | PP 37.1 |
| Hyderabad | E. | 85.3 | 72 | 12 47 | + 7 | 22 54 | [- 9] | 16 3 | PP 40.4 |
| Calcutta | N. | 89.4 | 62 | i 13 0k | 0 | i 22 34 | [- 55] | i 16 24 | PP i 42.6 |
| Colombo | E. | 92.9 | 80 | 13 26 | +10 | 24 12 | - 8 | — | — 50.1 |
| Dalren | | 95.9 | 31 | 17 21 | PP | 27 50 | PPS | — | — |
| Sapporo | | 97.9 | 15 | e 13 44 | + 5 | 24 18 | [+ 2] | — | 39.6 |
| Mori | | 98.7 | 16 | 13 53 | +11 | i 24 45 | [+ 25] | i 17 16 | PP i 53.6 |
| Zinsen | | 99.0 | 28 | e 17 45 | PP | 27 15 | PPS | — | — |
| Akita | | 100.9 | 16 | 13 38 | -14 | 24 53 | [+ 21] | — | — |
| Mizusawa | E. | 101.7 | 16 | 18 11 | PP | 26 45 | PS | — | — |
| | N. | 101.7 | 16 | 18 6 | PP | e 26 33 | PS | — | — |
| Sendai | | 102.5 | 16 | e 14 2 | + 2 | 24 2 | [- 37] | — | — |
| Hukuoka | | 103.8 | 27 | e 18 35 | PP | 27 42 | PS | — | 33.3 |
| Matuyama | | 104.4 | 24 | e 14 37 | +29 | 26 23 | +26 | — | — |
| Osaka | | 104.5 | 22 | 14 10 | P | 25 34 | {+ 7} | — | — |
| Tokyo Cen. Met. Ob. | | 104.7 | 18 | e 14 33 | P | 26 22 | +22 | 18 7 | PP 60.9 |
| Yokohama | | 104.9 | 18 | e 13 32 | P | e 33 18 | SS | 18 25 | PP e 57.8 |
| Miyazaki | | 105.7 | 26 | 17 26 | ? | 27 56 | PS | 18 45 | PP 43.4 |
| Medan | | 109.4 | 70 | 14 2 | P | — | — | — | 45.1 |
| Honolulu | | 109.9 | 319 | e 18 59 | PP | i 25 23 | [+ 11] | i 28 38 | PS e 51.5 |
| Titizima | | 113.5 | 18 | 18 0 | [- 40] | — | — | — | — |
| Manila | | 116.1 | 45 | 19 54 | PP | — | — | — | — |
| Batavia | | 121.9 | 72 | 19 38 | [+ 42] | — | — | — | 50.1 |
| Palau | | 129.1 | 36 | 19 29 | [+ 19] | — | — | — | — |
| Amboina | | 135.0 | 50 | 19 33 | [+ 12] | e 32 15 | PS | i 22 22 | PP 39.1 |
| Perth | | 142.7 | 96 | 19 56 | [+ 21] | 34 6 | PS | — | — |
| Apia | | 146.2 | 306 | i 19 46 | [+ 5] | — | — | — | — |
| Adelaide | | 161.9 | 90 | i 20 36 | [+ 33] | 46 10 | SSP | 24 15 | PP 72.9 |
| Tuai | | 167.2 | 259 | 20 27 | [+ 19] | 46 6? | SS | 25 21 | PP — |
| Brisbane | | 168.1 | 36 | e 20 27 | [+ 19] | i 46 9 | SS | i 25 28 | PP — |
| Arapuni | | 168.4 | 262 | 20 6? | [- 2] | 32 24 | {+ 29} | 25 24 | PP 77.1 |
| Wellington | | 168.7 | 264 | 20 31 | [+ 23] | 27 48 | [+ 37] | 25 26 | PP 78.9 |
| Auckland | | 169.0 | 269 | 20 23? | [+ 14] | 27 51 | [+ 40] | 25 13 | PP 89.1 |
| Christchurch | | 169.3 | 232 | 20 22 | [+ 13] | i 32 3 | {+ 4} | 25 36 | PP — |
| New Plymouth | | 169.6 | 257 | 21 38 | PKP ₃ | 27 36 | [+ 25] | 25 9? | PP — |
| Riverview | | 171.2 | 69 | e 20 12 _a | [+ 2] | i 27 19 | [+ 7] | i 25 38 | PP e 70.2 |
| Sydney | | 171.3 | 69 | e 20 27 | [+ 17] | — | — | e 25 33 | PP e 83.6 |

Additional readings:—

Lisbon iN = +1m.59s., Z = +2m.4s.

Granada sS = +5m.28s.

Almeria P_cP = +9m.2s., P_cS = +12m.34s.

Marseilles iPPP = +4m.48s., i = +4m.54s., +4m.58s., +5m.11s., and +5m.20s.

Aberdeen iN = +5m.16s., +5m.46s., +8m.36s., +9m.21s., and +9m.41s.

Stuttgart iSE = +9m.29s., iSN = +9m.32s.

Potsdam NW = +9m.6s.?

Prague P = +5m.49s.

Belgrade iPPP = +7m.35s., i = +8m.43s., +9m.29s., iSS = +12m.25s.

Warsaw iPN = +6m.32s., iSSN = +12m.21s.

Upsala i = +7m.9s., SSN = +13m.9s., iE = +14m.1s., iN = +14m.7s.

Sofia iPEN = +6m.42s., iSEN = +11m.22s.

Bucharest iPEN = +6m.57s., iN = +7m.54s., P_cPN = +8m.32s., iN = +13m.20s.,

iSSN = +14m.26s.

Istanbul SS = +15m.41s., SSS = +20m.56s.

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Bermuda e = +8m.16s.
 Seven Falls e = +8m.3s.
 Shawinigan Falls SS = +16m.45s., SSS = +17m.43s.
 Vermont iSS = +16m.36s.
 Ottawa SS = +17m.15s., SSS = +18m.10s.
 Hamilton (Δ unknown), iP = +8m.26s., PPP = +10m.48s., iS = +15m.12s., SS = +18m.29s., eL = +21m.24s.
 Georgetown i = +8m.23s., iPPP = +10m.43s.
 Ann Arbor +19m.48s., i = +20m.54s.
 Columbia i = +9m.9s., e = +10m.40s., iSS = +19m.19s.
 Chicago U.S.C.G.S. e = +9m.28s., iSS = +20m.29s.
 Chicago J.S.A. i = +9m.15s., +9m.21s., +9m.38s., +11m.48s., and +16m.29s., ISS = +20m.13s., i = +22m.26s.
 Florissant iEZ = +9m.36s., iN = +9m.48s., +10m.0s., +10m.10s., +14m.4s., iSE = +17m.15s., iSPE = +17m.49s., eE = +20m.44s.
 St. Louis iN = +17m.11s., iE = +17m.25s., iSPE = +17m.48s.
 Lincoln iPPP = +13m.10s., iSS = +21m.49s.
 Saskatoon PPP = +14m.5s., SSN = +22m.36s.
 Denver iN = +18m.56s., iE = +19m.31s., iN = +23m.6s.
 Bozeman i = +11m.3s., +15m.9s., +19m.44s., +22m.42s., iSS = +23m.24s.
 Butte ePPP = +14m.52s., iSS = +24m.14s.
 Logan i = +11m.24s., eSSS = +27m.58s.
 Spokane iEN = +11m.10s., +11m.25s., +14m.15s., +14m.35s., eEN = +20m.18s., iEN = +20m.50s., eEN = +24m.15s., iSSSEN = +24m.58s., iN = +28m.15s.
 Salt Lake City iPPP = +15m.26s., i = +20m.40s., iSS = +24m.40s.
 College i = +16m.44s., iScS = +21m.15s., i = +22m.55s., +23m.53s., iSS = +24m.51s.
 La Paz PPPN = +15m.39s., iPSN = +21m.6s., iN = +21m.39s., iZ = +21m.49s., SSiN = +25m.1s.
 Seattle iSS = +25m.28s., eSSS = +28m.52s.
 Victoria SSS = +28m.42s.
 Huancayo i = +12m.19s., iScS = +21m.58s., i = +24m.12s.
 Tucson i = +13m.10s., iPPP = +16m.5s., i = +23m.24s., +25m.18s., iSS = +25m.56s., iSSS = +28m.39s.
 Fresno iPN = +11m.59s.
 Pasadena iPKP, PKPZ = +39m.37s.
 Ukiah i = +12m.35s., ePPP = +16m.32s., iS = 21m.58s., i = +22m.12s., and +22m.55s., iSS = +26m.23s., eSSS = +29m.50s.
 Berkeley ePNZ = +11m.56s., eN = +12m.42s., eE = +12m.59s., ePPE = +15m.6s., ePPPE = +16m.36s., eSN = +22m.24s.
 Branner eSE = +21m.59s.
 Johannesburg i?EN = +16m.48s., eS?E = +21m.54s., iSSSEN = +27m.6s.
 Dehra Dun i?N = +29m.6s.
 Agra iPEN = +12m.14s., iEN = +12m.39s., PPE = +15m.9s., pPPEN = +15m.28s., sSE = +22m.37s., i = +22m.54s., SSEN = +27m.0s., sSSSEN = +27m.50s.
 Bombay PSE = +23m.14s.
 La Plata E. +15m.12s., PP = +15m.54s., PPP = +18m.18s., +19m.12s., +22m.0s., +22m.36s., +25m.6s., +27m.36s., SS = +28m.18s.
 La Plata N +15m.24s., PP = +16m.0s., +17m.18s., PPP = +17m.54s., +18m.36s., +19m.18s., +21m.36s., +22m.54s., +25m.36s., SS = +27m.42s., SSS? = +30m.0s.
 La Plata Z = +12m.30s., +13m.12s., +15m.12s., PP = +16m.3s., PPP = +17m.54s., +21m.0s., SS = +27m.54s., +29m.48s., SSS = +31m.46s., +34m.54s.
 Tananarive P_cP = +12m.56s., iScS = +23m.18s., iPS = +23m.41s., i = +24m.7s., SS = +28m.44s.
 Hyderabad SE = +23m.1s., SSE = +28m.20s.
 Calcutta iSN = +23m.51s., ePSN = +24m.47s., iSSN = +29m.33s.
 Mori i = +39m.12s.
 Tokyo Cent. Met. Obs. PPP = +20m.12s., SKS = +23m.14s., SS = +33m.37s., SSS = +36m.50s.
 Yokohama e = +49m.13s.
 Medan eP?EN = +14m.43s.
 Honolulu iPPP = +21m.24s., i = +27m.8s., iSS = +34m.42s., i = +45m.45s.
 Amboina iEN = +35m.43s.
 Perth i = +32m.11s.
 Adelaide PKP₂ = +21m.49s., SKKS = +32m.26s., SKSP = +35m.55s., Q = +67m.48s.
 Tuai i = +20m.51s., +21m.3s., PPP = +29m.18s., e = +39m.6s.?
 Brisbane eE = +20m.34s., iN = +29m.45s., +32m.24s., eN = +35m.37s., eE = +35m.46s., +39m.7s., iN = +39m.32s., eN = +52m.5s., iE = +53m.6s., and +57m.52s.
 Arapuni PKP₂ = +21m.30s., i = +36m.6s., e = +40m.6s.?, i = +43m.36s., SS = +46m.6s., SSS = +51m.6s.?, i = +54m.24s., e = +58m.6s., Q = +71m.6s.
 Wellington i = +20m.35s., iZ = +21m.11s., PKP₂? = +21m.27s., iZ = +22m.34s., +26m.14s., i = +28m.26s., PPPZ = +29m.14s., iZ = +30m.26s., PPP?Z = +31m.24s., SKKS? = +32m.36s., i = +32m.53s., i = +33m.54s., +34m.42s., S_cSPKP? = +36m.43s., i = +40m.31s., +45m.12s., SS = +46m.16s., SSS? = +51m.43s., i = +54m.6s., +57m.6s.?, +62m.41s., Q = +71m.11s.
 Auckland i = +20m.45s., PKP₂ = +21m.16s., SS = +45m.46s.?, SSS? = +53m.6s.?, Q = +70m.6s.

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Christchurch PKP₁ = +21m.28s., PPP = +29m.22s., iN = +36m.52s., iE = +39m.12s., SS = +46m.43s.
 New Plymouth PPP = +29m.26s., e = +31m.46s., SS = +46m.6s.†.
 Riverview iPKPZ = +20m.20s., iPKP₁EN = +22m.7s., iZ = +22m.17s., iSKPN = +23m.59s., eN = +25m.19s., iEN = +26m.3s., iZ = +26m.8s., iE = +26m.28s., eE = +27m.40s., iN = +28m.16s., iE = +28m.26s., +28m.40s., iPPN = +29m.53s., iN = +30m.59s., iZ = +31m.29s., iN = +31m.42s., iE = +31m.53s., iSKKSE = +32m.35s., iN = +33m.11s., iE = +33m.50s., iN = +34m.6s., eN = +36m.12s., iPSKS?E = +36m.30s., iN = +37m.9s., iE = +39m.29s., eE = +45m.25s., iSSN = +46m.33s., eE = +46m.54s., eN = +48m.19s., iE = +49m.46s., iN = +50m.5s., iE = +50m.50s., iN = +51m.25s., eN = +51m.58s., eE = +53m.22s., iSSN = +54m.5s., iN = +56m.51s., +57m.43s., eE = +60m.44s., iN = +63m.36s. and +64m.20s.
 Sydney e = +36m.3s. and +54m.54s.
 Long waves were also recorded at Sitka

November 25d. Readings also at 1h. (La Paz), 11h. (La Paz), 12h. (Edinburgh and Andijan), 18h. (La Paz), 19h. (La Paz, Tinemaha, Mount Wilson, Riverside, Pasadena, near Branner, Stuttgart, Clermont-Ferrand and Tucson), 21h. (near Mizusawa), 22h. (Andijan).

Nov. 26d. 1h. 6m. 6s. Epicentre 37°·4N. 19°·0W. (as on 1941, Nov. 25d.).

A = +·7530, B = -·2593, C = +·6048; δ = +3; h = -1.

| | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. |
|------------------|------|-----|--------|--------|--------|--------|-----------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Lisbon | 7·9 | 78 | 1 55 | - 4 | 3 18 | -12 | 2 11 P* | — |
| Coimbra | 8·7 | 68 | e 2 28 | PPP | — | — | — | — |
| Toledo | 11·9 | 73 | i 2 50 | - 4 | 1 4 57 | -12 | — | 5·8 |
| Granada | 12·2 | 86 | i 3 23 | PPP | 1 5 29 | SS | 5 42 SSS | e 6·5 |
| Almeria | 13·2 | 88 | e 3 32 | PPP | e 5 47 | + 7 | — | 7·9 |
| Clermont-Ferrand | 18·5 | 57 | e 4 21 | + 2 | — | — | — | — |
| Uccle | 21·3 | 43 | 1 4 54 | + 4 | — | — | — | e 10·9 |
| Stuttgart | 23·4 | 52 | e 5 14 | + 3 | — | — | 1 5 40 PP | — |

Lisbon also gives +2m.0s., SE = +3m.14s.
 Long waves were also recorded at De Bilt and La Paz.

Nov. 26d. 8h. 23m. 10s. Epicentre 16°·3N. 98°·6W. (as on 1941, June 18d.).

A = -·1436, B = -·9496, C = +·2789; δ = +15; h = +5;
 D = -·989, E = +·150; G = -·042, H = -·276, K = -·960.

| | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. |
|---------------|---------|-----|--------|----------------|---------|--------|----------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Oaxaca | N. 1·9 | 68 | 0 32 | - 2 | — | — | — | — |
| Puebla | N. 2·8 | 8 | 0 49 | + 2 | — | — | — | — |
| Tacubaya | E. 3·1 | 350 | 0 53 | + 2 | — | — | — | — |
| Vera Cruz | Z. 3·7 | 39 | i 0 59 | - 1 | — | — | — | — |
| Manzanillo | N. 6·0 | 298 | — | — | i 2 45 | + 2 | — | — |
| Guadalajara | N. 6·3 | 315 | e 2 5 | P _z | — | — | — | — |
| Merida | E. 9·7 | 61 | i 3 40 | † | — | — | — | — |
| Tucson | 19·4 | 328 | 1 4 32 | + 2 | e 8 14 | +10 | e 5 8 PP | 1 10·4 |
| Florissant | 23·6 | 16 | e 5 7 | - 6 | e 9 21 | - 4 | i 6 6 PP | 1 10·9 |
| La Jolla | 23·6 | 318 | e 5 17 | + 4 | — | — | — | — |
| Palomar | Z. 23·7 | 321 | i 5 18 | + 4 | — | — | — | — |
| Riverside | Z. 24·4 | 321 | i 5 24 | + 3 | — | — | — | — |
| Mount Wilson | Z. 25·0 | 321 | i 5 29 | + 2 | — | — | — | — |
| Pasadena | 25·0 | 321 | i 5 30 | + 3 | e 10 12 | +23 | — | e 12·3 |
| Haiwee | 26·2 | 324 | e 5 39 | + 1 | — | — | — | — |
| Santa Barbara | Z. 26·2 | 319 | e 5 35 | - 3 | — | — | — | — |
| Tinemaha | 27·1 | 324 | e 5 45 | - 1 | — | — | — | — |
| San Juan | 31·0 | 80 | e 7 58 | PP | e 10 54 | -32 | — | e 15·4 |
| Huancayo | 36·4 | 139 | e 6 57 | -11 | e 12 44 | - 6 | — | e 15·7 |
| La Paz | Z. 44·3 | 135 | 8 12 | - 1 | — | — | — | 23·5 |

Tucson i = +5m.22s.
 Florissant eSN = +9m.25s.
 Pasadena eZ = +8m.59s.
 Long waves were also recorded at Mazatlan and other American stations.

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Nov. 26d. Readings also at 2h. (near Lick (2), Santa Clara and Branner), 11h. (Auckland, Santa Barbara, Haiwee, Tinemaha, Huancayo, La Paz, Riverview, Palomar, Riverside, Mount Wilson, and Pasadena), 13h. (Riverview), 14h. (La Jolla, Pasadena, Mount Wilson, Riverside, and Palomar), 17h. (Oaxaca), 18h. (Pasadena and Branner), 19h. (Ksara, Tashkent, and Tchimkent), 21h. (Oaxaca), 22h. (Oaxaca).

Nov. 27d. 8h. 37m. 34s. Epicentre 6°·6S. 121°·1E. Depth of focus 0·060.

Intensity III in the Minor Soenda Islands. Epicentre 6°·6S. 121°·1E. Depth 570km. (Batavia).

Meteorologische en Geophysische Dienst te Batavia, Serie A, No. 44, Aardbevingen in Ned-Indië waargenomen gedurende het jaar 1941, p. 25.

$$A = -.5132, B = +.8507, C = -.1142; \quad \delta = +11; \quad h = +6;$$

$$D = +.856, E = +.517; \quad G = +.059, H = -.098, K = -.993.$$

| | Δ | Az. | P. | | O-C. | | S. | | O-C. | | Supp. | | L. m. |
|----------------------|----------|-----|------|-----------------|-------|------|-----|-------|------|-----|-------|--------|----------|
| | | | m. | s. | s. | m. | s. | m. | s. | m. | s. | | |
| Amboina | 7·6 | 68 | i 1 | 56 | + 4 | i 3 | 34 | +14 | 13 | 57 | ScS | — | |
| Batavia | 14·2 | 271 | i 3 | 13 | + 7 | 5 | 42 | + 7 | — | — | — | — | |
| Medan | 24·6 | 295 | i 4 | 50 | + 4 | 8 | 34 | - 3 | — | — | — | — | |
| Perth | 25·7 | 190 | 4 | 51 | - 5 | i 8 | 42 | -12 | — | — | — | — | |
| Isigakizima | 30·9 | 6 | 4 | 54 | -48 | 9 | 18 | -58 | — | — | — | — | |
| Adelaide | 32·5 | 154 | i 5 | 48 | - 8 | i 10 | 43 | + 2 | i 12 | 56 | sS | i 13·2 | |
| Brisbane | 36·7 | 129 | i 6 | 25 | - 6 | e 11 | 26? | -18 | i 8 | 0 | PP | — | |
| Riverview | 38·8 | 139 | i 6 | 42 _a | - 6 | i 12 | 0 | -16 | i 8 | 17 | pP | 20·2 | |
| Sydney | 38·9 | 139 | e 6 | 56 | + 7 | i 12 | 11 | - 6 | — | — | — | — | |
| Miyazaki | 39·5 | 15 | 8 | 48 | PP | i 12 | 28 | + 2 | — | — | — | — | |
| Kumamoto | 40·2 | 13 | e 7 | 0 | 0 | 12 | 39 | + 3 | — | — | — | — | |
| Calcutta | N. 43·2 | 313 | i 7 | 32 _a | + 8 | i 13 | 22 | + 2 | e 8 | 54 | PP | — | |
| Osaka | 43·2 | 18 | 7 | 14 | -10 | 13 | 20 | 0 | — | — | — | — | |
| Colombo | E. 43·3 | 288 | 7 | 25 | + 1 | — | — | — | — | — | — | — | |
| Nagoya | 44·1 | 20 | 7 | 33 | + 2 | 13 | 28 | - 4 | — | — | — | — | |
| Yokohama | 45·3 | 21 | e 7 | 49 | + 9 | e 13 | 47 | - 2 | — | — | — | — | |
| Tokyo, Cen. Met. Ob. | 45·6 | 21 | e 8 | 21 | +38 | e 13 | 5 | -49 | — | — | — | — | |
| Nagano | 45·9 | 19 | e 7 | 48 | + 3 | 13 | 58 | 0 | — | — | — | — | |
| Kodaikanal | E. 46·6 | 292 | e 7 | 53 | + 3 | — | — | — | — | — | — | — | |
| Sendai | 48·3 | 21 | i 8 | 6 | + 3 | 14 | 33 | + 2 | — | — | — | — | |
| Hyderabad | E. 48·4 | 301 | 8 | 1 | - 3 | 14 | 5 | -27 | 9 | 20 | PP | 20·2 | |
| Mizusawa | 49·1 | 21 | e 8 | 4 | - 6 | 14 | 41 | - 1 | — | — | — | — | |
| Sapporo | 52·7 | 19 | 8 | 36 | 0 | 15 | 34 | + 3 | — | — | — | — | |
| Agra | E. 53·5 | 312 | 8 | 40 | - 2 | 15 | 35 | - 7 | 9 | 45 | pP | — | |
| Bombay | 53·9 | 300 | e 8 | 44 | - 1 | i 15 | 39 | - 8 | e 10 | 24 | pP | — | |
| Dehra Dun | N. 55·2 | 314 | e 8 | 45? | - 9 | e 15 | 54 | -10 | — | — | — | e 22·9 | |
| Auckland | 57·3 | 130 | 8 | 46 | -22 | 16 | 6 | -25 | 17 | 26 | sS | — | |
| Christchurch | 58·1 | 138 | 9 | 7 | - 7 | 16 | 26 | -16 | 10 | 49 | pP | — | |
| Arapuni | 58·3 | 131 | — | — | — | 16 | 38 | - 6 | — | — | — | — | |
| Wellington | 58·8 | 135 | 9 | 11 | - 8 | 16 | 33 | -17 | 9 | 58? | sP | 24·4 | |
| Tuai | 59·7 | 132 | 9 | 21 | - 4 | 16 | 44 | -18 | — | — | — | — | |
| Irkutsk | 60·4 | 349 | e 9 | 31 | + 2 | 16 | 58 | -13 | — | — | — | — | |
| Frunse | 64·8 | 324 | e 9 | 59 | + 1 | 18 | 9 | + 4 | — | — | — | — | |
| Stalinabad | 66·1 | 318 | e 10 | 7 | + 1 | 18 | 18 | - 2 | — | — | — | — | |
| Tashkent | 67·2 | 321 | 10 | 15 | + 2 | 18 | 34 | 0 | 12 | 3 | pP | — | |
| Tchimkent | 67·5 | 322 | i 10 | 17 | + 2 | i 18 | 38 | + 1 | — | — | — | — | |
| Tananarive | 72·4 | 253 | i 10 | 41 | - 3 | i 19 | 25 | - 8 | 20 | 0 | PS | 30·9 | |
| Sverdlovsk | 80·0 | 331 | i 11 | 25 | - 1 | i 20 | 48 | - 6 | 13 | 14 | pP | — | |
| Ksara | 89·7 | 304 | — | — | — | e 22 | 41 | +14 | — | — | — | — | |
| College | 96·4 | 25 | e 18 | 9 | PPP | e 23 | 18 | - 7 | — | — | — | e 45·2 | |
| Upsala | 102·4 | 329 | — | — | — | i 23 | 2 | [- 7] | i 26 | 49 | PS | — | |
| Copenhagen | 105·9 | 326 | e 17 | 34 | PKP | 26 | 26 | ? | — | — | — | — | |
| Bergen | E. 108·3 | 332 | — | — | — | e 33 | 26? | SS | — | — | — | — | |
| Stuttgart | 109·3 | 319 | e 18 | 38 | PP | e 28 | 0 | PS | — | — | — | — | |
| Zurich | 110·0 | 318 | i 17 | 41 _k | [- 2] | — | — | — | — | — | — | — | |

Continued on next page.

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1941

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----|----------|-----|----------|--------|----------|--------|--------------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Basel | | 110.6 | 318 | e 17 52 | [+ 8] | — | — | 21 16 PPP | — |
| De Bilt | | 111.0 | 323 | — | — | e 27 26? | PS | — | e 36.4 |
| Victoria | | 111.7 | 40 | e 19 38 | pPKP | 27 32 | PS | — | 34.4 |
| Ukiah | | 114.0 | 49 | e 17 52 | [+ 1] | e 23 53 | [- 5] | — | — |
| Berkeley | | 115.0 | 51 | e 17 51 | [- 2] | e 33 56 | SS | — | — |
| Branner | E. | 115.1 | 51 | e 17 52 | [- 11] | — | — | e 19 1 PP | — |
| Santa Barbara | | 117.7 | 54 | i 17 57 | [- 1] | — | — | — | — |
| Tinemaha | | 118.2 | 51 | e 14 33 | P | — | — | i 17 58 PKP | — |
| Haiwee | | 118.7 | 52 | e 14 33 | P | — | — | i 17 59 PKP | — |
| Pasadena | | 119.0 | 54 | e 14 35 | P | e 24 10 | [- 7] | i 17 59k PKP | — |
| Mount Wilson | | 119.1 | 54 | e 14 30 | P | — | — | i 17 59k PKP | — |
| Riverside | Z. | 119.7 | 54 | e 14 38 | P | — | — | i 18 0k PKP | — |
| La Jolla | | 120.0 | 55 | i 18 1 | [- 2] | e 31 49 | ? | — | — |
| Palomar | Z. | 120.2 | 54 | e 14 41 | P | — | — | i 18 1k PKP | — |
| Bozeman | | 120.6 | 39 | e 18 7 | [+ 3] | — | — | e 30 7 PS | e 40.4 |
| Toledo | | 120.9 | 312 | i 18 7 | [+ 2] | — | — | e 19 42 PP | — |
| Tucson | | 125.4 | 54 | e 18 10 | [- 3] | e 24 59 | [+ 22] | i 20 16 PP | e 43.7 |
| Chicago U.S.C.G.S. | | 136.7 | 32 | e 18 31 | [- 3] | — | — | e 22 11 PP | e 57.7 |
| Florissant | | 137.2 | 36 | e 18 26 | [- 9] | — | — | — | — |
| St. Louis | | 137.4 | 36 | i 18 20 | [- 16] | e 27 24 | SKKS | 21 24 PP | — |
| Seven Falls | | 138.4 | 12 | e 14 44 | P | — | — | — | 39.4 |
| Cape Girardeau | N. | 138.6 | 37 | e 18 29 | [- 9] | — | — | — | — |
| La Plata | N. | 138.7 | 181 | 18 32 | [- 6] | — | — | 21 26 PP | — |
| Ottawa | | 138.7 | 17 | e 18 28 | [- 10] | e 39 14 | SS | — | — |
| East Machias | | 141.3 | 9 | e 18 55 | [+ 12] | — | — | 40 29 SSP | 49.7 |
| Pittsburgh | | 141.4 | 25 | i 18 37 | [- 6] | e 24 15 | [- 55] | — | — |
| Harvard | | 142.5 | 14 | i 18 40 | [- 5] | — | — | — | — |
| Weston | | 142.7 | 14 | i 18 42 | [- 3] | — | — | — | — |
| Fordham | | 143.4 | 19 | i 18 43 | [- 3] | — | — | — | — |
| Philadelphia | | 143.7 | 20 | i 18 44 | [- 3] | e 25 54? | [+ 40] | — | — |
| Rio de Janeiro | E. | 146.9 | 208 | e 18 56 | [+ 3] | — | — | — | — |
| Merida | Z. | 147.0 | 61 | i 20 8 | [+ 75] | — | — | — | — |
| Bermuda | | 153.8 | 10 | e 19 12 | [+ 10] | — | — | e 23 8 PP | — |
| Huancayo | | 155.3 | 138 | i 19 4 | [0] | — | — | — | — |
| La Paz | | 155.3 | 158 | i 19 2 | [- 2] | 25 54 | [+ 25] | i 21 17 sPKP | 77.2 |
| Balboa Heights | | 159.4 | 80 | e 18 26? | [- 43] | — | — | — | — |
| San Juan | | 166.4 | 30 | e 19 17 | [+ 1] | e 26 11 | [+ 33] | e 24 14 PP | e 66.4 |

Additional readings:—

Batavia iS?EN = +5m.5s.
 Perth i = +7m.11s.
 Adelaide i = +7m.23s., SN = +10m.24s., i = +11m.23s.
 Brisbane iN = +11m.6s. and +14m.23s.
 Riverview eN = +9m.8s., iSE = +12m.3s., iZ = +12m.7s., iEN = +14m.31s., iZ = +14m.37s., isS?EN = +14m.44s., iEN = +15m.12s., iN = +16m.12s., +16m.49s., and +17m.29s.
 Calcutta iPcPN = +9m.55s., iSSN = +15m.48s., iScSN = +17m.48s.
 Hyderabad SSE = +17m.5s.
 Mizusawa ePE = +8m.11s.
 Agra E sP = +10m.20s., PP = +10m.57s., i = +12m.18s., ScP = +13m.20s., sS = +17m.39s., i = +18m.25s., SS = +19m.36s.
 Bombay iE = +8m.48s., iPE = +10m.45s., ePPN = +10m.49s., iScPE = +13m.20s., iSN = +15m.43s., eN = +15m.58s., +16m.37s., and +17m.42s., isSE = +18m.38s., iE = +19m.1s., iSSN = +19m.14s., isSE = +19m.18s., eE = +22m.24s., iE = +25m.9s.
 Auckland PcS = +14m.23s., SS = +20m.26s.
 Christchurch PPP = +11m.45s., PcSZ = +13m.49s., SS = +19m.20s.
 Wellington pPP?Z = +10m.44s., sPPZ = +10m.55s., iZ = +11m.43s., +12m.11s., +12m.58s., +16m.46s., +18m.41s., and +20m.6s., SS = +20m.26s.
 Tashkent sS = +21m.39s.
 Tananarive EN = +22m.27s., SS = +23m.52s.
 Sverdlovsk isS = +24m.1s.
 College eSKS = +24m.43s., ePS = +27m.51s., eSS = +32m.58s.
 Upsala eN = +29m.26s.?, eE = +30m.2s.
 Stuttgart e = +18m.46s.
 Victoria eE = +30m.45s.
 Ukiah ePS = +27m.43s.
 Berkeley eN = +17m.54s., iN = +18m.56s. and +25m.11s., eE = +27m.51s., iPSZ = +27m.56s., iE = +32m.26s.

Continued on next page.

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Branner ePPN = +19m.6s.
 Tinemaha iZ = +28m.15s.
 Haiwee iPKKPZ = +28m.16s., eSKKPZ = +32m.7s.
 Pasadena iPEZ = +19m.29s., eEN = +25m.38s., ePKKPZ = +28m.13s., eSKKPZ = +31m.47s.
 Mount Wilson iPKKPZ = +28m.15s., eSKKPZ = +32m.1s.
 Riverside ePKKPZ = +28m.12s., eSKKPZ = +31m.51s.
 La Jolla iPKKPZ = +28m.12s.
 Palomar ePKKPZ = +28m.8s., iSKKPZ = +32m.4s.
 Bozeman e = +30m.7s., eSS = +32m.59s.
 Tucson e = +17m.55s., iPPP = +21m.54s., e = +23m.9s., eSKKS = +25m.59s., e = +30m.54s. and +31m.19s., eSS = +34m.19s., eSSS = +39m.12s.
 Chicago USCGS e = +24m.1s. and +33m.15s.
 Florissant iZ = +18m.33s., iPKPZ = +18m.37s., iZ = +21m.33s., iSKPZ = +21m.27s., eEN = +22m.7s., iPPEN = +22m.11s., eE = +24m.0s., ePPPN = +24m.4s., iSN = +27m.29s., iPPSZ = +30m.41s.
 St. Louis iZ = +18m.30s., iNZ = +22m.3s., eN = +23m.2s., iN = +27m.27s.
 Seven Falls e = +22m.8s.
 Cape Girardeau eN = +23m.7s., iN = +23m.13s., eN = +27m.32s.
 La Plata PKS?N = +22m.8s., PPPN = +27m.26s.
 Ottawa e = +22m.16s., eN = +24m.6s., e = +33m.26s. ?
 East Machias eSKS = +27m.57s.
 Fordham i = +20m.45s., +22m.9s., and +28m.8s., e = +35m.11s. and +39m.53s.
 Philadelphia i = +18m.48s. and +18m.56s., e = +19m.37s., e = +28m.0s., +28m.6s., and +33m.56s., eSS = +36m.59s.
 Bermuda e = +32m.46s., ePPS = +35m.56s., e = +41m.41s.
 Huancayo i = +21m.12s.
 La Paz iZ = +19m.8s., +20m.59s., and +22m.14s., iPP?Z = +22m.30s., SSZ = 42m.53s., SSS = +49m.40s., SSSS = +55m.24s.
 San Juan eSS = +43m.58s.
 Long waves were also recorded at Kew.

Nov. 27d. Readings also at 2h. (near Balboa Heights), 9h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Haiwee, Palomar, and near Medan), 12h. (Medan), 13h. (Auckland and Berkeley), 15h. (near Branner and Lick), 19h. (Pasadena, Mount Wilson, Riverside, Tinemaha, and Haiwee), 20h. (near Medan), 22h. (Balboa Heights), 23h. (Mizusawa, Bombay, Pasadena, Mount Wilson, Riverside, Tinemaha, Haiwee, and Palomar).

Nov. 28d. 12h. 23m. 29s. Epicentre 37°·0N. 70°·5E. Depth of focus 0·030.
 (as on 1940, Feb. 2d.).

Intensity VIII at Srinagar; VII at Kabul; VI at Peshawar, Chakdara, Cherat; IV at Lahore. Epicentre Hindu-Kouch 37°·0N., 70°·7E. (Bombay). See Government of India Seismological Bulletin for 1941, p. 86.

A = +·2672, B = +·7547, C = +·5992; $\delta = +1$; $h = -1$;
 D = +·943, E = -·334; G = +·200, H = +·565, K = -·801.

| | | Δ | Az. | P. | | O-C. | | S. | | O-C. | | Supp. | | L. |
|---------------|----|----------|-----|-----|-----|------|------|----|-----|------|----|-------|----------------|------|
| | | | | m. | s. | s. | m. | s. | s. | m. | s. | | | |
| Andijan | | 4·0 | 20 | i 1 | 7 | + 4 | — | — | — | — | — | 1 18 | P _e | — |
| Tashkent | | 4·4 | 351 | i 1 | 3 | - 5 | i 2 | 0 | - 1 | — | — | — | — | — |
| Almata | | 8·0 | 36 | 1 | 57 | + 3 | — | — | — | — | — | — | — | — |
| Dehra Dun | N. | 9·1 | 135 | e 1 | 49 | -19 | i 3 | 19 | -29 | — | — | — | — | — |
| Agra | | 11·7 | 145 | i 2 | 33 | - 8 | i 4 | 33 | -15 | 3 | 23 | sP | — | — |
| Semipalatinsk | | 15·1 | 24 | i 3 | 25 | + 1 | 6 | 21 | +16 | — | — | — | — | — |
| Baku | | 16·4 | 288 | 3 | 42 | + 3 | i 6 | 43 | + 9 | — | — | — | — | — |
| Bombay | | 18·2 | 174 | i 3 | 52k | - 7 | i 7 | 16 | + 5 | 1 | 4 | 46 | sP | — |
| Hyderabad | E. | 20·7 | 159 | 4 | 11 | -13 | 7 | 51 | - 6 | — | — | — | — | 9·8 |
| Calcutta | N. | 21·1 | 128 | i 4 | 23k | - 5 | i 8 | 3 | - 1 | e 4 | 36 | pP | — | — |
| Kodaikanal | E. | 27·4 | 165 | i 5 | 25k | - 2 | e 9 | 46 | - 3 | 6 | 9 | pP | — | — |
| Irkutsk | | 28·2 | 46 | 5 | 35 | + 1 | i 10 | 9 | + 7 | — | — | — | — | — |
| Ksara | | 28·3 | 273 | e 5 | 41 | + 6 | e 10 | 7 | + 4 | e 11 | 57 | SS | — | — |
| Colombo | E. | 31·2 | 162 | 7 | 2 | PP | 12 | 1 | ? | — | — | — | — | 14·5 |
| Helwan | Z. | 33·3 | 270 | i 6 | 14k | - 4 | — | — | — | — | — | — | — | — |

Continued on next page.

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1941

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| | Δ | Az. | P. | | O - C. | S. | | O - C. | Supp. | | L. |
|--------------|----------|-----|------|-----------------|--------|------|-----|--------|-------|----|------------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Warsaw | 37.6 | 311 | e 7 | 40 | +45 | e 12 | 31 | + 4 | e 15 | 8 | SS e 18.1 |
| Upsala | 40.4 | 322 | i 9 | 2 | PP | i 13 | 9 | 0 | i 16 | 9 | SS |
| Prague | 41.7 | 307 | e 9 | 49 | PPP | — | — | — | — | — | — |
| Medan | 42.1 | 135 | 7 | 37 | + 5 | 9 | 22 | PP | — | — | — |
| Potsdam | 42.5 | 311 | e 7 | 31 | - 4 | — | — | — | e 8 | 8 | pP |
| Copenhagen | 42.8 | 316 | e 7 | 37 | 0 | 13 | 49 | + 5 | 15 | 1 | sS |
| Jena | 43.5 | 308 | e 7 | 44 | + 1 | — | — | — | e 10 | 25 | PPP |
| Stuttgart | 45.3 | 305 | 1 7 | 56 _a | - 1 | i 17 | 31? | SS | i 8 | 45 | pP |
| Zurich | 45.9 | 304 | e 7 | 57 | - 5 | — | — | — | — | — | — |
| Basle | 46.6 | 303 | e 8 | 5 | - 2 | e 14 | 57 | +19 | — | — | — |
| De Bilt | 47.3 | 311 | — | — | — | i 14 | 53 | + 5 | — | — | e 18.5 |
| Uccle | 48.0 | 309 | e 9 | 19 | pP | e 15 | 1 | + 3 | e 19 | 7 | SSS e 28.7 |
| Kew | 50.8 | 311 | e 8 | 38 | - 1 | e 15 | 38 | + 1 | e 9 | 22 | PP e 25.5 |
| Tinemaha | z. 105.8 | 7 | e 18 | 11 | PP | — | — | — | — | — | — |
| Mount Wilson | z. 108.7 | 7 | e 18 | 32 | PP | — | — | — | — | — | — |
| Pasadena | z. 108.8 | 7 | e 17 | 13 | ? | e 27 | 29 | PS | e 18 | 17 | PKP |

Additional readings:—

Dehra Dun iN = +2m.38s.

Agra sS = +5m.40s.

Bombay ePPE = +4m.3s., iN = +4m.15s., iS = +7m.7s., iN = +7m.35s., iP_cPN = +7m.55s., ipP_cPN = +8m.43s., isP_cPE = +9m.4s., isP_cPN = +9m.7s., iE = +12m.43s.

Calcutta iSSN = +8m.24s., eP_cPN = +8m.41s., iS_cSN = +16m.3s.

Kodaikanal sPE = +6m.36s., sS = +11m.1s.

Helwan iZ = +7m.1s. and +7m.43s., eZ = +8m.46s.

Warsaw eN = +7m.52s., eE = +15m.16s. and +16m.34s., eN = +16m.51s., eE = +17m.12s., eN = +17m.25s.

Upsala eE = +14m.12s.

Medan iEN = +15m.11s.

Potsdam iZ = +8m.17s., +8m.20s., and +8m.59s., iEZ = +10m.23s., iN = +10m.39s., +11m.3s., and +11m.33s., iE = +12m.43s. and +14m.58s., iN = +16m.56s., iZ = +17m.32s., iE = +18m.3s., iN = +18m.7s., iZ = +18m.44s.

Copenhagen +16m.57s. and +17m.13s.

Jena eN = +7m.51s., eE = +8m.3s.

Stuttgart e = +10m.6s., +11m.29s., +12m.25s., and +21m.1s.

Kew ePPPZ = +11m.21s., eSSEZ = +20m.49s.

Nov. 28d. Readings also at 0h. (La Paz), 3h. (Copenhagen and near Sofia), 7h. (La Paz), 10h. (Haiwee, Pasadena, Mount Wilson, Tinemaha, and Palomar), 11h. (La Plata, Huancayo, and La Paz), 12h. (Lisbon, Stuttgart, and Coimbra), 14h. (Clermont-Ferrand, Granada, San Fernando, Almeria, Jena, Zurich, Basle, De Bilt, Uccle, Kew, Stuttgart, and Coimbra (2)), 17h. (near Mizusawa), 18h. (Riverside, Coimbra, Pasadena, Mount Wilson, Tinemaha, Palomar, and near Almata), 19h. (Harvard).

Nov. 29d. Readings at 0h. (La Paz and Branner), 1h. (Toledo, De Bilt, and Uccle), 3h. (Ksara), 22h. (Riverview).

Nov. 30d. Readings at 1h. (Pasadena, Palomar, La Jolla, Tinemaha, and near Apia), 4h. (Riverview, near Tashkent (2), Stalinabad, and Frunse), 13h. (La Paz), 18h. (Scoresby Sund), 19h. (Balboa Heights).

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1941

486

Dec. 1d. 19h. 56m. 20s. Epicentre 54°·3S. 57°·3W.

A = +·3167, B = -·4933, C = -·8102; $\delta = +7$; $h = -7$;
D = -·842, E = -·540; G = -·438, H = +·682, K = -·586.

| | | Δ | | Az. | | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|------------------|----------|----------|-----|------|-----|------------------|------|------|-------|------|------|-------|--------|------|
| | | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | s. | m. |
| La Plata | E. or z. | 19·4 | 359 | 4 | 32 | + 2 | 8 | 6 | + 2 | 5 | 52 | PP | 10·0 | |
| | N. | 19·4 | 359 | 1 | 4 | 28 | - 2 | 8 | 8 | + 4 | 4 | 44 | PP | 10·2 |
| Rio de Janeiro | | 33·1 | 25 | e 6 | 40 | 0 | e 12 | 1 | + 2 | — | — | — | e 15·8 | |
| La Paz | | 38·6 | 344 | 1 | 7 | 30k | + 4 | i 13 | 32 | + 9 | 9 | 1 | PP | 19·2 |
| Huancayo | | 44·5 | 335 | e 8 | 15 | 0 | e 14 | 34 | -17 | e 9 | 54 | PP | e 18·2 | |
| San Juan | | 72·8 | 352 | e 12 | 1 | +29 | e 20 | 47 | -11 | e 25 | 46 | SS | e 35·9 | |
| Christchurch | | 73·7 | 215 | 11 | 35 | - 3 | 21 | 22 | +14 | 31 | 2 | Q | — | |
| Wellington | | 74·9 | 217 | 11 | 45 | + 1 | 21 | 30 | + 8 | — | — | — | 34·7 | |
| Auckland | | 78·7 | 221 | — | — | — | 22 | 20 | +17 | 27 | 30 | SS | 39·7 | |
| Tananarive | | 83·2 | 112 | — | — | — | 22 | 37 | -12 | 23 | 4 | ? | 42·1 | |
| Bermuda | | 86·6 | 354 | e 18 | 13 | PPP | e 23 | 57 | PS | e 30 | 54 | ? | e 36·6 | |
| Riverview | | 88·9 | 203 | e 13 | 4 | + 6 | e 23 | 52 | + 8 | — | — | — | — | |
| Fordham | | 95·8 | 348 | — | — | — | i 24 | 5 | [0] | — | — | — | e 46·9 | |
| Florissant | | 97·0 | 334 | e 17 | 28 | PP | e 24 | 5 | [- 7] | 26 | 26 | PS | — | |
| Tucson | | 97·8 | 316 | e 13 | 39 | + 1 | e 26 | 35 | PS | e 17 | 43 | PP | e 48·2 | |
| Chicago | | 99·2 | 337 | — | — | — | e 24 | 19 | [- 4] | — | — | — | e 41·8 | |
| Seven Falls | | 101·7 | 351 | — | — | — | e 32 | 34? | SS | e 42 | 26? | Q | 48·7 | |
| Riverside | z. | 102·0 | 312 | e 17 | 39 | PKP | — | — | — | — | — | — | — | |
| Pasadena | z. | 102·5 | 312 | e 17 | 18 | PKP | — | — | — | — | — | — | e 50·8 | |
| Clermont-Ferrand | | 112·1 | 41 | — | — | — | e 29 | 1 | PS | — | — | — | e 53·8 | |
| Helwan | z. | 112·9 | 70 | 29 | 25 | PS | — | — | — | — | — | — | — | |
| Kew | | 115·6 | 35 | e 29 | 47 | PS | e 39 | 49 | SSS | — | — | — | e 63·7 | |
| Victoria | | 116·6 | 317 | — | — | — | e 30 | 16? | PPS | — | — | — | 64·7 | |
| Uccle | | 116·7 | 38 | — | — | — | e 25 | 16 | [-23] | e 29 | 47 | PS | e 53·7 | |
| De Bilt | | 118·1 | 38 | e 30 | 7 | PS | — | — | — | — | — | — | e 56·7 | |
| Bombay | E. | 128·2 | 113 | e 22 | 40? | PKS | — | — | — | — | — | — | — | |
| Tashkent | | 142·8 | 86 | 19 | 41 | [+ 6] | 29 | 45 | {+ 7} | 23 | 1 | PP | — | |
| Sverdlovsk | | 145·9 | 59 | i 19 | 40 | [- 1] | 36 | 1 | PPS | 23 | 11 | PP | — | |
| Frunse | | 146·8 | 89 | e 19 | 43 | [+ 1] | — | — | — | — | — | — | — | |
| Irkutsk | | 168·8 | 93 | e 21 | 26 | PKP ₂ | e 31 | 44 | {-13} | e 25 | 24 | PP | — | |

Additional readings:—

La Plata N = +8m.46s.

La Paz iN = +10m.8s., SS = +15m.47s., iN = +16m.13s.

Huancayo i = +8m.25s., eP_cP = +9m.48s., i = +14m.50s.

San Juan e = +15m.47s.

Auckland Q = +36m.0s.

Florissant iN = +24m.8s., eN = +24m.24s.

Tucson e = +13m.47s. and +16m.50s.

Helwan eZ = +29m.40s.

Kew eP_cPZ = +30m.14s., eSSS = +55m.10s.?, phases wrongly identified.

Uccle ePSEN = +28m.6s., ePPSE = +29m.50s., eSSEN = +36m.23s., eSSSE =

+39m.56s.

Irkutsk eS = +33m.7s., PS = +34m.59s.

Long waves were also recorded at other American and European stations.

Dec. 1d. Readings also at 2h. (Tucson and Tinemaha), 3h. (Tashkent and near Frunse), 5h. (Tucson, Haiwee, Mount Wilson, Palomar, Riverside, Tinemaha, Riverview, Bombay, Tashkent, Sverdlovsk, Batavia, and Medan), 6h. (near Frunse), 7h. (Scoresby Sund), 8h. (De Bilt), 15h. (La Paz), 16h. (near Mizusawa), 19h. (Almeria, Granada, near Coimbra, and near Apia), 21h. (Wellington).

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1941

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Dec. 2d. 5h. 2m. 56s. Epicentre $37^{\circ}5N$. $41^{\circ}0E$. (Epicentre given by Strasbourg).

$$A = +.6002, B = +.5218, C = +.6062; \quad \delta = -1; \quad h = -1; \\ D = +.656, E = -.754; \quad G = +.458, H = +.398, K = -.795.$$

| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|------------------|------------|------------|-----|-----|------|-----|-----|------|-------|-----|------------|
| | $^{\circ}$ | $^{\circ}$ | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Ksara | 5.6 | 230 | e 3 | 3 | S* | e 4 | 15 | L | — | — | (e 4.3) |
| Helwan | z. 11.1 | 229 | 2 | 46 | + 3 | 4 | 49 | 0 | 2 | 58 | PP |
| Bucharest | 13.2 | 306 | e 3 | 34? | PP | e 5 | 45 | + 5 | e 3 | 42 | PPP |
| Sofia | 14.4 | 296 | e 3 | 19 | - 8 | e 6 | 8 | - 1 | e 5 | 3 | ? |
| Warsaw | 20.3 | 323 | e 5 | 29 | PPP | e 8 | 32 | + 9 | e 5 | 39 | ? e 12.0 |
| Triest | 21.9 | 302 | e 7 | 31 | ? | — | — | — | — | — | — |
| Prague | 22.8 | 313 | e 7 | 52 | ? | — | — | — | — | — | — |
| Potsdam | 24.5 | 317 | e 5 | 52? | PP | — | — | — | 6 | 28? | PPP e 11.1 |
| Chur | 25.0 | 303 | e 5 | 27 | 0 | — | — | — | — | — | — |
| Stuttgart | 25.7 | 308 | e 5 | 42 | + 9 | — | — | — | i 6 | 1 | PP |
| Zurich | 25.7 | 304 | e 5 | 36 | + 3 | — | — | — | — | — | — |
| Basle | 26.4 | 304 | e 5 | 53 | +13 | — | — | — | — | — | — |
| Copenhagen | 26.5 | 324 | e 6 | 20 | PP | — | — | — | — | — | 13.1 |
| Uccle | 29.1 | 310 | e 6 | 4 | 0 | — | — | — | — | — | e 13.1 |
| Clermont-Ferrand | 29.3 | 298 | e 6 | 5 | - 1 | — | — | — | — | — | — |
| Toledo | 35.0 | 288 | e 6 | 46 | -10 | (12 | 54) | +26 | — | — | 12.9 |

Additional readings:—

Helwan iZ = +3m.14s., $P_ePZ = +8m.32s.$

Bucharest eE = +4m.39s., eS?E = +5m.53s.

Potsdam eE = +6m.33s.

Toledo PP = +7m.14s.

Long waves were also recorded at De Bilt, Upsala, and Kew.

Dec. 2d. Readings also at 1h. (Tucson, Mount Wilson, Riverside, and Palomar), 3h. (Tucson), 6h. (near Mizusawa), 7h. (Sofia and near Mizusawa), 9h. (near Mizusawa (2)), 11h. (near Mizusawa), 12h. (Tucson, Riverside, Tinemaha, Mount Wilson (2), St. Louis, and near La Paz), 13h. (Pasadena, Mount Wilson, Palomar, Berkeley, Huancayo, Bozeman, Lincoln, Salt Lake City, Tucson, Fordham, and Merida), 14h. (La Paz and Ukiah), 16h. (Tucson, Riverside, Mount Wilson, Palomar, Tinemaha, and La Paz), 17h. (near Mizusawa), 18h. (La Paz), 21h. (near Medan).

Dec. 3d. Readings at 0h. (Triest), 1h. (Fordham, Batavia, Harvard, Tucson, Tinemaha, Riverside, and Pasadena), 3h. (Mizusawa and Sofia), 6h. (Huancayo), 7h. (Huancayo, La Paz, and La Plata), 9h. (Pasadena (2), Palomar, Berkeley, St. Louis, Tucson (6), and Salt Lake City), 18h. (Mizusawa (2)), 19h. (Stuttgart), 21h. (near Mizusawa (2)).

Dec. 4d. 14h. 48m. 49s. Epicentre $43^{\circ}0N$. $90^{\circ}5E$.

$$A = -.0064, B = +.7336, C = +.6795; \quad \delta = -7; \quad h = -3; \\ D = +1.000, E = +.009; \quad G = -.006, H = +.679, K = -.734.$$

Very rough.

| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|------------|------------|------------|-----|-----|------|------|----|------|-------|----|-----------|
| | $^{\circ}$ | $^{\circ}$ | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Tchimkent | 15.4 | 275 | e 3 | 41 | + 1 | i 6 | 30 | - 2 | — | — | — |
| Tashkent | 15.8 | 271 | 3 | 41 | - 4 | 6 | 39 | - 3 | — | — | — |
| Stalinabad | 17.0 | 264 | i 4 | 12 | +11 | — | — | — | — | — | — |
| Agra | E. 18.8 | 217 | e 4 | 29 | + 6 | 8 | 1 | +11 | — | — | — |
| Calcutta | N. 20.5 | 187 | i 5 | 8k | +26 | i 9 | 19 | +52 | i 10 | 2 | SS e 11.8 |
| Sverdlovsk | 23.5 | 317 | i 5 | 10 | - 2 | 9 | 7 | -16 | — | — | — |
| Bombay | 28.3 | 218 | e 6 | 11? | +14 | e 11 | 18 | +35 | 12 | 20 | SS 16.2 |
| Uccle | 56.2 | 310 | e 9 | 41 | - 3 | — | — | — | — | — | e 28.2 |

Calcutta gives also i?N = +9m.8s., eS_cSN = +16m.24s.

Bombay ePE = +6m.17s.

Long waves were also recorded at other European stations.

Dec. 4d. Readings also at 3h. (Zurich, Triest, Stuttgart, Bucharest, Helwan, Warsaw, and Ksara), 8h. (Ksara), 14h. (near Batavia), 18h. (La Paz, Palomar, Riverside, Tinemaha, San Juan, Balboa Heights, Pasadena, Tucson, Mount Wilson, Huancayo (2), and Haiwee), 21h. (La Paz).

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1941

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Dec. 5d. 20h. 46m. 58s. Epicentre 8°·7N. 83°·2W.

Damage at Santiago; strong at Costa Rica. Epicentre 8°·4N. 83°·0W. (U.S.C.G.S.).
Magnitude VII-VI.

Observatorio astronomico, La Plata, Boletin sismologico, 1941.

J. P. Rothé.

Chronique séismologique, Revue pour l'Etude des Calamités, tome VII, No. 21, Geneva, 1944, p. 57.

A = +·1171, B = -·9816, C = +·1503; δ = -16; h = +7;
D = -·993, E = -·118; G = +·018, H = -·149, K = -·989.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----|----------|-----|---------------------|------|----------|------|--------|------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Balboa Heights | | 3·7 | 86 | e 1 2† | + 2 | — | — | — | — |
| Merida | | 13·7 | 334 | i 3 35 | PPP | — | — | — | — |
| Port au Prince | | 14·4 | 46 | i 3 39 | PP | i 6 43 | SSS | 3 49 | PPP i 10·4 |
| Oaxaca | E. | 15·6 | 304 | e 3 34 | - 9 | — | — | — | — |
| Vera Cruz | Z. | 16·3 | 311 | i 4 6 | PP | — | — | — | — |
| Puebla | E. | 17·8 | 307 | e 4 10 | - 1 | — | — | — | — |
| Tacubaya | Z. | 18·8 | 307 | i 4 24 | + 1 | — | — | — | — |
| San Juan | | 19·2 | 58 | i 4 25 | - 3 | i 7 46 | -13 | — | — |
| Huancayo | | 22·1 | 159 | i 4 57 | - 2 | i 9 14 | +16 | i 9 20 | SS i 11·9 |
| Guadalajara | N. | 22·8 | 305 | e 5 31 | PP | — | — | — | — |
| Manzanillo | E. | 22·9 | 301 | i 5 2 | - 4 | — | — | — | — |
| Columbia | | 25·3 | 5 | i 5 29 | - 1 | i 9 46 | - 8 | e 6 27 | PPP i 11·3 |
| Mazatlan | N. | 26·5 | 307 | e 5 31 | -10 | — | — | — | — |
| Bermuda | | 29·0 | 34 | i 5 59 | - 5 | i 11 27 | +33 | i 8 16 | PcP i 11·9 |
| Cape Girardeau | | 29·1 | 350 | e 6 3 | - 1 | i 10 56 | 0 | i 7 4 | PP — |
| La Paz | | 29·2 | 148 | i 6 4 _a | - 1 | i 11 17 | +19 | i 7 17 | PP 15·6 |
| Chihuahua | Z. | 29·3 | 317 | e 6 5 | - 1 | — | — | — | — |
| Cincinnati | | 30·3 | 358 | i 6 15 | 0 | i 11 20 | + 5 | i 7 8 | PP — |
| St. Louis | | 30·5 | 349 | i 6 17 | 0 | — | — | — | — |
| Georgetown | | 30·6 | 10 | i 6 18 | 0 | i 11 27 | + 7 | — | — |
| Florissant | N. | 30·7 | 349 | e 6 16 | - 3 | i 11 22 | + 1 | i 7 36 | PPP — |
| Pittsburgh | | 31·7 | 4 | i 6 30 | + 3 | i 12 1 | +24 | i 7 28 | PP — |
| Philadelphia | | 31·9 | 12 | i 6 29 | 0 | e 11 39 | - 1 | e 7 54 | PPP — |
| Pennsylvania | | 32·3 | 7 | i 6 33 | 0 | i 12 6 | +20 | e 7 47 | PP e 14·4 |
| Fordham | | 33·1 | 14 | i 6 39 | - 1 | i 12 3 | + 4 | — | — |
| Chicago U.S.C.G.S. | | 33·2 | 352 | e 6 39 | - 1 | — | — | — | — |
| Chicago J.S.A. | | 33·3 | 352 | i 6 41 | 0 | i 12 2 | 0 | i 8 1 | PP — |
| Ann Arbor | | 33·5 | 359 | i 6 44 | + 1 | i 12 26 | +21 | 8 8 | PP 15·1 |
| Lincoln | | 34·2 | 344 | i 6 51 | + 2 | i 12 3 | -13 | i 8 18 | PP i 14·4 |
| Buffalo | | 34·3 | 7 | i 6 49 | - 1 | i 12 23 | + 6 | i 7 53 | PP e 17·2 |
| Tucson | | 34·7 | 318 | i 6 54 | 0 | i 12 16 | - 8 | i 8 8 | PP e 14·7 |
| Toronto | | 35·0 | 5 | i 6 56 | 0 | i 12 38? | +10 | 8 29 | PPP 17·0 |
| Williamstown | | 35·0 | 14 | i 6 56 | 0 | i 12 11 | -17 | i 8 10 | PP i 16·2 |
| Harvard | | 35·2 | 15 | i 6 58 | 0 | i 12 41 | +10 | i 8 32 | PPP e 17·0 |
| Denver | | 36·6 | 332 | e 7 9 | - 1 | e 13 1 | + 8 | e 8 44 | PPP — |
| Vermont | | 36·7 | 12 | e 7 8 | - 2 | i 12 58 | + 4 | i 8 44 | PPP e 15·7 |
| Ottawa | | 37·1 | 8 | i 7 13 | - 1 | i 13 18 | +17 | 8 50 | PPP e 18·0 |
| East Machias | | 38·5 | 19 | i 7 26 | 0 | i 13 42 | +20 | i 8 28 | PP i 18·6 |
| Shawinigan Falls | | 38·8 | 12 | i 7 27 | - 1 | i 13 32 | + 6 | 9 12 | PP e 19·0 |
| Halifax | | 39·6 | 22 | i 7 35 | 0 | i 14 11 | +33 | 9 28 | PP 19·0 |
| La Jolla | | 39·6 | 313 | e 7 31 | - 4 | — | — | — | — |
| Palomar | Z. | 39·6 | 314 | i 7 35 | 0 | — | — | — | — |
| Seven Falls | | 39·7 | 13 | i 7 36 | 0 | i 13 54 | +14 | 9 33 | PPP 21·0 |
| Riverside | | 40·3 | 314 | e 7 41 _a | + 1 | — | — | — | — |
| Salt Lake City | | 40·8 | 326 | i 7 46 | + 1 | i 14 1 | + 5 | 9 37 | PcP i 17·2 |
| Mount Wilson | | 40·9 | 314 | i 7 47 _a | + 1 | — | — | — | — |
| Pasadena | | 40·9 | 314 | i 7 46 _a | 0 | e 13 53 | - 5 | — | — e 18·9 |
| Logan | | 41·5 | 328 | e 7 52 | + 2 | i 14 2 | - 5 | — | — e 17·2 |
| Halwee | | 41·8 | 317 | i 7 55 | + 2 | e 14 19 | + 8 | — | — |
| Santa Barbara | | 42·2 | 314 | e 7 56 | 0 | — | — | — | — |

Continued on next page.

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1941

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| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-------------------|----|------------|------------|----------------------|------|----------|-------|---------|--------|
| | | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Tinemaha | | 42.5 | 318 | i 7 59 | 0 | — | — | — | — |
| Fresno | N. | 43.4 | 317 | i 8 7 | + 1 | e 14 30 | - 5 | — | — |
| Bozeman | | 43.9 | 332 | i 8 9 | - 1 | i 14 39 | - 3 | i 9 20 | PP |
| Butte | | 44.9 | 332 | i 8 17 | - 1 | i 15 44 | +48 | i 10 32 | PPP |
| Lick | | 44.9 | 316 | i 8 20 | + 2 | e 15 9 | +13 | — | e 21.0 |
| Santa Clara | | 45.2 | 316 | i 8 22 | + 2 | i 14 59 | - 2 | — | e 21.6 |
| Berkeley | | 45.6 | 316 | e 8 24 | 0 | e 15 20 | +14 | — | e 20.8 |
| San Francisco | | 45.7 | 316 | e 8 26 | + 2 | i 15 30 | PPS | — | — |
| Ukiah | | 46.5 | 317 | e 8 35 | + 4 | e 15 31 | +12 | e 10 28 | PP |
| Saskatoon | | 47.4 | 341 | 8 42 | + 4 | e 15 33 | + 1 | 10 54 | PPP |
| Ferndale | E. | 48.3 | 319 | e 8 50 | + 5 | e 16 0 | +15 | — | e 21.0 |
| | N. | 48.3 | 319 | e 8 47 | + 2 | e 15 57 | +12 | — | e 21.2 |
| Spokane | | 48.6 | 330 | i 8 46 | - 1 | i 16 13 | +24 | e 10 42 | PP |
| La Plata | E. | 49.5 | 152 | 8 53 | - 1 | 16 2 | 0 | 14 32 | PcS |
| | N. | 49.5 | 152 | 8 53 | - 1 | 16 2 | 0 | 18 32 | ScS |
| | Z. | 49.5 | 152 | 8 58 | + 4 | 16 26 | PPS | 10 2 | PcP |
| Seattle | | 51.0 | 327 | e 8 39 | -27 | e 17 28 | +66 | — | e 20.9 |
| Victoria | | 52.1 | 327 | 8 18 | -56 | 15 41 | -57 | 21 2? | SSS |
| Angra do Heroismo | | 58.2 | 50 | — | — | e 18 21 | PPS | — | — |
| Ivigtut | | 58.4 | 19 | 9 57 | - 3 | 18 12 | +10 | 13 48 | PPP |
| Sitka | | 63.0 | 332 | e 10 45 | +14 | e 19 2 | + 1 | e 13 2 | PP |
| College | | 71.5 | 337 | e 11 23 | - 1 | e 20 46 | + 3 | e 14 7 | PP |
| Lisbon | E. | 72.2 | 52 | 11 27 | - 2 | 21 23 | +32 | — | i 34.3 |
| | N. | 72.2 | 52 | 11 55 | +26 | 21 21 | +30 | — | 30.7 |
| Scoresby Sund | | 72.5 | 18 | i 11 36 | + 6 | e 21 0 | + 6 | i 14 31 | PP |
| Honolulu | | 72.6 | 290 | i 11 38 | + 7 | i 21 5 | + 9 | — | i 29.5 |
| Coimbra | | 72.8 | 50 | 11 30 | - 2 | 21 0 | + 2 | 15 26 | PPP |
| San Fernando | | 74.4 | 55 | e 11 52 | +10 | e 21 56 | PS | e 15 2 | PP |
| Toledo | | 76.2 | 51 | i 11 53 | + 1 | i 21 49 | +13 | — | 37.0 |
| Granada | | 76.5 | 54 | i 11 54 | 0 | i 21 45 | + 6 | 12 11 | pP |
| Edinburgh | | 77.2 | 35 | 12 2 | + 5 | 22 2 | +15 | 12 11 | PcP |
| Almeria | | 77.5 | 54 | i 11 57 | - 2 | i 22 0 | +10 | 12 23 | PcP |
| Stonyhurst | | 77.6 | 37 | e 12 8 | + 8 | i 22 22 | PS | i 15 45 | PP |
| Aberdeen | E. | 77.9 | 33 | e 12 6 | + 5 | i 22 22 | PS | i 27 18 | SS |
| | N. | 77.9 | 33 | i 12 13 | +12 | i 22 28 | PS | — | — |
| Oxford | | 78.2 | 39 | 11 58 | - 5 | i 23 11 | PPS | — | e 37.0 |
| Kew | | 78.8 | 39 | i 12 7 _a | + 1 | i 22 14 | +10 | i 12 14 | PcP |
| Paris | | 80.7 | 43 | e 12 16 | 0 | e 22 38 | +14 | 15 55 | PP |
| Clermont-Ferrand | | 81.3 | 46 | i 12 19 _a | - 1 | i 22 41 | +11 | i 15 25 | PP |
| Algiers | | 81.8 | 54 | i 12 25 | + 3 | e 22 41 | + 6 | 15 56 | PP |
| Bergen | | 81.8 | 30 | i 12 23 | + 1 | e 22 47? | +12 | e 15 37 | PP |
| Uccle | | 81.8 | 40 | i 12 18 _a | - 4 | i 22 40 | + 5 | 15 39 | PP |
| De Bilt | | 82.2 | 38 | i 12 24 _a | 0 | i 22 18 | -21 | e 15 48 | PP |
| Besançon | | 83.1 | 44 | e 12 34 | + 5 | e 23 20 | PS | — | 39.0 |
| Marseilles | | 83.1 | 47 | e 12 36 | + 7 | 22 56 | + 8 | 24 13 | PS |
| Neuchatel | | 83.8 | 44 | e 12 31 | - 1 | e 23 2 | + 7 | — | — |
| Basle | | 84.2 | 43 | e 12 32 | - 2 | e 23 3 | + 4 | — | — |
| Zurich | | 84.9 | 44 | e 12 37 _a | - 1 | e 22 56 | -10 | e 16 11 | PP |
| Stuttgart | | 85.1 | 41 | i 12 37 _a | - 2 | i 23 40 | +32 | e 13 0 | pP |
| Milan | | 85.5 | 45 | — | — | e 23 36 | +24 | — | e 41.7 |
| Chur | | 85.6 | 43 | e 12 40 | - 1 | e 23 23 | +10 | — | — |
| Jena | | 86.3 | 40 | i 12 42 | - 3 | e 23 34 | +14 | e 16 29 | PP |
| Copenhagen | | 86.6 | 35 | i 12 43 _a | - 3 | 23 24 | + 1 | 16 42 | PP |
| Potsdam | | 87.0 | 38 | i 12 46 _a | - 2 | i 23 20 | [+ 6] | i 16 2? | PP |
| Upsala | E. | 87.9 | 30 | i 12 57 | + 4 | i 23 19 | [- 1] | e 16 35 | PP |
| | N. | 87.9 | 30 | e 13 9 | +16 | 23 45 | +10 | e 16 17 | PP |
| Prague | | 88.3 | 40 | 12 50 _a | - 5 | e 23 30 | [+ 8] | e 16 39 | PP |
| Triest | | 88.7 | 44 | i 12 56 | - 1 | i 23 54 | +11 | e 29 26 | SS |
| Apla | | 90.7 | 255 | e 12 49 | -17 | e 23 33 | [- 4] | e 19 17 | PPP |
| Warsaw | | 91.8 | 37 | 13 9 _a | - 2 | 24 16 | + 5 | e 17 6 | PP |
| Sofia | | 96.1 | 46 | e 13 31 | 0 | i 24 14 | [+ 7] | e 17 2 | PP |
| Bucharest | | 97.4 | 43 | e 15 18 | ? | e 25 53 | PS | e 19 12 | PPP |
| Arapuni | | 104.1 | 233 | 15 2 | +55 | 25 20 | [+34] | — | — |
| Auckland | | 104.7 | 235 | e 16 2? | ? | — | — | 43 2 | Q |
| Wellington | | 104.7 | 230 | 14 15 | + 6 | 24 56 | [+ 7] | 14 32 | sP |
| Christchurch | | 106.2 | 227 | 14 32 | P | 25 4 | [+ 8] | 18 43 | PP |

Continued on next page.

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | L. | |
|---------------------|----------|-----|------|----|-------|------|-----|-------|---------|-----|--------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | m. | |
| Helwan | 106.4 | 56 | 14 | 18 | P | 28 | 26 | PPS | e 18 27 | PP | — |
| Sverdlovsk | 108.3 | 20 | e 14 | 29 | P | 25 | 8 | [+ 3] | i 18 53 | PP | — |
| Ksara | 108.5 | 51 | e 19 | 25 | PP | 26 | 25 | {+31} | 28 29 | PS | — |
| Mizusawa | 117.1 | 322 | 15 | 53 | ? | 27 | 17 | {+22} | — | — | — |
| Irkutsk | 118.9 | 354 | 18 | 21 | [-29] | e 27 | 2 | {- 4} | 19 18 | PP | — |
| Tokyo Cen. Met. Ob. | 120.1 | 320 | e 19 | 8 | [+15] | e 29 | 14 | ? | — | — | — |
| Yokohama | 120.3 | 321 | e 19 | 33 | [+40] | e 30 | 14 | PS | — | — | e 61.4 |
| Brisbane | 123.9 | 243 | i 21 | 2 | PP | 28 | 3 | {+23} | 37 46 | SSP | e 52.0 |
| Sydney | 124.2 | 235 | e 20 | 50 | PP | e 31 | 2 | PS | e 42 38 | SSS | — |
| Tashkent | 124.2 | 24 | 15 | 42 | ? | 25 | 58 | [- 5] | 20 56 | PP | — |
| Riverview | 124.3 | 235 | e 16 | 4 | ? | e 28 | 12 | {+29} | e 20 54 | PP | e 59.3 |
| Stalinabad | 126.2 | 27 | i 19 | 18 | [+13] | 28 | 15 | {+20} | — | — | — |
| Hukuoka | 127.2 | 324 | e 21 | 3 | PP | — | — | — | — | — | — |
| Miyazaki | 127.8 | 321 | 21 | 11 | PP | 38 | 24 | SS | — | — | 52.5 |
| Tananarive | 131.2 | 108 | e 21 | 55 | PP | 26 | 43 | {+20} | 22 47 | PKS | 61.8 |
| Adelaide | 133.7 | 229 | i 23 | 16 | PKS | 40 | 21 | SSP | 64 32 | Q | 70.4 |
| Dehra Dun | N. 137.2 | 24 | e 18 | 7? | ? | — | — | — | — | — | e 79.0 |
| Agra | 140.0 | 26 | 19 | 41 | [+10] | 26 | 57 | {+18} | i 22 50 | PP | 64.7 |
| Bombay | E. 143.8 | 40 | e 19 | 39 | [+ 2] | i 30 | 9 | {+26} | e 42 28 | SS | 69.9 |
| | N. 143.8 | 40 | e 19 | 36 | [- 1] | e 30 | 7 | {+24} | e 42 20 | SS | — |
| Calcutta | N. 147.9 | 14 | i 19 | 35 | [- 9] | i 26 | 35 | [-15] | i 23 8 | SKP | i 71.2 |
| Manila | 146.7 | 313 | 19 | 46 | [+ 4] | — | — | — | 23 6 | PP | — |
| Hyderabad | E. 148.3 | 34 | 19 | 56 | [+11] | 30 | 35 | {+28} | 23 25 | PP | 63.5 |
| Perth | 150.9 | 215 | i 20 | 29 | [+40] | 30 | 49 | {+26} | — | — | 65.5 |
| Kodaikanal | E. 153.1 | 46 | 20 | 2? | [+10] | 44 | 47? | SS | 24 2? | PKS | — |
| Colombo | E. 157.1 | 48 | 20 | 7 | [+10] | — | — | — | — | — | 85.6 |
| Medan | 167.6 | 351 | 20 | 19 | [+11] | — | — | — | — | — | e 70.0 |
| Batavia | 169.7 | 284 | 20 | 4 | [- 5] | 32 | 42 | {+41} | — | — | 36.0 |

Additional readings :—

Port au Prince PPP = +3m.56s., iSEN = +6m.54s., SS = +7m.5s.
 Columbia i = +6m.44s. and +7m.15s., eS = +9m.40s., i = +9m.57s. and +10m.26s.
 Bermuda i = +9m.36s.
 La Paz iN = +12m.12s., iSSN = +12m.49s.
 Cincinnati i = +7m.28s.
 Florissant eN = +6m.19s., iE = +13m.36s., iN = +13m.45s.
 Pittsburgh iPPPZ = +7m.47s.
 Philadelphia i = +6m.49s., e = +12m.3s.
 Pennsylvania e = +10m.12s.
 Fordham i = +11m.51s.
 Chicago J.S.A. i = +7m.0s. and +14m.49s.
 Lincoln e = +9m.25s.
 Buffalo iPPP = +8m.23s.
 Tucson i = +7m.0s. and +7m.16s., iPPP = +8m.29s., i = +12m.5s., +12m.30s., and +13m.27s.
 Toronto SS = +15m.8s.?
 Williamstown +7m.48s.
 Harvard i = +7m.5s., iN = +7m.16s. and +7m.51s., i = +10m.42s.
 Ottawa SSN = +16m.0s., SSSE = +16m.22s., iN = +16m.44s.
 East Machias iPPP = +8m.50s., i = +9m.33s. and +13m.58s.
 Shawinigan Falls SSS = +16m.56s.?
 Halifax e = +7m.59s., SS = +17m.2s.?
 Seven Falls SS = +17m.2s.
 Salt Lake City i = +10m.17s., +14m.31s., and +16m.37s.
 Bozeman i = +10m.11s., iPPP = +10m.38s., i = +13m.17s.
 Butte i = +11m.15s.
 Berkeley iP = +8m.32s., eE = +15m.45s.
 Ukiah e = +10m.8s., eSS = +18m.50s., e = +19m.10s.
 Saskatoon SSS = +19m.46s.
 Spokane iN = +9m.1s., eSN = +16m.32s., iN = +18m.52s., eSSSN = +23m.2s.
 La Plata E. PS = +16m.26s., +17m.26s., SS? = +20m.14s., SSS? = +22m.50s., +24m.50s.
 La Plata N. PS = +16m.32s., +17m.26s., SS = +19m.14s., +21m.50s., SSS? = +22m.50s., +24m.2s., +25m.38s.
 La Plata Z. SSS = +20m.14s., +22m.14s., 24m.32s., and +26m.56s.
 Seattle e = +18m.44s.
 Victoria e = +18m.27s.
 Ivigtut +10m.16s., +17m.15s., +18m.31s., and +19m.8s.
 Sitka ePPP = +14m.28s.
 College e = +11m.28s., +16m.12s., +21m.10s., and +25m.55s., eSSS = +28m.37s.
 Lisbon PE = +11m.51s., Z = +12m.10s.

Continued on next page.

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Scoresby Sund $e = +14m.41s.$, $i = +16m.33s.$, $+21m.16s.$, and $+25m.30s.$, $e = +26m.3s.$, $iSSS = +28m.53s.$
 Honolulu $e = +11m.51s.$ and $+13m.46s.$, $iPPP = +16m.4s.$, $i = +22m.12s.$, $+26m.15s.$, and $+26m.23s.$
 Coimbra $PP = +13m.12s.$, $iPS = +21m.40s.$, $SS = +25m.49s.$, $SSS = +28m.22s.$
 San Fernando $PPN = +16m.30s.$, $SSN = +27m.20s.$
 Granada $P_cP = +12m.19s.$, $PP = +14m.53s.$, $PPP = +16m.23s.$, $sS = +22m.1s.$, $PS = +22m.21s.$, $sPS = +22m.59s.$, $eSS = +26m.38s.$, $eSSS = +30m.24s.$, $Q = +32m.38s.$
 Edinburgh $S = +20m.57s.$, $S_cS = +22m.18s.$
 Almeria $PP = +15m.19s.$, $PPP = +17m.2s.$, $PS = +22m.29s.$, $SS = +27m.19s.$, $SSS = +30m.57s.$
 Stonyhurst $iP = +12m.26s.$, $i = +12m.43s.$, $+21m.14s.$, and $+22m.45s.$, $iSS = +27m.24s.$, $i = +30m.49s.$
 Aberdeen $iE = +12m.19s.$, $iPSE = +23m.10s.$, $iE = +23m.33s.$, $iSSSEN = +30m.38s.$
 Kew $iNZ = +12m.22s.$, $iPP = +15m.8s.$, $e = +16m.30s.$, $ePPP = +17m.6s.$, $eS_cS = +22m.30s.$, $ePS = +22m.58s.$, $eSSSEN = +27m.22s.$, $eSSS = +31m.2s.?$, $Q = +34.0m.$
 Paris $ePS = +23m.32s.$, $eSS = +28m.17s.$, $eSSS = +31m.20s.$
 Clermont-Ferrand $i = +12m.43s.$
 Algiers $iS = +23m.11s.$, $PS = +23m.54s.$, $eSS = +28m.36s.$
 Bergen $eSS = +28m.2s.?$, $eSSS = +31m.51s.$
 Uccle $iZ = +12m.45s.$, $iE = +16m.35s.$, $+22m.9s.$, and $+23m.5s.$, $iPSE = +23m.30s.$, $iE = +24m.49s.$, $iSSE = +28m.38s.$, $iSSSE = +31m.37s.$
 De Bilt $iSS = +27m.28s.$
 Besançon $e = +29m.2s.?$
 Marseilles $S = +23m.18s.$, $eSS = +29m.5s.$
 Zurich $eS = +23m.27s.$
 Stuttgart $iPPE = +16m.15s.$, $eZ = +16m.25s.$, $epPP = +16m.37s.$, $ePPPE = +18m.17s.$, $eE = +22m.18s.$, $iPSE = +24m.35s.$, $iSSE = +29m.31s.$
 Jena $iPE = +12m.45s.$, $iE = +13m.8s.$, $iZ = +13m.18s.$, $iN = +13m.30s.$, $eN = +16m.36s.$, $eZ = +16m.50s.$, $eN = +16m.56s.$, $e = +17m.2s.$, $eS = +23m.41s.$, $i = +24m.14s.$, $iEN = +24m.18s.$, $e = +29m.2s.$, $eNZ = +36m.2s.$
 Copenhagen $i = +12m.46s.$, $+13m.7s.$, $+15m.44s.$, $+23m.45s.$, and $+28m.26s.$
 Potsdam $iPN = +12m.51s.$, $i = +12m.55s.$, $i = +13m.14s.$, $iNW = +13m.27s.$, $i = +15m.23s.$ and $+17m.15s.$, $iN = +20m.27s.$, $i = +20m.34s.$, $iN = +21m.27s.$, $iZ = +21m.44s.$, $iSEN = +23m.32s.$, $iS = +23m.35s.$, $iS_cSE = +23m.41s.$, $iZ = +23m.47s.$, $iE = +23m.56s.$, $iNW = +24m.17s.$, $+25m.51s.$, and $+28m.3s.$, $i = +29m.14s.$, $iSS?E = +29m.42s.$, $iE = +33m.38s.$
 Upsala $eN = +24m.7s.$, $eSSE = +29m.2s.?$, $eSSSE = +33m.39s.$, $eSSSN = +34m.2s.?$
 Prague $ePS = +24m.8s.$, $eSS = +29m.50s.$
 Apia $iS = +23m.54s.$, $eSS = +30m.19s.$, $eSSS = +33m.57s.$
 Warsaw $eZ = +13m.44s.$, and $+16m.9s.$, $SKSEN? = +23m.49s.$, $SZ = +24m.19s.$, $SN = +24m.22s.$, $iE = +24m.41s.$, $iN = +24m.46s.$, $iE = +25m.6s.$, $iN = +25m.9s.$, $iPSE? = +25m.24s.$, $iE = +25m.39s.$, $iPPSN? = +25m.53s.$, $PPSE = +26m.0s.$
 Sofia $ePPPN = +19m.21s.$, $eEN = +26m.41s.$
 Bucharest $eN = +16m.50s.$, $eE = +17m.50s.$, $eN = +19m.28s.$, $ePPP?N = +21m.22s.$, $ePPP?E = +21m.28s.$, $eE = +24m.39s.$, $eSKKSE = +26m.18s.$, $eSE = +26m.47s.$, $ePSE = +28m.8s.$
 Arapuni $PPS = +29m.44s.$, $i = +39m.8s.$
 Wellington $PPZ = +18m.37s.$, $pPP = +18m.54s.$, $PPPZ = +20m.48s.$, $pPPPZ = +21m.2s.$, $SKSP? = +25m.30s.$, $pS = +26m.29s.$, $S_cSPZ = +27m.47s.$, $PPS = +28m.30s.$, $i = +29m.45s.$, $PSPS?Z = +34m.32s.$, $PPPZ = +38m.2s.$, $Q = +44m.32s.$
 Mizusawa $P?E = +16m.3s.$
 Christchurch $PPP = +21m.34s.$, $PS = +27m.58s.$, $SS = +34m.4s.$, $SSS = +41m.47s.$
 Helwan $eZ = +17m.53s.$
 Irkutsk $PS = +28m.52s.$
 Yokohama $e = +52m.24s.$
 Brisbane $eN = +28m.22s.$, $iE = +31m.8s.$, $+32m.46s.$, and $+42m.46s.$
 Tashkent $PKP = +18m.56s.$
 Riverview $iZ = +21m.12s.$, $eE = +21m.21s.$ and $+24m.27s.$, $iPSZ = +31m.16s.$, $eE = +31m.30s.$, $iE = +33m.19s.$, $eN = +33m.27s.$, $iZ = +33m.46s.$, $iE = +34m.21s.$, $eSSSEN = +37m.59s.$, $eSSS? = +41m.49s.$, $eE = +42m.50s.$, $eN = +46m.8s.$, $eQN = +51m.56s.$
 Tananarive $PS = +31m.32s.$, $SS = +39m.8s.$
 Agra $i = +23m.16s.$, $SKPEN = +23m.30s.$, $SKKS = +29m.42s.$, $PSKS = +33m.0s.$, $SSE = +40m.37s.$, $SSS = +46m.41s.$
 Bombay $ePKPN = +19m.44s.$, $ePKPE = +19m.50s.$, $PPE = +23m.8s.$, $PKS = +23m.14s.$, $iE = +23m.35s.$, $+26m.3s.$, and $+27m.24s.$, $eN = +33m.0s.$, $iSKSPE = +33m.17s.$, $iPPSE = +35m.12s.$, $ePPS?N = +35m.36s.$, $iE = +40m.18s.$, $iSSSE = +48m.12s.$, $QEN = +63m.28s.$
 Calcutta $iPKP,N = +19m.46s.$, $iPPN = +23m.15s.$, $iPPPN = +26m.41s.$, $ePSKSN = +33m.31s.$, $eSSSN = +48m.26s.$
 Hyderabad $PKP,E = +20m.17s.$, $SKSPE = +33m.44s.$, $SSE = +42m.49s.$
 Perth $i = +22m.22s.$ and $+35m.16s.$, $SS = +41m.7s.$, $i = +44m.20s.$ and $+53m.30s.$
 Kodaikanal $PKP,E = +21m.2s.?$, $iE = +34m.22s.$ and $+40m.22s.$
 Colombo $SSE = +53m.22s.$, $SSSE = +61m.3s.$
 Batavia $ePE = +20m.7s.$
 Long waves were also recorded at Sapporo.

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December 5d. Readings also at 0h. (La Paz and near Lick), 3h. (Sofia), 4h. (Kodaikanal), 6h. (Haiwee, Palomar, Mount Wilson, Pasadena and Tinemaha), 7h. (Tucson and Calcutta), 9h. (Fordham), 10h. (La Paz, St. Louis, and Tucson (2)), 12h. (Tucson, Palomar, Mount Wilson, Pasadena, Tinemaha, and near Ksara), 16h. (Tucson, Palomar, Mount Wilson, and Tinemaha), 17h. (Berkeley), 21h. (La Paz (2) Merida, Copenhagen, Stuttgart, Almeria, Granada, Toledo, and Berkeley), 22h. (La Paz and Merida).

Dec. 6d. 1h. 25m. 2s. Epicentre $10^{\circ}4'N$. $85^{\circ}7'W$. (as on 1941 Oct. 8d.).

A = +.0738, B = -.9810, C = +.1794; $\delta = -1$; $h = +6$;
D = -.997, E = -.075; G = +.013, H = -.179, K = -.984.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----|------------|------------|---------|------|----------|------|---------|-------------------------|
| | | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Merida | N. | 11.1 | 341 | i 3 2 | +19 | — | — | — | — |
| Vera Cruz | Z. | 13.4 | 312 | — | — | e 5 52 | + 7 | — | — |
| Tacubaya | E. | 15.8 | 305 | e 3 53 | + 8 | — | — | — | — |
| San Juan | | 20.5 | 66 | i 4 37 | - 5 | i 8 19 | - 8 | i 5 15 | PP i 10.0 |
| Columbia | | 23.0 | 9 | e 5 14 | + 7 | e 9 26 | +12 | e 9 36 | SS e 11.2 |
| Huancayo | | 24.6 | 157 | i 5 22 | - 1 | e 9 51 | + 9 | i 6 41 | PP 11.6 |
| Cape Girardeau | N. | 27.0 | 355 | e 5 40 | - 5 | — | — | — | — |
| St. Louis | | 28.4 | 353 | e 5 58 | 0 | e 10 52 | + 7 | i 12 13 | SS — |
| Florissant | | 28.6 | 353 | e 5 55 | - 5 | e 10 53 | + 5 | e 6 38 | PP — |
| Bermuda | | 29.1 | 40 | e 5 59 | - 5 | e 11 2 | + 6 | e 7 52 | PPP e 13.0 |
| Philadelphia | | 30.9 | 17 | e 6 10 | -10 | e 11 18 | - 6 | e 8 35 | P _c P e 13.2 |
| Chicago U.S.C.G.S. | | 31.3 | 357 | e 10 28 | ? | e 12 18 | +47 | — | e 13.4 |
| Lincoln | | 31.8 | 347 | e 7 24 | PP | e 11 18 | -20 | — | e 13.3 |
| Tucson | | 31.8 | 317 | e 6 28 | 0 | — | — | e 7 46 | PPP e 14.4 |
| La Paz | | 31.9 | 147 | 6 28 | - 1 | i 11 47 | + 7 | i 7 44 | PPP 16.5 |
| Fordham | | 32.1 | 19 | e 6 26 | - 5 | e 11 48 | + 5 | — | — 17.0 |
| Toronto | | 33.6 | 9 | — | — | e 11 58? | - 8 | — | — 18.0 |
| Harvard | Z. | 34.3 | 20 | i 6 49 | - 1 | — | — | — | e 15.0 |
| Vermont | | 35.6 | 16 | e 11 33 | ? | e 12 29 | - 9 | — | — e 14.5 |
| Ottawa | | 35.9 | 12 | e 7 2 | - 2 | e 12 22? | -20 | — | — e 15.0 |
| Palomar | Z. | 36.6 | 315 | i 7 11 | + 1 | — | — | — | — |
| Riverside | Z. | 37.3 | 314 | i 7 16 | 0 | — | — | — | — |
| East Machias | | 37.7 | 22 | e 7 21 | + 2 | e 13 11 | + 1 | — | e 17.6 |
| Shawinigan Falls | | 37.7 | 15 | e 7 22? | + 3 | — | — | — | 20.0 |
| Mount Wilson | Z. | 37.9 | 314 | e 7 21 | + 1 | — | — | — | — |
| Pasadena | | 38.0 | 314 | e 7 22 | + 1 | — | — | — | e 19.2 |
| Salt Lake City | | 38.1 | 328 | e 8 52 | PP | — | — | — | e 16.9 |
| Seven Falls | | 38.7 | 17 | e 7 4? | -23 | — | — | e 9 10? | PP 13.0 |
| Haiwee | Z. | 38.9 | 317 | i 7 34 | + 5 | — | — | — | — |
| Bozeman | | 41.3 | 334 | e 8 36 | PP | e 14 24 | +20 | e 9 40 | P _c P e 23.1 |
| Berkeley | | 42.7 | 316 | i 8 2 | + 2 | i 14 48 | +24 | — | — e 20.0 |
| Seattle | | 48.2 | 328 | — | — | e 15 36 | - 7 | — | e 19.6 |
| La Plata | E. | 52.2 | 151 | 9 16 | + 1 | 16 22 | -17 | 12 16 | PPP 29.8 |
| | N. | 52.2 | 151 | 9 10 | - 5 | 16 40 | + 1 | — | — 29.0 |
| Coimbra | | 73.7 | 52 | e 17 28 | ? | e 22 58 | ? | — | — 36.3 |
| Toledo | | 77.0 | 52 | e 12 22 | +26 | — | — | — | — 38.2 |
| Granada | | 77.5 | 55 | 12 17 | +18 | — | — | — | — 37.4 |
| Kew | | 79.1 | 39 | i 31 58 | ? | — | — | — | e 41.5 |
| Uccle | | 82.1 | 40 | e 23 33 | PS | e 28 3 | SS | — | — e 36.0 |

Additional readings:—

Huancayo i = +9m.58s.

St. Louis eE = +10m.16s., eN = +10m.47s., iE = +11m.38s. and +12m.20s.

Florissant iE = +11m.42s. and +12m.36s., eSSE = +12m.47s.

Philadelphia e = +9m.59s.

Tucson e = +6m.45s., +7m.42s., and +9m.50s.

La Paz SSZ = +13m.32s., iSSN = +13m.40s.

Berkeley eN = +8m.8s.

Seattle e = +15m.13s. and +17m.20s.

La Plata S_cSE = +19m.4s., SSSE = +23m.22s., QE = +27m.16s.

Kew eN = +34m.54s. and +36m.14s., eE = +37m.46s., eEZ = +39m.18s.

Long waves were also recorded at Butte, Ukiah, Bombay, and other European stations.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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1941

493

Dec. 6d. 21h. 24m. 42s. Epicentre 8°·7N. 83°·2W. (as on 5d.).

A = +·1171, B = -·9816, C = +·1503; δ = -16; h = +7;
D = -·993, E = -·118; G = +·018, H = -·149, K = -·989.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|---------|------|---------|------|---------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Port au Prince | 14·4 | 46 | 13 47 | PP | e 7 5 | SSS | — | 7·8 |
| Oaxaca | 15·6 | 304 | e 3 30? | -13 | — | — | — | — |
| Tacubaya | 18·8 | 307 | e 4 15 | - 8 | — | — | — | — |
| San Juan | 19·2 | 58 | i 4 31 | + 3 | 17 59 | 0 | 8 11 | SS 10·6 |
| Huancayo | 22·1 | 159 | i 5 0 | + 1 | 18 51 | - 7 | i 5 31 | PP e 10·3 |
| Mobile | 22·4 | 350 | 15 7 | + 5 | i 9 9 | + 5 | — | — |
| Guadalajara | 22·8 | 305 | e 5 13 | + 8 | — | — | — | — |
| Manzanillo | 22·9 | 301 | e 4 54 | -12 | — | — | — | — |
| Columbia | 25·3 | 5 | 5 30 | 0 | 9 58 | + 4 | 10 18 | SS i 13·7 |
| Bermuda | 29·0 | 34 | e 6 0 | - 4 | e 11 22 | +28 | 7 31 | PPP e 13·8 |
| Cape Girardeau | 29·1 | 350 | e 6 10 | + 6 | e 10 50 | - 6 | e 6 52 | PP i 12·9 |
| La Paz | 29·2 | 148 | i 6 11k | + 6 | 11 23 | +25 | i 7 44 | PPP 15·6 |
| St. Louis | 30·5 | 349 | i 6 14 | - 3 | i 11 26 | + 8 | — | — |
| Georgetown | 30·6 | 10 | e 6 14 | - 4 | i 11 18 | - 2 | i 6 54 | PP — |
| Florissant | 30·7 | 349 | e 6 7 | -12 | i 11 17 | - 4 | i 7 14 | PP — |
| Pittsburgh | 31·7 | 4 | i 6 31 | + 4 | — | — | — | — |
| Philadelphia | 31·9 | 12 | 6 25 | - 4 | e 11 56 | +16 | e 7 45 | PP 13·1 |
| Pennsylvania | 32·3 | 7 | i 6 33 | 0 | e 11 50 | + 4 | i 8 1 | PPP — |
| Fordham | 33·1 | 14 | 6 37 | - 3 | i 12 4 | + 5 | 7 49 | PP i 16·8 |
| Chicago U.S.C.G.S. | 33·2 | 352 | i 6 35 | - 5 | i 12 6 | + 6 | i 7 47 | PP e 14·1 |
| Chicago J.S.A. | 33·3 | 352 | e 7 21 | PP | — | — | — | e 15·3 |
| Lincoln | 34·2 | 344 | e 6 54 | + 5 | e 12 6 | -10 | e 8 3 | PP e 13·8 |
| Tucson | 34·7 | 318 | e 6 43 | -11 | i 12 19 | - 5 | e 8 12 | PP i 14·1 |
| Toronto | 35·0 | 5 | 6 53 | - 3 | 12 27 | - 1 | — | — 16·3 |
| Williamstown | 35·0 | 14 | i 6 58 | + 2 | i 12 51 | +23 | — | — e 16·6 |
| Harvard | 35·2 | 15 | i 6 58 | 0 | i 12 43 | +12 | — | — e 15·3 |
| Vermont | 36·7 | 12 | e 7 13 | + 3 | e 12 57 | + 3 | e 8 44 | PP e 18·6 |
| Ottawa | 37·1 | 8 | 7 15 | + 1 | 13 10 | + 9 | 8 47 | PP 18·3 |
| East Machias | 38·5 | 19 | e 7 27 | + 1 | i 13 42 | +20 | 8 44 | PP 16·8 |
| Shawinigan Falls | 38·8 | 12 | 7 31 | + 3 | 13 44 | +18 | 9 6? | PP 20·3 |
| Halifax | 39·6 | 22 | 7 40 | + 5 | 14 5 | +27 | 9 36 | PPP 18·3 |
| La Jolla | 39·6 | 313 | e 7 26 | - 9 | — | — | — | — |
| Palomar | 39·6 | 314 | i 7 26 | - 9 | — | — | — | — |
| Seven Falls | 39·7 | 13 | 7 39 | + 3 | 14 0 | +20 | 9 24? | PP 19·3 |
| Riverside | 40·3 | 314 | e 7 35 | - 5 | — | — | — | — |
| Salt Lake City | 40·8 | 326 | e 7 38 | - 7 | e 13 50 | - 6 | i 9 37 | PP 17·9 |
| Mount Wilson | 40·9 | 314 | e 7 38 | - 8 | — | — | — | — |
| Pasadena | 40·9 | 314 | e 7 37 | - 9 | i 13 59 | + 1 | — | — e 19·2 |
| Logan | 41·5 | 328 | 7 47 | - 3 | e 14 14 | + 7 | e 9 46 | PP 17·6 |
| Santa Barbara | 42·2 | 314 | e 7 50 | - 6 | — | — | — | — |
| Tinemaha | 42·5 | 318 | e 7 49 | -10 | e 14 24 | + 2 | — | — |
| Fresno | 43·4 | 317 | e 8 6 | 0 | — | — | — | — |
| Bozeman | 43·9 | 332 | e 8 12 | + 2 | e 14 38 | - 4 | 9 52 | PP 18·1 |
| Butte | 44·9 | 332 | e 8 30 | +12 | e 15 9 | +13 | e 10 4 | PP e 18·4 |
| Lick | 44·9 | 316 | e 8 16 | - 2 | e 14 57 | + 1 | 15 30 | PPS e 23·3 |
| Santa Clara | 45·2 | 316 | 18 23 | + 3 | i 15 2 | + 1 | — | — e 24·5 |
| Berkeley | 45·6 | 316 | 18 18 | - 6 | i 15 4 | - 2 | e 15 12 | PS e 21·3 |
| Branner | 45·6 | 316 | e 8 15 | - 9 | 15 5 | - 1 | — | — 26·0 |
| Ukiah | 46·5 | 317 | 8 35 | + 4 | e 15 26 | + 7 | e 10 10 | PP 18·8 |
| Saskatoon | 47·4 | 341 | 8 41 | + 3 | 15 48? | +16 | 18 36 | SS 26·3 |
| Ferndale | 48·3 | 319 | e 9 8 | +23 | e 15 44 | - 1 | e 16 4 | PPS e 24·8 |
| La Plata | 49·5 | 152 | 9 12 | +18 | 16 18 | +16 | 10 36 | PcP 25·4 |
| | 49·5 | 152 | 9 6 | +12 | 16 12 | +10 | 10 24 | PcP 26·3 |
| | 49·5 | 152 | 9 6 | +12 | 18 24 | SeS | 9 42 | PcP 23·3 |
| Victoria | 52·1 | 327 | 9 17 | + 3 | 16 39 | + 1 | — | — 25·3 |
| Angra do Heroísmo | 58·2 | 50 | — | — | e 17 47 | -12 | — | — |
| Ivigtut | 58·4 | 19 | 9 54 | - 6 | 18 15 | +13 | — | — |
| College | 71·5 | 337 | e 11 17 | - 7 | e 20 43 | 0 | e 14 11 | PP e 25·7 |
| Lisbon | 72·2 | 52 | 11 30 | + 1 | i 21 11 | +20 | e 11 39 | pP 35·0 |
| Scoresby Sund | 72·5 | 18 | e 11 33 | + 3 | i 21 0 | + 6 | e 14 11 | PP i 24·8 |

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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1941

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|------------------|----------|-----|------|-----------------|-------|------|-----|-------|-------|-----|------------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Honolulu | 72.6 | 290 | i 16 | 59 | ? | e 20 | 54 | - 2 | i 21 | 48 | PS e 31.6 |
| Coimbra | 72.8 | 50 | e 11 | 16 | -16 | 20 | 44 | -14 | 21 | 26 | PS 34.5 |
| San Fernando | 74.4 | 55 | e 11 | 48 | + 6 | 21 | 48 | PS | — | — | 32.3 |
| Toledo | 76.2 | 51 | i 11 | 56 | + 4 | i 21 | 49 | +13 | — | — | 36.8 |
| Granada | 76.5 | 54 | i 11 | 58 | + 4 | i 21 | 51 | +12 | 12 | 8 | pP 33.5 |
| Edinburgh | 77.2 | 35 | — | — | — | 21 | 55 | + 8 | — | — | — |
| Almeria | 77.5 | 54 | 12 | 4 | + 5 | 22 | 12 | +22 | 12 | 12 | pP 35.3 |
| Stonyhurst | 77.6 | 37 | i 12 | 7 | + 7 | i 22 | 8 | +17 | 22 | 45 | PS 37.0 |
| Aberdeen | 77.9 | 33 | i 11 | 24 | -37 | i 21 | 59 | + 5 | 14 | 39 | PP 42.1 |
| Oxford | 78.2 | 39 | i 12 | 5 _a | + 2 | e 21 | 34 | -23 | — | — | e 37.1 |
| Kew | 78.8 | 39 | i 12 | 14 _k | + 8 | i 22 | 26 | +22 | 15 | 41 | PP e 38.8 |
| Paris | 80.7 | 43 | — | — | — | e 22 | 32 | + 8 | e 28 | 2 | SS 35.3 |
| Clermont-Ferrand | 81.3 | 46 | e 12 | 31 | +11 | i 22 | 58 | +28 | e 33 | 56 | SSS — |
| Algiers | 81.8 | 54 | e 12 | 5 | -17 | e 22 | 52 | +17 | e 28 | 18 | SS 34.3 |
| Bergen | 81.8 | 30 | 12 | 42 | +20 | e 22 | 55 | +20 | 28 | 52? | SS 36.3 |
| Uccle | 81.8 | 40 | e 12 | 27 | + 5 | i 22 | 56 | +21 | 28 | 14 | SS 36.3 |
| De Bilt | 82.2 | 38 | i 12 | 32 | + 8 | e 22 | 18 | -21 | — | — | e 35.3 |
| Besançon | 83.1 | 44 | 23 | 18? | PS | — | — | — | 28 | 18? | SS 45.3 |
| Neuchatel | 83.8 | 44 | e 12 | 35 | + 3 | — | — | — | — | — | — |
| Zurich | 84.9 | 44 | e 12 | 39 _a | + 1 | e 23 | 20 | +14 | — | — | — |
| Stuttgart | 85.1 | 41 | e 12 | 41 | + 2 | i 23 | 22 | +14 | e 16 | 23 | PP e 42.3 |
| Milan | 85.5 | 45 | — | — | — | e 23 | 20 | + 8 | — | — | — |
| Chur | 85.6 | 43 | e 12 | 44 | + 3 | e 23 | 25 | +12 | — | — | — |
| Jena | 86.3 | 40 | e 12 | 53 | + 8 | e 23 | 18 | - 2 | e 29 | 18 | SS e 36.3 |
| Copenhagen | 86.6 | 35 | e 12 | 51 | + 5 | 23 | 25 | + 2 | 16 | 18 | PP — |
| Potsdam | 87.0 | 38 | i 12 | 55 | + 7 | i 23 | 21 | - 6 | i 16 | 27 | PP e 34.3 |
| Upsala | 87.9 | 30 | e 13 | 11 | +18 | e 23 | 49 | +14 | 16 | 25 | PP e 38.3 |
| Prague | 88.3 | 40 | e 12 | 56 _a | + 1 | e 23 | 40 | + 1 | e 29 | 54 | SS 40.3 |
| Triest | 88.7 | 44 | e 13 | 8 | +11 | i 23 | 42 | - 1 | — | — | i 41.2 |
| Apia | 90.7 | 255 | — | — | — | i 23 | 47 | [+10] | — | — | 44.3 |
| Warsaw | 91.8 | 37 | e 13 | 28 | +17 | e 23 | 47 | [+ 4] | e 17 | 3 | PP e 41.3 |
| Belgrade | 93.5 | 44 | e 14 | 44 | ? | e 24 | 18 | - 7 | — | — | 34.4 |
| Sofia | 96.1 | 46 | e 13 | 18 | -13 | e 24 | 12 | [+ 5] | e 26 | 27 | PPS — |
| Bucharest | 97.4 | 43 | e 14 | 36? | +59 | e 24 | 29 | [+15] | e 17 | 34 | PP 39.3 |
| Arapuni | 104.1 | 233 | — | — | — | 24 | 18? | [-28] | 33 | 18? | SSP 49.3 |
| Auckland | 104.7 | 235 | 19 | 36 | ? | 33 | 23 | SS | 43 | 18 | Q 49.3 |
| Wellington | 104.7 | 230 | 16 | 46 | ? | 24 | 53 | [+ 4] | i 18 | 31 | PP 50.3 |
| Christchurch | 106.2 | 227 | 14 | 33 | P | 25 | 0 | [+ 4] | 18 | 34 | PP 50.5 |
| Helwan | 106.4 | 56 | 14 | 33 | P | 25 | 9 | [+12] | 18 | 55 | PP — |
| Sverdlovsk | 108.3 | 20 | 14 | 27 | P | 25 | 8 | [+ 3] | 18 | 56 | PP — |
| Ksara | 108.5 | 51 | — | — | — | e 25 | 31 | [+25] | 28 | 41 | PS — |
| Baku | 114.8 | 38 | 19 | 43 | PP | 36 | 37 | SSP | i 29 | 44 | PS — |
| Irkutsk | 118.9 | 354 | 19 | 52 | PP | 25 | 44 | [- 2] | — | — | — |
| Tashkent | 124.2 | 24 | 15 | 52 | ? | 26 | 12 | [+ 9] | 20 | 54 | PP — |
| Riverview | 124.3 | 235 | e 20 | 45 | PP | e 28 | 5 | {+22} | e 38 | 7 | SSP e 59.0 |
| Andijan | 125.9 | 23 | 20 | 2 | [+58] | — | — | — | 22 | 8 | ? |
| Tananarive | 131.2 | 108 | e 22 | 59 | PKS | 39 | 23 | SSP | 30 | 32 | ? |
| Adelaide | 133.7 | 229 | i 22 | 58 | PKS | — | — | — | 66 | 14 | Q 61.7 |
| Agra | E. 140.0 | 26 | e 19 | 28 | [- 3] | 29 | 37 | {+16} | 22 | 44 | PP 69.5 |
| Bombay | 143.8 | 40 | e 19 | 39 | [+ 2] | 29 | 55 | {+12} | i 23 | 9 | PP 69.3 |
| Manila | 146.7 | 313 | 19 | 44 | [+ 2] | — | — | — | — | — | — |
| Calcutta | N. 147.9 | 14 | i 19 | 46 | [+ 2] | e 30 | 5 | {- 2} | e 23 | 32 | PP e 71.1 |
| Hyderabad | E. 148.3 | 34 | 19 | 21 | [-24] | — | — | — | — | — | — |
| Perth | 150.9 | 215 | i 22 | 5 | ? | i 48 | 43 | SSS | i 42 | 51 | SS i 67.3 |
| Colombo | E. 157.1 | 48 | 20 | 9 | [+12] | — | — | — | — | — | 76.2 |
| Medan | 167.6 | 351 | e 19 | 59 | [- 9] | 29 | 15 | PPP | — | — | 79.3 |
| Batavia | 169.7 | 284 | e 20 | 26 | [+17] | 31 | 41 | {-21} | — | — | e 48.3 |

Additional readings:—

San Juan i = +6m.31s.

Huancayo i = +9m.15s.

Columbia e = +7m.47s.

Bermuda i = +9m.12s.

La Paz iSE = +11m.42s., iE = +12m.24s., iSSE = +13m.35s.

Georgetown i = +8m.34s.

Continued on next page.

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1941

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Florissant $i_{PNZ} = +6m.14s.$, $i_{NZ} = +6m.19s.$, $i_N = +7m.47s.$, $eE = +11m.25s.$, $iN = +11m.34s.$ and $+12m.12s.$, $iE = +12m.24s.$
 Philadelphia $e = +6m.33s.$, $+10m.15s.$, $+11m.16s.$, and $+12m.3s.$
 Chicago U.S.C.G.S. $e = +6m.54s.$, $i = +9m.21s.$, $iS = +11m.38s.$, $e = +13m.7s.$
 Tucson $e = +6m.49s.$, $i = +7m.38s.$, $iP_cP = +8m.40s.$, $e = +9m.27s.$
 Harvard $i = +7m.32s.$ and $+9m.29s.$
 Vermont $eP_cP = +9m.30s.$
 East Machias $iP_cP = +9m.16s.$, $iPPP = +9m.32s.$
 Seven Falls SSS = $+17m.24s.$?
 Salt Lake City $e = +8m.35s.$
 Logan $e = +11m.55s.$, $eS? = +13m.51s.$
 Bozeman $e = +10m.44s.$, $i = +15m.2s.$
 Berkeley $iZ = +8m.21s.$, $eN = +8m.30s.$, $iSE = +15m.7s.$
 Branner $eN = +8m.21s.$
 Ukiah $e = +15m.47s.$
 La Plata E. $+9m.48s.$, $P_cS? = +13m.36s.$, $PS = +16m.36s.$ and $+17m.30s.$, $SS = +20m.6s.$, $SSS? = +23m.0s.$
 La Plata N. $+9m.30s.$ and $+9m.36s.$, $P_cS? = +13m.24s.$, $PS = +16m.43s.$ and $+17m.36s.$, $S_cS = +19m.0s.$, $SS = +20m.42s.$, $SSS = +21m.18s.$ and $+23m.6s.$, $Q? = +23m.54s.$
 Ivigtut ? = $+10m.12s.$ and $+18m.57s.$
 College $eS_cS = +21m.27s.$, $eSS = +25m.11s.$
 Lisbon $e_{PN} = +11m.44s.$, $iS_cS?E = +21m.48s.$, $QN = +31m.6s.$
 Scoresby Sund $i = +21m.35s.$
 Honolulu $e = +26m.21s.$
 Coimbra SS = $+26m.4s.$
 Granada $P_cP = +12m.26s.$, $PP = +14m.35s.$, $PPP = +16m.20s.$, $sS = +22m.8s.$, $PS = +22m.38s.$, $iSS = +27m.5s.$
 Almeria $PP = +15m.34s.$, $PS = +22m.44s.$, $PPS = +23m.17s.$, $SS = +27m.13s.$
 Stonyhurst SS = $+28m.10s.$, $SSS = +30m.53s.$
 Aberdeen $iPSE = +22m.54s.$, $iN = +27m.4s.$, $iSSE = +27m.39s.$, $iE = +28m.49s.$, $iN = +34m.32s.$, $QE = +37m.24s.$
 Kew $iP_cPE = +12m.25s.$, $iPS = +22m.54s.$, $iSS = +27m.48s.$, $eSSS = +30m.48s.$, $eQE = +33.8m.$
 Paris $eSSS = 32m.8s.$
 Algiers PS = $+23m.31s.$
 Uccle $iZ = +13m.12s.$, $iE = +23m.53s.$
 Stuttgart $i = +12m.51s.$, $iPSE = +23m.57s.$, $eSSE = +29m.18s.$, $eSSN = +29m.52s.$
 Jena $e = +13m.18s.$, $eEN = +17m.18s.$
 Copenhagen $e = +13m.29s.$ and $+24m.12s.$
 Potsdam $iP_cPZ = +13m.1s.$, $eP_cPN = +13m.5s.$, $iZ = +13m.29s.$, $iSKKSE = +23m.34s.$, $iSN = +23m.44s.$, $iS_cSZ = +23m.51s.$, $iN = +24m.20s.$, $iZ = +28m.43s.$, $iSSE = +29m.32s.$, $iN = +30m.1s.$
 Upsala $e = +24m.25s.$, $eN = +27m.49s.$, $eSSE = +29m.42s.$, $eSSSN = +33m.18s.?$, $eSSSE = +33m.59s.$
 Prague $ePS = +24m.24s.$
 Warsaw $eE = +16m.7s.$ and $+17m.7s.$, $eN = +24m.2s.$ and $+24m.34s.$, $eZ = +24m.39s.$, $eN = +24m.59s.$, $eE = +25m.31s.$, $eN = +25m.35s.$, $eZ = +25m.41s.$
 Belgrade $e = +16m.15s.$ and $+22m.19s.$
 Bucharest $eN = +15m.0s.?$, $eE = +15m.54s.$, $+17m.46s.$, $+23m.48s.$, and $+26m.41s.$, $eN = +26m.44s.$
 Auckland PPS = $+27m.52s.$, $iZ = +29m.53s.$, $PPP = +36m.3s.$
 Wellington $PPZ = +17m.29s.$, $iZ = +17m.41s.$ and $+17m.58s.$, $i = +29m.35s.$, $SS = +33m.48s.$, $iZ = +34m.28s.$
 Christchurch PS = $+28m.0s.$, $SS = +33m.51s.$
 Helwan $iZ = +19m.12s.$, $PSE = +28m.18s.$, $iE = +28m.44s.$, $PPPSE = +29m.12s.$
 Sverdlovsk $iPS = +28m.24s.$
 Ksara $e = +34m.11s.$
 Tashkent PKP = $+19m.4s.$
 Riverview $iPSEN = +31m.1s.$, $eE = +32m.44s.$, $eQN = +52m.12s.$
 Adelaide $iPN = 19m.6s.$, $i = 21m.59s.$, $SSN = +35m.9s.$, $i = +47m.40s.$, $Q = +90m.56s.$, $R = +94m.0s.$ Phases wrongly identified.
 Agra SKPE = $+23m.17s.$, $PPPE = +26m.6s.$, $SKSPE = +32m.55s.$, $PPSE = +35m.21s.$, $SSE = +41m.33s.$
 Bombay $iPKP_2EN = +19m.51s.$, $ePKSN = +23m.16s.$, $SKSPE = +33m.21s.$, $eN = +35m.58s.$, $PPSE = +36m.23s.$, $SSE = +42m.3s.$, $SSN = +42m.8s.$, $SSSE = +47m.16s.$, $QE = +60m.47s.$
 Calcutta $ePPP = +26m.44s.$, $ePSKSN = +33m.45s.$, $iPPS = +36m.29s.$, $iSSN = +42m.39s.$, $iSSSN = +48m.20s.$
 Batavia PZ = $+20m.29s.$
 Long waves were also recorded at Sitka, Spokane, and Brisbane.

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1941

496

Dec. 6d. 23h. 54m. 38s. Epicentre 8°·7N. 83°·2W. (as at 21h.).

A = +·1171, B = -·9816, C = +·1503; $\delta = -16$; $h = +7$;

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----|----------|-----|---------|------|---------|------|--------|-----------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Tacubaya | N. | 18·8 | 307 | e 4 18? | - 5 | — | — | — | — |
| San Juan | | 19·2 | 58 | i 4 30 | + 2 | i 8 12 | +13 | e 5 1 | PP i 9·2 |
| Huancayo | | 22·1 | 159 | i 5 0 | + 1 | e 9 8 | +10 | i 5 38 | PP e 10·3 |
| Columbia | | 25·3 | 5 | e 5 44 | +14 | e 9 45 | - 9 | — | — i 13·2 |
| Cape Girardeau | N. | 29·1 | 350 | i 6 2 | - 2 | e 10 49 | - 7 | e 7 32 | PPP — |
| La Paz | | 29·2 | 148 | 6 9 | + 4 | i 11 20 | +22 | i 7 45 | PPP 17·3 |
| St. Louis | | 30·5 | 349 | i 6 13 | - 4 | i 11 17 | - 1 | i 7 10 | pP — |
| Florissant | | 30·7 | 349 | i 6 16 | - 3 | e 11 20 | - 1 | i 7 11 | pP — |
| Philadelphia | | 31·9 | 12 | e 6 32 | + 3 | e 11 52 | +12 | — | — e 13·8 |
| Fordham | | 33·1 | 14 | i 6 43 | + 3 | i 12 9 | +10 | — | — — |
| Chicago U.S.C.G.S. | | 33·2 | 352 | e 6 47 | + 7 | e 12 0 | 0 | i 7 50 | PP e 14·6 |
| Tucson | | 34·7 | 318 | e 6 52 | - 2 | e 12 18 | - 6 | e 8 4 | PP e 15·4 |
| Toronto | | 35·0 | 5 | e 7 22? | +26 | — | — | — | — 18·4 |
| Ottawa | | 37·1 | 8 | 7 15 | + 1 | 13 10 | + 9 | 8 41 | PP 18·4 |
| East Machias | | 38·5 | 19 | e 7 27 | + 1 | — | — | — | — e 16·5 |
| La Jolla | z. | 39·6 | 313 | i 7 34 | - 1 | — | — | — | — — |
| Palomar | z. | 39·6 | 314 | i 7 34 | - 1 | — | — | — | — — |
| Riverside | | 40·3 | 314 | i 7 40 | 0 | — | — | — | — — |
| Salt Lake City | | 40·8 | 326 | e 9 33 | PP | e 17 31 | SSS | — | — e 18·6 |
| Mount Wilson | | 40·9 | 314 | i 7 45 | - 1 | — | — | — | — — |
| Pasadena | | 40·9 | 314 | i 7 45 | - 1 | — | — | — | — e 29·4 |
| Haiwee | | 41·8 | 317 | i 7 52 | - 1 | — | — | — | — — |
| Santa Barbara | | 42·2 | 314 | i 7 56 | 0 | — | — | — | — — |
| Tinemaha | | 42·5 | 318 | i 7 58 | - 1 | — | — | — | — — |
| Berkeley | | 45·6 | 316 | i 8 24 | 0 | — | — | — | — — |
| Toledo | | 76·2 | 51 | i 11 52 | 0 | — | — | — | — — |
| Stuttgart | | 85·1 | 41 | i 12 40 | + 1 | — | — | — | — — |

Additional readings:—

San Juan i = +5m.39s. and +6m.37s.

Columbia i = +10m.14s.

La Paz P_cP = +9m.6s., iSSN = +13m.9s., iN = +14m.10s.

St. Louis iZ = +6m.34s. and +7m.31s., iE = +11m.46s., isSEN = +13m.4s.

Florissant eN = +7m.3s., +11m.25s., and +12m.4s., esSE = +13m.2s., eE = +13m.42s.

Tucson e = +10m.48s.

East Machias e = +11m.37s.

Toledo e = +13m.26s.

Dec. 6d. Readings also at 0h. (near Almeria, Granada, and Toledo), 1h. (Merida (2), La Paz, Huancayo, San Juan, Tacubaya, and Tucson), 3h. (Tucson, Berkeley, and Tinemaha), 6h. (Tucson), 7h. (Palomar, Haiwee, San Juan (2), Huancayo, La Paz, Merida, Ottawa, Columbia, Tucson, Tinemaha, Mount Wilson, and Pasadena), 9h. (San Juan, Calcutta, La Paz, Huancayo, Columbia, and Ottawa), 11h. (Huancayo), 12h. (La Paz), 13h. (La Paz), 19h. (Sverdlovsk, Tashkent, Helwan, Ksara, Baku, Andijan, and Copenhagen), 20h. (near Branner), 21h. (near Mizusawa, Tucson, Pasadena, and Mount Wilson), 22h. (Tucson, Pasadena, Mount Wilson, Tinemaha, Palomar, and La Paz).

Dec. 7d. 0h. 25m. 14s. Epicentre 8°·7N. 83°·2W. (as on 1941, December 6d.).

A = +·1171, B = -·9816, C = +·1503; $\delta = -16$; $h = +7$;

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------|----|----------|-----|--------|------|--------|------|--------|------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| San Juan | | 19·2 | 58 | e 4 26 | - 2 | i 8 1 | + 2 | e 5 6 | PPP 13·4 |
| Huancayo | | 22·1 | 159 | e 4 52 | - 7 | e 8 53 | - 5 | e 5 41 | PPP e 10·6 |
| La Paz | z. | 29·2 | 148 | 6 11 | + 6 | — | — | — | — — |
| St. Louis | z. | 30·5 | 349 | i 6 18 | + 1 | — | — | — | — — |
| Florissant | N. | 30·7 | 349 | e 6 18 | - 1 | — | — | — | — — |
| Tucson | | 34·7 | 318 | 6 55 | + 1 | — | — | — | — — |
| Ottawa | | 37·1 | 8 | e 7 13 | - 1 | — | — | — | — 17·8 |
| La Jolla | z. | 39·6 | 313 | i 7 36 | + 1 | — | — | — | — — |
| Palomar | z. | 39·6 | 314 | i 7 36 | + 1 | — | — | — | — — |
| Riverside | z. | 40·3 | 314 | e 7 42 | + 2 | — | — | — | — — |

Continued on next page.

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1941

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------|----------|-----|--------|------|-------|------|-------|----|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Mount Wilson | 40.9 | 314 | i 7 47 | + 1 | — | — | — | — |
| Pasadena | 40.9 | 314 | e 7 47 | + 1 | — | — | — | — |
| Haiwee | 41.8 | 317 | e 7 53 | 0 | — | — | — | — |
| Santa Barbara | 42.2 | 314 | e 7 59 | + 3 | — | — | — | — |
| Tinemaha | 42.5 | 318 | i 8 0 | + 1 | — | — | — | — |
| Berkeley | z. 45.6 | 316 | i 8 25 | + 1 | — | — | — | — |

San Juan also gives $iP = +4m.29s.$

Dec. 7d. 4h. 23m. 3s. Epicentre $8^{\circ}.7N. 83^{\circ}.2W.$ (as at 0h.).

$A = +.1171, B = -.9816, C = +.1503; \delta = -16; h = +7.$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----------|-----|--------|------|---------|------|------------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| San Juan | 19.2 | 58 | e 4 29 | + 1 | e 8 5 | + 6 | i 5 13 PPP | e 11.5 |
| Huancayo | 22.1 | 159 | e 4 56 | - 3 | e 9 1 | + 3 | e 5 43 PPP | e 10.4 |
| La Paz | N. 29.2 | 148 | 6 4 | - 1 | 11 6 | + 8 | — | 15.7 |
| St. Louis | 30.5 | 349 | i 6 16 | - 1 | i 11 20 | + 2 | — | — |
| Florissant | 30.7 | 349 | e 6 16 | - 3 | e 11 22 | + 1 | e 13 1 sS | — |
| Tucson | 34.7 | 318 | i 6 55 | + 1 | — | — | i 8 28 PPP | e 14.3 |
| Ottawa | 37.1 | 8 | e 7 13 | - 1 | — | — | — | 18.9 |
| La Jolla | 39.6 | 313 | e 7 37 | + 2 | — | — | — | — |
| Palomar | z. 39.6 | 314 | i 7 37 | + 2 | — | — | — | — |
| Mount Wilson | 40.9 | 314 | i 7 47 | + 1 | — | — | — | — |
| Pasadena | 40.9 | 314 | i 7 47 | + 1 | — | — | e 9 45 PPP | — |
| Haiwee | 41.8 | 317 | e 7 53 | 0 | — | — | — | — |
| Tinemaha | 42.5 | 318 | i 8 0 | + 1 | — | — | — | — |
| Berkeley | z. 45.6 | 316 | i 8 25 | + 1 | — | — | — | — |

Dec. 7d. 11h. 41m. 57s. Epicentre $8^{\circ}.7N. 83^{\circ}.2W.$ (as at 4h.).

$A = +.1171, B = -.9816, C = +.1503; \delta = -16; h = +7.$

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|---------------------|------|----------|------|-------------|--------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| San Juan | 19.2 | 58 | i 4 28 | 0 | i 8 7 | + 8 | i 5 20 PPP | e 11.0 |
| Huancayo | 22.1 | 159 | e 4 50 | - 9 | i 9 1 | + 3 | e 5 42 PPP | e 10.0 |
| Columbia | 25.3 | 5 | — | — | e 9 51 | - 3 | — | e 14.0 |
| Cape Girardeau | N. 29.1 | 350 | i 6 3 | - 1 | — | — | — | — |
| St. Louis | 30.5 | 349 | i 6 15 | - 2 | e 11 16 | - 2 | i 7 12 pP | — |
| Florissant | 30.7 | 349 | i 6 18 | - 1 | e 11 22 | + 1 | i 7 12 pP | — |
| Philadelphia | 31.9 | 12 | — | — | e 11 46 | + 6 | — | e 16.8 |
| Fordham | 33.1 | 14 | e 6 41 | + 1 | e 12 5 | + 6 | — | — |
| Chicago U.S.C.G.S. | 33.2 | 352 | e 7 39 | PP | — | — | — | e 14.6 |
| Tucson | 34.7 | 318 | e 6 54 | 0 | e 12 41 | + 17 | e 8 9 PP | e 14.7 |
| Ottawa | 37.1 | 8 | e 7 14 | 0 | e 13 3? | + 2 | — | 18.0 |
| East Machias | 38.5 | 19 | — | — | e 13 4 | - 18 | e 16 30 SSS | — |
| La Jolla | z. 39.6 | 313 | i 7 37 | + 2 | — | — | — | — |
| Palomar | z. 39.6 | 314 | i 7 36 | + 1 | — | — | — | — |
| Seven Falls | 39.7 | 13 | — | — | e 13 45? | + 5 | — | 21.0 |
| Riverside | z. 40.3 | 314 | i 7 41 _a | + 1 | — | — | — | — |
| Mount Wilson | 40.9 | 314 | i 7 45 _a | - 1 | — | — | — | — |
| Pasadena | 40.9 | 314 | i 7 46 _a | 0 | — | — | — | e 23.0 |
| Haiwee | 41.8 | 317 | i 7 55 | + 2 | — | — | — | — |
| Santa Barbara | 42.2 | 314 | e 7 57 | + 1 | — | — | — | — |
| Tinemaha | z. 42.5 | 318 | i 8 0 _a | + 1 | — | — | — | — |
| Berkeley | 45.6 | 316 | i 8 25 | + 1 | — | — | — | — |
| Auckland | 104.7 | 235 | — | — | e 37 38 | SSS | — | — |

Additional readings: —

San Juan $e = +7m.14s.$ and $+9m.47s.$

Columbia $e = +10m.15s.$

St. Louis $iEN = +11m.38s., isSEN = +12m.56s., iN = +13m.38s.$

Florissant $iN = +7m.20s., eE = +10m.48s. \text{ and } +11m.44s., isSE = +13m.1s.$

Tucson $e = +8m.20s.$

Ottawa $eN = +9m.41s.$

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1941

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Dec. 7d. Readings also at 0h. (Tucson, Palomar, Pasadena, Tinemaha and Riverside), 5h. (near Mizusawa, Mount Wilson, Cape Girardeau, Palomar, Pasadena and Tinemaha), 7h. (La Paz, near Berkeley and Ferndale), 10h. (near Angra de Heroismo and La Paz), 18h. (La Paz), 19h. (Andijan, Tashkent and Almata), 21h. (near Almata).

Dec. 8d. 7h. 41m. 14s. Epicentre $8^{\circ}7'N$. $83^{\circ}2'W$. (as on 6d.).

The first of four repetitions of the earthquake of Dec. 5d. For the other three shocks see below.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|------------|------------|---------|------|-----------|------|-------------------------|--------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| San Juan | 19.2 | 58 | i 4 31 | + 3 | i 8 13 | +14 | i 5 1 PP | i 9.3 |
| Huancayo | 22.1 | 159 | i 4 58 | - 1 | e 8 59 | + 1 | i 6 39 PPP | e 11.3 |
| Bermuda | 29.0 | 34 | i 7 14 | PPP | — | — | e 8 1 ? | e 12.0 |
| Cape Girardeau | 29.1 | 350 | i 6 2 | - 2 | e 10 53 | - 3 | — | — |
| La Paz | 29.2 | 148 | i 6 5a | 0 | 11 6 | + 8 | i 7 1 PP | 14.5 |
| St. Louis | 30.5 | 349 | i 6 17 | 0 | e 11 18 | 0 | — | — |
| Florissant | 30.7 | 349 | e 6 17 | - 2 | i 11 23 | + 2 | e 7 16 PP | 13.2 |
| Philadelphia | 31.9 | 12 | e 6 25 | - 4 | e 10 45 | -55 | — | e 11.7 |
| Fordham | 33.1 | 14 | i 6 42 | + 2 | i 12 2 | + 3 | — | e 16.3 |
| Chicago U.S.C.G.S. | 33.2 | 352 | e 7 55 | PP | — | — | — | e 14.1 |
| Tucson | 34.7 | 318 | i 6 53 | - 1 | e 12 28 | + 4 | e 8 11 PP | e 14.5 |
| Ottawa | 37.1 | 8 | 7 15 | + 1 | 13 7 | + 6 | — | 18.8 |
| La Jolla | 39.6 | 313 | i 7 34 | - 1 | — | — | — | — |
| Palomar | z. 39.6 | 314 | i 7 37 | + 2 | — | — | — | — |
| Seven Falls | 39.7 | 13 | — | — | e 13 52? | +12 | — | 17.8 |
| Riverside | 40.3 | 314 | i 7 41 | + 1 | — | — | — | — |
| Salt Lake City | 40.8 | 326 | e 10 18 | ? | — | — | — | e 17.9 |
| Mount Wilson | z. 40.9 | 314 | i 7 46 | 0 | — | — | — | — |
| Pasadena | 40.9 | 314 | i 7 46 | 0 | e 14 5 | + 7 | i 9 39 P _c P | e 18.8 |
| Haiwee | 41.8 | 317 | i 7 54 | + 1 | — | — | — | — |
| Santa Barbara | 42.2 | 314 | i 7 57 | + 1 | — | — | — | — |
| Tinemaha | 42.5 | 318 | i 8 0 | + 1 | — | — | — | — |
| Santa Clara | E. 45.2 | 316 | e 8 26 | + 6 | — | — | — | e 26.8 |
| Berkeley | 45.6 | 316 | i 8 24 | 0 | — | — | — | e 20.8 |
| La Plata | E. 49.5 | 152 | 9 28 | +34 | 17 4 | +62 | — | 28.8 |
| Rio de Janeiro | E. 50.2 | 129 | e 16 11 | S | (e 16 11) | 0 | e 21 16 SSS | e 25.3 |
| | N. 50.2 | 129 | e 16 8 | S | (e 16 8) | - 3 | e 21 12 SSS | — |
| College | 71.5 | 337 | — | — | e 21 26 | PPS | — | e 39.0 |
| Lisbon | 72.2 | 52 | — | — | 15 40 | PPP | 34 22 | 34.1 |
| Coimbra | 72.8 | 50 | e 12 16 | +44 | i 22 6 | PPS | — | 36.1 |
| San Fernando | E. 74.4 | 55 | — | — | e 21 46? | +30 | — | — |
| Granada | 76.5 | 54 | 14 10 | PP | — | — | — | — |
| Clermont-Ferrand | 81.3 | 46 | e 12 20 | 0 | — | — | — | e 41.0 |

Additional readings:—

San Juan i = +5m.39s.

La Paz iN = +8m.6s., SSN = +12m.44s.

St. Louis iE = +13m.32s.

Florissant iN = +8m.26s., iEN = +12m.56s.

Fordham e = +9m.22s.

Tucson e = +9m.17s., and +9m. 32s.

Long waves were also recorded at Riverview, Scoresby Sund, and other American European, and New Zealand stations.

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1941

499

Dec. 8d. 7h. 42m. 20s. Epicentre 8°·7N. 83°·2W. (as at 7h. 41m.).

| | | Δ | Az. | P. | O - C. | S. | O - C. |
|------------------|----|----------|-----|---------|--------|---------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. |
| Huancayo | | 22·1 | 159 | i 5 5 | + 6 | — | — |
| Cape Girardeau | | 29·1 | 350 | e 6 2 | - 2 | — | — |
| St. Louis | N. | 30·5 | 349 | e 6 16 | - 1 | e 10 50 | -28 |
| Florissant | | 30·7 | 349 | e 6 16 | - 3 | — | — |
| Fordham | | 33·1 | 14 | e 6 42 | + 2 | — | — |
| Tucson | | 34·7 | 318 | e 6 53 | - 1 | — | — |
| Ottawa | | 37·1 | 8 | 7 14 | 0 | — | — |
| La Jolla | Z. | 39·6 | 313 | i 7 34 | - 1 | — | — |
| Palomar | Z. | 39·6 | 314 | i 7 37 | + 2 | — | — |
| Riverside | Z. | 40·3 | 314 | i 7 40 | 0 | — | — |
| Mount Wilson | Z. | 40·9 | 314 | i 7 46 | 0 | — | — |
| Pasadena | | 40·9 | 314 | i 7 46 | 0 | e 14 11 | +13 |
| Haiwee | Z. | 41·8 | 317 | e 7 54 | + 1 | — | — |
| Tinemaha | Z. | 42·5 | 318 | i 7 59 | 0 | — | — |
| Clermont-Ferrand | | 81·3 | 46 | e 12 20 | 0 | — | — |

Dec. 8d. 7h. Two repetitions from the above epicentre were recorded in California :

| | | Δ | P reading | | Shock II | |
|--------------|----|----------|-----------|----|----------|----|
| | | | m. | s. | m. | s. |
| Tucson | | 34·7 | e 53 | 21 | e 53 | 56 |
| Palomar | Z. | 39·6 | e 54 | 3 | i 54 | 38 |
| Riverside | Z. | 40·3 | — | — | e 54 | 42 |
| Mount Wilson | Z. | 40·9 | — | — | i 54 | 49 |
| Pasadena | | 40·9 | e 54 | 14 | i 54 | 48 |
| Tinemaha | Z. | 42·5 | e 54 | 27 | i 55 | 2 |

Dec. 8d. 10h. 45m. 34s., I. Epicentre 8°·7N. 83°·2W.
 11h. 0m. 47s., II. (as at 7h.).
 16h. 24m. 58s., III.

| | | Δ | Az. | P. | O - C. | S. | O - C. | L. |
|----------------|----|----------|-----|--------|--------|----------|--------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. |
| I San Juan | | 19·2 | 58 | e 4 29 | + 1 | e 8 15 | +16 | e 10·3 |
| II | | 19·2 | 58 | e 4 31 | + 3 | e 8 9 | +10 | e 10·0 |
| III | | 19·2 | 58 | e 4 23 | - 5 | e 8 5 | + 6 | e 9·1 |
| I Huancayo | | 22·1 | 159 | e 4 57 | - 2 | e 9 11 | +13 | e 12·0 |
| III | | 22·1 | 159 | e 4 49 | -10 | (e 8 48) | -10 | e 8·8 |
| II Tucson | | 34·7 | 318 | e 6 53 | - 1 | e 10 37 | ? | — |
| III | | 34·7 | 318 | e 6 44 | -10 | — | — | — |
| I Palomar | Z. | 39·6 | 314 | e 7 39 | + 4 | — | — | — |
| II | Z. | 39·6 | 314 | i 7 37 | + 2 | — | — | — |
| III | Z. | 39·6 | 314 | i 7 38 | + 3 | — | — | — |
| III Riverside | Z. | 40·3 | 314 | e 7 38 | - 2 | — | — | — |
| I Mount Wilson | Z. | 40·9 | 314 | e 7 47 | + 1 | — | — | — |
| II | Z. | 40·9 | 314 | e 7 45 | - 1 | — | — | — |
| III | Z. | 40·9 | 314 | e 7 48 | + 2 | — | — | — |
| I Pasadena | Z. | 40·9 | 314 | e 7 47 | + 1 | — | — | — |
| II | Z. | 40·9 | 314 | e 7 45 | - 1 | — | — | — |
| III | | 40·9 | 314 | e 7 47 | + 1 | — | — | — |
| I Tinemaha | Z. | 42·5 | 318 | e 8 2 | + 3 | — | — | — |
| II | Z. | 42·5 | 318 | e 7 59 | 0 | — | — | — |
| III | Z. | 42·5 | 318 | e 7 59 | 0 | — | — | — |

Dec. 8d. Readings also at 0h. (near Berkeley, Branner, Lick, Fresno, San Francisco, Haiwee, Pasadena, Palomar, Tinemaha, near Tucson, and near Apia), 4h. (Rio de Janeiro), 7h. (Sofia), 8h. (Bombay), 11h. (Berkeley and La Paz), 12h. (Mount Wilson, Pasadena, Tucson, and Palomar), 13h. (Tucson, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Huancayo), 15h. (near Basle), 21h. (near Mizusawa).

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1941

500

Dec. 9d. 2h. 43m. 11s. Epicentre $4^{\circ}5S$. $120^{\circ}5E$.

A = -0.5060, B = +0.8590, C = -0.0779; $\delta = -1$; $h = +7$;
D = +0.862, E = +0.508; G = +0.040, H = -0.067, K = -0.997.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------|----------|-----|---------------------|-------|---------------|-------|---------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Batavia | 13.7 | 262 | 3 21 | + 3 | i 6 20 | SS | i 6 23 | SSS |
| Medan | 23.2 | 292 | e 5 8 | - 1 | 9 20 | + 2 | — | — |
| Perth | 27.7 | 189 | — | — | 12 11 | SSS | — | (14.2) |
| Adelaide | 34.6 | 154 | e 6 55 | + 2 | i 14 31 | SS | i 8 19 | PP |
| Brisbane | 38.5 | 131 | i 8 51 | PP | i 15 49 | SS | e 8 57 | PPP e 21.8 |
| Riverview | 40.8 | 140 | i 7 47 _a | + 2 | e 14 1 | + 5 | — | — e 21.5 |
| Sydney | 40.8 | 140 | — | — | e 12 1 | ? | — | — |
| Calcutta | N. 41.4 | 312 | e 7 44 | - 6 | i 13 51 | -14 | 9 6 | PP e 20.7 |
| Colombo | E. 42.1 | 285 | 7 55 | 0 | — | — | — | 22.7 |
| Kodalkanal | E. 45.3 | 290 | e 8 21 | 0 | e 14 54 | - 8 | 10 9 | PP 22.8 |
| Agra | E. 51.7 | 310 | e 8 58 | -13 | i 16 13 | -19 | — | — |
| Bombay | E. 52.4 | 298 | i 9 10 | - 6 | e 16 20 | -22 | 11 10 | PP 24.3 |
| Auckland | 59.1 | 130 | — | — | 17 14 | -57 | i 19 25 | ? 25.8 |
| Christchurch | 60.1 | 138 | 10 11 _a | 0 | — | — | 25 18 | Q 30.3 |
| Wellington | 60.7 | 136 | — | — | 17 49? | -43 | — | — 25.8 |
| Sverdlovsk | 77.9 | 331 | 11 43 | -18 | 21 53 | - 1 | — | — |
| Helwan | 91.5 | 300 | e 13 5 | - 5 | e 23 34 | [- 8] | e 16 43 | PP 66.8 |
| Upsala | 100.3 | 329 | — | — | e 38 49? | ? | — | e 46.8 |
| Copenhagen | 103.8 | 326 | — | — | 24 35 | [-10] | — | 52.8 |
| Potsdam | 104.2 | 323 | — | — | e 25 49? | - 6 | e 24 33 | SKS e 47.8 |
| Tinemaha | z. 117.4 | 50 | e 18 38 | [- 9] | — | — | — | — |
| Mount Wilson | z. 118.3 | 53 | e 18 38 | [-11] | — | — | — | — |
| Pasadena | z. 118.3 | 53 | e 18 38 | [-11] | — | — | e 19 49 | PP e 56.8 |
| Riverside | z. 118.9 | 53 | e 18 41 | [- 9] | — | — | — | — |
| Palomar | z. 119.5 | 53 | e 18 46 | [- 6] | — | — | — | — |
| Granada | 119.6 | 310 | e 26 59 | SKKS | (26 59) {-12} | — | e 29 49 | PS 62.5 |
| Tucson | 124.7 | 53 | e 18 51 | [-11] | — | — | — | e 63.9 |
| Huancayo | 157.2 | 136 | e 28 51 | PPP | e 30 25 | [-33] | — | e 66.4 |
| La Paz | z. 157.5 | 158 | i 20 0 | [+ 2] | — | — | — | 78.8 |
| San Juan | 164.7 | 25 | e 22 0 | ? | e 31 32 | [- 4] | e 27 59 | PPP e 86.0 |

Additional readings:—

Perth h given as SS.

Brisbane eN = +16m.16s.

Calcutta eSSN = +16m.42s.

Bombay iS_cSE = +18m.53s., SSE = +19m.28s., QE = +20m.22s.

Helwan eZ = +18m.16s.

Granada ePP = +33m.37s., iS = +39m.53s., PS = +42m.13s., eSS = +49m.27s.

Phrases wrongly identified.

San Juan e = +36m.30s.

Long waves were also recorded at De Bilt, Kew, Uccle, Aberdeen, Warsaw, Arapuni, and Bergen.

Dec. 9d. Readings also at 5h. (Tucson, Tinemaha and Pasadena), 7h. (near Belgrade), 14h. (Mount Wilson, Palomar, Haiwee, Tinemaha, near Apia and near Trieste), 16h. (La Paz), 18h. (Toledo), 19h. (Ksara, Granada, Wellington, Arapuni, Auckland, Riverside, Tucson, Riverview, Salt Lake City, Berkeley, Pasadena, and Tinemaha), 23h. (near Branner).

Dec. 10d. Readings at 0h. (De Bilt, Almeria, Granada, Kew, Zurich, Chur, Basle, Stuttgart, Jena, near Trieste, Potsdam, near Sofia and Bucharest (2)), 2h. (La Paz, La Plata, near Mizusawa, and Sofia), 3h. (Tucson, near Mount Wilson, Pasadena, La Paz, and Tinemaha), 7h. (near Sofia and Bucharest, and near Mizusawa), 11h. (near Lick), 12h. (near Mizusawa), 13h. (La Paz, Bombay, and near Huancayo), 16h. (near Mizusawa), 20h. and 22h. (near Andijan).

Dec. 11d. Readings at 1h. (Christchurch and Wellington), 10h. (near Mizusawa), 17h. (near Tashkent), 21h. (Auckland), 22h. (Wellington).

Dec. 12d. Readings at 1h. (Scoresby Sund, Lisbon, Berkeley, Granada, near San Juan and Port au Prince), 2h. (Granada and Almata), 4h. (near Apia), 6h. (Port au Prince and near San Juan), 9h. (La Paz), 12h. (Medan), 18h. (Huancayo), 23h. (Harvard, Ottawa, Medan, and near Shawinigan Falls).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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1941

501

Dec. 13d. 6h. 15m. 59s. Epicentre 37°·2N. 28°·3E. (as on 1941 September 21d.).

Much damage at Mougla (Turkey). Epicentre 37°·0N. 28°·5E. (Strasbourg).

J. P. Rothé.

Chronique séismologique, Revue pour l'Etude des Calamités tome VII, No. 21, Geneva 1944, p.49.

A = +·7031, B = +·3786, C = +·6020; δ = +9; h = -1;
D = +·474, E = -·880; G = +·530, H = +·285, K = -·799.

| | Δ | Az. | P. | | O - C. | S. | | O - C. | Supp. | | L. | | |
|------------------|----------|-----|------|-----------------|----------------|--------|-----|--------|-------|----|----------------|--------|---|
| | | | m. | s. | s. | m. | s. | m. | s. | | m. | | |
| Istanbul | 3·9 | 6 | 1 | 16 | P _r | 2 | 2 | S* | 2 | 13 | S _r | e 3·0 | |
| Sofia | 6·6 | 327 | e 1 | 43 | + 2 | e 3 | 5 | + 7 | i 3 | 44 | S _r | — | |
| Ksara | 7·0 | 116 | e 1 | 49 | + 3 | e 3 | 9 | + 1 | — | — | — | — | |
| Bucharest | N. 7·4 | 347 | i 1 | 54 | + 2 | i 3 | 33 | S* | i 4 | 11 | S _r | — | |
| Helwan | 7·7 | 160 | i 1 | 57 _a | + 1 | 3 | 23 | - 2 | 2 | 40 | P _r | — | |
| Belgrade | 9·6 | 325 | i 2 | 23 | + 2 | e 4 | 48 | S* | — | — | — | e 6·1 | |
| Triest | 13·8 | 312 | e 3 | 13 | - 6 | e 6 | 1 | + 7 | — | — | — | — | |
| Warsaw | Z. 15·9 | 343 | e 3 | 45 | - 2 | e 6 | 57 | SS | — | — | — | e 7·5 | |
| Prague | 16·3 | 327 | e 3 | 48 | - 4 | e 6 | 58 | + 5 | — | — | — | e 8·0 | |
| Chur | 16·9 | 311 | e 4 | 1 | + 2 | — | — | — | — | — | — | e 10·9 | |
| Baku | 17·1 | 72 | i 4 | 7 | + 5 | 17 | 25 | +13 | — | — | — | — | |
| Zurich | 17·7 | 311 | e 4 | 8 _k | - 2 | — | — | — | — | — | — | — | |
| Stuttgart | 18·1 | 315 | e 4 | 14 | 0 | e 7 | 55 | SS | — | — | — | e 9·7 | |
| Jena | 18·2 | 326 | i 4 | 14 | - 2 | e 7 | 47 | +10 | e 5 | 1 | PPP | e 9·0 | |
| Basle | 18·4 | 312 | e 4 | 18 | 0 | e 7 | 47 | + 6 | — | — | — | — | |
| Potsdam | 18·6 | 330 | i 4 | 20 _a | - 1 | 17 | 48 | + 2 | 18 | 0 | SS | 10·0 | |
| Algiers | 20·2 | 276 | i 4 | 37 | - 2 | 18 | 19 | - 2 | 18 | 45 | SS | e 15·0 | |
| Clermont-Ferrand | 20·6 | 303 | e 4 | 43 | 0 | — | — | — | — | — | — | — | |
| Copenhagen | 21·4 | 335 | i 4 | 50 _k | - 1 | 8 | 49 | + 4 | — | — | — | 11·0 | |
| Uccle | 21·8 | 316 | i 4 | 56 _a | 0 | 18 | 59 | + 7 | — | — | — | 12·0 | |
| De Bilt | 22·1 | 322 | — | — | — | e 9 | 17 | + 3 | — | — | — | e 11·5 | |
| Upsala | 23·7 | 345 | 9 | 37 | S | (9 37) | +10 | — | — | — | — | (12·6) | |
| Almeria | 24·5 | 279 | i 5 | 19 | - 3 | 9 | 29 | -11 | 5 | 54 | PP | 11·6 | |
| Kew | 24·7 | 315 | — | — | — | e 9 | 56 | +12 | — | — | — | e 13·0 | |
| Granada | 25·3 | 280 | 5 | 29 | - 1 | i 10 | 23 | +29 | 6 | 6 | pP | 14·5 | |
| Toledo | 25·4 | 286 | i 5 | 31 | 0 | 19 | 56 | 0 | — | — | — | — | |
| San Fernando | 27·5 | 280 | — | — | — | e 11 | 58 | SSS | — | — | — | — | |
| Sverdlovsk | 29·1 | 37 | i 6 | 7 | + 3 | 1 | 10 | 59 | + 3 | — | — | — | |
| Tashkent | 31·8 | 70 | e 6 | 26 | - 2 | -11 | 42 | + 4 | — | — | — | — | |
| Tchímkent | 31·9 | 68 | e 6 | 31 | + 2 | — | — | — | — | — | — | — | |
| Frunse | 35·5 | 67 | e 7 | 3 | + 3 | — | — | — | — | — | — | — | |
| Almata | 37·2 | 65 | e 7 | 38 | +23 | — | — | — | — | — | — | — | |
| Bombay | 41·9 | 103 | 18 | 2 | + 8 | i 14 | 28 | +15 | 8 | 25 | pP | 21·0 | |
| Agra | 42·8 | 88 | 8 | 8 | + 7 | 14 | 36 | +10 | 9 | 48 | PP | 20·9 | |
| Kodalkanal | E. 51·7 | 108 | e 8 | 59 | -12 | i 16 | 27 | - 5 | 19 | 4 | PP | 31·0 | |
| Calcutta | N. 53·3 | 88 | — | — | — | e 17 | 4 | +10 | 1 | 22 | 26 | SSS | — |
| Irkutsk | 53·6 | 48 | i 9 | 26 | + 1 | — | — | — | — | — | — | — | |
| Ottawa | 73·1 | 314 | e 11 | 34 | 0 | — | — | — | — | — | — | 41·0 | |
| San Juan | 82·5 | 287 | — | — | — | e 22 | 39 | - 3 | — | — | — | e 45·3 | |
| Tinemaha | Z. 99·9 | 334 | e 13 | 49 | + 1 | — | — | — | — | — | — | — | |
| Tucson | 101·1 | 326 | e 13 | 54 | + 1 | — | — | — | e 18 | 3 | PP | e 55·3 | |

Additional readings :—

Istanbul P_r = +1m.22s.

Sofia iN = +2m.53s., iE = +3m.28s., iN = +3m.52s.

Bucharest iS_rN = +4m.31s.

Belgrade e = +3m.26s.

Jena iP = +4m.17s., eSE = +7m.50s.

Potsdam iSN = +7m.53s., iSE = +7m.57s.

Clermont-Ferrand e = +4m.53s.

Upsala L given as S.

Almeria P_cP = +9m.10s., P_cS = +12m.45s., S_cS = +16m.35s.

Granada PP = +6m.37s., ePPP = +7m.34s., eP_cP = +8m.41s., Q = +10m.59s., sS =

+11m.20s.

Bombay sPE = +8m.45s., PPE = +9m.50s., sPPE = +10m.23s., PPPE = +10m.41s.,

eE = +13m.52s., S_cSE = +17m.47s., eE = +18m.39s.

Long waves were also recorded at Lisbon, Bergen, Aberdeen, La Paz, Pasadena, and

Salt Lake City.

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1941

502

Dec. 13d. 11h. 3m. 26s. Epicentre $9^{\circ}2'N$. $84^{\circ}2'W$. (as on 1940 November 23d.).

A = +.0998, B = -.9822, C = +.1589; $\delta = -7$; $h = +7$;
D = -.995, E = -.101; G = +.016, H = -.158, K = -.987.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|-------------|------------|------------|---------|------|----------|------|--------|------------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| San Juan | 19.8 | 60 | e 4 37 | + 2 | e 8 11 | - 2 | e 5 13 | PPP e 10.9 |
| Huancayo | 22.9 | 158 | e 5 2 | - 4 | e 9 3 | -10 | — | e 12.6 |
| Columbia | 24.9 | 7 | — | — | e 10 1 | +14 | — | e 13.4 |
| Florissant | 30.0 | 351 | e 6 32 | +20 | e 13 42 | SSS | — | e 16.0 |
| La Paz | 30.1 | 148 | i 6 13k | 0 | i 11 34 | +22 | i 7 10 | PP 17.3 |
| Tucson | 33.7 | 318 | e 6 44 | - 1 | e 12 20 | +12 | e 7 49 | PP e 19.0 |
| Ottawa | 36.8 | 9 | e 7 10? | - 1 | — | — | — | 18.6 |
| Palomar | z. 38.5 | 314 | i 7 25 | - 1 | — | — | — | — |
| Riverside | z. 39.2 | 315 | e 7 32 | + 1 | — | — | — | — |
| Seven Falls | 39.5 | 14 | — | — | e 16 58? | SSS | — | 22.6 |
| Pasadena | 39.8 | 315 | i 7 36 | 0 | — | — | — | e 21.6 |
| Tinemaha | z. 41.5 | 318 | e 7 51 | + 1 | — | — | — | — |

Additional readings:—

Huancayo e = +7m.11s., iS = +9m.21s.

La Paz P_cPN = +9m.18s., iSSN = +13m.17s., S_cSN +16m.53s.

Tucson e = +7m.19s., and +8m.53s.

Long waves were also recorded at Philadelphia.

Dec. 13d. 18h. Undetermined shock.

Strongly felt at Tarente, Potenza and Bari.

J. P. Rothé.

Chronique séismologique, Revue pour l'Etude des Calamités, tome VII, No. 21, Geneva 1944, p.48.

Sofia eEN = +15m.6s., eSEN = +16m.0s.

Belgrade eP = 15m.19s., iP*? = 15m.24s., iS = 15m.52s., IPS = 15m.57s., iS = 16m.18s., i = 16m.31s.

Triest eP = 15m.24s., iP* = 15m.37s., i = 15m.57s., iS = 16m.22s., iS* = 16m.41s.

Bucharest ePEN = 16m.1s., eN = 17m.43s., iE = 18.2m.

Chur eP = 16m.1s., eS? = 17m.28s.

Zurich eP = 16m.11s.

Basle eP = 16m.18s., eS? = 18m.48s.

Stuttgart iP = 16m.21s., e = 16m.40s., i = 17m.27s., iNW = 18m.6s.

Jena eN = 17m.38s. and 18m.11s., eE = 18m.14s., eN = 19m.10s.

Potsdam iN = 20m.40s., iE = 20m.50s., iN = 20m.53s., eZ = 21m.0s., iZ = 21m.20s., iN = 22m.14s., iZ = 22m.29s.

Long waves were recorded at Granada.

Dec. 13d. Readings also at 2h. (Tucson, Palomar, Riverside, and Pasadena), 4h. (Tucson, Riverside, Pasadena, Tinemaha and near Mizusawa (2)), 7h. (near Branner), 8h. (La Paz), 9h. and 11h. (Sofia), 13h. (near Mizusawa), 16h. (Tacubaya, Auckland, Tucson, Tinemaha, Riverside, and Palomar).

Dec. 14d. 9h. 23m. 41s. Epicentre $14^{\circ}8'N$. $95^{\circ}7'W$. (as on 1937 May 13d.).

A = -.0961, B = -.9624, C = +.2538; $\delta = -14$; $h = +6$;
D = -.995, E = +.099; G = -.025, H = -.253, K = -.967.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|------------|------------|--------|------|--------|------|-------|------------|
| | $^{\circ}$ | $^{\circ}$ | m. s. | s. | m. s. | s. | m. s. | m. |
| Oaxaca | E. 2.4 | 340 | 0 46 | + 5 | — | — | — | — |
| Vera Cruz | N. 4.4 | 355 | 1 7 | - 3 | — | — | — | — |
| Tacubaya | z. 5.7 | 323 | 1 28 | 0 | — | — | — | — |
| Tucson | 22.2 | 324 | e 4 58 | - 2 | — | — | 6 29 | PPP i 11.4 |
| Cape Girardeau | N. 23.1 | 13 | e 6 9 | +61 | e 9 45 | +29 | — | — |
| St. Louis | 24.2 | 10 | i 5 25 | + 6 | e 9 46 | +11 | — | — |
| Florissant | 24.4 | 10 | e 5 24 | + 3 | i 9 45 | + 6 | — | — |
| Palomar | z. 26.6 | — | i 5 43 | + 1 | — | — | — | — |
| Riverside | z. 27.4 | 318 | e 5 49 | 0 | — | — | — | — |
| Pasadena | 28.0 | 318 | e 5 54 | - 1 | — | — | — | e 15.2 |
| Tinemaha | z. 29.9 | 322 | i 6 12 | . 0 | — | — | — | — |

Additional readings:—

Tucson i = +5m.36s., e = +9m.14s.

St. Louis iZ = +5m.51s., +6m.12s., and +6m.23s.

Long waves also recorded at San Juan and Salt Lake City.

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1941

508

Dec. 14d. 10h. Probably Peru.

Huancayo iP = 40m.18s., i = 40m.30s., iS = 40m.37s., iL = 40m.52s.
 La Paz PZ = 42m.3s., SN = 44m.26s., LN = 44m.54s.
 Oaxaca PN = 44m.59s.
 Tacubaya PN = 45m.47s.
 Vera Cruz eE = 46m.9s.
 Tucson iP = 48m.57s. a, i = 49m.16s., e = 52m.57s.
 Palomar iPZ = 49m.29s. a.
 Riverside iPZ = 49m.34s., iZ = 49m.48s.
 Pasadena iP = 49m.38s., iZ = 49m.53s.
 Tinemaha iPZ = 49m.51s., iZ = 50m.5s.

Dec. 14d. Readings also at 3h. (La Paz and near Trieste), 4h. (San Juan), 5h. (La Paz, Huancayo, Tucson, Pasadena (2), Palomar (2), Riverside (2) and Tinemaha (2)), 6h. (Tucson, Pasadena, Palomar, Riverside, Tinemaha, La Plata, near Huancayo, and La Paz), 7h. (La Paz, Arapuni, Auckland, Christchurch, Wellington and Riverview), 8h. (Huancayo, Wellington, Auckland, Arapuni and Christchurch), 9h. (Huancayo, La Paz, Tucson, Pasadena, Riverside, Tinemaha, and near Mizusawa), 11h. (near Bucharest, Sofia Helwan, and Ksara), 12h. (Auckland, Riverview, Tucson, Pasadena, Palomar, Riverside, and Tinemaha), 13h. (Riverview), 14h. (Auckland, Riverview, Tucson, Pasadena, Palomar, Tinemaha, and near Apia), 16h. (Toledo and Tucson), 21h. (Berkeley (2)).

Dec. 15d. 4h. 24m. 20s. Epicentre 5.5S. 104.5E. (as on 1941 Oct. 3d.).

A = -0.2493, B = +0.9638, C = -0.0952; $\delta = +12$; $h = +6$;
 D = +0.968, E = +0.250; G = +0.024, H = -0.092, K = -0.996.

Rough.

| | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. |
|------------|----------|-----|-----------|--------|---------|--------|-------|---------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Batavia | 2.4 | 106 | i 0 34 | - 7 | i 11 16 | + 4 | — | — |
| Medan | 10.7 | 328 | 2 53 | +15 | i 14 55 | +16 | — | — |
| Kodakanal | E. 31.1 | 301 | e 6 15 | - 7 | i 11 14 | -14 | — | — |
| Bombay | E. 39.5 | 309 | e 7 38 | + 4 | 13 37 | 0 | 9 7 | PP 20.1 |
| Riverview | 51.6 | 129 | e 12 40 | PPP | — | — | — | e 27.7 |
| Andijan | 54.7 | 330 | e 9 38 | + 5 | e 17 31 | +18 | — | — |
| Sverdlovsk | 71.6 | 336 | 11 34 | + 9 | — | — | — | — |
| Tinemaha | z. 129.9 | 45 | e 19 25 | [+13] | i 22 48 | PKS | — | — |
| Pasadena | z. 131.3 | 48 | i 19 28 | [+14] | e 22 51 | PKS | — | — |
| Riverside | z. 132.0 | 48 | e 19 28 | [+12] | — | — | — | — |
| Tucson | 137.6 | 46 | e 19 31 | [+ 5] | e 23 4 | PKS | — | — |
| Florissant | 144.2 | 19 | e 19 48 | [+10] | — | — | — | — |
| St. Louis | z. 144.4 | 19 | (i 19 48) | [+10] | — | — | — | — |

Additional readings :—

Medan iS₁EN = +5m.37s.
 Bombay PPN = +9m.10s., SSE = +16m.22s., QE = +16m.42s., S_cSE = +17m.57s.
 St. Louis iZ = (+20m.1s.), and (+20m.27s.), readings increased by 3 minutes.
 Long waves were also recorded at Ksara and Huancayo, and Helwan.

Dec. 15d. Readings also at 0h. (La Paz, Auckland, Brisbane, Riverview, Sydney, Perth, Wellington, Batavia, Bombay, Andijan, Tashkent and Irkutsk), 1h. (Toledo and Andijan), 5h. (College, Tucson, Pasadena, Palomar, Riverside, Tinemaha, and near Batavia), 7h. (Riverview and La Paz), 8h. (Apia, Auckland, Wellington, Bombay, Irkutsk, Tucson (2), Pasadena (2), Palomar, Riverside (2) and Tinemaha (2)), 9h. (La Paz (2)), 11h. (Tucson, Pasadena, Palomar, Riverside, and Tinemaha), 12h. (Oaxaca, Vera Cruz, Palomar, and Tinemaha), 16h. (near Mizusawa), 19h. (Tucson, Pasadena, Palomar, and Tinemaha), 20h. (Auckland), 21h. (Florissant, St. Louis, Pasadena (2), Palomar (2), Tinemaha (2), Tucson (2), Bermuda, San Juan, Huancayo, La Paz and near Mizusawa).

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1941

504

Dec. 16d. 19h. 19m. 41s. Epicentre 23°·7N. 120°·0E.

Felt all over the island of Formosa, VI at Arisan, Tainan; V at Takao, Karenko, Giran, Taichu, and Taihoku. Epicentre 120°·6E. 23°·4N.

Macroseismic radius over 300km. Shallow. Seismological Bulletin of the Central Meteorological Observatory, Japan, 1941, Tokyo 1950.

Nature, London, vol. 149, p.20, 1942.

The most violent earthquake since 1930 did much damage in the south of Formosa on the 17th December 1941, epicentre near the town of Kagi.

H. Kawasumi, Seismology in Japan 1939-1947, Bulletin of the Seismological Society of America, vol. 39, 1949, p.161.

Ziro Kawase.

On the severe Kagi earthquake on December 17th, 1941. "Zisin" the Journal of the Seismological Society of Japan, vol. 15, 1943.

S. Kawada. Untersuchung des neuen Sees gebildet infolge des Erdbebens vom Jahre 1941 in Taiwan (Formosa).

Bulletin of the earthquake research institute, vol. XXI, Part 2, Tokyo, June 1943.

$$A = -.4583, B = +.7939, C = +.3996; \quad \delta = 0; \quad h = +3, \\ D = +.866, E = +.500; \quad G = -.200, H = +.346, K = -.917.$$

| | Δ ° | Az. ° | P. | | O-C. | | S. | | O-C. | | Supp. | | L. m. |
|------------|---------------|----------|----|-----|------|----|----|----|------|----|-------|---|----------|
| | | | m. | s. | s. | s. | m. | s. | m. | s. | | | |
| Tainan | 0·7 | 164 | 0 | 9k | - | 8 | 0 | 13 | - | 15 | — | — | — |
| Arisan | 0·8 | 104 | 0 | 12k | - | 6 | 0 | 15 | - | 16 | — | — | — |
| Sintiku | 1·4 | 40 | 0 | 26 | - | 1 | 0 | 47 | + | 1 | — | — | — |
| Taito | 1·4 | 132 | 0 | 20k | - | 7 | 0 | 34 | - | 12 | — | — | — |
| Karenko | 1·5 | 79 | 0 | 25k | - | 3 | 0 | 42 | - | 7 | — | — | — |
| Giran | 1·9 | 56 | 0 | 36 | + | 2 | 1 | 2 | + | 3 | — | — | — |
| Taihoku | 1·9 | 46 | 0 | 33a | - | 1 | 0 | 58 | - | 1 | — | — | — |
| Isgakizima | 3·9 | 79 | 1 | 6k | + | 4 | 1 | 45 | - | 5 | — | — | — |
| Miyakozima | 5·0 | 76 | 1 | 12k | - | 6 | 2 | 15 | - | 3 | — | — | — |
| Naha | 7·4 | 69 | 1 | 47 | - | 5 | 3 | 17 | - | 1 | — | — | — |
| Nake | 9·7 | 59 | 2 | 21 | - | 1 | 4 | 4 | - | 11 | — | — | — |
| Yakusima | 11·5 | 52 | 2 | 47 | - | 1 | 5 | 5 | + | 6 | — | — | — |
| Tomie | 11·8 | 39 | 2 | 53 | | 0 | 5 | 19 | + | 13 | — | — | — |
| Kagosima | 12·2 | 48 | 2 | 58 | | 0 | — | — | — | — | — | — | — |
| Nagasaki | 12·5 | 42 | 3 | 1 | - | 1 | 4 | 31 | - | 52 | — | — | — |
| Unzendake | 12·7 | 43 | 3 | 2 | - | 3 | 5 | 37 | + | 9 | — | — | — |
| Kumamoto | 13·1 | 44 | 3 | 11k | + | 1 | 6 | 13 | SSS | — | — | — | — |
| Hukuoka | 13·4 | 40 | 3 | 17 | + | 3 | 5 | 53 | + | 8 | — | — | — |
| Izuka | 13·6 | 41 | 3 | 23a | + | 6 | 5 | 56 | + | 6 | — | — | — |
| Husan | 13·8 | 33 | 3 | 21 | + | 2 | 6 | 2 | + | 8 | — | — | — |
| Taikyu | 14·2 | 29 | 3 | 27a | + | 3 | 6 | 18 | + | 14 | — | — | — |
| Simidu | 14·6 | 49 | 3 | 31 | + | 1 | 6 | 25 | + | 12 | — | — | — |
| Zinsen | 14·9 | 21 | 3 | 34a | | 0 | 6 | 34 | + | 14 | — | — | — |
| Keizyo | 15·1 | 22 | 3 | 38k | + | 2 | 6 | 50 | SSS | — | — | — | — |
| Matuyama | 15·1 | 45 | 3 | 42 | + | 6 | — | — | — | — | — | — | — |
| Dairen | 15·2 | 5 | 3 | 43 | + | 5 | 6 | 59 | SSS | — | — | — | — |
| Hirosima | 15·2 | 43 | 3 | 40a | + | 2 | 6 | 54 | SSS | — | — | — | — |
| Hamada | 15·3 | 40 | 3 | 39 | | 0 | 6 | 37 | + | 7 | — | — | — |
| Koti | 15·4 | 47 | 3 | 37 | - | 3 | 6 | 44 | + | 12 | — | — | — |
| Muroto | 15·7 | 49 | 3 | 49 | + | 5 | 7 | 11 | SSS | — | — | — | — |
| Sumoto | 16·8 | 47 | 3 | 55 | - | 3 | 7 | 40 | SS | — | — | — | — |
| Siomisaki | 16·9 | 51 | 4 | 1 | + | 2 | 8 | 51 | L | — | — | — | (8·9) |
| Wakayama | 16·9 | 48 | 4 | 2a | + | 3 | 7 | 12 | + | 5 | — | — | — |
| Kôbe | 17·2 | 47 | 4 | 17k | + | 14 | 7 | 33 | + | 19 | — | — | — |
| Osaka | 17·4 | 48 | 4 | 21 | PP | — | 7 | 45 | SS | — | — | — | — |
| Toyooka | 17·4 | 46 | 4 | 21 | PP | — | 8 | 27 | SSS | — | — | — | — |
| Owase | 17·5 | 50 | 3 | 39 | - | 28 | — | — | — | — | — | — | — |
| Kameyama | 18·1 | 50 | 4 | 21 | + | 7 | 8 | 0 | SS | — | — | — | — |
| Hikone | 18·2 | 48 | 4 | 18 | + | 2 | 7 | 52 | + | 15 | — | — | — |
| Gihu | 18·6 | 47 | 4 | 22 | + | 1 | 8 | 3 | + | 17 | — | — | — |

Continued on next page.

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1941

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| | Δ | Az. | P. | | O - C. | S. | | O - C. | Supp. | | L. |
|----------------------|---------|-----|------|-----|--------|------|-----|--------|----------|-----|--------|
| | | | m. | s. | | m. | s. | | m. | s. | |
| Nagoya | 18.7 | 48 | 4 | 28 | + 6 | 7 | 49 | + 1 | — | — | — |
| Hamamatu | 18.9 | 51 | 4 | 29 | + 5 | 8 | 8 | +15 | — | — | — |
| Shizuoka | 19.6 | 51 | 4 | 24 | - 8 | 8 | 4 | - 4 | — | — | — |
| Toyama | 19.7 | 44 | 4 | 34 | 0 | 8 | 27 | +17 | — | — | — |
| Hatidyozima | 19.8 | 56 | 4 | 30 | - 5 | 8 | 15 | + 2 | — | — | — |
| Wazima | 19.9 | 43 | 4 | 39 | + 3 | 8 | 25 | +10 | — | — | — |
| Kohu | 20.0 | 49 | 4 | 37 | 0 | 8 | 28 | +11 | — | — | — |
| Hunatu | 20.1 | 49 | 4 | 34 | - 4 | — | — | — | — | — | — |
| Osima | 20.2 | 53 | 4 | 31 | - 8 | 8 | 23 | + 2 | — | — | — |
| Nagano | 20.3 | 46 | 4 | 36 | - 4 | 8 | 56 | SS | — | — | — |
| Mera | 20.6 | 53 | 4 | 34 | - 9 | — | — | — | — | — | — |
| Yokohama | 20.7 | 52 | 4 | 45 | + 1 | 8 | 41 | +10 | — | — | — |
| Maebasi | 20.8 | 47 | 4 | 37 | - 8 | 8 | 34 | + 1 | — | — | — |
| Tokyo, Cen. Met. Ob. | 20.9 | 50 | 4 | 42 | - 4 | 8 | 32 | - 3 | — | — | — |
| Kakioka | 21.4 | 49 | 4 | 48 | - 3 | — | — | — | — | — | — |
| Tukubasan | 21.4 | 49 | 4 | 49 | - 2 | 8 | 40 | - 5 | — | — | — |
| Utunomiya | 21.4 | 48 | 4 | 44 | - 7 | 8 | 38 | - 7 | — | — | — |
| Mito | 21.7 | 49 | 4 | 51 | - 4 | 8 | 40 | -11 | — | — | — |
| Tyosi | 21.7 | 52 | 4 | 56 | + 1 | 9 | 3 | +12 | — | — | — |
| Hukusima | 22.4 | 47 | 4 | 54 | - 8 | 9 | 3 | - 1 | — | — | — |
| Sendai | 23.0 | 47 | 5 | 7 | 0 | 9 | 8 | - 6 | — | — | — |
| Akita | 23.3 | 43 | 5 | 21 | +11 | — | — | — | — | — | — |
| Mizusawa | E. 23.6 | 45 | e 5 | 9 | - 4 | 19 | 24 | - 1 | — | — | — |
| Aomori | 24.4 | 41 | 5 | 18 | - 3 | 9 | 34 | - 5 | — | — | — |
| Miyako | 24.5 | 44 | 5 | 23 | + 1 | 9 | 37 | - 3 | — | — | — |
| Hatinohe | 24.7 | 42 | 5 | 17 | - 7 | 9 | 18 | -26 | — | — | — |
| Mori | 25.1 | 38 | 5 | 27 | - 1 | — | — | — | — | — | — |
| Sapporo | 26.2 | 36 | 5 | 35 | - 3 | 10 | 13 | + 4 | — | — | — |
| Medan | 28.7 | 229 | 16 | 0 | - 1 | 11 | 44 | SSS | — | — | 18.3 |
| Nemuro | 28.8 | 41 | 6 | 1 | - 1 | 10 | 45 | - 6 | — | — | — |
| Calcutta | N. 29.1 | 274 | 15 | 56k | - 8 | 110 | 36 | -20 | e 6 37 | PP | 113.4 |
| Irkutsk | 31.0 | 341 | 6 | 21 | 0 | — | — | — | 6 59 | PP | — |
| Batavia | 32.4 | 204 | 15 | 47 | -47 | 11 | 17 | -31 | — | — | e 15.3 |
| Dehra Dun | N. 37.8 | 290 | e 6 | 49 | -31 | e 12 | 41 | -30 | e 15 21 | SS | e 19.6 |
| Agra | 38.0 | 284 | e 7 | 20 | - 1 | 13 | 20 | + 6 | 7 55 | pP | 19.1 |
| Hyderabad | 39.3 | 269 | 7 | 31 | - 1 | 13 | 35 | + 1 | 9 11 | PP | 19.0 |
| Frunse | 41.9 | 308 | e 7 | 56 | + 2 | — | — | — | — | — | — |
| Colombo | E. 42.0 | 253 | — | — | — | 17 | 47 | SSS | — | — | 24.3 |
| Kodaikanal | E. 42.6 | 260 | 17 | 56a | - 3 | 14 | 32 | + 9 | e 9 19† | PP | 21.3 |
| Bombay | 44.1 | 273 | 18 | 12 | 0 | 114 | 51 | + 6 | 18 45 | pP | 121.4 |
| Tchimkent | 45.5 | 307 | 18 | 25 | + 2 | e 15 | 9 | + 4 | — | — | — |
| Tashkent | 45.6 | 305 | 8 | 19 | - 5 | 15 | 8 | + 2 | — | — | — |
| Stalinabad | 45.7 | 302 | e 8 | 28 | + 4 | — | — | — | — | — | — |
| Sverdlovsk | 53.8 | 324 | 19 | 28 | + 2 | 17 | 5 | + 4 | — | — | — |
| Perth | 55.5 | 183 | 9 | 34 | - 5 | 17 | 19† | - 5 | 11 47 | PP | 28.1 |
| Brisbane | E. 60.0 | 146 | 110 | 0 | -11 | 18 | 18 | - 5 | 119 59 | SKS | — |
| Adelaide | N. 60.0 | 146 | 110 | 3 | - 8 | 18 | 6 | -17 | — | — | e 25.3 |
| Riverview | 60.9 | 163 | 110 | 5 | -12 | 118 | 23 | -11 | 12 9 | PP | — |
| Sydney | 64.4 | 151 | 110 | 32 | - 8 | 119 | 11 | - 7 | e 19 23 | PS | e 30.1 |
| | 64.5 | 151 | e 10 | 37 | - 4 | e 19 | 7 | -12 | — | — | e 30.3 |
| College | 69.7 | 27 | e 11 | 11 | - 3 | e 20 | 13 | - 9 | e 13 40 | PP | e 28.8 |
| Ksara | 72.6 | 299 | e 11 | 36 | + 5 | e 21 | 13 | +17 | — | — | — |
| Honolulu | 74.9 | 73 | e 11 | 53 | + 9 | e 21 | 22 | 0 | 121 52 | PS | e 32.3 |
| Upsala | E. 75.8 | 329 | e 11 | 52 | + 2 | e 21 | 33 | + 2 | e 30 19† | SSS | e 37.3 |
| | N. 75.8 | 329 | e 11 | 55 | + 5 | 21 | 36 | + 5 | e 30 12 | SSS | e 34.3 |
| Apia | 76.4 | 111 | 112 | 51 | ? | e 23 | 2? | ? | — | — | — |
| Bucharest | N. 76.5 | 312 | e 12 | 0 | + 6 | e 21 | 45 | + 6 | 14 54 | PP | 41.3 |
| Warsaw | 76.9 | 321 | e 11 | 56 | 0 | 21 | 47 | + 4 | e 14 45 | PP | e 37.3 |
| Helwan | 77.5 | 296 | 112 | 1k | + 2 | 21 | 38 | -12 | 12 49 | pP | — |
| Sitka | 77.8 | 33 | e 11 | 43 | -18 | e 21 | 54 | + 1 | e 26 50 | SS | e 46.5 |

Continued on next page.

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1941

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| | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. | |
|--------------------|----------|-----|------|-----------------|--------|-------|-----|--------|-------|-----|------|--------|
| | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. | |
| Sofia | 79.0 | 311 | e 12 | 8 | + 1 | e 22 | 10 | + 4 | — | — | 31.3 | |
| Auckland | 79.3 | 137 | i 15 | 19? | PP | e 22 | 3 | - 6 | i 27 | 49 | SS | 39.3 |
| Copenhagen | 80.0 | 327 | i 12 | 13 _a | 0 | e 22 | 19 | + 2 | 15 | 13 | PP | — |
| Belgrade | 80.1 | 314 | i 12 | 12 | - 1 | e 22 | 19 | + 1 | — | — | — | e 35.4 |
| Arapuni | 80.6 | 139 | — | — | — | e 22 | 19? | - 4 | e 27 | 19? | SS | e 37.3 |
| Bergen | 81.0 | 333 | — | — | — | e 22 | 41 | + 14 | — | — | — | e 36.3 |
| Potsdam | 81.3 | 324 | i 12 | 18? | - 2 | i 22 | 32 | + 2 | i 15 | 21 | PP | e 39.3 |
| Prague | 81.5 | 321 | e 12 | 16 | - 5 | e 22 | 35 | + 3 | — | — | — | e 39.3 |
| Wellington | 82.2 | 142 | 12 | 22 | - 2 | e 22 | 29 | - 10 | 35 | 19 | Q | e 41.3 |
| Tananarive | 82.4 | 245 | e 12 | 26 | + 1 | e 22 | 45 | + 4 | 23 | 27 | PS | e 39.8 |
| Christchurch | 82.5 | 144 | 12 | 24 | - 2 | i 22 | 46 | + 4 | 23 | 46 | PS | 39.8 |
| Jena | 82.7 | 322 | e 12 | 19 | - 8 | e 22 | 47 | + 3 | — | — | — | e 35.3 |
| Triest | 84.0 | 317 | i 12 | 35 | + 2 | i 22 | 53 | - 4 | e 28 | 36 | SS | — |
| Stuttgart | 85.2 | 322 | i 12 | 39 _a | 0 | i 23 | 18 | + 9 | e 16 | 2 | PP | e 43.3 |
| De Bilt | 85.6 | 325 | i 12 | 40 _a | - 1 | i 23 | 14 | + 1 | e 16 | 9 | PP | e 42.3 |
| Chur | 85.9 | 320 | e 12 | 43 | 0 | e 23 | 22 | + 6 | — | — | — | — |
| Aberdeen | 86.0 | 332 | i 12 | 52 | + 9 | i 23 | 25 | + 8 | i 24 | 23 | PS | e 40.9 |
| Zurich | 86.2 | 320 | e 12 | 43 _a | - 1 | e 23 | 15 | - 4 | — | — | — | — |
| Basel | 86.7 | 321 | e 12 | 45 | - 2 | e 23 | 33 | + 8 | e 16 | 44? | PP | — |
| Uccle | 86.7 | 325 | i 12 | 46 _a | - 1 | 23 | 12 | [0] | i 24 | 23 | PS | e 43.3 |
| Edinburgh | 87.3 | 331 | — | — | — | 23 | 39 | + 10 | — | — | — | — |
| Neuchatel | 87.4 | 320 | e 23 | 37 | S | (e 23 | 37) | + 7 | — | — | — | — |
| Stonyhurst | 88.3 | 330 | e 12 | 51 | - 4 | 23 | 48 | + 9 | 16 | 25 | PP | e 40.3 |
| Victoria | 88.5 | 37 | 13 | 0 | + 4 | 23 | 27 | [+ 4] | — | — | — | e 41.3 |
| Kew | 88.7 | 327 | i 13 | 0 _k | + 3 | e 23 | 28 | [+ 3] | e 16 | 26 | PP | e 41.3 |
| Paris | 88.9 | 323 | e 13 | 2 | + 4 | — | — | — | — | — | — | e 45.3 |
| Oxford | 89.0 | 328 | e 13 | 3 | + 5 | 23 | 45 | 0 | 23 | 7 | SKS | e 40.6 |
| Clermont-Ferrand | 90.3 | 321 | e 13 | 4 | 0 | e 24 | 6 | + 9 | e 16 | 33 | PP | e 46.6 |
| Marseilles | 90.3 | 318 | — | — | — | e 23 | 57 | 0 | — | — | — | e 45.3 |
| Ukiah | 94.0 | 44 | e 13 | 53 | + 32 | e 23 | 49 | [- 7] | e 31 | 0 | SSP | e 39.7 |
| Berkeley | z. 95.4 | 45 | — | — | — | i 23 | 57 | [- 6] | — | — | — | e 45.0 |
| Algiers | 95.5 | 313 | e 13 | 19 | - 9 | e 24 | 19 | [+ 15] | e 17 | 19 | PP | e 46.3 |
| Bozeman | 96.8 | 33 | — | — | — | e 24 | 7 | [- 3] | e 31 | 9 | SS | e 42.9 |
| Toledo | 98.0 | 319 | e 13 | 43 | + 4 | e 25 | 19 | + 15 | — | — | — | e 47.3 |
| Tinemaha | 98.4 | 44 | e 13 | 39 | - 2 | — | — | — | — | — | — | — |
| Almeria | 99.0 | 316 | 13 | 52 | + 8 | 24 | 31 | [+ 9] | 17 | 59 | PP | e 48.3 |
| Santa Barbara | z. 99.0 | 46 | e 13 | 42 | - 2 | — | — | — | — | — | — | — |
| Granada | 99.5 | 317 | i 17 | 18 | PP | i 25 | 25 | + 9 | 22 | 39 | PPS | e 50.8 |
| Salt Lake City | 99.8 | 37 | e 14 | 42 | + 55 | e 24 | 26 | [0] | 30 | 31 | ? | e 43.0 |
| Pasadena | 100.2 | 46 | e 13 | 45 | - 4 | i 24 | 24 | [- 4] | i 18 | 30 | PP | e 40.3 |
| Riverside | z. 100.9 | 46 | e 13 | 49 | - 3 | — | — | — | — | — | — | — |
| San Fernando | 101.5 | 318 | e 18 | 21 | PP | e 25 | 53 | + 20 | — | — | — | e 49.3 |
| Palomar | z. 101.6 | 45 | e 13 | 53 | - 3 | — | — | — | e 17 | 51 | PP | — |
| Lisbon | 101.8 | 321 | 18 | 33 | PP | 25 | 46 | + 11 | — | — | — | e 52.0 |
| Tucson | 106.2 | 43 | e 14 | 15 | P | e 24 | 58 | [+ 2] | i 18 | 35 | PP | e 43.2 |
| Seven Falls | 108.8 | 7 | e 28 | 7? | PS | 34 | 49? | SS | — | — | — | e 52.3 |
| Ottawa | 109.8 | 11 | e 18 | 31? | [- 2] | 28 | 37? | PS | — | — | — | e 49.3 |
| Chicago U.S.C.G.S. | 110.0 | 22 | — | — | — | e 25 | 18 | [+ 6] | e 28 | 37 | PS | e 51.5 |
| Toronto | 110.6 | 14 | e 28 | 43? | PS | — | — | — | — | — | — | e 55.3 |
| Vermont | 111.1 | 9 | — | — | — | e 25 | 58 | {- 15} | — | — | — | e 43.8 |
| East Machias | 111.5 | 5 | e 30 | 18 | PPS | — | — | — | — | — | — | e 53.0 |
| Florissant | 111.6 | 25 | i 19 | 16 | PP | i 25 | 21 | [+ 2] | i 28 | 52 | PS | e 58.0 |
| St. Louis | 111.8 | 25 | e 18 | 38 | [+ 1] | e 25 | 23 | [+ 4] | e 19 | 24 | PP | — |
| Fordham | 114.5 | 10 | — | — | — | e 26 | 40 | {+ 3} | i 29 | 28 | PS | — |
| Philadelphia | 115.1 | 12 | e 29 | 28 | PS | e 36 | 14 | SSP | — | — | — | e 58.3 |
| Columbia | 119.2 | 19 | e 30 | 2 | PS | e 25 | 55 | [+ 8] | e 27 | 6 | SKKS | e 55.9 |
| Bermuda | 124.1 | 4 | e 20 | 46 | PP | e 27 | 6 | {- 36} | e 32 | 12 | PPS | e 49.8 |
| San Juan | 137.8 | 8 | e 19 | 32 | [+ 6] | 26 | 35 | [0] | e 22 | 54 | PP | e 60.4 |
| Huancayo | 161.4 | 53 | e 20 | 3 | [+ 1] | e 44 | 47 | SS | e 24 | 39 | PP | e 66.9 |
| La Plata | E. 168.7 | 189 | 19 | 31 | [- 37] | 45 | 55 | SS | 25 | 13 | PP | 89.0 |
| | N. 168.7 | 189 | 19 | 38 | [- 30] | 31 | 31 | {- 25} | 25 | 1 | PP | — |
| | z. 168.7 | 189 | 20 | 10 | [+ 2] | — | — | — | — | — | — | e 96.3 |
| La Paz | 169.5 | 48 | i 20 | 10 _a | [+ 1] | i 31 | 56 | {- 4} | i 22 | 34 | pPKP | e 80.6 |

For Notes see next page.

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NOTES TO DECEMBER 16d. 19h. 19m. 41s.

Additional readings :—

Calcutta $iP_cPN = +9m.17s.$, $iSSN = +11m.44s.$, $iS_cSN = +16m.50s.$
 Agra $IP = +7m.25s.$, $PP = +9m.0s.$, $sSE = +14m.13s.$, $SS = +16m.2s.$, $eSSN = +16m.16s.$
 Hyderabad $SN = +13m.41s.$, $SS = +16m.43s.$
 Bombay $iPN = +8m.15s.$, $sPE = +9m.10s.$, $iPP = +10m.3s.$, $pPPE = +10m.27s.$, $iN = +10m.36s.$, $S_cPE = +12m.56s.$, $sS_cPN = +14m.2s.$, $iE = +15m.21s.$, $iN = +15m.31s.$, $eSSN = +17m.51s.$, $iSSE = +17m.54s.$, $iS_cSN = +18m.15s.$, $iN = +18m.36s.$
 Perth $PPP = +12m.47s.$, $PS = +18m.9s.$, $i = +20m.39s.$, $SSS = +23m.21s.$
 Adelaide $P_cP = +10m.56s.$, $S_cS = +18m.48s.$, $i = +21m.49s.$, $SS = +22m.17s.$
 Riverview $iE = +10m.36s.$, $iZ = +19m.14s.$, $iN = +19m.33s.$, $iS_cSE = +20m.29s.$, $iZ = +20m.40s.$, $eN = +28m.1s.$
 College $eSS = +24m.50s.$
 Honolulu $e = +25m.49s.$
 Upsala $eE = +16m.17s.$
 Bucharest $eN = +12m.32s.$, $ePS?N = +22m.24s.$, $eSS?N = +26m.56s.$
 Warsaw $iZ = +12m.1s.$, $eNZ = +12m.33s.$, $ePPPZ? = +16m.51s.$, $SZ = +21m.50s.$, $PSN = +22m.26s.$, $SSSE = +30m.17s.$, $SSSN = +30m.32s.$
 Helwan $PPEZ = +15m.3s.$, $iZ = +15m.34s.$, $PPPZ = +17m.4s.$, $sSE = +23m.1s.$, $SSEZ = +27m.7s.$
 Sitka $e = +13m.39s.$ and $+22m.44s.$
 Sofia $eEN = +19m.0s.$
 Auckland $e = +32m.49s.$
 Copenhagen $+27m.19s.$
 Belgrade $e = +13m.47s.$ and $+16m.13s.$
 Potsdam $iP_cP = +12m.25s.$, $iP_cPN = +12m.30s.$, $iZ = +12m.42s.$, $iPPZ = +15m.25s.$, $iS = +22m.37s.$, $iN = +27m.45s.$, $iSSE = +28m.6s.$, $iEZ = +29m.52s.$
 Wellington $PPS? = +23m.49s.$, $i = +25m.34s.$ and $+33m.29s.$
 Tananarive $SS = +27m.59s.$
 Christchurch $SSE = +28m.18s.$, $QN = +34m.31s.$
 Jena $iP = +12m.29s.$, $iZ = +12m.43s.$, $iN = +12m.47s.$ and $+12m.53s.$, $eSN = +22m.59s.$ and $+23m.3s.$, $eN = +32m.19s.$
 Trieste $ePP = +15m.53s.$, $ePS = +23m.19s.?$
 Stuttgart $eE = +24m.3s.$, $eSSEN = +28m.55s.$
 De Bilt $eSS = +28m.59s.$
 Aberdeen $iEN = +19m.42s.$, $iSSEN = +29m.31s.$, $iSSSEN = +33m.27s.$
 Uccle $i = 12m.52s.$, $PP = +15m.48s.$, $iSN = +23m.33s.$, $SSEN = +29m.2s.$
 Kew $eSNZ = +23m.49s.$, $ePSEZ = +24m.50s.$, $ePPSZ = +25m.12s.$, $eSS = +29m.28s.$, $eSSEN = +34m.19s.?$, $eQ = +35.8m.$
 Ukiah $e = +19m.57s.$, and $+24m.28s.$
 Almeria $PPP = +20m.2s.$, $S = +25m.17s.$, $PS = +26m.49s.$, $PPS = +27m.41s.$, $SS = +32m.5s.$, $SSS = +35m.50s.$
 Granada $SS = +33m.3s.$, $eSSS = +38m.7s.$
 Pasadena $ePKPZ = +17m.2s.$, $iZ = +18m.4s.$, $eSEN = +27m.2s.$
 Tucson $e = +22m.2s.$ and $+26m.50s.$, $ePS = +27m.42s.$, $eSS = +32m.25s.$
 Ottawa $e = +23m.19s.?$ and $+37m.19s.?$
 Vermont $eS = +26m.48s.$
 Florissant $iPPZ = +19m.24s.$, $iZ = +19m.40s.$ and $+29m.21s.$, $iPPSZ = +29m.59s.$, $iN = +30m.4s.$, $iZ = +31m.5s.$, $iSS?N = +34m.47s.$
 St. Louis $ePPZ = +19m.29s.$, $iN = +29m.15s.$, $iPPSN = +30m.2s.$, $iN = +31m.7s.$
 Bermuda $e = +22m.56s.$
 San Juan $e = +49m.23s.$
 Huancayo $e = +25m.26s.$, $i = +25m.34s.$
 La Plata E $+21m.43s.$, $PPP = +28m.49s.$, $PSS = +47m.19s.?$, $+49m.19s.?$
 La Plata N $? = +17m.43s.$, $PSS = +48m.1s.$, $SSS = +51m.19?s.$
 La Paz $iPKP_2 = +21m.16s.$, $iPKPZ = +23m.16s.$, $iPKP_2 = +23m.50s.$, $iPP = +25m.13s.$, $SKS = +26m.44s.$, $iPPP = +28m.51s.$, $iSKSP = +35m.38s.$, $SSN = +46m.6s.$, $iSSSN = +52m.36s.$
 Long waves were also recorded at Milan, Besançon, Ivigtut, Logan, Seattle, and Lincoln.

Dec. 16d. Readings also at 9h. (near Balboa Heights), 11h. (near Frunse (2)), 13h. (near Mizusawa (2)), 16h. (College), 18h. (near Apia), 19h. (Harvard, near Lick, and Berkeley), 20h. (near Mizusawa), 22h. (near St. Louis and near Medan).

Dec. 17d. Readings at 2h. (near Mizusawa), 3h. (Helwan, Bombay and Ksara), 4h. (near Frunse (2)), 8h. (Palomar and Tucson), 9h. (near La Paz), 13h. (near Ksara), 20h. (Harvard), 22h. (near Tunis), 23h. (Balboa Heights).

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Dec. 18d. 21h. European shock.

Triest eP = 23m.14s., eS = 23m.41s., i = 23m.55s.
 Lisbon N = 23m.24s., P = 23m.28s., S = 24m.40s., E = 24m.44s., N = 24m.47s. and 24m.50s., S*E = 25m.2s., E = 25m.45s.
 Zurich e = 23m.54s.
 Toledo eP,Z = 24m.14s., eS = 26m.23s., L = 27m.
 Stuttgart e = 25m.16s. and 25m.20s., i = 26m.30s.
 Clermont-Ferrand eP = 25m.47s., e = 28m.57s., eS = 31m.38s.
 Uccle ePEZ = 26m.8s., eL = 31m.
 Neuchatel e = 26m.10s.
 De Bilt e = 30m.
 Potsdam eN = 33m.0s., eE = 35m.0s., eZ = 36m.0s.
 Long waves were also recorded at Kew and Warsaw.

Dec. 18d. Readings also at 4h. (Balboa Heights, Huancayo, Auckland and near Apia), 7h. (Balboa Heights, near Berkeley, Branner, Lick, and San Francisco), 11h. (near Trieste, Basle, Zurich and Stuttgart), 12h. and 18h. (Balboa Heights), 20h. (near Fresno), 21h. (Bombay, Kodaikanal, Medan, Apia, Riverview, Tucson, Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha), 23h. (La Paz).

Dec. 19d. 16h. Local shock.

Triest eP = 8m.40s., eS = 9m.0s.?
 Chur eP = 9m.1s., eS = 9m.56s.
 Zurich eP = 9m.10s., eS = 10m.22s.
 Basle eP = 9m.16s., eS = 10m.27s.
 Neuchatel eP = 9m.16s., eS = 10m.30s.
 Stuttgart ePNE = 9m.26s., e = 10m.1s., eNE = 10m.10s., and 11m.22s., iNE = 11m.26s.
 Milan e = 9m.34s.
 Ravensburg eN = 9m.35s., eE = 9m.54s., 10m.37s., and 10m.55s., eN = 11m.8s., eE = 11m.16s.
 Jena eN = 9m.44s., eE = 9m.48s., e = 10m.36s.
 Belgrade e = 10m.6s., 10m.59s., and 12m.14s.
 Sofia ePEN = 10m.54s.
 Potsdam e = 13m.0s., iN = 13m.9s., 13m.12s., and 13m.39s., iE = 13m.46s.

Dec. 19d. Readings also at 1h. (Haiwee, Pasadena, Palomar, Riverside, Mount Wilson, Santa Barbara, Tinemaha, Berkeley, Tucson, Salt Lake City, and Sitka), 3h. (Huancayo), 4h. (near Mizusawa), 5h. (Agra, Kodaikanal, near Andijan and Tashkent), 6h. (Riverview), 7h. (near Batavia), 11h. (La Paz), 13h. (Andijan), 14h. (Agra and Tashkent), 19h. (near Branner).

Dec. 20d. Readings at 0h. (Berkeley and La Paz), 3h. (La Paz), 4h. (Riverview), 9h. (Tashkent and near Frunse), 12h. (near San Juan), 13h. (near Mizusawa), 14h. (Batavia), 15h. (Florissant, Ottawa, Tucson, Tinemaha, Riverside, and College (2)), 16h. (Fordham, Philadelphia, East Machias, Salt Lake City, Bombay and Chicago U.S.C.G.S.), 19h. (Kodaikanal and Bombay), 20h. (near Apia).

Dec. 21d. 5h. 37m. 31s. Epicentre 30° 8S. 71° 5W.

A = +.2730, B = -.8160, C = -.5095; δ = -2; h = +2;
 D = -.948, E = -.317; G = -.162, H = +.483, K = -.861.

| | | Δ | Az. | P. | O - C. | S. | O - C. | Supp. | L. | |
|----------------|----|-------|-----|---------------------|--------|---------|--------|---------|------------------|-------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| La Plata | E. | 12.1 | 114 | 2 54 | - 3 | 5 7 | - 7 | 3 11 | PP | 6.0 |
| | N. | 12.1 | 114 | 2 53 | - 4 | 5 6 | - 8 | 3 9 | PP | 5.9 |
| | Z. | 12.1 | 114 | 2 55 | - 2 | 5 6 | - 8 | 3 5 | PP | 5.9 |
| La Paz | | 14.6 | 13 | 1 3 31 _a | + 1 | 1 6 21 | + 8 | — | — | 8.2 |
| Huancayo | | 19.0 | 349 | 1 4 29 | + 3 | 1 8 7 | + 12 | e 5 12 | PPP | e 9.5 |
| San Juan | | 49.2 | 7 | 1 8 41 | - 11 | e 16 27 | PPS | e 11 0 | PP | 26.5 |
| Cape Girardeau | N. | 69.8 | 346 | e 11 13 | - 1 | e 20 21 | - 2 | — | — | — |
| Florissant | | 71.4 | 345 | 1 11 23 | - 1 | 1 20 40 | - 2 | i 21 43 | S ₀ S | — |
| Tucson | | 72.9 | 326 | 1 11 34 | + 1 | — | — | e 14 43 | PP | — |
| Riverside | | 77.6 | 323 | 1 12 1 | + 1 | — | — | — | — | — |
| Mount Wilson | | 78.2 | 323 | 1 12 3 | 0 | — | — | — | — | — |
| Pasadena | Z. | 78.2 | 323 | 1 12 4 | + 1 | — | — | — | — | — |
| Tinemaha | | 80.5 | 324 | 1 12 16 | + 1 | — | — | — | — | — |
| Bombay | E. | 145.7 | 102 | e 19 42 | [+ 2] | e 41 58 | SS | e 23 0 | PP | 70.5 |

For Notes see next page.

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NOTES TO DECEMBER 21d. 5h. 37m. 31s.

Additional readings :—

La Plata N + 3m.53s., and + 4m.9s.
La Plata Z = + 3m.29s., and + 4m.5s.
San Juan eSS = + 20m.3s.
Cape Girardeau eN = + 11m.30s.
Florissant iZ = + 11m.33s.
Tucson i = + 12m.50s.
Bombay ePKP₁E = + 19m.52s., eSKSPE = + 32m.40s., ePSPSE = + 43m.3s.

Dec. 21d. Readings also at 0h. (near Fresno), 5h. (La Plata), 6h. (La Plata, La Paz, and near Mizusawa), 7h. (near Fresno), 11h. (near Frunse), 14h. (Huancayo), 16h. (Bozeman), 17h. (Riverview), 19h. (La Plata, Tucson, Palomar, Pasadena, Tinemaha, Mount Wilson, Riverside, La Paz and Huancayo), 23h. (Berkeley).

Dec. 22d. Readings at 0h. (Calcutta, Bombay, near Berkeley, Branner and Lick), 4h. (near Andijan and Huancayo), 9h. (La Paz), 11h. (La Plata, La Paz and Huancayo), 13h. (Calcutta and Bombay), 14h. (Balboa Heights, Potsdam, De Bilt and Uccle), 17h. (Sofia), 20h. (Andijan), 21h. (La Paz), 23h. (Berkeley and near Mizusawa).

Dec. 23d. Readings at 1h. (Tucson), 3h. (Huancayo), 5h. (Huancayo), 7h. (near Andijan and Tashkent), 8h. (Agra), 10h. (La Paz), 11h. (Uccle, Andijan, Tucson, Agra, Calcutta, Bombay and Hyderabad), 12h. (Potsdam and De Bilt), 20h. (Medan), 22h. (La Paz and La Plata).

Dec. 24d. 3h. Undetermined shock.

Mazatlan eE = 33m.36s.
Tucson IP = 36m.4s., i = 37m.4s., e = 37m.35s., iE = 37.9m.
Riverside ePN = 36m.59s.
Mount Wilson iPZ = 37m.17s.
Pasadena iPZ = 37m.21s., eLEN = 39.8m.
Haiwee eP = 37m.28s.
Salt Lake City eP = 37m.50s., eL = 39.8m.
Berkeley ePZ = 38m.13s., eEN = 42m.24s.?, eZ = 45m.6s.
Tinemaha eP = 37m.37s.
Florissant ePN = 38m.21s., eE = 38m.24s., ePPE = 38m.54s., iSEN = 42m.55s.
St. Louis iPZ = 38m.21s., iSN = 42m.51s.
Cape Girardeau ePP?N = 38m.45s.
Butte e = 39m.31s., eL = 47.1m.
Fordham e = 40m.55s., eL = 50.5m.
Ottawa eZ = 40m.58s., L = 51.0m.
Chicago U.S.C.G.S. eS? = 44m.0s., eL = 46.7m.
Long waves were also recorded at Balboa Heights, Scoresby Sund, East Machias, Philadelphia, Ukiah, and Santa Clara.

Dec. 24d. 12h. Undetermined shock. Epicentre probably in Mexico.

Mazatlan PE = 1m.9s.
Tucson IP = 3m.54s., i = 4m.4s., iS? = 5m.0s., e = 5m.3s., iL = 5.2m.
Riverside eEN = 4m.53s.
Salt Lake City eP = 5m.59s., eS? = 8m.49s., eL = 10.9m.
Mount Wilson ePZ = 5m.11s.
Pasadena iPZ = 5m.15s., eSEZ = 8m.18s., eLZ = 10.2m.
Haiwee eP = 5m.25s.
Denver eN = 5m.33s. and 11m.52s., eE = 12m.0s.
Tinemaha iP = 5m.42s.
Berkeley iPZ = 6m.5s., ePE = 6m.11s., eLEN = 9.3m.
Florissant iP = 6m.19s., eN = 6m.43s., eSE = 10m.45s., LEN = 13m.15s.
Lincoln eP = 6m.30s., e = 10m.19s., eL = 12.4m.
Cape Girardeau ePP?N = 6m.39s., eE = + 12m.16s.
St. Louis iPPZ = 6m.48s., iSN = 10m.52s.
Butte eP? = 7m.8s., eS? = 11m.14s., eL = 14.8m.
Ottawa eZ = 8m.43s., L = 19.0m.
Santa Clara eE = 11m.56s.
Chicago U.S.C.G.S. eS? = 12m.8s., eL = 15.0m.
La Paz PZ = 11m.42s.
Long waves were also recorded at Ukiah, Philadelphia, East Machias and Fordham.

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Dec. 24d. 14h. 46m. 43s. Epicentre 6°·3S. 148°·2E. (as on 1941 November 6d.).

A = -·8449, B = +·5238, C = -·1090; δ = +10; h = +7;
D = +·527, E = +·850; G = +·093, H = -·057, K = -·994.

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. | |
|------------------|----|----------|-----|---------------------|-------|----------|-------|---------|------------------|--------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. | |
| Brisbane | E. | 21·5 | 170 | i 4 57 | + 5 | i 8 40 | - 7 | i 9 7 | SS | — |
| Riverview | | 27·5 | 175 | i 5 42 _a | - 8 | e 10 17 | -13 | i 6 10 | PP | e 12·6 |
| Sydney | | 27·6 | 175 | — | — | e 10 11 | -21 | — | — | e 15·1 |
| Adelaide | | 29·8 | 196 | e 5 52 | -19 | i 11 9 | + 2 | 7 2 | PP | i 15·6 |
| Arapuni | | 40·2 | 146 | — | — | 14 17? | +29 | — | — | — |
| Batavia | | 41·1 | 268 | e 6 48 | ? | — | — | — | — | — |
| Wellington | | 42·1 | 150 | 7 5 | -50 | 14 0 | -16 | 7 47 | pP | 21·8 |
| Christchurch | | 42·8 | 154 | 7 57 | - 4 | 14 14 | -11 | — | — | 17·2 |
| Medan | | 50·4 | 281 | 9 7 | + 6 | i 16 29 | +15 | — | — | — |
| Calcutta | N. | 65·2 | 299 | — | — | i 19 24 | - 4 | — | — | — |
| Irkutsk | | 69·3 | 333 | e 11 24 | +13 | e 19 57 | -20 | — | — | — |
| Colombo | E. | 69·4 | 280 | — | — | 20 35 | +17 | — | — | 66·0 |
| Agra | E. | 75·5 | 301 | e 11 43 | - 5 | i 21 17 | -11 | i 21 49 | PS | — |
| Bombay | E. | 78·3 | 291 | e 11 59 | - 4 | e 21 44 | -15 | 13 14 | P _c P | — |
| Pasadena | | 96·5 | 56 | e 13 33 | + 1 | — | — | — | — | e 44·3 |
| Stuttgart | | 125·3 | 328 | e 19 0 | [- 3] | e 37 31 | SS | — | — | e 67·3 |
| Ottawa | | 125·6 | 36 | e 19 2 | [- 2] | — | — | — | — | 47·3 |
| Kew | | 128·0 | 336 | e 21 47 | PP | (e 26 7) | [- 8] | — | — | e 59·8 |
| Clermont-Ferrand | | 130·4 | 328 | 19 13 | [0] | — | — | — | — | — |
| La Paz | N. | 137·5 | 123 | e 19 5 | [-21] | — | — | — | — | — |
| Lisbon | | 141·8 | 331 | 19 50 | [+16] | — | — | — | — | 55·4 |

Additional readings:—

Riverview iN = +10m.37s., i = +10m.59s., iN = +11m.2s., iSSNZ = +11m.31s.
Adelaide i = +6m.46s. and +7m.18s., iSN = +10m.52s., i = +11m.40s., SS = +13m.29s.
Wellington iZ = +8m.1s., P_cPZ = +8m.17s., PPZ = +9m.2s., PPPZ = +9m.57s.,
SS = +17m.30s., Q = +20m.17s.?
Batavia PZ = +6m.46s., ePN = +6m.48s.
Agra i = +12m.2s.
Bombay PPE = +14m.30s., iS_cSE = +22m.20s., eE = +23m.1s., eSSE = +25m.18s.,
iE = +26m.8s.
Kew SKS given as PP, eSSSEN = +48m.29s.
Lisbon eP_h = +19m.55s.
Long waves were also recorded at Hyderabad, Ksara, Milan, Upsala, Jena, Warsaw, Paris, San Fernando, Stonyhurst, Potsdam, and Scoresby Sund.

Dec. 24d. 15h. Probably South Atlantic.

La Paz PN = 20m.8s., PPN = 21m.44s., iSN = 27m.28s., LN = 33m.0s.
Huancayo eP = 20m.54s., e = 21m.2s. and 23m.1s., eS? = 25m.17s., e = 29m.2s., eL = 35m.36s.
Algiers eP = 23m., e = 31m., eS = 32m., eSSS = 41m., L = 47m.
Almeria eP = 23m.8s., PP = 26m.8s., PPP = 27m.48s., S = 32m.40s., L = 47m.
Toledo iPZ = 23m.21s., SSN = 38m.11s.
Helwan ePZ = 23m.27s., PPZ = 26m.18s., PPPZ = 27m.51s., SE = 33m.3s., PSE = 33m.39s., SSE = 37m.54s.
Clermont-Ferrand eP = 23m.47s., L = 51·5m.
Basle eP = 23m.57s.
Granada eP? = 24m.0s., ePP = 27m.8s., S = 33m.57s., sSS = 42m.43s., L = 48·6m.
Belgrade e = 24m.6s., and 32m.2s.
Sofia ePEN = 24m.19s., eEN = 31m.18s., LEN = 52m.24s.
Uccle ePZ = 24m.29s., eSN = 34m.52s., SSN = 40m.45s., eLN = 49m.
Triest eP = 24m.31s., eS = 34m.39s., eL = 50m.3s.
Bombay ePE = 28m.48s., P_cPE = 29m.12s., PPE = 31m.9s., SE = 37m.25s., SSE = 42m.57s., LE = 53·0m.
Tananarive EN = 29m.42s., 35m.29s., and 36m.11s., E = 37m.47s., N = 38m.50s.
De Bilt eN = 35m.20s. and 41m.10s., eL = 48m.
Long waves were also recorded at Riverview and Arapuni.

Dec. 24d. Readings also at 0h. (near La Paz), 2h. (Columbia and Balboa Heights), 7h. (Pasadena, Mount Wilson, Riverside, Palomar, and near Tucson), 10h. (near Tchinkent), 11h. (Columbia), 14h. (La Paz (2), Rio de Janeiro, and La Plata (2)), 15h. (La Plata), 18h. (near Mizusawa), 20h. (Aberdeen), 22h. (near Berkeley).

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Dec. 25d. 9h. 31m. 2s. Epicentre 33°·8N. 134°·5E. (as on 1940, May 28d.).

Intensity VI at Hukui; V at Sumoto, Tokushima, Koti, Okayama; IV at Muroto, Kobe, Miyadu, Kyiti, Gihu, Tsu; II-III at Simidu, Owase, Sakai, and Matsue.
Epicentre 33°·8N. 134°·6E. Macro seismic radius 200-300km. Shallow.
Seismological Bulletin of the Central Meteorological Observatory, Japan, 1941, Tokyo, 1950, pp. 45-46. Macro seismic chart p. 45.

A = -·5837, B = +·5939, C = +·5537; $\delta = +1$; $h = +1$;
D = +·713, E = +·701; G = -·388, H = +·395, K = -·838.

| | Δ | Az. | P. | O-C. | S. | O-C. |
|----------------------|----------|-----|-------------------|----------------|-------|----------------|
| | ° | ° | m. s. | s. | m. s. | s. |
| Muroto | 0·6 | 206 | 0 15 _k | 0 | 0 24 | - 2 |
| Sumoto | 0·6 | 30 | 0 17 _a | + 2 | 0 26 | 0 |
| Wakayama | 0·7 | 52 | 0 17 _a | 0 | 0 26 | - 2 |
| Koti | 0·8 | 253 | 0 20 _a | + 2 | 0 31 | 0 |
| Kobe | 1·0 | 32 | 0 20 _a | - 1 | 0 32 | - 4 |
| Siomisaki | 1·1 | 108 | 0 21 _a | - 1 | 0 34 | - 5 |
| Osaka | 1·2 | 45 | 0 24 | 0 | 0 38 | - 3 |
| Owase | 1·4 | 79 | 0 24 _a | - 3 | 0 38 | - 8 |
| Matuyama | 1·5 | 271 | 0 29 _a | + 1 | 0 43 | - 6 |
| Kyoto | 1·6 | 40 | 0 29 _a | - 1 | 0 37 | -14 |
| Simidu | 1·6 | 232 | 0 23 _a | - 7 | 0 41 | -10 |
| Toyooka | 1·7 | 9 | 0 46 | P _r | 1 9 | S _r |
| Hirosima | 1·8 | 288 | 0 34 _a | + 2 | 0 48 | - 8 |
| Kameyama | 1·9 | 57 | 0 34 _a | 0 | 0 58 | - 1 |
| Hikone | 2·1 | 45 | 0 32 _a | - 5 | 0 58 | - 6 |
| Hamada | 2·3 | 299 | 0 40 _a | 0 | 0 55 | -14 |
| Gihu | 2·4 | 49 | 0 41 _a | 0 | 1 8 | - 4 |
| Nagoya | 2·4 | 56 | 0 41 | 0 | 1 12 | 0 |
| Izuka | 3·1 | 267 | 0 55 | + 4 | 1 49 | S _r |
| Kumamoto | 3·3 | 253 | 0 54 _k | + 1 | 1 43 | S* |
| Hukuoka | 3·4 | 269 | 0 54 _a | - 1 | 2 1 | S _r |
| Toyama | 3·6 | 36 | 0 59 _k | + 1 | — | — |
| Unzendake | 3·7 | 254 | 0 54 | - 6 | 2 10 | S _r |
| Kohu | 3·8 | 60 | 1 1 _k | 0 | 1 49 | + 2 |
| Hunatu | 3·9 | 63 | 1 1 | - 1 | 1 40 | -10 |
| Misima | 3·9 | 68 | 1 1 | - 1 | 1 52 | + 2 |
| Nagasaki | 4·0 | 258 | 1 3 | - 1 | 1 29 | P _r |
| Wazima | 4·0 | 26 | 1 4 | 0 | 1 51 | - 1 |
| Nagano | 4·1 | 45 | 1 6 | + 1 | 1 55 | 0 |
| Osima | 4·1 | 76 | 1 6 | + 1 | 1 48 | - 7 |
| Mera | 4·5 | 76 | 1 16 | + 5 | 2 14 | + 9 |
| Maebasi | 4·6 | 55 | 1 11 | - 1 | 1 59 | - 8 |
| Yokohama | 4·6 | 66 | 1 15 | + 3 | 2 11 | + 4 |
| Husan | 4·7 | 286 | 1 13 | - 1 | 2 18 | + 8 |
| Tokyo, Cen. Met. Ob. | 4·7 | 64 | 1 13 | - 1 | 2 11 | + 1 |
| Yakusima | 4·8 | 226 | 1 15 | 0 | 2 9 | - 3 |
| Tomie | 5·0 | 258 | 1 18 | 0 | 2 34 | S* |
| Aikawa | 5·2 | 35 | 1 30 | + 9 | — | — |
| Kakioka | 5·2 | 61 | 1 22 | + 1 | — | — |
| Tukubasan | 5·2 | 60 | 1 28 | + 7 | 2 43 | S* |
| Utunomiya | 5·2 | 56 | 1 18 | - 3 | 2 32 | S* |
| Taikyu | 5·3 | 297 | 1 20 _a | - 2 | 2 18 | - 7 |
| Mito | 5·5 | 60 | 1 29 | + 4 | 2 35 | + 5 |
| Tyosi | 5·6 | 67 | 1 32 | + 5 | 2 33 | 0 |
| Onahama | 6·1 | 57 | 1 35 | + 1 | 2 32 | -13 |
| Hokusima | 6·2 | 48 | 0 50 | -45 | 1 49 | -59 |
| Sendai | 6·8 | 47 | 1 43 | - 1 | 2 56 | - 7 |
| Mizusawa | 7·5 | 43 | e 1 57 | + 4 | 3 35 | +15 |
| Tinemaha | 82·2 | 51 | i 12 22 | - 2 | — | — |
| Pasadena | 84·0 | 53 | i 12 30 | - 3 | — | — |
| Mount Wilson | z. 84·1 | 53 | i 12 31 | - 3 | — | — |
| Tucson | 90·0 | 51 | e 13 1 | - 2 | — | — |

Long waves were recorded at Kew.

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Dec. 25d. Readings also at 0h. (Riverview and Wellington), 3h. (near Berkeley, Lick, and Branner), 4h. (La Plata and La Paz), 5h. (Manzanillo), 7h. (near Almata), 14h. (La Paz), 15h. (near Mizusawa), 20h. (La Plata), 22h. (near Berkeley).

Dec. 26d. 14h. 47m. 59s. Epicentre 21°·7N. 99°·7E.

A = -·1567, B = +·9167, C = +·3676; $\delta = +2$; $h = +4$;
D = +·986, E = +·168; G = -·062, H = +·362, K = -·930.

| | | Δ | | Az. | | P. | | O-C. | | S. | | O-C. | | Supp. | | L. |
|----------------------|----|----------|-----|------|-----|-----|-------|------|-------|------|-----|----------------|--------|---------|----|----|
| | | ° | ' | m. | s. | s. | m. | s. | m. | s. | m. | s. | m. | s. | m. | |
| Calcutta | N. | 10·6 | 278 | e 2 | 27 | - 9 | i 4 | 21 | -16 | i 5 | 32 | S _r | | | | |
| Medan | | 18·0 | 184 | e 4 | 6 | - 7 | i 9 | 27 | L | | | | | (i 9·4) | | |
| Agra | | 20·5 | 290 | i 4 | 39 | - 3 | i 8 | 32 | + 5 | 5 | 1 | pP | | 10·2 | | |
| Hyderabad | E. | 20·5 | 262 | 4 | 51 | + 9 | 8 | 39 | +12 | | | | | 10·4 | | |
| Dehra Dun | N. | 21·2 | 299 | i 5 | 25 | PPP | i 9 | 20 | SS | | | | | i 12·4 | | |
| Kodalkanal | E. | 24·2 | 247 | i 5 | 9k | -10 | i 9 | 41 | + 6 | | | | | 12·9 | | |
| Bombay | | 25·4 | 268 | i 5 | 37 | + 6 | 10 | 5 | + 9 | i 6 | 19 | PP | | | | |
| Batavia | | 28·6 | 165 | 5 | 10 | -50 | 10 | 20 | -28 | | | | | i 14·4 | | |
| Almata | | 28·7 | 324 | 6 | 1 | 0 | | | | | | | | | | |
| Hukuoka | | 29·6 | 61 | e 6 | 33 | +24 | e 11 | 10 | + 6 | | | | | 16·2 | | |
| Andijan | | 29·9 | 315 | e 6 | 13 | + 1 | | | | | | | | | | |
| Irkutsk | | 30·7 | 6 | 6 | 18 | - 1 | | | | | | | | | | |
| Matnyama | | 31·5 | 61 | 11 | 32 | S | (11 | 32) | - 2 | | | | | (16·4) | | |
| Tashkent | | 32·2 | 314 | 6 | 33 | + 1 | 11 | 44 | - 1 | | | | | | | |
| Sempalatinsk | | 32·5 | 337 | e 6 | 28 | - 6 | 11 | 44 | - 5 | | | | | | | |
| Tokyo, Cen. Met. Ob. | | 37·5 | 59 | e 8 | 49 | PP | e 14 | 34 | ? | 16 | 30 | SSS | e 20·2 | | | |
| Mizusawa | | 39·3 | 54 | 7 | 30 | - 2 | 13 | 26 | - 8 | | | | | | | |
| Mori | | 39·8 | 50 | e 8 | 18 | +42 | e 16 | 35 | SS | | | | | 20·7 | | |
| Sapporo | | 40·6 | 48 | e 7 | 37 | - 6 | e 16 | 49 | SS | | | | | 21·0 | | |
| Sverdlovsk | | 45·2 | 301 | 8 | 19 | - 1 | 14 | 54 | - 7 | | | | | | | |
| Ksara | | 56·9 | 296 | e 9 | 53 | + 4 | e 17 | 49 | + 7 | | | | | | | |
| Helwan | | 61·3 | 293 | i 10 | 18k | - 2 | 18 | 40 | + 1 | i 12 | 25 | PP | | | | |
| Bucharest | | 63·6 | 310 | 9 | 13† | ? | e 19 | 6 | - 2 | 19 | 54 | PS | 36·0 | | | |
| Tananarive | | 65·1 | 235 | 10 | 52 | + 7 | 19 | 38 | +11 | 19 | 46 | PS | 31·8 | | | |
| Sofia | | 65·8 | 308 | e 10 | 50 | + 1 | e 19 | 36 | + 1 | e 26 | 49 | SSS | 32·8 | | | |
| Warsaw | Z. | 66·3 | 318 | e 10 | 49 | - 3 | e 20 | 19 | PPS | 27 | 13 | SSS | e 34·0 | | | |
| Adelaide | | 67·3 | 146 | | | | i 20 | 1 | PS | | | | e 35·2 | | | |
| Upsala | | 67·5 | 327 | 10 | 59 | - 1 | 19 | 52 | - 4 | e 24 | 1† | SS | e 32·0 | | | |
| Belgrade | | 67·6 | 310 | e 11 | 0 | - 1 | e 20 | 25 | +28 | e 13 | 6 | PP | e 33·7 | | | |
| Prague | | 70·7 | 317 | e 12 | 1† | +41 | e 21 | 23 | +49 | | | | e 27·0 | | | |
| Copenhagen | | 70·8 | 323 | | | | i 20 | 35 | 0 | 24 | 49 | SS | 28·3 | | | |
| Potsdam | | 71·1 | 320 | i 11 | 18a | - 4 | i 20 | 43 | + 5 | i 14 | 5 | PP | 35·0 | | | |
| Triest | | 72·1 | 313 | e 11 | 21 | - 7 | i 20 | 45 | - 5 | | | | | | | |
| Jena | | 72·3 | 318 | e 11 | 27 | - 2 | e 20 | 49 | - 3 | e 14 | 13 | PP | e 34·0 | | | |
| Bergen | | 73·5 | 329 | | | | e 26 | 1† | SS | e 29 | 16† | SSS | e 34·0 | | | |
| Riverview | | 73·8 | 137 | i 11 | 46k | + 8 | i 21 | 21 | +12 | e 29 | 39 | SSS | e 34·6 | | | |
| Stuttgart | | 74·4 | 317 | e 11 | 41k | - 1 | e 21 | 13 | - 3 | e 14 | 17 | PP | e 38·0 | | | |
| Chur | | 74·6 | 315 | e 11 | 41 | - 2 | e 21 | 16 | - 2 | | | | e 39·2 | | | |
| Zurich | | 75·1 | 316 | e 11 | 44k | - 1 | | | | | | | | | | |
| Basel | | 75·7 | 316 | e 11 | 49 | 0 | e 22 | 5 | PS | | | | | | | |
| De Bilt | | 75·9 | 320 | e 11 | 53 | + 3 | i 21 | 35 | + 3 | i 26 | 28 | SS | e 38·0 | | | |
| Neuchatel | | 76·3 | 316 | e 11 | 52 | 0 | e 21 | 35 | - 2 | | | | | | | |
| Uccle | | 76·8 | 319 | i 11 | 54 | - 1 | 21 | 41 | - 1 | 26 | 36 | SS | e 37·0 | | | |
| Aberdeen | | 78·0 | 327 | i 21 | 57 | S | (i 21 | 57) | + 2 | i 30 | 53 | SSS | 38·2 | | | |
| Paris | | 78·5 | 318 | | | | e 21 | 59 | - 2 | e 31 | 6 | SSS | 41·0 | | | |
| Clermont-Ferrand | | 79·2 | 314 | i 12 | 9 | + 1 | | | | | | | e 39·1 | | | |
| Edinburgh | | 79·2 | 326 | | | | e 31 | 23 | SSS | | | | | | | |
| Kew | | 79·3 | 321 | i 12 | 9 | 0 | i 22 | 8 | - 1 | e 27 | 1 | SS | e 36·0 | | | |
| College | | 79·5 | 24 | e 15 | 15 | PP | e 22 | 6 | - 5 | e 31 | 14 | SSS | e 40·4 | | | |
| Scoresby Sund | | 79·5 | 343 | e 17 | 21 | PPP | i 22 | 10 | - 1 | | | | e 29·8 | | | |
| Stonyhurst | | 79·6 | 324 | e 20 | 1 | ? | 22 | 12 | 0 | 23 | 5 | PS | e 38·0 | | | |
| Toledo | | 86·3 | 311 | i 12 | 47 | + 2 | | | | 16 | 24 | PP | 38·4 | | | |
| Almeria | | 86·4 | 308 | i 12 | 49 | + 4 | 23 | 19 | - 2 | 12 | 59 | pP | 50·0 | | | |
| Granada | | 87·1 | 309 | i 12 | 49 | 0 | i 23 | 40 | +12 | 13 | 16 | pP | 42·0 | | | |
| San Fernando | | 89·3 | 309 | | | | e 23 | 30 | [+ 1] | | | | 45·0 | | | |

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|--------------------|----------|-----|----------|-------|----------|-------|----------|------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Lisbon | 90.3 | 312 | 17 35 | ? | 23 36 | [+ 1] | — | 51.2 |
| Arapuni | 92.7 | 131 | — | — | 31 1 | SSP | — | 52.0 |
| Ivigtut | 93.4 | 345 | 26 7 | PPS | — | — | — | 45.0 |
| Wellington | 93.5 | 134 | — | — | 31 1 | SSP | — | e 45.0 |
| Victoria | 100.2 | 28 | — | — | e 24 37? | [+ 9] | e 36 25? | SSS 48.0 |
| Ukiah | 106.8 | 34 | e 18 26 | PP | e 33 47 | SS | e 28 18 | PS e 49.5 |
| Bozeman | 107.4 | 22 | — | — | e 28 6 | PS | e 33 49 | SS e 50.2 |
| Berkeley | 108.8 | 34 | i 28 23 | PS | i 34 27 | SS | 38 13 | SSS 47.2 |
| Seven Falls | 111.1 | 352 | — | — | e 26 55? | {+42} | — | — 45.0 |
| Ottawa | 113.1 | 356 | — | — | 26 31? | {+ 4} | e 35 1 | SS e 55.0 |
| Pasadena | 113.8 | 33 | e 19 18 | PP | e 29 6 | PS | — | — e 54.0 |
| Toronto | 115.0 | 359 | e 30 43? | PPS | — | — | — | — 55.0 |
| Chicago U.S.C.G.S. | 116.5 | 6 | — | — | 26 13 | {-37} | — | — e 61.1 |
| Fordham | 117.5 | 353 | — | — | i 40 40 | SSS | — | — |
| Philadelphia | 118.5 | 354 | — | — | e 40 43 | SSS | — | — e 58.0 |
| Tucson | 118.9 | 29 | e 18 57 | [+ 6] | e 31 59 | PPS | e 36 58 | SSP e 51.9 |
| Florissant | 119.1 | 8 | e 21 3 | ? | 29 20 | PS | 40 58 | SSS — |
| St. Louis | 119.3 | 8 | e 20 13 | PP | e 29 39 | PS | — | — |
| Bermuda | 124.2 | 343 | e 22 49 | PPP | e 27 58 | {+16} | — | — 58.1 |
| San Juan | 137.8 | 339 | e 23 3 | ? | — | — | — | — e 64.2 |
| La Plata | E. 156.4 | 232 | 18 7 | ? | 29 43 | ? | 24 31 | PP 70.0 |
| La Paz | 167.4 | 292 | i 20 20 | [+12] | 31 19 | {-31} | — | — 75.9 |
| Huancayo | 169.3 | 332 | e 21 6 | ? | e 32 4 | {+ 4} | e 25 10 | PP 78.3 |

Additional readings:—

Calcutta iS*N = +5m.2s.
 Medan iPEN = +4m.9s.
 Agra i = +4m.45s., iE = +4m.49s., PP = +5m.12s., sP = +5m.21s., sSE = +9m.5s.,
 SS = +9m.27s.
 Bombay iE = +6m.9s., +6m.31s., +7m.9s., +7m.19s., +7m.38s., +7m.54s., and
 +8m.5s., P_cPE = +9m.3s., iE = +9m.33s.
 Batavia iS?N = +10m.4s.
 Tokyo, Cen. Met. Ob. PP = +10m.9s.
 Helwan iZ = +11m.22s. and +13m.11s., PS?EZ = +19m.10s.
 Bucharest eE = +10m.22s., eN = +10m.40s. and +11m.48s., eE = +11m.53s., eN =
 +14m.10s., eSN = +19m.12s., eSSN = +24m.23s.
 Tananarive SS = +23m.54s.
 Upsala eSSS = +27m.1s.?, eSSSN = +27m.24s.
 Belgrade e = +18m.2s.
 Potsdam iNZ = +14m.46s., iE = +14m.51s., iEN = +20m.36s., iN = +20m.50s.,
 iPSE = +21m.12s., iSSS = +28m.39s.
 Jena ePN = +11m.31s., eN = +15m.46s., eE = +15m.53s., eZ = +16m.0s., eE =
 +25m.31s., e = +29m.1s.
 Riverview iE = +21m.24s., ePS?E = +22m.1s., iN = +22m.4s. and +25m.3s., iSSE =
 +25m.38s.
 Stuttgart i = +11m.44s., eSN = +21m.17s., ePSEN = +21m.46s., eSSE = +26m.23s.,
 eSSSEN = +29m.45s.
 De Bilt eSSS = +30m.1s.?
 Uccle PSEN = +22m.16s., eN = +23m.47s. and +30m.22s.
 Aberdeen iPN = +22m.3s., iSE = +31m.2s., iE = +34m.17s., iN = +34m.23s. Phases
 wrongly identified.
 Kew iP_cPZ = +12m.17s., ePPEZ = +14m.53s., eS_cSEZ = +22m.26s.?, eSSS =
 +31m.23s., eQ = +33m.1s.?
 College e = +18m.31s.
 Scoresby Sund iS = +22m.16s., i = +25m.30s.
 Stonyhurst i = +20m.23s. and +32m.57s.
 Almeria PP = +16m.15s., PPP = +18m.11s., S_cS = +23m.33s., PS = +24m.31s.,
 PPS = +24m.55s., SS = +29m.9s., SSS = +32m.45s.
 Granada ePP = +16m.12s., iSKS = +23m.15s., sS = +24m.43s., PPS = +26m.37s.,
 SS = +28m.28s., Q = +37m.13s.?
 Lisbon E = +22m.12s.
 Arapuni e = +38m.1s.?
 Ukiah e = +22m.13s.
 Bozeman e = +26m.35s., +37m.45s., and +47m.24s.
 Berkeley iE = +28m.29s., iN = +34m.42s.
 Ottawa eE = +46m.1s.
 Pasadena i = +19m.37s.
 Chicago U.S.C.G.S. e = +28m.49s. and +46m.5s.
 Philadelphia e = +48m.39s. and +53m.51s.
 Tucson iPP = +19m.11s., e = +22m.44s. and +23m.12s.
 Florissant eE = +41m.22s., eN = +42m.2s.
 St. Louis ePPZ = +22m.53s., eN = +25m.49s., iN = +30m.5s.

Continued on next page.

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Bermuda e = +35m.14s. and +44m.20s.
 San Juan e = +25m.1s., +25m.56s., +37m.51s., and +44m.45s.
 La Paz SSN = +43m.14s., SSSN = +49m.14s.
 Huancayo e = +46m.7s., +52m.27s., and +56m.18s.
 Long waves were also recorded at Milan, Algiers, Honolulu, and other American stations.

Dec. 26d. Readings also at 3h. (La Paz), 5h. (Balboa Heights and near Andijan), 6h. (Apia), 9h. (near Angra do Heroísmo), 10h. (Granada, Toledo, and De Bilt), 12h. (Port au Prince), 20h. (Tucson and Tinemaha).

Dec. 27d. 18h. 17m. 22s. Epicentre 36°·0N. 10°·5W.

Intensity IV at Casablanca, Fedala, Rabat, and Port Lyautey; III in Morocco, near Taza, Mogador, Marrakesh. Felt in Portugal at Lisbon, in the province of Algeria, at Beja, Evora, etc. Epicentre 35°·8N. 10°·0W. (Strasbourg).

J. Debrach.

Les tremblements de terre du 25 Novembre et du 27 Décembre, 1941.

Comptes-rendus des séances mensuelles de la Société des Sciences Naturelles du Maroc, Janvier, 1942, p. 6-9, Casablanca, 1942.

Note complémentaire sur les séismes du 25 Novembre et du 27 Décembre, 1941.

Comptes-rendus des séances mensuelles de la Société des Sciences Naturelles du Maroc, 1942, No. 3, p. 24.

A = +·7973, B = -·1478, C = +·5852; $\delta = -1$; $h = 0$;
 D = -·182, E = -·983; G = +·575, H = -·107, K = -·811.

| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|---------------------|------|---------|------|---------|-----|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Lisbon | 2·9 | 22 | 0 49 | + 1 | i 1 26 | + 2 | 0 59 | — |
| San Fernando | 3·5 | 81 | i 1 0 | + 3 | i 1 40 | 0 | i 1 10 | — |
| Coimbra | 4·5 | 21 | 1 10 | - 1 | 1 59 | - 6 | — | — |
| Granada | 5·7 | 75 | e 1 32 | + 4 | i 2 32 | - 3 | i 1 42 | P* |
| Toledo | 6·4 | 50 | i 1 39 | + 1 | i 2 46 | - 7 | — | — |
| Almeria | 6·5 | 80 | 1 43 | + 4 | 2 50 | - 5 | — | — |
| Algiers | 10·9 | 82 | i 2 38 | - 2 | — | — | e 2 59 | PPP |
| Clermont-Ferrand | 14·1 | 42 | i 3 25 | + 2 | i 5 50 | -12 | — | — |
| Marseilles | 14·2 | 54 | e 3 26 | + 2 | e 6 18 | SS | e 6 34 | SSS |
| Paris | 16·0 | 33 | e 3 50 | + 2 | i 6 55 | + 9 | — | — |
| Besançon | 16·7 | 42 | e 3 59 | + 2 | e 7 12 | + 9 | — | — |
| Neuchatel | 17·0 | 46 | e 4 3 | + 2 | e 7 10 | 0 | — | — |
| Kew | 17·1 | 22 | i 3 59 | - 3 | i 7 18 | + 6 | e 4 8 | PP |
| Milan | 17·6 | 52 | i 4 11 | + 3 | i 7 41 | SS | — | — |
| Basle | 17·7 | 44 | e 4 10 | 0 | e 7 26 | 0 | — | — |
| Zurich | 18·2 | 46 | e 4 16 _a | 0 | e 7 41 | + 4 | — | — |
| Uccle | 18·3 | 31 | i 4 18 _a | + 1 | e 7 40 | + 1 | — | — |
| Chur | 18·5 | 47 | e 4 21 | + 2 | — | — | — | — |
| Stonyhurst | 18·7 | 16 | i 4 27 | + 5 | i 7 54 | + 6 | i 4 34 | PP |
| Ebingen | 18·8 | 44 | i 4 26 _a | + 3 | e 8 2 | +12 | i 4 41 | PP |
| Ravensburg | 19·0 | 45 | i 4 27 | + 1 | e 8 2 | + 7 | i 4 53 | PP |
| Stuttgart | 19·3 | 43 | i 4 30 _a | + 1 | i 8 8 | + 6 | i 4 58 | PPP |
| De Bilt | 19·6 | 30 | i 4 33 | + 1 | i 8 15 | + 7 | — | — |
| Edinburgh | 20·6 | 13 | e 5 2 | PP | 8 38 | + 9 | — | — |
| Triest | 20·7 | 55 | i 4 45 | + 1 | i 8 34 | + 3 | e 9 12 | SSS |
| Jena | 21·8 | 42 | i 4 56 | 0 | e 9 2 | +10 | i 5 22 | PP |
| Aberdeen | 21·9 | 14 | i 4 53 | - 4 | i 8 57 | + 3 | — | — |
| Prague | 22·9 | 44 | i 5 8 _a | + 2 | i 9 20 | + 7 | — | — |
| Potsdam | 23·4 | 38 | i 5 11 _a | 0 | i 9 35 | +14 | i 5 40? | PP |
| Belgrade | 25·0 | 61 | e 5 18 | - 9 | e 8 40 | -69 | — | — |
| Copenhagen | 25·2 | 31 | i 5 29 _a | 0 | 9 58 | + 6 | — | — |
| Bergen | 26·4 | 17 | e 5 39 | - 1 | 10 38? | +26 | — | — |
| Sofia | 26·9 | 65 | e 5 46 | + 1 | e 10 26 | + 6 | — | — |
| Warsaw | 27·6 | 44 | 5 52 _a | + 1 | 10 32 | 0 | e 6 21 | PP |
| Upsala | 30·0 | 29 | e 6 12 | 0 | 11 8 | - 2 | — | — |

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1941

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| | | Δ | Az. | P. | | O-C. | S. | | O-C. | Supp. | | L. |
|---------------|----|----------|-----|------|-----------------|------|------|----|------|-------|----|-------------------------|
| | | ° | ° | m. | s. | s. | m. | s. | s. | m. | s. | m. |
| Scoresby Sund | | 35.1 | 354 | e 6 | 57 | 0 | e 12 | 30 | 0 | e 7 | 38 | sP e 16.8 |
| Helwan | z. | 35.4 | 89 | i 6 | 38? | -22 | — | — | — | — | — | — |
| Bermuda | | 44.6 | 282 | e 8 | 41 | +25 | e 14 | 50 | -2 | — | — | e 19.1 |
| Seven Falls | | 45.4 | 304 | i 8 | 21 | -1 | 15 | 8? | +4 | — | — | 22.6 |
| Harvard | z. | 46.8 | 298 | i 8 | 33 | 0 | — | — | — | — | — | — |
| Fordham | | 48.9 | 296 | i 8 | 49 | -1 | — | — | — | i 14 | 29 | S _c P e 22.6 |
| Ottawa | | 49.1 | 303 | i 8 | 50 | -1 | 15 | 52 | -4 | 10 | 13 | PP e 22.6 |
| Sverdlovsk | | 50.7 | 43 | i 9 | 5 | +2 | 16 | 17 | -1 | — | — | — |
| San Juan | | 51.8 | 266 | e 9 | 9 | -3 | e 16 | 30 | -3 | e 9 | 33 | pP e 22.1 |
| Florissant | | 61.5 | 299 | i 10 | 19 | -2 | e 18 | 13 | -29 | i 10 | 43 | pP — |
| St. Louis | z. | 61.5 | 299 | i 10 | 20 | -1 | — | — | — | — | — | — |
| Almata | | 64.8 | 54 | e 10 | 43 | 0 | — | — | — | — | — | — |
| Bozeman | | 71.7 | 314 | e 11 | 23 | -3 | — | — | — | — | — | e 34.6 |
| Agra | E. | 73.3 | 68 | e 10 | 58 | -37 | — | — | — | — | — | — |
| Bombay | E. | 73.9 | 79 | i 11 | 37 | -2 | 21 | 7 | -3 | 12 | 55 | P _c P — |
| Logan | | 74.4 | 312 | e 11 | 42 | 0 | e 21 | 8 | -8 | — | — | — |
| Irkutsk | | 75.4 | 36 | i 11 | 48 | +1 | e 21 | 24 | -3 | — | — | — |
| La Paz | | 75.4 | 236 | i 11 | 48 | +1 | — | — | — | — | — | 37.5 |
| Huancayo | | 77.5 | 245 | i 12 | 1 | +2 | e 22 | 20 | PS | — | — | e 39.5 |
| Tucson | | 79.2 | 302 | i 12 | 9 | +1 | — | — | — | i 12 | 50 | pP — |
| Tinemaha | | 81.2 | 310 | i 12 | 20 | +1 | — | — | — | — | — | — |
| Haiwee | | 81.6 | 309 | i 12 | 23 | +2 | — | — | — | — | — | — |
| Riverside | N. | 82.5 | 307 | e 12 | 26 | 0 | — | — | — | — | — | — |
| Mount Wilson | | 82.8 | 307 | i 12 | 28 _a | +1 | — | — | — | — | — | — |
| Pasadena | | 82.9 | 307 | i 12 | 28 _a | 0 | — | — | — | i 12 | 45 | pP e 40.7 |
| Berkeley | z. | 83.1 | 312 | i 12 | 29 | 0 | — | — | — | — | — | — |
| Santa Barbara | z. | 83.7 | 308 | i 12 | 34 | +2 | — | — | — | — | — | — |

Additional readings :—

Lisbon iS = +1m.21s.

San Fernando eP_gEN = +1m.16s., iS*E = +1m.54s.

Granada S_g = +2m.43s.

Algiers i = +3m.17s. and +6m.50s., e = +8m.8s.

Paris i = +9m.31s.

Kew iN = +4m.38s., eSSE = +7m.25s.

Uccle i = +4m.27s., iSNZ = +7m.45s.

Stonyhurst iPPP = +5m.13s., iSS = +8m.11s.

Stuttgart iNE = +4m.46s., eSSN = +8m.35s., eP_cP = +8m.47s.

Jena iN = +5m.25s., iNZ = +5m.38s., e = +9m.26s.

Potsdam iPEN = +5m.14s., iNZ = +5m.28s., iPPP = +5m.59s., iN = +9m.28s., iSZ = +9m.39s.?, iSSZ = +10m.3s.

Warsaw PN = +6m.38s.?, SE = +10m.36s., SSZ = +11m.53s.

Upsala eE = +11m.31s.

Scoresby Sund ePP = +8m.19s., e = +15m.3s.

Ottawa SSE = +19m.14s.?

San Juan eSS = +19m.58s.

Florissant iPZ = +10m.26s.

Bozeman e = +12m.43s.

Agra i = +11m.33s.

Bombay eE = +15m.1s., PSE = +21m.28s., SKSE = +21m.40s., S_cSE = +21m.57s., eE = +24m.54s.

Tucson ePP = +15m.10s., ePPP = +17m.2s.

Tinemaha iZ = +12m.36s.

Long waves were also recorded at Angra do Heroismo, and other American stations.

Dec. 27d. Readings also at 4h. (near Mizusawa), 11h. (Bombay, Agra, and Tananarive), 13h. (Tinimaha, Tucson, Oaxaca, Puebla, Vera Cruz, and Tacubaya (2)), 15h. (near La Paz), 22h. (Berkeley (3)).

Dec. 28d. Readings at 1h. (College), 3h. (Tucson), 5h. (near La Paz), 6h. (Medan and Balboa Heights), 15h. (Tucson, Guadalajara, and Tacubaya), 18h. (Bombay, Tchinkent, Frunse, and near Stalinabad).

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Dec. 29d. Readings at 1h. (Tucson, Haiwee, Tinemaha, and near College), 5h. (Tchimkent, Irkutsk, Brisbane, Riverview, Agra, and Bombay), 6h. (Riverview Agra, Bombay, Berkeley, Tucson, San Juan, Chicago U.S.C.G.S., Fordham, and Uccle), 7h. (Riverview, Agra, and Bombay), 11h. (Calcutta, Agra, and Bombay), 12h. (Calcutta, Agra, Bombay, and Medan), 19h. and 22h. (near Berkeley), 23h. (Spokane and near Berkeley).

Dec. 30d. Readings at 0h. (near Berkeley), 7h. (Bombay and near Andijan), 9h. (near Andijan), 15h. (near Lick), 18h. (Berkeley and La Paz), 21h. (St. Louis).

Dec. 31d. 6h. 48m. 46s. Epicentre 37°·6N. 118°·9W. (as on 1941, Sept. 14d.).

Intensity VI at Owens River Gorge. Epicentre 37°34'N. 118°44'W. Macro seismic area 28,000 square miles.

F. Neumann, United States Earthquakes, 1941, Washington, 1943, p. 19, map p. 8.

$$A = -.3839, B = -.6954, C = +.6076; \quad \delta = +14; \quad h = -1; \\ D = -.875, E = +.483; \quad G = -.294, H = -.532, K = -.794.$$

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|----------------|----|----------|-----|--------|----------------|--------|----------------|--------|----------------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Tinemaha | | 0·7 | 135 | i 0 11 | - 6 | — | — | — | — |
| Fresno | N. | 1·1 | 219 | i 0 21 | - 1 | — | — | — | i 8·7 |
| Haiwee | | 1·6 | 153 | 0 28 | - 2 | i 0 49 | - 2 | — | — |
| Lick | E. | 2·2 | 263 | i 0 40 | + 2 | — | — | — | — |
| Santa Clara | | 2·4 | 266 | i 0 46 | + 5 | i 1 9 | - 3 | — | i 1·4 |
| Branner | | 2·6 | 267 | e 0 46 | + 2 | 1 18 | + 1 | — | e 5·7 |
| Berkeley | | 2·7 | 276 | i 0 46 | + 1 | i 1 23 | + 4 | 0 54 | P _r 1·4 |
| San Francisco | | 2·8 | 273 | e 0 50 | + 3 | i 2 17 | L | i 1 0 | P _r (2·3) |
| Santa Barbara | | 3·2 | 192 | i 0 48 | - 4 | — | — | — | — |
| Mount Wilson | Z. | 3·5 | 169 | i 0 55 | - 2 | — | — | — | — |
| Pasadena | | 3·5 | 171 | 0 55 | - 2 | i 1 48 | S* | — | — |
| Ukiah | | 3·7 | 296 | e 1 15 | P _r | e 2 3 | S _r | — | e 2·3 |
| Ferndale | | 5·1 | 307 | — | — | e 2 57 | S _r | — | 13·4 |
| Salt Lake City | | 6·3 | 57 | e 1 55 | P* | e 3 18 | S* | — | e 3·6 |
| Logan | | 6·8 | 51 | e 2 3 | P* | — | — | — | e 3·6 |
| Tucson | | 8·5 | 126 | 2 4 | - 3 | e 3 32 | -13 | e 2 43 | PPP e 4·4 |
| Florissant | E. | 22·4 | 78 | e 5 7 | + 5 | e 9 12 | + 8 | — | — |

Additional readings:—

Berkeley iZ = +0m.49s., iSE = +1m.10s.

Tucson e = +3m.1s.

Long waves were also recorded at other American stations.

Dec. 31d. 17h. 23m. 27s. Epicentre 20°·5S. 179°·0W. Depth of focus 0·100. (as on 1941, June 21d.).

$$A = -.9373, B = -.0164, C = -.3481; \quad \delta = -3; \quad h = +5; \\ D = -.017, E = +1·000; \quad G = +.348, H = +.006, K = -.937.$$

| | | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|---------------|----|----------|-----|---------|------|---------|------|---------|------------------|
| | | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Auckland | | 17·2 | 197 | 3 23? | - 4 | 5 53 | -21 | 7 23 | P _c P |
| Arapuni | | 18·1 | 195 | — | — | 6 21 | - 7 | — | — |
| New Plymouth | | 19·5 | 195 | e 3 45? | - 3 | 5 30 | ? | — | — |
| Wellington | | 21·4 | 193 | 4 1 | - 4 | 7 0 | -22 | 7 28 | P _c P |
| Brisbane | E. | 26·4 | 250 | i 6 53 | + 4 | i 8 42 | + 2 | i 7 32 | pP |
| Riverview | | 29·6 | 237 | 1 6 54 | -22 | i 9 30 | 0 | e 12 40 | SSS |
| Batavia | | 73·1 | 269 | 1 9 19 | -68 | i 17 58 | -65 | — | — |
| Santa Barbara | Z. | 78·5 | 47 | e 10 58 | + 2 | — | — | — | — |
| Berkeley | Z. | 78·8 | 43 | i 10 56 | - 2 | — | — | — | — |
| Lick | | 78·9 | 43 | i 11 0 | + 2 | — | — | — | — |

Continued on next page.

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| | Δ ° | Az. ° | P. | | O-C. s. | S. | | O-C. s. | Supp. | | L. m. |
|------------------|---------------|----------|------|-----|------------|------|----|------------|-------|------|----------|
| | | | m. | s. | | m. | s. | | m. | s. | |
| Pasadena | 79.4 | 47 | i 11 | 2k | + 1 | — | — | — | — | — | — |
| Mount Wilson | 79.5 | 47 | i 11 | 3 | + 2 | — | — | — | — | — | — |
| Riverside | 79.8 | 47 | i 11 | 5 | + 2 | — | — | — | — | — | — |
| Halwee | 80.6 | 46 | i 11 | 9k | + 2 | — | — | — | — | — | — |
| Tinemaha | 80.9 | 45 | i 11 | 11 | + 3 | — | — | e 13 | 22 | pP | — |
| Tucson | 83.6 | 52 | i 11 | 25 | + 3 | — | — | e 13 | 36 | pP | — |
| Medan | 84.1 | 276 | 11 | 23 | - 1 | 20 | 41 | -14 | — | — | — |
| Butte | 89.3 | 40 | e 12 | 40 | +51 | — | — | — | — | — | — |
| Calcutta | N. 100.0 | 290 | — | — | — | e 28 | 44 | ? | — | — | — |
| Agra | E. 110.2 | 292 | e 21 | 6 | ? | i 24 | 5 | sSKS | — | — | — |
| Bombay | E. 112.9 | 282 | e 20 | 17 | PPP | e 26 | 47 | SP | — | — | — |
| Copenhagen | 143.8 | 351 | i 18 | 24 | [+ 2] | — | — | — | — | — | — |
| Warsaw | 144.7 | 340 | 18 | 28k | [+ 5] | — | — | — | — | — | — |
| Ksara | 146.4 | 301 | e 18 | 36 | [+10] | — | — | e 22 | 1 | PP | — |
| Potsdam | 146.8 | 347 | i 18 | 27 | [0] | — | — | i 21 | 54 | PP | — |
| De Bilt | 148.3 | 355 | i 18 | 37 | [+ 8] | — | — | — | — | — | — |
| Jena | 148.5 | 347 | e 18 | 33 | [+ 3] | — | — | — | — | — | — |
| Uccle | 149.6 | 358 | e 18 | 33a | [+ 2] | — | — | — | — | — | — |
| Belgrade | 150.9 | 330 | e 18 | 29 | [- 4] | — | — | e 19 | 32 | pPKP | — |
| Stuttgart | 151.0 | 350 | i 18 | 36k | [+ 3] | — | — | — | — | — | — |
| Basle | 152.5 | 351 | e 20 | 13 | pPKP | — | — | — | — | — | — |
| Zurich | 152.5 | 351 | i 18 | 36k | [+ 1] | — | — | — | — | — | — |
| Neuchatel | 153.1 | 352 | e 18 | 39 | [+ 3] | — | — | — | — | — | — |
| Milan | Z. 154.2 | 346 | e 18 | 38 | [+ 1] | — | — | — | — | — | — |
| Clermont-Ferrand | 154.7 | 357 | e 18 | 41 | [+ 4] | — | — | — | — | — | — |
| Toledo | 160.2 | 11 | i 18 | 49 | [+ 4] | — | — | i 23 | 20 | PP | — |

Additional readings :—

Auckland i = +6m.23s., S_cS? = +13m.58s.
 Wellington S_cS = +14m.5s.
 Riverview eN = +9m.16s., eNZ = +12m.43s., iN = +14m.45s.
 Berkeley iNZ = +11m.0s.
 Tucson e = +15m.5s.
 Bombay eE = +30m.56s.
 Potsdam iNZ = +18m.33s.
 Jena i = +18m.38s. and +18m.49s., iE = +19m.4s., iN = +19m.26s., iZ = +20m.57s.
 Uccle i = +18m.39s., iZ = +18m.47s.
 Stuttgart i = +18m.43s. and +18m.54s.
 Zurich i = +18m.45s.k
 Toledo i = +19m.33s.

Dec. 31d. 17h. 36m. 6s. Epicentre 2°.5S. 81°.0W.

A = +.1562, B = -.9868, C = -.0433; δ = +5; h = +7;
 D = -.988, E = -.156; G = -.007, H = +.043, K = -.999.

| | Δ ° | Az. ° | P. | | O-C. s. | S. | | O-C. s. | Supp. | | L. m. | |
|----------------|---------------|----------|-----|-----|------------|------|----|------------|-------|----|----------|--------|
| | | | m. | s. | | m. | s. | | m. | s. | | |
| Huancayo | 11.0 | 149 | i 2 | 46 | + 4 | i 4 | 43 | - 4 | — | — | i 5.4 | |
| Balboa Heights | 11.5 | 7 | e 2 | 44 | - 4 | — | — | — | — | — | — | |
| La Paz | 18.8 | 137 | i 4 | 27a | + 4 | i 8 | 2 | +12 | i 8 | 26 | SS | 10.6 |
| Merida | N. 24.8 | 341 | e 4 | 14 | -71 | — | — | — | — | — | — | |
| San Juan | 25.4 | 35 | e 5 | 28 | - 3 | i 9 | 52 | - 4 | i 6 | 8 | PP | e 11.3 |
| Columbia | 36.3 | 359 | e 7 | 15 | + 8 | e 12 | 37 | -11 | — | — | e 16.0 | |
| Bermuda | 38.0 | 23 | e 7 | 27 | + 6 | e 13 | 9 | - 5 | e 8 | 50 | PP | e 16.3 |
| La Plata | 38.7 | 149 | 7 | 27 | 0 | 13 | 26 | + 1 | 8 | 58 | PP | 21.3 |
| Cape Girardeau | 40.4 | 350 | i 7 | 36 | - 5 | i 14 | 0 | +10 | e 9 | 31 | PP | — |
| St. Louis | 41.8 | 349 | i 7 | 49 | - 4 | i 14 | 8 | - 3 | i 9 | 37 | PP | — |
| Rio de Janeiro | N. 41.9 | 121 | e 7 | 54 | 0 | i 13 | 44 | -29 | — | — | i 19.4 | |
| Florissant | 42.0 | 349 | e 7 | 50 | - 4 | i 14 | 24 | +10 | i 9 | 41 | PP | — |
| Philadelphia | 42.6 | 8 | e 7 | 46 | -13 | i 14 | 17 | - 6 | i 9 | 39 | PP | e 18.4 |
| Pittsburgh | 42.7 | 2 | i 8 | 7 | + 7 | e 14 | 12 | -12 | — | — | — | |
| Fordham | 43.6 | 9 | i 8 | 17 | + 9 | e 14 | 37 | - 1 | i 9 | 54 | PP | — |

Continued on next page.

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| | Δ | Az. | P. | O-C. | S. | O-C. | Supp. | L. |
|------------------|----------|-----|----------|-------|---------|-------|---------|-------------|
| | ° | ° | m. s. | s. | m. s. | s. | m. s. | m. |
| Chicago | 44.5 | 353 | e 8 19 | + 4 | e 14 29 | -22 | e 9 56 | PP e 19.5 |
| Tucson | 44.6 | 323 | i 8 14 | - 2 | e 14 41 | -11 | i 10 12 | PPP e 18.5 |
| Ottawa | 47.9 | 5 | 8 37 | - 5 | 15 28 | -11 | 10 28 | PP e 21.9 |
| East Machias | 48.6 | 13 | — | — | e 15 44 | - 5 | — | e 19.9 |
| Riverside | 49.9 | 320 | i 8 57 | 0 | — | — | — | — |
| Seven Falls | 50.2 | 10 | 8 56 | - 4 | 16 67 | - 5 | 18 367 | SS 19.9 |
| Mount Wilson | 50.5 | 320 | i 9 1 | - 1 | — | — | — | — |
| Pasadena | 50.5 | 320 | i 9 0 | - 2 | i 16 14 | - 2 | i 10 18 | PP e 24.7 |
| Haiwee | 51.6 | 322 | i 9 9 | - 1 | — | — | — | — |
| Santa Barbara | z. 51.7 | 319 | i 9 9 | - 2 | — | — | — | — |
| Logan | 52.2 | 332 | 9 7 | - 8 | — | — | — | e 38.6 |
| Tinemaha | 52.4 | 322 | i 9 15 | - 1 | — | — | — | — |
| Bozeman | 54.9 | 335 | e 9 24 | -11 | e 17 5 | -11 | e 11 30 | PP e 27.5 |
| Berkeley | 55.4 | 320 | i 9 16 | -22 | i 17 18 | - 4 | — | — |
| Ukiah | 56.7 | 321 | e 9 56 | + 8 | e 17 58 | +18 | — | e 26.9 |
| Victoria | 62.7 | 330 | — | — | e 18 54 | - 3 | — | 29.9 |
| Granada | 81.5 | 52 | i 12 26 | + 5 | i 23 14 | [+37] | — | — |
| Toledo | 81.6 | 52 | e 12 20 | - 1 | e 22 26 | - 7 | — | 39.9 |
| College | 82.6 | 336 | — | — | e 22 37 | - 6 | — | e 43.7 |
| Stonyhurst | 85.3 | 36 | — | — | 23 2 | [- 1] | — | e 41.9 |
| Aberdeen | 86.1 | 32 | — | — | e 22 56 | [-12] | — | e 45.1 |
| Kew | 86.1 | 38 | — | — | e 23 5 | [- 3] | — | e 42.9 |
| Clermont-Ferrand | 87.7 | 44 | e 12 40 | -12 | e 23 27 | - 6 | — | — |
| Uccle | 89.0 | 39 | e 13 6 | + 8 | e 23 20 | [- 7] | — | e 38.9 |
| De Bilt | 89.6 | 38 | — | — | i 23 45 | - 6 | — | e 42.9 |
| Neuchatel | 90.4 | 43 | e 13 10 | + 6 | — | — | — | — |
| Basle | 90.9 | 42 | e 14 3 | +56 | — | — | — | — |
| Stuttgart | 92.0 | 41 | e 13 10 | - 2 | e 24 18 | + 6 | — | — |
| Copenhagen | 94.0 | 34 | — | — | 24 30 | 0 | — | — |
| Potsdam | 94.5 | 37 | i 13 37 | +14 | e 24 29 | - 5 | i 17 17 | PP e 45.9 |
| Warsaw | 99.3 | 38 | — | — | e 24 20 | [- 4] | e 25 5 | SKKS e 51.9 |
| Belgrade | 99.9 | 45 | e 16 53 | PP | — | — | — | — |
| Tananarive | 125.1 | 115 | — | — | e 39 17 | SSP | 48 40 | ? e 62.6 |
| Agra | E. 148.3 | 37 | e 19 50 | [+ 5] | — | — | — | — |
| Bombay | E. 149.6 | 56 | e 20 2 | [+15] | e 28 53 | ? | e 23 31 | PKS 72.9 |
| Colombo | E. 160.5 | 77 | e 18 54? | [-67] | — | — | — | — |
| Medan | 178.9 | — | 20 16 | [+ 4] | 33 6 | {+20} | — | — |

Additional readings:—

San Juan i = +7m.15s.
 La Plata E = +14m.36s., SSSN = +16m.42s.
 Cape Girardeau iN = +7m.49s., eE = +16m.58s. and +18m.2s.
 St. Louis iNZ = +8m.2s., iN = +13m.45s. and +17m.16s.
 Florissant iNZ = +8m.2s., and +9m.24s., iE = +14m.4s., eN = +17m.6s., iN = +17m.19s.
 Philadelphia eSS = +17m.39s.
 Pittsburgh iZ = +8m.13s.
 Fordham i = +14m.53s., +18m.0s., and +18m.28s.
 Chicago U.S.C.G.S. iSS = +18m.0s.
 Tucson i = +9m.14s., e = +15m.5s.
 Ottawa SS = +18m.28s.
 Pasadena eSSZ = +20m.36s.
 Logan e = +9m.15s.
 Bozeman eS_eS = +19m.11s.
 Berkeley iPZ = +9m.37s., iN = +9m.44s., eE = +9m.52s., iSNZ = +17m.26s.
 Aberdeen iN = +23m.8s.
 Kew iSEN = +23m.13s.
 Uccle iN = +23m.38s., +24m.13s., and +29m.46s.
 Potsdam eE = +24m.24s.
 Warsaw eN = +25m.13s.
 Medan P?EN = +20m.25s.
 Long waves were also recorded at Butte and Riverview.

Dec. 31d. Readings also at 7h. (near Fresno), 8h. (Scoresby Sund, Berkeley, near Lick, and near Fresno), 11h. (Berkeley (2), near Lick (2), and near Fresno (2)), 12h. (Berkeley, near Lick, and near Fresno), 14h. (La Plata), 18h. (San Francisco, near Lick, Berkeley, and Branner), 19h. (Auckland, Arapuni, Wellington, Riverview, Brisbane, Adelaide, Sydney, Berkeley, Ukiah, Tucson, Mount Wilson, Pasadena, Riverside, and Warsaw), 20h. (Bombay, De Bilt, Uccle, Potsdam, East Machias, and near Lick), 23h. (Berkeley and Calcutta).

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A digital hypocenter file of the ISS (Villaseñor and Engdahl, 2005) can be obtained from the USGS web site: <http://earthquake.usgs.gov/scitech/iss/>

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Villaseñor, A., and E.R. Engdahl, *A digital hypocenter catalog for the International Seismological Summary*, Seism. Res. Lett., vol. 76, no. 5, pp. 554-559, 2005.

Villaseñor, A., E.A. Bergman, T.M. Boyd, E.R. Engdahl, D.W. Frazier, M.M. Harden, J.L. Orth, R.L. Parkes, and K.M. Shedlock, *Toward a comprehensive catalog of global historical seismicity*, Eos Trans. AGU, vol. 78, no. 50, pp. 581, 583, 588, 1997.