

Original 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 have been scanned and collected by SGA Storia Geofisica Ambiente (Bologna) thanks to funding provided by the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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The International Seismological Summary.

1937 January, February, March.

FORMERLY THE BULLETIN OF THE
BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The tables published by Jeffreys and Bullen in 1935,¹ and used as a standard of comparison in the I.S.S. for 1930-1936, have been found to need some substantial corrections, and it has also been found that for accurate work it is necessary to make some allowance for the ellipticity of the Earth. No tables consistent with the 1935 tables have been published for deep focus earthquakes.

Accordingly the International Seismological Association has decided that in future the tables used for reduction shall be the Jeffreys-Bullen tables of 1940²; these embody the corrections found, and make allowances for ellipticity and focal depth convenient. This is the first number computed with the tables of 1940. The change entails several deviations from previous practice in the preparation of the I.S.S. The tables were collected and republished in one pamphlet by the British Association Seismological Committee in 1940 with a new introduction containing explanations and instructions for use. A reprint of this pamphlet is in preparation and will be distributed to the stations when ready.

- (1) Time at origin. This is now taken to be the time when the waves leave the focus, measured from Greenwich Mean Midnight.
- (2) The Epicentre is determined in terms of *Geographic* co-ordinates ϕ , λ , those normally used to define position on the Earth's surface.
- (3) The constants of the epicentre:—

$$\begin{array}{lll}
 A = \cos \phi' \cos \lambda & D = \sin \lambda & G = \sin \phi' \cos \lambda \\
 B = \cos \phi' \sin \lambda & E = -\cos \lambda & H = \sin \phi' \sin \lambda \\
 C = \sin \phi' & & K = -\cos \phi'
 \end{array}$$

¹ Bureau Central Séism. Int., Trav. Sci. 11.

² Papers in M.N.R.A.S. Geophys. Suppl., Vols. 4, 5; British Association Publication, 1940.

where ϕ' stands for *Geocentric* Latitude. These numbers form a set of mutually orthogonal direction-cosines which can be used to calculate angular distance (Δ) or Azimuth ($Az.$) of the observing station by means of the formulae:—

$$2 - 2\cos \Delta = (a - A)^2 + (b - B)^2 + (c - C)^2$$

$$\cos \Delta = aA + bB + cC$$

for Δ , where a, b, c bear the same relation to the position of the observing station as A, B, C do to the Epicentre.

$$\text{Also } 2 + 2\sin \Delta \sin Az. = (a - D)^2 + (b - E)^2 + c^2$$

$$2 + 2\sin \Delta \cos Az. = (a - G)^2 + (b - H)^2 + (c - K)^2$$

for the Azimuth.

δ is the nearest whole number to $(A^2 + B^2 + C^2 - 1)10^5$. Its significance is explained in a note to "The Constants of Seismological Observing Stations," Brit. Ass. Pubn., 1937. This publication gives the Geocentric direction cosines of the stations then in operation, and tables of $\cos \phi'$, $\sin \phi'$ in terms of ϕ .

- (4) Δ and $Az.$ Δ is the angular distance between station and epicentre calculated on the assumption of a spherical earth by the formulae in § 3. The Azimuth is the bearing of the station from the epicentre measured from North through East. Normally this is read from a terrestrial globe, but for small distances is calculated.
- (5) The letters P and S denote the times of arrival of the longitudinal and transverse elastic waves refracted directly through the earth. The composite symbols PP, PS, SS refer to similar waves arriving after reflection at the surface. In the case of PP, SS the wave has travelled over both portions of its path in the same type. In PS the wave is longitudinal to the point of reflection and is then retransmitted as transverse. PPP is a longitudinal wave twice reflected at the surface.

PcP, PcS, ScS imply similar reflections, but at the surface of the earth's "liquid core." When a wave is refracted through the earth's "liquid core" the longitudinal wave inside the core is denoted by K, so that, for example, PKP is a longitudinal wave refracted through the core. SKS similarly starts as transverse and after traversing the core as a longitudinal wave continues on as transverse. SKKS has been once reflected internally at the surface of the core. Pg, Sg, P*, S* are body waves observed at short distances in shallow earthquakes, the two former having travelled in the upper layer and the two latter in the intermediate layer.

pP, sP, sS are waves reflected near the epicentre in deep focus earthquakes.

- (6) The tabular part of the Summary gives the times of two "body" waves in columns headed P and S, together with their residuals, and columns for L and M. All times are measured from the adopted T_0 . Under P is entered the true P where this is observed, but for distances greater than those for which this phase is normally read, PP or PKP or PKP₂ are substituted. Similarly SKS, SKKS are substitutes for S. When a residual is made with reference to the tables of PKP or SKS, the entry is given in brackets []. When made for PKP₂ or SKKS the entry is { }.

The letter "a" after a P phase means that the initial motion is upwards and outwards from the epicentre; "k" means that it is downwards and towards the epicentre.

Where the data do not lead to a determination of focal depth the comparison is with the tabulated times for a surface focus. Otherwise the focal depth is rounded to the nearest multiple of 0.01R. Note that "Surface focus" and "depth of 0.00R" are not synonymous. The latter would mean that the focus is at the level of the base of the continental layers, which is taken in the table as 33 km. This method has been found the most convenient for interpolation. The correction for "height above mean sphere" described in the introduction to the tables has not been applied, but should be used in the most accurate work. It is always less than 1s for P, but could theoretically reach 2s for PKP in special cases.

- (7) Long waves. Under L are recorded the times of onset of the surface (long) waves, which are confined to the neighbourhood of the surface. They are of two types, the Rayleigh wave, giving displacements in the plane of propagation, and the Love wave, giving horizontal displacements at right angles to the plane of propagation. The latter is sometimes indicated by L_q . M is the time when the maximum amplitude is observed.

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Contributors are reminded that in future their Bulletins should be sent to :—

DIRECTOR (I.S.S.),
Kew Observatory,
Richmond, Surrey,
England.

(Not to the
University Observatory,
Oxford.)

The present issue of the Summary, 1937 January, February, March gives Epicentres and readings for 117 earthquakes, for which 24 are repetitions from previously used epicentres.

Cases of abnormal depth of focus :—

Date.	Epicentre.	Depth.
Jan. 5th 11h.	28°.2N. 139°.0E.	0.080
Mar. 29th 7h.	16°.4S. 71°.0W.	0.010

March, 1948.

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1937 JANUARY, FEBRUARY, MARCH.

Jan. 1d. Readings at 5h. (Almata, Frunse, and near Samarkand), 6h. (Christchurch, Wellington, San Javier, Marselles, and Strasbourg), 9h. (Manila and Wellington), 11h. (Frunse, Samarkand, near Andijan, and near Tiflis), 12h. (2) and 14h. (Tiflis), 15h. (Hong Kong and near Manila), 17h. (La Plata and near Kobe), 21h. (La Paz), 22h. (near Nagoya).

Jan. 2d. 14h. 3m. 54s. Epicentre 34°·1N. 24°·9E.

Strasbourg determination, Epicentre 32°·5N., 23°·5E., U.S.S.R. 34°·0N., 26°·5E.

A = +·7527, B = +·3494, C = +·5580; $\delta=0$; $h=0$;
D = +·421, E = -·907; G = +·506, H = +·235, K = -·830.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Athens	4·0	349	i 1 4	0	i 1 48	- 4	—	—
Helwan	6·9	126	e 1 46	+ 1	e 2 56	- 9	—	—
Sofia	8·7	354	e 2 17	+ 7	e 2 58	-52	—	5·8
Ksara	9·1	90	e 2 15	+ 1	i 3 46	-14	—	—
Bucharest	10·3	358	e 2 42	+10	e 4 38	+28	—	7·5
Belgrade	11·3	344	e 2 49 ^a	+ 3	e 5 22	+28	—	—
Sebastopol	12·4	30	e 3 6	+ 5	e 5 54	+33	8·7	—
Yalta	12·6	33	e 2 59	- 4	e 5 44	+18	9·3	—
Zagreb	13·5	333	e 3 14	- 1	e 6 1	+14	e 6·6	8·5
Theodosia	13·6	33	e 3 13	- 4	e 6 10	+20	8·1	—
Budapest	14·1	344	e 3 32	+ 9	—	—	e 8·1	9·6
Florence	14·3	315	e 2 13	-73	e 6 6	0	—	8·1
Triest	14·3	327	e 3 26	0	e 5 51	-15	—	—
Sotchi	14·9	46	e 3 33	- 1	—	—	—	—
Padova	15·1	323	e 3 12	-24	—	—	—	—
Vienna	15·5	338	e 3 55	+13	e 6 44	+ 9	—	11·1
Erevan	16·8	63	e 4 1	+ 3	e 6 58	- 7	—	—
Piatigorsk	17·2	49	e 4 2	- 1	e 7 20	+ 6	—	—
Chur	17·2	322	e 4 6	+ 3	e 7 26	+12	—	—
Tiflis	17·4	58	e 4 4	- 2	i 7 20	+ 1	e 9·4	11·8
Prague	17·7	338	e 4 11	+ 1	e 7 27	+ 1	e 10·0	12·1
Algiers	18·0	284	e 4 19	+ 6	e 7 41	+ 9	14·1	—
Zurich	18·1	321	e 4 16	+ 2	e 7 37	+ 2	—	—
Cheb	18·4	333	e 4 36	+18	e 7 48	+ 7	e 10·8	12·8
Grozny	18·7	54	e 4 24	+ 2	e 7 55	+ 7	—	—
Basle	18·7	320	e 4 21	- 1	—	—	—	—
Neuchatel	18·7	320	e 4 22	0	—	—	—	—
Stuttgart	18·7	327	e 4 24	+ 2	e 7 42	- 6	e 11·1	13·1
Strasbourg	19·3	324	e 4 25	- 4	e 8 13	+11	e 11·1	—
Jena	19·4	334	e 4 29	- 1	e 8 6	+ 2	e 11·1	13·1
Tortosa	20·5	296	e 4 44	+ 2	8 31	+ 4	—	—
Göttingen	20·5	333	e 4 41	- 1	—	—	—	—
Baku	20·8	64	e 4 46	+ 1	e 8 33	0	11·8	15·0
Paris	22·2	318	e 5 7	+ 7	—	—	14·1	—
Hamburg	22·2	336	e 5 3	+ 3	—	—	e 13·1	—
Almeria	22·4	285	e 5 5	+ 3	e 9 16	+12	—	—
Uccle	22·4	323	e 5 4	+ 2	e 9 8	+ 4	e 13·1	—
De Bilt	22·9	328	—	—	e 9 17	+ 4	e 12·1	15·6
Copenhagen	23·2	342	e 5 13	+ 4	e 9 18	0	13·1	—
Granada	23·3	286	e 5 15	+ 5	e 9 6	-14	—	—
Moscow	23·4	18	e 5 11	0	e 9 15	- 6	12·6	14·9
Toledo	23·8	293	e 5 14	- 1	e 9 50	+22	—	—
Pulkovo	25·9	7	e 5 33	- 2	10 6	+ 2	14·1	15·9
Upsala	26·2	350	e 6 19	+41	e 11 2	+53	14·1	17·4
Tashkent	35·5	65	e 6 59	- 1	i 12 32	- 4	e 23·8	27·5
Vladivostok	78·3	46	11 46	-17	—	—	—	—

For Notes see next page

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NOTES TO JAN. 2d. 14h. 3m. 54s.

Additional readings :—

Helwan $P_s = +1m.56s.$, $iS_s = +3m.21s.$
 Ksara $eS_s = +4m.38s.$
 Bucharest $eE = +4m.50s.$
 Belgrade $iZ = +3m.16s.$, $eNE = +6m.16s.$ and $+6m.34s.$
 Zagreb $ePPNW = +3m.28s.$, $eNE = +3m.47s.$, $eNW = +5m.52s.$
 Budapest $iN = +4m.54s.$
 Trieste $i = +6m.21s.$ and $+8m.13s.$
 Tiflis $eZ = +5m.1s.$, $iE = +7m.24s.$
 Algiers $PPP? = +4m.44s.$
 Grozny $PP = +4m.45s.$
 Stuttgart $eS = +8m.10s.$
 Göttingen $eEN = +4m.48s.$
 Long waves were also recorded at stations in Great Britain and at Cape Town.

Jan. 2d. 22h. 33m. 26s. Epicentre $17^{\circ}0N. 104^{\circ}5W.$

A = - .2396, B = - .9264, C = + .2906 ; $\delta = +7$; $h = +5$;
 D = - .968, E = + .250 ; G = - .073, H = - .281, K = - .957.

		Δ	Az.	P.	O-C.	S.	O-C.	L.
		o.	o.	m. s.	s.	m. s.	s.	m.
Manazanillo	N.	2.1	4	0 32	- 5	—	—	0.9
Gadalaajara	N.	3.8	14	0 59	- 2	—	—	—
Tacubaya		5.6	63	1 45	+18	—	—	—
Mazatlan	E.	6.4	346	1 26	-12	—	—	—
Tucson		16.2	340	e 3 50	0	e 6 52	+ 1	e 7.9
La Jolla		19.5	326	i 4 31	0	—	—	—
Riverside		20.5	327	e 4 41	- 1	—	—	—
Little Rock		20.7	29	e 4 49	+ 5	e 8 32	+ 1	e 24.0
Pasadena		21.0	326	i 4 47	0	e 8 38	+ 1	e 12.1
Santa Barbara	Z.	22.1	325	i 5 0	+ 1	—	—	—
Haiwee	N.	22.5	330	i 5 2	0	—	—	—
Denver		22.6	359	e 4 34	-29	—	—	e 11.4
Tinemaha		23.4	331	e 5 12	+ 1	—	—	—
Florissant		25.0	26	e 6 7	+40	i 9 37	-12	—
Berkeley		26.0	327	i 5 41	+ 5	i 10 18	+12	—
Madison		29.0	23	—	—	e 13 34?	?	—

Additional readings :—

Tucson $e = +7m.44s.$
 Little Rock $iPPP = +5m.16s.$, $eE = +22m.34s.$
 Denver $eE = +10m.8s.$, $+11m.6s.$, $iE = +11m.8s.$
 Florissant $iNZ = +11m.40s.$, $iN = +12m.37s.$, $iEN = +13m.31s.$, $iNZ = +14m.49s.$
 Berkeley $iEN = +5m.46s.$

Long waves were also recorded at Sitka, Oak Ridge, Philadelphia, Columbia, Butte, Bozeman, Scoresby Sund, Wellington, Oaxaca, Moscow, Kew, Strasbourg, Pulkovo, Paris, Sverdlovsk, and Stuttgart.

Jan. 2d. Readings also at at 2h. (La Paz), 3h. (Strasbourg, Zurich, near Marseilles, and near Santiago), 6h. (near Nagoya), 7h. (near Perth), 8h. (Baku and Sverdlovsk), 11h. (near Tucson), 13h. (Malaga), 15h. (near Santiago), 16h. (Frunse, Tashkent, and near Andijan), 17h. (Nagoya, near Hukuoka B, near Apia, Vladivostok), 18h. (Sverdlovsk and near Nagoya), 19h. (La Paz), 20h. (Pasadena, Tinemaha, La Plata, La Paz, near Santiago, and near Nagoya), 21h. (Chicago and Huancayo), 23h. (Calcutta, Erevan, Almata, Ksara, Grozny, Tiflis, Frunse, Andijan, Baku, Sverdlovsk, Moscow, Pulkovo, and near Nagoya).

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Jan. 3d. 10h. 11m. 55s. Epicentre 38° 2'N. 71° 0'E.

The stations of Central Asia suggest Epicentre 38° 50'N. 69° 50'E.

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.	M.
			m. s.	s.	m. s.	s.	m. m.
Andijan	2.7	22	e 0 47	+ 2	e 1 23	+ 4	1.7
Samarkand	3.4	297	0 56	+ 1	i 1 34	- 3	—
Tchimkent	4.2	346	1 7	0	i 2 5	+ 8	2.3
Frunse	5.4	30	e 1 16	- 8	e 2 23	- 5	3.2
Almata	6.8	40	e 1 44	0	e 2 57	- 6	3.8
Grozny	19.8	293	e 4 30	- 5	e 8 15	+ 2	—

Additional readings:—

Andijan $iP_g = +54s.$, $i = +1m.3s.$
Frunse $e = +2m.12s.$ and $+2m.47s.$
Almata $e = +3m.34s.$

Jan. 3d. Readings also at 0h. (Mizusawa, near Kobe, Sumoto, and Nagoya), 3h. (Cheb), 5h. (near Lick), 8h. (Frunse and near Almata), 10h. (Wellington, Fresno, Erevan, and Grozny), 11h. (Erevan, Grozny, and Christchurch), 12h. (near Hukuoka B), 13h. (near Berkeley, Branner, and Lick), 15h. (Basle, Trieste, Ksara, Tiflis, Theodosia, Yalta, and near Nagoya), 16h. (Nagoya), 19h. (Andijan, Cheb, and Santiago), 20h. (Melbourne and Perth), 21h. (Erevan, Grozny, and Piatigorsk), 22h. (La Jolla, Pasadena, Riverside, Tucson, and near Nagoya).

Jan. 4d. 22h. 46m. 55s. Epicentre 4° 5'S. 140° 5'E.

A = -.7693, B = +.6342, C = -.0779; $\delta = +10$; $h = +7$;
D = +.636, E = +.772; G = +.060, H = -.050, K = -.997.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Palau	13.2	333	3 14	+ 3	5 34	- 6	—	—
Manila	27.1	315	e 5 55	+ 9	10 8	-16	—	—
Adelaide	30.3	184	i 11 43	S	(i 11 43)	+28	i 19.5	—
Riverview	30.8	163	—	—	e 11 56	+33	e 18.3	21.7
Sydney	30.8	163	e 10 23	S	(e 10 23)	-60	17.1	18.5
Melbourne	33.4	174	—	—	e 12 30	+27	18.4	20.6
Perth	35.8	217	13 20	S	(13 20)	+39	i 20.6	—
Hong Kong	37.0	317	8 40	?	13 5	+ 6	13.6	17.3
Nagoya	39.6	356	7 39	+ 4	—	—	—	—
Gihu	39.8	356	7 32	- 4	—	—	—	—
Zi-ka-wei	z. 39.9	334	e 7 37	0	—	—	—	23.4
Tokyo, Cent. Met. Obs.	40.0	359	7 48	+10	—	—	—	—
Maebasi	40.7	358	7 21	-23	—	—	—	—
Oiwake	40.7	358	7 42	- 2	—	—	—	—
Nagano	41.0	357	7 49	+ 3	—	—	—	—
Medan	42.5	281	e 8 1	+ 2	e 14 34	+12	—	—
Wellington	47.8	145	—	—	e 19 45	?	27.1	—
Christchurch	48.1	149	e 8 47	+ 4	15 55	+13	23.7	—
Calcutta	n. 57.6	300	e 10 14	+20	i 18 11	+20	—	—
Colombo	61.6	281	19 2	S	(19 2)	+19	—	—
Irkutsk	64.3	337	e 10 44	+ 5	e 19 12	- 5	e 31.1	—
Kodaikanal	E. 64.4	284	e 10 55	+15	e 19 37	+19	—	—
Agra	E. 68.0	302	e 11 11	+ 8	e 19 54	- 8	—	—
Bombay	E. 70.5	292	—	—	20 47	+15	—	—
Frunse	75.7	316	e 11 43	- 6	—	—	—	—
Andijan	76.6	314	e 12 7	+13	—	—	—	—
Sverdlovsk	88.2	328	—	—	23 51	+13	40.1	55.0
Baku	93.3	310	e 17 23	?	e 24 43	+19	46.1	—
Tiflis	97.2	311	e 11 10	?	e 21 51	?	51.6	64.1
Pasadena	z. 101.9	56	i 13 50	- 7	—	—	—	—
Ksara	104.6	303	i 18 53	PP	—	—	—	61.6
Huancayo	140.8	115	e 16 13	?	e 40 24	?	e 67.9	—

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NOTES TO JAN. 4d 22h. 46m. 55s.

Additional readings :—

Manila ePE = +5m.58s.
 Adelaide iPP = +12m.32s., i = +15m.4s., iS? = +17m.17s., i = +17m.52s.
 Riverview iN = +17m.33s.
 Sydney eS = +14m.13s.
 Melbourne i = +15m.4s.
 Perth PP = +13m.41s., S = +18m.5s., SS = +19m.5s.
 Christchurch L₂E = +20.0m.
 Calcutta iN = +18m.33s.
 Agra PSE = +20m.44s.
 Bombay eN = +26m.35s.
 Sverdlovsk e = +24m.58s. and +33m.14s.
 Baku e = +25m.55s., +31m.7s., and +33m.5s.
 Tiflis ePPN = +18m.16s., ePSN = +25m.10s., eSSN = +31m.35s.
 Ksara ePPS = +28m.55s., eSS = +37m.57s.
 Long waves were also recorded at Tucson, Berkeley, Moscow, Pulkovo, Copenhagen, Cheb, Paris, and Cape Town.

Jan. 4d. 23h. 54m. 43s. Epicentre 1°0S. 139°0E.

A = -0.7546, B = +0.6560, C = -0.173; δ = +6; h = +7;
 D = +0.656, E = +0.755; G = +0.13, H = -0.11, K = -1.000.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	9.4	332	2 20	+ 2	3 50	-17	—	—
Manila	23.6	313	5 17	+ 4	9 25	0	12.0	—
Batavia	32.5	261	7 7	+33	i 13 0	+71	—	—
Hong Kong	33.5	316	7 22	+39	—	—	—	21.4
Adelaide	33.8	181	i 6 46	0	i 12 21	+11	i 18.6	—
Riverview	34.6	162	—	—	e 12 31	+ 9	e 19.4	24.2
Sydney	34.6	162	e 11 37	S	(e 11 37)	-45	24.7	25.6
Zi-ka-wei	z. 36.1	335	8 29	?	i 15 27	?	17.8	20.4
Gihu	36.3	358	7 5	- 2	12 32	-16	—	—
Melbourne	37.1	172	e 9 35	?	i 13 6	+ 5	20.6	21.1
Oiwake	37.1	0	7 22	+ 8	—	—	—	—
Nagano	37.5	359	7 24	+ 7	—	—	—	—
Perth	37.8	213	7 17	+ 3	13 17	+ 6	20.3	22.8
Hokusima	38.6	2	7 30	+ 4	—	—	—	—
Medan	40.5	278	e 7 31	-11	i 13 35	-17	—	—
Christchurch	51.9	149	9 16	+ 4	16 47	+12	25.4	—
Calcutta	N. 54.6	299	e 9 37	+ 5	i 17 3	- 8	22.8	—
Irkutsk	60.6	337	e 10 20	+ 5	18 31	+ 1	29.3	—
Kodalaknal	E. 62.2	283	e 10 19	- 7	e 18 32	-19	—	—
Hyderabad	62.3	291	—	—	18 37	-15	—	34.4
Agra	E. 64.9	301	e 10 35	- 8	i 19 11	-13	—	—
Bombay	67.9	291	i.11 3	+ 1	i 19 51	-10	—	—
Andijan	73.1	313	e 11 37	+ 3	—	—	—	—
Sverdlovsk	84.5	328	—	—	23 10	+ 8	39.3	51.6
Baku	90.1	310	e 13 3	0	i 23 59	+ 4	e 44.3	51.5
Tiflis	93.8	312	e 13 39	+19'	e 24 40	+12	e 46.3	62.6
Ksara	101.4	304	e 17 45	?	e 26 47	?	—	59.3

Additional readings :—

Adelaide i = +7m.58s.
 Riverview eN = +17m.27s.
 Sydney iS = +18m.17s.
 Perth SS = +17m.42s.
 Hokusima i = +7m.34s.
 Medan ePN = +7m.42s.
 Christchurch L₂ = +21.9m.
 Calcutta iN = +19m.3s.
 Agra PSE = +19m.43s.
 Sverdlovsk e = +24m.8s.
 Tiflis iSKS = +23m.54s., eSKKS = +24m.27s., eN = +28m.10s., eSSE = +29m.50s.
 Ksara e = +32m.35s.

Long waves were also recorded at Wellington, Tucson, Ukiah, Florissant, Rio de Janeiro, Moscow, Pulkovo, and other European stations.

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Jan. 4d. Readings also at 0h. (Huancayo, La Paz, La Plata, Santiago, San Javier, and Rio de Janeiro), 2h., 3h., and 4h. (near Nagoya), 6h. (La Paz, La Plata (2), Rio de Janeiro, near Santiago (2), and San Javier), 7h. and 8h. (near Santiago), 10h. (near Hukuoka B), 12h. (Baku, Samarkand, and Ksara), 13h. (La Plata, Santiago, and near Hukuoka B), 15h. (La Plata, San Javier, and near Santiago), 20h. (Calcutta and near Taihoku), 21h. (Malabar, Tiflis, and near Hukuoka B), 22h. (Hong Kong and near Nagoya).

Jan. 5d. 4h. 46m. 19s. Epicentre 1°0S. 139°0E. (as on 4d.).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	e	e	m. s.	s.	m. s.	s.	m.	m.
Palau	9.4	332	2 20	+ 2	3 59	- 8	4.6	—
Manila	23.6	313	5 11	- 2	9 23	- 2	—	—
Batavia	32.5	261	—	—	12 18	+29	—	—
Hong Kong	33.5	316	—	—	11 54	-11	—	15.6
Adelaide	33.8	181	e 6 49	+ 3	i 12/22	+12	e 16.0	—
Riverview	34.6	162	e 6 59	+ 6	e 12 30	+ 8	e 20.1	25.2
Sydney	34.6	162	—	—	e 12 31	+ 9	18.4	20.7
Sumoto	z.	35.4	356	e 6 2	-58	—	—	—
Osaka	35.6	356	6 59	- 2	12 30	- 8	—	—
Kameyama	35.7	358	7 6	+ 4	—	—	—	—
Nagoya	36.0	358	e 6 45	-20	—	—	—	—
Zi-ka-wei	z.	36.1	335	e 7 7	+ 2	—	—	20.3
Hikone	36.2	358	7 1	- 5	—	—	—	—
Gihu	36.3	358	7 8	+ 1	—	—	15.4	—
Kohu	36.4	0	7 25	+17	—	—	—	—
Tokyo, Cent. Met. Obs.	36.5	1	7 11	+ 2	—	—	—	—
Melbourne	37.1	172	e 7 51	+37	13 0	- 1	i 20.6	21.0
Kakioka	37.1	1	7 16	+ 2	—	—	—	—
Oiwake	37.1	0	7 32	+18	—	—	—	—
Maebasi	37.2	0	7 8	- 7	—	—	—	—
Nagano	37.6	359	7 30	+13	—	—	—	—
Perth	37.8	213	9 13	?	15 1	?	22.1	—
Sendai	39.1	3	8 36	+65	—	—	—	—
Mizusawa	E.	40.0	4 (e 7 50)	+12	e 7 50	P	—	—
Medan	40.5	278	7 38	- 4	13 37	-15	—	—
Chiufeng	45.9	336	i 8 29k	+ 3	i 15 6	- 5	20.7	—
Christchurch	51.9	149	9 23	+11	16 43	+ 8	—	—
Calcutta	54.6	299	—	—	i 17 8	- 3	25.4	—
Irkutsk	60.6	337	e 10 20	+ 5	18 28	- 2	28.7	—
Kodaikanal	E.	62.2	283 i 10 23	- 3	i 18 44	- 7	—	—
Agra	E.	64.9	301 i 10 38	- 5	i 19 12	-12	—	—
Bombay	67.9	291	i 10 53	- 9	e 19 43	-18	—	—
Almata	70.7	318	e 11 22	+ 2	—	—	—	—
Semipalatinsk	71.4	326	e 11 28	+ 4	—	—	—	—
Frunse	72.2	316	e 11 31	+ 2	e' 20 45	- 6	—	—
Andijan	73.1	313	e 12 31	+57	—	—	—	—
Samarkand	76.7	311	e 11 53	- 2	—	—	—	—
Sverdlovsk	84.5	328	i 12 48	+12	i 23 10	+ 8	39.7	—
Baku	90.1	310	e 13 5	+ 2	i 23 58	+ 3	42.7	50.2
Tiflis	93.8	312	e 13 16	- 4	e 24 27	- 1	e 45.7	—
Berkeley	E.	97.5	52	—	e 32 28	SS	—	—
Ksara	101.4	304	e 17 25	?	e 26 31	+59	—	57.7
Tucson	107.5	57	—	—	e 34 35	?	e 50.0	—
Huancayo	143.5	113	e 19 37	[0]	—	—	e 71.8	—
La Paz	148.1	125	e 19 56	[+12]	—	—	78.7	95.4

Additional readings:—

Adelaide i = +8m.17s. and +12m.4s.

Riverview i = +18m.40s.

Melbourne e = +3m.44s.

Perth PP = +10m.46s., SP = +15m.11s., SS = +19m.1s., SSS = +19m.41s.

Chiufeng SSEN = +18m.13s.

Agra ePPE = +13m.5s., PSE = +19m.46s.

Bombay e = +14m.49s.

Almata e = +12m.14s.

Tiflis ePPZ = +17m.5s., eSKSE = +23m.50s., eZ = +27m.0s., eN = +39m.5s.

Huancayo e = +20m.32s., +21m.1s., +23m.31s., and +41m.46s.

La Paz IPKP₂ = +20m.8s.

Long waves were also recorded at Wellington, Ukiah, Florissant, and other Asiatic and European stations.

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Jan. 5d. 11h. 9m. 13s. Epicentre 28°·2N. 139°·0E.

(the Japanese stations give 28°·0N. 139°·6E.)

A = -·6661, B = +·5791, C = +·4701; $\delta = +4$; $h = +2$;
D = +·656, E = +·755; G = -·355, H = +·308, K = -·883.

Depth of focus 0·080.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Titizima	3·0	112	1 15	0	2 12	- 2	—	—
Hatidyozima	4·9	7	1 29 _k	0	2 36	- 4	—	—
Siomisaki	5·9	334	1 39 _a	+ 1	2 54	- 2	—	—
Omaesaki	6·4	354	1 45 _a	+ 2	—	—	—	—
Muroto	6·5	322	1 44	0	3 7	+ 1	—	—
Hamamatu	6·6	351	1 45	0	3 6	- 2	—	—
Mera	6·7	5	1 44	- 2	3 6	- 3	—	—
Ito	6·7	1	1 46	0	—	—	—	—
Tu	6·8	344	1 51	+ 5	3 13	+ 2	—	—
Wakayama	6·8	333	1 48 _a	+ 2	3 13	+ 2	—	—
Yagi	6·8	337	1 48	+ 2	—	—	—	—
Misima	6·9	0	1 47	0	3 7	- 6	—	—
Numadu	6·9	358	1 50	+ 3	3 8	- 5	—	—
Kaneyama	7·0	343	1 49 _a	+ 1	3 13	- 2	—	—
Tokusima	7·0	329	1 47	- 1	3 14	- 1	—	—
Sumoto	7·1	332	i 1 48 _a	- 1	3 13	- 3	—	3·4
Nagoya	7·1	346	1 51	+ 2	3 17	+ 1	—	3·3
Osaka	7·1	336	1 51	+ 2	3 18	+ 2	—	—
Osaka B	7·1	336	1 51 _a	+ 2	3 17	+ 1	—	—
Kobe	7·2	334	i 1 51 _a	+ 1	i 3 21	+ 3	—	4·5
Yokohama	7·2	4	1 53	+ 3	3 13	- 5	—	—
Kyoto	7·3	340	1 53	+ 2	3 23	+ 3	—	—
Iida	7·3	353	1 53	+ 2	3 17	- 3	—	—
Hunatu	7·3	358	1 52	+ 1	3 15	- 5	—	—
Kohu	7·4	357	1 53	+ 1	3 16	- 6	—	—
Gihu	7·4	346	1 53 _a	+ 1	3 20	- 2	—	—
Hikone	7·4	347	1 54	+ 2	3 21	- 1	—	—
Tokyo, Cent. Met. Obs.	7·5	4	1 54	+ 1	3 18	- 6	—	—
Miyazaki	7·5	302	1 57	+ 4	3 23	- 1	—	—
Tadotu	7·5	325	1 54	+ 1	3 22	- 2	—	—
Okayama	7·7	328	1 58	+ 3	3 29	+ 2	—	—
Tyosi	7·7	11	1 55	0	3 22	- 5	—	—
Matuyama	7·8	318	1 55 _a	- 1	3 27	- 2	—	—
Kumagaya	7·9	2	1 56 _k	- 1	3 23	- 8	—	—
Tukubasan	8·0	6	1 56 _k	- 2	3 21	-11	—	—
Kakioka	8·0	7	1 56 _k	- 2	3 27	- 5	—	—
Miyadu	8·0	338	1 58	0	3 31	- 1	—	—
Matumoto	8·0	354	2 1	+ 3	3 29	- 3	—	—
Oiwake	8·1	357	1 59 _k	0	3 29	- 5	—	—
Ooita	8·1	310	2 11	+12	3 41	+ 7	—	—
Toyooka	8·2	336	2 0 _a	0	3 34	- 2	—	—
Maebasi	8·2	1	2 2	+ 2	3 18	-18	—	—
Mito	8·2	8	2 1	+ 1	3 32	- 4	—	—
Nake	8·4	274	2 5	+ 3	3 42	+ 2	—	—
Nagano	8·4	355	2 3	+ 1	3 37	- 3	—	—
Utunomiya	8·4	5	2 2	0	3 34	- 6	—	—
Kumamoto	8·5	305	2 6	+ 3	3 43	+ 1	—	—
Kanazawa	8·5	349	2 7	+ 4	3 40	- 2	—	—
Toyama	8·6	351	2 6	+ 2	3 41	- 2	—	—
Huiki	8·7	350	2 11	+ 6	3 45	0	—	—
Takada	8·8	355	2 19	+13	3 46	- 1	—	—
Onahama	8·8	10	2 4	- 2	3 40	- 7	—	—
Sakai	8·8	328	2 8	+ 2	—	—	—	—
Unzendake	8·8	303	2 9 _k	+ 3	3 49	+ 2	—	—
Hamada	8·9	321	2 8	+ 1	3 44	- 5	—	—

Continued on next page.

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	Δ	Az.	P.	O - C.	S.	O - C.	L.	M.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m.	m.
Saga	9-0	306	2 15	+ 7	3 57	+ 6	—	—
Hukuoka	9-1	308	2 10	+ 1	i 3 54	+ 1	—	—
Hukuoka B	9-1	308	2 12	+ 3	i 3 54	+ 1	—	—
Nagasaki	9-1	301	2 11	+ 2	—	—	—	—
Wazima	9-3	350	2 10	- 1	3 51	- 5	—	—
Hukushima	9-6	7	2 15 _a	0	3 59	- 3	—	—
Yamagata	10-1	6	2 20	0	4 7	- 4	—	—
Sendai	10-2	8	2 19 _a	- 2	4 8	- 5	—	—
Husan	10-9	312	2 29	+ 1	4 27	+ 1	—	4-5
Mizusawa	11-0	9	i 2 31	+ 2	i 4 29	+ 1	—	—
Akita	11-5	4	2 36	+ 2	4 39	+ 1	—	—
Morioka	11-6	8	2 37	+ 2	4 43	+ 4	—	—
Taikyū	11-6	314	e 2 37	+ 2	4 44	+ 5	—	—
Aomori	12-7	6	2 49	+ 3	5 4	+ 4	—	—
Hatinoke	12-7	9	2 45	- 1	4 54	- 6	—	—
Hakodate	13-6	6	5 22	S	(5 22)	+ 6	—	—
Keizyo	13-7	316	e 2 56	0	e 5 15	- 3	e 8-3	—
Zinsen	13-9	315	e 3 4	+ 6	i 5 30	+ 8	—	—
Urakawa	14-2	11	5 29	S	(5 29)	+ 2	—	—
Sapporo	14-9	6	5 5	S	(5 5)	- 35	—	—
Obihiro	15-1	12	3 17	+ 7	5 51	+ 7	—	—
Helzyo	15-4	318	e 3 14	+ 1	5 55	+ 6	—	—
Zi-ka-wei	z. 15-5	286	e 3 10	- 4	5 54	+ 3	—	9-1
Asahigawa	15-8	9	5 54	S	(5 54)	- 2	—	—
Nemuro	16-0	17	3 22	+ 3	—	—	—	—
Karenko	16-2	259	3 22	+ 1	6 8	+ 5	—	—
Taityu	16-9	261	3 29	+ 1	6 18	+ 2	—	—
Taito	17-0	255	3 27	- 2	—	—	—	—
Arisan	17-0	256	3 32	+ 3	—	—	—	—
Kosyun	17-6	254	3 37	+ 2	6 31	+ 3	—	—
Takao	17-8	256	3 43	+ 7	—	—	—	—
Manila	21-5	235	4 10	- 1	6 17	- 76	—	—
Chiufeng	22-2	309	i 4 17 _a	- 1	7 32	- 12	—	—
Hong Kong	23-2	261	4 25	- 1	6 33	- 67	—	—
Phu-Lien	30-3	264	i 5 32	+ 3	i 9 55	+ 3	—	—
Irkutsk	35-2	323	6 12	+ 2	i 11 8	+ 2	13-8	14-6
Medan	45-5	245	7 37	+ 5	i 13 40	+ 5	—	—
Calcutta	N. 45-9	275	e 7 36	0	i 13 45	+ 4	20-1	—
Almata	51-4	305	e 8 0	- 17	e 14 58	+ 2	—	—
Frunse	53-2	304	e 8 29	0	15 20	0	—	—
Agra	E. 53-5	284	e 10 38	?	15 18	- 6	—	—
Tchinkent	56-9	304	—	—	e 16 7	- 1	—	—
Tashkent	57-3	303	1 8 58	0	i 16 13	0	—	35-0
Samarkand	59-3	302	e 9 19	+ 7	i 16 39	- 1	—	—
Kodaikanal	E. 60-2	267	e 9 19	+ 2	e 18 18	+ 88	—	—
Sverdlovsk	60-6	322	1 9 33	+ 13	i 17 6	+ 12	—	—
Bombay	60-7	276	e 9 17	- 4	i 18 5	+ 69	—	—
Baku	71-7	307	i 10 31	+ 2	i 19 10	+ 5	34-8	—
Tiflis	74-7	310	7 46	?	i 19 36	- 2	e 41-8	47-6
Theodosia	79-4	345	e 11 13	+ 2	e 20 20	- 8	—	—
Berkeley	E. 79-5	53	e 11 15	+ 3	—	—	—	—
Yalta	80-5	315	e 11 18	+ 1	e 20 37	- 2	—	—
Sebastopol	80-7	316	e 11 19	+ 1	e 20 39	- 2	—	—
Scoresby Sund	80-7	354	i 11 20	+ 2	—	—	—	—
Tinmahā	82-7	52	i 11 32	+ 4	e 21 1	+ 1	—	—
Santa Barbara	83-0	55	i 11 33	+ 4	—	—	—	—
Halwee	N. 83-4	53	e 11 33	+ 2	—	—	—	—
Pasadena	84-2	55	i 11 36 _a	+ 3	i 21 19	+ 4	—	—
Ksara	84-6	305	e 12 28	+ 51	i 22 11	+ 52	—	—
Copenhagen	84-8	333	i 11 39	+ 1	—	—	—	—
Riverside	84-9	55	e 11 40	+ 1	e 21 22	0	—	—
La Jolla	85-6	56	e 11 45	+ 3	i 21 21	- 7	—	—
Tucson	90-5	53	(e 12 41)	+ 36	—	—	e 19-7	—
Huancayo	144-1	71	e 18 37	[+ 3]	—	—	—	—

For Notes see next page.

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NOTES TO JAN. 5d. 11h. 9m. 13s.

Additional readings:—

Kobe iE = +2m.47s., eEZ = +3m.7s., iS_cSEN = +13m.49s., eEN = +15m.37s.
 Keizyo iEN = +5m.28s.
 Chiufeng iEZ = +6m.34s.
 Hong Kong SS? = +7m.57s.
 Agra iE = +17m.21s.
 Bombay eE = +12m.5s., iE = +16m.58s.
 Tiflis eSKSN = +20m.38s., eSSN = +24m.27s.
 Yalta e = +24m.36s.
 Tinemaha eN = +12m.42s.
 Pasadena epPZ = +13m.23s., iSKPPKPZ = +40m.22s.
 Huancayo e = +19m.2s. and +20m.15s.

Jan. 5d. 20h. 58m. 15s. Epicentre 46°5N. 13°0E.

(Approximate origin suggested by Strasbourg).

Damage at Pontebba (46°30'N., 13°21'E.) and Chiusaforte in N.E. of Udine (Italy), see Bulletin of the Seismological Society of America, vol. 27, p.139, No. 2, April, 1937.

A = +6731, B = +1554, C = +7231; δ = +9; h = -4;
 D = +225, E = -974; G = +705, H = +163; K = -688.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Treviso	0.9	214	e 0 23	+ 3	—	—	—
Triest	1.0	149	i 0 16	- 5	i 0 27	- 9	—
Padova	1.4	216	e 0 28	+ 1	0 39	- 7	—
Graz	1.8	71	—	—	i 0 57	+ 1	1.2
Zagreb	2.2	108	e 0 37	- 1	e 1 7	+ 1	—
Chur	2.4	279	e 0 43	+ 2	e 1 15	+ 3	—
Ravensburg	2.6	299	—	—	e 1 26	+ 9	—
Vienna	2.9	52	e 0 59	+11	i 1 34	+10	—
Florence	3.0	204	e 0 15	?	—	—	—
Zurich	3.1	286	e 0 51	0	e 1 44	+15	—
Stuttgart	3.5	312	e 1 9	+12	e 1 56	+16	—
Basle	3.8	285	e 1 1	0	e 2 7	+20	—
Strasbourg	4.1	300	i 1 27	+22	i 2 23	+28	—
Neuchatel	4.2	276	e 1 5	- 2	—	—	—
Jena	4.5	342	e 1 45	+34	e 2 23	+18	2.5
Göttingen	5.4	336	1 45?	+21	—	—	3.2

Additional readings:—

Zagreb eZ = +44s., e = +47s.
 Stuttgart e = +1m.41s. and +1m.51s.
 Strasbourg e = +2m.9s.

Jan. 5d. 21h. 5m. 28s. Epicentre 31°0N. 132°4E.

(Fore-runner of shock at 21h. 38m.).

A = -5790, B = +6341, C = +5125; δ = -2; h = +1;
 D = +738, E = +674; G = -346, H = +378; K = -859.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Hukuoka	3.1	327	e 0 50	- 1	1 25	- 4	1.7
Hukuoka B	3.1	327	e 0 52	+ 1	1 29	0	—
Sumoto	3.9	30	i 1 3	+ 1	1 48	- 2	2.0
Kobe	4.4	30	e 1 11	+ 1	e 1 55	- 7	3.9
Nagoya	5.6	41	e 1 30	+ 3	2 31	- 2	—
Keizyo	7.9	327	e 4 12	S	(e 4 12)	+42	—
Chiufeng	16.0	309	e 3 38	-10	—	—	11.8

Additional readings:—

Kobe eZ = +5m.36s.
 Keizyo eSEN = +6m.4s.
 Chiufeng eEN = +3m.52s.

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Jan. 5d. 21h. 37m. 57s. Epicentre 31°0N. 132°4E.

(Given by Japanese stations and as at 21h. 5m.).

Felt strongly at Miyazaki and Kagosima, moderately at Kumamoto, Simidu, Matuyama, and Ooita. Radius greater than 300Km. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937, Tokyo 1939, p.15-16; macroseismic chart, p.17.

A = -·5790, B = +·6341, C = +·5125; $\delta = -2$; $h = +1$;
D = +·738, E = +·674; G = -·346, H = +·378; K = -·859.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Miyazaki	1·2	318	0 26 _a	+ 2	0 45	+ 4	—	—
Kagosima	1·7	290	0 34	+ 3	0 58	+ 4	—	—
Simidu	1·8	15	0 32	0	0 54	- 2	—	—
Kumamoto	2·3	322	0 40 _a	0	1 7	- 2	—	—
Ooita	2·3	343	0 43	+ 3	1 10	+ 1	—	—
Unzendake	2·5	314	0 44 _a	+ 1	1 14	0	—	—
Koti	2·7	20	0 44 _k	- 1	1 15	- 4	—	—
Nagasaki	2·8	309	0 45 _a	- 2	1 11	-11	—	—
Matuyama	2·9	6	0 45 _k	- 3	1 17	- 7	—	—
Saga	2·9	322	0 56	+ 8	1·41	+17	—	—
Hukuokā	3·1	327	0 50 _a	- 1	1 25	- 4	—	3·4
Hukuoka B	3·1	327	0 52	+ 1	1 21	- 8	—	1·8
Simonoseki	3·2	337	0 52	0	1 28	- 4	—	—
Hirosima	3·4	0	0 54	- 1	1 30	- 7	—	—
Tadotu	3·5	19	0 56 _a	- 1	1 32	- 8	—	—
Tomie	3·5	297	0 55	- 2	1 55	S _g	—	—
Tokusima	3·6	30	0 57 _a	- 1	1 36	- 6	—	—
Nake	3·7	226	0 48 _a	-12	1 29	-16	—	—
Siomisaki	3·8	48	0 59	- 2	—	—	—	—
Hamada	3·9	356	1 1	- 1	1 50	0	—	—
Okayama	3·9	18	1 2	0	1 42	- 8	—	—
Sumoto	3·9	30	1 0 _k	- 2	e 2 1	S _g	—	3·8
Wakayama	4·0	35	1 5	+ 1	e 2 22	S _g	—	—
Izuhara	4·1	322	1 10	+ 5	2 4	S _g	—	—
Kobe	4·4	30	1 9 _a	- 1	2 1	- 1	—	6·6
Osaka	4·5	34	1 13	+ 2	2 25	S _g	—	—
Osaka B	4·5	34	1 12	+ 1	2 16	S _g	—	—
Yagi	4·5	38	1 12	+ 1	—	—	—	—
Sakai	4·6	8	1 13	+ 1	2 6	- 1	—	—
Kyoto	4·9	34	1 11	- 6	—	—	—	—
Toyooka	5·0	23	1 17	- 1	2 48	S _g	—	4·6
Kameyama	5·1	40	1 19	- 1	2 53	S _g	—	—
Miyadu	5·1	28	1 19 _a	- 1	3 2	S _g	—	—
Tu	5·1	42	1 21	+ 1	—	—	—	—
Hikone	5·3	36	1 24	+ 2	3 51	?	—	—
Ibukisan	5·5	36	1 26	+ 1	—	—	—	—
Nagoya	5·6	41	1 25	+ 2	3 52	?	—	—
Gihu	5·7	38	1 26 _k	- 2	2 30	- 5	—	—
Hamamatu	5·8	49	1 25	- 4	3 33	S _g	—	—
Taikyu	5·8	328	e 0 4	?	4 26	?	—	6·6
Hukui	6·0	31	1 16	-16	—	—	—	—
Omaesaki	6·1	52	1 32	- 2	4 24	?	—	—
Iida	6·4	44	1 41	+ 3	—	—	—	—
Syuhurei	6·4	326	1 50	+12	3 22	S _g	—	—
Hatidyozima	6·6	69	1 41	0	2 52	- 6	—	—
Numadu	6·7	51	1 47	+ 5	2 49	-11	—	—
Misima	6·8	51	1 43	- 1	4 24	?	—	—
Ito	6·9	52	1 44	- 1	3 39	S _g	—	—
Kohu	6·9	46	1 44	- 1	3 28	S _g	—	—
Toyama	6·9	33	1 48	+ 3	3 12	+ 7	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hunatu	7.0	48	1 44	- 2	3 39	S*	—	—
Husiki	7.0	32	1 38	- 8	3 20	+12	—	—
Matumoto	7.0	40	1 48	+ 2	4 3	S _r	—	—
Mera	7.4	56	1 54	+ 2	3 59	S*	—	—
Nagano	7.4	38	1 53 _a	+ 1	3 39	S*	—	—
Oiwake	7.4	42	1 51 _a	- 1	4 34	?	—	—
Wazima	7.4	28	1 52	- 0	3 42	S _r *	—	—
Yokohama	7.5	51	1 59	+ 6	4 17	S _r *	—	—
Maebasi	7.7	44	1 57	+ 1	3 46	S _r *	—	—
Tokyo, Cent. Met. Obs.	7.7	50	1 58	+ 2	4 38	+73	—	—
Kumagaya	7.8	46	1 58	0	4 46	?	—	—
Keizyo	7.9	327	e 2 1	+ 2	e 4 13	S _r	e 6.1	7.0
Zinsen	8.0	325	1 53	- 7	3 51	S*	—	7.0
Kakioka	8.3	48	2 0	- 4	5 14	?	—	—
Tukubasan	8.3	49	2 1k	- 3	4 23	S _r	—	—
Utunomiya	8.3	46	2 6	+ 2	—	—	—	—
Tyosi	8.5	54	2 10	+ 3	5 15	?	—	—
Mito	8.6	49	2 7	- 2	—	—	—	—
Titizima	9.4	113	2 24	+ 6	—	—	—	—
Zi-ka-wei	9.4	274	e 2 5	-13	3 55	-12	5.3	9.5
Hokusima	9.5	42	2 20	0	4 18	+ 8	—	—
Heizyo	9.7	327	e 2 26	+ 4	4 56	S*	—	—
Yamagata	9.8	40	2 25	+ 1	—	—	—	—
Sendai	10.1	42	2 30 _a	+ 2	6 50	?	—	—
Mizusawa	10.8	39	2 38	- 1	5 42	S*	—	—
Giran	11.3	239	3 15	+29	—	—	—	—
Taihoku	11.3	241	1 57	-49	—	—	—	—
Nanking	11.7	279	i 2 48	- 3	—	—	—	—
Arisan	12.7	237	3 10	+ 5	—	—	—	—
Taito	13.0	233	3 14	+ 5	7 41	?	—	—
Tainan	13.4	237	3 32	+18	—	—	—	—
Kosyup	13.8	232	3 19	0	—	—	—	—
Sapporo	14.0	28	3 28	+ 6	7 32	?	—	—
Chinfeng	16.0	309	i 3 46 _a	- 2	i 6 50	+ 4	7.9	11.7
Hong Kong	18.4	246	4 13k	- 5	7 40	- 1	9.3	14.9
Manila	19.4	215	4 32 _a	+ 2	8 30	+26	—	—
Palau	23.6	176	5 19	+ 6	9 27	+ 2	—	—
Phu-Lien	25.3	252	e 5 28	- 2	10 3?	+ 9	—	—
Irkutsk	29.6	323	6 10	+ 1	e 10 56	- 8	13.0	20.8
Calcutta	N.	40.0	e 7 30	- 8	13 40	- 4	19.8	—
Medan	41.9	236	7 56	+ 2	i 14 14	+ 1	—	—
Semipalatinsk	43.0	313	e 7 59	- 4	—	—	—	—
Batavia	44.3	218	i 8 12	- 1	i 14 47	- 1	—	—
Almata	45.1	302	e 8 24	+ 4	—	—	—	—
Frunse	46.9	301	e 9 46	?	—	—	27.0	—
Agra	47.3	279	e 8 37	0	15 25	- 6	22.6	—
Andijan	48.8	298	e 8 50	+ 1	e 15 51	- 1	e 29.7	—
Hyderabad	50.6	268	8 51	-11	16 12	- 5	24.1	34.8
Tashkent	51.0	300	e 9 33	+27	e 16 5	-17	25.8	31.6
Colombo	54.6	255	9 35	+ 3	17 8	- 3	—	—
Bombay	54.8	272	e 9 28	- 6	17 10	- 4	—	—
Kodalkanal	E.	54.8	e 9 30	- 4	i 17 15	+ 1	26.3	—
Sverdlovsk	54.8	321	i 9 44	+10	i 17 23	+ 9	25.0	37.0
College	58.1	30	e 10 0	+ 2	e 18 1	+ 3	29.1	—
Perth	64.5	195	20 3	S	(20 3)	+44	—	—
Baku	65.4	304	10 47	0	i 19 42	+12	33.0	39.6
Sitka	65.7	37	e 10 36	-12	e 19 18	-16	e 30.1	—
Adelaide	65.8	174	i 19 30	S	(i 19 30)	- 5	—	—
Riverview	66.9	163	—	—	e 19 30	-19	e 27.4	34.8
Moscow	67.6	322	e 10 57	- 4	19 52	- 5	32.6	44.0

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Tiflis	68.5	307	11 3	- 3	20 3	- 5	e 34.5	42.0
Pulkovo	69.4	328	i 10 28	-44	19 32	-46	39.6	45.0
Yalta	74.3	313	—	—	e 20 55	-20	e 46.0	—
Sebastopol	74.7	314	e 11 51	+ 8	—	—	e 46.0	—
Upsala	74.9	332	—	—	e 21 16	- 6	e 37.0	51.8
Ksara	78.3	302	i 12 7	+ 4	22 7	+ 8	—	—
Copenhagen	79.7	330	—	—	22 5	- 8	40.0	—
Budapest	E. 81.6	321	e 12 23	+ 2	22 35	+ 2	37.5	55.5
	N. 81.6	321	e 12 34	+13	i 22 35	+ 2	e 46.0	48.0
Sofia	82.0	315	e 12 23	0	e 22 36	- 1	e 46.0	60.0
Hamburg	82.1	330	e 12 25	+ 1	i 24 27	?	e 45.0	48.0
Belgrade	82.4	318	e 12 24 ^a	- 1	e 22 41	0	e 52.3	—
Prague	82.4	326	e 12 22	- 3	e 22 35	- 6	—	47.0
Vienna	82.6	323	e 12 24	- 2	—	—	e 47.0	59.0
Jena	83.2	327	e 12 28	- 1	e 26 48	?	44.0	48.0
Cheb	83.4	327	e 12 3?	-27	e 22 51	0	e 47.0	56.0
Helwan	83.6	310	e 12 48	+16	i 22 48	- 5	—	—
Zagreb	84.3	321	e 12 33	- 2	e 22 55	- 5	—	46.0
Graz	84.9	322	i 12 35	- 3	e 23 3	- 3	e 47.0	55.0
De Bilt	85.2	331	—	—	e 23 8	- 1	e 41.0	50.2
Tinemaha	85.4	50	i 12 39	- 1	—	—	—	—
Edinburgh	85.5	337	—	—	e 23 13	+ 1	—	63.0
Triest	85.6	322	e 12 39	- 2	i 23 9	- 4	e 42.0	47.8
Stuttgart	85.8	326	e 12 48	+ 6	e 23 15	0	e 47.0	57.6
Santa Barbara	86.0	50	i 12 41	- 2	—	—	—	—
Uccle	86.5	330	e 12 26	-20	i 23 15	- 7	e 40.0	57.6
Strasbourg	86.6	327	i 12 45 ^a	- 1	e 23 8	-15	e 44.0	57.9
Padova	86.8	323	—	—	e 24 30	+65	—	—
Stonyhurst	86.9	335	—	—	i 23 25	- 1	47.0	52.3
Chur	87.0	326	e 12 46	- 2	—	—	—	—
Zurich	87.1	326	e 12 45	- 4	—	—	e 56.0	—
Mount Wilson	87.2	52	i 12 47	- 2	—	—	—	—
Pasadena	87.2	52	i 12 47	- 2	e 23 33	+ 5	e 36.3	—
Basle	87.4	327	e 12 48	- 2	—	—	—	—
Kew	88.0	333	—	—	e 23 45	+ 9	42.0	60.1
Neuchatel	88.1	327	e 12 51	- 3	—	—	—	—
Florence	88.2	322	e 12 33	-21	23 34	- 4	49.5	—
Rathfarnham Castle	88.7	337	—	—	e 23 33	-10	40.0	46.0
Tucson	93.2	49	—	—	e 25 33	+70	e 33.8	—
Algiers	97.6	321	—	—	e 23 3?	?	54.0	62.0
Cape Town	125.1	248	—	—	33 21	?	71.7	—
Huancayo	148.2	60	e 19 45	[0]	—	—	e 69.2	—
La Paz	z. 156.4	56	i 19 59	[+ 3]	—	—	—	—

Additional readings:—

Sumoto eSN = +2m.8s., eSZ = +2m.14s.
 Kobe SE = +2m.12s., SN = +2m.14s., IE = +2m.36s.
 Toyooka iN = +2m.10s., iZ = +2m.13s.
 Kelzyo iEN = +3m.37s., eEN = +18m.27s.
 Zi-ka-wei iZ = +2m.21s., +2m.53s., +4m.27s., and +6m.59s.
 Hong Kong SS = +8m.8s.
 Irkutsk e = +7m.12s. and +9m.26s.
 Calcutta e = +9m.17s., SSSN = +17m.7s.
 Batavia ePE = +8m.20s.
 Tashkent e = +16m.39s., e = +18m.50s., e = +20m.3s., e = +34m.33s.
 Agra PPE = +10m.22s., ePPPE = +11m.12s., SSE = +18m.22s., SSSE = +19m.33s.
 Kodaikanal iPSE = +17m.44s., SSE = +20m.44s.
 Sitka ePS = +19m.52s.
 Adelaide e = +23m.41s.
 Tiflis PPZ = +13m.55s., ePPPZ = +15m.28s., ePSZ = +20m.43s., SKSNZ = +21m.3s., eSKKSN = +21m.41s., eSSN = +24m.45s., eSSSEN = +27m.58s.
 Pulkovo L_a = +34.0m.
 Ksara PP = +16m.9s., PS = +22m.53s.
 Copenhagen = +27m.15s.
 Jena eE = +12m.39s.

Continued on next page.

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Zagreb $eP_cPNW = +12m.48s.$
 Trieste $i = +24m.4s., +25m.38s.$
 Stuttgart $eSSE = +29m.3s.$
 Strasbourg $iSEN = +23m.28s., iPSZ = +24m.17s., eSSE = +29m.7s.?$
 Huancayo $ePKP_2 = +20m.8s., e = +20m.53s., +21m.37s., eSKSP = +22m.56s.,$
 $ePP = +23m.24s., e = +31m.40s., ePSKS = +33m.27s., eSS = +42m.55s.,$
 $eSSS = +47m.25s.$
 La Paz $IZ = +25m.39s.$
 Long waves were also recorded at Oxford, Malaga, Göttingen, Columbia, Durham, Tortosa, Oak Ridge, Barcelona, Bidston, Aberdeen, Bucharest, Almeria, Scoresby Sund, Stara Dalja, Paris, Jersey, Simferopol, Granada, and San Fernando.

Jan. 5d. Readings also at 0h. (near Hukuoka B. and near Nagoya), 1h. (Nagoya), 2h. (Sebastopol, Theodosia, Yalta, and Tiflis), 3h. (Nagoya), 5h. (La Paz), 7h. (Melbourne, near Hukuoka, Hukuoka B (2), Sumoto, and Nagoya), 8h. (near Mizusawa, Nagoya, and Sumoto), 10h. (Arapuni, Christchurch, Wellington, Adelaide, Riverview, Sydney, Melbourne, Perth, and Tiflis), 11h. (Pasadena), 14h. (near La Paz, near Kobe, Nagoya, and Sumoto), 16h. (Calcutta), 17h. (Andijan, Agra, and Bombay), 19h. (La Paz and Tortosa), 21h. (Philadelphia, Tiflis, Nagoya, near Kobe (2), Sumoto, Toyooka, Hukuoka (3), and Hukuoka B (2)), 22h. (near Apia and near Batavia), 23h. (near Berkeley and near Nagoya).

Jan. 6d. 12h. 33m. 14s. Epicentre $35^{\circ}6'N, 140^{\circ}0'E.$

(Epicentre given by the Japanese stations).

$A = -6243, B = +5239, C = +5795; \delta = +4; h = 0;$
 $D = +643, E = +766; G = -444, H = +373, K = -815.$

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m.
Tokyo, Cent. Met. Obs.	0.2	298	0 13k	+ 3	1 0 22	+ 6	0.4
Tokyo, Imp. Univ.	0.2	298	0 13	+ 3	0 20	+ 4	—
Komaba	0.2	281	0 14	+ 4	0 22	+ 6	—
Mitaka	0.4	280	0 14	+ 1	0 22	+ 1	—
Kiyosumi	0.5	162	0 14	0	0 23	0	—
Kamakura	0.5	232	0 14	0	0 24	+ 1	—
Tukubasan	0.6	7	0 15	0	0 25	- 1	—
Titibu	0.8	297	0 14	- 4	0 27	- 4	—
Koyama	0.9	253	0 14	- 6	0 27	- 7	—
Susaki	1.2	222	0 24	0	0 40	- 1	—
Yosiwara	1.2	248	0 14	-10	0 30	-11	—
Nagoya	2.5	260	e 0 39	- 4	1 23	+ 9	—
Mizusawa	E. 3.7	14	—	—	1 29	?	—

Jan. 6d. Readings also at 0h. (Oak Ridge and near Hukuoka B), 1h. (near Hukuoka B), 2h. (near Santiago), 3h. (Arapuni, Wellington, Riverview, Sydney, and Tiflis), 4h. (Perth, Melbourne, and Wellington), 5h. (Wellington), 6h. (near Santiago), 7h. (near Hukuoka B and near Santiago), 8h. (Medan and near Batavia), 9h. (Batavia and Santiago), 10h. (Malabar and near Hukuoka B), 13h. (Frunse and near Andijan), 16h. (near Hukuoka B (2)), 17h. (Adelaide and Perth), 18h. (Adelaide, Riverview, and Perth), 19h. (San Juan and near Port au Prince), 20h. (near Grozny), 21h. (near Hukuoka B), 22h. (near Hukuoka B).

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Jan. 7d. 6h. 12m. 0s. Epicentre 38°-8N. 142°-0E. (as given by Japanese stations).

Strongly felt at Isinomaki, Miyako, Mizusawa, Sendai, Morioka, Hukusima, and Tukubasan. Radius greater than 300km.

See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937, Tokyo 1939, p. 17-19; Macroseismic Chart, p.17.

A = -6157, B = +4811, C = +6240; $\delta = -8$; $h = -1$;
D = +616, E = +788; G = -492, H = +384; K = -781.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Isinomaki	0.7	236	0 14	- 3	0 25	- 3	—	—
Mizusawa	0.8	296	0 20k	+ 2	0 34	+ 3	—	—
Miyako	0.8	0	0 15k	- 3	0 27	- 4	—	—
Sendai	1.0	238	0 22k	+ 1	0 37	+ 1	—	—
Morioka	1.1	324	0 26	+ 4	0 42	+ 3	—	—
Hukusima	1.6	229	0 30k	0	0 52	+ 1	—	—
Akita	1.7	301	0 36k	+ 5	1 1	+ 7	—	—
Hatinoke	1.8	348	0 34k	+ 2	0 57	+ 1	—	—
Aidu	1.9	230	0 33k	- 1	0 50	- 9	—	—
Onahama	2.1	205	0 31	- 6	0 54	-10	—	—
Aomori	2.2	335	0 42	+ 4	1 11	+ 5	—	—
Niigata	2.5	249	0 54	+11	1 29	+15	—	—
Mito	2.7	207	0 44	- 1	1 13	+ 1	—	—
Utsunomiya	2.8	217	0 49	+ 2	1 32	+10	—	—
Kakioka	3.0	209	0 48	- 2	1 23	- 4	—	—
Tukubasan	3.0	210	0 48	- 2	1 22?	- 5	—	—
Hakodate	3.2	342	1 12a	+20	2 6	+34	—	—
Tyosii	3.2	196	0 53	+ 1	1 32	0	—	—
Kumagaya	3.4	220	0 55	0	1 42	+ 5	—	—
Maebasi	3.4	224	0 54k	- 1	1 36	- 1	—	—
Takada	3.4	240	0 51a	- 4	—	—	—	—
Urakawa	3.4	11	1 1	+ 6	1 46	+ 9	—	—
Titibu	3.6	220	1 8	+10	1 57	+15	—	—
Tokyo, Cent. Met. Obs.	3.6	210	0 59a	+ 1	e 1 42	0	—	3.0
Tokyo, I.U.	3.6	210	0 58	0	1 41	- 1	—	—
Komaba	3.7	211	0 59	- 1	1 44	- 1	—	—
Mitaka	3.7	212	1 0	0	1 45	0	—	—
Nagano	3.7	236	1 3a	+ 3	1 46	+ 1	—	—
Oiwake	3.7	229	1 4a	+ 4	1 47	+ 2	—	—
Katunra	3.9	203	1 6	+ 4	1 48	- 2	—	—
Kiyosumi	3.9	203	1 8	+ 6	1 57	+ 7	—	—
Yokohama	3.9	210	1 3	+ 1	1 45	- 5	—	—
Kamakura	4.0	208	1 5	+ 1	1 51	- 1	—	—
Hunatu	4.2	218	1 9k	+ 2	1 59	+ 2	—	—
Koyama	4.2	215	1 8	+ 1	1 58	+ 1	—	—
Kohu	4.2	221	1 9a	+ 2	2 1	+ 4	—	—
Mera	4.2	204	1 6	- 1	2 18	+21	—	—
Obhiro	4.2	13	1 13	+ 6	2 11	+14	—	—
Wasima	4.2	252	1 9a	+ 2	2 1	+ 4	—	—
Sapporo	4.3	353	1 12	+ 4	1 58	- 2	—	—
Toyama	4.3	242	1 14	+ 6	2 11	+11	—	—
Misima	4.4	214	1 13	+ 3	2 14	+12	—	—
Ito	4.5	212	1 12k	+ 1	2 11	+ 6	—	—
Numadu	4.5	215	1 15	+ 4	2 18	+13	—	—
Yosiwara	4.5	217	1 8	- 3	2 4	- 1	—	—
Kusiro	4.6	23	0 58	-14	1 49	-18	—	—
Takayama	4.6	236	1 24a	+12	2 27	+20	—	—
Iida	4.7	226	1 14	0	2 10	0	—	—
Kanazawa	4.8	244	1 17	+ 2	2 18	+ 6	—	—
Suzaki	4.8	211	1 15	0	2 12	0	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	T.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Asahigawa	5-0	4	1 22	+ 4	2 20	+ 2	—	—
Omaesaki	5-2	216	1 23	+ 2	2 32	+10	—	—
Hamamatu	5-3	220	1 25	+ 3	—	—	—	—
Nemuro	5-3	31	1 18	- 4	2 12	-13	—	—
Gihu	5-4	233	1 26 _a	+ 2	2 27	- 1	—	—
Nagoya	5-4	229	1 27 _a	+ 3	2 35	+ 7	—	3-1
Haboro	5-6	358	1 27	0	—	—	—	—
Ibukisan	5-6	233	1 30 _a	+ 3	2 37	+ 4	—	—
Hikone	5-8	234	1 32	+ 3	2 45	+ 7	—	—
Hattdyozima	5-9	197	1 35	+ 4	2 27	-13	—	—
Kameyama	5-9	230	1 32	+ 1	2 40	0	—	—
Tu	6-0	228	1 31	- 1	2 41	- 2	—	—
Kyoto	6-3	234	1 38 _k	+ 2	2 50	0	—	—
Miyadu	6-3	241	1 31	- 5	2 45	- 5	—	—
Osaka	6-6	233	1 42	+ 1	3 21	+23	—	—
Osaka B	6-6	233	1 50	+ 9	3 20	+22	—	—
Toyooka	6-6	242	1 43 _a	+ 2	3 1	+ 3	—	3-2
Yagi	6-6	231	1 46	+ 5	3 2	+ 4	—	—
Kobe	6-9	235	1 46 _a	+ 1	3 11	+ 6	—	4-0
Wakayama	7-1	232	1 47	- 1	3 27	+17	—	—
Sumoto	7-2	234	1 49	0	3 15	+ 2	—	4-2
Siomisaki	7-3	225	1 50	0	3 26	+11	—	—
Okayama	7-6	241	1 58	+ 3	3 28	+ 5	—	—
Tokushima	7-6	234	1 56	+ 1	3 23	0	—	—
Sakai	7-7	247	1 59	+ 3	3 35	+10	—	—
Tadotu	8-0	238	2 4 _a	+ 4	3 44	+11	—	—
Muroto	8-4	231	2 5	- 1	4 12	+29	—	—
Koti	8-6	235	2 10	+ 1	4 12	+24	—	—
Hamada	8-8	247	2 14	+ 3	3 52	- 1	—	—
Matuyama	9-0	239	2 16	+ 3	4 0	+ 2	—	—
Simidu	9-5	233	2 20	0	4 9	- 1	—	—
Simonoseki	10-1	245	2 37	+ 9	—	—	—	—
Hukoka	10-7	244	2 28	-10	4 45	+ 6	—	7-2
Kumoka B	10-7	244	e 2 27	-11	4 42	+ 8	—	—
Kumamoto	10-9	240	2 39	- 1	3 54	-50	—	—
Husan	11-0	254	2 44	+ 2	4 51	+ 4	e 6-3	—
Miyazaki	11-0	234	2 40	- 2	4 40	- 7	—	—
Talkyu	11-1	258	2 47	+ 4	4 57	+ 8	—	—
Unzendake	11-3	241	2 56	+10	5 24	+30	—	—
Nagasaki	11-6	242	2 53	+ 3	5 14	+13	—	—
Titizima	11-7	179	4 43	S	(4 43)	-21	—	—
Kelzyo	11-9	265	e 2 58	+ 4	e 5 18	+ 9	e 6-2	—
Zinsen	12-2	268	e 2 58	0	e 5 16	0	—	—
Tomte	12-4	244	2 46	-15	5 1	-20	—	—
Heizyo	12-7	276	e 2 59	- 6	—	—	6-3	—
Yingkow	15-3	283	3 18	-21	5 38	-52	—	—
Zi-ka-wei	z. 18-5	253	4 14	- 5	7 40	- 4	10-8	12-0
Chiufeng	20-0	254	i 4 31 _a	- 6	8 13	- 4	9-1	14-3
Hong Kong	28-9	243	6 3	0	10 49	- 4	14-1	19-5
Irkutsk	29-3	311	16 6	0	10 58	- 1	15-0	18-6
Manila	30-4	224	6 13	- 3	11 14	- 2	—	—
Phu-Lien	35-3	250	e 6 56	- 3	e 12 29	- 4	20-0	—
Sempalatinsk	44-3	307	e 8 9	- 4	—	—	—	—
College	47-4	33	—	—	e 15 23	- 9	e 21-4	—
Almata	48-2	298	e 8 43	- 1	e 15 40	- 3	30-4	—
Calcutta	N. 48-3	267	8 46	+ 1	15 44	- 1	23-0	—
Frunse	49-9	298	8 36	-21	e 16 2	- 5	30-0	—
Medjan	52-3	296	e 9 15	0	e 16 47	+ 8	e 31-0	—
Medan	52-7	241	9 18	0	—	—	e 26-0	—
Agra	E. 53-9	278	9 23	- 4	16 51	-11	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sverdlovsk/	54.1	318	i 9 37	+ 8	f 17 11	+ 6	26.1	—
Tashkent	54.2	298	9 26	- 3	i 16 58	- 8	e 27.0	35.1
Batavia	55.4	224	17 12	S	(17 12)	-10	—	—
Hyderabad	58.8	268	10 2	0	18 6	- 1	28.0	39.0
Bombay	62.4	273	i 10 24	- 3	e 18 48	- 5	—	—
Colombo	64.1	258	10 34	- 4	19 9	- 5	—	—
Victoria	65.0	47	—	—	e 19 18	- 8	e 27.0	—
Moscow	66.1	323	e 10 47	- 4	e 19 34	- 5	e 33.5	42.4
Pulkovo	66.9	330	10 52	- 4	19 40	- 9	34.0	41.8
Baku	67.6	305	i 10 58	- 3	e 19 46	-11	32.8	43.0
Grozny	68.6	309	e 11 9	+ 2	—	—	—	—
Tiflis	70.1	308	11 0	-16	e 20 2	-25	e 34.0	44.5
Scoresby Sund	70.4	355	11 15	- 3	—	—	36.0	—
Erevan	71.2	307	e 11 24	+ 1	—	—	—	—
Theodosia	73.6	315	e 11 35	- 2	—	—	e 45.0	—
Simferopol	74.4	316	e 11 38	- 4	—	—	e 44.0	—
Tinemaha	E. 74.4	55	e 11 40	- 2	—	—	—	—
Yalta	74.7	315	e 11 35	- 8	e 21 3	-16	e 43.0	—
Santa Barbara	Z. 75.0	58	e 11 43	- 2	—	—	—	—
Mount Wilson	Z. 76.3	57	i 11 47	- 5	—	—	—	—
Copenhagen	76.5	334	11 51	- 3	21 33	- 6	36.0	—
Ksara	80.5	306	i 12 13	a - 2	22 30	+ 8	—	—
Cheb	81.0	331	—	—	e 25 24	+ 3	e 43.0	50.0
Sofia	81.6	319	e 12 20	- 1	(22 36)	+ 3	e 22.6	—
Stuttgart	83.3	331	e 12 25	- 5	e 22 54	+ 4	e 45.0	53.0
Uccle	83.3	335	e 12 30	0	e 22 42	- 8	e 40.0	—
Triest	83.9	327	—	—	e 23 11	+15	e 41.0	46.2
Strasbourg	84.0	332	e 12 31	- 3	e 23 18	+21	e 38.0	—
Basle	84.9	331	e 12 35	- 3	—	—	—	—
Paris	85.7	335	e 13 0?	+18	—	—	42.0	50.0
Florence	86.5	326	—	—	e 22 35	[-36]	—	—
Chicago	87.9	36	—	—	e 22 43	[-31]	e 41.1	—
Florissant	89.0	39	i 13 0	+ 2	i 23 42	- 3	e 33.6	—
Ottawa	89.6	26	—	—	e 23 40	-11	e 36.0	—
Little Rock	91.2	43	—	—	e 22 55	[-46]	—	—
Huancayo	137.5	62	e 23 0	PP?	—	—	e 63.4	—
La Paz	Z. 145.5	58	i 19 39	k [- 11]	—	—	70.5	91.7

Additional readings:—

Toyooka I = +1m.58s., SZ = +3m.5s.
 Kobe IN = +1m.55s.
 Zi-ka-wei PPZ = +4m.29s., PPPZ = +4m.36s., SSZ = +8m.11s.
 Chiufeng PP = +4m.50s., SN = +8m.15s.
 Hong Kong PP = +6m.50s.
 College eSS = +18m.24s.
 Calcutta PPPN = +11m.14s.
 Medan PN = +9m.47s.
 Agra PPE = +11m.23s., ePPPE = +13m.21s., PSE = +17m.28s., eSSE = +20m.32s., SSSE = +22m.2s.
 Tiflis eE = +13m.42s.
 Ksara PP = +15m.20s., PS = +23m.13s.
 Cheb eS? = +32m.30s.
 Strasbourg ePSE = +23m.50s.
 Florence S? = +29m.49s.
 Chicago e = +23m.10s., eSS = +29m.6s.
 Florissant eZ = +25m.30s.
 Little Rock eEN = +59m.52s.
 Huancayo eSS = +40m.12s.
 Long waves were also recorded at Dehra Dun, Rio de Janeiro, Sebastopol, Zagreb, San Juan, San Fernando, Algiers, Stara Dala, Christchurch (N.Z.), Stonyhurst, Toledo, Granada, Graz, Prague, Hamburg, Budapest, Bidston, Kew, Ivigtut, De Bilt, Sitka, and East Machias.

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Jan. 7d. 13h. 20m. 38s. Epicentre 35°5N. 97°7E.

Bulletin of Central Meteorological Observatory, Tokyo, gives Epicentre 36°2N. 98°4E. Strongly felt at Sining (Ku-Ku-Nor); damage in Karsu at Chu-Hai. See "Les Seismes de 1937; Revue pour l'étude des Calamités," Vol. 1, p. 96. Geneva 1938.

A = -1093, B = +8086, C = +5781; $\delta = -2, \lambda = 0$;
D = +991, E = +134; G = -077, H = +573, K = -816.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	m. s.	s.	m. s.	s.	m.	m.
Chiufeng	15.2	67	13 33k	- 5	16 49	+21	7.8	—
Calcutta	15.3	215	3 36	- 3	6 35	+ 5	—	—
Phu-Lien	16.6	149	13 53a	- 3	17 11	+11	8.4	14.2
Irkutsk	17.4	13	14 7	+ 1	7 25	+ 6	—	—
Almata	17.8	302	14 10	- 1	7 18	-10	9.4	—
Agra	18.7	248	14 16	- 6	17 46	- 2	8.9†	—
Dairen	19.3	72	4 29k	0	8 11	+ 9	10.5	—
Fruse	19.3	299	14 30	+ 1	e 8 24	+22	—	—
Hong Kong	19.5	123	4 27k	- 4	8 8	+ 2	9.2	10.4
Sempalatinsk	19.6	326	4 28	- 4	e 8 16	+ 8	—	—
Yingkow	20.0	66	4 14	-23	7 57	-20	9.5	—
Zi-ka wei	20.3	94	14 35k	- 5	8 15	- 8	10.2	13.0
Andlian	20.6	292	e 4 42	- 1	e 8 46	+17	11.7	—
Hokoto	22.4	116	4 51	-11	9 7	+ 3	—	—
Heiyo	22.6	72	15 4a	+ 1	19 4	- 3	12.7	14.3
Hsinking	22.7	59	4 26a	-38	—	—	—	—
Tchir-kent	22.8	296	5 5	0	9 22	+11	—	—
Taiyu	22.9	115	5 3	- 3	9 15	+ 2	—	—
Taihoku	23.0	110	15 6a	- 1	19 18	+ 4	11.6	13.5
Tainan	23.2	116	5 15	+ 6	9 27	+ 9	—	—
Arisan	23.3	115	5 15a	+ 5	9 26	+ 6	—	—
Giran	23.3	110	6 16	+ 6	9 27	+ 7	12.3	—
Zinsen	23.3	76	15 10	0	19 16	- 4	11.6	—
Takao	23.5	116	5 12	0	10 22	+59	—	—
Karenko	23.7	112	5 12a	- 2	9 27	0	11.3	—
Taito	24.0	116	5 17	0	9 38	+ 6	—	—
Kosyur	24.2	117	5 18	- 1	9 39	+ 4	12.1	—
Syuhurei	24.5	79	6 24	+ 2	9 48	+ 8	12.8	13.8
Sarrarkand	24.6	289	15 27	+ 4	e 9 52	+10	—	—
Hyderabad	24.8	228	5 22	- 3	9 48	+ 2	11.8	17.8
Taikyn	25.1	79	5 29	+ 1	11 17	+85	13.6	—
Isagakizima	25.4	103	5 30	- 1	10 3	+ 7	—	—
Husan	25.5	81	15 32	0	9 51	- 6	—	15.9
Ituhara	25.9	82	5 37	+ 2	10 24	+20	—	—
Tomie	25.9	87	5 35	0	10 2	- 2	—	—
Nagasaki	26.7	86	5 39	- 4	10 11	- 6	—	—
Hukuoka	26.8	84	5 42	- 3	10 18	- 1	—	10.8
Hukuoka B	26.8	84	15 45	0	10 20	+ 0	13.3	17.3
Saga	26.9	85	5 43	+ 2	10 31	+11	—	—
Utsunomiya	27.0	86	5 53	+ 8	10 31	+ 9	—	—
Naha	27.2	101	5 47	0	10 35	+10	13.5	—
Simonoseki	27.3	82	5 51	+ 3	10 49	+22	—	—
Kumamoto	27.4	86	5 5	- 2	—	—	—	—
Vladivostok	27.4	83	15 47	- 2	e 10 8	-20	—	26.9
Bombay	27.5	239	15 47	- 3	i 10 27	- 3	13.4	—
Kagoshima	27.6	89	5 54	+ 5	10 30	- 2	14.5	—
Nak	27.6	85	5 45	- 4	10 45	+11	—	—
Hanada	28.4	81	5 53k	+ 1	10 34	+ 4	13.4	—
Oota	28.0	84	5 55	0	10 10	- 8	—	—
Miyasaki	28.2	87	6 52a	- 4	10 37	- 4	13.4	—
Hiroshima	28.4	83	5 57	- 1	10 47	+ 2	—	—
Matuyama	28.8	83	6 53	- 9	10 54	+ 3	16.2	—
Sakai	28.8	79	6 14	+12	—	—	—	—
Koti	29.5	83	6 8k	0	10 54	- 3	—	—
Manila	29.5	120	16 7a	- 1	10 55	- 7	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.	
	°		m. s.	s.	m. s.	s.	m.	m.	
Tadotu	29.5	81	6 10	+ 2	10 55	- 7	—	—	
Okayama	29.6	80	6 14	+ 5	11 0	- 4	—	—	
Muroto	30.1	84	6 14	+ 1	11 26	+14	—	—	
Toyooka	30.1	78	6 13	0	11 15	+ 3	15.9	20.2	
	E.	30.1	78	6 10	- 3	11 13	+ 1	15.7	20.1
	N.	30.1	78	6 11	- 2	11 37	+25	15.6	20.0
	Z.								
Tokusima	30.2	81	6 5	- 9	11 10	- 3	—	—	
Miyadu	30.4	78	6 12	- 4	11 45	+29	—	—	
Sumoto	30.4	79	6 10	- 6	11 7	- 9	11.4	20.5	
	E.	30.4	79	6 13	- 3	11 8	- 8	12.0	18.9
	N.	30.4	79	6 12	- 4	11 6	-10	11.7	20.3
	Z.								
Kobe	30.6	79	e 6 1	-17	e 11 10	-10	e 15.5	19.0	
Wakayama	30.6	80	6 19k	+ 1	11 19	- 1	15.6	—	
Kyoto	30.9	79	6 17	+ 3	11 17	- 7	—	—	
Osaka	30.9	79	6 22	+ 2	11 30	+ 6	—	—	
Osaka B	30.9	79	6 21	+ 1	13 13	SS	—	—	
Yagi	31.1	79	6 22	0	—	—	—	—	
Hikone	31.3	79	6 23	- 1	11 28	- 3	—	—	
Siomisaki	31.3	82	6 25k	+ 1	11 29	- 2	—	—	
Ibukisan	31.4	79	6 27	+ 2	11 40	+ 8	17.2	—	
Wazima	31.4	73	6 23	- 2	11 37	+ 5	—	—	
Kameyama	31.5	79	6 23	- 3	11 46	+12	15.4	—	
Tu	31.6	79	6 28	+ 2	11 32	- 3	—	—	
Gibu	31.7	79	6 23k	- 4	11 23	-14	15.4	—	
Husiki	31.7	75	6 24	- 3	11 41	+ 4	—	—	
Medan	31.8	178	6 28	0	11 48	+10	15.4	—	
Toyama	31.8	75	6 29	+ 1	11 34	- 4	—	—	
Nagoya	31.9	79	e 6 28	- 3	11 21	-19	17.4	20.9	
Takayama	31.9	76	6 35	+ 6	—	—	e 16.7	—	
Iida	32.5	78	6 52	+18	—	—	—	—	
Matumoto	32.5	78	6 30	- 4	11 53	+ 4	—	—	
Hamamatu	32.6	79	6 36	+ 1	11 56	+ 5	15.9	—	
Nagano	32.6	75	6 36	+ 1	11 59	+ 8	—	—	
Takada	32.6	74	6 39	+ 4	11 58	+ 7	—	—	
Colombo	32.8	214	6 39	+ 2	14 22?	?	22.4	28.4	
Otwake	32.9	78	6 39k	+ 1	11 56	0	16.3	—	
Omacesaki	33.0	79	6 50	+11	11 44	-13	—	—	
Hunatu	33.1	76	6 41	+ 1	11 59	0	16.9	—	
Kohu	33.1	76	6 40	0	11 43	-16	—	—	
Maebasi	33.3	78	6 41	0	12 10	+ 8	17.2	—	
Numadu	33.4	78	6 43	+ 1	12 3	0	—	—	
Misima	33.5	78	6 47	+ 4	12 12	+ 7	—	—	
Kumagaya	33.6	75	6 55	+11	12 0	- 6	17.5	—	
Ito	33.7	78	6 47	+ 2	—	—	—	—	
Hakodate	33.9	65	6 59	+12	—	—	—	—	
Aomori	34.0	67	6 44	- 4	—	—	—	—	
Tokyo, Cent. Met. Obs.	34.0	77	6 49	+ 1	12 8	- 5	15.7	—	
Yamagata	34.0	72	6 58	+10	—	—	—	—	
Yokohama	34.0	77	6 47	- 1	12 2	-11	17.3	—	
Muroran	34.1	64	7 4	+16	—	—	—	—	
Hokusima	34.2	73	6 54	+ 6	12 18	+ 2	—	—	
Thakubasan	34.2	75	6 25	-24	12 7	- 9	—	—	
Kakioka	34.2	75	6 47	+ 2	12 5	-11	17.1	—	
Mera	34.2	78	6 58	+ 9	12 1	-15	—	—	
Sapporo	34.3	62	6 50	0	12 16	- 1	17.9	—	
Katuura	34.4	77	6 56	+ 9	—	—	—	—	
Mito	34.4	74	6 50	- 1	—	—	17.2	—	
Morioka	34.4	69	6 50	- 1	12 28	+ 9	—	—	
Souda	34.4	72	6 48k	- 3	12 13	- 7	16.5	—	
Haboru	34.6	61	6 59	+ 7	12 59	+39	—	—	
Miruwawa	E. 34.5	70	e 6 49	- 3	12 14	- 6	16.1	—	
	N. 34.5	70	e 6 56	+ 4	12 16	- 4	16.0	—	

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Hatinohe	34.6	68	6 50	- 3	12 14	- 8	—	—
Onahama	34.7	73	7 13	+19	—	—	—	—
Tyosí	34.9	76	7 3	+ 8	12 30	+ 3	—	—
Asahigawa	35.0	62	7 2	+ 6	12 41	+13	—	—
Miyako	35.1	69	—	—	12 26	- 4	—	—
Otomari	35.3	56	7 1	+ 2	—	—	18.3	—
Urakawa	35.4	64	7 6	+ 6	—	—	—	—
Obihiro	35.7	63	6 58	- 4	—	—	—	—
Sikka	35.7	52	8 2	+60	13 40	+61	20.4	—
Kusiro	36.6	64	6 53	-17	—	—	—	—
Baku	37.6	292	17 21	+ 3	i 13 18	+10	—	—
Nemuro	38.3	62	7 20	- 4	15 26	SS	—	—
Titizima	38.7	89	8 13	+46	—	—	—	—
Grozny	40.3	297	17 46	+ 6	i 13 35	-14	—	—
Tifis	41.3	295	i 7 51	+ 2	i 14 4	0	e 19.4	—
Erevan	41.8	293	e 7 36	-17	—	—	—	—
Platigorsk	42.2	299	i 7 59	+ 3	i 14 15	- 2	19.4	—
Batavia	42.3	166	7 55	- 2	i 14 27	+ 8	20.4	—
Palau	43.8	121	8 12	+ 3	14 38	- 2	—	—
Sotchi	44.6	299	8 22	+ 6	e 14 52	0	—	—
Moscow	45.0	315	e 8 19	0	15 0	+ 2	19.9	30.6
Theodosia	47.4	302	e 8 35	- 3	15 43	+11	27.5	—
Simferopol	48.3	302	8 39	- 6	15 49	+ 4	14.4	—
Yalta	48.4	301	8 42	- 4	15 52	+ 6	17.7	—
Sebastopol	48.8	302	e 8 46	- 3	16 0	+ 8	28.4	—
Pulkovo	48.9	321	i 8 47	- 3	i 15 52	- 1	22.4	31.3
Ksara	50.1	286	i 8 59k	0	e 16 17	+ 7	—	—
Lemberg	53.9	310	e 9 39	+12	e 17 5	+ 3	28.1	34.4
Bucharest	54.0	303	9 24	- 4	17 9	+ 6	—	30.0
Helwan	55.2	284	19 35	- 2	i 17 22	+ 2	—	37.4
Upsala	55.2	323	19 30f	- 7	i 17 15	- 5	e 27.4	34.8
Sofia	56.4	301	e 9 45	0	e 17 42	+ 6	e 33.3	36.6
Kecschemet	57.5	307	e 22 0	?	e 30 34	?	e 47.4	55.9
Belgrade	z. 57.5	304	19 53a	0	i 17 48	- 2	e 23.4	38.6
Budapest	57.7	307	9 58	+ 3	18 3	+10	27.7	39.4
Stara Dala	58.2	308	e 9 59	+ 1	i 18 7	+ 8	e 26.4	32.9
Copenhagen	59.0	319	e 10 0	- 4	e 18 12	+ 2	24.4	—
Vienna	59.2	309	e 10 5	0	e 18 1	-11	e 30.4	33.9
Prague	59.8	312	i 10 7k	- 2	18 23	+ 3	e 25.9	37.4
Graz	60.2	308	e 9 34	-38	i 18 36	+11	e 31.4	34.0
Zagreb	60.3	306	e 10 11	- 2	e 18 23	- 3	e 31.4	34.9
Bergen	61.0	325	10 18	0	18 46	+11	—	36.3
Cheb	61.0	313	e 10 18	0	e 18 40	+ 5	e 32.4	38.4
Hamburg	61.1	317	10 18	0	e 18 42	+ 5	e 30.4	37.4
Jena	E. 61.1	313	i 10 17	- 1	e 18 36	- 1	e 29.4	38.9
	N. 61.1	313	i 10 22	+ 4	e 18 40	+ 3	e 29.4	38.9
	Z. 61.1	313	i 10 17	- 1	e 18 41	+ 4	e 29.4	41.9
Laiibach	61.2	314	i 10 27	+ 8	i 18 41	+ 3	e 32.0	38.9
Triest	61.6	308	i 10 19k	- 4	i 18 56	+10	i 30.4	35.8
Göttingen	61.9	315	i 10 21	- 3	e 18 52	+ 5	e 31.4	39.7
Padova	63.1	308	i 10 34	+ 2	18 52	-10	e 34.4	41.0
Capodimonte	63.4	393	e 10 32	- 2	e 19 17	+11	36.4	40.2
Stuttgart	63.4	315	i 10 32k	- 2	e 19 10	+ 4	e 33.4	39.6
Ohur	64.0	311	e 10 35	- 3	e 19 11	- 2	—	—
Florence	64.2	306	i 10 42	+ 3	19 22	+ 6	—	—
De Bilt	64.4	317	i 10 41	+ 1	i 19 20	+ 2	e 31.4	39.7
Strasbourg	64.4	312	i 10 39k	- 1	i 19 19	+ 1	e 30.4	40.2
Zurich	64.4	311	e 10 38k	- 2	e 19 24	+ 5	—	—
Basle	64.6	311	e 10 41	- 2	e 19 29	+ 6	—	—
Uccle	65.4	316	10 44k	- 3	i 19 29	- 1	31.4	41.2
Nauchatel	65.5	311	e 10 44	- 3	e 19 37	+ 5	—	—
Aberdeen	65.8	324	10 56	+ 7	19 40	+ 5	30.8	—
Scoresby Sund	65.9	341	10 40	-10	e 19 39	+ 2	—	—
Besançon	66.0	312	e 10 50	0	e 19 30	- 8	33.4	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		m. s.	m. s.	s.	m. s.	s.	m.	m.
Lille	66.2	316	e 14 52	?	e 19 40		e 33.4	41.4
Durham	66.7	321	e 10 54	- 1	19 48	+ 2	—	44.4
Edinburgh	67.0	323	11 0	+ 3	i 19 54	+ 4	30.4	42.2
Paris	67.4	314	e 10 56	- 3	i 19 58	+ 3	27.4	43.4
Kew	67.7	318	e 10 59 ^a	- 2	i 19 53	- 5	29.4	42.9
Stonyhurst	67.7	321	11 1	0	i 19 54	- 4	33.4	42.9
College	67.8	25	11 2	0	e 19 47	- 13	29.2	—
Oxford	68.0	318	—	—	i 19 5	- 57	30.4	44.1
Bidston	68.2	321	i 13 27	PP	i 19 42	- 22	31.4	42.5
Marseilles	N. 68.2	308	e 11 11	+ 7	i 20 16	+ 12	32.5	37.4
Perth	69.2	163	11 22	+ 12	20 22	+ 6	32.3	40.6
Jersey	69.8	317	i 11 6 ^b	- 8	20 23	0	33.9	44.1
Rathfarnham Castle	69.9	321	i 11 16	+ 1	i 20 30	+ 6	32.0	43.9
Reykjavik	70.0	336	i 11 29	+ 14	20 43	+ 17	—	—
Barcelona	71.2	308	e 11 49	+ 26	e 20 30	- 10	e 34.2	45.2
Bagnères	71.6	310	e 15 52	?	—	—	e 28.9	48.1
Tananarive	72.0	229	e 11 25	- 3	e 20 49	0	31.2	40.4
Tanariva	72.6	307	11 30	- 1	21 9	+ 13	e 33.4	41.2
Algiers	73.0	302	i 11 33	0	121 7	+ 7	i 42.1	46.4
Toledo	76.0	308	i 11 51	0	i 21 34	0	—	48.1
Almeria	76.7	306	i 11 54	- 1	121 40	- 1	e 39.9	—
Granada	77.3	306	e 11 57	- 1	121 53	+ 5	—	—
Sitka	77.5	26	—	—	121 50	0	e 32.7	—
Malaga	78.1	306	i 12 3	+ 1	21 55	- 1	37.8	—
San Fernando	79.4	307	i 12 17	+ 8	122 17	+ 7	—	—
Ivigtut	79.7	344	12 7	- 4	e 21 55	- 18	33.4	—
Adelaide	79.8	147	i 12 17	+ 5	122 24	+ 10	i 36.8	—
Melbourne	85.1	144	12 44	+ 5	23 11	+ 3	37.2	53.3
Riverview	85.2	138	e 12 43	+ 4	e 23 3	- 6	e 37.3	52.6
Sydney	85.2	138	e 12 46	+ 7	123 34	+ 25	41.9	60.1
Victoria	88.8	26	13 0	+ 3	23 29	- 15	e 37.4	—
Honolulu	88.9	64	—	—	e 23 30	- 14	e 36.6	—
Seattle	89.8	26	e 13 16	+ 14	e 23 41	- 12	e 38.7	—
Saskatoon	90.2	15	13 13	+ 9	23 58	+ 2	38.4	—
Butte	93.4	21	e 13 25	+ 7	e 24 22	- 2	e 45.6	—
Bozeman	95.1	20	—	—	e 24 5	[+ 3]	e 40.8	—
Ukiah	96.7	31	—	—	e 24 5	[- 5]	e 40.4	—
Seven Falls	97.1	352	14 3	+ 28	24 54	[+ 20]	e 44.4	—
Shawinigan Falls	97.9	353	13 38	- 1	24 21	[+ 5]	e 44.4	—
Berkeley	98.1	31	e 21 30	?	e 24 20	[+ 2]	—	—
Apia	N. 98.3	101	—	—	25 22	+ 16	—	—
Lick	98.8	31	e 17 52	PP	e 25 4	- 6	—	—
East Machias	99.0	349	e 17 46	PP	124 30	[+ 8]	e 45.1	—
Ottawa	99.3	355	16 52	PP	e 24 30	[+ 6]	39.4	—
Vermont	100.0	353	i 17 0	PP	124 28	[+ 1]	e 41.6	—
Fresno	100.1	30	e 18 3	?	—	—	—	—
Tinemaha	N. 100.4	28	e 14 6	+ 16	e 25 31	+ 7	—	—
Cape Town	101.2	237	e 15 54	0	125 50	+ 20	e 44.5	57.9
Toronto	101.2	358	18 10	PP	24 39	[+ 6]	e 48.4	—
Madison	101.5	5	e 18 11	PP	e 25 32	- 1	—	—
Oak Ridge	101.7	352	e 13 54	- 2	e 24 42	[+ 7]	e 44.6	—
Weston	101.8	352	e 13 54	- 2	25 27	- 8	47.4	—
Buffalo	101.9	357	e 18 53	PP	e 25 34	- 2	—	—
Santa Barbara	102.1	31	e 18 15	PP	—	—	—	—
Denver	102.3	18	e 17 6	?	e 24 30	[- 8]	e 48.0	55.1
Des Moines	102.6	8	—	—	e 24 58	[+ 19]	e 51.1	—
Araruni	102.8	128	e 23 52	?	125 58	+ 14	44.4	48.4
Chicago	102.8	5	e 18 5	PP	e 25 45	+ 1	42.4	—
Pasadena	103.0	30	e 14 20	+ 18	e 25 50	+ 4	e 44.7	—
Fordham	103.6	352	e 18 12	PP	125 42	- 9	145.6	—
Christchurch, N.Z.	104.0	134	e 17 9	?	27 41	?	53.3	61.0
Pennsylvania	104.0	356	—	—	e 24 52	[+ 6]	e 58.9	67.7
Wellington	104.0	131	18 36	PKP	37 49	?	62.4	—
La Jolla	N. 104.5	30	e 18 30	PP	—	—	—	—
Philadelphia	104.6	353	i 18 20	PP	124 51	[+ 2]	144.0	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		o	m. s.	s.	m. s.	s.	m.	m.
St. Louis	105.9	6 e	18 12	PP	i 25 49	-21	1 50.0	58.3
Tucson	107.5	25 e	18 53	PP	e 26 32	S	e 44.7	—
Little Rock	109.5	9 e	18 41	PP	e 25 7	[- 3]	e 49.9	—
Columbia	110.9	359 e	18 57	PP	e 25 8	[- 8]	e 47.7	—
Tacubaya	E. 123.9	18	19 17?	[+17]	—	—	—	—
San Juan	124.3	341 e	19 28	[+27]	—	—	e 57.8	—
Rio de Janeiro	143.9	280 e	19 33	[- 4]	e 29 47	?	e 46.8	—
Huancayo	155.8	342 e	19 56	[+ 1]	—	—	69.7	—
La Paz	Z. 157.2	322 i	20 2	[+ 5]	—	—	78.9	90.2
La Plata	160.1	264	20 45	[+44]	—	—	82.9	—
Santiago	170.2	279 i	20 2	[- 7]	—	—	—	—

Additional readings:—

Chiufeng IPPEN = +3m.46s.
 Agra PP = +4m.35s.
 Hong Kong PP = +4m.36s., ? = +7m.47s.
 Zi-ka-wai PPN = +4m.54s., PPN = +4m.59s., PPPPN = +5m.3s., iN = +6m.25s., iE = +6m.59s., iE = +7m.13s., iE = +8m.29s., SSN = +8m.49s., SSSN? = +9m.8s.
 Taihoku i = +5m.12s., iSE = +9m.20s., SZ = +9m.26s.
 Koryun PPP = +6m.18s.
 Ithara PP = +7m.15s.
 Naha PP = +6m.24s.
 Kumamoto PP = +5m.46s., PPP = +6m.3s., SS = +11m.38s.
 Vladivostok e = +6m.55s., e = +7m.30s.
 Bombay PP = +6m.23s., SS = +11m.39s.
 Koti PPP = +7m.7s.
 Kobe PN = +6m.16s., SE = +11m.16s.
 Osaka PPP = +7m.25s., SS = +12m.55s.
 Wazima PPP = +7m.29s.
 Gihu PP = +7m.23s.
 Medan iE = +6m.42s.
 Nagoya IP = +6m.30s.
 Hamamatu SS = +13m.32s.
 Nagano PPP = +7m.59s., SS = +14m.11s.
 Oiwake PP = +7m.51s.
 Kohu PPP = +7m.49s.
 Kumagaya i = +8m.0s.
 Tokyo PP = +7m.45s., PPP = +7m.55s., i = +8m.17s. and +8m.57s., SS = +13m.40s.
 Kakioka PP = +8m.22s.
 Sapporo PPP = +8m.8s.
 Morioka SS = +15m.4s.
 Ootomari PPP = +8m.22s.
 Tiflis iN = +7m.56s., iPPE = +9m.31s., iPPPN = +9m.43s., eSSS = +17m.19s.
 Batavia PEZ = +7m.58s., iP = +8m.5s., iEN = +9m.46s.
 Palau SS = +18m.1s.
 Theodosia i = +8m.52s.
 Simferopol i = +8m.48s.
 Sebastopol i = +9m.1s. and +10m.49s.
 Ksara ePP = +11m.53s., eSS = +19m.53s.
 Bucharest PPN = +11m.14s., PPE = +11m.16s., PPP = +12m.25s., SSE = +20m.39s.
 Upsala PPE = +11m.43s., PPPE = +12m.33s., iSS = +21m.13s.
 Sofia ePPN = +11m.56s., ePPP = +12m.53s., e = +21m.34s.
 Kecskemet ePP = +24m.34s., e = +25m.34s., ePS = +26m.29s., e = +28m.54s., ePS = +33m.56s., eSS = +34m.34s., e = +44m.52s.
 Belgrade iPPPE = +13m.21s.
 Budapest iN = +10m.24s., P₀PE = +10m.37s., P₀PN = +10m.43s., iN = +11m.54s., iE = +11m.37s., PP = +12m.2s., eN = +12m.37s., iE = +12m.35s., iN = +13m.29s., iN = +14m.6s., PS = +14m.51s., iE = +16m.35s., iN = +16m.44s., SN = +18m.6s., S₀S = +19m.50s., SSS = +21m.54s., SSN = +22m.6s., iN = +22m.25s., iN = +22m.50s., iN = +24m.6s., iE = +25m.56s.
 Copenhagen PPZ = +13m.14s., eE = +13m.24s., PPP = +13m.34s., eSE = +13m.4s., eN = +13m.39s., eE = +13m.58s., S₀SN = +19m.54s., eN = +21m.38s., SS = +22m.10s.
 Vienna e = +10m.50s., PP = +12m.31s., P₀S = +14m.51s., PS = +15m.31s., SS = +22m.19s., SSS = +24m.15s.
 Prague ePP = +12m.22s., ePPP = +13m.29s., eSS = +22m.19s.
 Zagreb e = +10m.26s., ePPZ = +12m.40s., ePPP = +13m.53s., ePS = +19m.4s., ePS = +20m.8s., eSS = +23m.3s., eSSS = +25m.59s.
 Bergen PP = +12m.20s., PPP = +13m.59s.
 Oheb ePP = +12m.39s., ePPP = +13m.56s., eSS = +22m.41s.
 Hamburg ePPPZ = +14m.3s., eSSZ = +22m.54s., eSSSN = +25m.72s.

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Jena iPPE = +12m.34s., iPPPE = +14m.0s., iPPPN = +14m.3s., iSS = +22m.50s., eZ = +26m.10s.
Laibach ePNE = +10m.30s., iPPNE = +14m.7s.
Triest i = +14m.17s., +13m.46s., iPS = +19m.22s., i = +22m.42s., +25m.30s.
Göttingen iZ = +13m.36s., iPPPNZ = +14m.6s., eN = +20m.10s., eN = +21m.10s.
Stuttgart e = +11m.7s., ePcP = +11m.32s., ePP = +12m.57s., ePPP = +14m.20s., iPPP = +14m.24s., e = +16m.41s., iS = +19m.17s., eSSS = +26m.12s.
De Bilt iPPZ = +13m.5s., iN = +19m.23s.
Strasbourg iPP = +13m.1s., iPPP = +14m.41s., PPPP = +15m.27s., iPS = +19m.35s., SS = +23m.58s., SSS = +26m.32s., iSSS = +27m.48s.
Zurich e = +14m.29s.
Uccle iPP = +13m.9s., iPPPZ = +14m.38s., iEN = +14m.47s., iN = +20m.24s., iSSE = +23m.37s., iSSSE = +26m.36s.
Aberdeen PPP = +14m.46s., e = +38m.57s.
Scoresby Sund PP = +13m.22s., PPP = +15m.4s., iSE = +19m.45s., SpSN = +20m.48s., SS = +23m.46s., SSS = +27m.22s. ?
Besançon ePE = +10m.52s., eSN = +19m.34s.
Edinburgh i = +13m.28s., +15m.0s., i = +21m.12s., i = +27m.12s., i = +28m.25s.
Paris PP = +13m.28s., PPP = +15m.6s., ePS = +21m.9s., SS? = +24m.21s.
Kew iZ = +11m.2s., iPP = +13m.32s., iPPPEZ = +15m.19s., iZ = +19m.25s., iE = +19m.59s., iSPZ = +20m.2s., iSSN = +24m.5s., iE = +24m.13s., iZ = +25m.39s., iSSS = +27m.27s.
Stonyhurst i = +26m.49s.
College eS = +19m.59s., iPS = +20m.3s., iS = +20m.6s., e = +20m.23s., SS = +24m.17s., SSS = +27m.46s.
Oxford PP = +13m.32s., iSKS = +20m.4s.
Bidston iSS = +24m.47s., iSSS = +27m.54s.
Marseilles iN = +11m.17s., eSN = +19m.23s.?, eSS = +24m.32s., eSSS = +27m.59s.
Perth PcP = +12m.2s., PP = +14m.2s., PPP = +15m.33s., PPPP = +16m.39s., SP = +20m.47s., SS = +25m.28s., SSS = +27m.57s., SSSS = +29m.27s.
Jersey i = +11m.21s.?, PP? = +13m.49s., PPP? = +15m.25s., PS? = +21m.0s., SS = +24m.58s., e = +28m.18s.
Rathfarnham Castle i = +11m.28s., iPP = +13m.56s., PPP = +15m.24s., i = +20m.57s., SS = +25m.8s., ? = +25m.46s., SSS = +27m.52s.
Barcelona PR = +14m.4s., PPP = +15m.43s.
Tananarive ePP = +14m.9s., PSEN = +21m.10s., SSN = +25m.22s.?, SSE = +25m.50s.
Algiers PP = +14m.7s., PPP = +16m.0s., PS = +21m.43s., ? = +25m.15s., SS = +26m.13s.
Toledo PP = +14m.22s., iPPP = +16m.25s., SS = +26m.31s., SSS = +29m.11s.
Almeria PP = +14m.58s., SS = +26m.39s.
Sitka SS = +27m.2s., eSSS = +30m.34s.
Malaga i = +12m.11s., i = +12m.27s., PP = +14m.51s., S = +21m.45s., PS = +22m.35s., SS = +26m.57s., e = +30m.29s.
San Fernando PP = +15m.41s.
Ivigtut iZ = +12m.20s., PP = +15m.4s., PPP = +17m.2s., iE = +22m.13s.
Adelaide i = +12m.37s., +12m.55s., +15m.20s., e = +18m.36s., iSS = +27m.39s.
Melbourne i = +15m.55s., SS = +28m.24s., i = +35m.3s.
Riverview iN = +23m.9s., +23m.27s., iE = +23m.32s., iN = +24m.4s., eSSE = +28m.16s., eSSSE = +32m.16s.
Sydney PPP = +19m.46s., SS = +28m.4s.
Victoria PP = +16m.21s., SS = +29m.22s.
Honolulu eSKKS = +23m.43s., S = +23m.55s., PS = +24m.50s., PPS = +24m.58s., eSS = +29m.30s., eSSS = +34m.41s., e = +36m.2s.
Seattle ePS = +24m.39s.
Butte eSSS = +32m.20s.
Roseman eSKKS = +24m.27s., eS = +24m.42s., eSS = +31m.9s.
Ukiah eSKKS = +24m.40s., eS = +24m.57s., ePS = +26m.28s., eSS = +31m.31s., e = +35m.2s., eSSS = +35m.32s.
Seven Falls PP = +17m.52s., SS = +31m.29s., SSS = +35m.0s.
Shawinigan Falls PPP = +19m.1s.
Berkeley eN = +21m.55s., eEN = +23m.30s., eE = +24m.30s., eE = +25m.6s., eN = +25m.14s., iE = +25m.38s.
Apta S = +26m.46s., SS = +32m.5s.
Lick eE = +17m.54s., eE = +25m.17s.
East Machias eS = +25m.19s., iSS = +31m.52s., eSSS = +35m.30s., e = +36m.30s., e = +42m.0s.
Ottawa PS = +25m.14s.
Vermont iPPP = +19m.53s., i = +24m.36s., e = +36m.46s.
Tinemaha ePPE = +18m.1s.
Cape Town iN = +17m.20s., iE = +18m.49s., iSKS = +24m.34s., iSKSE = +25m.1s., iSKKSN = +25m.7s., iSE = +25m.54s., iPSN = +27m.3s., iPSE = +27m.7s., iPPSE = +27m.44s., iPPSN = +27m.49s., iE = +28m.36s., iN = +28m.44s., iE = +29m.14s., iN = +29m.24s., iN = +29m.57s., i = +30m.86s., iSS = +32m.42s., iSSSN = +36m.42s., iSSSE = +36m.54s., i = +27m.59s.
Toronto PS = +26m.58s.

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Madison ePS = +27m.17s., eSS = +32m.38s.
 Oak Ridge ePPZ = +18m.3s., iSKKSE = +25m.26s., iSN = +25m.42s., eSPN = +26m.52s., eE = +32m.22s.
 Weston ePPZ = +18m.3s., iSKSN = +24m.44s., iPSN = +26m.39s., ePPS?N = +27m.17s., eSSE = +32m.22s.
 Buffalo ePPP = +20m.29s., SP = +27m.8s.
 Denver eE = +17m.14s., ePPEN = +18m.17s., ePPPE = +19m.32s., eE = +21m.6s., eE = +23m.39s., eE = +24m.4s., eSKKSE = +25m.28s., eSN = +26m.2s., eE = +28m.18s., eE = +31m.10s., eSSE = +32m.36s., eN = +33m.10s.
 Des Moines e = +43m.53s.
 Arapuni SKKS? = +27m.52s., PPS? = +32m.22s.
 Chicago e = +23m.39s., eSKS = +24m.40s., e = +24m.51s., e = +25m.33s., eSS = +32m.36s.
 Pasadena iPPZ = +18m.18s., ePKKPZ = +29m.59s., iSSE = +32m.51s., eSSE = +37m.4s.
 Fordham iPPP = +20m.37s., i = +27m.34s., iSS = +32m.57s.
 Christchurch SKKS = +28m.32s., L_a = +45.3m.
 Pennsylvania e = +27m.28s., e = +41m.34s., e = +50m.58s.
 Wellington PPS = +32m.16s., SS = +37m.22s., L_a = +44.4m.
 Philadelphia ePPP = +20m.22s., e = +23m.20s., i = +25m.59s., iPS = +27m.44s., e? = +30m.9s., e = +32m.10s., e = +34m.8s.
 St. Louis ePPEN = +18m.31s., ePPP = +20m.41s., iSKKEN = +24m.31s., iSKKSEN = +24m.59s., eE = +27m.25s., eSPEN = +27m.29s., iPPSN = +27m.49s., iSSEN = +32m.59s., iSSSN = +37m.7s.
 Tucson eSKS = +25m.7s., ePS = +27m.55s., eSS = +34m.2s., eSSS = +37m.42s.
 Little Rock iEN = +19m.36s., iPPP = +21m.19s., eN = +31m.59s., eEN = +23m.1s., eSKKSE = +26m.3s., iSEN = +26m.41s., eN = +27m.56s., eN = +29m.6s., ePKKP = +29m.51s.
 Columbia eS = +26m.47s., ePS = +28m.33s., eSS = +34m.42s.
 San Juan PP = +20m.47s., eSS = +37m.43s.
 Rio de Janeiro eSS = +35m.50s.
 Huancayo ePKP = +20m.25s., e = +20m.38s., ePP = +24m.4s., PPP = +27m.11s., e = +40m.8s., eSS = +44m.41s., e = +46m.28s., eSSS = +49m.22s., e = +61m.19s.
 La Paz iZ = +20m.22s., iPKPZ = +20m.42s., iPPZ = +24m.6s., iSSZ = +45m.10s., SSSZ = +50m.2s.
 Santiago e = +57m.12s.
 Long waves were also recorded at New Plymouth, Branner, Ferndale, and Oaxaca.

Jan. 7d. 17h. 45m. 16s. Epicentre 35°5N. 97°7E. (as at 13h.).

A = -1093, B = +8086, C = +5781; δ = -2; λ = 0.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Chiufeng	15.2	67	e 3 33	- 5	6 45	+17	7.4	—
Phu-Lien	16.6	149	e 4 1	+ 5	—	—	8.7	—
Irkutsk	17.4	13	4 8	+ 2	7 23	+ 4	8.7	—
Almata	17.8	302	1 4 16	+ 5	e 7 38	+10	—	—
Agra	E. 18.7	248	4 21	- 1	1 7 55	+ 7	—	—
Frunse	19.3	299	e 4 30	+ 1	—	—	—	—
Hong Kong	19.5	188	4 28	- 3	8 6	0	9.7	11.2
Zi-ka-wel	Z. 20.3	94	e 4 36	- 4	—	—	—	12.9
Andijan	20.6	292	e 4 45	+ 2	—	—	e 12.4	—
Tashkent	23.0	295	1 5 12	+ 5	1 9 32	+18	1 13.5	17.9
Hyderabad	24.8	228	e 5 25	0	10 2	+16	13.0	16.2
Vladivostok	27.4	63	5 44	- 5	10 44	+16	e 15.4	—
Bombay	27.5	239	—	—	e 10 44?	+14	e 15.1	—
Manila	29.5	129	11 5	S	(11 5)	+ 3	—	—
edan	E. 31.8	178	e 10 27	S	(e 10 27)	-71	—	—
Tiflis	41.3	295	7 54	+ 5	e 14 12	+ 8	e 23.0	—
Ksara	50.1	286	1 9 2	+ 3	e 18 24	+14	—	—

Additional readings:—

Almata e = +7m.8s.

Agra PPE = +4m.37s., eSSE = +8m.34s.

Andijan e = +12m.73s.

Manila S = +16m.34s.

Medan eSE = +17m.42s.

Tiflis eN = +19m.8s.

Ksara eP,P = +10m.21s., ePP = +11m.59s.

Long waves were also recorded at Taihoku, Baku, Semipalatinsk, Moscow, Pulkovo, Bucharest, Sofia, Copenhagen, Zagreb, Cheb, Stuttgart, De Bilt, Strasbourg, and Paris.

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Jan. 7d. Readings also at 0h. (Cheb), 3h. (Tiflis (3), near Mizusawa, and Nagoya), 4h. (Nagoya, Florence, Sverdlovsk, Tashkent, Samarkand, Zinsen, Hong Kong, Husan, Keizyo, Taikyū, Chiufeng, Zi-ka-wei, Kobe, Sumoto, near Hukuoka, Hukuoka B (3), and near Wellington), 5h. (Baku), 6h. (near Hukuoka B, Mizusawa, and near Nagoya), 7h. (Tiflis, Yalta, Simferopol, Andijan, Mount Wilson, Tinemaha, Scoresby Sund, Sumoto, near Hukuoka, Hukuoka B, Nagoya (2), Mizusawa, Toledo, and near Granada), 8h. (near Hukuoka B), 11h. (New Plymouth), 12h. (Malabar and Agra), 13h. (Erevan (2), Grosny, Piatigorsk, near Tiflis (2), and near Hukuoka B (2)), 14h. (New Plymouth, Erevan (2), near Fresno, and near Tiflis (2)), 16h. (Grozny, Sofia, New Plymouth, near Erevan (2), and Tiflis), 18h. (Triest), 19h. (Adelaide, near Erevan, and near Kobe), 20h. (New Plymouth, Moscow, Pulkovo, Baku, Ksara, Tashkent, Sochi, Erevan, near Grosny, Tiflis, and Piatigorsk), 21h. (Tucson, Erevan, Grosny, Baku, near Tiflis, near Hukuoka B, and near Santiago), 22h. (New Plymouth, Tashkent, Tiflis, Baku, and near Hukuoka B).

Jan. 8d. 9h. 20m. 29s. Epicentre 30°-5S. 72°-0W.

Felt Scale V Elqui Valley (30°-0S. 71°-0W.). See "Boletín del Servicio Sismológico de la Univ. de Chile, Observaciones de 1937." Santiago, Chile, 1939, p. 75.

A = +.2667, B = -.8209, C = -.5050; $\delta = +3$; $h = +2$;
D = -.951, E = -.309; G = -.156, H = +.480, K = -.863.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Santiago	3.2	159	0 53	+ 1	1 42	+10	—	—
San Javier	5.1	178	1 26	+ 6	2 42	+22	—	—
La Plata	12.6	114	3 6	+ 3	5 37	+11	6.6	—
La Paz	14.4	15	1 3 29k	+ 2	e 6 57	+48	8.8	9.4
Huancayo	18.6	349	4 12	- 9	e 7 44	- 2	—	—
Rio de Janeiro	26.8	80	e 5 39	- 5	e 10 23	+ 4	e 14.4	—
St. Louis	70.9	345	e 11 18	- 3	e 20 35	- 1	—	—
Pasadena	z. 77.7	322	1 11 56	- 4	—	—	—	—
Ksara	120.0	67	e 18 1	PP	e 29 31	?	—	—
Tiflis	128.8	59	e 21 20	PP	e 31 37	PS	e 67.5	—

Additional readings:—

Huancayo PP = +5m.20s., S = +8m.13s.

St. Louis eE = +20m.30s.

Tiflis eZ = +22m.35s.

Long waves were also recorded at San Juan, Sitka, Dę Bilt, Copenhagen, Sverdlovsk, and Baku.

Jan. 8d. 15h. 9m. 40s. Epicentre 39°-8S. 74°-0W.

Epicentre at Gorbea. Felt Scale VI at Temuco (38°-5S. 72°-8W.). See "Boletín de Servicio Sismológico de la Univ. de Chile, Observaciones de 1937." Santiago, Chile, 1939, p. 75.

A = +.2123, B = -.7405, C = -.6376; $\delta = -5$; $h = -2$;
D = -.961, E = -.276; G = -.176, H = +.613, K = -.770.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
San Javier	4.5	23	1 4	- 7	1 53	-12	—	—
Santiago	6.9	24	1 37	- 8	2 53	-12	—	—
La Plata	13.7	74	3 18	0	5 50	- 2	6.7	—
La Paz	23.8	15	1 5 15a	0	19 29	+ 1	13.6	14.6
Huancayo	27.7	357	e 5 51	- 1	e 10 27	- 6	e 12.5	—
Rio de Janeiro	31.1	66	—	—	e 11 20	- 8	e 15.8	—
Pasadena	84.1	324	1 12 41	+ 7	—	—	e 41.3	—
Mount Wilson	84.2	324	e 12 41	+ 7	—	—	—	—
Tinemaha	86.7	326	1 12 53	+ 6	—	—	—	—
Ksara	124.8	73	e 20 24	PS	e 32 20	SSS	—	73.3
Tiflis	134.5	66	e 19 23	[+ 8]	—	—	e 66.3	92.6
Andijan	154.4	77	e 19 59	[+ 5]	e 25 8	?	—	—
France	156.3	72	e 20 18	[+ 22]	e 24 31	?	—	—

For Notes see next page.

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NOTES TO JAN. 8d. 15h. 9m. 40s.

Additional readings:—

La Paz IN = +9m.44s.

Huancayo e = +6m.22s., +9m.59s., and +10m.51s., ePS = +11m.17s.

Ksara e = +22m.24s.

Long waves were also recorded at Cape Town, Christchurch, Wellington, Perth, Calcutta, Berkeley, Tucson, Vladivostok, Tashkent, Sverdlovsk, Pulkovo, Moscow, and several European stations.

Jan. 8d. Readings also at 1h. (Florence, Trieste, and near Erevan), 2h. (La Paz (2), Florence, and Trieste), 3h. (La Paz), 5h. (Andijan), 6h. (Tacubaya, Tiflis, near Andijan, near Erevan, and near Hukuoka B), 7h. (near Santiago), 8h. (La Plata, San Javier, and near Santiago), 9h. (La Plata, near Santiago, and San Javier), 10h. (La Plata, La Paz, San Javier, Santiago, and Rio de Janeiro), 12h. (Fresno and Andijan), 14h. (La Paz, near Santiago, San Javier, and near Hukuoka B), 15h. (San Javier (2)), 17h. (Calcutta), 18h. (near Mizusawa and Nagoya), 19h. (La Plata and near La Paz), 20h. (La Paz), 21h. (Malabar and Santiago), 23h. (near Santiago and near Sumoto).

Jan. 9d. 19h. 13m. 36s. Epicentre 46° 5N. 13° 0E. (as on Jan. 5d.).

Very strongly felt at Genoa (46° 17'N. 13° 09'E.).

See "Bulletin of the Seismological Society of America," Vol. 27, No. 2, p. 139.

A = +6731, B = +1554, C = +7231; $\delta = +9$; $h = -4$.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Treviso	0.9	214	e 0 26	+ 6	—	—	—
Triest	1.0	149	e 0 19	- 2	10 29	S _r ?	—
Padova	1.4	216	e 0 38	?	0 3	?	—
Graz	1.8	71	e 0 25	- 7	—	—	1.0
Zagreb	2.2	108	e 0 45	P _r	e 1 3	- 3	1.4
Ravensburg	2.6	299	e 0 54	P _r	e 1 30	S _r	—
Prato	2.9	207	e 0 49	+ 1	—	—	—
Vienna	2.9	52	e 0 49	+ 1	1 28	+ 4	1.9
Florence	3.0	204	e 0 24?	?	—	—	—
Zurich	3.1	286	e 0 54	+ 3	e 1 48	S _r	—
Ebingen	3.2	302	e 1 50	+58	e 1 55	S _r	—
Stuttgart	3.5	312	e 0 59	+ 2	e 1 55	S _r	2.5
Basle	3.8	285	s 1 4	+ 3	e 2 6	S _r	—
Strasbourg	4.1	300	e 1 40	P _r	12 19	S _r	—
Neuchatel	4.2	276	e 1 8	+ 1	e 2 17	S _r	—
Jena	4.5	342	e 1 24	P*	—	—	—
Göttingen	5.4	336	1 48?	P _r	—	—	3.2

Additional readings:—

Zagreb IP_rNW = +1s., I = +1m.8s., IS_r = +1m.11s.

Vienna IP = +59s.

Zurich eP_r = +1m.2s.

Stuttgart eP_r = +1m.10s., IS_r = +2m.0s.

Basle eS_r = +2m.13s.

Strasbourg S_r = +2m.32s.

Jan. 9d. Readings also at 0h. (Sumoto, La Plata, near Berkeley, Branner, Fresno, and Lick), 1h. (near Mizusawa), 2h. (near Erevan and Tiflis), 3h. (Arapuni, Christchurch, Wellington, Melbourne, Riverview, Sydney, Florence, and Trieste), 5h. (Arapuni, Wellington, Adelaide, Riverview, Christchurch, Sydney, and near Hukuoka B), 6h. (La Paz, La Plata, near Santiago, and near Huancayo B), 9h. (Ksara, near Hukuoka B, and near Santiago (2)), 14h. and 15h. (near Andijan), 20h. (Almeria), 22h. (near Nagoya).

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Jan. 10d. 7h. 3m. 46s. Epicentre 35°·6N. 139°·8E. (given by Tokyo).

A = -8225, B = +5260, C = +5795; δ = 0; h = 0;
D = -645, E = -764; G = -443, H = +374, K = -815.

	Δ	P.		O-C.		S.		O-C.	
		m.	s.	m.	s.	m.	s.	m.	s.
Komaba	0·1	0	8	0	0	13	0	0	0
Tokyo	0·1	0	8	0	0	12	-	1	-
Mitaka	0·2	0	10	0	0	16	-	0	-
Kamakura	0·4	0	4	-	9	14	-	7	-
Kiyosumi	0·5	0	17	+	3	26	+	3	-
Titibu	0·7	0	17	0	0	24?	-	4	-
Tukubasan	0·7	0	4	-	13	9	-	19	-

Jan. 10d. Readings also at 0h. (near Erevan and Tiflis), 1h. (La Paz, La Plata, and near Santiago), 2h. (Batavia and Medan), 5h. (Apia, Mount Wilson, and Pasadena), 6h. (near Malaga (2) and near Tiflis), 7h. (Tiflis, near Mizusawa (2), and Nagoya (2)), 8h. (near Berkeley, Branner, and Lick), 9h. (near Santiago and San Javier), 10h. (Malabar and near Erevan (2)), 11h. (near Tiflis), 12h. (Tiflis and near Erevan), 14h. (Fresno), 17h. (Grozny and Malabar (2)), 18h. (near Tananarive and Erevan), 22h. (Chiufeng and Irkutsk), 23h. (Christchurch, Wellington, and Tiflis).

Jan. 11d. 13h. 21m. 10s. Epicentre 16°·2N. 93°·6W.

A = -0603, B = -9589, C = +2773; δ = +2; h = +6;
D = -998, E = +063; G = -017, H = -276, K = -961.

	N.	Δ	Az.	P.		O-C.		S.		O-C.		L.	M.
				m.	s.	m.	s.	m.	s.	m.	s.		
Oaxaca	N.	3·1	285	0	38	-	13	-	-	-	-	-	-
Tacubaya	N.	6·2	302	1	38	+	3	-	-	-	-	-	-
Guadalajara	N.	10·3	297	2	40	+	8	-	-	-	-	-	-
Little Rock		18·5	4	14	22	+	3	17	39	-	5	-	-
Columbia		21·0	29	e 4	52	+	5	8	42	+	5	11·3	-
Tucson		22·3	320	e 5	2	+	1	9	4	+	2	12·2	-
St. Louis		22·6	8	15	3	0	0	19	7	0	0	-	-
Floriissant		22·7	8	15	5	+	1	19	9	0	112·3	15·3	-
Chicago		26·1	9	e 5	36	-	1	e 10	0	-	7	-	-
La Jolla		27·1	313	15	46	0	0	e 10	23	-	1	-	-
Riverside		27·8	314	e 5	50	-	3	-	-	-	-	-	-
Mount Wilson		28·4	315	15	57	-	1	-	-	-	-	-	-
Pasadena		28·4	315	15	57	-	1	10	43	-	2	e 12·9	-
Philadelphia		28·6	32	e 6	28	+	28	e 11	21	+	33	116·1	-
Haiwee	N.	29·4	318	e 6	9	+	2	-	-	-	-	-	-
Santa Barbara	N.	29·6	313	e 6	43	+	34	-	-	-	-	-	-
Toronto		29·9	21	-	-	-	-	e 10	32	-	37	e 14·8	-
Tinemaha	N.	30·2	319	e 6	15	+	1	e 11	13	0	0	-	-
Oak Ridge		32·3	32	16	54	+	21	e 13	32	?	9	e 19·8	-
Weston		32·3	32	16	40	+	7	e 12	15	+	29	e 16·8	-
Boseman		32·8	337	e 6	43	+	6	e 11	45	+	1	e 18·2	-
Ottawa		32·8	32	e 7	14	+	37	e 12	60?	+	66	e 15·8	-
Berkeley		33·2	317	-	-	-	-	13	1	+	1	-	-
Hanayoyo		33·4	146	6	41	-	1	e 11	60	-	13	e 14·2	-
Butte		33·7	337	6	39	-	6	e 12	4	-	4	-	-
Ukiah		34·5	318	-	-	-	-	e 12	50	+	30	e 16·2	-
East Machias		36·1	33	e 8	26	PP	-	-	-	-	-	e 13·5	-
Seven Falls		36·1	35	18	25	PP	-	-	-	-	-	e 13·0	-
Seattle		39·3	350	-	-	-	-	e 13	60?	+	16	21·8	-
Victoria		46·3	330	-	-	-	-	e 12	40	-	9	e 21·6	-
La Paz	N.	41·1	140	7	50	+	3	113	56	-	5	-	-
Stika		51·4	333	-	-	-	-	116	28	0	0	e 26·8	-
Paris		81·9	42	112	20	-	3	-	-	-	-	e 39·8	-
Alicante		82·5	58	12	36	+	4	-	-	-	-	-	-
Uccle		82·6	39	412	28	0	0	-	-	-	-	e 39·6	-

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
De Bilt	82.7	38	i 12 27	0	—	—	e 39.8	—
Neuchatel	85.3	42	e 12 39	- 1	—	—	—	—
Strasbourg	85.3	41	i 12 41 _a	+ 1	e 23 34	+ 24	e 41.3	—
Copenhagen	85.5	33	i 12 40	- 1	e 23 6	- 6	e 38.8	—
Stuttgart	86.1	40	i 12 44 _a	0	e 23 20	+ 2	e 44.8	—
Florence	89.3	45	e 12 50?	- 9	—	—	—	—
Triest	90.2	42	i 13 1	- 3	i 23 27	[- 6]	—	—
Zagreb	91.5	42	e 13 11	+ 1	e 23 39	[- 3]	—	—
Sverdlovsk	104.1	14	e 18 33	PP	e 24 49	[+ 3]	e 48.8	—
Tiflis	110.7	32	e 19 22	PP	e 26 13	[+ 3]	e 51.8	—

Additional readings:—

Little Rock iEN = +4m.28s., ipPEN = +4m.34s., ipPEN = +5m.10s., iEN = +5m.45s., +6m.35s., +7m.13s., iSSE = +8m.0s., iPcPE = +8m.5s.

Columbia ePP = +5m.10s.

Tucson e = +5m.40s.

St. Louis ipPEN = +5m.23s., IPPN = +5m.38s., ipPPEN = +5m.56s., iN = +8m.25s., iPcPEN = +8m.35s., iSSN = +9m.45s., iSSEN = +10m.2s., iSSSEN = +10m.25s.

Florissant iN = +5m.24s., ipPEN = +5m.27s., IPPN = +5m.33s., iPPPN = +6m.12s., eN = +8m.0s., iSSEN = +9m.50s., iSSSEN = +10m.16s., iSSSN = +11m.6s.

Chicago eSS = +11m.16s.

Philadelphia ISS = +12m.35s.

Oak Ridge iZ = +7m.21s., eZ = +15m.4s.

Weston IPP = +7m.50s., iZ = +9m.25s.

Berkeley iE = +13m.18s., iN = +13m.41s.

Huancayo e = +7m.2s., ePcP = +9m.30s., S = +12m.36s., eScS = +16m.56s.

Butte ePP = +7m.55s.

Seattle e = +16m.50s.?

Victoria e = +17m.33s.

La Paz iN = +17m.42s.

Zagreb ePcP = +13m.17s.

Strasbourg i = +12m.56s. and +13m.1s.

Stuttgart eZ = +13m.31s.

Triest i = +23m.52s.

Sverdlovsk e = +27m.45s.

Tiflis ePSNZ = +28m.40s., ePPSE = +30m.10s.

Long waves were also recorded at San Juan, Samarkand, Madison, Pulkovo, and Tashkent.

Jan. 11d. Readings also at 1h. (Tucson, Sverdlovsk, Hong Kong, Chiufeng, near Hukuoka, Hukuoka B, Nagoya, and Sumoto), 2h. (Tiflis), 3h. (near Medan), 4h. (La Paz), 7h. (Oak Ridge), 10h. (near Santiago and San Javier), 12h. (Grozny, Tiflis, and near Erevan), 13h. (Little Rock, Florissant, St. Louis, Pasadena, Mount Wilson, Oaxaca, Tacubaya; repetition from shock of 13h.21m.10s.); Sitka, Andijan, Samarkand, Dehra Dun, Almeria, near Granada, and Toledo), 16h. (near Batavia), 17h. (Dehra Dun and Malabar), 18h. (Medan), 19h. (near Erevan), 22h. (Sverdlovsk and Tashkent), 23h. (Hastings).

Jan. 12d. Readings at 0h. (Almata, Andijan, Frunse, Semipalatinsk, and Chiufeng), 5h. (Agra, Andijan, Bombay, Erevan, Grozny, Platigorsk, Tashkent, Tiflis, Sverdlovsk, Samarkand, Calcutta, Kodalkanal, Hyderabad, and Medan), 6h. (Almata, Frunse, Tchikent, and Hastings), 8h. (Kaara, Erevan, Tiflis, and near Zagreb), 10h. (near Samarkand), 12h. (Phu-Lien), 15h. (near Hukuoka B and near San Javier), 17h. (near Hukuoka B), 18h. (Tiflis), 19h. (Hastings, Calcutta, and near Almata).

Jan. 13d. Readings at 1h. (Platigorsk, Sochi, near Erevan, Grozny, and Tiflis), 2h. (Tucson, Andijan, near Almata, and Frunse), 3h. (near Erevan and Tiflis), 4h. (Kaara), 7h. (near Samarkand), 8h. (near Sumoto), 9h. (Erevan, Tiflis, and Kaara), 10h. (near Andijan), 13h. (La Paz), 14h. (near Pananarive), 18h. (Erevan, Tiflis, and Wellington), 21h. (Weston), 22h. (near Santiago).

Jan. 14d. Readings at 5h. (near Andijan), 6h. (Malabar), 7h. (Malaga and Phu-Lien), 9h. (Monowai), 10h. (near Erevan), 11h. (near Belgrade), 12h. (Alicante), 13h. (Tiflis), 14h. (Sofia, Calcutta, and near Nagoya), 16h. (Erevan and near Santiago), 18h. and 21h. (near Andijan).

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Jan. 15d. 5h. 10m. 57s. Epicentre 2°·2N. 126°·0E.

A = -·5874, B = +·8084, C = +·0382; δ = +1; h = +7;
D = +·809, E = +·588; G = -·022, H = +·031, K = -·999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	9·9	59	2 28	+ 3	4 3	-17	—	—
Manila	13·2	338	3 14	+ 3	7 14	S _r	—	—
Batavia	N. 20·9	248	3 43?	-63	8 45	+10	—	—
Isgakizima	22·1	355	4 57	- 2	—	—	—	—
Hong Kong	23·0	331	5 10	+ 3	9 18	+ 4	—	14·7
Phu-Lien	26·4	316	5 43	+ 3	e 10 15	+ 3	—	—
Medan	E. 27·3	275	5 39	- 9	—	—	—	—
Kumamoto	30·8	8	6 15	- 5	—	—	—	—
Kameyama	33·9	17	6 44	- 3	—	—	—	—
Nagoya	34·3	17	e 6 48	- 2	—	—	—	—
Gihu	34·5	17	6 51	- 1	—	—	—	—
Hunatu	35·2	18	7 2	+ 4	—	—	—	—
Kohu	35·2	18	6 55	- 3	12 39	+ 8	—	—
Perth	35·3	196	9 3?	?	—	—	—	—
Oiwake	35·9	17	6 57	- 7	12 37	- 5	—	—
Nagano	38·1	16	7 5	0	12 46	+ 1	—	—
Hukusima	37·8	20	7 17	- 3	13 6	- 5	—	—
Chiufeng	38·7	347	7 26k	- 1	i 13 28	+ 3	e 17·4	—
Mizusawa	E. 39·3	18	(7 36)	+ 4	7 36	P	—	—
Calcutta	N. 41·8	302	e 9 41	?	i 14 17	+ 6	—	—
Riverview	43·0	150	e 9 33	?	e 17 27	?	e 24·5	28·2
Melbourne	43·5	158	—	—	i 14 21	-15	25·0	28·8
Irkutsk	53·1	344	e 9 21	0	16 55	+ 4	28·0	—
Bombay	54·6	292	—	—	e 14 11	?	—	—
Almata	59·7	321	e 10 13	+ 4	—	—	—	—
Andijan	61·6	316	e 10 23	+ 1	e 18 45	+ 2	—	—
Sempalatinsk	61·6	329	e 9 58	-24	—	—	—	—
Tashkent	64·0	316	e 10 34	- 4	i 19 9	- 4	e 30·0	42·6
Sverdlovsk	74·9	329	i 12 53	+69	i 21 28	+ 6	37·0	45·6
Grozny	81·4	314	e 12 21	+ 1	—	—	—	—
Tiflis	82·0	312	e 12 28	+ 5	e 22 41	+ 4	e 43·0	—
Erevan	82·1	310	e 12 27	+ 3	—	—	—	—
Piatigorsk	83·4	315	e 12 32	+ 2	—	—	22·0	—
Moscow	87·3	325	e 12 50	0	23 27	- 2	—	—
Ksara	88·9	303	e 12 59	+ 1	e 23 50	+ 6	—	50·6
Theodosia	88·9	315	—	—	e 23 44	0	—	—
Yalta	89·2	314	—	—	e 23 21	[-7]	—	—
Simferopol	89·8	315	—	—	e 23 36	-17	—	—
Pulkovo	91·0	330	—	—	i 24 0	- 3	—	—
Mount Wilson	z. 109·9	53	e 18 46	[+13]	—	—	—	—
Pasadena	z. 109·9	53	e 18 45	[+12]	—	—	—	—

Additional readings:—

Batavia PE? = +5m.12s.
Hong Kong PP = +5m.23s., SS = +9m.45s.
Medan ePN = +5m.55s.
Chiufeng P_cSZ? = +13m.21s.
Calcutta e = +16m.40s.
Bombay e = +17m.3s.
Andijan e = +13m.5s.
Sverdlovsk i = +12m.57s.
Moscow SKS = +23m.11s., PS = +24m.32s.
Ksara ePP = +16m.27s., ePS = +24m.53s.
Yalta e = +25m.38s.
Pulkovo e = +25m.8s.

Long waves were also recorded at Christchurch, Wellington, Bucharest, Sydney, and Copenhagen.

Jan. 15d. Readings also at 1h. (near Granada), 2h. (Hastings), 3h. (near Santiago), 4h. (near Mizusawa), 5h. (Florence, Trieste, and Zagreb), 6h. (Santiago), 8h. (near Santiago), 9h. (Batavia, Medan, and Samarqand), 11h. (Phu-Lien and near Nagoya), 12h. (Alcanta, Sebastopol, Simferopol, and Yalta), 14h. (Sverdlovsk, Tashkent, Sumoto, and near Hukuoka B), 16h. (near Hukuoka B and Sumoto), 18h. (Fresno), 19h. (near Trieste), 20h. (Sotchi).

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Jan. 16d. Readings at 0h. (Granada (2) and near Santiago), 2h. (Medan, Almata, and near Andijan), 6h. (Nagoya), 10h. (Mount Wilson and Pasadena), 13h. (Agra, Bombay, Almata, near Calcutta (2), and near Santiago), 14h. (Tiflis), 17h. (Balboa Heights, San Juan, Huancayo, and La Paz), 18h. (Tucson), 19h. (Agra, Bombay, Calcutta, Almata, Andijan, Frunse, Tashkent, Tiflis, Sverdlovsk, Vladivostok, and Hyderabad), 20h. (Andijan, Tiflis, Vladivostok, Sverdlovsk, Sofia, Batavia, and Perth), 22h. (Columbia and near Santiago).

Jan. 17d. 2h. 12m. 8s. Epicentre 43°·1N, 13°·2E.

Scale VII at Caldarola (Macerata), distant 50-60km. Macroseismic area 8000-11,000 sq. km. Epicentre as above: Bollettino della Soc. Seism. Ital. XXXV, p.67.

A = +·7131, B = +·1673, C = +·6808; $\delta = -1$; $\lambda = -3$;
D = +·228, E = -·974; G = +·663, H = +·155, K = -·732.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Florence	1·6	296	0 29	- 1	0 44	- 7	—	1·0
Triest	2·6	9	e 0 48	+ 4	i 1 37	+20	—	—
Treviso	2·7	344	e 0 52	+ 7	—	—	—	—
Zagreb	3·4	36	e 1 5	P _r	e 1 51	S _r	—	2·1
Chur	4·6	327	e 1 11	- 1	e 2 7	0	—	—
Ravensburg	5·3	333	e 2 25	S	(e 2 25)	0	—	—
Zurich	5·4	323	e 1 18	- 6	e 2 26	- 2	—	—
Belgrade	N.W. 5·5	70	—	—	e 2 22	- 8	—	—
Neuchatel	5·9	313	e 1 29	- 2	e 2 34	- 6	—	—
Basle	6·0	321	e 1 29	- 3	e 2 39	- 4	—	—
Stuttgart	6·3	336	e 2 40	S	(e 2 40)	-10	e 3·6	4·1
Strasbourg	6·7	327	e 1 52?	+10	e 3 10	+10	—	—
Sofia	7·4	90	—	—	e 4 11	S _r	—	—
Jena	7·9	353	e 1 52?	- 7	e 2 22	-68	—	4·7

Additional readings:—

Triest IPP = +1m.12s.

Zagreb eNE = +1m.23s., e = +2m.1s. and +2m.5s.

Chur IP_r = +1m.15s.

Zurich eP_r = +1m.23s.

Belgrade e = +2m.37s., eNW = +2m.56s., and +3m.36s.

Strasbourg eSS = +3m.25s. and e = +4m.8s.

Jan. 17d. Readings also at 1h. (near Mizusawa), 4h. (near Christchurch, Wellington, and near Mizusawa), 5h. (Huancayo, La Paz, La Plata, and near Hukuoka B), 6h. (Santiago, near Mizusawa, and Nagoya), 7h. (San Juan), 8h. (Riverview, Christchurch, and Wellington), 10h. (Samarkand), 11h. (near Hukuoka B and near Taihoku), 15h. (near Erevan and Tiflis), 17h. (near Trieste), 19h. (near Nagoya), 20h. (Andijan and near Mizusawa).

Jan. 18d. Readings at 0h. (La Paz), 2h. (Capodimonte), 3h. (Christchurch and Wellington), 5h. (Mizusawa), 9h. (near Mizusawa), 13h. (Malabar), 16h. (near San Javier and Santiago), 17h. (near Mizusawa), 21h. (East Machias, near Santiago, and San Javier), 23h. (Nagoya, San Juan, near Santiago, and San Javier).

Jan. 19d. 22h. Data inadequate for determination of epicentre:—

Denver eE = 19m.48s. and 23m.49s., eN = 26m.14s., iN = 26m.43s., eE = 26m.50s.,

eN = 27m.5s., eE = 27m.48s., m = 28m.0s.

Tucson eP = 21m.21s., IP = 21m.32s., e = 21m.38s., i = 21m.58s., eS = 22m.7s.,

e = 22m.20s., 22m.29s., and 22m.32s., iL = 22m.59s.

Mount Wilson IPZ = 22m.18s.

Pasadena ePZ = 22m.20s., eL = 24m.

Santa Barbara eZ = 22m.32s.

Melroe ePEN = 22m.40s.

Tinamah ePEN = 22m.51s.

Fresno eN = 22m.52s.

Spanner eN = 22m.51s.

Little Rock eEE = 22m.25s., eN = 29m.37s., iN = 29m.51s., 30m.39s., and 31m.25s.

Butte e = 24m.20s., 27m.51s., and 30m.24s.

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Florissant IPNZ = 24m.50s., iSEN = 29m.37s., iSS = 31m.4s., iLZ = 32m.13s.,
 i = 33m.7s. and M = 34m.5s.
 St. Louis ePEN = 24m.51s., eN = 28m.46s., eSE = 29m.46s., eSSN = 30m.54s.,
 eSSE = 31m.0s.
 Lick eEN = 26m.52s.
 Oak Ridge eZ = 27m.5s., eL_Q = 38.7m., eL_r = 41.5m.
 Berkeley eE = 27m.23s., eN = 27m.28s., eEN = 27m.48s.
 Bozeman e = 27m.42s., eL = 29.9m.
 Weston iP = 28m.11s., L = 42m.0s.
 Victoria e = 29m.30s., eL = 32m.
 Chicago e = 29m.56s. and 32m.15s., L = 32m.55s. and 33m.10s.
 Sitka e = 32m.30s. and 35m.6s., L = 39m.
 Madison e = 32m.53s.
 Ottawa eE = 33m., eL = 37m.
 Columbia e = 33m.31s., eL = 34m.45s.
 Pennsylvania eN = 37m.9s., M = 38.8m.
 Vermont P = 38m.0s., iL = 38m.18s.
 Rathfarnham Castle e = (53m.5s.), L = (61.0m.); (readings having been increased
 by 1h.).
 Moscow e = 57m.31s., eL = 71.5m., M = 75.4m.
 Long waves were also at Ivigtut, Scoresby Sund, Ksara, and other American,
 European, and Russian stations.

Readings also at 0h. (near Nagoya and near Trieste), 1h. (Florence and near Trieste),
 3h. (Triest), 4h. (Calcutta), 5h. (San Juan), 8h. (Sverdlovsk, Tashkent,
 Mizusawa, and near Tananarive), 9h. (Tiflis), 13h. (Tiflis, Hong Kong,
 Phu-Lien, Vladivostok, Bombay, Calcutta, Tashkent, Tchimbkent, Sverdlovsk,
 Florence, Almata (2), Samarkand, near Andijan, and Frunse (2)),
 14h. (Florence, Almata, and Frunse), 18h. (Stara Dalja), 19h. (Frunse, near
 Almata, and near Batavia), 20h. (Oaxaca and Tacubaya), 21h. (Tucson),
 22h. (near Christchurch and Wellington), 23h. (Lick, Fresno, and Takaka).

Jan. 20d. 0h. 2m. 50s. Epicentre 42°-0N. 142°-8E.

Strongly felt at Urakawa, moderately at Hakodate and Hatinohe. Radius 200-
 300km. See Seismological Bulletin of the Central Meteorological Observ-
 ervatory, Japan, for the year 1937. Tokyo 1939, pp. 19-20. Macro-
 seismic chart, p. 20.

A = -5937, B = +4507, C = +6666; δ = -3; λ = -2;
 D = +605, E = +797; G = -531, H = +403, K = -745.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Urakawa	0.2	355	0 12	+ 2	0 18	+ 2	—	—
Muroran	1.4	284	0 31k	+ 4	0 44	- 2	—	—
Kusiro	1.5	50	0 16	- 12	0 35	- 14	—	—
Sapporo	1.5	315	0 35k	+ 7	0 57	+ 8	—	—
Hakodate	1.6	261	0 44	+ 14	1 7	+ 16	—	—
Hatinohe	1.7	213	0 33k	+ 2	0 52	- 2	—	—
Aomori	1.9	232	0 37	+ 3	1 3	+ 4	—	—
Miyako	2.4	195	0 35	- 6	1 0	- 12	—	—
Nemuro	2.4	57	0 44	+ 3	—	—	—	—
Haboro	2.5	341	0 56	+ 13	1 26	+ 12	—	—
Morioka	2.6	208	0 47a	+ 3	1 16	- 1	—	—
Akita	3.1	221	0 54	+ 3	1 31	+ 2	—	—
Mizusawa	3.1	264	1 0 54	+ 3	1 31	+ 2	—	—
Iinomaki	3.7	198	1 0	0	1 41	- 4	—	—
Sendai	4.0	201	1 5	+ 1	1 48	- 4	—	—
Hukusima	4.6	204	1 13	+ 1	2 6	- 1	—	—
Aidu	4.9	205	1 23a	+ 6	2 18	+ 3	—	—
Niigata	4.9	216	1 53	P _a	2 51	S _r	—	—
Osahama	5.2	196	1 28	+ 7	2 23	+ 1	—	—
Mito	5.9	198	1 30	- 1	2 35	- 5	—	—
Utunomiya	5.9	203	1 31	0	2 35	- 5	—	—
Takada	6.0	217	1 30	+ 7	2 55	+ 12	—	—
Kakiko	6.1	206	1 34	0	2 37	- 8	—	—
Tsuchibasan	6.1	200	1 31	- 3	2 36	- 9	—	—
Matsuy	6.3	208	1 35	- 1	2 47	- 3	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Kumagaya	6.4	205	1 39	+ 1	2 46	- 7	—	—
Nagano	6.4	215	1 42	+ 4	3 6	+13	—	—
Tyosi	6.4	194	1 46	+ 8	2 46	- 7	—	—
Wazima	6.4	226	1 43	+ 5	—	—	—	—
Oiwake	6.6	211	1 45	+ 4	3 5	+ 7	—	—
Tokyo, Cent. Met. Obs.	6.7	202	1 42	0	3 27	+27	—	—
Husiki	6.8	222	1 48	+ 4	—	—	—	—
Matumoto	6.8	214	2 26	+42	—	—	—	—
Toyama	6.9	221	1 46	+ 1	3 20	+15	—	—
Yokohama	7.0	201	2 1	+15	3 2	- 6	—	—
Hunatu	7.2	207	1 50	+ 1	3 13	0	—	—
Kanaawa	7.2	223	2 17	+28	4 20	+67	—	—
Kohu	7.2	208	1 49	0	—	—	—	—
Iida	7.5	212	2 6	+13	—	—	—	—
Misima	7.5	205	2 6	+13	—	—	—	—
Numadu	7.5	206	2 25	+32	3 34	+14	—	—
Ito	7.6	203	2 8	+13	3 16	- 7	—	—
Gibu	8.1	217	2 2	0	4 13	+38	—	—
Vladivostok	8.1	231	1 2 16	P*	1 3 54	S*	—	5.5
Nagoya	8.2	215	e 2 6	+ 3	3 42	+ 4	—	4.8
Hikone	8.4	219	2 8	+ 2	3 49	+ 6	—	—
Kameyama	8.7	217	2 12	+ 2	4 58	S*	—	—
Tu	8.8	216	2 11	0	—	—	—	—
Osaka B	9.3	220	2 33	+16	—	—	—	—
Kobe	9.4	222	e 2 18	0	4 26	+19	—	5.0
Wakayama	9.8	220	2 28	+ 4	4 49	+32	—	—
Talkyu	12.6	245	3 7	+ 4	—	—	—	—
Husan	12.8	242	e 3 4	- 2	—	—	—	—
Hukuoka B	12.9	233	3 29	+22	e 5 19	-14	—	—
Keizyo	13.0	255	e 3 9	0	e 6 21	+46	—	—
Chiufeng	20.2	276	4 36 ^a	- 3	8 18	- 3	9.4	13.2
Zi-ka-wei	Z. 20.2	246	e 4 26	-13	8 47	+26	—	14.0
Irkutsk	27.8	306	5 52	- 1	10 33	- 2	15.2	—
Hong Kong	31.0	240	—	—	11 49	+23	—	18.0
Almata	47.3	296	e 8 40	+ 3	e 14 11	?	—	—
Frunse	49.0	296	e 9 15	+25	—	—	—	—
Calcutta	N. 49.1	265	e 8 56	+ 5	1 16 24	+28	—	—
Andijan	51.5	294	e 9 5	- 4	—	—	—	—
Sverdlovsk	52.2	317	i 8 19	-56	1 16 41	+ 2	25.2	31.5
Tashkent	53.3	297	e 13 13	?	e 17 8	+14	e 28.8	30.5
Moscow	63.5	323	—	—	e 20 32	?	34.7	31.1
Tiflis	68.7	307	11 8	+ 1	e 20 28	+18	e 34.2	42.2
Tinemaha	E. 72.1	57	e 11 29	+ 1	—	—	—	—
Mount Wilson	Z. 74.0	58	e 11 37	- 2	—	—	—	—
Pasadena	Z. 74.0	58	e 11 40	+ 1	—	—	—	—
Ksara	79.1	306	e 12 6	- 2	—	—	—	47.2

Additional readings:—

Vladivostok e = +2m.31s. and +4m.20s.

Kobe ez = +4m.37s.

Tashkent e = +17m.26s., +18m.8s., e = +20m.55s.

Tiflis eE = +20m.35s., eN = +30m.8s.

Ksara PP = +15m.10s., ePS = +23m.14s.

Long waves were also recorded at Uccle, Trieste, Stuttgart, Sitka, De Bilt, Budapest, Strasbourg, Paris, Pulkovo, and Copenhagen.

Jan. 20d. Readings also at 0h. (near Medan), 1h. (near Sumoto), 3h. (Tucson), 6h. (Bucharest, Ksara, and near La Paz), 8h. (near Nagoya), 10h. (Ferndale), 11h. (near Berkeley, Branner, Lick, and San Francisco), 12h. (Erevan and near Santiago), 14h. (near Mizusawa), 17h. (Almata, Andijan (2), Grozny, Erevan, Ksara, near Frunse, and Tiflis (3)), 18h. (Andijan, Frunse, near Kobe, and Sumoto), 19h. (Tacubaya, Almata, and Frunse), 21h. (Mount Wilson and Pasadena), 22h. (near Tiflis and near Andijan).

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Jan. 21d. Readings at 0h. (Fresno, Liek, near Berkeley, Branner, and San Francisco), 1h. (Nagoya), 2h. (Taikyū), 3h. (Mizusawa, Andijan, near Almata, and near Nagoya), 8h. (near Tananarive), 11h. (Tiflis), 13h. (near Hukuoka B), 14h. (Jena, Sverdlovsk, Tiflis, and near Hukuoka B), 15h. (Tashkent, Pulkovo, Moscow, Copenhagen, Göttingen, and Jena), 17h. (Andijan and near Mizusawa), 18h. (near Mizusawa).

Jan. 22d. Readings at 0h. (near Santiago and San Javier), 1h. (Andijan, Tiflis, Mizusawa, and near Hukuoka B (2)), 2h. (near Manila), 3h. (near Hukuoka B), 4h. (Arapuni, Christchurch, Wellington, Adelajde, Melbourne, Perth, Sydney, Batavia, Medan, Hong Kong, Manila, Chiufeng; Agra, Calcutta, Andijan, Frunse, Tashkent, Trieste, and La Paz), 5h. (Hong Kong, Phu-Lien, Tiflis, Pulkovo, Trieste, Berkeley, Ukiah, Tucson, and Huancayo), 6h. (Malabar (2)), 8h. (Frunse, La Paz, and near Andijan), 9h. (Riverview), 20h. (near Christchurch and Wellington), 21h. (Christchurch), 22h. (La Paz).

Jan. 23d. 8h. 49m. 46s. Epicentre 33°3N. 131°6E.

Moderately at Ooita, Miyazaki, Simidu, and Uwazima. Radius 200-300km. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937. Tokyo 1939, pp. 21, macroseismic chart p. 20.

A = -5561, B = +6263, C = +5464; $\delta = +5$; $h = +1$.

The Bulletin of Central Meteorological Observatory attributes focal depth 100km. or 0-015, but the depth is regarded here as normal.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Ooita	0-1	168	0 20k	+12	0 30	+17	—
Kumamoto	0-9	237	0 19k	-1	0 32	-2	—
Matuyama	1-0	61	0 27k	+6	0 45	+9	—
Hukuoka	1-0	286	10 21k	0	10 37	+1	—
Hukuoka B	1-0	286	10 22k	+1	10 39	+3	0-7
Saga	1-1	267	0 23	+1	—	—	—
Hirosima	1-3	33	0 30	+5	0 49	+5	—
Simidu	1-3	114	0 25a	0	0 43	-1	—
Unzendake	1-3	243	0 23	-2	0 40	-4	—
Miyazaki	1-4	186	0 25a	-2	0 41	-5	—
Nagasaki	1-5	249	0 26	-2	0 44	-5	—
Koti	1-6	81	0 31a	+1	0 44	-7	—
Kagosima	1-9	207	0 34	0	0 51	-8	—
Tadotu	2-0	61	0 38a	+3	1 5	+3	—
Muroto	2-2	91	0 37	-1	1 3	-3	—
Okayama	2-4	55	0 45	+4	1 15	+3	—
Tomie	2-5	254	0 50	P _e	—	—	—
Sakai	2-6	31	0 44	0	1 21	+4	—
Tokusima	2-6	73	0 46	+2	1 13	-4	—
Husan	2-8	310	0 46	-1	1 35	+13	—
Sumoto	2-9	69	0 51	+3	1 24	0	1-4
Wakayama	3-1	73	0 49	-2	1 23	-6	—
Kobe	3-2	65	0 53	+6	1 33	+1	1-0
Osaka B	3-5	65	1 28	S	(1 28)	-12	—
Siomisaki	3-5	86	0 56a	-1	1 36	-4	—
Toyooka	3-5	50	0 58	+1	1 40	0	1-7
Taikyū	3-6	317	(0 51)	-7	—	—	—
Miyadu	3-6	52	1 3	+5	1 53	S*	—
Yagi	3-7	70	1 32	S	(1 32)	-13	—
Kyoto	3-8	62	1 23	+22	—	—	—
Hikone	4-3	62	1 49	S	(1 49)	-11	—
Kameyama	4-3	67	1 11	+3	1 54	-6	—
Gifu	4-8	62	2 9	S	(2 9)	-3	—
Nagoya	4-8	66	0 1 19	+4	2 12	0	2-9
Toyama	5-7	52	1 29	+1	—	—	—
Wazima	6-0	46	1 35	+3	—	—	—
Kohu	6-2	66	1 46	+11	2 46	-2	—
Nagano	6-3	57	1 50	+14	—	—	—

Additional readings:—

Sumoto eE = +1m.20s., eZ = +1m.24s.

Kobe ePEZ = +1m.2s.

Taikyū reading is given as e = 8h.47m.37s. The necessary correction to the minutes figure has been made to bring it into line.

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Jan. 23d. 8h. 57m. 55s. Epicentre 36°0N. 140°1E.

A = -0221, B = +5202, C = +5852; $\delta = +8$; $h = 0$;
D = +641, E = +767; G = -449, H = +375, K = -811.

Epicentre given in Report Earthquake Research Institute of Tokyo Imperial Univ.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tukubasan	0.2	0	0 12	+ 2	0 17	+ 1	—
Tokyo, Cent. Met. Obs.	0.4	222	10 14 _a	+ 1	0 22	+ 1	0.4
Tokyo I.U.	0.4	222	0 14	+ 1	0 22	+ 1	—
Komaba	0.5	224	0 14	0	0 23	0	—
Mitaka	0.6	233	0 15	0	0 24	- 2	—
Kamakura	0.8	213	0 20	+ 2	0 31	0	—
Kiyosumi	0.8	175	0 18	0	0 31	0	—
Titibu	0.8	269	0 18	0	0 28	- 3	—
Misaki	0.9	205	0 20	0	0 34	0	—
Koyama	1.1	234	0 18	- 4	0 34	- 5	—
Yosiwara	1.4	234	0 18	- 9	0 35	-11	—
Susaki	1.6	214	0 30	0	0 47	- 4	—
Nagoya	2.7	252	0 46	+ 1	1 14	- 5	1.7
Mizusawa	3.2	15	0 54	+ 2	e 1 29	- 3	—
Kobe	4.2	254	e 1 20	P _r	e 2 5	S*	2.6
Toyooka	4.3	266	1 22	P _r	2 17	S _t	2.3
Sumoto	4.6	251	e 1 34	P _r	e 2 22	S*	2.7
Rukuoka B	8.3	257	e 4 21	S*	—	—	—

Additional readings —

Tokyo (Cent. Met. Obs.) i = +19s.

Mizusawa SE = +1m.32s.

Kobe SN = +2m.10s.

Toyooka PZ = +1m.27s.

Sumoto ePN = +1m.36s., eZ = +1m.53s., eSZ = +2m.26s.

Jan. 23d. 10h. 55m. 51s. Epicentre 5°1S. 153°1E.

A = -8883, B = +4507, C = -0883; $\delta = 0$; $h = +7$;
D = +452, E = +892; G = +079, H = -040, K = -996.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	22.3	304	5 2	+ 1	—	—	—	—
Riverview	28.6	184	15 59	- 1	10 46	- 2	—	18.2
Sydney	28.7	184	e 5 45	-16	110 39	-11	15.2	18.4
Adelaide	32.6	202	e 6 51	+16	111 51	0	17.0	—
Melbourne	33.4	192	6 42	0	11 52	-11	14.0	19.4
Titizima	33.7	343	6 49	+ 4	11 51	-17	—	—
Apia	35.7	106	e 7 8	+ 6	112 27	-12	—	—
Manila	37.4	304	17 20 _a	+ 4	13 2	- 3	—	—
Arapuni	38.7	152	—	—	113 39	+14	17.4	21.2
Nake	40.3	323	7 41	+ 1	—	—	—	—
Istakizima	40.6	313	7 19	-24	13 55	+ 1	—	—
Wellington	40.9	155	7 44	- 3	14 24	+26	17.2	22.2
Kosyun	41.6	312	7 59	+ 8	18 55	SS	—	—
Mera	41.7	344	7 59	+ 7	—	—	—	—
Siomisiaki	41.7	339	7 53	+ 3	—	—	—	—
Taft	41.7	313	7 46	- 6	—	—	—	—
Christchurch	42.0	169	17 33	-16	113 56	-18	—	—
Karenko	42.2	314	7 53	+ 2	—	—	—	—
Misima	42.2	343	8 6	+ 4	—	—	—	—
Miyasaki	42.2	333	7 55	- 1	13 29	-48	—	—
Numadu	42.2	343	8 16	+20	—	—	—	—
Simidu	42.2	334	7 58	+ 3	14 2	-15	—	—
Arisae	42.5	314	8 4	+ 6	—	—	—	—
Tokyo	42.5	344	8 2	+ 3	14 14	- 8	18.5	—
Giran	42.6	316	7 56	- 3	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Hunatu	42.6	343	8 1	+ 2	—	—	—	—
Wakayama	42.6	339	8 36	+37	—	—	—	—
Kameyama	42.7	340	8 5	+ 5	—	—	—	—
Kohu	42.7	343	8 3	+ 3	—	—	—	—
Koti	42.7	336	8 15	+15	—	—	16.3	—
Nagoya	42.8	342	8 10	+ 9	—	—	—	—
Sumoto	42.8	339	e 8 3	+ 2	e 14 20	- 6	e 18.4	21.6
Kakioka	42.9	346	7 59	- 3	14 8	-19	—	—
Mito	42.9	346	8 1	- 1	—	—	—	—
Osaka	42.9	339	8 14	+12	—	—	—	—
Osaka B	42.9	339	9 6	+64	—	—	—	—
Taihoku	42.9	316	8 9	+ 7	14 39	+12	—	—
Taiyu	42.9	315	8 19	+17	—	—	—	—
Kobe	E. 43.0	339	e 8 0	- 3	—	—	e 18.0	21.6
	N. 43.0	339	e 7 51	-12	e 13 16	-73	e 17.7	21.6
	Z. 43.0	339	e 7 59	- 4	e 13 20	-69	e 16.4	21.5
Kumagaya	43.0	344	8 3	0	—	—	—	—
Kyoto	43.1	340	8 13	+ 9	—	—	—	—
Gifu	43.1	342	8 10	+ 6	14 27	- 3	17.9	—
Hikone	43.2	341	—	—	e 14 20	-12	—	—
Kumamoto	43.3	333	8 2k	- 3	—	—	—	—
Maebasi	43.3	344	8 10	+ 5	—	—	—	—
Matuyama	43.3	336	8 1	- 4	—	—	—	—
Uzendaake	43.3	332	7 57	- 8	—	—	—	—
Oiwake	43.4	343	8 12	+ 6	14 22	-13	18.2	—
Nagasaki	43.6	332	8 6	- 2	14 37	- 1	—	—
Nagano	43.8	343	8 12	+ 3	—	—	—	—
Perth	43.9	228	8 20	+10	14 45	+ 3	21.8	26.5
Toyooka	N. 43.9	339	8 16	+ 6	—	—	18.9	22.2
Hukuoka B	44.1	333	8 12	0	14 42	- 3	18.0	—
Tomie	44.1	331	8 13	+ 1	—	—	—	—
Toyama	44.1	342	8 17	+ 5	—	—	18.2	—
Hukusima	44.2	346	8 16	+ 4	14 50	+ 4	—	—
Yamagata	44.7	346	9 24	+68	—	—	—	—
Niigata	44.8	345	9 8	+51	—	—	—	—
Mizusawa	45.4	348	e 8 21	- 1	e 15 1	- 3	19.1	—
Batavia	46.0	267	e 8 27	0	1 15 17	+ 5	22.2	—
Husan	46.0	332	8 20	- 7	e 15 8	- 4	e 22.0	—
Akita	46.2	347	8 31	+ 3	—	—	—	—
Hong Kong	46.8	308	e 8 32k	- 1	15 27	+ 3	22.8	24.5
Taiyu	46.8	333	e 8 30	- 3	e 15 19	- 5	—	—
Aomori	47.1	348	8 41	+ 6	—	—	—	—
Z. Hi-ka-wei	47.1	333	8 30	- 5	15 21	- 7	22.6	24.1
Hakodate	48.0	348	8 58	+15	—	—	—	—
Keiryu	48.9	333	e 8 49	- 1	e 15 52	- 1	e 19.5	—
Kinsen	49.0	333	e 8 51	+ 1	1 16 0	+ 5	—	—
Phu-Lien	52.4	301	9 16	0	1 16 50	+ 8	25.2	—
Honolulu	54.8	60	e 9 29	- 5	1 17 11	- 3	e 23.4	—
Medan	55.0	279	e 9 26	- 9	1 17 19	+ 2	—	—
Chinfeng	56.4	327	9 39a	- 6	1 17 31	- 5	1 23.8	29.8
N. Calcutta	69.0	297	e 11 24	+15	20 40	+26	34.0	—
Irkutsk	70.5	332	11 15	- 3	20 27	- 5	30.2	—
E. Colombo	71.1	279	11 41	+ 1	21 12	0	37.3	40.2
Kodakanal	E. 76.8	282	1 11 54	- 1	1 21 48	+ 6	36.4	—
Hyderabad	77.9	290	11 56	0	21 46	+ 1	36.7	49.1
E. Agra	79.1	299	1 12 3	- 5	1 22 1	- 6	37.9	—
College	82.0	22	—	—	e 22 12	-25	e 33.3	—
Bombay	82.5	280	12 23	- 3	22 44	+ 2	—	—
Sempalatinsk	83.1	323	e 12 27	- 2	e 22 48	0	—	—
Almata	83.5	315	12 30	- 1	23 2	+10	—	—
Sitka	84.4	32	e 12 29	- 7	22 56	- 5	e 34.8	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o.		m. s.	s.	m. s.	s.	m.	m.
Frunse	85.1	314	e 12 49	+10	e 23 12	+ 4	—	—
Andijan	86.3	311	e 12 47	+ 2	—	—	—	—
Ukiah	88.3	51	—	—	e 22 50	-49	e 36.3	—
Tashkent	88.7	312	i 12 58	+ 1	i 23 46	+ 3	e 35.7	50.2
Berkeley	88.9	53	e 12 56	- 2	e 23 22	-22	—	—
Samarkand	89.2	310	e 13 2	+ 3	23 57	+10	—	—
Victoria	89.5	42	13 1	+ 1	24 21	+31	e 41.2	—
Seattle	90.1	43	—	—	e 22 15	?	e 36.6	—
Pasadena	91.8	57	e 13 6	- 5	e 24 4	- 7	e 37.2	—
Mount Wilson	z. 91.9	57	i 13 5	- 6	—	—	—	—
Tinemaha	92.0	54	e 13 15	+ 3	—	—	—	—
Sverdlovsk	95.6	327	i 13 29	+ 1	i 24 39	- 4	47.0	50.2
Butte	96.7	45	e 17 33	PP	e 24 1	[- 9]	e 40.5	—
Bozeman	97.7	45	—	—	e 25 9	+ 8	e 40.3	—
Tucson	97.8	58	e 14 42	+ 4	—	—	e 38.5	—
Saskatoon	100.3	38	e 17 51	PP	e 32 9?	SS	e 46.2	—
Tananarive	103.0	249	—	—	e 25 17	-29	—	58.2
Grozny	106.1	314	e 14 24	P	—	—	—	—
Tiflis	107.0	312	e 14 25	P	i 14 26 14	- 8	53.2	56.8
Moscow	108.4	328	14 40	P	e 26 29	S	e 45.7	57.8
Pulkovo	110.4	333	e 14 36	P	e 25 31	[-13]	47.2	64.0
Sotchi	110.4	315	e 19 39	?	—	—	—	—
Little Rock	113.0	55	e 19 26	[+47]	e 25 24	[0]	e 51.3	—
Theodosia	113.0	317	19 41	[+62]	e 30 49	PPS	58.2	—
Madison	113.4	45	e 19 51	[+71]	—	—	—	—
Florissant	113.8	50	i 19 28	[+47]	i 26 39	—	—	56.0
St. Louis	113.9	50	e 19 31	[+50]	e 25 12	[-15]	e 50.7	56.1
Simferopol	113.9	317	e 19 30	[+49]	e 27 5	?	e 57.2	—
Yalta	114.0	316	e 19 41	[+60]	e 29 20	PS	59.7	—
Sebastopol	114.4	317	e 18 33	[- 9]	—	—	e 63.2	—
Scoresby Sund	114.6	358	—	—	e 29 15	PS	52.2	—
Chicago	115.0	46	e 19 1	[+18]	e 25 9	[-23]	e 51.0	—
Ksara	115.4	304	i 19 49	PP	—	—	—	—
Helwan	119.9	301	e 20 21	PP	i 27 45	{+32}	—	—
Toronto	120.1	42	e 20 45	PP	e 25 45	[- 5]	e 50.2	—
Copenhagen	120.6	335	20 33	PP	30 15	PS	52.2	—
Ottawa	121.6	38	e 18 27	[-29]	25 33	[-22]	e 50.2	—
Cape Town	122.2	224	e 20 29	PP	i 26 29	[+32]	e 58.6	64.2
Budapest	E. 122.3	324	19 39	[+42]	—	—	e 60.6	64.6
	N. 122.3	324	19 27	[+30]	—	—	59.1	64.6
Columbia	122.3	53	e 20 18	PP	e 25 51	[- 7]	e 53.3	—
Stara Dala	122.6	326	e 21 14	?	—	—	—	61.2
Belgrade	122.8	321	e 20 40	PP	e 30 38	PS	e 71.5	—
Hamburg	123.1	335	e 21 26	?	—	—	e 53.2	68.2
Prague	123.3	329	e 24 9?	?	—	—	e 52.2	64.2
Vienna	123.4	327	e 19 4	[+ 5]	—	—	e 55.2	—
Seven Falls	123.7	35	e 22 3	?	—	—	e 48.2	—
Chen	124.4	331	e 21 0	PP	e 30 49	?	e 53.2	67.1
Philadelphia	124.5	44	e 20 44	PP	e 25 58	[-.6]	e 57.2	—
Zagreb	125.0	324	e 19 4	[+ 2]	—	—	e 62.2	—
Oak Ridge	125.7	40	i 19 1	[- 3]	—	—	e 59.2	—
Weston	125.9	40	i 19 3k	[- 1]	—	—	e 52.2	—
De Bilt	126.2	336	e 21 8?	PP	—	—	e 53.2	60.8
Triest	126.4	326	e 19 49	[+44]	—	—	e 54.2	64.2
Stuttgart	126.8	331	e 19 12	[+ 6]	—	—	e 61.2	—
East Machias	127.0	36	e 21 38	PP	—	—	e 51.0	—
Uccle	127.5	336	e 19 33	[+26]	—	—	e 55.2	62.0
Strasbourg	127.6	332	e 19 33	[+26]	—	—	e 54.2	—
Zurich	128.0	330	e 18 59	[- 9]	—	—	—	—
Bladston	128.1	342	—	—	e 37 19?	SS	54.2	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Kew	128.8	338	—	—	e 37 9?	SS	54.2	69.1
Huancayo	128.9	110	21 14	PP	e 26 13	[- 4]	e 53.2	—
Paris	129.8	335	e 20 9?	[+57]	—	—	60.2	64.2
La Paz	133.9	120	i 19 18	[- 1]	26 21	[- 8]	63.2	70.0
Algiers	138.2	322	e 17 54	?	e 32 24	?	e 69.2	—
San Juan	139.5	67	23 9	PKS	—	—	e 66.0	—
Toledo	139.7	332	e 19 28	[- 2]	—	—	—	75.8
Almeria	141.3	328	e 19 43	[+10]	—	—	e 73.6	—
Granada	142.5	330	e 19 33	[- 2]	—	—	—	—
San Fernando	143.5	332	e 19 54	[+17]	—	—	69.2	—
Rio de Janeiro	147.9	151	24 9?	?	—	—	—	—

Additional readings :-

Riverview iZ = +6m.6s., iNZ = +6m.27s., iE = +6m.29s., iN = +11m.35s., iE = +13m.8s.
 Adelaide iE = +14m.57s.
 Melbourne i = +9m.39s.
 Apia iPP = +7m.27s., iPP = +7m.54s., e = +8m.58s., e = +9m.56s., isS = +13m.3s., eSS = +13m.56s., e = +14m.59s.
 Manila iZ = +9m.40s.
 Wellington pP = +8m.1s., i = +10m.19s., iP_CS? = +13m.51s.
 Tokyo PP = +9m.22s.
 Wakayama SSS = +18m.6s.
 Nagoya S? = +9m.52s.
 Sumoto ePN = +8m.5s., eEN = +17m.45s.
 Taihoku eP = +8m.12s.
 Perth PP = +10m.9s., PPP = +10m.39s., PPPP = +10m.54s., SP = +15m.4s., iSS = +18m.9s., SSS = +19m.39s., SSSS = +20m.39s.
 Mizusawa ePP = +8m.26s.
 Toyama PPP = +10m.28s.
 Batavia iPZ = +8m.32s., iPE = +8m.34s., iN = +8m.57s. and +13m.57s., iSE = +15m.27s.
 Hong Kong PE = +8m.38s., ? = +9m.4s., PP? = +10m.19s., ? = +14m.26s., SS? = +18m.48s.
 Zi-ka-wai iZ = +8m.46s., iZ = +9m.13s., PPZ = +10m.15s., PPPZ = +11m.1s., PPPPZ = +11m.27s., iZ = +15m.47s., iZ = +16m.27s., SSZ = +18m.23s., SSSZ = +19m.47s., SSSSZ = +20m.23s.
 Phu-Lien PP = +9m.19s.
 Honolulu i = +9m.44s., e = +16m.27s., eS = +16m.50s., e = +17m.7s. and +17m.56s., eSS = +19m.34s., SSS = +32m.1s.
 Medan EE = +9m.38s., iE = +10m.22s., iN = +10m.28s., iE = +18m.3s.
 Chiufeng iP = +9m.46s., iZ = +10m.22s., iSNZ = +17m.36s.
 Calcutta PPN = +14m.4s., PSN = +21m.13s.
 Kodaikanal iPSE = +22m.24s.
 College eSS = +27m.19s., eSSS = +31m.13s.
 Bombay PS = +23m.35s., SSE = +28m.22s.
 Agra iPPE = +15m.13s., PPPE = +17m.0s., PSE = +22m.41s., iSSE = +27m.19s., SSSE = +30m.31s.
 Almata e = +16m.15s.
 Sitka eSKS = +22m.16s., SS = +27m.23s.
 Tashkent eS_CS = +24m.10s., eSS = +29m.33s.
 Berkeley eE = +13m.2s., eZ = +13m.5s., e = +13m.9s., eN = +13m.32s. and +14m.52s., eZ = +16m.47s., eE = +23m.27s., eN = +23m.34s. and +23m.46s.
 Victoria PP = +16m.50s., SKS = +23m.24s.
 Seattle eSS = +28m.15s.
 Pasadena iEZ = +13m.9s., iZ = +13m.45s., eE = +17m.1s., eSN? = +23m.57s.
 Mount Wilson iZ = +13m.46s.
 Tinemaha eE = +16m.47s.
 Sverdlovsk iPP = +17m.18s., iSKS = +23m.58s., iS_CS = +24m.57s., PPS = +26m.32s., SS = +30m.51s., L_q = +41.8m.
 Butte e = +23m.18s., eSKKS = +24m.18s., e = +24m.38s. and +29m.8s., eSS = +31m.40s.
 Bozeman eSKS = +24m.10s., eSS = +30m.27s.
 Tucson ePP = +17m.33s., ePS = +25m.59s., e = +26m.32s., eSS = +31m.45s.
 Tananarive PS = +23m.1s., PPS = +29m.5s., e = +33m.14s.
 Grozny e = +16m.47s.
 Tiflis eZ = +14m.30s., iPPZ = +18m.47s., iEZ = +19m.26s., eSKSE = +25m.3s., ePSZ = +27m.22s., eN = +29m.25s., eSSN = +34m.30s., eN = +39m.27s.
 Moscow PP = +19m.0s., SKKS = +25m.56s., PS = +28m.19s., SS = +34m.27s., SSS = +36m.45s.
 Pulkovo PP = +19m.10s., PS = +28m.31s., SS = +33m.33s., SSS = +38m.33s.
 Little Rock eEN = +20m.37s., eSPE = +28m.20s., eE = +33m.5s., iEN = +39m.48s.

Continued on next page.

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Theodosia e = +14m.47s.
 Madison e = +29m.14s., +35m.9s.
 Florissant IPPPZ = +21m.31s., iSPN = +28m.13s., iZ = +28m.59s., iEN = +29m.25s., iN = +35m.7s., eSSSE = +40m.43s., eN = +43m.47s.
 St. Louis eNE = +20m.0s., eE = +20m.56s., ePPEN = +21m.22s., eNE = +24m.12s., eSPEN = +28m.12s., ePPSEN = +29m.17s., eSSN = +34m.12s., eN = +35m.9s., eE = +39m.22s.
 Chicago eSKKS = +26m.38s., ePS = +28m.1s., +29m.11s., e = +33m.6s., eSS = +34m.57s., e = +39m.36s., eSSS = +39m.56s., e = +47m.1s.
 Ksara iPS = +29m.37s., ePPS = +30m.49s., eSS = +36m.4s.
 Toronto e = +36m.33s., eE = +41m.27s.
 Ottawa PPP = +20m.27s., SSS = +36m.49s.
 Cape Town ePPE = +20m.35s., iPP = +21m.2s., iSE = +29m.45s., iPSN = +30m.45s., iPPSE = +32m.35s., iPPSN = +32m.15s., iSS = +37m.39s.
 Columbia e = +30m.39s., eSS = +36m.36s., eSSS = +41m.27s.
 Prague e = +30m.39s., +37m.39s.
 Vienna e = +20m.50s.
 Seven Falls e = +27m.33s., +30m.21s., and +37m.15s.
 Cheb eSS? = +37m.49s.
 Philadelphia eSKKS = +27m.21s., e = +32m.12s., eSS = +37m.39s., eSSS = +41m.30s., e = +48m.41s. and +50m.21s.
 Zagreb ePNW = +19m.6s., ePNE = +19m.9s., ePZ = +20m.53s., eL_qNW = +56.2m.
 Oak Ridge iZ = +20m.54s., iPPZ = +21m.23s., iSSE? = +38m.7s., eZ = +52m.9s.?
 Weston iZ = +21m.3s., i = +21m.19s., iPPZ = +23m.13s., ePPS = +32m.28s., eSS = +37m.53s.
 Trieste i = +21m.14s., +22m.26s., +31m.21s., +32m.33s., +52m.34s.
 Stuttgart ePP = +21m.14s., e = +21m.33s., ePKS = +22m.26s., eSS = +38m.45s.
 East Machias eSS = +37m.46s., e = +38m.29s.
 Uccle eEN = +22m.29s., eE = +30m.51s., eN = +39m.21s.
 Strasbourg iSKP = +22m.40s., e = +22m.59s.?, +35m.17s., +35m.59s., iSSE = +38m.30s.
 Huancayo e = +21m.56s., ePKS = +22m.11s., e = +22m.34s., PPP = +24m.1s., e = +24m.53s., +27m.6s., and +27m.29s., eSKSP = +30m.49s., PS = +31m.28s., SS = +38m.36s., e = +40m.57s., +41m.18s.
 La Paz PPN = +22m.49s., SSN = +40m.19s., L_qN = +56m.9s.
 Algiers iPP = +23m.6s., ePS = +34m.39s.
 Toledo ePP = +23m.4s.
 Almeria PP = +23m.16s.
 Granada i = +23m.24s.
 San Fernando ePP = +24m.50s., ePPSN = +36m.40s., eSS = +43m.49s.
 Long waves were also recorded at Branner, Durham, Upsala, Bergen, Ivigut, Aberdeen, Jena, Göttingen, Graz, Edinburgh, Stonyhurst, Rathfarnham Castle, Besançon, La Plata, Jersey, Tortosa, and Malaga.

Jan. 23d. Readings also at 1h. (La Paz), 2h. (Medan), 4h. (Wellington), 6h. (near Erevan and Tiflis), 8h. (near Hukuoka B and Sumoto), 9h. (Arapuni, Christchurch, Wellington, Huancayo, La Paz, and near Sumoto), 10h. (Berkeley, Pasadena, and Tucson), 13h. (Perth), 14h. (Andijan, La Paz, La Plata, near Santiago, near Berkeley, Branner, and Lick), 18h. (Tucson), 23h. (near Kobe and Sumoto).

Jan. 24d. 16h. 12m. 45s. Epicentre 56°0N. 129°0E.

A = -3536, B = +4368, C = +8273; $\delta = +2$; $\lambda = -6$;
 D = +777, E = +629; G = -521, H = +642, K = -562.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Irkutsk	14.9	266	e 3 26	+ 2	e 6 30	+ 19	7.5	—
Chifeng	18.1	213	i 2 9k	8	(18 9k)	+ 24	9.6	10.4
Semipalatinsk	28.2	279	e 5 1	- 4	—	—	e 12.5	—
Sverdlovsk	38.4	300	e 7 4	- 4	e 12.42	- 8	17.2	—
Andijan	39.4	271	e 6 30	- 63	—	—	e 20.5	—
Tiflis	53.8	292	e 9 27	+ 1	e 16 52	- 9	e 27.2	30.8
Ksara	64.4	293	e 11 0	+ 20	e 18 23	- 55	—	—

Additional readings:—

Chifeng iZ = +5m.23s.

Tiflis eN = +21m.51s. and +25m.4s.

Long waves were also recorded at Hong Kong, Calcutta, Hyderabad, Frunse, Tchimkent, Tashkent, Moscow, Pulkovo, and Cheb.

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Jan. 24d. Readings also at 1h. (Tiflis), 4h. (Almeria, near Granada (2), and near Malaga (2)), 5h. (Andijan), 6h. (New Plymouth), 7h. (Erevan), 9h. (La Paz), 16h. (Hukuoka B, Heizyo, Taikyū, Zinsen, near Husan, Keizyo, and near Wellington), 19h. (Taikyū, near Heizyo, Husan, Keizyo, Zinsen, and near Wellington), 21h. (Oaxaca and Tacubaya), 22h. (near Batavia), 23h. (Branner and near Santiago).

Jan. 25d. 6h. 34m. 0s. Epicentre 10°-5S. 163°-0E.

(Japanese stations give 7°-0S. 165°-0E.)

A further revision of the origin adopted gives 10°-3S. 163°-1E. with the same time at origin.

A = -0405, B = +2875, C = -1811; $\delta = -1$; $h = +6$;
D = +292, E = +956; G = +173, H = -053, K = -984.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Apia	24.9	101	15 28	+ 2	e 9 45	- 2	—	—
Riverview	25.6	203	e 5 34	+ 2	e 9 47	-12	13.0	14.0
Sydney	25.6	203	e 5 30	- 2	i 9 50	- 9	11.5	13.5
Arapuni	29.7	159	6 48	+38	11 30	+24	13.0	14.0
Melbourne	31.7	208	6 31	+ 4	11 40	+ 3	15.0	17.5
Wellington	32.4	164	6 36	+ 2	11 40	- 8	16.5	18.0
Adelaide	E. 33.0	218	e 6 12	-27	i 12 0	+ 3	15.9	—
Palau	33.5	300	6 40	- 3	—	—	—	—
Christchurch	33.9	168	i 6 50	+ 3	i 12 14	+ 3	16.3	—
Tiritzima	42.5	333	7 58	- 1	—	—	19.8	—
Perth	48.4	236	8 45	- 1	15 42	- 4	23.5	24.0
Manila	48.5	300	18 46 _a	0	15 35	-13	26.0	—
Hatidyozima	48.7	334	8 48	0	15 47	- 3	21.9	—
Naha	49.6	317	8 59	+ 4	16 12	+ 9	23.1	—
Honolulu	49.8	51	—	—	e 16 9	+ 3	—	—
Mera	50.2	335	8 58	- 2	16 9	- 2	—	—
Nake	50.4	321	9 1 _a	0	16 23	+ 9	—	—
Tyosi	50.5	338	9 1	- 1	16 11	- 5	23.4	—
Ito	50.6	335	9 2	0	16 20	+ 3	24.6	—
Omaesaki	50.6	334	9 2	0	—	—	—	—
Misima	50.8	335	9 2	- 2	16 17	- 3	23.8	—
Numadu	50.8	335	9 4	0	—	—	—	—
Shomisaki	50.8	330	9 3	- 1	—	—	—	—
Yokohama	50.8	335	9 5	+ 1	16 21	+ 1	—	—
Tokyo, Cent. Met. Obs.	50.9	336	9 5 _a	0	16 20	- 1	23.9	—
Hamamatu	51.0	334	10 37 _a	?	17 52	?	—	—
Hunatu	51.2	335	9 6	- 1	16 31	+ 6	23.3	—
Kakioka	51.2	337	9 7 _a	0	16 25	0	—	—
Mito	51.2	337	9 6	- 1	16 26	+ 1	25.9	—
Tokubasan	51.2	337	9 7 _a	0	16 22	- 3	—	—
Iwakitama	51.3	313	9 10	+ 2	16 28	+ 2	—	—
Kouu	51.4	335	9 9	0	—	—	—	—
Kumagaya	51.5	335	9 8 _a	- 1	—	—	24.3	—
Muroto	51.5	329	9 8	- 1	16 28	- 1	—	—
Tu	51.5	332	9 19	+10	16 36	+ 7	—	—
Iida	51.6	335	9 2	- 8	—	—	—	—
Kaneyama	51.6	333	9 9	- 1	16 30	+ 1	—	—
Nagoya	51.7	334	9 11	0	16 33	+ 1	23.6	27.1
Shimizu	51.7	328	9 9	- 2	16 27	- 5	—	—
Wakayama	51.7	331	9 10 _a	- 1	16 30	- 2	—	—
Yagi	51.7	331	9 9	- 2	—	—	—	—
Maebashi	51.8	336	9 9	- 3	16 31	- 2	24.3	—
Tokusima	51.8	330	9 21	+ 9	16 52	+19	—	—
Miyazaki	51.9	326	9 10	- 2	16 35	0	—	—
Osaka	51.9	331	9 15	+ 3	—	—	—	—
Osaka B	51.9	331	9 14	+ 2	16 31	- 4	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o	o	m. s.	s.	m. s.	s.	m.	m.
Gihu	52.0	334	9 12 _a	- 1	16 35	- 1	—	—
Koti	52.0	329	9 14 _a	+ 1	16 36	0	—	—
Sumoto	52.0	331	9 10 _a	- 3	(16 33)	- 3	16.6	27.0
Hikone	52.1	333	9 13	- 1	16 36	- 2	—	—
Ibukisan	52.1	333	9 15	+ 1	16 35	- 3	—	—
Kagosima	52.1	324	9 15	+ 1	—	—	—	—
Kobe	52.1	331	9 11	- 3	16 29	- 9	e 21.8	27.5
Kyoto	52.1	332	9 14 _a	0	16 37	- 1	—	—
Matumoto	52.1	335	9 13	- 1	16 24	- 14	24.5	—
Aidu	52.4	337	9 44	+ 28	17 2	+ 20	—	—
Hukusima	52.4	337	9 16	0	16 41	- 1	—	—
Nagano	52.4	336	9 16	0	16 43	+ 1	—	—
Kosyun	52.5	309	9 16	- 1	16 41	- 2	—	—
Matuyama	52.7	328	9 17 _a	- 1	16 44	- 2	—	—
Okayama	52.7	331	9 15	- 3	16 45	- 1	—	—
Sendai	52.7	339	9 18 _a	0	16 46	0	—	—
Taito	52.7	310	9 26	+ 8	—	—	—	—
Miyadu	52.8	331	9 17	- 2	16 45	- 2	—	—
Ooita	52.8	327	9 15	- 4	—	—	—	—
Takada	52.8	336	9 16	- 3	16 57	+ 10	25.2	—
Toyama	52.8	335	9 19	0	16 59	+ 12	—	—
Yamagata	52.9	338	9 19	- 1	—	—	—	—
Kanazawa	53.0	334	9 32	+ 11	16 51	+ 1	—	—
Karenko	53.0	310	9 23	+ 2	—	—	—	—
Kumamoto	53.0	326	9 18 _a	- 3	16 46	- 4	—	—
Toyooka	53.0	331	9 19 _a	- 2	16 49	- 1	23.0	28.8
Niigata	53.1	338	9 42	+ 21	—	—	—	—
Hirosima	53.2	329	9 10	- 12	—	—	—	—
Unzendake	53.2	326	9 17	- 5	16 38	- 14	—	—
Arisan	53.4	309	9 23	- 1	16 42	- 13	—	—
Giran	53.4	312	9 25	+ 1	16 47	- 8	26.0	—
Mizusawa	53.4	339	9 23 _a	- 1	16 54	- 1	24.3	—
Nagasaki	53.4	326	9 22 _a	- 2	16 54	- 1	—	—
Tainan	53.5	310	9 21	- 3	—	—	—	—
Wazima	53.6	335	9 23	- 2	—	—	—	25.5
Hukuoka	53.7	326	9 23	- 2	16 56	- 3	26.0	27.0
Hukuoka B	53.7	326	i 9 24 _a	- 2	16 53	- 6	23.7	27.0
Taihoku	53.7	312	9 24 _a	- 2	16 56	- 3	23.7	30.0
Hamada	53.8	328	9 21	- 5	16 56	- 5	—	—
Taiyu	53.8	310	9 25	- 1	16 59	- 2	—	—
Morioka	53.9	340	9 16	- 11	17 3	+ 1	—	—
Tomie	53.9	324	9 26	- 1	—	—	—	—
Akita	54.3	339	9 28	- 2	17 6	- 1	—	—
Hatinohe	54.5	341	9 30 _a	- 2	17 10	0	—	—
Aomori	55.0	340	9 30	- 5	—	—	—	—
Husan	55.6	326	9 41	+ 1	17 26	+ 1	23.8	—
Urakawa	55.6	343	9 13	+ 27	—	—	—	—
Batavia	55.7	270	i 9 36 _a	- 4	—	—	e 28.0	—
Hakodate	55.9	340	9 44	+ 2	—	—	—	—
Kusiro	55.9	344	9 28	- 14	—	—	—	—
Nemuro	55.9	345	9 42	0	17 25	- 4	25.9	—
Obihiro	56.2	344	9 47	+ 3	17 37	+ 4	—	—
Taikyu	56.4	327	9 55?	+ 10	18 1	+ 25	24.4	—
Sapporo	56.9	342	9 44	- 5	17 43	+ 1	27.8	—
Syuhuri	57.0	326	9 40	- 10	17 34	- 9	—	—
Asahigawa	z. 57.2	343	9 56	+ 5	—	—	—	—
Zi-ka-wai	57.5	318	i 9 49 _k	- 4	17 41	- 9	30.3	35.8
Keiyo	58.5	327	e 10 0	0	e 18 2	- 1	e 26.2	25.2
Zinsen	58.6	326	e 9 57	+ 4	i 18 0	- 4	e 25.0	23.9
Heiyo	60.3	327	e 10 12	- 1	18 27	+ 1	e 26.4	35.0

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Phu-Lien	63.5	300	i 10 33	-1	e 18 47	-20	—	—
Medan	65.5	280	10 46	-1	—	—	—	—
Chiufeng	66.4	323	i 10 51 _a	-2	i 19 36	-7	i 27.1	33.5
Calcutta	80.1	295	12 19	+6	22 15	-3	37.3	—
Irkutsk	80.1	328	11 10	-63	i 21 16	-62	35.0	39.0
College	83.6	19	e 12 15	-17	e 22 31	-22	e 34.1	—
Sitka	84.1	29	e 12 42	+8	e 22 15	-43	34.8	—
Ukiah	84.3	49	e 12 28	-7	23 3	+3	e 38.8	—
Branner	84.5	51	e 12 38	+2	e 23 5	+3	—	—
Colombo	84.5	278	12 35	-1	23 2	0	41.8	55.7
Berkeley	84.6	51	e 12 36	0	i 23 7	+4	—	—
Lick	84.9	51	e 12 37	-1	e 23 13	+7	—	—
Santa Barbara	85.6	55	i 12 43	+2	e 23 20	+7	—	—
Fresno	86.2	53	e 12 48	+4	—	—	—	—
Pasadena	86.7	55	i 12 45	-2	i 23 15	-9	i 36.2	—
Mount Wilson	86.9	55	e 12 48	0	—	—	—	—
La Jolla	87.2	56	e 12 47	-2	e 23 15	-13	—	—
Victoria	87.2	40	12 54	+5	23 32	+4	e 40.0	—
Riverside	87.3	55	e 12 50	0	e 23 14	-15	—	—
Haiwee	87.4	53	e 12 52	+2	e 23 14	-16	—	—
Tinemaha	87.4	52	e 12 52	+2	e 23 21	-9	—	—
Kodalkanal	87.5	281	i 13 51	+60	i 24 46	+75	i 44.7	—
Seattle	87.6	41	e 12 54	+3	23 39	+7	36.5	—
Hyderabad	88.0	288	12 51	-1	23 22	-14	39.4	53.7
Agra	90.3	297	i 12 54	-10	i 23 47	-10	—	—
Dehra Dun	90.9	300	13 30	+23	24 0	-3	39.0	55.0
Tucson	92.3	58	e 13 22	+9	e 24 27	+12	e 42.2	—
Bombay	93.5	288	i 13 21	+2	24 35	+10	48.0	—
Butte	93.6	43	17 4	PP	24 28	+2	e 40.0	—
Almata	94.3	313	e 13 13	-10	e 24 1	[+ 4]	—	—
Bozeman	94.6	44	—	—	e 24 5	[+ 6]	e 39.5	—
Frunse	95.9	312	e 13 40	+10	e 24 1	[+ 5]	—	—
Andijan	97.3	309	e 13 46	+10	e 24 15	[+ 2]	50.0	—
Saskatoon	98.4	39	—	—	e 24 30	[+ 11]	e 45.0	—
Tochimkent	99.5	311	e 17 46	PP	—	—	—	—
Tashkent	99.6	310	e 13 48	+2	i 24 28	[+ 3]	48.7	62.2
Samarkand	101.2	308	e 14 43	+49	e 24 40	[+ 7]	—	—
Tacubaya	101.3	72	e 19 56 ₂	PPP	—	—	—	—
Sverdlovsk	105.5	325	i 14 11	-3	i 26 8	+2	49.6	61.7
Little Rock	107.9	57	e 18 40	PP	e 24 44	[-19]	e 51.5	—
Florissant	109.5	52	e 14 31	P	i 28 29	?	e 51.3	58.3
St. Louis	109.6	52	e 17 46	?	e 25 7	[- 4]	e 51.3	58.0
Madison	109.9	47	e 18 0 ₂	[-33]	—	—	—	—
Tananarive	110.0	245	—	—	25 15	[+ 3]	51.0	57.2
Chicago	111.3	49	—	—	27 7	S	e 49.8	—
Grozny	116.9	313	e 19 0	[+13]	—	—	—	—
Toronto	117.1	46	—	—	e 27 0 ₂	S	e 49.0	—
Columbia	117.3	56	e 20 2	PP	e 25 47	[+ 7]	e 52.1	—
Buffalo	117.6	46	e 19 42	PP	—	—	—	—
Huanchayo	117.9	110	e 19 8	[+19]	—	—	49.8	—
Tiflis	117.9	312	15 11	?	i 25 48	[+ 5]	e 58.0	64.3
Moscow	118.1	327	e 19 45	PP	i 25 48	[+ 5]	54.5	65.6
Erevan	118.4	309	e 20 12	PP	—	—	—	—
Platigorsk	118.7	314	e 20 7	PP	e 25 51	[+ 5]	—	—
Pennsylvania	118.8	49	—	—	e 28 3	?	e 53.4	—
Pulkovo	119.6	334	e 20 0	PP	25 49	[+ 1]	58.0	68.8
Ottawa	120.0	43	e 20 18	?	25 48	[- 2]	e 50.0	—
Scoresby Sund	120.0	2	—	—	30 0	?	50.0	—
Philadelphia	121.0	50	e 20 2	PP	e 25 50	[- 3]	e 53.9	—
Vermont	121.2	44	e 20 20	PP	e 26 0	[+ 6]	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Fordham	121.7	47	e 18 39	[-17]	e 28 48	?	—	—
Seven Falls	121.9	39	e 20 48	PP	e 25 48	[- 8]	e 55.0	—
La Paz	122.7	117	e 19 8	[+10]	e 26 16	[+17]	58.0	80.3
Oak Ridge	z. 122.9	45	1 20 48	PP	e 27 0?	?	—	—
Weston	123.1	45	1 19 0	[+ 1]	e 25 39	[-21]	57.5	—
Cape Town	E. 124.4	215	e 18 54	[- 7]	1 28 9	?	56.4	66.1
Upsala	124.4	339	—	—	e 41 0?	?	e 54.0	78.6
Simferopol	124.5	317	e 20 48	PP	e 29 50	?	62.5	—
Yalta	124.6	316	e 20 47	PP	e 30 41	?	56.0	—
East Machias	125.0	42	e 20 53	PP	e 28 0	?	e 56.7	—
Sebastopol	125.0	318	e 20 50	PP	e 30 45	—	—	—
Ksara	126.5	303	e 19 7	[+ 2]	—	—	—	68.0
Bergen	127.5	346	22 23	PPP	31 18	PS	63.8	80.0
Halifax	127.5	41	—	—	e 25 0?	[-73]	e 39.0	—
Copenhagen	129.4	339	21 21	PP	—	—	56.0	—
Helwan	131.1	300	1 21 40	PP	—	—	—	82.2
Hamburg	131.9	339	1 21 37	PP	—	—	e 60.0	69.0
San Juan	131.9	74	e 19 26	[+10]	—	—	e 59.6	—
Budapest	E. 132.2	327	e 19 47	[+31]	1 26 51	[+26]	e 64.0	80.5
	N. 132.2	327	e 19 53	[+37]	1 26 30	[+ 5]	e 65.5	70.5
Sofia	N.W. 132.5	319	e 19 42	[+25]	—	—	—	70.2
Stara Dala	132.5	328	e 20 6	[+49]	—	—	—	72.5
Prague	132.8	332	e 21 45	PP	—	—	e 61.0	71.0
Belgrade	133.1	322	1 19 20	[+ 2]	1 26 34	[+ 6]	e 59.1	—
Vienna	133.1	329	e 19 15	[- 3]	26 28	[+ 0]	e 73.0	—
Göttingen	133.5	337	e 19 17	[- 2]	—	—	e 61.0	73.0
Cheb	133.7	334	e 21 49	PP	e 32 8	?	e 64.0	77.0
Jena	133.9	334	e 19 17	[- 2]	—	—	e 60.6	69.5
Graz	134.4	328	1 21 51	PP	e 32 13	?	e 69.0	80.6
De Bilt	134.8	341	e 22 0?	PP	—	—	e 59.0	70.4
Zagreb	135.0	327	e 19 28	[+ 7]	e 32 9	?	66.3	78.0
Stonyhurst	135.2	347	—	—	1 37 6	SS	66.0	84.4
Lalbach	N.E. 135.6	329	e 19 44	[+22]	—	—	e 72.8	—
Bidston	135.8	348	—	—	e 32 23	?	65.0	—
Stuttgart	136.0	335	e 19 25	[+ 2]	—	—	e 66.0	82.5
Triest	136.2	329	1 19 24	[+ 0]	1 32 19	?	1 66.0	81.1
Uccle	136.2	341	e 19 29	[+ 5]	—	—	e 57.0	72.2
Rathfarnham Castle	136.5	350	e 22 31	PP	1 33 15	?	62.7	75.0
Strasbourg	136.7	336	1 19 30	[+ 6]	1 26 35	[+ 1]	e 56.0	—
Kew	136.9	345	1 22 12	PP	—	—	65.0	75.9
Chur	137.4	334	e 19 26	[+ 0]	—	—	—	—
Zurich	137.4	335	e 19 24	[- 2]	—	—	—	—
Rio de Janeiro	138.0	142	e 32 26	PP	e 34 23	?	e 57.7	—
Paris	138.5	340	e 19 29	[+ 1]	—	—	65.0	68.0
Florence	138.8	328	e 19 28	[+ 0]	22 30	PP	—	—
Jersey	139.5	346	—	—	1 31 31	?	70.2	—
Tortosa	N. 146.1	336	1 19 44	[+ 3]	—	—	e 47.0	76.7
Algiers	148.2	327	1 19 50	[+ 6]	—	—	75.0	86.0
Toledo	148.6	340	1 19 46	[+ 1]	—	—	—	—
Almeria	150.7	335	e 19 55	[+ 7]	—	—	e 72.7	—
Granada	150.8	338	e 20 1	[+12]	—	—	72.0	—
San Fernando	N. 152.4	341	1 20 29	[+38]	34 1	?	—	—

Additional readings: —

Apla ePPP = +6m.23s., 1? = +7m.26s., eSS = +10m.54s., 1PcS1 = +12m.36s., 1S.S = +15m.45s.

Riverview 1EN = +5m.46s., 1E = +7m.6s., 1N = +7m.10s., 1EN = +10m.8s., 1E = +10m.37s., 1N = +12m.27s.

Melbourne PP = +6m.30s., 1 = +13m.57s.

Wellington pP1 = +7m.3s., PP1 = +7m.45s., pPP1 = +6m.2s., P.P = +6m.34s., 1 = +13m.17s., P.S1 = +13m.4s., L1 = +15.6m.

Christchurch L1 = +14.5m.

Perth P.S = +6m.37s., PP = +11m.6s., PPP = +11m.40s., PPPP = +12m.5s., P.S = +13m.55s., SP = +16m.6s., SS = +19m.10s., SSS = +23m.10s., SSSS = +21m.50s.

Continued on next page.

Honolulu eSSS = +20m.9s.
Tokyo I = +11m.30s.
Hamamatu e = +18m.15s.
Kakioka SS = +19m.33s.
Simidu PP = +11m.8s.
Wakayama PPP = +13m.10s.
Gihu SSS = +22m.7s.
Koti SSS = +22m.36s.
Sumoto eSN = +13m.50s.
Kobe PEN = +9m.14s., eZ = +16m.32s., iSN = +16m.38s.
Hukushima SSS = +22m.13s.
Matuyama SSS = +22m.57s.
Taito PPP = +12m.4s.
Sendai SSS = +23m.8s.
Mizusawa SE = +16m.59s.
Hukuoka SS = +20m.54s., SSS = +22m.30s.
Hamada PP = +11m.15s.
Tomie SS = +21m.8s.
Urakawa SSS = +24m.42s.
Batavia IPE = +9m.38s.
Zi-ka-wel IE = +10m.0s., iZ = +10m.9s. and +10m.41s., PPZ = +12m.21s.,
PPZ = +13m.23s., PPPZ = +14m.2s., iZ = +15m.46s., PSZ = +17m.55s.,
iZ = +18m.41s. and +19m.11s., SSZ = +21m.47s., iZ = +22m.17s. and
+22m.49s., SSSZ = +23m.49s., SSSSZ = +24m.44s., iZ = +25m.2s. and
+26m.23s.
Phu-Lien I = +11m.55s., PP = +12m.44s.
Chiufeng P_cPE = +11m.29s., iS_oSN = +20m.55s., iSSN = +23m.41s.
Calcutta SSN = +27m.24s.
College ePP = +15m.20s., iS = +22m.39s., eSS = +27m.5s.
Sitka ePP = +15m.54s., iPS = +23m.0s., SS = +27m.29s.
Ukiah ePS = +23m.28s., eSS = +28m.42s.
Berkeley eE = +12m.42s., eN = +12m.51s., iZ = +19m.19s.
Mount Wilson iZ = +17m.20s., iSKPKPZ = +43m.25s.
Pasadena IPEN = +12m.48s., iZ = +13m.7s., iPPE = +16m.56s., iN = +23m.28s.
Pasadena SKS = +23m.15s., SS = +29m.32s., e = +36m.0s.†
Halwee eN = +23m.38s.
Tinemaha eN = +23m.39s.
Kodalkanal iSKSE = +24m.14s., iPSE = +25m.50s., iPPSE = +26m.10s.,
iSSE = +31m.15s.
Seattle eSKS = +23m.19s.
Agra PP = +16m.19s., iSKS?E = +23m.21s., PPS?E = +24m.54s., SSE =
+29m.12s.
Tucson e = +13m.44s., ePP = +17m.12s., e = +20m.20s., e = +22m.23s., iSKS =
+23m.58s., e = +24m.7s., ePS = +25m.46s., eSS = +30m.32s., eSSS =
+34m.13s., e = +37m.49s.
Bombay iSKS = +23m.53s., PSE = +25m.30s., SS? = +32m.0s.
Butte e = +23m.11s., eSKS = +23m.58s.
Almata e = +17m.11s.
Bozeman eS = +24m.32s., eSS = +31m.10s., eSSS = +34m.40s.
Frumoe e = +17m.11s.
Andijan e = +17m.32s.
Saskatoon e = +32m.0s.†
Tashkent ePP = +17m.51s., SSS = +36m.30s.
Sverdlovsk iPP = +18m.35s., iSKS = +24m.54s., iPS = +27m.51s., SS =
+33m.12s.
Little Rock ePPPN = +20m.35s., eSEN = +26m.25s., eEN = +27m.20s.,
eSPE = +27m.57s., eEN = +49m.5s.
Florissant ePPZ = +19m.0s., iZ = +19m.44s., ePPPEZ = +21m.18s., iNZ =
+30m.16s., I = +21m.48s., iSSZ = +34m.42s., iZ = +35m.28s.
St. Louis eK = +18m.30s., eE = +18m.45s., ePPE = +18m.50s., eE = +20m.30s.,
eE = +25m.11s., eE = +25m.17s., eSKSE = +26m.11s., iSE = +26m.43s.,
iE = +26m.50s., eSPE = +28m.19s., ePPSE = +29m.10s., eSSE =
+34m.33s.
Tananarive PSE = +28m.23s., SSN = +34m.35s., E = +34m.50s., N =
+35m.7s.
Chicago SS = +34m.54s.
Toronto e = +36m.10s.
Columbia e = +23m.40s., eS = +27m.58s., ePS = +29m.43s., eSS = +36m.3s.
eSSS = +40m.28s.
Buffalo eSP = +29m.39s., e = +31m.3s., SS = +36m.14s., e = +38m.40s., e =
+39m.32s.
Huancaayo e = +19m.31s., ePP = +20m.14s., ePPP = +22m.2s., PS = +30m.3s.
Tiflis PKPZ = +14m.41s., eZ = +19m.54s., iPP = +20m.5s., eSKSN =
+24m.57s., iPPZ = +29m.50s., eEZ = +36m.34s.
Moscow SKS = +27m.3s., PS = +29m.38s., PPS = +31m.30s., SS = +36m.18s.,
SSS = +41m.0s.

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Pennsylvania eN = +36m.31s.
Pulkovo PPP = +22m.51s., SKKS = +27m.3s., PPS = +31m.17s., SS = +35m.54s.
Ottawa PS = +30m.0s.? SS = +36m.24s.
Scoresby Sund +36m.42s.
Philadelphia e = +24m.46s., eSKKS = +27m.11s., e = +28m.16s., iS = +28m.22s., eSKSP = +30m.14s., i = +31m.39s., eSS = +36m.20s., eSS = +37m.8s., i = +40m.8s., iSSS = +41m.38s., e = +50m.20s.
Vermont eSP = +30m.17s., e = +36m.34s. and +40m.10s.
Fordham ePP = +20m.18s., iPP = +23m.14s., eSKKS = +27m.45s., iSP = +30m.48s., iSS = +37m.6s., iSSS = +41m.33s.
Seven Falls e = +30m.36s. and +37m.18s.
La Paz PP = +20m.43s., SKKS? = +28m.20s., PSN = +30m.46s., SSN = +38m.4s., SSZ = +40m.28s.
Oak Ridge iPPZ = +22m.27s., iZ = +30m.33s.
Weston ePZ = +15m.50s., iPSEZ = +30m.44s., eSSEZ = +37m.32s.
Cape Town iE = +20m.54s. and +23m.44s., iSKKSE = +27m.1s., iPSE = +30m.12s.
East Machias e = +21m.25s., ePS = +31m.0s., eSS = +37m.28s., i = +40m.50s., e = +50m.0s.
Ksara iPP = +20m.55s., iPS = +31m.5s.
Bergen ? = +41m.7s.
Copenhagen +22m.36s., SS = +38m.18s.
Helwan i = +22m.37s.
Hamburg iN = +22m.52s.
San Juan e = +19m.45s., ePP = +21m.51s., ePKS = +22m.41s., e = +23m.15s., e = +24m.0s., ePPP = +24m.29s.
Budapest e. iE = +19m.47s., eE = +22m.21s. and +23m.49s., iE = +24m.4s., eE = +24m.21s., and +24m.47s., iE = +25m.8s. and +25m.43s., eE = +27m.2s., iE = +27m.21s.
Budapest n. iN = +20m.32s. and +20m.38s., eN = +20m.51s., iN = +21m.4s., +21m.17s., and +21m.47s., eN = +22m.25s., iN = +23m.4s., eN = +23m.51s. and +26m.30s., iN = +26m.49s., +27m.15s., and +27m.45s.
Sofia eNW = +22m.53s.
Stara Dala e = +21m.25s.
Belgrade i = +21m.45s. and +21m.50s.
Vienna e = +21m.28s. and +21m.54s., PP = +22m.19s., SKP = +22m.52s., e = +27m.19s., +29m.36s., +31m.37s., and +40m.27s., SSS = +46m.30s.
Göttingen iNZ = +21m.46s., i = +22m.33s., iEN = +23m.54s.
Cheb e = +22m.53s., eSS? = +39m.16s.
Jena e = +21m.42s., e = +22m.30s.
Zagreb eZ = +21m.51s., e = +22m.54s., eNE = +23m.54s.
Stonyhurst i = +40m.1s.
Laibach eNE = +22m.2s., +22m.50s., and +31m.49s.
Bidston e = +34m.18s., +39m.53s., i = +45m.33s.
Stuttgart ePP = +21m.59s., ePKS = +23m.3s.
Triest i = +23m.57s. and +40m.11s.
Uccle iPPNZ = +22m.5s., iPKSN = +23m.5s.
Rathfarnham Castle i = +35m.16s., e = +39m.49s., i = +42m.1s. and +44m.57s.
Strasbourg iPP = +22m.9s., iSKKS = +28m.25s., iPPPP = +29m.25s., eS = +30m.28s., iPPPS = +35m.38s., iSSE = +40m.11s.
Kew iZ = +22m.27s., ePS = +32m.29s., ePPP = +34m.26s., eSSN = +40m.4s., iPSSE = +40m.26s., iSSSEN = +45m.25s.
Chur ePP = +22m.9s.
Zurich ePP = +22m.10s., e = +23m.16s.
Rio de Janeiro ePPN = +26m.32s., iSSS = +46m.40s.
Paris PP = +22m.21s.
Jersey i = +39m.0s., and +40m.48s., i? = +41m.28s.
Algiers iPKP₂ = +20m.26s., SKP = +23m.15s., PP = +24m.8s., PPS = +36m.57s., SS = +42m.30s., SSS = +48m.0s.
Toledo ePP = +22m.40s., ePPP = +25m.55s.
San Fernando PKPN = +22m.49s., PPN = +25m.55s., SKSN = +30m.31s., PSN = +36m.38s., SSN = +42m.21s., iE? = +43m.18s., SSSN = +47m.43s.
Long waves were also recorded at Ivigtut, Bucharest, Basle, Kecskemet, Durham, Edinburgh, Aberdeen, and La Plata.

Jan. 25d. Readings also at 1h. (La Paz, Rio de Janeiro, Mount Wilson, and Pasadena), 2h. (Christchurch, Wellington, and near Mizusawa), 3h. (Sverdlovsk and Tashkent), 7h. (Berkeley, Branner, and near Mizusawa), 10h. (Fresno), 12h. (Ksara, Tiflis, Piu-Lien, and near Taihoku), 18h. (Erevan, Grözy, Ksara, Tiflis, and Christchurch), 19h. (Perth), 21h. (Mount Wilson, Tinamah, and Perth), 22h. (Tucson).

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Jan. 26d. 7h. 17m. 52s. Epicentre 12°-6N. 144°-7E.

A = -0.7967, B = +0.5641, C = +0.2168; $\delta = -6$; $h = +6$;
D = +0.578, E = +0.816; G = -0.177, H = +0.125, K = -0.976.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	11.4	244	2 47	0	—	—	—	—
Wakayama	23-2	340	5 1	- 8	—	—	—	—
Hunatu	23-4	348	5 12	+ 1	—	—	—	—
Tokyo, Cent. Met. Obs.	23-4	350	5 17	+ 6	9 12	- 9	—	—
Gihu	23-8	345	5 13	- 2	—	—	—	—
Kumamoto	23-9	331	5 20	+ 4	—	—	—	—
Maebasi	24-2	348	5 27	+ 8	9 28	- 7	—	—
Oiwake	24-3	348	5 21	+ 1	9 42	+ 5	—	—
Nagano	24-7	348	5 25	+ 1	—	—	—	—
Riverview	46-6	173	—	—	e 16 50	?	—	22-8
Melbourne	50-2	180	—	—	e 16 24	?	26-5	28-9
Tinemaha	E. 88-0	53	e 12 58	+ 5	—	—	—	—
Pasadena	Z. 88-8	55	e 12 56	- 1	—	—	—	—
Mount Wilson	Z. 88-9	55	i 12 56	- 2	—	—	—	—
Riverside	Z. 89-5	55	e 12 53	- 7	—	—	—	—
La Paz	N. 148-0	102	e 20 0	[+16]	—	—	—	—

Additional readings:—

Wakayama i = +5m.40s.

Melbourne e = +22m.42s.

Long waves were also recorded at Wellington, Perth, Hong Kong, and Huancayo.

Jan. 26d. Readings also at 1h. (Mount Wilson, Pasadena, Tinemaha, Huancayo, La Paz, and near Santiago), 3h. (near Santiago), 4h. (Mount Wilson and Pasadena), 6h. (Christchurch, Almata, Andijan, Irkutsk, and near Samarkand), 7h. (Chiufeng, Manila, Sverdlovsk, Tashkent, Mount Wilson (2), Pasadena (2), and Riverside (2)), 9h. (near Nagoya), 10h. (Frunse, Andijan, Sofia, and near Samarkand), 14h. (Sebastopol, Simferopol, Yalta, near Bucharest, and Sofia), 15h. (Oaxaca, Tacubaya, Christchurch, Mount Wilson, Pasadena, and Tinemaha), 16h. (Wellington), 19h. (Andijan, Frunse, Tchinkent, and near Samarkand), 20h. (Adelaide, Sydney, Riverview, Christchurch, Wellington, Nagoya, Pasadena, Mount Wilson, and Tinemaha), 21h. (Perth), 22h. (Kobe, Port au Prince, La Paz, La Plata, near Santiago, and near New Plymouth).

Jan. 27d. 7h. 4m. 45s. Epicentre 32°-7N. 130°-8E.

Strongly felt at Kumamoto, moderately at Unzendake, Nagasaki, Miyazaki, and Oita. Radius 200-300kms. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937, Tokyo, 1939, pp. 21-22, macroseismic chart p. 23.

A = -0.5510, B = +0.6383, C = +0.5377; $\delta = +15$; $h = +14$;
D = +0.757, E = +0.653; G = -0.351, H = +0.407, K = -0.843.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Kumamoto	0-2	324	0 3 _r	- 7	0 6	-10	—
Unzendake	0-4	274	0 10 _k	- 3	0 17	- 4	—
Saga	0-7	323	0 14	- 3	0 23	- 5	—
Nagasaki	0-8	272	0 15	- 3	0 26	- 5	—
Oita	0-9	52	0 20 _a	0	0 31	- 2	—
Hukuoka	0-9	340	1 0 17 _a	- 3	0 29	- 5	0-5
Hukuoka B	0-9	340	1 0 18 _a	- 2	1 0 31	- 3	0-5
Miyazaki	1-0	146	0 19 _a	- 2	0 32	- 4	—
Kagosima	1-1	191	0 25	+ 3	0 40	+ 1	—
Simonseski	1-2	5	0 21	- 3	0 38	- 3	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Uwazima	1.6	70	0 29	- 1	0 50	- 1	—
Tomie	1.7	267	0 32 _a	+ 1	0 54	0	+
Simidu	1.8	87	0 34	+ 2	0 59	+ 3	—
Ituhara	2.0	320	0 35	0	1 0	- 2	—
Matuyama	2.0	55	0 36 _k	+ 1	1 4	+ 2	—
Hiroshima	2.2	40	0 36 _k	- 2	1 3	- 3	—
Hamada	2.4	26	0 42	+ 1	1 10	- 2	—
Kotl	2.5	70	0 45 _k	+ 2	1 24	+10	—
Husan	2.8	329	0 51	+ 4	1 26	+ 4	—
Muroto	2.9	79	0 49	+ 1	1 36	+12	—
Tadotu	2.9	57	0 57	+ 9	1 33	+ 9	—
Okayama	3.2	53	1 1	+ 9	1 45	S _r	—
Sakai	3.5	35	0 56	- 1	1 54	+14	—
Tokusima	3.5	65	1 13	+16	2 5	S _r	—
Taiyu	3.7	330	1 8	+ 8	1 54	+ 9	—
Sumoto	3.8	63	1 10 _k	+ 9	2 2	S _r	2.1
Wakayama	4.0	67	1 7	+ 3	2 1	S _r	—
Kobe	4.2	60	e 1 19	+12	e 2 3	+ 6	2.4
Siomisaki	4.2	78	1 7	0	—	—	—
Syuhurei	4.2	327	1 16	+ 9	2 5	+ 8	—
Toyooka	E. 4.4	48	1 16	+ 6	2 20	S _r *	2.6
	N. 4.4	48	e 1 18	+ 8	e 2 18	S _r *	2.5
	Z. 4.4	48	e 1 11	+ 1	e 2 16	S _r *	2.5
Nake	4.5	194	1 16	+ 5	—	—	—
Miyadu	4.6	51	1 16	+ 4	2 30	S _r	—
Yagi	4.6	65	1 21	+ 9	—	—	—
Kyoto	4.7	60	1 21	+ 7	—	—	—
Hikone	5.2	59	1 44	P _r	2 54	S _r	—
Kameyama	5.2	64	1 22	- 1	2 52	S _r	—
Ibukisan	5.4	59	1 21	- 3	2 42	S _r *	—
Gifu	5.6	60	1 27	0	3 1	S _r	—
Nagoya	5.7	63	e 1 21	- 7	3 3	+ S _r	—
Kelkyo	5.8	328	e 1 52	+23	e 2 48	+10	3.6
Zinsen	E. 5.8	326	—	—	e 3 3	S _r	—
Hamamatu	6.1	69	1 30	- 4	—	—	—
Huski	6.6	50	2 13	+32	—	—	—
Kohu	7.1	64	1 47	- 1	3 28	S _r *	—
Nagano	7.2	55	2 0	+11	3 58	S _r	—
Oiwake	7.3	58	1 59	+ 9	3 54	S _r	—
Heiyo	7.6	328	e 2 42	-13	3 54	S _r	—
Tokyo	7.9	66	2 42	-17	—	—	—

Additional readings:—

Sumoto ePN = +1m.13s., SN = +2m.4s.

Toyooka ePE = +1m.16s., SE = +2m.20s.

Zinsen eN = +2m.25s.

Long waves were also recorded at Chinfeng, Hong Kong, Tashkent, and

Sverdlovsk.

Jan. 27d. Readings also at 0h. (Hukuoka B (2), Zi-ka-wel, Hong Kong, Chinfeng, Sverdlovsk, Tashkent, Calcutta, and near Batavia), 1h. (New Plymouth), 3h. (Manila), 4h. (Perth, Christchurch, Wellington, Chinfeng, Hong Kong, Mount Wilson, Pasadena, Riverside, Baku, Sverdlovsk, Tashkent, near Santiago, and San Javier), 5h. (Mount Wilson, Pasadena, Riverside, Tinsaha, Manila, Chinfeng, Hong Kong, Sverdlovsk, and New Plymouth), 6h. (Christchurch, Wellington, Perth, Moscow, Tashkent, Pulkovo, Baku, and Tiflis), 8h. (Zi-ka-wel, Ksara, and near Hukuoka B), 11h. (near Hukuoka and Hukuoka B), 12h. (Tanarivo), 14h. and 16h. (2) (near Hukuoka B), 17h. (near Brevan), 18h. (Nagoya and near Trieste), 19h. (near Hukuoka), 20h. (near Manila), 21h. (near Branner).

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Jan. 28d. 0h. 43m. 42s. Epicentre 32°7'N. 130°8'E. (as on Jan. 27d.).
(given by Japanese stations).

A = -5510, B = +6383, C = +5377; $\delta = +15$; $h = +1$;
D = +757, E = +653; G = -351, H = +407, K = -843.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
			m. s.	s.	m. s.	s.	m.
Hukuoka	0.9	340	10 19 _a	- 1	0 32	- 2	0.6
Hukuoka B	0.9	340	10 19 _a	- 2	10 30	- 4	0.6
Husan	2.8	329	0 51	+ 4	1 26	+ 4	—
Taiyu	3.7	330	0 55	- 5	1 53	+ 8	—
Sumoto	E. 3.8	63	11 11	P*	2 2	S _g	2.3
	N. 3.8	63	1 8	P*	1 59	S*	2.2
Kobe	4.2	60	1 16	P*	2 13	S*	2.3
Toyooka	4.4	48	e 1 11	+ 1	2 14	S*	2.6
Nagoya	5.7	65	e 1 32	+ 4	3 3	S _g	2.6
Kelzo	5.8	328	e 1 53	P _r	e 2 56	S _g	—
Zinsen	5.8	326	—	—	e 2 32	- 6	—
Helzo	7.6	328	e 3 9	S	(6 3 9)	- 14	—

Additional readings:—
Zinsen eSEIN = +3m.3s.
Long waves were given at Hong Kong.

Jan. 28d. Readings also at 0h. (near Hukuoka B), 1h. (near Hukuoka and Hukuoka B), 3h. (near Hukuoka B), 4h. (Misawa), 5h. (Moscow and Pulkovo), 6h. (near Florence), 11h. (Helwan, Kears, Baku, Tashkent, Sverdlovsk, and Bombay), 14h. (Chungking and Hukuoka B), 15h. (Baku, Sverdlovsk, Tashkent, Pulkovo, Hong Kong, Moscow, Tientsin, Calcutta, Copenhagen, and near Batavia), 18h. (near Samarkand), 22h. (Tiflis).

Jan. 29d. 14h. 6m. 55s. Epicentre 22°5'N. 129°8'E.

A = -5104, B = +7712, C = +3905; $\delta = +4$; $h = +4$;
D = +834, E = +552; G = -216, H = +317, K = -925.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Taihoan	5.1	324	10 45	- 6	11 2	- 27	—	1.1
Maaila	5.3	191	2 3	S	(4 8)	S*	8.1	—
Hong Kong	5.6	176	3 9	0	3 54	+ 6	4.4	5.8
Zinsen-wai	E. 5.7	142	e 3 27	0	3 36	- 18	—	5.4
Kelzo	15.3	19	e 3 44	+ 4	e 3 28	L	(8.5)	—
Phi-Lien	15.3	332	e 4 12	+ 27	—	—	e 3.1	—
Osaka	12.4	273	e 4 18	- 4	e 3 32	+ 23	e 3.2	17.4
Calcutta	N. 32.4	273	—	—	e 21 32	- 16	—	—
Sverdlovsk	26.7	524	3 43	S	—	—	—	—

Additional readings:—
Taihoan IN = +1m.2s. IS2 = +1m.4s.
Maaila SEIN = +3m.18s.
Osaka P = +4m.18s.
Calcutta IN = +1m.15s.
Long waves were also recorded at Copenhagen, Pulkovo, Tiflis, Moscow, Strasbourg, and Stuttgart.

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Jan. 29d. 17h. 25m. 19s. Epicentre 21°-5N. 146°-0E.

A = -0.7721, B = +0.5208, C = +0.3644; δ = +16; h = +4;
D = +0.559, E = +0.829; G = -0.302, H = +0.204, K = -0.931.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Nagoya	15.7	332	(3 45)	+ 1	3 45	P	—	3.9
Sumoto	16.1	325	13 47k	- 2	—	—	—	—
Kobe	16.2	325	13 51a	+ 1	—	—	—	—
Mizusawa	18.1	349	e 4 15	+ 1	e 7 19	-16	—	—
Hukuoka	18.3	315	4 15	- 2	7 42	+ 3	—	—
Hukuoka B	18.3	315	i 4 18k	+ 1	7 44	+ 5	—	—
Husan	20.1	317	4 37	- 1	8 23	+ 4	—	—
Taiyū	20.9	318	e 4 40	- 6	e 8 38	+ 3	—	—
Syuhurei	21.5	317	4 56	+ 4	—	—	—	—
Keizyo	23.0	319	e 5 6	- 1	e 9 15	+ 1	e 12.4	—
Zinsen	23.1	318	i 5 5	- 3	e 9 14	- 2	—	—
Zi-ka-wei	z. 24.0	300	i 5 14a	- 3	9 14	-18	—	19.0
Heizyo	24.6	320	i 5 24	+ 1	—	—	—	—
Manila	24.7	258	5 27	+ 3	11 26	?	—	—
Hong Kong	29.5	278	6 10	+ 2	10 55	- 7	—	17.4
Chiufeng	31.4	314	i 6 22k	- 3	11 27	- 5	e 14.4	19.5
Phu-Lien	E. 36.7	277	e 7 10	0	—	—	—	—
Batavia	47.2	239	13 37	+ 1	i 15 25	- 4	—	—
Calcutta	N. 53.2	283	e 9 29	+ 7	i 16 49	- 3	—	—
Perth	60.5	209	e 18 31	S	(18 31)	+ 2	—	—
College	60.7	27	—	—	e 18 23	- 9	e 22.8	—
Agra	E. 61.5	290	10 17	- 4	i 18 31	-11	—	—
Frunse	62.3	308	10 23	- 3	18 48	- 4	—	—
Mishan	64.1	306	10 37	- 1	e 19 13	- 1	—	—
Tashkent	66.4	307	i 10 52	- 1	i 19 37	- 6	e 33.2	43.1
Bombay	68.1	282	i 11 9	+ 5	i 20 2	- 1	—	—
Samarkand	68.4	306	11 4	- 2	e 20 1	- 6	—	—
Sverdlovsk	69.8	325	i 11 13	- 1	i 20 17	- 6	31.7	40.3
Baku	81.0	310	—	—	i 22 27	0	42.7	52.3
Santa Barbara	z. 81.5	57	e 12 22	+ 1	—	—	—	—
Tnemaha	81.7	54	e 12 24	+ 2	—	—	—	—
Haiwee	N. 82.3	54	e 12 27	+ 2	—	—	—	—
Moscow	82.3	326	12 26	+ 1	22 36	- 4	35.2	49.1
Grozny	82.6	314	e 12 31	+ 5	22 42	- 1	—	—
Pasadena	z. 82.8	56	i 12 29	+ 2	—	—	—	—
Mount Wilson	z. 82.9	56	e 12 29	+ 1	—	—	—	—
Pulkovo	83.7	333	12 30	- 2	e 22 56	+ 2	39.7	46.4
Tiflis	83.9	312	12 23	-10	22 52	- 4	39.7	48.3
La Jolla	z. 84.0	57	e 12 35	+ 1	—	—	—	—
Brevan	84.7	311	e 12 39	+ 2	—	—	—	—
Scoresby Sund	87.9	356	—	—	22 41f	-54	—	—
Copenhagen	93.6	335	17 2	PP	—	—	46.7	—
Ksara	93.7	308	e 13 11	- 9	e 24 42	+15	—	—
Cheb	97.8	332	—	—	e 30 41f	SS	e 48.7	58.7
Helwan	99.0	307	—	—	i 24 23	[+ 1]	—	—
Stuttgart	100.1	358	e 17 55	PPf	—	—	e 52.7	—
La Paz	147.4	87	19 49	[+ 6]	—	—	71.9	85.4

Additional readings:—

Nagoya eP = +2m.40s.
Kobe iN = +4m.45s., iE = +5m.8s.
Zi-ka-wei iZ = +9m.50s. and +10m.0s.
Manila iN = +11m.30s.
Phu-Lien e = +5m.33s.
Batavia iPE = +9m.41s.
Calcutta iN = +19m.44s.
Bombay e = +11m.24s., e = +20m.32s.
Baku e = +31m.0s.
Moscow PP = +13m.20s., PPP = +17m.34s.
Pulkovo PP = +15m.42s., PPP = +17m.33s., SS = +28m.11s.
Tiflis ePPZ = +15m.50s., ePPSZ = +24m.8s., eSSN = +28m.34s., eN = +34m.47s.
Ksara ePP = +17m.6s., ePS = +25m.59s.
La Paz iPKPZ = +19m.51s., iN = +19m.53s.
Long waves were also recorded at Udaq, San Juan, Christchurch, Hamburg, De Bilt, Paris, Uccle, Strasbourg, Trieste, and Zagreb.

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Jan. 29d. 17h. 27m. 22s. Epicentre 44°8N. 14°8E.

Felt Force V at Sinj (45°00'N. 14°51'E.), Jablanac (44°42'N. 14°54'E.), Baska (44°59' 14°44'E.), Krivi-Put (45°02'N. 14°57'E.), and at Force III at Trieste. See J. Mihailovic, Yearly Macroseismic Annual XVII, 1937, Belgrade, 1938, p. 7.

A = +.6883, B = +.1819, C = +.7023; δ = +.7; h = -.3;
D = +.255, E = -.967; G = +.679; H = +.179, K = -.712.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
			m. s.	s.	m. s.	s.	m.
Triest	1-1	319	0 23	+ 1	10 38	- 1	—
Laibach	1-2	351	(10 25)	+ 1	(10 43)	+ 2	(0.7)
Zagreb	1-3	39	e 0 24	- 1	10 40	- 4	1.8
Florence	2-7	248	0 54	+ 9	1 21	+ 2	—
Vienna	3-6	17	e 0 58	0	1 27	-15	—
Ravensburg	4-7	312	e 1 32	P _g	e 2 34	S _g	—
Zurich	5-1	303	e 1 18	- 2	e 2 39	S _g	—
Stuttgart	5-5	318	e 1 24	- 1	e 2 53	S _g	—
Basle	5-7	302	e 1 28	0	e 3 14	S _g	—
Neuchatel	5-9	295	e 1 30	- 1	—	—	—
Strasbourg	6-1	311	e 2 23	?	e 2 57	S*	—
Jena	6-5	342	e 1 38	- 1	12 49	- 6	3-6
Besançon	6-6	295	e 2 26	?	e 3 26	S _g	—

Additional readings and notes:—

Laibach i = (+.41s.); readings having been increased by 1m.

Zagreb IPP = +.28s., iSS = +.48s.

Vienna IPP = +1m.12s., S = +1m.58s., S_g = +2m.2s.

Zurich eP_g = +1m.38s.

Stuttgart eP_g = +1m.50s., iS_g = +3m.7s.

Strasbourg eS_g = +3m.18s., iSS = +3m.30s., e = +3m.46s.

Long waves were also recorded at Göttingen.

Jan. 29d. 21h. 18m. 11s. Epicentre 24°0N. 124°0E.

A = -.5114, B = +.7582, C = +.4045; δ = +.2; h = +.4;
D = +.829, E = +.559; G = -.226, H = +.335, K = -.915.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Taihuo	2-5	295	0 41	- 2	1 5	- 9	—	1-5
Zi-ka-wai	z.	7-5	343	e 1 51	- 2	—	3-9	5-8
Hong Kong	9-1	262	3 13?	+ 6	4 37	+37	5-4	5-6
Manila	9-8	193	2 30	+ 6	5 34	S _g	—	—
Kolyyo	13-8	10	e 6 19	S*	—	—	e 10-5	—
Phi-Lien	16-4	262	e 3 51	- 2	—	—	—	—
Chinfeng	17-3	349	4 7 _a	+ 3	7 26	+10	—	12-0
Calcutta	N.	32-7	375	—	e 10 39	-73	—	—
Sverdlovsk	35-7	324	e 9 33	- 2	—	—	27-8	30-7

Additional readings:—

Taihuo iZ = +.49s., iN = +.53s.

Kolyyo eSE = +3m.10s.

Sverdlovsk e = +3m.45s.

Long waves were also recorded at Tiflis, Copenhagen, Palkovo, Cheb, Moscow, Tashkent, and Baku.

Jan. 29d. Readings also at Oh. (Christchurch), Ah. (Aps and Christchurch), 15h. (Adelaide, Perth, Christchurch, and Wellington), 15h. (Göttingen (S) and near Lick), 17h. (Gronau, Tiflis, near Erevan, and near Trieste), 22h. (near Musawa and near Nagoya).

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis	89.4	312	e 12 57	- 3	e 23 26	[- 3]	e 40.7	53.1
Pulkovo	91.2	333	—	—	e 23 30	[- 10]	46.7	56.0
Ksara	98.7	307	e 17 50	PP	e 26 42	PS	—	59.7
Huancayo	140.1	94	e 16 22	?	—	—	e 63.7	—
La Paz	147.3	101	i 19 52	[+ 9]	—	—	—	78.8

Additional readings:—

Nagoya S = +5m.41s.

Chinfeng PPEZ = +8m.37s.

Melbourne I = +21m.22s.

Tashkent e = +20m.59s. and +23m.8s., SSS = +28m.58s.

Moscow e = +35m.18s.

Tiflis eSKSE = +23m.2s.

Pulkovo e = +34m.2s.

Huancayo e = +9m.40s.

Long waves were also recorded at Hong Kong, Christchurch, Wellington, Tucson, San Juan, and other European stations.

Jan. 30d. Readings also at 2h. (Perth), 5h. (Agra, Calcutta, Hyderabad, Cape Town, Tashkent, Baku, Ksara, Tananarive, Perth, and Christchurch), 6h. (Sverdlovsk, Tiflis, and Uccle), 7h. (Ksara), 8h. (near Apia, near Florissant, and Little Rock), 10h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Tinemaha, Huancayo, La Paz, La Plata, near Santiago, and San Javier), 12h. (near Hukuoka B), 13h. (Mount Wilson and Pasadena), 17h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Tinemaha, Riverside, and near Apia), 22h. (Kobe, near Hukuoka B and near Nagoya).

Jan. 31d. Readings at 0h. (Mizusawa), 2h. (East Machias, Madison, Little Rock, Bozeman, Ukiab, Florissant, near Tucson, near Andijan, and Samarkand), 3h. and 4h. (Santiago), 6h. (Nagoya and Tiflis), 8h. (Nagoya and near Sumoto), 11h. (La Paz), 12h. (near Sumoto), 15h. (Tucson), 16h. (near La Paz), 18h. (near Tiflis), 20h. (Samarkand), 21h. (Tiflis), 23h. (Christchurch, Wellington, Phu-Lien, and Calcutta).

Feb. 1d. 9h. 12m. 43s. Epicentre 16° 55. 148° 5E. (Very rough).

A = -8179, B = +5012, C = -2823; $\delta = -14$; $h = +5$;
D = +523, E = +853; G = +241, H = -147, K = -959.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	17.4	173	—	—	7 35	+16	e 14.9	17.3
Arapunt	32.1	137	—	—	e 13 17	85	—	—
Perth	33.4	286	15 12	?	14 32	?	21.0	—
Wellington	33.5	143	15 27	-76	—	—	e 20.3	32.3
Christchurch	33.8	148	(6 46)	0	6 46	P	16.7	—
Manila	41.1	317	7 54	+ 7	13 54	- 7	19.4	—
Hong Kong	51.2	318	—	—	13 37	-28	22.9	24.8
Phu-Lien	55.4	311	—	—	e 17 29	0	25.3	—
Vladivostok	61.3	346	—	—	e 17 12	-37	—	27.1
Chinfeng	63.0	333	12 22	PP?	18 3	-69	e 24.9	29.6
Kodikanal	75.1	296	e 12 34	+48	—	—	—	—
Bombay	82.3	298	e 13 7	+49	e 22 16	+36	—	—
France	85.8	375	e 13 19	+17	—	—	—	—
Andijan	86.5	217	e 13 10	+ 6	—	—	—	—
Tashkent	89.9	212	1 14 16	+ 60	1 23 53	-27	e 41.2	52.1
Samarkand	94.0	210	e 13 19	- 5	—	—	—	—
Santa Barbara	100.0	67	e 13 54	+ 3	—	—	—	—
Pasadena	101.8	55	1 13 37	+ 1	—	—	—	—
Mount Wilson	101.8	55	1 13 38	+ 1	—	—	—	—
Haiwee	102.3	55	e 13 59	0	—	—	—	—
La Jolla	102.3	55	e 14 3	+ 6	—	—	—	—
Tinemaha	102.3	55	1 14 3	+ 6	—	—	—	—
Sverdlovsk	102.3	55	e 14 6	+ 6	—	—	58.3	53.6
Ksara	117.0	229	e 20 25	PP	e 20 19	PS	—	62.3
Pulkovo	118.2	250	e 19 47	?	25 31	SS	59.3	63.3

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	e	m. s.	m. s.	s.	m. s.	s.	m.	m.
Scoresby Sund	195.7	357	80 17	PS	37 5	SS	55.3	—
Huancayo	128.2	121	e 22 27	?	23 22	?	e 39.9	—
La Paz	131.2	131	i 20 9k	[+55]	—	—	65.8	75.6
Cheb	131.4	323	—	—	e 38 17?	SS	e 64.3	68.3
Triest	132.4	317	—	—	e 50 34	?	e 64.3	70.8
Stuttgart	133.9	323	e 33 17?	PPS	—	—	e 66.3	75.3
Chur	134.6	322	e 19 49	[+28]	—	—	—	—
Paris	137.5	327	e 34 17?	PPS	—	—	71.3	—

Additional readings:—

Riverview eSN = +11m.33s.
 Perth PP = +15m.22s., SS = +18m.47s.
 Wellington e = +15m.17s.?
 Christchurch ePZ? = 9h.11m.48s., SS = +10m.27s., L_e = +15.1m.
 Hong Kong SS? = +18m.37s.
 Phu-Lien e = +23m.32s.
 Chiufeng IPS = +18m.29s., SSN = +21m.46s.
 Samarkand e = +21m.17s.
 Mount Wilson iZ = +14m.44s., +17m.34s., and +20m.57s.
 Sverdlovsk e = +17m.45s.
 Pulkovo e = +29m.7s.
 Huancayo e = +32m.28s.
 La Paz PP = +23m.42s.
 Long waves were also recorded at Hyderabad, Cape Town, Ivigtut, Melbourne, Sydney, and other American, European, and Asiatic stations.

Feb. 1d. Readings also at 0h. (Bombay, Irkutsk, Sverdlovsk, Sumoto, Medan (2), and near Batavia), 1h. (Almeria, Ksara, La Paz, Rio de Janeiro, Cape Town, and near Hukuoka B), 2h. (Tiflis and Irkutsk), 3h. (Hastings and Tashkent), 6h. (Triest, Vienna, and Zurich), 7h. (near Santiago), 8h. (Mount Wilson, Pasadena, Sverdlovsk, Tashkent, Samarkand, Hong Kong, Manila, and near Taihokn), 11h. (Hong Kong), 12h. (Hong Kong, Vladivostok (2), and near Sverdlovsk (2)), 13h. (Hong Kong), 14h. (Vladivostok, Sverdlovsk, near Hukuoka and Hukuoka B), 16h. (near Apia), 17h. (Frunse, near Andijan, Samarkand, near Kobe, Sumoto, and Nagoya), 18h. (La Paz, La Plata, Samarkand, near Nagoya, and Sumoto), 19h. (Christchurch, Mount Wilson, Wellington, and Riverside), 20h. (Adelaide, Melbourne, Perth, Christchurch, Pasadena, Calcutta, Manila, Apia, Pulkovo, Pasadena, Mount Wilson, Wellington, Tiflis, and Ksara), 21h. (Andijan, Tashkent, Samarkand, Frunse, Huancayo, Vladivostok, Kodalkanal, Moscow, Copenhagen, Cheb, De Bilt, Uccle, Strasbourg, Stuttgart, Paris, Kew, Scoresby Sund, Florissant, St. Louis, Tucson, and La Paz), 22h. (near Taikyu).

Feb. 2d. 16h. 11m. 8s. Epicentre 44°5N. 148°0E.

A = -6969, B = +3792, C = +6985; $\delta = +2$; $\lambda = -3$;
 D = +530, E = +848; G = -592, H = +370, K = -716.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	e	m. s.	m. s.	s.	m. s.	s.	m.	m.
Mirisawa	7.4	226	e 1 56	+ 4	e 2 58	-20	—	73
Vladivostok	11.7	268	e 2 51	0	—	—	—	—
Nagoya	17.6	226	e 3 14	+11	5 29	+ 3	—	—
Chiufeng	23.9	271	i 5 13	- 3	13 24	- 6	e 10.4	14.8
Nankang	25.9	251	5 36	+ 1	—	—	—	—
Irkutsk	39.7	301	e 7 35	PPF	e 13 13	SS	16.2	19.1
Hong Kong	35.5	242	—	—	13 27	+46	—	21.1
Manila	37.6	226	e 6 57	-21	13 1	- 7	—	—
Almeria	49.7	295	e 4 27	+ 1	e 18 30	+16	—	—
Frunse	51.2	295	e 9 11	+ 2	e 17 15	+47	—	—
Sverdlovsk	53.9	317	13 21	0	16 43	- 8	27.9	24.9
Calcutta	N. 53.7	265	i 10 16	+48	13 27	- 4	—	—
Andijan	53.3	295	e 9 23	- 4	—	—	—	—
Tashkent	54.9	297	e 9 35	0	—	—	—	—
Tashkent	55.8	297	13 41	+ 1	14 21	- 4	e 56.3	39.9

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		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
				m. s.	s.	m. s.	s.	m.	m.
Pulkovo		64.3	330	e 10 29	-10	---	---	33.9	41.1
Bombay		66.6	274	e 10 53	-2	---	---	---	---
Tinianaha	E.	67.6	60	e 11 2	+2	---	---	---	---
Grosny		68.6	310	e 10 59	-7	---	---	---	---
Mount Wilson	Z.	69.5	62	e 11 10	-3	---	---	---	---
Pasadena	Z.	69.5	62	e 11 9	-3	---	---	---	---
Tiflis		70.1	309	11 15	-1	e 20 27	0	e 37.6	45.4
Copenhagen		73.4	356	11 35	-1	---	---	36.9	---
Ksara		80.6	303	11 17	+1	---	---	45.9	62.9
Florisant		81.8	43	---	---	e 22 30	-5	e 44.6	---

Additional readings:—

Irkutsk e = +13m.19s., e = +13m.47s.

Ksara ePP = +13m.10s.

Long waves were also recorded at Strasbourg, Uccle, Stuttgart, Scoresby Sand, Cheb, Prague, and De Bilt.

Feb. 2d. Readings also at 0h. (Perth), 5h. (Andijan and Frunse), 10h. (Berkeley), 12h. (Tananarive), 13h. (Alicante), 14h. (Malabar), 16h. (near Santiago and near San Javier), 18h. (Hastings (3) and Wellington), 21h. (Tiflis and near Hastings), 22h. (near Tananarive).

Feb. 3d. Readings at 0h. (near Christchurch), 1h. (Christchurch, Takaka, near New Plymouth, and Wellington), 2h. (Grosny, Tiflis, Sverdlovsk, Tashkent, Mount Wilson, Pasadena, near Berkeley, Fresno, Brauner, Lick, and near Tananarive), 3h. (Hastings (3), Irkutsk, Sverdlovsk, and Tashkent), 4h. (near Bayjavik), 5h. (Christchurch and Wellington), 6h. (Frunse and Andijan), 7h. (Belgrade, Bucharest, Moscow, Hong Kong, Trieste, Zagreb, and Pulkovo), 8h. (Copenhagen, Sverdlovsk, and Hong Kong), 11h. (Medan, near Samarland, and near Grosny), 12h. (Hong Kong), 13h. (near Trieste), 14h. (New Plymouth and Christchurch), 15h. (near Santiago), 19h. (Mount Wilson, Pasadena, and Riverside), 20h. (Erevan, Tiflis, Nagoya, and near Minsawa), 21h. (Tiflis), 22h. (near Nagoya), 23h. (near Berkeley, Brauner, and Lick, Hakuba B, Nagoya, Toyocita, near Kobe, and Sumoto).

Feb. 4d. 10h. 39m. 46s. Epicentre 49° 0N, 139° 9W.

(as given by Seismographic Report of U.S. Coast and Geodetic Survey).

A = -4145, B = -5418, C = +7525; F = +1; A = -5;

D = -777, E = +979; G = -274, H = -555, K = -539.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
				m. s.	s.	m. s.	s.	m.	m.
Seattle		47.7	494	e 1 12	-2	---	---	e 3.8	---
Osaka		17.3	60	---	---	e 4 8	+ 3	0.4	---
Berkeley	Z.	19.1	164	e 2 50	-1	---	---	---	---
Fresno	E.	14.0	142	e 2 52	+ 0	---	---	---	---
Tinianaha	Z.	14.9	149	e 2 30	+ 3	---	---	---	---
Copenhagen		14.5	89	e 2 27	-14	F 14	+ 23	9.7	---
Osaka (Berkeley)		16.1	111	e 2 29	+ 1	---	---	---	---
Osaka (Fresno)		16.3	113	e 2 28	+ 0	---	---	---	---
Osaka (Seattle)		16.5	115	e 2 27	+ 0	---	---	e 11.5	---
Osaka (Tiflis)	E.	17.3	123	e 2 1	- 0	---	---	---	---
La Jolla	E.	18.4	141	e 2 11	- 7	---	---	---	---
Osaka		18.8	145	e 2 10	- 1	---	---	+ 10	e 9.8
Tokyo		19.8	153	e 2 12	+ 2	---	---	+ 11	e 11.3
Hastings		27.0	29	e 2 37	+ 1	---	---	+ 13	---
St. Louis		28.0	33	e 2 37	+ 1	---	---	+ 14	e 14.9
Osaka		29.1	39	---	---	---	---	+ 20	e 14.9
Osaka (Lick)		29.1	39	---	---	---	---	+ 21	e 14.9
Osaka (Florisant)		29.1	39	---	---	---	---	+ 22	e 14.9
Osaka (Pasadena)		29.1	39	---	---	---	---	+ 23	e 14.9
Osaka (Mount Wilson)		29.1	39	---	---	---	---	+ 24	e 14.9

Fig. 2. Wave and wave group.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M _o
	z.		m. s.	s.	m. s.	s.	m.	m.
Mount Wilson	8.4	134	12 6	0	13 45	+ 2	—	—
Pasadena	8.4	136	12 6	0	13 38	- 5	14.1	—
Riverside	8.9	133	12 14	+ 2	—	—	—	—
Butte	10.7	54	e 2 32	- 6	e 4 33	- 6	e 5.6	—
Bozeman	11.6	58	e 2 47	- 3	e 4 57	- 4	e 5.8	—
Tucson	14.1	121	e 3 27	+ 4	e 6 17	+15	e 7.1	—
Denver	15.5	85	13 50	+ 8	e 6 46	+11	e 7.6	8.6
Saskatoon	17.3	41	e 3 57	- 7	e 7 9	- 7	e 8.9	—
Sitka	17.9	342	e 4 6	- 6	e 7 36	+ 6	e 18.3	—
Des Moines	23.7	76	e 8 53	PeP	—	—	e 12.2	—
Little Rock	26.4	93	e 5 43	+ 3	e 10.19	+ 7	e 14.6	16.0
Florissant	26.7	83	e 5 33	-10	e 10 8	- 9	—	14.0
Madison	26.7	72	e 5 39	- 4	e 10 21	+ 4	e 13.2	—
College	27.8	339	e 5 51	- 2	e 10 35	- 2	—	—
Chicago	28.1	75	e 5 39	-16	e 10 30	-10	14.1	—
Toronto	33.8	69	6 46	0	12 10	0	15.5	—
Columbia	35.4	86	—	—	e 12 33	- 1	e 18.9	—
Ottawa	36.1	65	7 6	+ 1	12 44	- 1	e 17.9	—
Philadelphia	37.7	74	e 7 16	- 3	e 13 3	- 3	e 19.6	—
Shawinigan Falls	37.9	63	7 20	0	13 10	- 7	—	—
Seven Falls	39.1	62	7 22	- 9	13 21	-10	—	—
Weston	39.8	69	e 7 44	+ 8	—	—	18.9	21.4
Scoresby Sund	56.7	24	—	—	22 3	?	30.4	—
Huancayo	69.6	128	e 11 16	+ 3	e 20 27	+ 6	e 28.4	—
Vladivostok	71.7	311	—	—	e 20 56	+11	—	—
Bidston	74.1	82	—	—	e 21 17	+ 5	—	—
Kew	76.6	32	—	—	e 21 40	0	e 37.4	—
La Paz	77.5	125	12 9	+10	—	—	43.4	—
Pulkovo	78.1	12	e 13 17	+15	e 21 55	- 1	38.4	43.2
Irkutsk	78.2	332	e 12 14	+11	e 22 1	+ 2	32.4	—
Uccle	79.0	31	—	—	e 22 4	- 2	e 35.4	—
Cheb	82.5	26	—	—	e 22 27	-15	e 42.4	51.4
Sverdlovsk	83.0	357	12 31	+ 3	22 58	+12	29.4	47.6
Moscow	83.1	10	e 12 58	+29	—	—	—	—
Toledo	83.7	42	e 12 37	+ 5	—	—	—	—
Granada	86.0	44	e 12 59	+16	—	—	—	—
Triest	86.8	28	—	—	e 23 81	+ 6	136.2	39.0
Florence	87.4	39	e 23 17	S	(e 23 17)	-13	—	—
Tashkent	97.6	350	—	—	e 24 15	-45	e 45.4	60.4
Tiflis	97.7	8	e 13 43	+ 5	e 24 21	-40	e 45.7	65.3
Baku	99.5	4	—	—	e 22 18	?	49.4	52.2
Ksara	104.1	17	—	—	e 23 1	?	60.4	65.4

Additional readings:—

- Utah 1 = +41s.
- Berkeley 1 = +1m.1s., 1Z = +1m.26s., eN = +2m.3s., eZ = +2m.3s.
- Brammer 1E = +1m.32s., 1N = +1m.43s., eN = +2m.2s., 1N = +2m.20s.
- 14s 1E = +1m.11s.
- Fresno 1N = +2m.44s.
- Seattle e = +2m.3s.
- Mount Wilson 1 = +2m.8s.
- Pasadena 1 = +2m.7s.
- Butte e = +4m.16s.
- Bozeman e = +2m.58s., e = +5m.17s., e = +5m.27s., i = +6m.34s., j = +5m.3s.
- Tucson e = +5m.45s.
- Denver eN = +3m.52s., 1E = +4m.3s., eN = +4m.37s.
- Sitka 1P = +4m.18s., 1PP = +4m.23s., 1PP = +4m.35s., 1S = +7m.47s., e = +5m.7s.
- Little Rock eN = +6m.3s., ePPP = +6m.33s., eN = +13m.17s.
- Florissant eN = +12m.45s.
- College e = +12m.3s.
- Chicago e = +13m.3s.
- Ottawa 1S = +14m.57s.
- Philadelphia e = +16m.38s., eS = +17m.68s.
- Huancayo e = +14m.3s., e = +17m.37s.

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Irkutsk e = +14m.42s., +16m.6s., and +26m.28s.
 Uccle e = +28m.15s.
 Florence eS = +27m.57s.
 Tashkent e = +34m.21s.
 Baku e = +34m.14s.

Long waves were also recorded at De Bilt, Strasbourg, Paris, Rio de Janeiro, Stuttgart, San Juan, Honolulu, East Machias, Ivigtut, San Fernando, Stonyhurst, Copenhagen, Pennsylvania, Oak Ridge, and Hamburg.

Feb. 7d. Readings also at 1h. (Baku Tifis, Platigorsk, Grozny, and near Erevan (2)), 2h. (Ksara, Tashkent (2), Sverdlovsk, Samarkand, near Almata, Andijan, and Frunse), 3h. (Granada and near Almeria), 4h. (near Wellington), 5h. (near Ferndale), 10h. (near Apia), 11h. (Manila and Tifis), 12h. (near Ferndale), 13h. (Frunse and near Andijan), 14h. (Frunse and near Andijan (2)), 16h. (near Samarkand), 17h. (Erevan and Grozny), 19h. (Triest and near Hukuoka B), 20h. (near Christchurch), 21h. (Christchurch, (2), Triest, and near Ferndale).

Feb. 8d. 8h. 36m. 13s. Epicentre 4°5S. 102°0E. (very approximate).

A = -2073, B = +9752, C = -0779; $\delta = +6$; $h = +7$;
 D = +978, E = +208; G = +016, H = -076, K = -997.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	5.1	109	1 16	- 4	1 2 23	+ 3	—	—
Medan	8.7	338.	2 26	PP	e 4 50	S _f	—	—
Manila	26.7	44	6 23	PP	12 26	?	19.4	—
Kodaikanal	e. 28.5	301	—	—	1 10 47	+ 1	—	—
Bombay	37.0	310	e 8 47?	PP	—	—	—	—
Agra	e. 39.1	325	—	—	e 13 1	- 30	—	—
Chiufeng	46.2	14	e 8 27	- 1	e 15 30	+ 15	—	31.7
Tashkent	54.5	330	—	—	e 17 5	- 5	e 30.7	36.3
Vladivostok	54.6	27	—	—	e 24 43	?	31.8	—
Irkutsk	56.6	2	—	—	e 17 43	+ 5	30.8	33.8
Tifis	69.4	317	e 11 16	+ 4	20 14	- 4	e 37.8	—
Sverdlovsk	69.7	337	1 11 15	+ 1	20 21	- 1	32.8	—
Ksara	73.0	307	e 12 2	+29	21 32	+32	—	44.8

Additional readings:—

Batavia IN = +2m.55s.

Bombay e = +15m.47s.?

Agra IL = +17m.27s.

Tashkent I = +17m.8s., e = +19m.13s. and +21m.41s.

Irkutsk e = +23m.55s.

Tifis ePSN = +20m.30s.

Long waves were also recorded at Baku, Hong Kong, Phu-Lien, and Christchurch.

Feb. 8d. 12h. 18m. 19s. Epicentre 33°5N. 132°0E. (as given by Hukuoka).

A = -5591, B = +6210, C = +5493; $\delta = -4$; $h = +1$;
 D = +748, E = +669; G = -368, H = +408, K = -836.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Hukuoka	1.3	374	1 0 35k	0	1 0 42	- 2	—
Hukuoka B	1.3	374	0 39	+ 4	1 0 47	+ 3	—
Sumoto	2.6	70	0 42	- 2	1 13	S _f	1.4
Kobe	2.9	86	1 0 41a	- 1	1 29	S _f	1.7
Husan	3.0	303	e 0 48	- 2	e 1 17	- 10	—
Toyooka	3.1	49	(e 0 57)	+ 8	e 1 56	S _f	1.8
Takyo	3.7	311	1 8	P _f	2 14	+29	—
Nagoya	4.4	67	e 1 8	- 1	2 32	S _f	3.0
Keloyo	5.6	316	e 2 34	S	(e 2 34)	+ 4	—

Additional readings and note:—

Sumoto eSZ = +1m.20s.

Toyooka P has been increased by 1m.

Keloyo eDEN = +3m.30s.

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Feb. 8d. Readings also at 1h. (Almeria), 2h. (near Sumoto, Kobe, Nagoya, and Toyooka), 4h. (Christchurch), 5h. (Frunsa and near Andijan), 13h. (near Mizusawa), 14h. (College and Tiflis), 17h. (La Paz), 18h. (near Algiers), 20h. (Christchurch), 21h. (near Manila).

Feb. 9d. Readings at 1h. (Medan), 6h. (Andijan and near Reykjavik), 9h. (Samar-kand, and near Nagoya), 11h. (near Andijan), 14h. (near Apia), 17h. (Andi- jan), 19h. (Tiflis), 20h. (Tiflis, Oak Ridge, and near Fresno), 21h. (La Paz).

Feb. 10d. 8h. 14m. 41s. Epicentre 36° 6N. 7° 5E.

Epicentre 12km. S.E. of Guelma. Felt force IX at Lapaine and Bled Gafar. Macroseismic radius about 100kms. See note on the earthquake of 10th Feb- ruary, 1937, in "Algers," pp.106-111, "Annales de l'Institute de Physique du Globe," Strasbourg University.

A = +7978, B = +1650, C = +5936; $\delta = -15$; $h = 0$;
D = +131, E = -991; G = +589, H = +077, K = -808.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Tunis	2.1	85	0 41	P.	—	—	—	—
Algiers	3.6	273	0 41	S	(0 1 41)	- 1	—	—
Tortosa	6.9	310	0 2 49	S	(2 49)	- 16	5.1	7.1
Florence	7.7	30	1 49	- 7	2 59	- 35	4.1	4.8
Almeria	8.0	273	0 2 32	P.	0 4 13	S.	0 4.6	—
Granada	8.9	277	0 2 12	0	0 4 40	S*	—	—
Padova	9.4	19	0 1 57	-21	4 57	+ 8	—	—
Toledo	9.6	294	1 2 30	- 1	0 4 30	+ 3	0 4.9	7.1
Triest	10.2	35	0 1 19	+	—	—	0 4.8	8.6
Neuchatel	10.4	358	0 2 39	+ 5	—	—	—	—
Zurich	10.8	3	0 2 2	+23	—	—	—	—
Basle	10.9	0	0 2 47	+ 7	—	—	—	—
San Fernando	11.1	274	—	—	0 5 3	+ 14	—	—
Eggeb	11.2	32	0 2 43	- 1	—	—	0 5.6	6.8
Gras	12.0	27	1 3 55	0	0 5 7	+ 4	0 5.3	8.4
Strasbourg	12.0	1	0 2 47	+ 2	0 5 27	+ 16	0 5.3	—
Stuttgart	12.4	5	0 3 10	+12	0 5 24	+ 5	0 6.1	9.6
Vienna	13.3	26	2 16	-57	0 4 9	—	—	—
Chab	13.8	13	0 0 19	—	—	—	0 7.3	10.9
Ucle	14.4	352	0 3 25	- 2	0 6 19	+ 1	0 6.8	8.1
Hamburg	17.1	4	—	—	0 6 19	- 53	0 9.3	11.3
Bathurstham Castle	18.2	232	1 5 25	+56	1 9 59	—	12.0	14.2
Copenhagen	18.4	5	1 2 20	0	2 7	+ 3	11.3	—
Hawa	21.0	193	0 4 43	+ 1	1 3 45	+ 3	—	19.8
Sevastopol	21.8	48	2 47	+	—	—	—	—
Aberdeen	21.9	345	5 47	+58	0 8 59	+ 7	—	13.9
Tokyo	21.7	90	0 4 45	-10	0 8 55	+ 7	—	—
Sancti Spiritus	21.8	54	0 4 55	+ 3	0 9 16	+24	—	—
Osaka	22.0	80	1 3 11	—	1 9 27	+ 7	—	—
Pelivoro	27.0	34	2 30	+ 7	1 0 45	+29	14.3	16.1
Moscow	28.0	97	0 3 42	+ 1	0 10 49	+11	13.3	27.2
Paris	28.0	67	0 3 4	+ 1	0 10 39	—	0 14.2	—
Brussels	28.0	83	1 1 23	+ 1	0 12 25	- 7	21.4	29.1
London	28.0	82	0 9 15	+27	—	—	—	23.8
Vladivostok	28.0	97	—	—	0 27 19	+	25.7	30.0

Additional readings

Algeria 12h. + 1m. 30s. Az. = + 2m. 10s. P. = + 3m. 2s.

Tortosa 13h. + 1m. 30s.

Strasbourg 14h. + 1m. 30s.

Bathurstham Castle 15h. + 1m. 30s. + 1m. 10s.

Hawa 16h. + 1m. 30s.

London 17h. + 1m. 30s.

Tokyo 18h. + 1m. 30s. + 1m. 10s. + 1m. 30s. + 1m. 10s.

Long wave area with readings at Osaka, Chiba, Tokyo, Nagoya, and Manila.

Source: Bull. Intern. Geophys. and Astron. Union, 1937, No. 1.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata	66.1	321	e 10 56	+ 5	—	—	—	—
Andijan	67.8	316	e 11 4	+ 2	e 20 2	+ 2	—	—
Tashkent	70.2	316	e 11 39	+22	1 20 26	- 2	e 32.8	—
Samarkand	71.1	314	e 11 15	- 7	—	—	—	—
Sverdlovsk	81.4	329	e 12 25	+ 5	e 22 34	+ 3	—	—
Baku	83.9	311	—	—	e 23 7	+11	—	—
Grozny	87.4	314	e 13 5	+15	—	—	—	—
Moscow	93.8	325	e 13 20	0	e 24 55	+27	—	—
Ksara	94.4	303	e 13 31	+ 8	e 24 59	+26	—	—
Pulkovo	97.6	329	17 54	PP	24 14	[- 1]	—	—
Copenhagen	107.8	328	19 5	PP	25 9	[+ 6]	59.4	—
Cheb	109.6	322	e 21 25?	PPP	—	—	e 63.4	80.5
Stuttgart	112.0	321	—	—	(e 27 25?)	SKKS	e 27.4	—
Strasbourg	113.0	322	e 19 42	PP	—	—	e 60.4	73.4
De Bilt	113.1	326	—	—	e 26 25?	SKKS	e 65.4	75.1
Paris	116.1	323	e 19 59	PP	e 29 30	PS	74.4	—
Huancayo	151.4	124	e 20 3	[+14]	—	—	e 77.2	—
La Paz	153.8	141	e 20 11	[+18]	44 25	SS	78.4	—

Additional readings :—

Perth SS = +10m.25s., SSS = +10m.45s., SSSS = +11m.0s.
 Medan eP = +7m.18s., eSE = +11m.7s.
 Adelaide i = +5m.34s., +8m.46s., e = +14m.36s.
 Riverview eE = +12m.1s., eN = +15m.26s.
 Melbourne i = +16m.34s.
 Chufeng i = +8m.34s., iNZ = +9m.7s., PPNZ = +10m.8s., iN = +15m.10s.
 Wellington i = +24m.57s.
 Bombay P_cPE† = +11m.14s., e = +13m.16s., S_cSE = +20m.18s.
 Irkutsk e = +23m.25s.†
 Tashkent ePP = +15m.43s., ePPP = +20m.19s., PS = +24m.13s., ePPS = +25m.19s.
 Sverdlovsk i = +22m.36s., SKS = +22m.44s.
 Moscow PKP = +17m.15s., e = +22m.39s., eSKS = +23m.36s.
 Ksara e = +26m.7s., +26m.41s.
 Pulkovo e = +22m.15s. and +26m.1s., SS = +33m.13s., e = +36m.2s.
 Strasbourg ePPP = +22m.2s., ePS = +29m.12s.
 Huancayo e = +20m.23s., +31m.23s., +35m.59s.
 Long waves were also recorded at Tucson.

Feb. 19d. 5h. 33m. 29s. Epicentre 35°2N. 98°2E.

A = -1166, B = +8106, C = +5739; $\delta = +8$; $h = 0$;
 D = +990, E = +143; G = -082, H = +568, K = -819.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Chufeng	15.0	66	e 3 33	- 2	1 6 45	+22	7.4	9.9
Calcutta	N. 15.3	217	3 41	+ 2	6 54	+24	8.6	10.8
Phu-Lien	16.2	151	3 57	+ 7	e 7 11	+20	8.5	9.4
Irkutsk	17.6	12	4 6	- 2	7 24	+ 1	9.2	—
Almata	18.3	303	4 14	- 3	e 7 30	- 9	—	—
Agra	19.0	350	4 18	- 8	7 57	+ 2	—	11.4
Hong Kong	19.0	128	4 26	0	8 11	+16	10.5	11.1
France	19.2	329	e 5 30	PPP	—	—	—	—
Semipalatinsk	20.0	325	e 4 33	- 4	—	—	—	—
Andijan	21.1	292	e 4 44	- 4	e 3 50	+11	—	—
Arkan	22.8	115	5 10	+ 5	9 30	+19	—	—
Zinsen	N. 23.0	76	e 6 42	?	e 11 44	?	—	—
Tashkent	23.4	293	5 10	- 1	10 25	+ 4	112.5	13.6
Hyderabad	24.0	330	6 31	+ 5	10 4	+17	12.3	15.3
Samarkand	25.1	289	5 28	- 3	—	—	—	—
Vladivostok	27.1	63	e 5 48	0	e 10 42	+18	—	18.1
Bombay	27.7	241	e 6 53	+ 1	1 10 56	+23	14.6	17.2
Kodakanzai	N. 21.2	283	e 6 25	+ 2	e 11 41	+13	—	—
Sverdlovsk	33.3	327	1 6 41	0	1 12 2	0	17.4	19.0
Moscow	45.1	316	e 8 27	- 1	—	—	18.0	23.8
Ksara	50.0	287	1 9 1.	- 1	e 10 23	+ 6	—	—

For Notes see next page.

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NOTES TO FEB. 12d. 5h. 33m. 29s.

Additional readings:—

Aimata e = +10m.24s.
 Agra SSE? = +8m.41s.
 Hong Kong PP = +4m.41s., SS = +8m.52s.
 Frunse e = +9m.25s., e = +11m.37s.
 Samarkand e = +6m.4s.
 Vladivostok e = +11m.43s., e = +12m.25s., e = +14m.42s.
 Sverdlovsk L₀ = +14.8m.

Long waves were also recorded at Taito, Taityu, Keizyo, Tainan, Medan, Taihoku, Pulkovo, Scoresby Sund, and several European stations.

Feb. 12d. 7h. 56m. 1s. Epicentre 36° 0N. 139° 9E.

A = -.6203, B = +.5223, C = +.5852; $\delta = +3$; $\lambda = 0$;

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.
Tokyo	0.3	201	0 12	+ 1	0 23	+ 5
Tukubasan	0.3	37	0 13	+ 2	0 22	+ 4
Komaba	0.4	207	0 12	- 1	0 22	+ 1
Mitaka	0.5	220	0 13	- 1	0 24	+ 1
Kamakura	0.7	203	0 13	- 4	0 25	- 3
Titibu	0.7	269	0 23	+ 6	0 35	+ 7
Kiyosumi	0.9	165	0 23	+ 3	0 36	+ 2
Misaki	0.9	195	0 13	- 7	0 29	- 5
Koyama	1.0	229	0 23	+ 2	0 36	0
Nagoya	2.5	251	e 0 41	- 2	e 1 37	S _r
Mizusawa	E. 3.3	17	—	—	1 31	- 4

Feb. 12d. 19h. Epicentre reported to be Hu San Province, China. See Seismo. Bull. Cent. Met. Obs., Tokyo, page 82.

Hong Kong P_i = 23h.21s., PP_i = 24m.9s., L = 32m.20s., M = 36m.26s.
 Azinkoto P = 27m.35s., S = 29m.38s.
 Taihoku P = 27m.46s.; S = 29m.50s., M = 30m.30s.
 Girau P = 27m.50s., S = 30m.5s.
 Taito P = 27m.56s.
 Taityu P = 27m.56s., S = 30m.31s.
 Arisan P = 28m.8s., S = 30m.16s.
 Tainan P = 28m.37s.
 Nanking P = 29m.1s.
 Chufeng eP_iN = 29m.47s., eSN = 33m.5s., M = 40m.42s.
 Kosyun P = 30m.20s.
 Vladivostok e = 30m.22s., L = 39m.48s., M = 44m.45s.
 Manila P = 32m.13s., S = 34m.45s., L = 36m.15s.
 Keizyo eE = 36m.54s.
 Tashkent e = 39m.54s., 45m.12s., 48m.24s., 50m.2s., and 54m.44s., M = 59m.24s.
 Calcutta eN = 39m.57s.
 Keara e = 40m.25s. and 47m.15s.
 Sverdlovsk e = 43m.33s., L = 60m.0s.
 Pulkovo e = 35m.53s., L = 62m.0s., M = 72m.6s.
 Long waves were also recorded at Phu-Lien, Uccle, Irkutsk, Moscow, Copenhagen, Strasbourg, De Bilt, and Paris.

Feb. 12d. Readings also at 0h. (near New Plymouth), 1h. (near Mizusawa), 3h. (Aia), Pasadena, Batavia, and Tinamaha), 4h. (Strasbourg, and Christchurch), 5h. (Baku), 7h. (Adelaide, near Hukuoka B and near Mizusawa), 9h. (near Lick), 11h. (near Santiago and San Javier), 12h. (Tiflis (2), Grosny (2), near Bucharest, Sofia, and near Tananarive), 13h. (Tiflis and Grosny), 14h. (Oak Ridge), 15h. (Batavia and Medan), 18h. (Oak Ridge, La Plata, La Paz, Hailwe, Mount Wilson, Pasadena, Riverside, Santa Barbara, and Tinamaha), 19h. (Tucson, Mount Wilson, Riverside, Tinamaha, Tiflis, and near Irkutsk), 20h. (Mount Wilson (2), Pasadena (2), Riverside, Tucson, Stuttgart, and near Manila), 21h. (Tiflis), 22h. (Berkeley, Brauner, Fresno, Tucson, and near Lick and Zurich).

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Feb. 13d. 2h. 17m. 56s. Epicentre 31° 5N. 56° 0E.

A = +4777, B = +7082, C = +5199; $\delta = +4$; $k = +1$;
D = +829, E = -559; G = +291, H = +431, K = -864.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand	12.1	44	2 44	-13	e 4 47	-27	—	—
Tiflis	13.6	322	e 3 33	+16	e 7 46	L	8.7	—
Grozny	14.9	329	e 3 25	-1	e 6 13	+ 7	—	—
Andijan	16.1	50	e 3 54	+ 5	—	—	e 8.1	—
Ksara	17.1	283	—	—	e 7 59	SSS	e 10.2	—
Frunse	18.6	47	e 4 16	- 5	e 8 0	SS	e 9.4	—
Sverdlovsk	25.5	6	e 5 32	0	e 9 47	-10	13.1	—
Triest	35.5	306	—	—	e 13 39	?	—	15.4
Florence	37.1	302	e 11 5	?	—	—	—	14.1
Cheb	37.2	313	—	—	e 14 53	+63	e 16.1	19.1
Granada	48.8	294	—	—	e 11 53	?	—	—

Long waves were also recorded at Pulkovo, Semipalatinsk, and other European stations.

Feb. 13d. Readings also at 0h. (Tiflis), 1h. (Tinmahs and Tashkent), 2h. (Mount Wilson, Pasadena, and near Algiers), 5h. (Chinfeng, Hong Kong, Irkutsk, Vladivostok, Sverdlovsk, Keiyo, near Hukuoka, and Hukuoka B), 6h. (Copenhagen, Stuttgart, Fresno, near Berkeley and Branner), 11h. (Phu-Lien, Chinfeng, Hong Kong, Irkutsk, Medan, Bombay, Calcutta, Frunse, Sverdlovsk, Tiflis, Andijan, Amata, Baku, Pulkovo, Moscow, Copenhagen, De Bilt, Strasbourg, Paris, Stuttgart, Kiyansyo, and La Paz), 13h. (Toyooka), 18h. (near Santiago and San Javier), 19h. (near New Plymouth and Wellington), 25h. (Andijan).

Feb. 14d. 1h. 5m. 14s. Epicentre 33° 3N. 132° 1E. (given by Japanese stations).

A = -5616, B = +6214, C = +5464; $\delta = -3$; $k = +1$;
D = +742, E = +670; G = -366, H = +405, K = -836.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka	1.4	291	0 27	0	0 49	0	—	—
Hukuoka B	1.8	291	0 27	0	0 43	- 3	—	—
Samoto	2.6	66	0 43	0	1 23	S _c	—	—
Kobe	3.9	89	e 6 54	P _c	e 1 32	—	—	—
Husan	3.1	508	0 32	+ 1	1 26	- 3	—	—
Toyooka	3.2	44	e 1 1	F _c	1 45	E _c	—	—
Yokya	3.2	313	1 1	—	1 59	S _c	—	—
Nagoya	4.4	64	e 1 11	—	2 13	S _c	—	—
Keiyo	5.3	317	e 1 49	P _c	2 22	S _c	—	—
Osaka	5.1	315	e 2 14	?	e 2 5	S _c	—	—

Additional readings —

Keio 12N = +1m. 0s. 11N = +1m. 33s.

Toyooka 22 = +1m. 1s. 22N = +1m. 3s. 22E = +1m. 13s.

Feb. 14d. Readings also at 1h. (Hankow), 2h. (Florence and near Madrid), 3h. (Hankow, near Moscow and Moscow), 4h. (Hankow, near Moscow and Moscow), 5h. (Hankow, near Moscow and Moscow), 6h. (Hankow, near Moscow and Moscow), 7h. (Hankow, near Moscow and Moscow), 8h. (Hankow, near Moscow and Moscow), 9h. (Hankow, near Moscow and Moscow), 10h. (Hankow, near Moscow and Moscow), 11h. (Hankow, near Moscow and Moscow), 12h. (Hankow, near Moscow and Moscow), 13h. (Hankow, near Moscow and Moscow), 14h. (Hankow, near Moscow and Moscow), 15h. (Hankow, near Moscow and Moscow), 16h. (Hankow, near Moscow and Moscow), 17h. (Hankow, near Moscow and Moscow), 18h. (Hankow, near Moscow and Moscow), 19h. (Hankow, near Moscow and Moscow), 20h. (Hankow, near Moscow and Moscow), 21h. (Hankow, near Moscow and Moscow), 22h. (Hankow, near Moscow and Moscow), 23h. (Hankow, near Moscow and Moscow), 24h. (Hankow, near Moscow and Moscow).

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Feb. 15d. 2h. 17m. 37s. Epicentre 66°5N. 70°0W.

Doubtful.

A = +.1372, B = -.3768, C = +.9161; $\delta = +4$; $h = -11$;
D = -.916, E = -.342; G = +.313, H = -.861, K = -.401.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Seven Falls	19.4	185	4 27	- 3	7 51	-13	10.1	—
Shawinigan Falls	20.1	186	4 36	- 2	8 5	-14	10.4	—
Ottawa	21.4	191	—	—	e 8 45	0	e 10.4	—
Saskatoon	23.6	251	i 6 23	PPP?	—	—	—	8.1
Oak Ridge	24.1	182	e 5 23	+ 5	e 10 7	+33	e 12.5	—
Weston	24.2	182	i 5 20k	+ 1	i 9 44	+ 9	12.5	—
Madison	25.8	215	—	—	e 9 11	-51	e 11.1	—
Chicago	26.5	212	—	—	e 11 36	SSS	—	—
Philadelphia	26.7	188	—	—	e 10 33	+16	—	—
Bozeman	30.1	247	—	—	e 10 51	-21	11.8	—
Florissant	30.1	213	e 5 37	-36	e 10 15	-57	—	—
St. Louis	30.2	213	e 5 36	-38	e 10 20	-53	—	—
Denver	E. 33.3	233	—	—	e 10 25	?	—	—
Little Rock	34.4	214	e 6 51	0	e 12 18	- 1	—	—
Tucson	42.0	237	—	—	e 16 53	SS	e 18.4	—

Additional Readings:—

Shawinigan Falls e = +8m.25s

Ottawa eK = +8m.45s.

Oak Ridge e = +12m.21s.

Weston iPPZ = +5m.52s., iP_oSNZ? = +12m.23s.

Chicago e = +11m.53s., +12m.15s.

Philadelphia e = +11m.27s., i = +13m.20s.

Bozeman e = +11m.27s.

Florissant eZ = +5m.40s., eE = +10m.22s.

St. Louis eEN = +10m.29s., iEN = +13m.28s. and +13m.57s.

Denver eE = +12m.44s., eE = +13m.50s., +14m.19s., +14m.23s., iE = +14m.32s.

Little Rock eN = +11m.20s., iEN = +14m.45s., iN = +15m.31s.

Long waves were also recorded at East Machias and Toronto.

Feb. 15d. Readings also at 0h. (Calcutta and Malabar), 1h. (Andijan, Frunse, Samarkand, Bombay, Calcutta, and Granada), 7h. (Ksara), 13h. (San Juan), 15h. (Tiflis), 22h. (Frunse, Samarkand, and near Andijan).

Feb. 16d. Readings at 4h. (Grozny, Ksara, Tiflis, and near Erevan), 7h. (Taikyu, near Santiago, and San Javier), 8h. (Grozny), 9h. (Sverdlovsk), 12h. (Tiflis, Christchurch, New Plymouth, Tual, near Hastings, and Wellington), 13h. (Grozny), 14h. (Tiflis), 17h. (Fresno, Lick, and La Paz), 19h. (La Paz), 22h. (Tiflis).

Feb. 17d. 3h. 33m. 10s. Epicentre 36°7N. 121°1W.

(as given in the Bulletin of the Seis. Stations at Berkeley, etc.).

A = -.4151, B = -.6881, C = +.5951; $\delta = -7$; $h = 0$.

	Δ	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Lick	0.8	325	e 0 18	0	e 0 30	- 1
Fresno	N. 1.1	88	e 0 22	0	i 0 37	- 2
Branmer	1.1	310	i 0 22	0	i 0 38	- 1
Berkeley	1.6	321	e 0 26	- 2	i 0 54	+ 5
San Francisco	1.5	315	i 0 28	0	i 0 52	+ 3

Additional readings:—

Fresno iPN = +24s.

Berkeley eN = +34s., eE = +39s.

Long waves were recorded at Tucson.

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Feb. 17d. 9h. 15m. 24s. Epicentre 44°·6N. 149°·4E.

A = -6149, B = +3637, C = +6998; $\delta = +10$; $h = -3$;
D = +509, E = +861; G = -603, H = +356, K = -714.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8·2	231	e 2 2	- 1	i 3 26	-12	—	—
Vladivostok	12·7	269	e 3 3	- 2	—	—	6·2	7·9
Nagoya	13·4	229	e 3 18	+ 4	5 29	-16	—	6·4
Taikyu	18·1	248	e 4 30	+16	—	—	—	—
Hukuoka B	18·3	238	e 4 25	+ 8	e 7 46	+ 7	—	—
Husan	18·3	246	4 14	- 3	e 7 42	+ 3	—	—
Keizyo	18·3	254	e 4 18	+ 1	e 7 43	+ 4	e 9·9	—
Chiufeng	24·9	272	1 5 26 ^a	0	9 50	+ 3	11·1	15·4
Zi-ka-wei	z.	25·7	248	e 5 33	0	10 17	+16	13·9
Nanking	26·9	253	e 5 46	+ 1	—	—	—	16·8
Irkutsk	30·5	301	e 6 13	- 4	e 11 6	-12	15·6	19·4
Hong Kong	36·4	244	—	—	13 6	+16	—	22·1
Manila	38·4	227	6 36	-49	13 18	- 2	19·6	25·1
College	39·4	36	e 10 48	?	i 13 42	+ 7	e 19·9	—
Frunse	52·3	296	9 12	- 3	16 40	0	29·6	—
Calcutta	N.	54·1	267	—	i 17 26	+21	—	39·5
Andijan	54·8	295	9 30	- 4	17 14	0	—	—
Tashkent	56·4	297	e 9 58	+13	e 17 33	- 3	e 28·1	29·5
Agra	E.	58·6	277	e 9 58	- 3	e 18 6	+ 2	37·1
Samarkand	58·8	296	9 56	- 6	e 18 14	+ 7	—	—
Pulkovo	64·7	331	—	—	e 19 15	- 7	32·6	37·7
Tinemaha	E.	65·6	61	e 11 9	+15	—	—	—
Haiwee	67·4	61	e 11 21	+22	—	—	—	—
Pasadena	z.	68·5	63	e 11 11	+ 5	—	—	—
Mount Wilson	z.	68·6	63	i 11 5	- 2	—	—	—
Baku	68·8	306	i 11 9	+ 1	e 20 19	+ 8	34·5	44·6
Grozny	69·2	310	e 11 20	+10	—	—	e 39·6	—
Platigorsk	70·1	312	e 11 14	- 2	—	—	e 41·1	—
Tiflis	70·8	310	e 11 21	+ 1	e 20 38	+ 3	35·9	47·8
Theodosia	73·3	317	11 36	+ 1	—	—	43·6	—
Copenhagen	73·7	336	i 11 37	- 1	—	—	38·6	—
Simferopol	74·0	318	e 11 39	0	—	—	—	—
Yalta	74·3	317	e 11 41	0	—	—	—	—
Sebastopol	74·5	318	e 12 4	+22	—	—	—	—
Jena	78·1	333	e 12 2	0	—	—	—	—
Cheb	78·6	333	—	—	e 26 36 [†]	SS	e 42·6	46·6
Ksara	81·3	309	i 12 19	- 1	22 52	+22	—	47·3
Zurich	82·1	335	e 12 24	0	—	—	—	—
Basle	82·3	335	e 12 25	0	—	—	—	—
Chur	82·3	334	e 12 25	0	—	—	—	—
Neuchatel	82·9	335	e 12 28	0	—	—	—	—
Helwan	86·9	309	—	—	23 41	+15	—	—

Additional readings:—

Chiufeng iN = +6m.6s.

Irkutsk PP = +7m.17s., eSS = +13m.0s.

Tashkent e = +17m.54s. and +21m.48s.

Agra eSSE = +22m.3s.

Pulkovo e = +26m.8s.

Pasadena iZ = +11m.19s.

Tiflis eSSN = +25m.22s., eSSSN = +29m.6s.

Ksara PS = +23m.39s.

Long waves were also recorded at Cape Town, Hamburg, La Paz, Upsala, Strasbourg, Bombay, Hyderabad, Paris, Stuttgart, De Bilt, Phu-Lien, Scoresby Sund, Tucson, Honolulu, Huancayo, Zinsen, Uccle, Trieste, and Prague.

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Feb. 17d. 13h. 3m. 48s. Epicentre 35°-9N. 140°-1E.

(as given by the Japanese stations).

A = -0.6229, B = +0.5208, C = +0.5838; $\delta = +6$; $h = 0$.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tukubasan	0.3	0	0 13	+ 2	0 22	+ 4	—
Tokyo Cen. Met. Ob.	0.4	231	0 14	+ 1	0 24	+ 3	—
Tokyo Imp. Univ.	0.4	231	0 14	+ 1	0 24	+ 3	0.4
Komaba	0.4	234	0 13	0	0 22	+ 1	—
Mitaka	0.5	242	0 14	0	0 24	+ 1	—
Kamakura	0.8	217	0 15	- 3	0 26	- 5	—
Kiyosumi	0.8	175	0 20	+ 2	0 31	0	—
Tifibu	0.8	276	0 20	+ 2	0 34	+ 3	—
Koyama	1.1	239	0 20	- 2	0 34?	- 5	—
Yosiwara	1.3	238	0 20	- 5	0 39	- 5	—
Susaki	1.5	216	0 22	- 6	0 42	- 7	—
Nagoya	2.6	254	0 45	+ 1	1 25	+ 8	1.6

Feb. 17d. Readings also at 0h. (Sverdlovsk), 1h. (Simferopol, Theodosia, Yalta, Samarkand, and near Andijan), 2h. (Grozny and Ksara), 3h. (Copenhagen, Basle, Jena, Ravensburg, Strasbourg, Stuttgart, Neuchatel, near Vienna, near Chur, Zurich, Samarkand, and near Tiflis), 4h. (near Santiago and San Javier), 7h. (Christchurch, New Plymouth, Wellington, Mount Wilson, Pasadena, and Trieste), 9h. (Mizusawa (2), Mount Wilson, Pasadena, and Tiflis), 13h. (Irkutsk, Vladivostok, Tashkent, Mizusawa, near Nagoya, and near Samarkand), 14h. (Baku, Tiflis, Huancayo, La Paz, and Tucson), 19h. (near Medan), 23h. (Columbia, Berkeley, Ukiah, Tucson, San Juan, La Paz (2), La Plata, Huancayo, Rio de Janeiro, Pasadena, Paris, Strasbourg, Christchurch, Wellington, Uccle, Vladivostok, and Scoresby Sund).

Feb. 18d. 8h. 28m. 19s. Epicentre 44°-8N. 12°-0E.

A = +0.6964, B = +0.1480, C = +0.7023; $\delta = +10$; $h = -3$;

D = +0.208, E = -0.978; G = +0.687, H = +0.146, K = -0.712.

	Δ	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Triest	1.5	55	10 28	0	10 44	- 5
Chur	2.7	320	e 0 45	0	e 1 15	- 4
Zagreb	3.0	70	e 0 49	- 1	e 1 33	+ 6
Ravensburg	3.4	331	e 0 57	+ 2	e 1 31	- 6
Zurich	3.5	317	e 0 59	+ 2	e 1 41	+ 1
Basle	4.2	314	e 1 15	P*	e 2 7	+10
Neuchatel	4.2	304	e 1 8	+ 1	e 1 19	?
Stuttgart	4.4	335	e 1 9	- 1	e 2 3	+ 1
Jena	6.1	357	e 1 41?	+ 7	—	—

Additional readings:—

Chur eP₂ = +47s.

Zurich eP₂ = +1m.3s.

Stuttgart eP₂ = +1m.13s., e = +1m.44s.

Feb. 18d. Readings also at 0h. (Tiflis, Ksara, Copenhagen, Cheb, Baku, Tashkent, Irkutsk, and Cape Town), 2h. (Tiflis and Ksara), 3h. (Tiflis and Tucson), 4h. (Tucson and near Grozny), 5h. (Toyooka), 6h. (Takaka and Tucson), 8h. (La Paz), 10h. (Chiufeng, Hetzyo, Keizyo, and Taikyu), 11h. (Malabar), 19h. (Tiflis), 22h. (Kobe (2)), 23h. (Andijan and near Almata).

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Feb. 19d. 9h. 9m. 19s. Epicentre 39°-1N. 117°-3W.

Felt Force V at Hawthorne and Yerington. Macroseismic area 5000 square miles. United States Earthquakes, 1937, Serial No. 619, Coast and Geodetic Survey, Washington, 1940.

A = -3559, B = -6896, C = +6307; $\delta = 0$; $h = -1$;
D = -889, E = +459; G = -289, H = -560, K = -776.

	Δ	Az.	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Tinemaha	2-3	201	1 0 38	- 2	1 0 55	-14	—
Fresno	N. 3-2	220	e 0 49	- 3	1 1 16	-16	—
Haiwee	N. 3-2	190	e 0 51	- 1	e 1 25	- 7	—
Lick	3-9	241	e 1 0	- 2	e 1 41	- 9	—
Berkeley	4-2	251	e 1 13	+ 6	e 1 58	+ 1	—
Branner	4-3	245	e 1 12	+ 4	1 1 58	- 2	—
San Francisco	4-3	250	e 1 11	+ 3	1 1 57	- 3	—
Mount Wilson	5-1	187	1 1 19	- 1	e 2 28	+ 8	—
Pasadena	5-2	189	1 1 20	- 1	1 2 28	+ 6	—
Santa Barbara	5-2	203	e 1 22	+ 1	1 2 26	+ 4	—
Riverside	5-3	180	e 1 22	0	1 2 34	+ 9	—
Tucson	8-6	139	e 2 59	P _r	—	—	e 4-8

Additional readings:—

Fresno iPN = +52s., iN = +1m.18s.

Lick eEN = +1m.3s., eN = +1m.8s., iN = +1m.30s., +1m.38s.

Berkeley ePN = +1m.16s.

Branner iE = +1m.53s.

San Francisco iEN = +2m.0s.

Long waves were also recorded at Tiflis, Little Rock, and Butte.

Feb. 19d. Readings also at 3h. (Malabar), 4h. (Tiflis and near Nagoya), 8h. (near Kobe and Sumoto), 9h. (College and Mizusawa), 10h. (Bombay), 13h. (Tiflis), 15h. (Agra, Calcutta, Frunse, near Almata, and Andijan), 16h. (Fresno), 17h. (near Tiflis), 20h. (Tiflis, near Santiago, and San Javier), 21h. (Cape Town, Ksara (2), Baku, Tiflis, Sverdlovsk, and Tashkent), 22h. (Baku, Tiflis, Sverdlovsk, and Tashkent), 23h. (Christchurch, Mizusawa, Berkeley, Lick, near Fresno, and near Andijan).

Feb. 20d. 5h. 55m. 48s. Epicentre 16°-1N. 119°-8E.

A = -4777, B = +8342, C = +2766; $\delta = +4$; $h = +6$;
D = +368, E = +497; G = -137, H = +239, K = -961.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	1-9	143	1 0 39k	+ 5	1 6	+ 7	—	—
Hong Kong	8-1	319	—	—	3 44	+ 9	—	6-2
Zi-ka-wei	Z. 15-1	5	e 3 36	0	6 38	+13	8-9	9-5
Chiufeng	24-1	354	5 19a	+ 1	1 9 43	+ 9	—	15-5
Nagoya	24-4	36	e 5 17	- 4	—	—	—	—
Batavia	25-6	211	5 31	- 1	10 7	+ 8	—	—
Vladivostok	28-8	19	e 6 5	+ 3	e 10 51	0	18-2	18-2
Calcutta	N. 30-3	288	—	—	e 10 26	-49	—	—
Irkutsk	38-1	345	e 7 42	+20	e 13 14	- 2	20-2	—
Tashkent	50-1	311	—	—	e 16 26	+16	e 25-6	30-1
Sverdlovsk	59-9	328	1 10 9	- 1	e 18 19	- 2	20-2	—
Ksara	76-3	302	e 11 37	-15	e 21 39	+ 2	—	—

Additional readings:—

Chiufeng iZ = +5m.41s.

Batavia iE = +8m.42s.

Calcutta i = +14m.55s.

Irkutsk e = +8m.51s.

Tashkent e = +19m.38s.

Ksara e = +22m.25s.

Long waves were also recorded at Phu-Lien, Tiflis, Baku, and Copenhagen.

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Feb. 20d. Readings also at 0h. (near Tiflis), 1h. (Ksara and near Berkeley), 2h. (Tiflis, Tashkent, and Sverdlovsk), 4h. (Agra), 5h. (Hukuoka B), 8h. (Tiflis), 9h. (Berkeley, Branner, Lick, and near Fresno), 14h. and 15h. (Tiflis), 16h. (Tashkent, Sverdlovsk, Vladivostok, Irkutsk, East Machias, College, and near Andijan), 19h. (Ferndale), 20h. (Andijan, Tiflis, and near Santiago), 21h. (Andijan), 23h. (near La Paz).

Feb. 21d. 7h. 2m. 37s. Epicentre 44°6N. 149°4E. (as on 17d.).

Moderately felt at Nemuro, Kusiro, Hatinohe, Aomori, and Hakodate. Radius more than 300kms. See "Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937," Tokyo, Japan, 1939, pp. 24-26, Macro-seismic Chart, p. 24.

A = -.6149, B = +.3637, C = +.6998; $\delta = +10$; $h = -3$;
D = +.509, E = +.861; G = -.603, H = +.356, K = -.714.

The following epicentres have been published in connection with this earthquake

Schweiz Erdbeben 44°N. 147°E.
Chiufeng 44°N. 151°E.
U.S. Coast and Geodetic Survey 45°N. 148°E.
Jesuit Seismological Association 44°2N. 148°6E.
U.S.S.R. 46°5N. 152°5E.
Strasbourg 47°N. 143°E.

	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
			m. s.	s.	m. s.	s.					
Nemuro	3-0	246	0 53 _a	+ 3	1 39	+12	—	—	—	—	—
Kusiro	4-0	246	0 44 _a	-20	1 30	-22	—	—	—	—	—
Obihiro	4-8	256	1 18 _k	+ 3	2 4	- 8	—	—	—	—	—
Asahigawa	5-1	264	1 20 _a	0	2 48	S _e	—	—	—	—	—
Ootomari	5-1	297	1 25	+ 5	2 29	+ 9	—	—	—	—	—
Urakawa	5-4	245	1 23	- 1	2 26	- 2	—	—	—	—	—
Sapporo	6-0	258	1 36 _a	+ 4	2 47	+ 4	—	—	—	—	—
Sikka	6-3	319	1 40 _k	+ 4	3 0	+10	—	—	—	—	—
Muroran	6-5	252	1 42 _a	+ 3	3 11	+16	—	—	—	—	—
Hakodate	6-9	249	1 55 _k	+10	2 57	- 8	—	—	—	—	—
Hatinohe	7-0	237	1 46 _a	0	3 1	- 7	—	—	—	—	—
Aomori	7-4	242	1 53 _k	+ 1	3 50	S*	—	—	—	—	—
Miyako	7-4	230	1 52 _k	0	3 18	0	—	—	—	—	—
Morioka	7-8	234	1 59 _a	+ 1	3 25	- 3	—	—	—	—	—
Mizusawa	E. 8-2	231	1 2 3	0	3 54	+16	—	—	—	—	—
	N. 8-2	231	2 1	- 2	3 58	+20	—	—	—	—	—
Akita	8-5	238	2 8 _k	+ 1	3 54	+ 9	—	—	—	—	—
Sendai	9-0	228	2 13 _k	0	3 46	-12	—	—	—	—	—
Yamagata	9-3	230	2 17	0	3 56	- 9	—	—	—	—	—
Hukusima	9-6	227	2 20	- 1	4 1	-11	—	—	—	—	—
Aidu	9-9	226	2 21	- 4	4 2	-18	—	—	—	—	—
Onahama	10-0	223	2 33	+ 6	4 14	- 8	—	—	—	—	—
Mito	10-6	223	2 36	0	—	—	—	—	—	—	—
Utsunomiya	10-8	225	2 38	- 1	4 34	- 8	—	—	—	—	—
Kakioka	10-9	222	2 37 _a	- 3	4 31	-13	—	—	—	—	—
Tokubasan	11-6	223	2 39 _k	- 3	4 29	-18	—	—	—	—	—
Tyosi	11-0	219	2 40	- 2	4 34	-13	—	—	—	—	—
Maebasi	11-3	227	2 47	+ 1	4 49	- 5	—	—	—	—	—
Takada	11-3	232	2 38	- 8	4 21	-33	—	—	—	—	—
Kumagaya	11-4	225	2 46	- 2	4 50	- 6	—	—	—	—	—
Nagano	11-6	231	2 50	0	5 23	+22	—	—	—	—	—
Tokyo	11-6	223	2 45	- 5	5 23	+22	—	—	—	—	—
Oiwake	11-7	229	2 53	+ 2	5 1	- 3	—	—	—	—	—
Katsuura	11-8	220	2 59	+ 6	4 45	-21	—	—	—	—	—
Wazima	11-8	237	2 53	0	5 8	+ 2	—	—	—	—	—
Yokohama	11-8	222	2 51	- 2	4 56	-10	—	—	—	—	—
Matumoto	12-0	230	2 53	- 2	5 5	- 6	—	—	—	—	—
Toyama	12-1	235	2 55	- 2	5 39	+25	—	—	—	—	—
Hanatu	12-2	225	2 55	- 3	5 8	- 8	—	—	—	—	—
Husiki	12-2	234	2 58	0	6 20	+64	—	—	—	—	—
Kohu	12-2	227	2 54	- 4	5 8	- 8	—	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ito	12.4	223	3 13	+12	5 9	-13	—	—
Mera	12.4	220	3 6	+ 5	5 21	0	—	—
Misima	12.4	224	3 1	+ 0	5 50	+29	—	—
Numadu	12.4	224	3 12	+11	5 28	+ 7	—	—
Iida	12.6	228	3 15	+12	5 56	+30	—	—
Vladivostok	12.7	269	i 3 4	- 1	e 5 28	0	—	—
Omaesaki	13.2	224	3 13	+ 2	—	—	—	—
Gihu	13.3	231	3 11 _a	- 2	5 54	+12	—	—
Hamamatu	13.3	226	e 3 20 _k	+ 7	5 51	+ 9	—	—
Nagoya	13.4	229	e 3 13	- 1	—	—	9.4	9.8
Ibukisan	13.5	231	3 19 _a	+ 4	5 48	+ 1	—	—
Hatidyozima	13.7	216	3 25 _k	+ 7	6 2	+10	—	—
Hikone	13.7	231	3 19	+ 1	6 48	+56	—	—
Kameyama	13.9	230	3 19	- 2	6 50	+53	—	—
Tu	13.9	229	3 32	+11	6 18	+21	—	—
Miyadu	14.1	235	3 22	- 1	7 19	L	(7.3)	—
Kyoto	14.2	232	3 25	+ 1	6 49	? 1	—	—
Toyouka	14.3	236	3 25 _a	- 1	6 7	+ 1	6.9	10.4
Yagi	14.5	231	3 37	+ 9	6 52	+41	—	—
Osaka	14.6	232	3 29	- 1	6 34	+21	—	—
Osaka	B. 14.6	232	3 26	- 4	6 50	+37	—	—
Kobe	E. 14.7	233	e 3 31	0	6 37	+21	6.9	10.0
	N. 14.7	233	e 3 31	0	6 42	+26	6.8	9.9
	Z. 14.7	233	e 3 27	- 4	e 6 35	+19	7.9	10.5
Wakayama	15.1	232	2 34	- 2	6 32	+ 7	—	—
Sumoto	15.2	232	3 34 _a	- 4	6 46	+18	7.2	10.2
Sakai	15.3	239	3 40	+ 1	—	—	—	—
Siomisaki	15.4	228	3 36	- 4	6 44	+12	—	—
Okayama	15.5	235	3 54	+12	7 39	L	(7.6)	—
Tkusima	15.5	232	3 46	+ 4	7 46	L	(7.8)	—
Tadota	15.8	235	3 54	+ 9	7 34	L	(7.6)	—
Muroto	16.3	231	3 57 _a	+ 5	7 18	+25	—	—
Hamada	16.4	240	3 31	-22	7 14	+18	—	—
Koti	16.5	233	3 53 _a	- 1	7 10	+12	—	—
Hirosima	16.6	238	4 1 _a	+ 5	7 15	+15	—	—
Matuyama	16.8	236	3 57	- 1	7 18	+13	—	—
Hsinking	17.3	276	4 12	+ 8	7 34	+18	—	—
Simidu	17.4	230	4 14	+ 8	7 38	+19	—	—
Ooita	17.8	237	4 16	+ 5	8 1	+33	—	—
Simonosaki	17.8	239	4 11	0	—	—	—	—
Taikyū	18.1	248	4 13 _a	- 1	8 27	+52	9.9	10.4
Hukuoka	18.3	238	4 12 _a	- 5	7 53	+14	i 9.1	11.9
Hukuoka B	18.3	238	e 4 16 _a	- 1	7 45	+ 6	—	10.6
Husan	18.3	246	4 14	- 3	7 56	+17	8.8	11.7
Keizyo	18.3	254	e 4 16	- 1	i 7 38	- 1	—	12.5
Syuhurei	18.3	250	4 18	+ 1	7 57	+18	8.9	11.1
Heizyo	18.4	261	i 4 22 _a	+ 4	i 7 55	+14	9.4	12.4
Titizima	18.4	199	4 20	+ 2	8 4	+23	—	—
Zinsen	N. 18.5	256	i 4 18 _a	- 1	i 7 50	+ 6	e 9.8	12.8
	Z. 18.5	256	i 4 20	+ 1	e 7 58	+14	e 10.0	12.7
Ituhara	18.6	244	4 19	- 2	—	—	—	—
Kumamoto	18.7	233	4 22 _a	0	7 56	+ 8	—	—
Miyazaki	18.9	234	4 21	- 3	8 0	+ 7	—	—
Unzendake	19.0	235	4 30	+ 4	8 8	+13	—	—
Nagasaki	19.2	235	4 30	+ 2	8 21	+22	—	—
Kagosima	19.7	234	4 40	+ 6	8 17	+ 7	—	—
Tomie	20.0	235	4 37	0	—	—	—	—
Yingkow	20.3	280	4 18	-22	7 58	-25	—	—
Dairen	21.4	266	4 31	-20	8 35	-10	—	—
Nako	22.6	231	5 7 _k	+ 4	9 22	+15	—	—
Chiufeng	24.9	272	i 5 25 _a	- 1	e 9 51	+ 4	11.9	15.6
Zi-ka-wei	25.7	248	i 5 34 _k	+ 1	10 18	+17	13.6	17.0

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Isigakizima	28.8	233	6 1	- 1	11 53	+62	—	—
Taihoku	29.8	238	6 8	- 3	e 11 11	+ 4	—	19.8
Giran	29.9	238	6 18	+ 6	11 23	+14	—	—
Irkutsk	30.5	301	6 16	- 1	11 3	-15	15.4	—
Karenko	30.6	237	7 6	+48	—	—	—	—
Tajtyu	31.0	239	6 37	+16	13 6	SSS	—	—
Arisan	31.4	239	6 23	- 2	11 28	- 4	—	—
Tainan	32.2	239	6 38	+ 6	11 57	+12	—	—
Kosyun	32.6	235	6 36	+ 1	11 54	+ 3	—	—
Hong Kong	36.4	244	7 8k	0	13 5	+15	18.3	22.2
Manila	38.4	227	7 25a	0	13 47	+27	20.1	—
College	39.4	36	e 7 30	- 3	i 13 30	- 5	18.1	—
Phu-Lien	42.5	250	e 7 59	0	i 14 20	- 2	20.4	23.7
Sempalatinsk	45.5	303	8 22	- 1	15 30	+25	22.1	—
Sitka	46.7	46	e 8 32	0	i 15 23	+ 1	—	—
Honolulu	49.0	100	e 8 33	-17	i 15 58	+ 3	22.3	—
Almata	50.6	296	19 7	+ 5	16 19	+ 2	—	—
Frunze	52.3	296	9 15	0	e 16 41	+ 1	25.7	—
Sverdlovsk	53.6	317	19 23	- 2	i 16 56	- 2	27.4	—
Calcutta	N. 54.1	267	9 29	0	17 4	- 1	25.9	35.5
Andijan	54.8	295	9 35	+ 1	17 15	+ 1	23.4	—
Tchikent	55.7	298	9 40	0	17 25	- 1	22.9	—
Tashkent	56.4	297	i 9 45	0	17 41	+ 5	—	—
Dehra Dun	56.7	281	9 53	+ 5	17 43	+ 3	29.5	35.4
Victoria	57.0	53	9 49	- 1	17 34	- 9	e 24.4	—
Seattle	58.0	53	e 10 8	+11	e 17 38	-19	e 24.2	—
Agra	58.6	277	9 59	- 2	17 57	- 2	27.8	37.4
Samarkand	58.8	296	10 0	- 2	18 5	- 2	27.6	—
Ukiah	62.3	61	e 10 31	+ 5	18 53	+ 1	e 26.1	—
Batavia	63.4	228	i 10 33	- 1	i 19 3	- 3	e 27.4	—
Berkeley	63.6	62	e 10 36	+ 1	e 19 8	0	—	—
San Francisco	63.6	62	e 10 49	+14	e 19 4	- 4	—	—
Saskatoon	63.6	42	10 41	+ 6	19 13	+ 5	29.4	—
Branner	E. 64.0	62	e 10 46	+ 8	e 19 9	- 4	—	—
Lick	E. 64.3	62	e 10 44	+ 5	e 19 13	- 4	—	—
Butte	64.4	49	10 42	+ 2	19 34	+16	—	—
Hyderabad	64.5	269	10 41	0	19 11	- 8	30.2	40.2
Moscow	64.7	324	i 10 40	- 2	19 16	- 6	30.9	31.5
Pulkovo	64.7	331	10 37	- 5	—	—	29.9	33.3
Scoresby Sund	65.1	357	e 10 41	- 4	e 19 29	+ 2	34.4	—
Bozeman	65.4	49	e 10 34	-13	e 19 20	-10	e 28.6	—
Fresno	N. 65.9	62	e 10 51	+ 1	—	—	—	—
Timemaha	E. 66.6	61	e 10 55	+ 1	e 19 44	- 1	—	—
Haiwee	N. 67.4	61	e 11 0	+ 1	e 19 59	+ 4	—	—
Santa Barbara	67.4	64	i 11 0	+ 1	e 19 58	+ 3	—	—
Bombay	67.5	274	i 10 57	- 3	e 19 53	- 3	32.4	44.2
Apla	68.0	138	e 11 27	+24	20 38	+36	e 27.4	—
Pasadena	68.5	63	e 11 4	- 2	e 19 50	-18	e 27.4	—
Mount Wilson	68.6	63	i 11 3	- 4	e 20 7	- 2	—	—
Upsala	68.7	336	11 4	- 3	20 14	+ 4	e 31.4	43.5
Baku	68.8	306	i 11 9	+ 1	—	—	—	—
Riverside	69.1	63	e 11 9	- 1	e 20 11	- 4	—	—
Grozny	69.2	310	i 11 17	+ 7	—	—	—	—
La Jolla	70.0	63	e 11 12	- 3	e 20 21	- 5	—	—
Kodaikanal	E. 70.0	265	i 11 16	+ 1	i 20 27	+ 1	33.4	46.4
Platigorsk	70.1	312	11 15	- 1	20 28	+ 1	34.4	—
Colombo	70.6	260	11 18	- 1	20 37	+ 4	37.7	46.6
Tiflis	70.8	310	i 11 21	+ 1	e 20 34	- 1	36.4	—
Bergen	71.3	342	11 22	- 1	20 49	+ 8	32.4	—
Erevan	72.0	308	e 11 29	+ 1	—	—	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sotchi	72.2	314	e 11 31	+ 2	e 20 52	+ 1	e 24.4	—
Denver	72.8	52	e 11 29	- 3	e 20 53	- 5	—	36.9
Theodosia	73.3	317	e 11 36	+ 1	e 21 2	- 2	26.4	—
Ivrigut	73.6	9	e 11 54	- 3	e 21 4	- 3	31.4	—
Copenhagen	73.7	336	i 11 35 _a	- 3	e 21 12	+ 4	33.4	—
Simferopol	74.0	318	i 11 38	- 1	e 21 7	- 4	40.4	—
Yalta	74.3	317	e 11 40	- 1	e 21 10	- 5	39.4	—
Tucson	74.4	60	e 11 48	+ 6	e 21 16	0	e 32.9	—
Sebastopol	74.5	318	i 11 44	+ 2	e 21 18	+ 1	40.4	—
Lemberg	74.6	326	i 11 58	+15	e 23 50	?	35.7	54.2
Aberdeen	75.8	344	—	—	e 21 41	+10	45.6	49.9
Hamburg	76.2	337	i 11 52 _a	0	e 21 31	- 5	e 36.6	40.4
Edinburgh	77.2	344	—	—	e 21 41	- 6	32.4	46.3
Des Moines	77.3	43	e 12 1	+ 3	e 21 53	+ 5	e 35.9	—
Prague	77.9	332	e 12 1	0	e 21 48	- 6	e 35.4	47.4
Durham	78.0	343	e 11 56	- 6	e 21 53	- 2	—	50.4
Göttingen	78.0	335	e 12 0	- 2	e 21 57	+ 2	e 42.4	57.0
Bucharest	78.1	322	e 12 5	+ 3	e 21 56	0	—	47.4
Jena	78.1	333	e 12 1	- 1	i 21 59	+ 3	e 36.4	37.2
Riverview	78.1	178	i 12 22 _a	+20	i 21 57	+ 1	e 33.1	44.1
Sydney	78.1	178	e 12 23	+21	i 21 53	- 3	41.9	51.8
Madison	78.2	39	e 12 3	0	e 21 49	- 8	—	—
Budapest	78.4	328	e 12 7	+ 3	e 22 0	0	37.4	51.4
Stara Dala	78.4	329	e 12 3	- 1	e 22 0	0	e 26.4	50.9
Cheb	78.6	333	e 12 5	0	e 22 16	+14	e 36.4	51.9
Kecskenet	78.7	328	e 12 18	+12	e 22 10	+ 7	e 49.4	44.4
Vienna	78.8	330	i 12 10	+ 4	—	—	—	56.4
De Bilt	78.9	338	i 12 7	0	e 22 1	- 4	e 35.4	49.9
Stonyhurst	79.0	343	e 12 2	- 5	e 22 8	+ 2	34.9	49.1
Bidston	79.6	344	i 12 12	+ 2	—	—	—	52.8
Adelaide	79.8	189	e 11 21	-51	i 22 12	- 2	e 33.7	49.6
Chicago	79.9	40	e 12 13	+ 1	e 21 59	-17	e 35.8	—
Chicago (Loyola)	79.9	40	e 12 15	+ 3	i 22 8	- 8	—	—
Belgrade	80.1	325	e 12 12	- 1	e 22 11	- 7	39.2	48.5
Graz	80.1	330	i 12 14	+ 1	e 22 13	- 5	38.4	57.2
Rathfarnham Castle	80.3	345	i 12 15	+ 1	i 22 24	+ 4	38.9	60.4
Uccle	80.3	339	e 12 10 _a	- 4	i 22 13	- 7	e 35.4	—
Sofia	80.6	322	e 12 17	+ 1	e 22 20	- 3	—	50.0
Oxford	80.7	341	i 12 20	+ 4	e 22 30	+ 6	35.6	67.6
Stuttgart	80.7	335	i 12 16 _a	0	e 22 22	- 2	41.4	46.4
Kew	80.8	341	i 12 16 _k	- 1	i 22 19	- 6	e 37.4	60.0
Florissant	81.0	43	e 12 15	- 3	i 22 22	- 5	—	—
Zagreb	81.0	329	e 12 10	- 8	e 22 23	- 4	e 39.1	53.1
St. Louis	81.2	43	e 12 23	+ 4	e 22 24	- 5	e 38.0	45.8
Ksara	81.3	609	i 12 19 _a	- 1	e 22 30	0	—	—
Laibach	81.3	330	e 12 35	+15	e 22 39	+ 9	e 42.5	70.5
Strasbourg	81.3	335	i 12 18 _a	- 2	i 22 35	- 5	e 37.4	54.7
Seven Falls	81.6	26	i 12 19	- 2	e 22 33	-10	38.4	—
Ottawa	81.9	30	i 12 25	+ 2	e 22 31	- 5	e 35.4	—
Shawinigan Falls	81.9	28	i 12 25	0	e 22 31	- 5	40.4	—
Triest	81.9	331	i 12 21 _a	- 2	i 22 31	- 5	36.4	54.5
Toronto	82.0	33	e 12 26	+ 3	e 22 30	- 7	35.4	—
Zurich	82.1	335	e 12 22 _a	- 2	e 22 36	- 2	—	—
Melbourne	82.2	183	e 12 4	+10	e 22 37	- 2	38.7	57.6
Basle	82.3	335	e 12 24	- 1	e 22 36	- 4	—	—
Cheb	82.3	334	e 12 23	- 2	e 22 16	-24	—	—
Paris	82.6	339	i 12 26 _a	0	e 22 41	- 2	36.4	51.4
Buffalo	82.8	33	i 12 25	- 2	i 23 51	+66	—	—
Padova	82.8	331	e 12 32	+ 5	e 22 50	+ 5	e 43.4	57.4
Neuchatel	82.9	335	e 12 30	+ 2	e 22 20	-26	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o	o	m. s.	s.	m. s.	s.	m.	m.
Besancoon	83-0	336	e 12 23	- 5	e 23 3	+16	i 47-9	—
Little Rock	83-2	47	e 12 29	0	e 22 51	+ 2	—	—
Jersey	83-3	342	i 12 35	+ 5	i 23 6	+16	36-6	62-4
Cincinnati	83-5	39	e 12 32	+ 1	i 22 53	+ 1	—	—
Vermont	83-8	28	e 12 33	+ 1	i 22 45	-10	e 37-2	—
Florence	84-4	331	i 12 39	+ 3	23 11	+10	—	—
Pennsylvania	85-0	34	e 12 44	+ 6	e 23 12	[+11]	e 40-6	56-6
East Machias	85-2	25	e 12 7	-32	i 23 5	- 4	e 37-2	—
Arapuni	85-7	159	—	—	24 23	+69	37-4	45-4
Capodimonte	N. 85-9	327	e 11 45	-58	e 22 24	-52	49-4	62-4
Oak Ridge	Z. 85-9	28	i 12 42	- 1	—	—	—	—
Weston	86-1	28	i 12 46 _a	+ 2	e 23 13	- 5	38-4	—
New Plymouth	86-2	160	16 51 ₇	PP	27 17	?	46-4	—
Halifax	86-4	23	i 12 53	+ 8	23 23	+ 2	39-4	—
Fordham	86-5	30	e 12 42	- 4	e 22 26	-56	e 38-9	—
Philadelphia	86-8	33	e 12 42	- 5	i 22 53	-32	i 38-2	—
Georgetown	86-9	33	i 12 48	0	23 21	- 5	—	—
Helwan	86-9	309	—	—	i 23 43	+17	—	61-6
Guadalajara	N. 87-3	63	e 12 51 ₇	+ 1	—	—	—	—
Manzanillo	N. 87-8	65	—	—	e 23 45	+11	—	—
Bagnères	E. 88-5	338	—	—	e 24 44	+63	42-4	—
Wellington	88-5	161	13 3	+ 7	23 18	[- 6]	43-0	45-4
Columbia	89-3	40	e 12 59	0	e 23 44	- 4	e 41-4	—
Barcelona	89-5	336	e 13 2	+ 2	23 38	-12	e 30-7	58-7
Christchurch	90-2	163	i 13 9	+ 5	23 26	[- 7]	42-7	—
Tacubaya	N. 90-9	61	e 13 22	+15	—	—	—	—
Toledo	92-6	340	i 13 15	0	i 24 0	-18	—	61-6
Algiers	93-4	333	e 13 21	+ 3	24 34	+10	45-4	60-9
Almeria	95-0	337	e 13 46	+20	e 24 38	0	e 43-0	52-0
Granada	95-0	338	e 13 36	+10	e 24 31	- 7	—	—
San Fernando	96-3	340	e 13 56	+24	i 26 22	PS	51-9	—
San Juan	109-4	35	e 17 11	?	?	?	e 55-5	—
Tananarive	111-4	264	14 34	?	25 35	[+17]	55-4	64-0
Huancayo	129-9	63	19 15	[+ 3]	28 19	{ 0}	59-1	—
La Paz	137-8	59	19 33 _a	[+ 6]	—	—	66-7	72-7
Cape Town	141-1	269	i 22 49	PP	i 26 50	[+ 9]	e 66-4	78-3
Santiago	147-3	83	e 19 33	[-10]	—	—	—	78-4
Rio de Janeiro	N. 156-1	28	e 20 5	—	—	—	i 43-7	—
La Plata	157-0	73	17 47 ₇	?	—	—	74-0	—

Additional readings:—

Vladivostok e = +3m.25s., e = +4m.15s., e = +4m.49s., e = +5m.13s.
 Toyooka iZ = +3m.44s.
 Sumoto SE = +6m.48s.
 Zi-ka-wei PPN = +6m.15s., PPPN = +6m.28s., SSN = +11m.47s., SSSN = +12m.5s., SSSSN = +12m.23s.
 Taihoku ePN = +6m.17s., eS? = +11m.33s., eSZ = +12m.18s.
 Irkutsk PP = +7m.33s.
 Hong Kong PP? = +8m.43s., ? = +10m.23s.
 College e = +7m.37s., iSSS = +16m.28s.
 Phu-Lien PP = +9m.48s.
 Sitka e = +8m.38s., ePP = +10m.2s., SS = +18m.28s.
 Honolulu e = +9m.0s., +9m.5s., P = +9m.15s.
 Almata e = +11m.11s.
 Calcutta PPPN = +12m.24s., PSN = +17m.38s.
 Victoria SS = +21m.23s.
 Seattle e = +18m.30s.
 Agra PPE = +12m.14s., PPPE = +13m.13s., PSEN = +18m.26s., iSSE = +22m.19s., SSN? = +22m.35s., SSSSE = +23m.44s.
 Ukiah ePP = +12m.48s., e = +19m.33s.
 Berkeley iPNZ = +10m.40s., eE = +10m.42s., iPPZ = +13m.9s., eS₂SZ = +20m.39s.
 San Francisco eN = +19m.14s.
 Branner eN = +10m.52s., eN = +19m.16s.
 Lick eSN = +19m.17s.
 Butte e₂P = +11m.13s., ePP = +13m.1s., e = +18m.44s., eS₂S = +20m.16s., eSSS = +20m.23s.

Continued on next page.

- Pulkovo $i = +12m.22s.$, $PP = +13m.41s.$, $PPP = +14m.54s.$, $PS = +19m.55s.$,
 $SS = +23m.47s.$, $SSS = +26m.29s.$
- Scoresby Sund $iN = +10m.50s.$, $iZ = +11m.9s.$, $eP_eSN = +15m.0s.$, $eN = +15m.29s.$, $eEN = +19m.41s.$, $iN = +20m.13s.$, $eE = +20m.42s.$, $eEN = +20m.56s.$, $SSN = +23m.23s.$, $eL_eE = +27.1m.$
- Bozeman $ePP = +13m.24s.$, $eSSS = +26m.40s.$
- Bombay $P_eP = +11m.36s.$, $eE = +15m.3s.$, $PS = +20m.29s.$, $S_eS = +21m.3s.$,
 $SS = +24m.46s.$
- Apia $PP = +14m.24s.$
- Pasadena $iP = +11m.7s.$, $iZ = +11m.19s.$, $ePKPPKPZ = +39m.30s.$, $eZ? = +58m.12s.$, $iZ = +58m.19s.$
- Mount Wilson $iPEZ = +11m.8s.$, $iZ = +11m.19s.$, $iPKPPKPZ = +39m.31s.$
- Upsala $iN = +21m.13s.$, $SSN = +25m.7s.$
- Baku $PP = +14m.12s.$, $e = +16m.13s.$, $iPS = +20m.41s.$
- Kodaikanal $iPSE = +21m.5s.$, $SE = +27m.45s.$
- Colombo $+25m.11s.$
- Tiflis $eEN = +14m.7s.$, $eZ = +16m.30s.$, $eE = +17m.10s.$
- Denver $iPPE = +11m.44s.$, $iP_ePN = +11m.53s.$, $iEN = +11m.57s.$, $iSE = +20m.57s.$, $eE = +21m.5s.$, $eSN = +21m.7s.$
- Ivigtut $eZ = +12m.17s.$, $eN = +21m.22s.$, $eZ = +21m.30s.$, $eE = +23m.33s.$,
 $SS = +26m.23s.$
- Copenhagen $i = +11m.39s.$, $PPP = +16m.27s.$, $e = +17m.23s.$, $i = +21m.22s.$,
 $iPSNZ = +21m.58s.$, $eE = +24m.53s.$, $SS = +26m.52s.$, $SSS = +29m.29s.$
- Tucson $ePS = +21m.57s.$, $eSS = +26m.11s.$, $e = +28m.41s.$
- Aberdeen $+26m.46s.$, $+31m.36s.$
- Hamburg $iZ = +21m.48s.$, $eSSN = +26m.17s.$, $SSSN = +29m.53s.$, $iZ = +35m.46s.$
- Edinburgh $e = +21m.41s.$, $i = +22m.13s.$, and $+22m.26s.$
- Des Moines $e = +23m.53s.$ and $+27m.3s.$
- Prague $eSS = +27m.23s.$
- Göttingen $iZ = +35m.55s.$
- Bucharest $PP = +15m.1s.$, $PPP = +16m.32s.$, $PS = +22m.21s.$, $SSN = +26m.45s.$, $SSE = +26m.47s.$
- Jena $iP = +12m.6s.$, $e = +21m.49s.$, $iSN = +22m.11s.$, $eE = +26m.53s.$, $eN = +27m.11s.$, $eSSN = +27m.23s.$, $eSSSN = +27m.55s.$, $eN = +30m.47s.$,
 $eE = +30m.59s.$
- Riverview $ePE = +12m.24s.$, $iSN = +22m.0s.$, $PSE = +22m.24s.$, $PSN = +22m.26s.$, $eSSN = +26m.17s.$, $eE = +26m.37s.$
- Sydney $SS = +26m.41s.$, $SSS = +33m.3s.$
- Madison $+15m.5s.$, $+25m.53s.$
- Budapest $P_eP = +12m.13s.$, $iE = +12m.30s.$ and $+12m.53s.$, $iN = +13m.38s.$ and $+14m.13s.$, $PPN = +14m.46s.$, $S_eSN = +22m.22s.$, $S_eSE = +22m.30s.$, $iN = +22m.53s.$ and $+23m.46s.$, $eE = +24m.7s.$, $eN = +24m.9s.$, $SSN = +26m.53s.$,
 $iEN = +28m.5s.$ and $+32m.9s.$
- Cheb $eSS = +27m.58s.$
- Kecskemet $eZ = +12m.36s.$, $eP_ePN = +12m.25s.$, $ePPZ = +14m.46s.$, $eZ = +16m.16s.$ and $+18m.52s.$, $ePSZ = +22m.36s.$, $eSN = +22m.16s.$, $ePSE = +22m.43s.$, $eSSZ = +26m.43s.$
- Vienna $P_eP = +12m.33s.$, $PP = +15m.21s.$
- Adelaide $i = +12m.23s.$ and $+22m.33s.$, $eSS = +27m.34s.$, $iSKS = +31m.45s.$
- Chicago $ePP = +15m.6s.$, $e = +18m.56s.$, $iPS = +22m.12s.$, $e = +24m.25s.$ and $+26m.42s.$, $eSS = +27m.21s.$, $eSSS = +30m.52s.$
- Chicago (Loyola) $e = +27m.13s.$
- Belgrade $eP = +12m.15s.$, $iP_eP = +12m.24s.$, $i = +12m.32s.$, $+12m.43s.$, and $+14m.4s.$, $P_eS = +22m.32s.$
- Graz $eS_eS = +22m.33s.$, $iPS = +23m.2s.$
- Rathfarnham Castle $i = +12m.39s.$, $+15m.25s.$, $+17m.15s.$, and $+18m.29s.$,
 $iSS = +27m.59s.$, $SSS = +31m.27s.$
- Uccle $iZ = +12m.15s.$, $iPPE = +15m.29s.$, $iPPPE = +17m.22s.$, $iPPPPN = +18m.44s.$, $iPSN = +22m.39s.$, $iN = +24m.9s.$, $iSSN = +27m.43s.$, $iN = +28m.30s.$, $iSSSE = +32m.23s.$
- Sofia $PS = +22m.47s.$, $eSSNE = +28m.38s.$
- Stuttgart $i = +12m.23s.$, $e = +14m.0s.$, $ePP = +15m.23s.$, $ePPP = +17m.19s.$,
 $e = +18m.45s.$, $iS = +22m.40s.$, $iS_eS = +22m.56s.$, $e = +25m.37s.$, $eSS = +27m.41s.$, $e = +33m.47s.$
- Kew $iP_eP = +12m.24s.$, $i = +12m.41s.$, $iZ = +14m.14s.$, $iPPPP = +18m.46s.$,
 $iEZ = +22m.31s.$, $iEN = +22m.35s.$, $iPPS = +23m.27s.$, $i = +24m.31s.$,
 $iN = +28m.13s.$, $iEZ = +28m.39s.$, $iSKKPZ = +34m.6s.$
- Flouissant $iE = +12m.18s.$, $iEZ = +12m.23s.$, $e = +12m.29s.$, $iZ = +14m.36s.$,
 $iPPZ = +15m.22s.$, $iPPPPZ = +15m.29s.$, $eSKSZ = +22m.14s.$, $iEZ = +22m.27s.$, $iN = +22m.31s.$, $iE = +22m.45s.$
- Zagreb $eP = +12m.19s.$, $eP_ePNE = +12m.49s.$, $eSKSZ = +22m.13s.$, $eSKKSNW = +22m.39s.$, $e = +27m.17s.$, $eNE = +28m.35s.$, $eSSS = +31m.19s.$, $e = +35m.7s.$, $eNW = +37m.7s.$

Continued on next page.

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St. Louis ipP = +12m.27s., ipP_cP = +12m.35s., iEN = +12m.45s., ePPN = +15m.20s., ipPP = +15m.34s., ePPFN = +17m.25s., eE = +17m.38s., isS = +22m.47s., iEN = +32m.23s.
 Strasbourg ePP = +15m.23s.? ePPP = +17m.30s., ePPPP = +18m.53s., iPS = +22m.53s., eSS = +28m.15s., eSSSS = +33m.45s.
 Ottawa PP = +15m.37s., SSE = +28m.3s.
 Shawinigan Falls e = +32m.23s.?
 Trieste i = +19m.7s., iE = +22m.39s., i = +22m.54s., iPS? = +23m.5s., iE = +23m.8s., eE = +23m.27s., i = +28m.24s., iS = +28m.58s., i = +32m.5s.
 Toronto PPN = +15m.39s., SSE = +28m.0s.
 Melbourne SS = +27m.33s., i = +34m.14s., e = +35m.23s.
 Chur e = +36m.16s., e = +37m.33s.
 Paris iPS = +23m.10s.
 Buffalo i = +15m.31s., iPP = +15m.49s., iPPP = +17m.32s., iSKS = +22m.31s., iSS = +27m.23s.
 Little Rock ipPEN = +12m.45s., iN = +13m.39s., eSKSEN = +22m.41s., esSEN = +23m.11s., eSSN = +28m.17s.
 Jersey PP? = +18m.10s., SKS? = +22m.41s., PS? = +25m.29s.
 Cincinnati iP = +12m.35s., iPP = +15m.34s., ipPP = +15m.59s., ipPPP = +17m.56s.
 Vermont iP = +12m.36s., i = +12m.53s., eSS = +29m.3s., e = +31m.58s., i = +34m.16s.
 Pennsylvania i = +13m.21s., eSSS = +36m.52s.
 East Machias eP = +12m.36s., e = +12m.48s., and +13m.14s., PPP = +18m.11s., eSKS = +22m.18s., SKKS = +23m.32s., ePS = +24m.10s., e = +25m.13s., eSS = +28m.22s., eSSS = +32m.20s.
 Arapuni e = +34m.23s.
 Oak Ridge i = +36m.37s.
 Weston iZ = +13m.0s., ePPPE = +18m.3s., eSKS = +23m.29s., ePSZ = +24m.17s.
 Halifax PS = +24m.11s., SS = +32m.59s.
 Fordham esS = +23m.36s.
 Philadelphia i = +12m.49s., eSKS = +23m.4s., e = +25m.53s., eSS = +28m.40s., eSSS = +32m.30s., i = +33m.33s., e = +35m.54s.
 Georgetown pPP = +16m.20s., SKS = +23m.25s., SKKS = +23m.26s.
 Bagnères eSN = +24m.50s.
 Wellington ipP? = +13m.37s., S_cS = +23m.48s., PPS? = +24m.48s., SS = +28m.59s., L_q? = +37.4m.
 Columbia eP = +13m.5s., ePP = +16m.38s., eSKS = +23m.28s., eSS = +29m.54s., eSSS = +33m.14s.
 Christchurch S = +23m.57s., L_qE = +38.1m.
 Toledo PP = +16m.43s., PS = +24m.57s., SSS = +34m.10s.
 Algiers e = +15m.40s., SKS = +24m.7s., PS = +25m.50s., SS = +32m.4s.
 San Fernando iSKS = +24m.22s., iSS = +35m.6s.
 San Juan ePP = +18m.59s., e = +20m.5s., eSS = +34m.25s.
 Tananarive ePP = +19m.27s., N = +23m.24s., PSEN = +28m.36s., SSN = +35m.0s., SSSN = +37m.59s.
 Huancayo PP = +21m.42s., SKP = +22m.34s., eSS = +39m.1s., SSS = +43m.47s., e = +54m.26s.
 La Paz iPKPZ = +19m.42s., iPP?Z = +22m.26s., iPPN = +22m.39s., iSSN = +40m.41s., iSSSN = +44m.23s., iSSSZ = +45m.23s.
 Cape Town iPSKS = +32m.59s., iPPS = +34m.55s., iSS = +41m.31s., iSSS = +46m.45s.
 Rio de Janeiro ePE = +20m.13s., iPPPN = +24m.4s., eSSN = +34m.34s.
 Long waves were also recorded at Oaxaca and Mazatlan.

Feb. 21d. 7h. 26m. 32s. Epicentre 44° 6N. 149° 4E. (as at 7h.2m.).

A = -6149, B = +3637, C = +6998; δ = +10; λ = -3.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8.2	231	(1 49)	-14	1 49	P	—	—
Toyooka	14.3	236	3 19	-7	e 5 58	-8	7.2	9.9
Kobe	14.7	233	e 3 36	+5	6 23	+7	7.1	10.4
	N.	14.7	233	e 3 34	+3	6 40	+24	7.3
	Z.	14.7	233	e 3 42	+11	—	e 8.7	10.3
Sumoto	E.	15.2	232	3 52	+14	7 28	—	12.0
	E.	15.2	232	3 52	+14	7 39	—	10.4
	N.	15.2	232	3 54	+16	—	—	10.4
	Z.	15.2	232	e 3 42	+4	e 8 5	—	10.4

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o	o	m. s.	s.	m. s.	s.	m.	m.
Taikyu	18.1	248	e 4 10	- 4	e 6 55	- 40	8.9	10.6
Hukuoka	18.3	238	e 4 12	- 5	e 7 45	+ 6	---	---
Hukuoka B	18.3	238	e 4 14	- 3	e 7 44	+ 5	---	10.8
Husan	18.3	246	e 4 9	- 8	e 6 45	- 54	---	---
Keizyo	18.3	254	e 4 11	- 6	e 7 40	+ 1	---	---
Heizyo	18.4	261	e 4 15	- 3	e 8 4	+ 23	10.4	11.8
Zinsen	18.5	256	e 4 16	- 3	e 8 3	+ 19	e 9.2	12.1
Zi-ka-wei	25.7	248	e 5 33	0	10 8	+ 7	13.5	18.3
Taihoku	z.	29.8	238	e 6 18	+ 7	12 14	SS?	20.4
Almata	50.6	296	e 9 12	+ 10	---	---	---	---
Frunse	52.3	296	e 9 19	+ 4	---	---	---	---
Andijan	54.8	295	e 9 35	+ 1	---	---	---	---
Tohinkent	55.7	298	e 9 38	- 2	---	---	---	---
Samarkand	58.8	296	e 10 1	- 1	---	---	---	---
Batavia	63.4	228	i 10 27	- 7	i 19 1	- 5	---	---
Berkeley	z.	63.6	62	e 10 41	+ 6	---	---	---
Scoresby Sund	65.1	357	i 10 46	+ 1	---	---	---	---
Fresno	N.	65.9	62	e 11 11	+ 21	---	---	---
Tinemaha	66.6	61	e 10 55	+ 1	e 19 48	+ 3	---	---
Haiwee	N.	67.4	61	e 11 14	+ 15	---	---	---
Santa Barbara	67.4	64	e 11 0	+ 1	---	---	---	---
Pasadena	z.	68.5	63	i 11 5	- 1	---	---	---
Mount Wilson	68.6	63	i 11 4	- 3	---	---	---	---
Upsala	68.7	336	e 11 5	- 2	---	---	---	---
Riverside	N.	69.1	63	e 11 9	- 1	---	---	---
La Jolla	z.	70.0	63	e 11 16	+ 1	---	---	---
Tifis	E.	70.8	310	i 11 20	0	---	---	---
Bergen	71.3	342	i 11 27	+ 4	20 0	- 41	---	---
Theodosia	73.3	317	i 11 36	+ 1	21 1	- 3	---	---
Ivigtut	73.6	9	i 11 35	- 2	---	---	---	---
Copenhagen	73.7	336	i 11 34	- 4	---	---	---	---
Simferopol	74.0	318	i 11 37	- 2	21 7	- 4	---	---
Yalta	74.3	317	i 11 38	- 3	21 8	- 7	---	---
Sebastopol	74.5	318	i 11 46	+ 4	21 17	0	---	---
Prague	77.9	332	i 11 59	- 2	e 22 16	+ 22	---	43.5
Jena	78.1	333	i 12 0	- 2	e 21 56	0	---	27.3
Stara Dala	78.4	329	e 12 8	+ 4	e 22 10	+ 10	---	31.5
Kecskenet	78.7	328	e 12 13	+ 7	e 22 12	+ 9	---	---
Vienna	78.8	330	i 12 8	+ 2	---	---	---	---
De Bilt	z.	78.9	338	i 12 10	+ 3	---	---	45.0
Graz	80.1	330	i 12 16	+ 3	i 22 16	- 2	---	44.0
Uocle	80.3	339	i 12 13	- 1	---	---	---	34.2
Stuttgart	80.7	335	i 12 15	- 1	---	---	---	---
Florissant	E.	81.0	43	e 12 21	+ 3	e 22 22	- 5	---
Zagreb	81.0	329	e 12 19	+ 1	e 22 39	+ 12	---	---
St. Louis	81.2	43	e 12 31	+ 12	e 23 3	+ 34	---	---
Ksara	81.3	309	i 12 25	+ 5	e 23 49	+ 19	---	---
Lalbach	81.3	330	e 12 10	- 10	e 22 23	- 7	---	---
Strasbourg	81.3	335	e 12 13	- 7	e 22 27	- 3	---	---
Triest	81.9	331	i 12 18k	- 5	i 22 37	+ 1	---	---
Zurich	82.1	335	e 12 23	- 1	---	---	---	---
Basle	82.3	335	e 12 23	- 2	---	---	---	---
Paris	82.6	339	i 12 25	- 1	e 23 28?	+ 45	---	---
Neuchatel	82.9	335	e 12 27	- 1	---	---	---	---
Beaunon	83.0	336	e 12 28	0	---	---	---	---
Little Rock	83.2	47	e 12 33	+ 4	e 22 35	- 14	---	---
Oak Ridge	z.	85.9	28	i 12 43	- 1	---	---	---
Bagnères	88.6	338	---	---	e 24 48	PS	---	---
Toledo	92.6	340	e 13 11	- 4	---	---	---	---
Almeria	95.0	337	e 13 39	+ 13	---	---	---	---
Granada	95.0	338	e 13 25	- 1	e 24 28	+ 50	---	---

For Notes see next page.

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NOTES TO FEB. 21d. 7h. 26m. 32s.

Additional readings :—

Mizusawa PEI = +7h.26m.13s.
 Zi-ka-wei IE = +10m.28s.
 Berkeley e = +10m.45s. and +10m.56s.
 Mount Wilson iPKP,PKPZ = +39m.22s.
 Pasadena iPKP,PKPZ = +39m.16s.
 Jena iP = +12m.6s.
 Keosauket eE = +12m.25s., eZ = +14m.5s.
 Uccle iZ = +12m.18s.
 Zagreb eZ = +22m.31s. = S + 4s.
 Laibach iZ = +12m.29s.
 Strasbourg i = +12m.22s.
 Trieste i = +12m.25s.
 Besançon i = +15m.8s.
 Bagnères eSN = +24m.58s.
 Long waves recorded at Vladivostok.

Feb. 21d. 7h. 49m. 39s. I | Epicentre 44° 6N. 149° 4E.
 7h. 59m. 13s. II | (as at 7h.26m.)

		Δ	Az.	P.	O-C.	S.	O-C.
		°	°	m. s.	s.	m. s.	s.
I Mizusawa	E.	8-2	231	1 56	- 7	3 27	-11
II		8-2	231	(2 10)	+ 7	2 10	P
I Toyooka	N.Z.	14-3	236	3 20	- 6	—	—
II	N.	14-3	236	3 17	- 9	—	—
I Kobe	E.Z.	14-7	233	e 3 34	+ 3	—	—
II	N.Z.	14-7	233	e 3 34	+ 3	—	—
II Hukuoka B		18-3	238	4 14	- 3	—	—
I Almata		50-6	296	e 9 9	+ 7	—	—
II		50-6	296	e 9 5	+ 3	—	—
I Frunse		52-3	296	e 9 17	+ 2	—	—
II		52-3	296	e 9 18	+ 3	—	—
I Andijan		54-8	295	e 9 33	- 1	—	—
II		54-8	295	e 9 35	+ 1	—	—
I Tchinkent		55-7	298	e 9 39	- 1	—	—
II		55-7	298	e 7 55	?	—	—
I Samarkand		58-8	296	e 10 3	+ 1	e 18 8	+ 1
II Tinemaha	E.	66-6	61	e 11 0	+ 6	—	—
II Santa Barbara	Z.	67-4	64	e 11 0	+ 1	—	—
II Pasadena	Z.	68-5	63	1 11 5	- 1	—	—
II Mount Wilson	Z.	68-7	63	1 11 4	- 3	—	—
II La Jolla	Z.	70-0	63	e 11 14	- 1	—	—
II Erevan		72-0	308	—	—	e 20 45	- 4
I Sochi		72-2	314	e 11 29	0	—	—
I Copenhagen		73-7	336	1 11 38	0	—	—
I Yalta		74-3	317	1 11 41	0	21 14	- 1
I Florissant	E.	81-0	43	e 12 32	+14	—	—
II	E.	81-0	43	e 11 49	-29	e 22 24	- 3
II Zagreb		81-0	329	e 12 13	- 5	—	—
II Zurich		82-1	335	e 12 26	+ 2	—	—
II Little Rock		83-2	47	e 12 38	+ 9	—	—
I Oak Ridge	Z.	85-9	28	e 12 56	+13	—	—
II	Z.	85-9	28	1 12 43	0	—	—

Additional readings :—

Mizusawa I SN = +3m.19s., II SE = +2m.22s.
 Toyooka I PE = +3m.38s., II PZ = +3m.20s.
 Kobe I ePN = +3m.37s., II eP'E = +3m.43s.
 Mount Wilson II ePKP,PKPZ = +39m.17s.
 Pasadena II ePKP,PKPZ = +39m.19s.
 Florissant II IE = +12m.0s.

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Feb. 21d. 10h. 52m. 8s. Epicentre 44°·6N. 149°·4E. (as at 7h.59m.).

Slightly felt at Kusiro. Radius 100-200kms. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937. Tokyo, Japan, 1939, pp. 27-28.

A = -·6149, B = +·3637, C = +·6998; $\delta = +10$; $h = -3$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nemuro	3·0	246	0 53	+ 3	1 34	+ 7	—	—
Kusiro	4·0	246	1 0	- 4	1 51	- 1	—	—
Obihiro	4·8	256	1 17	+ 2	2 28	+ 16	—	—
Asahigawa	5·1	264	1 20	0	2 35	+ 15	—	—
Urakawa	5·4	245	1 29	+ 5	2 40	+ 12	—	—
Sapporo	6·0	258	1 37 ^a	+ 5	2 52	+ 9	—	—
Muroran	6·5	252	1 43	+ 4	3 5	+ 10	—	—
Hakodate	6·9	249	1 55	+ 10	3 21	+ 16	—	—
Hatinohe	7·0	237	1 46 ^k	0	3 5	- 3	—	—
Aomori	7·4	242	1 52	0	3 38	+ 20	—	—
Morioka	7·8	234	1 57	- 1	3 24	- 4	—	—
Mizusawa	8·2	231	2 2	- 1	3 28	- 10	—	—
Akita	8·5	238	2 8	+ 1	3 28	+ 17	—	—
Isinomaki	8·6	227	2 6	- 3	3 42	- 6	—	—
Yamagata	9·3	230	2 19	+ 2	3 58	- 7	—	—
Hukushima	9·6	227	2 20	- 1	4 2	- 10	—	—
Aidu	9·9	228	2 26	+ 1	4 13	- 7	—	—
Mito	10·6	223	2 43	+ 7	4 27	- 10	—	—
Utunomiya	10·8	225	2 44	+ 5	—	—	—	—
Kakioka	10·9	223	2 36	- 4	4 29	- 15	—	—
Tukubasan	11·0	223	2 38	- 4	4 33	- 14	—	—
Tyosi	11·0	219	2 47	+ 5	4 35	- 12	—	—
Maebasi	11·3	227	2 49	+ 3	4 47	- 7	—	—
Takada	11·3	232	2 44	- 2	4 51	- 3	—	—
Kumagaya	11·4	225	2 47	0	4 48	- 8	—	—
Nagano	11·6	231	2 57	+ 7	5 36	+ 35	—	—
Tokyo	11·6	223	2 42	- 8	4 50	- 11	—	—
Oiwake	11·7	229	3 2	+ 11	5 12	+ 8	—	—
Wazima	11·8	237	2 52	- 1	5 5	- 1	—	—
Toyama	12·1	235	3 0	+ 3	—	—	—	—
Hunatu	12·2	225	2 59	+ 1	5 11	- 5	—	—
Kohu	12·2	227	3 1	+ 3	5 8	- 8	—	—
Ito	12·4	223	3 17	+ 16	—	—	—	—
Misima	12·4	224	3 1	0	5 9	- 12	—	—
Numadu	12·4	224	3 21	+ 20	5 33	+ 12	—	—
Gihu	13·3	231	3 12 ^k	- 1	6 8	+ 26	—	—
Nagoya	13·4	229	e 3 15	+ 1	5 51	+ 6	—	—
Ibukisan	13·5	231	3 17	+ 2	—	—	—	—
Hikone	13·7	231	3 18	0	—	—	—	—
Kameyama	13·9	230	3 11	- 10	—	—	—	—
Toyooka	14·3	236	3 27	+ 1	—	—	—	—
Kobe	14·7	233	e 3 16	- 15	—	—	—	9·1
Wakeyama	15·1	232	3 35	- 1	6 44	+ 19	—	—
Sumoto	15·2	232	3 40	+ 2	—	—	e 9·7	—
Siomisaki	15·4	228	3 49	+ 9	—	—	—	—
Hamada	16·4	240	3 55	+ 2	7 10	+ 14	—	—
Koti	16·5	233	3 51	- 3	—	—	—	—
Matuyama	16·8	236	3 58	0	—	—	—	—
Ooita	17·8	237	4 13	+ 2	—	—	—	—
Taikyū	18·1	248	4 18	+ 4	8 1	+ 26	10·0	—
Hukuoka B	18·3	238	e 4 17	0	e 8 9	+ 30	—	—
Husan	18·3	246	4 16	- 1	e 7 53	+ 14	—	10·2
Kelzo	18·3	264	e 4 15	- 2	e 7 57	+ 18	e 10·4	—
Titizima	18·4	199	7 28	S	(7 28)	- 13	—	—
Zinsen	N. 18·5	256	14 19	0	e 8 8	+ 24	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Kumamoto	18.7	233	4 22	0	7 59	+11	—	—
Miyazaki	18.9	234	4 24	0	8 7	+14	—	—
Zi-ka-wei	25.7	248	5 36	+ 3	10 35	+34	14.0	17.1
Irkutsk	30.5	301	7 16	PP	e 10 53	-25	15.9	19.7
Manila	38.4	227	7 28	+ 3	e 14 39	?	—	—
College	39.4	36	—	—	e 13 18	-17	e 16.4	—
Phu-Lien	42.5	250	e 8 0	+ 1	—	—	—	—
Semipalatinsk	45.5	303	e 8 22	- 1	—	—	—	—
Almata	50.6	296	9 6	+ 4	—	—	—	—
Frunse	52.3	296	9 14	- 1	e 16 53	+13	29.9	—
Sverdlovsk	53.6	317	i 9 21	- 4	e 16 56	- 2	33.5	34.7
Andijan	54.8	295	9 33	- 1	e 17 39	+25	31.4	—
Tchikent	55.7	298	9 39	- 1	—	—	—	—
Tashkent	56.4	297	e 12 28	PP	e 17 37	+ 1	i 35.1	—
Agra	E. 58.6	277	e 9 57	- 4	e 18 3	- 1	—	37.1
Samarkand	58.8	296	10 14	+12	e 18 14	+ 7	—	—
Moscow	64.7	324	e 10 41	- 1	—	—	—	47.3
Pulkovo	64.7	331	e 10 38	- 4	e 20 8	+46	33.9	38.2
Tinemaha	66.6	61	e 11 4	+10	—	—	—	—
Santa Barbara	67.4	64	i 10 55	- 4	—	—	—	—
Bombay	67.5	274	e 10 59	- 1	e 20 4	+ 8	—	—
Pasadena	Z. 68.5	63	i 11 2	- 4	—	—	—	—
Mount Wilson	Z. 68.6	63	i 11 1	- 6	—	—	—	—
Uppsala	68.7	336	e 10 59	- 8	—	—	e 39.9	47.5
Baka	68.8	306	i 11 9	+ 1	e 20 29	+18	e 35.9	44.8
Grozny	69.2	310	i 11 13	+ 3	e 20 31	+15	—	—
Kodaikanal	E. 70.0	265	e 11 16	+ 1	e 20 30	+ 4	—	—
La Jolla	Z. 70.0	63	e 11 16	+ 1	—	—	—	—
Platigorsk	70.1	312	i 11 17	+ 1	—	—	e 41.9	—
Tifis	70.8	310	i 11 22	+ 2	e 20 37	+ 2	e 35.6	47.5
Brevan	72.0	308	e 11 18	-10	—	—	—	—
Sotchi	72.2	314	i 11 29	0	—	—	—	—
Theodosia	73.3	317	i 11 34	- 1	—	—	50.9	—
Copenhagen	73.7	336	i 11 34 _a	- 4	—	—	37.9	—
Simferopol	74.0	318	i 11 38	- 1	e 21 10	- 1	46.3	—
Yalta	74.3	317	i 11 40	- 1	—	—	e 50.9	—
Tucson	74.4	60	(e 11 54)	+12	—	—	e 11.9	—
Sebastopol	74.5	318	e 11 43	+ 1	—	—	—	—
Hamburg	76.2	337	i 11 50 _a	- 2	—	—	e 40.9	48.9
Prague	77.9	332	i 12 1 _a	0	e 21 52	- 2	e 40.9	43.9
Bucharest	78.1	322	e 12 4	+ 2	—	—	—	—
Stara Dala	78.4	329	i 12 6 _k	+ 2	e 22 46	[+31]	—	—
Vienna	78.8	330	i 11 59	- 7	—	—	—	—
Uccle	80.3	339	i 12 12 _a	+ 2	—	—	e 41.9	—
Soña	80.6	322	e 12 15	- 1	e 22 37	+14	—	51.1
Stuttgart	80.7	335	i 12 15 _a	- 1	e 19 35	?	e 44.9	—
Florissant	E. 81.0	43	i 12 17	- 1	e 22 17	-10	—	—
Zagreb	81.0	329	e 12 16	- 2	e 22 22	- 5	—	49.4
St. Louis	81.2	43	e 12 24	+ 5	i 22 25	- 4	—	—
Ksara	81.3	309	i 12 19	- 1	e 22 35	+ 5	—	—
Strasbourg	81.3	335	i 12 17 _a	- 3	—	—	e 18.9?	—
Triest	81.9	331	12 18	- 5	22 30	- 6	e 42.0	52.3
Zurich	82.1	335	e 12 23 _a	- 1	—	—	—	—
Basle	82.3	335	e 12 23	- 2	—	—	e 42.4	—
Chur	82.3	334	e 12 23	- 2	—	—	—	—
Paris	82.6	339	i 12 25	- 1	—	—	48.9	53.9
Neuchatel	82.9	335	e 12 26	- 2	—	—	—	—
Little Rock	83.2	47	e 12 39	+10	e 22 40	- 9	—	—
Florence	84.4	331	e 12 30	- 6	e 17 57	PPP	—	—
Oak Ridge	Z. 85.9	28	i 12 37	- 6	—	—	—	—
Helwan	86.9	309	e 12 47	- 1	23 12	-14	—	—
Toledo	92.6	340	i 13 13	- 2	—	—	—	—

For Notes see next page.

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NOTES TO FEB. 21d. 10h. 52m. 8s.

Additional readings:—

Sumoto eN? = +3m.5s.
 Irkutsk e = +12m.59s. and +13m.49s.
 College eL = +19m.28s.
 Sverdlovsk L₀ = +27.7m.
 Tashkent e = +30m.16s.
 Agra eSSE = +22m.0s.
 Pasadena 1Z = +11m.15s., ePKP,PKPZ = +39m.9s.
 Mount Wilson ePKP,PKPZ = +33m.58s.
 Grozny 1 = +16m.4s.
 Kodalkanal ePPE = +13m.52s.
 Yalta e = +19m.52s.
 Bucharest eN = +12m.20s., eEN = +12m.59s., eE = +13m.30s., eEN = +13m.59s., eE = +14m.6s.
 Vienna S = 1L = +12m.6s.
 Long waves were also recorded at Cape Town, Göttingen, De Bilt, Cheb, Ivigtut, and Scoresby Sund.

Feb. 21d. 15h. 5m. 20s. Epicentre 44°·6N. 149°·4E. (as at 10h.).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8·2	231	e 1 48	-15	3 19	-19	—	—
Nagoya	13·4	229	e 3 46	P*	5 59	+14	—	—
Chiufeng	24·9	272	1 5 25 _a	-1	10 6	+19	—	15·3
Irkutsk	30·5	301	e 6 46	+29	—	—	17·7	19·7
Frunze	52·3	296	e 9 26	+11	—	—	—	—
Sverdlovsk	53·6	317	—	—	e 20 58	SS	28·7	34·6
Andijan	54·8	295	e 9 34	0	e 17 16	+2	—	—
Tashkent	56·4	297	1 9 45	0	e 17 52	+16	—	35·6
Pulkovo	64·7	331	e 10 28	-14	e 19 38	+16	33·7	—
Pasadena	z. 68·5	63	e 11 9	+3	—	—	—	—
Mount Wilson	z. 68·6	63	e 11 10	+3	—	—	—	—
Tiflis	70·8	316	e 11 25	+5	e 20 45	+10	e 35·2	—
Copenhagen	73·7	336	12 0	+22	—	—	36·7	—

Additional readings:—

Irkutsk e = +9m.40s. ? and +14m.14s.
 Pasadena 1Z = +11m.24s.
 Long waves were also recorded at Hong Kong, Vladivostok, Baku, Moscow, Stuttgart, Strasbourg, Paris, and Scoresby Sund.

Feb. 21d. 22h. 28m. 55s. Epicentre 44°·6N. 149°·4E. (as at 15h.).

A = -6149, B = +3637, C = +6998; $\delta = +10$; $h = -3$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8·2	231	e 1 53	-10	1 3 29	-9	—	—
Nagoya	13·4	229	e 3 32	+18	5 57	+12	—	—
Tayooka	14·3	236	2 38	-48	—	—	—	11·2
Taikyu	18·1	248	e 3 28	-46	—	—	10·5	—
Hakuoka B	18·3	238	e 4 31	+14	e 8 2	+23	—	—
Husan	18·3	246	e 4 45	+28	—	—	e 10·8	—
Zinsen	z. 18·5	256	e 4 52	+33	e 8 12	+28	—	—
Chiufeng	24·9	272	1 5 27 _a	+1	9 57	+10	e 12·4	16·7
Zi-ka-wei	z. 25·7	248	e 5 35	+2	10 21	+20	15·1	17·4
Irkutsk	30·5	301	e 6 12	-5	e 11 14	-4	16·5	19·1
Hong Kong	36·4	244	—	—	12 55	+5	—	20·9
Manila	38·4	227	7 11	-14	13 23	+3	—	—
College	39·4	36	—	—	e 13 35	0	—	—
Sitka	48·7	46	—	—	(e 15 5?)	-17	15·1	—
Honolulu	49·0	160	—	—	e 13 5	?	e 20·7	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Frunse	52.3	296	9 16	+ 1	16 42	+ 2	29.1	—
Sverdlovsk	53.6	317	9 24	- 1	16 58	0	33.9	34.5
Calcutta	N. 54.1	267	e 9 30	+ 1	i 17 5	0	—	—
Andijan	54.8	295	e 9 25	- 9	e 17 16	+ 2	—	—
Tashkent	56.4	297	19 44	- 1	i 17 35	+ 2	e 28.0	35.9
Agra	E. 58.6	277	—	—	e 18 11	+ 7	—	—
Samarkand	58.8	296	10 1	- 1	18 11	+ 4	—	—
Moscow	64.7	324	e 10 40	- 2	e 19 20	- 2	23.6	39.8
Pulkovo	64.7	331	e 10 36	- 6	e 19 16	- 6	34.1	38.4
Pasadena	Z. 68.5	63	e 11 14	+ 8	—	—	—	—
Baku	68.8	306	11 8	0	e 20 28	+ 17	36.1	45.6
Grozny	69.2	310	e 11 13	+ 3	—	—	e 41.1	—
Tiflis	70.8	310	11 22	+ 2	20 40	+ 5	39.1	47.4
Theodosia	73.3	317	e 11 34	- 1	—	—	—	—
Copenhagen	73.7	336	i 11 35	- 3	21 11	+ 3	37.1	—
Yalta	74.3	317	e 11 52	+ 11	—	—	—	—
Prague	77.9	332	e 11 55	- 6	e 21 59	+ 5	—	44.1
Cheb	78.6	333	—	—	e 21 5 ⁹	- 57	43.1	46.1
Bidston	79.6	344	—	—	e 22 24	+ 12	e 44.1	—
Stuttgart	80.7	335	e 12 16	0	—	—	e 45.1	—
Kew	80.8	341	—	—	e 22 29	+ 4	e 44.1	—
Strasbourg	81.3	335	e 12 5 ⁹	- 15	—	—	e 45.1	—
Ksara	81.3	309	1 12 19	- 1	e 22 42	+ 12	—	48.1
Triest	81.9	331	e 12 13	- 10	e 22 29	- 7	—	43.4
Chur	82.3	334	e 12 23	- 2	—	—	—	—
Paris	82.6	339	e 12 23	- 3	—	—	47.1	55.1
Helwan	86.9	309	—	—	e 23 25	- 1	—	—

Additional readings:—

Mizusawa PN = +1m.48s.

Chinfeng PPN = +6m.5s.

Irkutsk e = +7m.26s., +13m.2s., and +14m.14s.

Calcutta IN = +17m.41s.

Sverdlovsk L₁ = +28.7m.

Agra eSSE = +22m.0s.

Ksara ePS = +23m.30s.

Triest e = +32m.45s.

Long waves were also recorded at Kobe, Sumoto, Keizyo, Phu-Lien, Vladivostok, Cape Town Univ., Berkeley, Ukiah, East Machias, Tucson, Oak Ridge, Scoresby Sund, Uccle, Stonyhurst, De Bilt, and Hamburg.

Feb. 21d. Readings also at 3h. (Christchurch), 4h. (Mizusawa and near Hukuoka B), 5h. (Oaxaca and Tacubaya), 6h. (Guadalajara, Tucson, Almata (2), Andijan (2), Frunse (2), Samarkand (2), Tashkent (2), and Tchikent), 7h. (Helwan, Sebastopol, Vienna, Stuttgart, Basle, Zurich, Mount Wilson, Pasadena, and Tucson), 8h. (Mizusawa (4)), 9h. (Mount Wilson, Pasadena, Tiflis (2), and Mizusawa (2)), 10h. (Tiflis (2), Andijan and Mizusawa (6)), 11h. (Tiflis (2), Erevan, Sotchi, Grozny, Sverdlovsk, Frunse, Almata, Riverside, Mount Wilson, Pasadena, and Mizusawa (4)), 12h. (Mizusawa, Tashkent, Sverdlovsk, Bergen, Sotchi, Tiflis, Bucharest, Soda, Ksara, Theodosia, near Sebastopol, Simferopol, and Yalta), 13h. (Sverdlovsk, Tiflis, Tashkent, and Mizusawa (3)), 14h. (Ksara, Helwan, Tiflis (3), Sverdlovsk, Tashkent, Baku, Irkutsk, Vladivostok, Cape Town, and Mizusawa (3)), 15h. (Mizusawa and Ksara), 17h. (Tiflis, Sverdlovsk, Andijan, Tashkent, Irkutsk, Chinfeng, Hong Kong, Vladivostok, Mizusawa (3), Mount Wilson, Pasadena, Riverside, near Florence, and Triest), 18h. (Andijan, Frunse, Baku, Sverdlovsk, Pulkovo, Copenhagen, Basle, Vladivostok, Irkutsk, Ksara, Chinfeng, Mizusawa, Mount Wilson, Pasadena, and Riverside), 19h. (Tashkent, Baku, Pulkovo, Ksara, Moscow, Cheb, Hong Kong, Tarkya, and near Husan), 21h. (Tashkent, Baku, Tiflis, Sverdlovsk (2), and Cape Town), 22h. (Vladivostok), 23h. (Batavia, Manila, Hong Kong, Vladivostok, Andijan, Samarkand, Sverdlovsk, Grozny, Tiflis, and Sebastopol).

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Feb. 22d. 0h. 19m. 33s. Epicentre 44°·6N. 149°·4E. (as on 21d.).

	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
			m. s.	s.	m. s.	s.		m. s.	s.		
Mizusawa	8·2	231	e 1	45	-18	i 3	18	-20	—	—	—
Nagoya	13·4	229	e 2	57	-17	—	—	—	—	—	—
Chufeng	24·9	272	i 5	26 ^a	0	9	52	+ 5	—	—	16·4
Irkutsk	30·5	301	7	20	PP	e 11	40	+22	—	17·4	19·8
Frunse	52·3	296	e 9	18	+ 3	—	—	—	—	—	—
Sverdlovsk	53·6	317	9	29	+ 4	e 21	16	SS	—	28·4	35·1
Andijan	54·8	295	e 9	32	- 2	e 17	18	+ 4	—	—	—
Tashkent	56·4	297	19	48	+ 3	17	28	- 8	—	29·3	35·8
Grozny	69·2	310	e 11	30	+20	—	—	+20	—	e 41·8	49·9
Tifis	70·8	310	11	27	+ 7	20	55	—	—	—	—
Ksara	81·3	309	e 12	35	+15	e 22	45	+15	—	—	54·9
Basle	82·3	335	e 12	29	+ 4	—	—	—	—	—	—
Chur	82·3	334	e 12	34	+ 9	—	—	—	—	—	—

Additional readings:—

Irkutsk e = +14m.22s.?

Long waves were also recorded at Hong Kong, Baku, Pulkovo, Moscow, Scoresby Sund, Cape Town, and at other European stations.

Feb. 22d. 1h. 18m. 38s. Epicentre 19°·0N. 104°·9W.

(given by Mexican stations).

A = -·2433, B = -·9144, C = +·3236; δ = +4; h = +5;
D = -·966, E = +·257; G = -·083, H = -·313, K = -·946.

	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
			m. s.	s.	m. s.	s.		m. s.	s.		
Manzanillo	N.	0·5	85	0	8	- 6	—	—	—	—	—
Guadalajara	N.	2·2	38	0	35	- 3	—	—	—	—	—
Tacubaya	N.	5·4	85	1	21	- 3	—	—	—	—	—
Tucson		14·2	339	e 3	40	+16	e 6	48	+44	e 7·9	—
La Jolla		17·7	323	e 4	14	+ 4	—	—	—	—	—
Riverside	E.	18·6	325	e 4	24	+ 3	—	—	—	—	—
Pasadena		19·2	325	e 4	29	+ 1	e 13	31	?	—	—
Little Rock		19·3	34	e 4	29	0	—	—	—	—	—
Santa Barbara	Z.	20·2	323	e 4	43	+ 4	—	—	—	e 10·8	—
Halwee	E.	20·6	330	e 4	43	0	—	—	—	—	—
Tinemaha		21·5	330	e 4	57	+ 5	—	—	—	—	—
Butte		27·7	350	—	—	—	e 7	48	PPP	e 17·5	—

Long waves were also recorded at Mazatlan, Berkeley, St. Louis, Madison, East Machias, Scoresby Sund, and Cape Town.

Feb. 22d. 2h. 53m. 55s. Epicentre 44°·6N. 149°·4E. (as on 21d.).

A = -·6149, B = +·3637, C = +·6998; δ = +10; h = -3.

	Δ	Az.	P.		O-C.		S.	O-C.		L.	M.
			m. s.	s.	m. s.	s.		m. s.	s.		
Mizusawa	8·2	231	e 1	51	-12	3	16	-22	—	—	—
Vladivostok	12·7	269	e 3	3	- 2	e 5	45	+17	—	6·4	8·5
Nagoya	13·4	229	e 3	10	- 4	6	3	+18	—	—	—
Toyouka	N.	14·3	236	2	28	-58	—	—	—	—	10·6
Kobe		14·7	233	e 4	48	?	—	—	—	e 7·6	11·1
Sumoto	E.	15·2	232	e 3	15	-23	e 6	28	0	e 9·4	—
	N.	15·2	232	e 3	24	-14	e 6	33	+ 5	e 9·9	—
Huknoka B		18·3	238	e 4	29	+12	e 7	40	+ 1	—	—
Husan		18·3	246	e 4	11	- 6	e 7	48	+ 9	e 11·3	—
Keizyo		18·3	254	e 7	40	S	(e 7	40)	+ 1	—	—
Zinsen	N.	18·5	256	e 4	5	-14	—	—	—	e 9·3	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Chiufeng	24.9	272	i 5 25 ^a	- 1	9 53	+ 6	—	16.4
Zi-ka-wei	25.7	248	5 31	- 2	10 7	+ 6	—	19.2
Irkutsk	30.5	301	e 6 14	- 3	e 11 16	- 2	17.1	19.9
Hong Kong	36.4	244	7 15	+ 7	12 46	- 4	—	20.7
Manila	38.4	227	7 33	+ 8	13 15	- 5	—	—
Phu-Lien	42.5	250	e 7 56	- 3	—	—	22.1	—
Semipalatinsk	45.5	303	8 23	0	—	—	—	—
Frunse	52.3	296	e 8 16	-59	—	—	31.4	—
Sverdlovsk	53.6	317	i 9 25	0	17 2	+ 4	34.0	35.1
Calcutta	54.1	267	e 9 31	+ 2	17 6	+ 1	26.0	—
Andijan	54.8	295	e 8 33	-61	e 16 17	-57	32.1	—
Tashkent	56.4	297	i 9 45	0	i 17 38	+ 2	e 29.0	35.9
Agra	58.6	277	e 9 56	- 5	18 1	- 3	—	—
Samarkand	58.8	296	10 6	+ 4	18 6	- 1	—	—
Berkeley	63.6	62	—	—	e 19 21	+13	—	—
Moscow	64.7	324	e 10 43	+ 1	e 19 28	+ 6	31.6	40.2
Pulkovo	64.7	331	e 10 39	- 3	e 19 29	+ 7	33.6	38.8
Scoresby Sund	65.1	357	—	—	e 19 39	+12	36.1	—
Tinemaha	66.6	61	e 11 12	+18	—	—	—	—
Haiwee	67.4	61	e 11 21	+22	—	—	—	—
Bombay	67.5	274	e 11 3	+ 3	—	—	—	—
Pasadena	68.5	63	i 11 12	+ 6	—	—	e 29.6	—
Baku	68.8	306	e 11 12	+ 4	e 20 20	+ 9	e 39.1	45.0
Grozny	69.2	310	e 11 16	+ 6	e 20 22	+ 6	e 44.1	—
Piatigorsk	70.1	312	e 11 18	+ 2	—	—	e 41.1	—
Tiflis	70.8	310	i 11 24	+ 4	20 40	+ 5	39.4	48.1
Sotchi	72.2	314	e 11 29	0	—	—	—	—
Theodosia	73.3	317	e 11 25	-10	21 6	+ 2	e 44.1	—
Copenhagen	73.7	336	i 11 38 ^a	0	21 11	+ 3	36.1	—
Simferopol	74.0	318	e 12 0	+21	e 22 22	?	—	—
Yalta	74.3	317	e 11 53	+12	e 21 25	+10	e 44.1	—
Hamburg	76.2	337	e 12 2	+10	—	—	e 41.1	44.1
Prague	77.9	332	e 12 1	0	e 21 59	+ 5	e 39.1	43.6
Cheb	78.6	333	—	—	e 21 5?	-57	e 43.1	57.4
De Bilt	78.9	338	e 12 11	+ 4	—	—	e 40.1	49.0
Bidston	79.6	344	—	—	e 22 30	+18	e 44.1	—
Uccle	80.3	339	e 12 17	+ 3	e 22 21	+ 1	e 40.1	—
Stuttgart	80.7	335	e 12 18	+ 2	—	—	e 45.1	—
Kew	80.8	341	—	—	e 22 32	+ 7	e 43.1	—
Zagreb	81.0	329	e 12 21	+ 3	—	—	—	46.1
Ksara	81.3	309	i 12 20 ^a	0	e 22 40	+10	—	—
Strasbourg	81.3	335	e 12 24	+ 4	—	—	e 42.1	—
Triest	81.9	331	e 12 34	+11	22 41	+ 5	e 40.1	46.3
Zurich	82.1	335	e 12 53	+29	—	—	—	—
Basle	82.3	335	e 12 27	+ 2	—	—	—	—
Chur	82.3	334	e 12 26	+ 1	—	—	—	—
Paris	82.6	339	i 12 29	+ 3	—	—	46.1	48.1
Wellington	88.5	161	—	—	e 20 5	?	—	—

Additional readings:—

Chiufeng SZ = +9m.58s.

Toyooka PZ = +3m.5s.

Kelzyo eSEN = +10m.58s.

Phu-Lien e = +18m.11s.

Sverdlovsk L_g = +29.6m.

Calcutta PSN = +17m.39s.

Agra SSE = +22m.2s.

Pasadena 1NZ = +11m.25s., ePKP, PKPZ = +39m.19s.

Tiflis eZ = +16m.31s.

Copenhagen i = +11m.50s.

Ksara ePP = +15m.29s., ePS = +23m.23s.

Long waves were also recorded at Christchurch, La Paz, East Machias, Stonyhurst, Cape Town, Hyderabad, San Fernando, Ukiah, Tucson, Ivigtut, Kodaikanal, Sitka, College, and Oak Ridge.

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Feb. 22d. 4h. 35m. 53s. Epicentre 44°·6N. 149°·4E. (as at 2h.).

A = -·6149, B = +·3637, C = +·6998; $\delta = +10$; $h = -3$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8·2	231	e 1 55	- 8	3 15	-23	—	—
Vladivostok	12·7	269	e 3 3	- 2	e 6 1	+33	6·5	8·0
Nagoya	13·4	229	e 3 18	+ 4	—	—	—	—
Kobe	14·7	233	e 3 0	-31	—	—	—	10·2
Hukuoka B.	18·3	238	e 4 26	+ 9	e 7 34	- 5	—	—
Chiufeng	24·9	272	i 5 24 _a	- 2	—	—	e 12·0	15·9
Zi-ka-wet	z. 25·7	245	e 5 30	- 3	10 20	+19	15·3	17·2
Irkutsk	30·5	301	e 6 14	- 3	e 10 46	-32	16·1	19·8
Hong Kong	36·4	244	—	—	12 45	- 5	—	20·4
Manila	38·4	227	7 11	-14	16 19	SSS	—	19·8
Frutse	52·3	296	e 9 13	- 2	—	—	—	—
Sverdlovsk	53·6	317	i 9 23	- 2	16 59	+ 1	34·0	35·3
Calcutta	N. 54·1	267	e 13 47	?	21 22	SS	—	—
Andijan	54·8	295	e 9 29	- 5	17 14	+ 0	—	—
Tashkent	56·4	297	i 9 47	+ 2	i 17 49	+13	e 28·0	29·9
Agra	E. 58·6	277	e 9 55	- 6	e 17 58	- 6	—	—
Samarkand	58·8	296	e 10 3	+ 1	e 17 52	-15	—	—
Pulkovo	64·7	331	e 10 35	- 7	19 29	+ 7	34·1	40·5
Tinmahua	z. 66·6	61	i 11 13	+19	—	—	—	—
Pasadena	z. 68·5	63	e 11 5	- 1	—	—	—	—
Baku	68·8	306	e 11 10	+ 2	e 20 32	+21	39·1	44·0
Grozny	69·2	310	e 11 18	+ 8	e 20 14	- 2	—	—
Piatigorsk	70·1	312	e 11 17	+ 1	—	—	e 46·1	—
Tiflis	70·8	310	e 11 22	+ 2	e 20 38	+ 3	39·4	47·6
Theodosia	73·3	317	e 12 55	?	—	—	—	—
Copenhagen	73·7	336	i 11 37	- 1	21 23	+15	36·1	—
Simferopol	74·0	318	e 11 51	+12	—	—	—	—
Prague	77·9	332	e 12 5	+ 4	—	—	e 40·1	44·1
Ohel	78·6	333	—	—	e 32 7?	?	42·1	46·1
Vienna	z. 78·8	330	e 12 6	0	—	—	—	—
Stuttgart	80·7	335	e 12 17	+ 1	—	—	e 45·1	—
Keara	81·3	309	i 12 20 _a	- 0	e 22 40	+10	—	48·1
Strasbourg	81·3	335	e 12 7?	-13	—	—	—	—
Zurich	82·1	335	e 12 45	+21	—	—	e 44·1	—
Basle	82·3	335	e 12 25	0	—	—	—	—
Chur	82·3	334	e 12 25	0	—	—	—	—
Paris	82·6	339	e 12 7?	-19	—	—	49·1	—

Additional readings:—

Kobe ePE? = +3m.5s.

Chiufeng PPN = +5m.58s.

Zi-ka-wet IZ = +6m.7s.

Irkutsk PP = +7m.4s., e = +12m.38s. and +14m.18s.

Sverdlovsk L_e = +29·8m.

Calcutta IN = +21m.57s.

Agra eSSE = +21m.58s.

Vienna e = +12m.43s.

Keara ePP = +15m.35s., ePS = +23m.34s.

Long waves were also recorded at Kelsyo, Phu-Lien, Bombay, Moscow, Scoresby

Sund, Ivigtut, Tucson, Cape Town, and other European stations.

Feb. 22d. 13h. 23m. 57s. Epicentre 44°·6N. 149°·4E. (as at 4h.).

A = -·6149, B = +·3637, C = +·6998; $\delta = +10$; $h = -3$;

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8·2	231	2 4	+ 1	3 32	- 6	—	—
Vladivostok	12·7	269	e 3 7	+ 2	e 5 45	+17	6·7	8·0
Nagoya	13·4	229	e 3 24	+10	—	—	—	—
Toyooka	14·3	236	3 27	+ 1	—	—	8·8	11·1
Kobe	14·7	233	e 3 36	+ 5	—	—	e 8·9	10·3

Continued on next page.

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		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
				m. s.	s.	m. s.	s.	m.	m.
Sumoto		15.2	232	e 3 53	+15	e 7 41	L'	(e 7.7)	10.6
Taikyū		18.1	248	e 4 31	+17	e 7 51	+16	e 19.5	—
HukuoKa B		18.3	238	e 4 25	+ 8	e 8 2	+23	e 10.5	—
Husan		18.3	246	e 4 20	+ 3	e 8 27	+48	—	—
Keizyo		18.3	254	e 4 19	+ 2	e 8 11	+32	e 10.0	—
Zinsen	N.	18.5	256	e 4 17	- 2	e 8 3	+19	—	—
Chiufeng		24.9	372	1 5 28 _a	+ 2	e 9 58	+11	e 12.3	16.1
Zi-ka-wei	Z.	25.7	248	e 5 37	+ 4	e 10 23	+22	—	17.3
Irkutsk		30.5	301	e 6 17	+ 0	e 11 9	- 9	16.5	20.0
Hong Kong		36.4	244	e 7 13	+ 5	e 12 54	+ 4	—	20.8
Manila		38.4	227	e 7 23	- 2	e 13 23	+ 3	—	—
College		39.4	36	e 7 31	- 2	e 13 31	- 4	e 19.2	—
Sitka		46.7	46	—	—	(e 15 3?)	-19	e 15.0	—
Honolulu		49.0	100	—	—	e 19 30	SS	e 25.1	—
Almata		50.6	296	e 9 5	+ 3	—	—	—	—
Frunse		52.3	296	e 9 15	0	e 16 56	+16	29.4	—
Sverdlovsk		53.6	317	e 9 24	- 1	e 16 59	+ 1	32.4	34.4
Calcutta	N.	54.1	267	e 9 35	+ 6	e 17 10	+ 5	e 26.0	—
Andijan		54.8	295	e 9 30	- 4	e 17 19	+ 5	30.0	—
Tashkent		56.4	297	e 9 46	+ 1	e 17 41	+ 5	30.0	35.8
Agra	E.	58.6	277	e 9 57	- 4	e 18 5	+ 1	—	—
Berkeley		63.6	62	—	—	e 19 3?	- 5	—	—
Moscow		64.7	324	e 10 40	- 2	e 19 19	- 3	30.6	36.6
Pulkovo		64.7	331	e 10 37	- 5	e 19 16	- 6	33.0	38.0
Scoresby Sund		65.1	357	—	—	e 19 39	+12	30.0	—
Tinemaha	Z.	66.6	61	e 11 8	+14	—	—	—	—
Haiwee	E.	67.4	61	e 11 18	+19	—	—	—	—
Santa Barbara	Z.	67.4	64	e 11 13	+14	—	—	—	—
Bombay		67.5	274	e 10 34	-26	e 20 7	+11	—	—
Pasadena		68.5	63	e 11 3	- 3	—	—	e 29.4	—
Mount Wilson	Z.	68.6	63	e 11 1	- 6	—	—	—	—
Upsala	N.	68.7	336	—	—	e 21 3?	+53	e 37.0	47.6
Baku		68.8	306	e 11 12	+ 4	e 20 22	+11	36.0	45.4
Grozny		69.2	310	e 11 13	+ 3	e 20 21	+ 5	e 35.0	—
Kodalkanal	E.	70.0	265	—	—	e 20 3	-23	—	—
Platigersk		70.1	312	e 11 7	+ 1	—	—	e 41.0	—
Tiflis		70.8	310	e 11 22 _a	+ 2	e 20 38	+ 3	38.9	44.0
Sotchi		72.2	314	e 11 31	+ 2	—	—	—	—
Ivigut		73.6	9	—	—	e 21 9	+ 2	36.0	—
Copenhagen		73.7	336	e 11 36	- 2	e 21 15	+ 7	37.0	—
Simferopol		74.0	318	e 11 41	+ 2	—	—	—	—
Yalta		74.3	317	e 11 42	+ 1	—	—	—	—
Hamburg		76.2	337	e 11 51 _a	- 1	—	—	e 33.0	45.0
Prague		77.9	332	e 12 1	0	e 21 57	+ 3	e 41.0	43.6
Budapest	E.	78.4	328	e 12 3	- 1	e 22 3	+ 3	—	51.6
	N.	78.4	328	e 12 5	+ 1	e 22 1	+ 1	e 46.0	51.6
Cheb		78.6	333	—	—	e 22 3?	+ 1	e 43.0	47.0
De Bilt		78.9	338	e 12 8	+ 1	e 22 9	+ 4	e 37.0	43.2
Uccle		80.3	339	e 12 13	- 1	e 22 19	- 1	e 39.0	—
Oxford		80.7	341	—	—	e 22 19	-14	e 36.2	49.4
Stuttgart		80.7	335	e 12 16 _a	0	e 22 21	- 3	e 45.0	—
Kew		80.8	341	e 12 15	- 2	—	—	e 40.0	44.6
Zagreb		81.0	339	e 12 10	- 8	e 22 30	+ 3	e 45.6	49.6
Kaara		81.3	309	e 12 20 _a	0	e 22 46	+16	—	52.0
Strasbourg		81.3	335	e 12 21	+ 1	—	—	e 32.0	—
Triest		81.9	331	e 12 4	-18	e 22 46	+10	—	44.0
Chur		82.3	334	e 12 24	- 1	—	—	—	—
Paris		82.6	339	e 12 26	0	—	—	47.0	52.0
Helwan		86.9	309	e 12 48	0	e 23 25	- 1	—	—

For Notes see next page.

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NOTES TO FEB. 22d. 13h. 23m. 57s.

Additional readings:—

Mizusawa ePN = +2m.8s.
 Kobe ePZ = +3m.39s.
 Sumoto ePE = +3m.57s., eZ = +7m.13s.
 Chiufeng i = +5m.41s.
 Zi-ka-wei iZ = +6m.53s. and +10m.37s.
 Irkutsk PPP = +7m.28s., e = +13m.54s. and +14m.36s.
 Honolulu e = +21m.6s.
 Sverdlovsk L_g = +28.4m.
 Calcutta PSN = +17m.43s.
 Agra PSE = +18m.35s., SSE = +21m.55s.
 Tiflis iS = +20m.49s., eSSN = +29m.12s.
 Budapest iE = +22m.16s.
 Ksara ePP = +15m.30s., ePS = +23m.34s.
 Trieste i = +30m.30s.

Long waves were also recorded at Tucson, East Machias, Ukiah, Wellington, Belgrade, La Paz, Sofia, Phu-Lien, San Fernando, Rathfarnham Castle, Aberdeen, and Bidston.

Feb. 22d. Readings also at 0h. (Cheb, Mizusawa, Haiwee, La Jolla, Pasadena, Riverside, Santa Barbara, and Tinemaha), 1h. (Perth and Tashkent), 2h. (Mizusawa, Vladivostok, Tashkent, Sverdlovsk (2), Oak Ridge, and near New Plymouth), 4h. (Mizusawa (3), Vladivostok, Irkutsk, Tiflis, Tashkent, and Mazatlan), 7h. (Andijan), 8h. (Graz), 9h. (Tiflis (2), Sverdlovsk (2), Irkutsk, Chiufeng, Mizusawa, Hong Kong, and near Manila), 10h. (Tashkent, Copenhagen, and De Bilt), 12h. (Mizusawa and Bozeman), 13h. (Andijan, Christchurch, and near Taihoku), 14h. (Mizusawa (2), Tiflis, Mount Wilson, and Pasadena), 15h. (Tashkent), 16h. (Sverdlovsk), 17h. (Mizusawa, Vladivostok, Irkutsk, Sverdlovsk, Tashkent, Tiflis, and near Andijan), 18h. (Branner, Lick, near Berkeley, and Fresno), 19h. (Irkutsk, Vladivostok, Pulkovo, Tashkent, Tiflis, Sverdlovsk, Chiufeng, and near Mizusawa), 20h. (Baku, Copenhagen, and near Medan), 23h. (Mizusawa (2), Andijan, Tashkent, Sverdlovsk, Baku, Tiflis, Grozny, Piatigorsk, Ksara, near Erevan, and near Hastings).

Feb. 23d. 0h. 9m. 16s. Epicentre 25° 8'N. 98° 4'E.

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.		m. s.		m.	m.
Phu-Lien	9.1	122	2 13	- 1	4 41	+41	—	—
Calcutta	N. 9.7	253	—	—	4 22	+ 7	—	—
Hong Kong	14.8	100	6 36	S	(6 36)	+18	—	9.1
Agra	E. 18.3	278	e 4 13	- 4	e 7 38	- 1	—	12.8
Chiufeng	20.5	41	e 4 40	- 2	e 8 38	+11	—	11.4
Medan	22.1	180	e 4 51	- 8	—	—	11.7	—
Manila	23.9	114	5 18	+ 2	9 48	+18	—	—
Bombay	24.6	259	1 5 27	+ 4	i 9 54	+12	—	—
Almata	24.7	320	e 5 29	+ 5	e 9 58	+14	—	—
Kodalkanal	E. 25.1	237	e 5 23	- 5	e 9 53	+ 2	—	—
Frunse	25.9	317	e 5 38	+ 3	e 10 23	+19	17.4	—
Andijan	26.3	310	e 5 39	0	e 10 37	+26	—	—
Irkutsk	26.8	8	—	—	e 9 37	-42	i 13.8	—
Kelzyo	E. 26.9	58	e 10 40	S	(e 10 40)	+20	—	—
Tashkent	28.6	310	e 5 51	- 9	i 10 47	- 1	16.1	18.7
Samarkand	29.6	304	e 6 7	- 2	—	—	—	—
Sverdlovsk	41.1	329	7 44	- 3	13 59	- 2	20.7	—
Tiflis	46.6	304	e 8 34	+ 2	e 15 18	- 3	e 18.7	—
Moscow	52.7	322	—	—	e 16 49	+ 3	e 31.2	33.1
Ksara	54.1	294	e 9 27	- 2	e 17 15?	+10	—	—
Pulkovo	57.1	326	—	—	e 17 45	0	e 30.7	—
Florence	70.7	310	(15 44)	PPP	15 44?	PPP	—	21.7

Additional readings:—

Calcutta S* = +4m.52s., S_g = +5m.25s.
 Hong Kong S? = +7m.37s.
 Kelzyo eSE = +13m.30s.
 Samarkand e = +6m.49s.
 Moscow SS = +21m.2s.

Long waves were also recorded at Batavia, Zinsen, Baku, Hyderabad, Vladivostok, Sofia, Stuttgart, De Bilt, Copenhagen, and Uccle.

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Feb. 23d. 0h. 48m. 12s. Epicentre 44°-6N. 149°-4E. (as on 22d.).

Moderately felt at Kusiro. Radius greater than 300km. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937, pp. 28-29. Tokyo.

A = -6149, B = +3637, C = +6998; $\delta = +10$; $h = -3$.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Nemuro	3.0	246	0 50	0	1 25	- 2	—	—
Kusiro	4.0	246	0 48 _a	-16	1 53	+ 1	—	—
Obihiro	4.8	256	1 18	+ 3	2 30	S*	—	—
Asahigawa	5.1	264	1 28	+ 8	—	—	—	—
Ootomari	5.1	297	1 34	P*	2 26	+ 6	—	—
Urakawa	5.4	245	1 22	- 2	2 33	+ 5	—	—
Haboro	5.5	271	1 28	+ 3	2 31	+ 1	—	—
Sapporo	6.0	258	1 37 _a	+ 5	2 42	- 1	—	—
Sikka	6.3	319	1 13	-23	2 51	+ 1	—	—
Muroran	6.5	252	1 44 _a	+ 5	2 55	0	—	—
Hakodate	6.9	249	1 58	+13	3 36	S*	—	—
Hatinohe	7.0	237	1 44 _a	- 2	3 2	- 6	—	—
Aomori	7.4	242	1 50	- 2	3 13	- 5	—	—
Morioka	7.8	234	1 57	- 1	3 21	- 7	—	—
Mizusawa	8.2	231	1 2 3	0	1 3 29	- 9	—	—
Akita	8.5	238	2 15	+ 8	3 37	- 8	—	—
Isinomaki	8.6	227	2 3	- 6	—	—	—	—
Sendai	9.0	228	2 9 _a	- 4	3 47	-11	—	—
Yamagata	9.3	230	2 18	+ 1	3 56	- 9	—	—
Hokusima	9.6	227	2 20	- 1	3 59	-13	—	—
Niigata	10.2	233	2 52	+21	4 58	S*	—	—
Utunomiya	10.8	225	2 23	-16	4 26	-16	—	—
Kakioka	10.9	223	2 35	- 5	4 27	-17	—	—
Tukubasan	11.0	223	2 36	- 6	4 29	-18	—	—
Tyosi	11.0	319	2 48	+ 6	4 30	-17	—	—
Maebasi	11.3	227	2 50	+ 4	4 48	- 6	—	—
Takada	11.3	232	2 33	-13	4 42	-12	—	—
Kumagaya	11.4	225	2 47	0	4 42	-14	—	—
Nagano	11.6	231	2 50	0	5 10	+ 9	—	—
Tokyo	11.6	223	2 53	+ 3	4 43	-18	—	—
Oiwake	11.7	229	2 50	- 1	5 1	- 3	—	—
Wazima	11.8	237	2 51	- 2	5 3	- 3	—	—
Yokohama	11.8	222	3 8	+15	5 16	+10	—	—
Matumoto	12.0	230	3 8	+13	4 59	-12	—	—
Toyama	12.1	235	2 58	+ 1	—	—	—	—
Hunatu	12.2	226	2 28	-30	5 5	-11	—	—
Husiki	12.2	234	3 6	+ 8	5 19	+ 3	—	—
Kohu	12.2	227	3 2	+ 4	5 8	- 8	—	—
Ito	12.4	223	3 17	+16	—	—	—	—
Mera	12.4	220	3 28	+27	6 6	S*	—	—
Misima	12.4	224	3 10	+ 9	—	—	—	—
Numadu	12.4	224	3 6	+ 5	5 27	+ 6	—	—
Kanazawa	12.6	235	2 56	- 7	5 12	-14	—	—
Vladivostok	12.7	269	1 3 8	+ 3	e 5 56	+28	6.8	9.3
Gihu	13.3	231	3 12 _k	- 1	e 5 52	+10	—	—
Hamamatu	13.3	226	3 6	- 7	4 47	-55	—	—
Nagoya	13.4	229	e 3 20	+ 6	5 46	+ 1	—	7.0
Ibukisan	13.5	231	3 17	+ 2	—	—	—	—
Hikone	13.7	231	3 18	0	—	—	—	—
Kameyama	13.9	230	3 16	- 5	—	—	—	—
Tu	13.9	229	3 47	+26	—	—	—	—
Kyoto	14.2	232	3 24	0	—	—	—	—
Toyooka	14.3	236	3 25	- 1	5 59	- 7	—	10.0
Yagi	14.5	231	3 18	-10	—	—	—	—
Osaka B	14.6	232	3 47	+17	—	—	—	—

Continued on next page.

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	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Kobe	14.7	233	e 3 14	-17	6 33	+17	e 7.3	10.0
Wakayama	15.1	232	3 35	-1	6 41	+16	---	---
Sumoto	15.2	232	e 3 29	-9	e 6 41	+13	e 8.0	10.6
Slomisaki	15.4	238	3 44 _a	+4	6 47	+15	---	---
Okayama	15.5	235	3 45	+3	---	---	---	---
Tadotu	15.8	235	3 11	-34	---	---	---	---
Hamada	16.4	240	3 46	-7	7 12	+16	---	---
Koti	16.5	233	3 53	-1	7 10	+12	---	---
Hirosima	16.6	238	3 58	+2	---	---	---	---
Hsinking	17.3	276	3 54	-10	8 50	L	(8-8)	---
Talkyu	18.1	248	e 3 26	-48	e 8 12	SSS	e 9.2	---
Hukuoka	18.3	238	4 16	-1	7 47	+8	---	---
Hukuoka B	18.3	238	4 17	0	7 50	+11	12.0	---
Husan	18.3	246	4 16	-1	7 47	+8	9.4	---
Keizyo	18.3	254	e 4 15	-2	e 8 4	+25	e 9.3	---
Heizyo	18.4	261	e 4 5	-13	---	---	9.6	---
Titizima	18.4	199	4 23	+5	---	---	---	---
Zinsen	18.5	256	e 4 17	-2	e 8 3	+19	e 10.2	12.5
Miyazaki	18.9	234	4 25 _a	+1	8 2	+9	---	---
Unzendake	19.0	235	3 55	-31	---	---	---	---
Kagosima	19.7	234	4 30	-4	---	---	---	---
Tomie	20.0	235	4 37	0	---	---	---	---
Nake	22.6	231	5 6 _a	+3	9 22	+15	---	---
Chiufeng	24.9	272	i 5 26 _a	0	i 9 53	+6	12.0	15.9
Naha	z. 25.4	232	5 35	+4	9 1	-55	---	---
Zi-ka-wei	25.7	248	i 5 35 _k	+2	10 14	+13	14.3	17.1
Taihoku	29.8	238	e 6 26	+15	e 11 51	+44	---	---
Irkutsk	30.5	301	6 27	+10	e 12 2	+44	14.8	18.6
Taito	31.8	235	6 21	-7	---	---	---	---
Kosyun	32.6	235	6 36	+1	---	---	---	---
Hong Kong	36.4	244	7 9	+1	12 48	-2	---	22.2
Manila	38.4	227	7 27 _a	+2	13 31	+11	21.7	---
College	39.4	36	e 7 34	+1	e 13 31	-4	e 22.1	---
Phu-Lien	42.5	250	e 7 59	0	e 14 35	+13	---	---
Sempalatinsk	45.5	303	e 8 20	-3	---	---	---	---
Sitka	46.7	46	e 8 39	+7	15 16	-6	e 22.7	---
Honolulu	49.0	100	---	---	15 55	0	e 22.0	---
Almata	50.6	296	e 9 7	+5	16 18	+1	28.8	---
Frunse	52.3	296	e 9 14	-1	16 42	+2	---	---
Sverdlovsk	53.6	317	9 23	-2	17 3	+5	33.8	34.7
Calcutta	54.1	267	i 9 33	+4	---	---	---	40.4
Andijan	54.8	295	9 33	-1	e 17 16	+2	30.8	---
Tchimkent	55.7	298	e 10 40	+60	---	---	---	---
Tashkent	56.4	297	i 9 45	0	i 17 35	-1	26.7	36.1
Dehra Dun	56.7	281	10 8	+20	17 18	-22	30.8	35.8
Victoria	57.0	53	9.48	-2	17 31	-12	e 26.8	---
Agra	58.6	277	e 9 57	-4	---	---	---	---
Semarkand	58.8	296	e 10 1	-1	18 8	+1	---	---
Medan	60.3	243	e 10 14	+1	18 28	+2	33.8	---
Ukiah	62.3	61	---	---	e 18 51	-1	e 26.1	---
Batavia	63.4	225	i 10 30	-4	i 19 4	-2	---	---
Berkeley	63.6	62	i 16 34	-1	e 19 5	-3	---	---
Butte	64.4	49	---	---	e 19 3	-15	e 28.5	---
Moscow	64.7	324	10.41	-1	19 21	-1	30.3	42.5
Pulkovo	64.7	331	i 10 37	-5	e 19 16	-6	32.8	37.0
Scoresby Sund	65.1	357	10 45	0	19 30	+3	29.8	---
Bozeman	65.9	49	---	---	e 19 25	-12	e 29.0	---
Fresno	65.9	62	e 11 4	+14	---	---	---	---
Tinimaha	66.6	61	e 10 51	-3	---	---	---	---

Continued on next page.

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		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Haiwee	E.	67.4	61	e 10 57	- 2	—	—	—	—
Santa Barbara	Z.	67.4	64	e 10 58	- 1	—	—	—	—
Bombay		67.5	274	i 10 58	- 2	e 20 6	+ 10	—	—
Pasadena		68.5	63	e 11 3	- 3	e 19 57	- 11	e 26.3	—
Mount Wilson	E.	68.6	63	e 11 4	- 3	—	—	—	—
Upsala		68.7	336	e 10 57	- 10	e 19 56	- 14	e 33.8	46.8
Baku		68.8	306	i 11 25	+ 17	i 20 17	+ 6	35.8	44.5
Riverside		69.1	63	e 11 8	- 2	—	—	—	—
Grozny		69.2	310	e 11 15	+ 5	e 20 18	+ 2	e 29.8	—
Kodaikanal	E.	70.0	265	e 10 48?	- 27	—	—	—	—
La Jolla		70.0	63	e 11 14	- 1	—	—	—	—
Platigorsk		70.1	312	e 11 2	- 14	—	—	e 37.8	—
Colombo		70.6	260	11 17	—	—	—	—	48.2
Tiflis		70.8	310	i 11 23a	+ 3	e 20 29	- 6	37.5	47.6
Bergen		71.3	342	11 18	- 5	20 28	- 13	43.8	—
Erevan		72.0	308	e 11 29	+ 1	e 20 55	+ 6	—	—
Sotchi		72.2	314	e 11 30	+ 1	—	—	—	—
Theodosia		73.3	317	11 36	+ 1	21 4	0	39.8	—
Ivigtut		73.6	9	11 35?	- 2	21 2	- 5	30.8	—
Copenhagen		73.7	336	i 11 35	- 3	21 4	- 4	34.8	—
Simferopol		74.0	318	11 38	- 1	21 15	+ 4	40.0	—
Yalta		74.3	317	e 11 41	0	e 21 15	0	38.8	—
Tucson		74.4	60	e 11 42	0	e 21 13	- 3	e 32.4	—
Sebastopol		74.5	318	e 11 42	0	—	—	43.8	—
Aberdeen		75.8	344	—	—	e 20 38	- 53	—	44.2
Hamburg		76.2	337	e 11 51a	- 1	e 21 34	- 2	e 36.8	48.8
Edinburgh		77.2	344	—	—	e 25 58	?	e 45.8	47.8
Prague		77.9	332	e 11 59	- 2	e 21 50	- 4	e 37.3	43.3
Göttingen		78.0	335	e 11 54	- 8	e 21 54	- 1	e 37.8	50.4
Durham		78.0	343	—	—	i 22 30	+ 35	—	—
Bucharest		78.1	322	e 12 3	+ 1	21 56	0	27.8	46.1
Jena		78.1	333	e 12 0	- 2	e 21 48	- 8	e 38.8	45.3
Budapest		78.4	328	e 12 1	- 3	i 21 59	- 1	e 45.8	49.8
Stara Dala		78.4	329	e 12 6	+ 2	e 22 0	0	e 47.8	50.8
Cheb		78.6	333	—	—	e 21 48?	- 14	42.8	46.3
Vienna		78.8	330	e 12 6	0	22 6	+ 2	e 47.3	50.8
De Bilt		78.9	338	i 12 6	- 1	e 22 3	- 2	e 36.8	42.9
Stonyhurst		79.0	343	—	—	e 22 15	+ 9	42.8	47.6
Bidston		79.6	344	—	—	i 22 10	- 2	e 40.8	—
Chicago		79.9	40	e 12 11	- 1	e 20 51	?	e 33.9	—
Belgrade		80.1	325	e 12 12a	- 1	e 22 17	- 1	e 44.7	—
Graz		80.1	330	e 12 10	- 3	e 21 44	- 34	e 42.8	51.3
Rathfarnham Castle		80.3	345	i 12 16	+ 2	i 22 14	- 6	44.8	52.8
Uccle		80.3	339	i 12 18	+ 4	e 22 20	0	e 36.8	53.4
Sofia		80.6	322	e 12 15	- 1	i 22 19	- 4	—	45.8
Oxford		80.7	341	e 12 21	+ 5	e 22 28	+ 4	e 42.0	52.2
Stuttgart		80.7	335	i 12 16a	0	e 22 17	- 7	e 45.8	54.8
Kew		80.8	341	i 12 18a	+ 1	i 22 21	- 4	e 41.8	45.3
Florissant		81.0	43	e 12 23	+ 5	i 22 27	0	e 34.0	44.0
Zagreb		81.0	329	e 12 15	- 3	e 22 31	+ 4	e 42.3	49.3
St. Louis	E.	81.2	43	e 12 31	+ 12	e 22 22	+ 7	e 37.8	—
Keara		81.3	309	i 12 19a	- 1	e 22 39	- 9	—	51.8
Strasbourg		81.3	335	i 12 19a	- 1	e 22 29	- 1	e 31.8	55.8
Ottawa		81.9	30	i 12 24	+ 1	22 24	- 12	e 37.8	—
Triest		81.9	331	i 12 7	- 16	22 31	- 5	e 38.8	47.4
Toronto		82.0	33	—	—	e 22 48?	+ 11	e 38.8?	—
Zurich		82.1	335	e 12 19	- 5	e 22 44	+ 6	—	—
Melbourne		82.2	183	—	—	i 22 41	+ 2	47.4	—
Basle		82.3	335	e 12 24	- 1	e 22 45	+ 5	—	—
Chur		83.3	334	e 12 24	- 1	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Paris	82.6	339	i 12 25 _a	- 1	i 22 59	+16	42.8	54.8
Neuchatel	82.9	335	e 12 27	- 1	e 25 5	+19	—	—
Little Rock	83.2	47	e 10 11	?	—	—	e 43.1	—
Jersey	83.3	342	—	—	e 22 0	-50	44.5	—
East Machias	85.2	25	—	—	23 8	- 1	e 40.2	—
Weston	86.1	28	i 12 48 _a	+ 4	—	—	39.8	—
Philadelphia	86.8	33	—	—	e 23 22	- 3	42.2	—
Helwan	86.9	309	12 48	0	23 38	+12	—	56.7
Christchurch	90.2	163	11 20	?	23 16	[-18]	47.5	—
Tortosa	N. 90.5	336	—	—	23 56	- 3	e 33.8	57.7
Toledo	92.6	340	e 13 13	- 2	e 25 40	?	—	59.9
Granada	95.0	338	e 13 28	+ 2	—	—	56.8	—
San Fernando	96.3	340	—	—	e 24 26	-23	—	—
San Juan	109.4	35	—	—	e 32 48	SS	e 56.8	—
Huancayo	129.9	63	e 21 12	PP	—	—	61.1	—
La Paz	137.8	59	i 19 36 _a	[+ 9]	—	—	68.3	72.3

Additional readings:—

Kobe ePE = +3m.17s., ePZ = +3m.26s.
 Sumoto eZ = +3m.46s.
 Zi-ka-wei iZ = +6m.3s., +7m.7s., and +10m.51s.
 Irkutsk e = +9m.58s. and +13m.6s.
 Hong Kong PP? = +8m.38s.
 College eSS = +16m.29s.
 Sitka eSS = +18m.26s., SSS = +18m.58s., e = +20m.48s.
 Honolulu eSS = +19m.7s., eSSS = +20m.14s.
 Almata e = +10m.25s.
 Frunse i = +17m.11s.
 Sverdlovsk L_c = +28.8m.
 Calcutta iN = +11m.47s.
 Agra iSSE? = +22m.58s.
 Berkeley ePE = +10m.37s.
 Butte eSSS = +26m.11s.
 Batavia iPN = +10m.33s.
 Bombay PPE = +13m.20s., iE = +15m.21s. and +24m.2s.
 Pasadena ePKP, PKPZ = +39m.20s.
 Tifis eS = +20m.37s., eSSN = +25m.26s., eSSS = +29m.7s.
 Copenhagen i = +21m.19s.
 Tucson eSS = +25m.54s., eSS = +28m.42s.
 Hamburg eSSSN = +29m.43s.
 Durham ? = +19m.13s.
 Bucharest e = +7m.18s., e = +26m.40s.
 Budapest iN = +12m.18s., iE = +12m.16s., iN = +12m.59s., iSN = +22m.3s.,
 iN = +22m.18s., iE = +22m.16s.
 Vienna P = +12m.26s., PP = +14m.33s., PPP = +17m.7s., PS = +22m.42s.,
 SS = +27m.28s., SSS = +31m.43s.
 Bidston eSS = +28m.11s.
 Chicago eSS = +27m.26s., e = +29m.7s.
 Rathfarnham Castle S? = +22m.33s., SS = +28m.31s.
 Uccle iN = +28m.38s.
 Stuttgart iP_cP = +12m.36s., eSKKS = +22m.58s., e = +32m.0s.
 Kew iSE = +22m.31s., eSSN = +28m.15s.
 Zagreb eNW = +22m.53s., eSSS = +31m.45s.
 St. Louis iSE = +22m.25s.
 Ksara ePP = +15m.31s., PS = +23m.27s.
 Strasbourg iNZ = +12m.42s., ePS = +23m.7s., eSS = +28m.18s.
 Ottawa PPN = +15m.30s.
 Trieste i = +22m.46s., e = +28m.20s.
 Melbourne e = +34m.10s.
 Basle e = +22m.56s.
 Jersey e = +43m.37s.
 Weston iZ = +12m.58s., iPPZ = +15m.59s.
 Philadelphia e = +34m.18s.
 Christchurch SKS = +21m.56s., L_cN = +40.6m.
 Toledo eSKS = +24m.5s.
 San Fernando eSSN = +35m.26s.
 San Juan e = +46m.54s.
 Huancayo eSS = +38m.30s., eSSS = +43m.18s., eSSS = +45m.54s.
 La Paz iPPN = +23m.6s., SSN = +40m.38s.
 Long waves were also recorded at Madison, Rio de Janeiro, Oak Ridge, Almeria, Sydney, Hyderabad, Florence, Algiers, Wellington, Columbia, and Cape Town.

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Feb. 23d. 13h. 51m. 13s. Epicentre 44° 6'N. 149° 4'E. (as at 0h.).

A = -6149, B = +3637, C = +6998; $\delta = +10$; $h = -3$.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°		m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	8.2	231	e 1 45	-18	3 27	-11	—	—
Vladivostok		12.7	269	e 3 7	+2	e 5 53	+25	6.5	9.0
Nagoya		13.4	229	e 4 2	+48	—	—	—	—
Sumoto		15.2	232	—	—	e 6 57	+29	e 10.3	—
Hukuoka B		18.3	238	e 4 52	+35	e 8 3	+24	e 10.4	—
Chiufeng		24.9	272	i 5 29 _a	+3	10 0	+13	c 12.6	16.2
Nanking		26.9	254	e 5 49	+4	—	—	—	—
Irkutsk		30.5	301	e 6 24	+7	e 11 12	-6	16.8	20.0
Hong Kong		36.4	244	—	—	12 55	+5	—	20.8
College		39.4	36	—	—	e 13 23	-12	—	—
Phu-Lien		42.5	250	e 6 19	?	—	—	23.8	—
Sverdlovsk		53.6	317	9 24	-1	17 5	+7	27.8	34.1
Calcutta	N.	54.1	267	9 34	+5	i 17 9	+4	—	—
Andijan		54.8	295	9 35	+1	e 17 20	+6	—	—
Tashkent		56.4	297	i 9 47	+2	i 17 40	+4	30.0	35.8
Agra	E.	58.6	277	e 9 59	-2	e 18 15	+11	—	—
Pulkovo		64.7	331	e 10 37	-5	e 19 18	-4	33.8	37.8
Bombay		67.5	274	e 11 25	+25	—	—	—	—
Pasadena	Z.	68.5	63	i 11 15	+9	—	—	—	—
Mount Wilson	Z.	68.6	63	e 11 2	-5	—	—	—	—
Baku		68.8	306	e 15 47	PPP	—	—	—	—
Tiflis		70.8	310	11 22	+2	e 20 39	+4	e 35.1	44.2
Sotchi		72.2	314	e 11 5	-24	—	—	—	—
Paris		82.6	339	e 12 19	-7	—	—	49.8	—

Additional readings:—

Irkutsk PPP = +7m.31s., eSS = +13m.17s., e = +14m.44s.

College e = +17m.47s., +19m.53s., and +21m.23s.

Calcutta iN = +17m.42s.

Agra eSSE = +22m.5s.

Bombay eE = +13m.19s.

Tiflis eSSN = +29m.21s.

Long waves were also recorded at Taikyu, Keizyo, Sitka, Moscow, Scoresby Sund, Copenhagen, Hamburg, De Bilt, Uccle, Stuttgart, Ksara, Strasbourg, and San Fernando.

Feb. 23d. 23h. 37m. 39s. Epicentre 41° 3'N. 21° 6'E. (given by Belgrade).

Felt Force IV at Kostince (41° 29'N. 21° 15'E.) and Prilep (41° 20'N. 21° 34'E.). See Annuaire Macroseismique, Vol. XVII, 1937. Published by the Institute of Seismology of the University of Belgrade. Series A, p. 8.

A = +7006, B = +2774, C = +6575; $\delta = +10$; $h = -2$;
D = +368, E = -930; G = +611, H = +242, K = -753.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°		m. s.	s.	m. s.	s.	m.	m.
Sofia		1.9	43	e 1 1	+27	e 1 35	+36	—	—
Belgrade		3.6	346	i 1 7 _a	+9	i 1 31	-11	—	—
Bucharest		4.5	46	e 1 45	P _g	e 2 31	S _g	13.0	3.4
Kecskemet	Z.	5.8	346	—	—	e 3 2	S*	—	—
Zagreb		6.1	320	e 1 37	+3	e 2 54	+9	—	—
Triest		7.2	310	e 1 43	-6	2 53	-20	—	—
Vienna		7.9	333	e 2 36	P _g	—	—	14.7	—
Chur		10.3	307	e 2 29	—	—	—	—	—
Zurich		11.1	307	e 2 40	-3	e 4 37	-12	—	—
Stuttgart		11.5	315	—	—	e 5 21	S _g	—	7.0
Basle		11.8	306	e 2 50	-3	e 5 17	+11	—	—
Neuchatel		11.9	303	—	—	e 4 29	-40	—	—
Strasbourg		12.2	311	e 3 21 _f	+23	—	—	e 6.4	—

Additional readings:—

Belgrade eZ = +1m.13s., iNW = +1m.53s. and +1m.58s.

Zagreb eNW = +3m.5s., eZ = +3m.14s.

Triest i = +3m.31s.

Vienna P* = +2m.54s.

Stuttgart e = +5m.51s., eS = +6m.1s.

Long waves were also recorded at Ksara, Copenhagen, De Bilt, and Uccle.

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Feb. 23d. Readings also at 0h. (Dehra Dun), 1h. (Medan, Phu-Lien, La Paz, and near Mizusawa (4)), 2h. (Padova), 3h. (Budapest and Irkutsk), 4h. (Mizusawa, Vladivostok, Irkutsk, and Sverdlovsk (2)), 5h. (La Paz and near Wellington), 7h. (Irkutsk, Sverdlovsk, Baku, Andijan, Pulkovo, Tashkent, and Mizusawa), 8h. (Phu-Lien, Calcutta, and Andijan (2)), 9h. (Medan, Irkutsk, Andijan, Hong Kong, Tashkent, and Bombay), 10h. (near Wellington), 12h. (Mizusawa, Irkutsk, Sverdlovsk, Tiflis, Baku, Frunse, Tashkent, near Andijan (2), and Samarkand), 13h. (Sebastopol and Tiflis), 15h. (Mizusawa, Tiflis, Sebastopol, and Vladivostok), 16h. (Helwan, Mizusawa, Irkutsk, Tiflis, Baku, Tashkent (2), Sverdlovsk (2), Ksara, and Hong Kong), 17h. (Malabar), 18h. (Sverdlovsk, Tashkent, and Mizusawa), 19h. (Arapuni, Christchurch, Wellington, Perth, Mount Wilson, Pasadena, Tinemaha, College, Baku, Irkutsk, Vladivostok, Sverdlovsk, Tashkent, Pulkovo, Tiflis, Ksara, and Stuttgart), 20h. (De Bilt, Paris, Uccle, Strasbourg, and Copenhagen), 21h. (Takaka).

Feb. 24d. 18h.

Readings which do not afford a determination :—

La Paz IPZ = 47m.17s., iSZ = 48m.18s., LZ = 48m.33s., M = 50m.20s.

La Plata P = 48m.55s., S = 51m.36s., L = 52m.54s.

San Javier S = 50m.43s.

Riverside IP = 56m.55s.

Mount Wilson IPZ = 56m.58s.

Haiwee IPZ = 57m.6s.

Tinemaha IPZ = 57m.6s.

Toledo IP = 57m.52s.

Medan ePE = 60m.57s., iN = 61m.34s. and 61m.48s.

St. Louis e = 64m.13s., eE = 65m.25s. and 65m.57s.

Tiflis eZ = 65m.32s. and 74m.52s., eLN = 138°5m.

Andijan e = 67m.39s.

Long waves were also recorded at Hong Kong, Irkutsk, Vladivostok, Tashkent, Sverdlovsk, and Baku.

Feb. 24d. Readings also at 1h. (Cheb), 3h. (Mizusawa, Irkutsk, and Tashkent), 4h. (Sverdlovsk), 7h. (Vladivostok, Irkutsk, Tiflis, Ksara, and Sverdlovsk), 8h. (Mizusawa, Vladivostok, Tashkent, Sverdlovsk), 9h. (Tashkent, Irkutsk, and Sverdlovsk), 14h. (Perth), 15h. (Batavia and Manila), 16h. (Alicante and Ksara), 17h. (near La Paz), 18h. (La Paz), 19h. (Mizusawa), 20h. (Mizusawa (2)), 21h. (Frunse, near Almata, and Andijan), 22h. (Baku, Tashkent, Tiflis, Irkutsk, Sverdlovsk, Grozny, Andijan, and Ksara), 23h. (Frunse and near Andijan).

Feb. 25d. 0h. 39m. 46s. Epicentre 44° 6N. 149° 4E. (as on 23d.).

A = -6149, B = +3637, C = +6998; $\delta = +10$; $h = -3$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8.2	231	2 9	+ 6	13 33	- 5	—	—
Vladivostok	12.7	269	e 2 56	- 9	6 3	+35	6.7	8.0
Nagoya	13.4	229	e 2 53	-21	4 18	?	—	—
Chufeng	24.9	272	5 27 _a	+ 1	9 54	+ 7	—	16.9
Irkutsk	30.5	301	e 7 28	PP	e 11 13	- 5	16.2	19.8
Sverdlovsk	53.6	317	9 23	- 2	e 20 59	SS	29.2	34.5
Andijan	54.8	295	e 9 31	- 3	e 17 24	+10	—	—
Agra	58.6	277	—	—	1 18 2	- 2	—	—
Pulkovo	64.7	331	—	—	e 23 40	SS	40.2	43.9
Bombay	67.5	274	—	—	e 19 14 _f	-42	—	—
Grozny	69.2	310	e 11 14	+ 4	—	—	—	—
Tiflis	70.8	340	e 11 22	+ 2	e 20 56	+21	e 39.7	49.7
Jena	78.1	333	1 12 4	+ 2	—	—	—	—
Vienna	78.8	330	e 9 51	?	—	—	—	—
Ksara	81.3	309	e 12 31 _f	+11	—	—	50.7	54.6
Basle	82.3	355	e 12 24	- 1	—	—	—	—
Neuchatel	82.9	335	e 12 28	0	—	—	—	—

For Notes see next page.

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NOTES TO FEB. 25d. 0h. 39m. 46s.

Additional readings:—

Chufeng SEN = +9m.58s.

Irkutsk e = +13m.49s.

Pulkovo e = +31m.18s.

Tiflis PZ = +11m.25s.

Vienna e = +10m.17s.

Long waves also recorded at Hong Kong, Baku, Tashkent, Moscow, and Copenhagen.

Feb. 25d. 9h. 27m. 44s. Epicentre 44° 0N. 20° 4E.

Felt Scale VI at Takovo, Gucati, Ostra, Stragari, etc. Epicentre at Takovo 44° 03' N. 20° 25' E. See *Annuaire Macroseismique*, Vol. XVII, 1937. Published by the Institute of Seismology, University of Belgrade, Series A, p. 8.

A = +.6764, B = +.2516, C = +.6922; $\delta = -4$; $h = -3$;

D = +.349, E = -.937; G = +.649, H = +.241, K = -.722.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Belgrade	0.8	2	10 16k	- 2	10 30	- 1	—	0.6
Sofia	2.5	121	e 0 43	0	11 16	+ 2	—	1.7
Kecskemet	3.0	350	e 0 34	-16	e 1 14	-13	—	—
Budapest.	3.6	346	0 58	0	2 11	S _r	e 3.3	—
Zagreb	3.6	302	e-1 4	+ 6	e 2 3	S _r	—	3.0
Bucharest.	4.1	82	1 6	+ 1	2 16 ^g	S _r	—	2.8
Stara Dala	4.2	339	e 1 19	P _r	e 2 23	S _r	—	5.4
Laibach	4.6	299	e 1 44	P _r	e 2 28	S _r	—	2.9
Graz	4.7	314	1 13	- 2	e 2 24	S _r	—	3.0
Triest	5.0	312	e 1 46	P _r	2 16	- 2	—	—
Vienna	5.1	328	e 1 16	- 4	4 22	?	—	—
Chur	8.2	294	e 2 4	+ 1	—	—	—	—
Zurich	8.9	296	e 2 12	0	—	—	—	—
Basle	9.6	297	e 2 20	- 1	—	—	—	—
Strasbourg	9.9	302	e 3 19	?	e 5 36	S _r	—	—
Ksara	15.7	126	e 4 24	+40	—	—	—	10.8

Additional readings:—

Belgrade i = +13m.23s.

Sofia eP_r = +53s., i = +1m.24s.

Kecskemet eP_r = +43s., ePSN = +1m.1s., eN = +2m.40s.

Budapest iN = +1m.21s., +1m.56s., iE = +1m.58s., iE = +2m.13s., iE = +2m.35s.

Zagreb e = +1m.11s., +1m.16s., eNW = +1m.26s., iNW = +2m.23s.

Bucharest e = +1m.25s., iPS = +1m.45s., e = +1m.56s., +2m.10s., i = +3m.9s.

Stara Dala eS_r = +3m.10s.

Laibach eNE = +2m.36s.

Triest i = +2m.41s., and +2m.56s.

Vienna PP = +1m.31s.

Strasbourg e = +3m.86s. and +4m.12s.

Long waves were also recorded at Prague, Stuttgart, Padova, Florence, Pulkovo, and Sverdlovsk.

Feb. 25d. Readings also at 1h. (near Granada), 4h. (Andijan, Irkutsk, Vladivostok, and Mirnsawa (2)), 5h. (Baku, Tashkent, Tiflis, Sverdlovsk, Manzanillo, Butte, Seattle, Sikk, and near College), 6h. (Bozeman, Tucson, Little Rock, St. Louis, Chicago, Oak Ridge, East Machias, Sverdlovsk, Tiflis, Baku, Tashkent, and Vladivostok), 8h. (Malabar), 9h. (Belgrade), 10h. (Christ-church, Riverview, and Sydney), 11h. (Perth), 12h. (Wellington and Mirnsawa), 16h. (near Nagoya), 18h. (San Juan and near Fresno), 19h. (Batavia and near Medan), 20h. (Bombay, Calcutta, Colombo, Kodaikanal, Manila, Phu-Lien, Hong Kong, Chufeng, Keiyo, Irkutsk, Vladivostok, Sverdlovsk, Ksara, Andijan, Tashkent, and near Samarkand), 22h. (Perth and Theodosia (2)).

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Feb. 26d. 4h. 14m. 31s. Epicentre 44°·6N. 149°·4E. (as on 21d.).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8·2	231	e 2 8	+ 5	e 3 14	-24	—	—
Vladivostok	12·7	269	e 2 53	-12	e 4 49	-39	6·3	9·4
Nagoya	13·4	229	e 3 12	-2	4 50	-55	—	—
Kobe	14·7	233	e 2 22	-69	—	—	—	12·1
Hukuoka B	18·3	238	e 4 14	-3	e 7 33	-6	—	—
Husan	18·3	246	4 9	-8	e 7 37	-2	11·7	—
Zinsen	N. 18·5	256	e 4 17	-2	e 8 2	+18	e 9·7	—
Chufeng	24·9	272	i 5 24 _a	-2	9 51	+4	—	16·5
Irkutsk	30·5	301	6 29	+12	e 10 29?	-49	16·5	20·0
Hong Kong	36·4	244	—	—	12 41	-9	—	21·2
Frunse	52·3	296	9 29	+14	—	—	—	—
Sverdlovsk	53·6	317	9 25	0	e 17 13	+15	34·9	35·0
Calcutta	N. 54·1	267	—	—	e 16 22	-43	—	—
Andijan	54·8	295	e 9 33	-1	e 16 23	-51	—	—
Tashkent	56·4	297	8 45	-60	i 17 39	+3	e 28·3	35·9
Agra	E. 58·6	277	e 9 59	-2	e 18 1	-3	—	—
Samarkand	58·8	296	e 10 29	+27	—	—	—	—
Pulkovo	64·7	331	—	—	e 19 25	+3	34·5	42·9
Grozny	69·2	310	e 11 16	+6	—	—	—	—
Tiflis	70·8	310	11 31	+11	20 59	+24	e 38·5	48·4
Ksara	81·3	309	e 12 43?	+23	e 23 4?	+34	49·5	55·2
Basle	82·3	335	e 12 28	+3	—	—	—	—
Chur	82·3	334	e 12 27	+2	—	—	—	—

Additional readings:—

Irkutsk e = +13m.29s.?

Sverdlovsk L₀ = +29·4m.

Tashkent e = +17m.47s.

Agra eSSE = +22m.1s.

Pulkovo eSSS = +25m.59s.

Tiflis eSKKSN = +22m.11s.

Ksara eSS = +28m.51s.

Long waves were also recorded at Moscow, Baku, Paris, Strasbourg, Bombay, Cheb, Prague, Phu-Lien, Copenhagen, Toyooka, and Stuttgart.

Feb. 26d. 13h. 43m. 32s. Epicentre 35°·0N. 135°·5E.

A = -·5856, B = +·5754, C = +·5710; $\delta = +5$; $h = 0$.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Kobe	0·4	219	i 0 13	0	i 0 18	-3	0·3
Toyooka	0·8	314	0 19	+1	0 29	-2	0·5
Sumoto	0·9	218	0 19	-1	0 30	-4	0·5
Nagoya	1·2	83	e 0 26	+2	0 42	+1	—

Feb. 26d. 14h. 27m. 39s. Epicentre 35°·0N. 135°·5E. (as at 13h.).

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Kobe	0·4	219	e 0 14	+1	0 20	-1	0·4
Toyooka	0·8	314	—	—	0 30	-1	0·5
Sumoto	0·9	218	e 0 17	-3	e 0 32	-2	0·5
Nagoya	1·2	83	e 0 28	+4	e 0 45	+4	—

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Feb. 26d. 23h. 18m. 21s. Epicentre 44° 1N. 150° 2E.

A = -6292, B = +3581, C = +6935; $\delta = +5$; $h = -3$;
D = +497, E = +368; G = -602, H = +345, K = -720.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	8.4	237	e 2 6	0	e 3 31	-12	—	—
Vladivostok	13.1	272	e 3 1	-9	e 5 41	+3	6.6	7.8
Nagoya	13.5	233	e 3 15	0	—	—	—	—
Keizyo	E. 18.7	258	e 5 7	+45	e 9 44	L	(e 9.7)	—
Chiufeng	25.5	274	e 5 28	-4	9 46	-11	e 12.0	15.8
Irkutsk	31.2	303	e 8 27	?	e 11 48	+19	16.7	18.7
Hong Kong	36.7	247	—	—	12 50	-4	—	20.5
Sverdlovsk	54.4	318	9 35	+4	21 15	SS	25.7	—
Calcutta	N. 54.7	269	—	—	e 16 11	-62	—	—
Andijan	55.5	296	e 9 41	+2	e 17 15	-9	—	—
Tashkent	57.2	298	e 9 44	-7	i 17 36	-10	e 30.5	35.6
Tinemaha	Z. 66.4	61	i 10 53	0	—	—	—	—
Haiwee	Z. 67.1	62	i 10 59	+2	—	—	—	—
Mount Wilson	Z. 68.3	63	i 11 3	-2	—	—	—	—
Pasadena	Z. 68.3	63	i 11 4	-1	—	—	—	—
Tiflis	71.5	312	e 11 30	+6	20 46	+3	e 39.8	48.0
Ksara	82.1	310	e 12 36	+12	e 24 7	PPS	—	51.6

Additional reading:—

Irkutsk e = +14m.12s.

Long waves were also recorded at Pulkovo, Moscow, and Baku.

Feb. 26d. Readings also at 0h. (Tucson and near Theodosia (2)), 1h. (Tucson and near Fresno), 3h. (Basle, Chur, Neuchatel, Frunse, Andijan, near Samarkand, and Tchikent), 4h. (College), 11h. (near Hukuoka B), 12h. (Paris), 13h. (Mizusawa, Sumoto, near Hukuoka, and Hukuoka B), 14h. (Tinimaha, Mount Wilson, Mizusawa, and near Nagoya), 15h. (near Mizusawa and Nagoya), 16h. (Sverdlovsk, Tashkent, Vladivostok, and near Manila), 18h. (Sverdlovsk, Vladivostok, Tashkent, Chiufeng, Baku, Irkutsk, Tiflis, and near Mizusawa), 20h. (Basle, Paris, and Calcutta), 22h. (near Sumoto and Nagoya), 23h. (near Mizusawa and Nagoya).

Feb. 27d. 1h. 15m. 30s. Epicentre 36° 5N. 141° 6E.

(given in report of Earthquake Institute of Tokyo Imp. Univ.).

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.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tukubasan	1.2	257	0 26	+2	0 44	+3	—	—
Tokyo (Imp. Univ.)	1.7	242	0 30	-1	0 55	+1	—	—
Kiyosumi	1.8	220	0 38	+6	0 57	+1	—	—
Komaba	1.8	241	0 32	0	—	—	—	—
Kamakura	2.0	235	0 39	+4	1 13	+11	—	—
Misaki	2.1	230	0 39	+2	1 9	+5	—	—
Titibu	2.1	256	0 38	+1	1 8	+4	—	—
Koyama	2.4	242	0 38	-3	1 15	+3	—	—
Mizusawa	2.6	352	0 51	+7	i 1 23	+6	—	—
Yosiwara	2.7	241	0 38	-7	1 25	+6	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Susaki	2.8	229	0 46	- 1	1 28	+ 6	—	—
Nagoya	4.0	252	e 1 6	+ 2	2 6	SS ^a	—	2.7
Kobe	5.5	253	e 1 16	- 9	e 2 45	SS ^a	—	3.3
Toyooka	N. 5.6	262	1 38	+11	3 16	SS ^a	—	3.7
	Z. 5.6	262	1 33	+ 6	3 7	SS ^a	—	3.3
Sumoto	5.9	250	1 40	+ 9	3 8	SS ^a	—	3.6
Hukuoka B	9.6	256	e 2 29	+ 8	e 5 12	SS ^a	—	—
Vladivostok	10.0	315	12 23	- 4	e 4 34	+12	5.2	6.0
Husan	10.3	266	e 2 33	+ 1	e 5 23	SS ^a	—	—
Taiyu	10.5	270	2 40	+ 5	—	—	6.0	—
Keizyo	N. 11.8	280	e 2.56	+ 3	e 5 55	+49	—	—
Zinsen	12.0	279	e 1 40	- 75	e 5 38	+27	—	—
Heizyo	12.8	286	3 24	+18	—	—	7.2	—
Chiufeng	20.3	290	4 36 ^a	- 4	8 22	- 1	e 9.9	14.7
Hong Kong	27.6	247	5 50	- 1	10 49	+17	—	17.9
Manila	28.6	226	6 7	+ 7	12 4	SS	—	—
Irkutsk	30.6	313	e 6 20	+ 2	e 11 24	+ 4	15.5	19.6
Shu-Lien	34.2	253	e 5 1	?	e 12 2	-14	15.5	—
Sempalatinsk	45.4	309	e 8 27	+ 5	—	—	—	—
Calcutta	N. 47.8	269	e 12 10	?	—	—	—	31.6
Andijan	53.0	297	e 9 17	- 4	e 17 6	+16	—	—
Batavia	53.5	225	e 16 15	S	(e 16 15)	-42	—	—
Agra	E. 54.0	279	e 9 26	- 2	17 17	+14	—	35.6
Tashkent	55.0	300	19 29	- 6	17 19	+ 2	e 28.3	34.4
Sverdlovsk	55.6	319	9 39	- 1	17 42	+17	e 26.5	35.9
Samarkand	57.2	298	e 9 51	0	—	—	—	—
Bombay	62.2	274	e 10 28	+ 2	—	—	—	—
Moscow	67.8	324	e 11 14	+12	—	—	e 35.0	45.5
Baku	68.7	305	e 11 11	+ 4	e 18 48	?	e 35.5	43.8
Pulkovo	68.7	330	e 17 46	?	e 24 26	SS	e 37.5	42.3
Tiflis	71.3	308	e 11 5	-18	e 20 53	+12	e 35.1	46.4
Ukiah	71.6	55	(e 18 36)	?	—	—	e 18.6	—
Fresno	N. 75.2	56	e 15 13	?	—	—	—	—
Tinemaha	Z. 76.0	54	i 11 52	+ 1	—	—	—	—
Haiwee	Z. 76.7	54	e 11 55	0	—	—	—	—
Pasadena	Z. 77.7	57	e 12 1	+ 1	—	—	—	—
Mount Wilson	Z. 77.8	57	i 12 1	0	—	—	—	—
Ksara	81.6	305	i 12 22 ^a	+ 1	—	—	—	50.5
Tucson	83.8	54	e 15 5	PP	—	—	e 40.5	—
La Paz	Z. 147.0	61	19 56	[+13]	—	—	74.0	82.0

Additional readings:—

Miyusawa SN = +1m.26s.
 Kobe ePZ = +1m.19s., ePN = +1m.24s.
 Sumoto iPEN = +1m.43s.
 Zinsen ePPE = +2m.51s.
 Chiufeng iE = +5m.14s.
 Irkutsk PPP = +7m.24s., e = +12m.44s.
 Agra SSE = +21m.20s.
 Pulkovo e = +12m.21s.
 Pulkovo e = +27m.23s.
 Tiflis eZ = +11m.35s., eE = +17m.7s.
 Fresno eN = +15m.32s., eSN = +16m.38s.
 Pasadena iZ = +12m.11s.
 Ksara ePP = +15m.37s., ePS = +23m.43s., eSS = +28m.41s.
 Tucson e = +15m.17s. and +15m.58s.

Long waves were also recorded at Trieste, Uccle, San Fernando, Hyderabad, Prague, Copenhagen, Belgrade, Strasbourg, Paris, Stuttgart, Cheb, De Bilt, Graz, and Kew.

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Feb. 27d. 14h. 41m. 56s. Epicentre 33° 7N. 132° 1E.

Strongly felt at Matuyama, Tadotu; fairly strongly at Hiroshima, Ooita, Koti, Simidu, Okayama, and Saga. Radius greater than 300kms. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1937, Tokyo, Japan, 1939, pp. 29-31. Macroseismic Charts, p. 30.

A = -5589, B = +6186, C = +5523; $\delta = +7$; $h = +1$;
D = +742, E = +670; G = -370, H = +410, K = -834.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Matuyama	0.6	76	0 16a	+ 1	0 23	- 3	---	---
Ooita	0.6	221	0 23	+ 8	0 35	+ 9	---	---
Uwazima	0.6	141	0 24a	+ 9	0 34	+ 8	---	---
Hiroshima	0.7	22	0 16	- 1	0 25	- 3	---	---
Simonoseki	1.0	284	0 21k	0	0 34	- 2	---	---
Hamada	1.2	359	0 20	- 4	0 33	- 8	---	---
Koti	1.2	97	0 24k	0	0 40	- 1	---	---
Simidu	1.2	142	0 24k	0	0 41	0	---	0.8
Hukuoka	1.4	265	0 25k	- 2	0 41	- 5	---	0.8
Hukuoka B	1.4	265	0 28k	+ 1	0 42	- 4	---	---
Kumamoto	1.5	233	0 30a	+ 2	0 49	0	---	---
Tadotu	1.5	67	0 26a	- 1	0 43	- 6	---	---
Okayama	1.6	57	0 31a	+ 1	0 50	- 1	---	---
Saga	1.6	253	0 30a	0	0 50	- 1	---	---
Muroto	1.8	105	0 32k	0	0 53	- 3	---	---
Unzendake	1.8	238	0 38a	+ 6	1 4	+ 8	---	---
Miyazaki	1.9	197	0 36a	+ 2	1 4	+ 5	---	---
Nagasaki	2.1	243	0 37a	0	1 4	0	---	---
Sakai	2.1	27	0 37k	0	0 58	- 6	---	---
Tokushima	2.1	80	0 40a	+ 3	1 5	+ 1	---	---
Ituhara	2.4	286	0 37	- 4	1 14	+ 2	---	---
Sumoto	2.4	74	10 38a	- 3	10 55	- 17	---	1.6
N.	2.4	74	10 39a	- 2	11 1	- 11	---	1.6
Kagosima	2.5	211	0 47	+ 4	1 32	+ 18	---	---
Wakayama	2.6	78	0 42a	- 2	1 9	- 8	---	---
Kobe	2.8	69	0 44a	- 3	11 13	- 9	---	---
Husan	2.9	299	0 47a	- 1	1 19	- 5	---	1.6
Toyooka	2.9	51	0 46a	- 2	1 18	- 6	---	1.5
N.	2.9	51	1 3a	P _r	1 19	- 5	---	1.6
Osaka	3.0	72	0 50	0	1 22	- 5	---	---
Osaka B	3.0	72	0 49	- 1	1 13	- 14	---	---
Tomie	3.0	249	0 51a	+ 1	1 27	0	---	---
Miyadu	3.1	54	0 50	- 1	1 27	- 2	---	---
Shimonisaki	3.1	95	0 48k	- 3	1 23	- 6	---	---
Yagi	3.2	70	0 51	- 1	1 24	- 8	---	---
Kyoto	3.3	59	0 51	- 2	1 26	- 9	---	---
Taikyu	3.6	308	11 0	+ 2	1 53	8*	---	1.9
Hikone	3.8	63	1 0a	- 1	1 42	- 5	---	---
Kameyama	3.8	70	0 58	- 3	---	---	---	---
Tu	3.8	74	1 0	- 1	1 43	- 4	---	---
Gifu	4.2	64	1 5a	- 1	1 52	- 5	---	---
Syuhurei	4.2	308	1 5	- 2	1 39	- 18	---	---
Nagoya	4.3	68	11 7a	- 1	1 54	- 6	---	3.0
Kanasawa	4.7	52	1 11	- 3	2 9	- 1	---	---
Hamamatsu	4.8	76	1 13k	- 2	2 2	- 10	---	---
Takayama	4.9	58	1 17	0	2 39	8*	---	---
Huaki	5.1	52	1 19	- 1	2 27	+ 7	---	---
Iida	5.1	67	1 19	- 1	2 14	+ 6	---	---
Omaesaki	5.1	79	1 17	- 3	2 25	- 5	---	---
Toyama	5.1	53	1 18	- 2	2 37	8*	---	---
Matumoto	5.4	61	1 25	+ 1	2 25	- 3	---	---
Wasima	5.4	45	1 19	- 5	2 20	- 8	---	---

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	T.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Keizyo	5-7	314	e 1 27	- 1	e 2 27	- 8	—	—
Kohu	5-7	68	e 1 27k	- 1	e 2 27	- 8	—	—
Nake	5-7	203	1 31	+ 3	2 34	- 4	—	—
Hunatu	5-8	70	1 26	- 3	2 32	- 6	—	—
Misima	5-8	74	1 27	- 2	—	—	—	—
Nagano	5-8	57	1 29	0	2 35	- 3	—	—
Numadu	5-8	73	1 18	- 11	2 49	+ 11	—	—
Zinsen	5-8	312	i 1 32a	+ 3	2 40	+ 2	1 2-9	3-1
Ito	5-9	76	1 29k	- 2	2 54	S*	—	—
Oiwake	5-9	62	1 33	+ 2	2 37	- 3	—	—
Takada	6-0	54	1 37	+ 5	2 59	S*	—	—
Maebasi	6-3	63	1 35	- 1	2 44	- 6	—	—
Kumagaya	6-5	65	1 39	0	2 50	- 5	—	—
Yokohama	6-5	72	1 39	0	2 55	- 0	—	—
Tokyo	6-6	70	1 40	- 1	2 52	- 6	—	—
Tukubasan	6-9	67	1 44	- 1	3 13	+ 8	—	—
Utunomiya	7-0	64	1 40	- 6	—	—	—	—
Kakioka	7-1	67	1 45	- 3	3 18	+ 8	—	—
Heizyo	7-4	318	e 1 52	0	3 38	S*	—	4-2
Mito	7-4	66	1 49	- 3	3 16	- 2	—	—
Tyosi	7-5	72	1 53	0	—	—	—	—
Hukushima	7-9	56	1 59	0	3 28	- 2	—	—
Sendai	8-4	55	1 58	- 8	—	—	—	—
Mizusawa	E. 9-1	51	2 17	+ 3	—	—	—	—
Vladivostok	9-4	359	e 2 25	+ 7	e 4 10	+ 3	4-6	6-5
Zi-ka-wei	Z. 9-4	257	i 1 18k	- 60	3 8	- 59	4-6	5-3
Aomori	9-9	42	2 31	+ 6	—	—	—	—
Titizima	10-9	125	2 46	+ 6	—	—	—	—
Sapporo	11-8	35	2 59	+ 6	—	—	—	—
Nemuro	14-2	44	2 15	- 69	—	—	—	—
Chiufeng	14-3	301	i 3 22a	- 4	i 6 2	- 4	7-5	8-6
Hong Kong	19-4	239	4 24	- 6	8 2	- 2	9-9	14-1
Manila	21-5	210	i 4 50	- 2	i 8 50	+ 3	—	—
Phu-Lien	26-0	246	e 5 30	- 6	e 10 20	+ 14	—	—
Irkutsk	27-3	322	5 45	- 3	10 19	- 8	14-1	—
Calcutta	N. 39-9	266	e 7 55	+ 18	i 14 11	+ 28	19-5	—
Sempalatinsk	41-1	311	e 7 37	- 10	—	—	—	—
Frunse	45-3	300	e 8 56	+ 35	—	—	—	—
Andijan	47-3	297	e 8 25	- 12	e 18 18	SS?	—	—
Tashkent	49-4	299	i 8 46	- 7	15 48	- 12	e 23-9	30-2
Sverdlovsk	52-6	320	i 9 9	- 9	i 16 30	- 14	25-1	32-0
Bombay	54-5	271	e 9 27	- 5	e 17 42	+ 32	—	—
Moscow	65-3	322	i 10 37	- 9	19 14	- 15	30-6	40-9
Tiflis	66-7	306	e 10 57	+ 2	e 19 53	+ 7	e 32-6	43-4
Pulkovo	67-0	328	10 47	- 10	19 35	- 15	35-1	38-5
Tinemaha	83-8	50	e 12 30	- 2	—	—	—	—
Haiwee	Z. 84-6	50	i 12 31	+ 5	—	—	—	—
Chur	84-7	326	e 12 29	- 8	—	—	—	—
Basle	85-0	327	e 12 32	+ 6	—	—	—	—
Mount Wilson	Z. 85-7	52	i 12 36	- 6	—	—	—	—
Pasadena	Z. 85-7	52	i 12 36	- 6	—	—	—	—
La Paz	N. 155-0	50	20 17	[+23]	—	—	—	—

Additional readings: —

Sumoto ISZ = + 57s.

Kobe IZ = + 52s., IN = + 55s., IZ = + 1m.1s.

Toyooka IE = + 1m.5s., IN = + 1m.10s.

Mizusawa PN = + 2m.29s.

Zi-ka-wei IZ = + 3m.34s. and + 4m.6s.

Manila IN = + 8m.57s.

Calcutta IN = + 16m.43s.

Long waves were also recorded at Hyderabad, Strasbourg, Stuttgart, Cheb,

and De Bilt.

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Feb. 27d. Readings also at 1h. (Andijan, Frunse, and near Nagoya), 2h. (Basle), 4h. (Nagoya), 5h. (near Almata), 6h. (Christchurch and Tiflis), 9h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, Samarkand, and near Andijan), 10h. (Port au Prince and near San Juan), 15h. (near Hukuoka B), 17h. (Almata, Andijan, Frunse, and Samarkand), 18h. (Andijan, Sverdlovsk, and Tashkent), 21h. (Riverview and Sydney), 22h. (Ksara).

Feb. 28d. Readings at 1h. (Tiflis, Malabar, and Ksara), 3h. (near Balboa Heights), 4h. (near Barcelona and Tortosa), 7h. (Calcutta, New Plymouth, Stratford, near Christchurch, Takaka, and Wellington), 9h. (Sofia, Trieste, Tiflis, and near Erevan), 13h. (Sofia), 15h. (Calcutta, Colombo, Hyderabad, Kodai-kanal, Tucson, Huancayo, and La Paz), 18h. (Fresno), 19h. (Almata, Frunse, Tashkent, near Andijan, and Tchimkent), 20h. (Mizusawa), 23h. (near Santiago and San Javier).

Mar. 1d. Readings at 0h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, and near Taihoku), 1h. (Hong Kong), 2h. and 4h. (Christchurch), 5h. (near Balboa Heights), 6h. (New Plymouth, Christchurch, near Arapuni, Tuai, Hastings, and Wellington), 7h. (Williamstown), 10h. (Wellington, Mizusawa, Trieste, and near Zagreb), 16h. (Sverdlovsk), 17h. (Tashkent), 19h. (Malabar, Tashkent, Almata, Frunse, Samarkand, Tchimkent, and near Andijan), 20h. (Almata, Frunse, Samarkand, and near Andijan), 23h. (Tacubaya).

Mar. 2d. 14h. 47m. 29s. Epicentre $40^{\circ}4'N$. $84^{\circ}2'W$.

Felt Strength VII at Anna, Force VI at Sydney. Macroseismic Area 70,000 square miles. See Bulletin of the Seismological Society of America, Vol. 30, No. 3, July, 1940, pp. 251 to 260.

$$A = +.0772, B = -.7598, C = +.6456; \delta = +6; h = -2; \\ D = -.995, E = -.101; G = +.065, H = -.642, K = -.764.$$

	Δ	Az	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Cincinnati	1.3	190	i 0 29	+ 4	i 0 47	+ 3	—
Chicago	3.0	300	—	—	e 1 25	- 2	i 1.7
Chicago (Loyola)	3.0	300	e 0 55	+ 5	i 1 31	+ 4	—
Madison	4.7	307	e 1 33	+19	e 2 11	+ 1	e 2.5
Pennsylvania	4.8	83	i 1 29	+14	—	—	—
Buffalo	5.0	56	e 1 29	+11	i 2 11	- 7	—
St. Louis	5.0	252	i 1 20	+ 2	i 2 19	+ 1	—
Ithaca	6.2	68	2 6	P _r	3 18	S _r	—
Columbia	6.8	157	—	—	e 3 36	+33	—
Philadelphia	6.9	90	e 1 53	+ 8	i 3 5	0	—
Des Moines	7.2	283	2 5	+16	e 3 17	+ 4	—
Fordham	7.9	83	e 2 24	+25	i 3 28	- 2	—
Ottawa	8.0	48	—	—	e 3 25	- 8	4.1
Little Rock	8.6	232	e 2 29	+20	i 3 41	- 7	—
Williamstown	8.6	71	i 2 9	0	3 44	- 4	—
Oak Ridge	9.7	74	i 2 21	- 1	i 4 5	-10	—
Weston	9.9	74	i 2 26	+ 1	—	—	—
Shawinigan Falls	10.3	50	2 36	+ 4	4 25	- 5	5.3
Seven Falls	11.8	51	2 47	- 6	4 56	-10	5.8
East Machias	13.2	65	—	—	e 6 39	+59	—
Denver	15.9	274	5 33	?	e 6 38	- 6	8.0

Additional readings:—

Chicago i = +1m.28s. and +1m.38s.
 Pennsylvania i = +1m.59s. and +2m.35s.
 Buffalo e = +1m.55s., iS* = +2m.27s., iS_r = +2m.51s.
 St. Louis iP* = +1m.30s., iP_r = +1m.47s., iS* = +2m.36s.
 Ithaca P* = +2m.52s.
 Columbia e = +4m.14s.
 Philadelphia e = +2m.21s., i = +3m.26s., +3m.30s., and +3m.38s.
 Des Moines e = +3m.36s., i = +3m.53s. and +4m.15s.
 Fordham iS* = +4m.4s., eS_r = +4m.34s.
 Ottawa e = +3m.32s. and +3m.43s.
 Little Rock iP_rEN = +2m.52s., iS*N = +4m.14s.
 Williamstown iP = +2m.34s., i = +3m.17s., i = +4m.20s.
 Oak Ridge eN = +2m.31s., eS_rZ = +4m.10s., iSN = +4m.51s., iSEZ = +4m.59s.
 Shawinigan Falls i = +4m.39s.
 East Machias e = +7m.7s.
 Long waves were also recorded at Bozeman, Butte, Tucson, Pasadena, and Tinemaha.

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Mar. 2d. Readings also at 0h. (near La Paz), 1h. (Nagoya), 5h. (Andijan), 7h. (near Tiflis), 11h. (Florence and Manila), 12h. (Medan), 13h. (Bucharest and near Samarkand), 14h. (Tashkent, Kobe, and near Sumoto), 15h. (near Andijan (2)), 16h. (Ferndale), 17h. (Tiflis), 20h. (Calcutta, Manila, Chiufeng, Hong Kong, Phu-Lien, Irkutsk, Vladivostok, Sverdlovsk, and Tashkent), 22h. (Hong Kong and Manila), 23h. (Nagoya).

Mar. 3d. 9h. 21m. 12s. Epicentre $11^{\circ}0N$. $118^{\circ}5W$.

A = -4685, B = -8629, C = +1896; $\delta = +4$; $\lambda = +6$;
D = -879, E = +477; G = -090, H = -167, K = -982.

	Δ	Az.	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	m. s.	m. s.	m. s.	m.
Tucson	22.3	17	e 4 10	-51	—	—	—
Pasadena	23.0	2	e 5 8	+1	—	—	—
Mount Wilson	Z. 23.1	2	e 5 4	-4	—	—	—
Haiwee	E. 25.0	2	e 5 29	+2	—	—	—
Tinemaha	Z. 26.0	1	e 5 40	+4	—	—	—
Little Rock	33.6	41	e 6 40	-4	e 12 0	-6	e 13.6
Butte	35.3	7	(e 8 0)	+61	—	—	e 8.0
St. Louis	37.3	37	7 16	0	i 13 44	+40	—
Florissant	37.3	37	—	—	e 12 34	-30	—
Madison	40.7	32	—	—	e 15 18	?	—
Chicago	40.9	36	—	—	e 15 24	?	—

Additional readings :-

Tucson e = +5m.9s. and +5m.38s.

Mount Wilson iZ = +5m.13s.

Little Rock eEN = +7m.4s., eEN = +12m.22s., iEN = +12m.50s.

St. Louis eEN = +14m.56s. and +15m.38s.

Florissant iE = +13m.48s., iEZ = +13m.55s., eEZ = +15m.27s.

Long waves were also recorded at Oak Ridge, Philadelphia, and East Machias.

Mar. 3d. Readings also at 8h. (Andijan and Samarkand), 10h. (Tiflis), 11h. (near La Paz), 17h. (Malabar), 22h. (Philadelphia), 23h. (Medan).

Mar. 4d. Readings at 0h. (La Paz, Tiflis, Samarkand, near Andijan, and Tashkent), 2h. (Mount Wilson, Pasadena, and Tinemaha), 6h. (Chur), 7h. (Bombay), 9h. (Hong Kong and near Tashoku), 10h. (Phu-Lien, Irkutsk, and Sverdlovsk), 13h. (Sverdlovsk), 16h. (Tucson and near Sumoto), 17h. (near Branner and near Batavia), 20h. (Christchurch and near Mizusawa).

Mar. 5d. 13h. Shock from origin in S.W. Pacific.

Manila P = 22m.26s., S₂ = 23m.0s.

Batavia ePN = 22m.35s., ePE = 22m.39s., iE = 23m.6s., eSN? = 25m.50s., eSE? = 25m.58s.

Adelaide eP = 23m.22s., i = 24m.19s., iS = 27m.47s., i = 28m.10s., eL = 31m.4s., M = 35m.6s.

Sydney e = 24m.32s., L = 35m.15s., M = 36m.

Perth i = 27m.30s., e = 28m.0s.

Irkutsk e = 27m.43s. and 36m.0s., L = 50m.

Andijan eP = 28m.29s., e = 37m.42s.

Tashkent i = 28m.47s., e = 29m.27s., i = 29m.43s., eS = 38m.47s., eL = 52m.48s., M = 64m.12s.

Melbourne e = 29m.12s. and 30m.35s., i = 32m.22s.

Grozny e = 29m.40s.

Ksara eP = 29m.45s., ePP = 32m.44s., eS = 39m.45s., ePS = 40m.27s., M = 74m.

Tiflis eZ = 30m.29s.

Riverview eE = 30m.59s., eN = 31m.7s., eEN = 34m.54s., M = 35m.38s.

Mount Wilson ePZ = 31m.56s., iPZ = 35m.49s.

Pasadena iPZ = 32m.0s., iPZ = 35m.50s.

Riverside ePZ = 32m.0s., ePZ = 35m.50s.

Hong Kong M = 32m.30s.

Calcutta iN = 32m.36s.

La Paz iPZ = 37m.5s., iZ = 37m.40s.

Almata e = 38m.33s.

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Mar. 5d. Readings also at 0h. (near Santiago), 4h. (Andijan, Frunse, Christchurch, Samarkand, and near Medan), 7h. (Belgrade), 9h. (Andijan, Samarkand, Semipalatinsk, Tashkent, Tchimkent, near Almata, and Frunse), 11h. (Calcutta, Tashkent, Irkutsk, Hong Kong, Chiufeng, and near Wellington), 12h. (near Berkeley, Branner, Fresno, Lick, and San Francisco), 13h. (Triest, Zagreb, near Belgrade, and Sofia), 14h. (Oaxaca and near San Javier), 16h. (Semipalatinsk), 23h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Ukiah, Florissant, St. Louis, Tucson, Tacubaya, San Juan Huancayo, La Paz, and Scoresby Sund).

Mar. 6d. 0h. 54m. 30s. Epicentre 39° 6N. 19° 8E.

Damage and Force V at Corfu. See Bolletino della Societa Siomolog. Italiana, Vol. XXXIX, No. 1-2, 1941, published by the Institute of Geophysics, Rome. No. 84.

$$A = +.7269, B = +.2617, C = +.6349; \quad \delta = -3; \quad h = -2;$$

$$D = +.339, E = -.941; \quad G = +.597, H = +.215, K = -.773.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Athens	3.4	116	1 14	P _r	1 56	S _r	—	—
Sofia	4.1	39	1 5	0	—	—	—	2.7
Capodimonte	N. 4.4	289	e 1 25	P _r	e 2 30	S _r	—	3.2
Belgrade	5.2	5	e 1 20 _a	- 1	e 2 39	S*	—	—
Bucharest	6.7	40	e 2 0	P*	e 2 44	-16	4.1	—
Zagreb	6.8	337	1 42	- 2	e 3 33	S*	—	—
Triest	7.5	326	e 1 53	0	i 3 11	- 9	—	—
Graz	8.1	339	i 2 6	+ 4	e 4 22	S _r	—	5.2
Zurich	11.2	317	e 4 48	S	(e 4 48)	- 4	—	—
Simeropol	11.9	59	e 2 52	- 2	—	—	—	—
Ksara	14.1	109	e 3 43	+ 20	—	—	—	—
Moscow	20.0	30	e 4 34	- 3	e 8 21	+ 4	e 11.7	12.8
Pulkovo	21.3	15	e 4 42	- 8	e 8 42	- 1	11.5	13.1

Additional readings:—

Belgrade e = +1m.38s., i = +3m.0s. and +3m.8s.

Bucharest e = +2m.18s., +2m.22s. and +2m.27s., iE = +3m.37s., e = +3m.38s.

Zagreb eEZ = +3m.41s.

Triest i = +4m.11s. and +4m.46s.

Simeropol e = +6m.48s.

Ksara e = +7m.2s.

Long waves were also recorded at Theodosia, Yalta, Cheb, Stuttgart, Copenhagen, Uccle, Strasbourg, and De Bilt.

Mar. 6d. Readings also at 0h. (Grozny, Baku, Tashkent, Irkutsk, Copenhagen, De Bilt, Paris, Stuttgart, Strasbourg, Uccle, Tortosa, Pasadena, Mount Wilson, Tinemaha, La Paz, and near Huancayo), 1h. (Chiufeng, Hong Kong, Manila, Phu-Lien, Irkutsk, Tashkent, and Ksara), 2h. (Tiflis), 4h. (near Andijan), 5h. (Grozny, near Erivan, and Tiflis (2)), 7h. (near Santiago, San Javier, and La Paz), 9h. (La Paz), 12h. (near Almata, Andijan, Frunse, and near Balboa Heights), 13h. (Apia), 15h. (near Samarkand), 17h. (near Batavia and near Nagoya), 20h. (near Grozny), 21h. (near Chur and Zurich), 22h. (near Haiwee, Mount Wilson, Pasadena, and Tinemaha).

Mar. 7d. 19h. 10m. 50s. Epicentre 38° 5N. 45° 0E.

$$A = +.5548, B = +.5548, C = +.6199; \quad \delta = -12; \quad h = -1;$$

$$D = +.707, E = -.707; \quad G = +.438, H = +.438, K = -.785.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Erevan	1.7	347	e 0 27	- 4	0 52	- 2	—	0.9
Tiflis	3.1	357	0 59	+ 1	e 1 16	- 13	1.6	2.1
Baku	4.2	61	e 1 8	+ 1	i 2 12	S*	e 3.1	4.9
Grozny	4.9	3	e 3 9	S	(e 2 0)	- 6	—	—
Piatigorsk	5.7	347	e 1 38	P*	e 2 53	S*	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Sotchi	6.4	324	e 1 48	P*	e 3 31	P _e	—	—
Ksara	8.7	241	e 2 14	+ 4	e 3 49	- 1	—	—
Theodosia	9.7	315	—	—	e 4 37	+ 22	—	—
Yalta	10.1	310	e 2 34	+ 6	e 4 34	+ 9	—	—
Simferopol	10.4	312	e 2 49	+ 15	—	—	—	—
Sebastopol	10.5	309	—	—	e 4 33	- 2	—	—
Moscow	18.0	347	e 4 8	- 5	e 7 24	- 8	9.7	11.2
Tashkent	18.9	74	i 4 24	0	i 8 0	+ 7	e 9.7	16.3
Sverdlovsk	21.1	24	e 4 40	- 8	e 8 33	- 6	14.6	15.6
Andijan	21.2	75	e 4 45	- 4	—	—	—	—
Pulkovo	23.3	341	e 5 5	- 5	e 9 14	- 6	12.7	14.3
Copenhagen	27.7	319	—	—	10 58	+ 25	15.2	—

Additional readings :-

Erevan P_r = +29s., PP = +36s., PS = +48s.

Tiflis eN = +55s., iN = +1m.49s.

Grozny e = +2m.53s.

Ksara SS = +4m.45s.

Yalta e = +7m.48s.

Sverdlovsk L₀ = +11.4m.

Long waves were also recorded at Irkutsk and Helwan.

Mar. 7d. Readings also at 1h. (near Wellington), 2h. (near Santiago), 3h. (Mount Wilson and Pasadena), 4h. (near Mizusawa), 12h. (Andijan and near Samarkand), 15h. (Sverdlovsk), 16h. (La Paz), 17h. (La Plata and near Santiago), 18h. (Guadalajara, Manzanillo, Tacubaya, Mount Wilson, Pasadena, Riverside, and Tinemaha), 19h. (La Paz, La Plata, near Santiago, and San Javier), 20h. (near Santiago), 23h. (Andijan).

Mar. 8d. 19h. 34m. 9s. Epicentre 40°-5N. 99°-5E.

A = -1258, B = +7522, C = +6469; $\delta = +11$; $h = -2$;
D = +986, E = +165; G = -107, H = +638, K = -763.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Semipalatinsk	16.7	313	e 3 53	- 4	—	—	—	—
Almata	17.0	287	e 3 48	- 13	e 5 35	?	—	—
Frunse	18.7	284	e 4 19	- 3	e 7 15	- 33	—	—
Andijan	20.5	279	e 5 8	+ 26	e 8 15	- 12	—	—
Tashkent	22.8	282	e 5 10	+ 5	9 29	+ 18	e 11.8	12.4
Sverdlovsk	29.9	316	6 2	- 10	e 10 49	- 20	12.3	—

Additional readings :-

Semipalatinsk e = +5m.27s.

Almata i = +6m.46s.

Frunse e = +6m.31s.

Andijan i = +7m.59s.

Long waves were also recorded at Irkutsk, Copenhagen, and Tiflis.

Mar. 8d. Readings also at 0h. (Andijan, Semipalatinsk, Almata, Tashkent, and near Frunse), 1h. (Andijan and Semipalatinsk), 4h. (Andijan, Tashkent, and near Samarkand), 6h. (Guadalajara, Manzanillo, and Tacubaya), 8h. (Wellington), 10h. (Ferndale, San Francisco (2), Berkeley (3), near Branner, Fresno, Lick, Ukiah, and near Apia), 11h. (near Berkeley (4), San Francisco, and near Strasbourg), 12h. (Cheb), 14h. (Kobe, near Toyooka, Nagoya, near Berkeley, and San Francisco), 15h. (Irkutsk, Tashkent, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Berkeley), 16h. (Baku and Tiflis), 17h. (Kobe, near Sumoto, and Toyooka), 18h. (Grozny), 19h. (Grozny and near Wellington), 21h. (Ksara, Baku, Copenhagen, Tiflis, Tashkent, De Bilt, Strasbourg, Stuttgart, Paris, and near Manila), 22h. (Little Rock) 23h. (Merida, San Juan, Mount Wilson, Pasadena, and Tinemaha).

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Mar. 9d. 5h. 7m. 32s. Epicentre 39° 0N. 71° 8E.

A = +2434, B = +7402, C = +6268; $\delta = +2$; $h = -1$;
D = +950, E = -312; G = +196, H = +595, K = -779.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan	1-8	14	0 24	- 8	0 49	- 7	—	1-3
Tashkent	3-0	320	e 0 43	- 7	i 1 27	- 0	—	2-0
Tchimkent	3-7	333	1 0	0	e 1 44	- 1	—	—
Samarkand	3-8	281	1 1	0	1 54	+ 7	—	2-9
Frunse	4-4	28	1 22	P _g	2 11	S*	—	2-6
Almata	5-7	41	1 33	+ 5	2 47	S*	—	3-0

Additional readings:—

Andijan e = +27s., e = +30s., e = +44s.

Tashkent i = +1m.15s.

Tchimkent e = +1m.8s., and +1m.18s., S_g = +1m.56s.

Samarkand e = +1m.18s., e = +1m.44s., e = +1m.50s.

Long waves were also recorded at Sverdlovsk, Baku, and Irkutsk.

Mar. 9d. 5h. 44m. 31s. Epicentre 40° 4N. 84° 2W. (as on Mar. 2d.).

Intensity VIII. Macroseismic Area 150,000 square miles. Felt at Sydney and Anna. See Bulletin of the Seismological Society of America, Vol. 30, No. 3, July 1940. P. 251-260.

A = +0772, B = -7598, C = +6456; $\delta = +6$; $h = -2$.

	Δ	Az	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Cincinnati	1-3	190	i 0 29	+ 4	i 0 47	+ 3	—	—
Chicago	3-0	300	e 1 1	P _g	i 1 25	- 2	i 1-6	—
Chicago (Loyola)	3-0	300	i 0 56	P _g	i 1 34	*S	—	—
Madison	4-7	307	i 1 17	+ 3	i 2 13	+ 3	i 2-6	—
Toronto	4-8	46	—	—	i 2 14	+ 2	2-5	—
Buffalo	5-0	56	i 1 18	0	i 2 9	- 9	—	—
Florissant	5-0	254	e 1 20	+ 2	i 2 21	+ 3	—	—
St. Louis	5-0	252	e 1 17	- 1	i 2 15	- 3	—	—
Ithaca	6-2	68	i 1 57	P*	i 3 15	S*	—	—
Philadelphia	6-9	90	1 48	+ 3	e 3 19	S*	—	—
Des Moines	7-2	283	e 2 18	P _g	i 3 10	- 3	—	—
Ottawa	8-0	48	1 59	- 1	3 25	- 8	3-7	—
Little Rock	8-6	232	e 2 13	+ 4	i 3 43	- 5	—	—
Williamstown	8-6	71	e 2 8	- 1	i 3 36	- 12	—	—
Vermont	9-1	61	—	—	e 3 51	- 9	i 4-8	—
Oak Ridge	z. 9-7	74	i 2 23	+ 1	e 4 8	- 7	—	—
Weston	9-9	74	i 2 26	+ 1	—	—	—	—
Shawmigan Falls	10-3	50	2 31	- 1	4 23	- 7	—	5-2
Seven Falls	11-8	51	2 46	- 7	4 55	- 11	5-9	—
East Machias	13-2	65	—	—	e 5 32	- 8	e 8-0	—
Denver	15-9	274	—	—	e 6 22	- 22	—	—
Saskatoon	19-4	315	e 6 39	?	—	—	8-9	—
Bozeman	20-3	294	—	—	e 7 29	- 54	e 10-5	—
Tucson	22-9	258	—	—	e 10 25	SSS	—	—
Mount Wilson	z. 27-5	268	1 5 53	+ 3	—	—	—	—
Pasadena	z. 27-6	268	e 6 29	PP	—	—	—	—

Additional readings:—

Chicago e = +1m.19s. and 1m.23s.

Chicago (Loyola) i P_g = +1m.6s.

Buffalo i P* = +1m.27s., i = +1m.48s., i S* = +2m.24s.

Florissant i P* = +1m.31s., i S* = +2m.35s., i = +3m.10s.

St. Louis i P* = +1m.28s., i S* = +2m.31s.

Ithaca i = +3m.11s. and +3m.19s.

Philadelphia e = +2m.10s. and +2m.29s., i = +3m.31s., +4m.1s., +4m.9s.

and +4m.51s.

Des Moines e = +2m.37s. and 2m.50s., i = +2m.54s.

Little Rock i P* = +2m.27s., i P_g = +2m.36s., i S* = +4m.14s., i S_g = +4m.32s.

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Williamstown P = +2m.35s., i = +2m.49s., +3m.54s., and +4m.14s.
 Vermont i = +4m.39s. and +5m.16s.

Oak Ridge iSZ = +6m.7s.

East Machias e = +6m.36s. and +6m.50s.

Denver eE = +7m.19s., eN = +7m.52s., eEN = +8m.13s., iEN = +8m.27s.

Tucson e = +11m.11s., +11m.57s., and +12m.3s.

Mount Wilson eZ = +13m.38s. and +14m.32s.

Pasadena e = +14m.41s.

Long waves were also recorded at Tinemaha, Scoresby Sund, Butte, and Columbia.

Mar. 9d. 15h. 40m. 20s. Epicentre 9°-0N. 83°-4W.

Felt Force II-III at Balboa Heights and along the length of the Panama Canal.
 See Seismographic report U.S.C.G.S., March, 1937, p. 5.

A = +.1135, B = -.9813, C = +.1554; $\delta = -2$; $h = +7$;
 D = -.993, E = -.115; G = +.018, H = -.154, K = -.983.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	3.8	89	11 0	- 1	i 1 45	- 2	—	—
Merida	N. 13.3	334	2 32	-41	—	—	—	2.1
Port au Prince	14.3	47	—	—	e 5 36	-30	—	—
Tacubaya	N. 18.4	307	e 4 21	+ 3	—	—	—	—
San Juan	19.2	59	e 4 29	+ 1	8 10	+11	—	—
Huancayo	22.4	158	e 5 0	- 2	i 9 5	+ 1	—	—
Guadalajara	N. 22.5	304	—	—	e 9 50	SS	—	—
Manzanillo	N. 22.6	300	5 9?	+ 6	—	—	—	—
Columbia	25.0	5	e 5 28	+ 1	e 9 43	- 6	e 12.7	—
Little Rock	26.9	344	e 5 43	- 2	—	—	—	—
La Paz	29.5	147	16 10k	+ 2	i 11 13	+11	13.6	18.9
Cincinnati	30.0	359	16 13	+ 1	i 11 10	0	—	—
St. Louis	30.2	350	16 12	- 2	i 10 59	-14	e 15.2	18.9
Florissant	30.3	350	16 13	- 2	i 11 0	-15	—	—
Philadelphia	31.7	13	i 6 27	0	e 11 26	-11	i 16.6	—
Pennsylvania	32.0	7	e 7 34	PP	e 11 40?	- 2	—	—
Fordham	32.8	13	6 38	+ 1	12 2	+ 8	—	21.0
Chicago	33.0	354	6 36	- 3	i 11 53	- 4	15.9	—
Des Moines	33.7	347	e 6 52	+ 7	e 12 6	- 2	e 21.3	—
Ithaca	33.9	9	i 6 50	+ 3	e 12 12	+ 1	—	—
Buffalo	34.0	6	i 6 48	0	—	—	—	—
Tucson	34.4	317	e 6 52	+ 1	e 12 22	+ 3	e 16.9	—
Toronto	34.7	5	6 53	- 1	i 12 22	- 2	15.2	—
Williamstown	34.8	13	e 6 56	+ 2	12 33	+ 8	e 22.0	—
Weston	34.9	16	i 6 58k	+ 3	i 12 41	+14	16.7	25.3
Oak Ridge	35.0	16	16 57	+ 1	e 12 19	- 9	e 18.2	—
Denver	36.1	331	e 7 0	- 5	e 12 44	- 1	—	26.7
Vermont	36.4	12	i 7 9	+ 1	12 59	+ 9	18.1	—
Ottawa	36.9	9	7 13	+ 1	13 0	+ 2	e 17.7	—
East Machias	38.3	19	e 7 30	+ 6	e 13 6	-13	e 17.3	—
Shawinigan Falls	38.5	12	7 28	+ 2	13 27	+ 5	20.7	—
La Jolla	39.2	313	i 7 30	- 1	e 13 34	+ 2	—	—
Halifax	39.4	23	e 7 40	+ 7	e 16 40?	SS	e 19.7	—
Seven Falls	39.5	14	7 36	+ 2	13 40	+ 3	19.7	—
Riverside	39.9	314	7 38	+ 1	13 33	-10	—	—
Mount Wilson	40.5	314	17 41	- 1	e 13 43	- 9	—	—
Pasadena	40.6	314	i 7 43a	0	i 13 59	+ 5	e 17.2	—
Halwee	E. 41.4	316	e 7 51	+ 1	e 14 16	+11	—	—
Santa Barbara	41.8	313	e 7 56	+ 3	e 14 6	- 5	—	—
Tinemaha	42.1	317	17 56	+ 1	e 14 27	+11	—	—
Fresno	N. 43.0	316	e 8 6	+ 3	e 14 30	+ 1	—	—
Bozeman	43.6	333	e 7 46	-22	e 14 34	- 4	e 20.7	—
Butte	44.6	331	e 7 53	-23	e 15 15	+21	e 22.7	—
Lick	44.6	316	e 8 16	0	e 14 57	+ 5	—	—
Branner	45.0	315	e 8 18	0	—	—	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Berkeley	45.3	316	i 8 21	0	e 15 10	+ 8	—	—
Ukiah	46.5	317	8 33	+ 2	e 15 20	+ 1	e 22.7	—
Saskatoon	47.0	341	7 40	-55	e 14 28	-58	26.7	—
La Plata	49.9	152	8 59	+ 2	15 58	-9	25.7	—
Victoria	51.6	328	9 11	+ 1	16 34	+ 3	23.7	—
Ivigtut	58.2	19	9 57	- 1	18 5	+ 6	25.7	—
Sitka	62.4	332	e 10 41	+14	19 4	+11	29.1	—
College	71.2	336	e 11 24	+ 1	e 20 44	+ 4	e 24.7	—
Scoresby Sund	72.2	18	11 30	+ 1	e 20 54	+ 3	—	—
Honolulu	72.3	290	11 29	0	e 20 40	-12	e 33.5	—
San Fernando	74.4	55	e 11 50	+ 8	21 35	+19	36.2	—
Rathfarnham Castle	75.1	37	i 11 29	-17	i 21 12	-12	35.7	39.7
Malaga	75.9	54	e 11 50	0	21 37	+ 5	36.7	—
Toledo	76.1	52	i 11 51	0	21 38	+ 3	e 36.4	33.2
Granada	76.5	54	i 11 55	+ 1	e 22 10	+31	—	—
Bidston	77.1	38	—	—	e 21 57	+11	e 33.7	—
Edinburgh	77.1	35	—	—	i 21 58	+12	—	49.7
Almeria	77.4	34	e 12 1	+ 3	e 21 50	+ 1	e 37.7	—
Stonyhurst	77.4	37	i 12 1	+ 3	i 21 56	+ 7	36.7	42.2
Jersey	77.6	42	i 12 0	0	e 22 3	+12	37.1	39.7
Aberdeen	77.8	33	e 12 41	+40	22 36	+43	35.2	39.8
Durham	78.0	36	12 3	+ 1	22 3	+ 8	—	43.2
Oxford	78.1	39	e 11 52	-10	21 54	- 2	e 35.7	42.4
Kew	78.7	39	i 12 4a	- 2	e 22 16	+13	e 33.7	39.7
Paris	80.6	42	i 12 18	+ 2	e 22 28	+ 5	34.7	40.7
Bergen	81.6	30	12 20	- 1	22 43	+10	36.7	—
Uccle	81.7	40	12 22a	0	e 22 30	- 4	e 37.7	42.4
De Bilt	82.1	39	i 12 24	0	e 22 53	+15	e 38.7	41.9
Strasbourg	84.1	42	i 12 18a	-16	e 23 5	+ 7	e 39.7	45.7
Hamburg	84.8	37	e 12 35k	- 2	i 23 13	+ 8	e 38.7	46.7
Zurich	84.8	43	e 12 38k	+ 1	—	—	—	—
Stuttgart	85.0	42	12 39a	+ 1	e 23 9	+ 2	e 39.7	34.7
Chur	85.5	44	e 12 40	- 1	—	—	—	—
Copenhagen	85.9	34	12 44	+ 1	e 23 16	0	31.7	—
Jena	86.2	40	e 12 40	- 4	e 22 55	-24	e 40.7	45.2
Florence	87.2	46	12 45	- 4	—	—	—	—
Cheb	87.4	40	e 12 51	+ 1	e 23 18	-12	e 42.7	46.7
Uppsala	87.8	30	—	—	e 23 25	- 9	e 45.7	52.6
Prague	88.2	40	e 12 53	- 1	e 23 33	- 5	e 36.2	45.7
Triest	88.6	44	i 12 57	+ 1	i 23 37	- 5	—	43.3
Graz	89.5	42	i 13 5	+ 5	i 23 36	-14	e 44.7	54.3
Vienna	89.8	41	e 13 1	- 1	e 22 3	?	—	—
Stara Dala	91.1	42	e 13 12	+ 4	e 23 6	-58	—	50.7
Budapest	91.7	42	e 13 40?	+30	—	—	e 46.7	—
Belgrade	93.4	44	e 17 5k	PP	e 25 43	PS	e 55.6	—
Pulkovo	93.8	28	13 18	- 2	23 40	[-14]	40.7	47.1
Bucharest	97.4	43	—	—	23 40?	[-34]	47.7	—
Moscow	98.6	29	e 13 46	+ 4	24 2	[-18]	45.2	53.4
Sebastopol	102.2	40	e 19 11	?	e 27 25	PS	—	—
Simferopol	102.4	40	e 14 25	+26	e 27 28	PS	e 39.7	—
Yalta	102.6	40	e 14 5	+ 5	e 27 25	PS	e 52.7	—
Cape Town	104.8	123	—	—	e 24 41	?	e 51.7	57.0
Wellington	104.8	280	—	—	e 28 40?	PPS	e 49.7	58.7
Christchurch	106.3	227	e 24 47a	?	i 34 13	SSP	48.3	—
Helwan	106.4	55	e 14 22	P	25 0	[+ 3]	—	—
Sverdlovsk	108.0	19	e 18 33	PP	24 57	[- 7]	47.7	64.9
Ksars	108.4	50	e 14 40?	P	28 52	PPS	—	—
Platigorsk	108.4	37	e 18 56	PP	—	—	e 54.7	—
Grozny	110.4	37	e 18 2	[-32]	—	—	e 28.7	—
Tiflis	110.8	39	i 14 41	P	25 13	[- 2]	e 42.6	67.1

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		o.	m. s.		m. s.	s.	m.	m.
Baku	114.7	37	19 50	PP	25 45	[+14]	57.7	65.0
Irkutsk	118.6	354	19 53	PP	e 31 3	PPS?	60.7	71.7
Vladivostok	119.0	331	e 20 10	PP	e 25 45	[- 2]	55.7	76.2
Sempalatinsk	119.2	11	e 20 5	PP	—	—	—	—
Tashkent	124.0	24	i 15 39	P	e 26 2	[- 1]	e 53.5	73.2
Andijan	125.7	22	e 19 43	[+40]	—	—	—	—
Melbourne	127.9	229	e 22 30	?	e 26 8	[- 7]	e 61.0	—
Chiufeng	128.0	340	e 19 10k	[+ 2]	i 25 59	[-16]	e 58.2	81.2
Adelaide	133.8	229	—	—	e 35 40	?	e 64.6	80.4
Agra	E. 139.8	25	e 19 35	[+ 5]	e 23 4	PP	—	—
Bombay	143.7	39	e 19 36	[0]	—	—	67.7	—
Hong Kong	144.5	331	19 40	[+ 2]	—	—	41.7	—
Manila	146.3	314	i 19 46a	[+ 5]	—	—	—	—
Calcutta	N. 147.6	13	i 19 52	[+ 9]	i 26 36	[-15]	—	—
Hyderabad	148.2	34	20 24	[+40]	30 24	{+17}	64.4	92.4
Colombo	157.0	47	19 34	[-23]	—	—	—	104.1
Medan	167.4	351	e 20 12	[+ 4]	—	—	e 74.7	—
Batavia	Z. 169.5	285	20 8	[- 1]	—	—	—	—

Additional readings :-

Balboa Heights i = +1m.26s.
 San Juan i = +4m.35s.
 Huancayo iPP = +5m.5s., i = +5m.18s., iPP = +5m.28s., i = +6m.25s. and +7m.4s., iSSS = +10m.48s.
 Columbia e = +7m.59s. and +8m.33s.
 Little Rock iPPEN = +5m.51s., iPPE = +6m.23s., iPcPE = +8m.13s., eSSEN = +11m.15s.
 Cincinnati iPP = +7m.5s.
 St. Louis iPPEN = +6m.21s., ePPN = +7m.4s., iPPP = +7m.15s., iPPPN = +7m.22s., iS = +11m.16s., iSS = +12m.42s., iSSS = +13m.2s.
 Florissant iPPNZ = +6m.21s., ePP = +7m.5s., iPP = +7m.16s., e = +10m.54s., esS = +11m.17s., iEN = +11m.49s., iSS = +12m.26s., iSSS = +12m.55s.
 Philadelphia iPP = +7m.33s., iS = +11m.50s., e = +12m.28s., i = +15m.19s.
 Chicago e = +7m.36s., PP = +7m.41s., PPP = +8m.21s.
 Des Moines ePP = +7m.58s., eSS = +14m.20s.
 Ithaca iPP = +7m.56s., e = +12m.16s., iSS = +12m.28s.
 Buffalo iPP = +7m.52s., i = +18m.32s., +22m.14s., +22m.34s., +23m.2s. and +24m.50s.
 Tucson ePP = +8m.23s., eSS = +14m.58s.
 Toronto PPP = +8m.6s., e = +12m.4s., SS = +14m.16s.
 Williamstown PP = +8m.20s.
 Weston iP = +7m.5s., iPPNZ = +8m.17s., iSSE = +15m.23s.
 Oak Ridge iPPNZ = +7m.4s., iSPZ = +7m.22s., iPP = +8m.20s., esSE = +12m.38s., eZ = +12m.58s. and +15m.25s.
 Denver ePPE = +7m.22s., ePPE = +8m.28s., ePcP = +9m.42s., eN = +12m.16s., esSE = +13m.0s., eSSN = +13m.7s.
 Vermont iPP = +8m.30s., i = +8m.40s., iSS = +15m.39s.
 Ottawa PP = +8m.46s., SS = +14m.55s., iN = +16m.30s.
 East Machias ePP = +8m.47s., e = +16m.34s.
 Shawinigan Falls e = +8m.56s.
 Seven Falls PPP = +9m.12s., SSS = +16m.51s.
 Bozeman eP = +8m.0s., ePP = +9m.50s., e = +13m.46s., eSS = +18m.14s.
 Butte e = +10m.11s.
 Lick eSE = +15m.0s.
 Berkeley ePPEZ = +10m.3s., eE = +10m.53s., eZ = +10m.55s.
 Ukiah e = +14m.56s.
 Saskatoon e = +18m.16s.
 Victoria iN = +19m.4s., SSS = +21m.40s.?
 Ivigtut +13m.34s.
 Sitka eSP = +19m.43s., eSS = +23m.24s.
 Scoresby Sund +25m.40s.?
 Honolulu eS = +19m.56s., S = +21m.9s., eSSS = +29m.20s.
 Rathfarnham Castle i = +11m.49s., PS = +21m.47s., iPPP = +28m.52s.
 Malaga i = +12m.0s., e = +14m.16s. and +15m.56s.
 Toledo PP = +14m.53s., PPP = +16m.37s., PS = +22m.13s.
 Stonyhurst eSS = +27m.1s.
 Jersey i = +12m.7s. and +26m.0s.
 Aberdeen e = +17m.51s. and +27m.26s.
 Oxford ePPN = +15m.55s., SE = +21m.58s.
 Kew iPZ = +12m.6s., iEZ = +12m.13s., eSSE = +27m.36s.

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Uccle iEZ = +12m.24s., iPPe = +15m.24s., iPSE = +23m.15s., iSSE = +27m.54s., iSSSE = +31m.33s.
 De Bilt ePPZ = +15m.31s., eSS = +28m.14s.
 Strasbourg iZ = +12m.41s.? and +13m.15s., ePPZ = +15m.48s., ePS = +24m.0s., eSSN = +28m.40s.? eSSSN = +32m.40s.?
 Hamburg iZ = +12m.42s., eN = +28m.35s., eSSE = +28m.53s.
 Stuttgart iPePZE = +12m.47s., ePPZE = +15m.54s., ePPPZE = +18m.40s., eSZ = +23m.14s., ePS = +24m.7s., eSS = +28m.58s.
 Copenhagen i = +12m.51s., PP = +16m.5s., PPP = +17m.55s., iS = +23m.31s., PS = +24m.22s., SSE = +29m.16s.
 Jena eN = +13m.40s.
 Upsala SSN = +29m.30s.
 Prague e = +29m.40s.
 Trieste i = +16m.32s., eSKS = +23m.6s., iPS? = +24m.48s., iSS = +29m.53s.
 Vienna P = +13m.35s.
 Pulkovo PP = +17m.6s., PS = +25m.47s., SS = +30m.4s., SSS = +33m.58s.
 Moscow PP = +17m.46s., ePPP = +19m.59s., PS = +26m.46s., eSS = +31m.46s.
 Simferopol e = +18m.12s.
 Yalta e = +18m.12s.
 Cape Town iE = +27m.42s.
 Wellington e = +34m.40s.
 Christchurch iPEZ = +24m.53as., PPE = +27m.42s., SSE = +38m.51s., SSSE = +41m.30s., GN = +44m.41s.
 Helwan PP = +18m.55s., i = +27m.55s. and +28m.40s.
 Sverdlovsk PS = +28m.10s., SS = +34m.40s.
 Ksara e = +19m.20s.?
 Tiflis PP = +19m.9s., iPSen = +28m.49s., ePSSE = +35m.25s., eSSSE = +39m.29s.
 Baku PS = +29m.28s., SS = +36m.16s., SSS = +40m.34s.
 Irkutsk SKS = +25m.45s., SS = +36m.4s., eSSS = +40m.52s.
 Tashkent iPKP = +18m.59s., iPP = +20m.37s., PPP = +23m.20s., PS = +30m.49s., eSS = +38m.28s., eSSS = +42m.28s.
 Melbourne e = +32m.50s. and +38m.52s.
 Chiufeng PP = +21m.11s., PKSEN = +24m.24s., iZ = +24m.39s.
 Adelaide e = +40m.28s. and +53m.10s.
 Hong Kong PP? = +22m.52s., SS? = +33m.10s.
 Bombay eN = +22m.59s., iN = +25m.56s., ePPSEN = +35m.40s.
 Calcutta iN = +20m.15s., iPPN? = +23m.51s., eN? = +35m.28s., iN = +44m.0s.
 Hyderabad SKSP = +34m.14s.
 Batavia ePN = +20m.27s., ePE = +21m.3s.
 Long waves were also recorded at Sydney, Kaitaia, Theodosia, Sofia, Riverview, Phu-Lien, Göttingen, and Perth.

Mar. 9d. 20h. 19m. 14s. Epicentre 27°0N. 92°0E.

A = -0311, B = +8917, C = +4516; δ = +4; h = +3;
 D = +999, E = +035; G = -016, H = +451, K = -892.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	5.5	217	2 35	P _g	3 21	+51	—	—
Agra	E. 12.5	275	e 3 11	+9	5 46	+23	6.7	—
Bombay	19.4	250	e 4 47	+17	e 8 32	+28	—	14.5
Andijan	21.2	315	e 4 51	+2	e 8 40	-1	—	—
Fruse	21.2	323	e 5 8	+19	—	—	—	—
Tashkent	23.5	313	i 4 51	-21	e 9 19	-4	13.0	14.7
Chiufeng	23.9	49	e 5 16	0	9 33	+3	i 12.6	14.5
Samarkand	24.3	307	e 5 17	-3	9 42	+5	—	—
Vladivostok	36.0	53	—	—	e 12 29	-15	19.5	—
Baku	37.1	302	—	—	e 14 46	?	21.8	—
Sverdlovsk	37.2	333	e 7 12	-3	e 12 52	-10	18.3	20.2
Grozny	40.6	306	e 7 46	+3	—	—	—	—
Moscow	48.2	322	e 8 44	0	e 19 13	SS	e 28.3	31.2
Pulkovo	52.9	326	e 9 21	+1	e 16 29	-19	26.8	30.7

Additional readings:—

Calcutta S* = +3m.50s., S_g = +3m.53s.
 Agra SSE = +6m.16s.
 Bombay e = +10m.19s., i = +11m.9s. and +12m.23s.
 Tashkent iPP = +5m.27s., e = +6m.55s., e = +9m.38s., e = +11m.53s., i = +12m.55s.
 Chiufeng iSEN = +9m.40s.
 Samarkand e = +8m.54s.
 Long waves were also recorded at Irkutsk, Hyderabad, Hong Kong, Copenhagen, and Tiflis.

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Mar. 9d. Readings also at 0h. (Batavia and Pennsylvania), 1h. (Tucson), 2h. (Chiufeng, Hong Kong, Mizusawa, Zi-ka-wei, and near Taihoku), 3h. (Vladivostok, Irkutsk, Tashkent, Pulkovo, De Bilt, Copenhagen, and Seattle), 6h. (near Hukuoka and Hukuoka B), 8h. (Bombay, Calcutta, Chiufeng, Irkutsk, and Tashkent), 12h. (Frunse and near Andijan), 13h. (Mount Wilson, Pasadena, and Tinemaha), 15h. (Balboa Heights, near Branner, Fresno, and Lick), 16h. (near Manila), 17h. (San Javier, Hong Kong, and near Hukuoka B), 19h. (Frunse, Samarkand, Tashkent, and near Andijan), 21h. (Andijan).

Mar. 10d. 21h. 34m. 51s. Epicentre 45°4N. 16°1E.

Given by Laibach.

Felt Force V at Jukinac, Glina, Vrgin Most, Petrinja, Force III at Zagreb. See *Annuaire Macroseismique*, Vol. XVII, 1937, published by the Institute of Seismology of the University of Belgrade, Series A, p. 10.

A = +.6770, B = +.1954, C = +.7096; $\delta = +4$; $h = -4$;
D = +.277, E = -.961; G = +.682, H = +.197, K = -.705.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Zagreb	0.4	349	e 0 11	- 2	i 0 19	- 2	0.4
Laibach	1.3	300	e 0 27	+ 2	i 0 44	0	0.8
Graz	1.7	345	e 0 29	- 2	i 0 51	- 3	1.0
Triest	1.7	279	i 0 31a	0	i 0 53	- 1	—
Vienna	2.9	4	e 0 48	0	i 1 42	+18	—
Padova	3.0	270	—	—	e 1 38	S*	—
Belgrade	3.1	101	e f 1a	P _f	e 1 45	S _f	—
Stuttgart	5.8	308	e i 29	0	e 3 9	S _f	—
Jena	6.3	333	—	—	e 2 9?	P _f	3.6
Göttingen	7.4	329	—	—	e 3 45	S*	4.2

Additional readings:—

Zagreb IPP = +15s., i = +18s., iPPS = +23s., iSS = +25s.

Laibach PP = +36s.

Graz iP = +36s.

Triest i = +56s.

Belgrade e = +1m.7s. and +1m.48s.

Mar. 10d. Readings also at 0h. (San Juan and near Balboa Heights), 1h. (La Paz, Mount Wilson, Pasadena, and Philadelphia), 4h. (Sitka, College, Little Rock, Ksara, Tifis, and Andijan), 5h. (San Juan, Tucson, Berkeley, Butte, Bozeman, Ukiah, Mount Wilson, Pasadena, Oak Ridge, Weston, Florissant, St. Louis, Madison, East Machias, Philadelphia, Ivigtut, Scoresby Sund, Copenhagen, Stuttgart, De Bilt, Paris, Kew, Bidston, Pulkovo, Sverdlovsk, Tashkent (2), Baku, Tifis, Ksara, Grozny, Chiufeng, Hong Kong, Irkutsk, and Vladivostok), 11h. (Batavia and Medan), 19h. (Baku, Ksara, and Tashkent), 21h. (Tifis (2), Andijan, and near Calcutta), 23h. (Malabar).

Mar. 11d. Readings at 0h. (Tifis), 1h. (Balboa Heights), 6h. (near Mizusawa (2)), 7h. (Mount Wilson, Pasadena, Sverdlovsk, Medan, and near Batavia), 8h. (Andijan (2), Sverdlovsk, Theodosia, Ksara, and Hong Kong), 14h. (Semi-palatinsk, Andijan, Sverdlovsk, Haiwee, La Jolla, Mount Wilson, Pasadena, Santa Barbara, and Tinemaha), 16h. (Bombay, Kodakanal, Calcutta, Tashkent, Dehra Dun, Sverdlovsk, near Agra, near Andijan, and Samar-kand), 21h. (Ukiah).

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Mar. 12d. 9h. 25m. 14s. Epicentre 6°·5N. 94°·5E.

Felt Force II at Koetatljane (Atjeh, N. Sumatra), see "Natuurkundig Tijdschrift voor Nerdlerlansch," Indie, Apl. 3, Deel. XCIX, 39, pp. 101-131.

A = -0780, B = +9906, C = +1125; $\delta = +3$; $h = +7$;
D = +997, E = +078; G = -009, H = +112, K = -994.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Medan	5.1	124	e 1 15	- 5	i 2 24	+ 4	—	—
Colombo	14.5	272	e 3 30	+ 2	13 18?	?	—	27.4
Kodaikanal	E. 17.2	287	e 3 59	- 4	i 7 9	- 5	—	—
Batavia	N. 17.6	137	e 6 8	?	—	—	—	—
Phu-Lien	18.4	39	e 4 27	+ 9	8 7	+26	—	—
Hyderabad	19.0	307	4 33	+ 7	8 6	+11	9.6	16.0
Bombay	24.4	303	3 4	?	9 48	+ 9	16.8	22.2
Hong Kong	24.6	48	5 40	+17	10 19	+37	—	15.7
Agra	E. 25.8	326	e 5 33	- 1	10 20	+18	16.1	20.2
Manila	27.2	70	i 6 41k	PPP	11 52	SS	15.7	—
Chiufeng	38.6	27	e 7 23	- 3	i 14 14	+51	e 19.9	27.6
Andijan	39.4	334	e 7 39	+ 6	e 13 49	+14	—	—
Almata	39.7	340	e 7 45	+ 9	—	—	—	—
Frunse	40.2	337	e 8 10	+30	—	—	—	—
Tashkent	41.3	331	e 8 16	+27	e 14 39	+35	15.6	27.6
Perth	43.4	153	17 46?	SS	—	—	—	—
Semipalatinsk	45.2	348	e 8 18	- 2	—	—	—	—
Irkutsk	46.3	8	—	—	e 18 46?	SS	23.8	29.1
Baku	52.2	317	e 13 55	PS	e 17 42	+63	26.8	35.2
Tiflis	56.2	317	e 9 39	- 5	e 19 30	?	e 30.0	38.2
Sverdlovsk	56.8	339	9 43	- 5	17 35	- 6	28.8	37.2
Ksara	60.4	304	e 10 10	- 3	e 18 17	-11	—	—
Moscow	66.4	329	e 10 47	- 6	e 19 41	- 2	e 32.3	44.2
Pulkovo	71.5	332	e 17 59	?	e 20 40	- 3	39.8	45.0

Additional readings:—

Medan iN = +2m.2s., iE = +2m.11s. and +2m.28s.

Batavia PZ = +6m.11s., PE = +6m.16s.

Bombay PPP = +5m.22s., SSEN = +12m.34s., S_CEN = +13m.4s.

Chiufeng S₁EN = +16m.40s.

Baku e = +21m.34s.

Tiflis eZ = +13m.6s.

Ksara ePP = +12m.26s., eSS = +22m.29s.

Long waves were also recorded at Helwan, Florissant, De Bilt, Cape Town, Copenhagen, Scoresby Sund, Paris, Strasbourg, College, Keizyo, Zinsen, Stuttgart, and La Paz.

Mar. 12d. Readings also at 1h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, Santa Barbara, Tinemaha, and Jena), 15h. (Kobe, Nagoya, Toyooka, and near Sumoto), 17h. (Wellington), 18h. and 19h. (Ksara).

Mar. 13d. Readings at 5h. (Bucharest and near Sofia), 6h. (near Florence), 11h. (Medan and Mizusawa), 12h. (Bombay), 17h. (near Apia and near San Javier), 19h. (Bucharest and Trieste), 20h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Simferopol), 22h. (Perth).

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Mar. 14d. 11d. 55m. 42s. Epicentre 24°-7S. 70°-2W.

Felt strongly Force VI with damage to houses at Taltal (Chile) 25°-5S. 70°-5W.
See "Bulletin del Servicio Sismologico de la Univ. de Chile Observaciones de 1937," Santiago, Chile, p.75.

A = +3081, B = -8558, C = -4155; $\delta = -4$; $h = +3$;
D = -.941, E = -.339; G = -.141, H = +.391, K = -.910.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o	o	m. s.	s.	m. s.	s.	m.	m.
Montezuma	2.4	31	i 0 55	P _e	—	—	i 1.3	—
La Paz	8.4	14	i 2 15 _a	+ 9	i 4 28	S*	4.9	6.0
Santiago	8.7	182	1 58	-12	3 38	-12	—	—
San Javier	11.0	187	2 35	-7	4 44	-3	—	—
Huancayo	13.5	338	3 28	+13	i 5 54	+7	7.1	—
La Plata	14.7	137	3 29	-2	6 24	+8	7.9	—
Rio de Janeiro	24.7	92	i 5 36	+12	i 9 56	+12	i 13.1	—
San Juan	43.0	6	e 8 5	+2	14 22	-7	e 19.8	—
Columbia	59.3	350	e 10 5	-1	18 9	-5	e 31.0	—
Little Rock	62.8	340	e 10 31	+1	i 18 56	-2	e 23.6	—
Philadelphia	64.5	357	e 10 40	-1	i 19 20	+1	e 26.1	—
Dakar	64.6	59	e 11 20	+39	—	—	—	—
Fordham	65.3	358	10 48	+2	19 14	-15	—	—
Pennsylvania	65.6	354	i 10 48	0	e 19 39	+6	—	—
St. Louis	65.7	343	e 10 49	+1	i 19 30	-4	—	—
Florissant	65.9	343	i 10 50	0	e 19 31	-6	—	—
Weston	66.7	359	i 10 58 _a	+3	e 19 48	+2	—	—
Oak Ridge	66.9	359	i 10 59	+3	i 19 52	+3	e 29.3	—
Williamstown	67.1	358	i 10 59	+2	19 59	+8	—	—
Buffalo	67.8	354	i 11 3	+1	e 20 7	+7	i 32.8	—
Chicago	68.2	346	e 11 0	-4	e 19 59	-5	e 31.0	—
Toronto	68.5	354	11 4	-2	20 3	-5	33.3	—
Tucson	68.6	324	e 11 9	+2	e 20 12	+3	e 33.8	—
East Machias	69.2	3	11 16	+6	20 18	+2	e 30.0	—
Madison	69.7	346	e 11 15	+1	20 18?	-4	—	—
Ottawa	69.9	357	11 18	+3	20 25	+1	e 33.3	—
Shawinigan Falls	71.0	359	11 23	+1	20 37	0	—	—
Seven Falls	71.5	0	11 25	+1	20 39	-4	—	—
La Jolla	72.7	320	i 11 30	-2	—	—	—	—
Riverside	73.6	321	i 11 34	-3	e 21 3	-4	—	—
Mount Wilson	E. 74.2	321	e 11 41	+1	—	—	—	—
Pasadena	74.2	321	i 11 41 _k	+1	i 21 13	-1	e 31.9	—
Santa Barbara	75.3	320	e 11 44	-3	e 21 11	-15	—	—
Haiwee	E. 75.5	322	e 11 48	0	e 21 57	+29	—	—
Cape Town	75.6	121	i 12 6	+18	i 21 26	-3	e 35.5	39.2
Tinemaha	76.3	322	i 11 54 _k	+2	e 21 31	-6	—	—
Fresno	N. 76.9	321	e 11 58	+2	—	—	—	—
Lick	78.4	321	e 12 5	+1	e 21 55	-5	—	—
Berkeley	79.1	321	e 12 8	0	i 22 34	+27	—	—
Bozeman	79.3	333	e 12 3	-6	e 22 5	-4	—	—
Butte	80.2	332	e 12 15	+1	e 21 51	-28	e 37.6	—
Ukiah	80.5	321	e 12 30	+15	e 22 18	-4	e 33.5	—
San Fernando	85.7	47	e 15 33	PP	i 23 14	0	44.3	—
Victoria	86.9	328	12 45	-3	23 18	-8	36.3	—
Ivigut	87.4	11	12 52	+2	i 23 31	+1	—	—
Granada	87.8	47	e 12 49	-3	e 23 23	-11	—	—
Almeria	88.4	49	—	—	e 23 21	[-2]	—	—
Toledo	89.0	45	e 12 56	-2	i 23 30	-15	—	—
Christchurch (N.Z.)	91.0	221	i 13 8 _k	-1	i 24 8	+5	41.8	—
Wellington	91.0	223	13 7	0	24 28	+25	e 41.3	—
Algiers	92.1	51	e 13 31	+19	i 23 45	-28	e 47.3	—
Honolulu	96.6	291	—	—	e 26 24	PS	e 44.3	—
Bidston	97.0	34	—	—	i 24 18?	[+6]	e 37.3	—
Oxford	97.1	36	—	—	i 24 14	[+2]	—	—
Kew	97.4	36	—	—	i 24 14	[+1]	e 39.3	52.6

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Stonyhurst	97.5	33	—	—	i 24 17	[+ 3]	44.3	52.4
Paris	97.6	39	—	—	e 24 18?	[+ 3]	47.3	51.3
Sitka	98.0	330	—	—	e 25 27	+23	e 47.2	—
Edinburgh	98.3	32	—	—	i 24 16	[- 3]	e 50.3	—
Durham	98.4	33	—	—	i 24. 18?	[- 1]	—	53.3
Aberdeen	99.4	31	—	—	e 24 17	[- 7]	52.0	53.2
Uccle	99.6	38	—	—	i 24 25	[0]	e 44.3	—
Strasbourg	100.6	41	i 14 8	+17	24 18	[-12]	e 48.8	51.3
De Bilt	100.7	37	—	—	e 24 33	[+ 3]	e 49.3	53.5
Scoresby Sund	100.8	15	—	—	24 32	[+ 1]	—	—
Florence	100.9	47	8 18	?	—	—	—	—
Stuttgart	101.6	41	e 14 18	+22	e 24 35	[0]	e 50.3	—
Padova	101.9	45	—	—	e 24 40	[+ 4]	—	—
Triest	103.2	46	i 13 39	-24	i 24 41	[- 1]	e 44.3	51.6
Hamburg	103.9	37	e 15 18?	+72	i 24 45	[0]	e 48.3	54.3
Cheb	104.0	41	e 14 32?	+26	e 24 47	[+ 1]	e 50.3	58.3
Bergen	104.3	29	—	—	e 26 0	+ 4	—	—
Graz	104.8	45	—	—	e 24 18?	[-32]	e 46.3	56.6
Prague	105.2	41	—	—	e 24 55	[+ 3]	—	56.3
Copenhagen	106.1	36	18 30	PP	24 57	[+ 2]	43.3	—
College	107.0	334	—	—	e 24 48	[-11]	e 50.6	—
Sofia	108.8	51	e 21 18?	PPP	—	—	—	—
Melbourne	109.6	209	—	—	i 25 4	[- 6]	—	52.7
Upsala	110.0	32	—	—	e 26 10	[+ 5]	e 50.3	60.8
Bucharest	111.2	49	—	—	e 25 16	[0]	56.3	—
Helwan	111.3	66	19 34	PP	25 15	[- 2]	—	71.0
Ksara	116.1	64	i 19 52	PP	25 30	[- 6]	55.3	62.0
Pulkovo	116.3	33	18 58	[+13]	25 30	[- 7]	51.3	58.0
Sebastopol	116.4	51	—	—	e 26 6	[+29]	e 68.3	—
Simferopol	116.9	50	e 18 52	[+ 6]	—	—	—	—
Yalta	116.9	51	e 20 14	PP	—	—	e 64.3	—
Theodosia	117.8	50	—	—	e 25 26	[-16]	e 63.3	—
Moscow	120.0	38	19 0	[+ 7]	25 51	[+ 1]	e 54.8	65.0
Perth, W.A.	123.4	186	34 18?	?	—	—	—	—
Tiflis	124.3	55	e 19 5	[+ 4]	25 59	[- 5]	50.5	75.8
Grozny	125.1	53	e 19 23	[+21]	e 27 47	{ 0}	—	—
Baku	128.1	57	19 11	[+ 3]	—	—	61.3	71.0
Sverdlovsk	132.4	34	19 16	[0]	28 30	{ - 4}	64.3	68.0
Samarkand	141.2	57	20 5	[+33]	—	—	—	—
Tashkent	142.6	53	19 44	[+ 9]	—	—	e 66.4	83.1
Andijan	145.0	53	19 42	[+ 3]	—	—	—	—
Nemuro	145.3	312	19 42	[+ 2]	—	—	—	—
Bombay	145.3	92	i 19 47	[+ 7]	e 29 39	{ -13}	63.3	82.6
Frunse	145.9	49	19 43	[+ 2]	—	—	—	—
Kodalkanal	E. 146.1	108	—	—	e 27 53	[+65]	—	—
Colombo	146.3	117	19 50	[+ 9]	—	—	70.9	77.5
Almata	147.3	46	19 54	[+11]	—	—	—	—
Batavia	Z. 149.2	175	i 19 51	[+ 5]	—	—	—	—
Hakodate	149.2	312	19 26	[-20]	—	—	—	—
Mizusawa	149.9	306	e 19 28	[-19]	20 21	?	—	—
Hukusima	E. 150.9	304	19 53	[+ 4]	—	—	—	—
Agra	151.3	78	e 19 56	[+ 7]	i 30 18	{ - 7}	—	—
Nilgata	151.9	305	20 9	[+19]	—	—	—	—
Tokyo	152.0	300	20 3	[+13]	—	—	—	—
Yokohama	152.1	300	19 18?	[-32]	—	—	—	—
Irkutsk	152.2	7	19 57	[+ 7]	27 31	[+34]	75.3	85.3
Kumagaya	152.2	301	20 3	[+13]	—	—	—	—
Maebasi	152.3	302	20 4	[+13]	—	—	—	—
Oiwake	152.8	302	19 59	[+ 8]	—	—	—	—
Kohu	152.9	300	20 2	[+11]	—	—	—	—

Continued on next page.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Nagano	152.9	303	20 2	[+11]	—	—	—	—
Vladivostok	154.2	320	19 53	[- 1]	—	—	72.5	77.3
Gihu	154.4	300	20 1	[+ 7]	—	—	—	—
Osaka B	155.6	300	19 52	[- 3]	—	—	—	—
Medan	156.4	151	e 20 8	[+12]	—	—	—	—
Sumoto	Z. 156.2	300	19 56	[0]	—	—	—	—
Hukuoka B	160.0	300	e 20 46	[+45]	—	—	—	—
Calcutta	N. 160.2	91	21 20	?	1 30 35	{-37}	e 67.4	90.5
Chiufeng	163.8	343	20 7k	[+ 3]	26 11	[-56]	e 77.1	81.4
Manila	165.5	228	i 20 9k	[+ 3]	—	—	—	—
Zi-ka-wei	Z. 167.4	306	20 10	[+ 3]	25 5	?	—	80.8
Phu-Lien	175.1	142	e 25 47	PP	32 20	{- 9}	47.1	50.4
Hong Kong	175.4	241	21 48	?	—	—	—	—

Additional readings :-

Huancayo i = +3m.43s., +3m.55s., and +6m.7s.
 San Juan ePP = +9m.44s., e = +9m.52s., +10m.7s., ePS = +14m.50s., eSSS = +17m.49s.
 Columbia e = +19m.50s. and +20m.20s., eSS = +23m.18s., eSSS = +24m.54s.
 Little Rock ipPEN = +10m.43s., iEN = +19m.0s., eSSEN = +19m.16s., eSPEN = +19m.22s., eEN = +20m.21s. and +20m.51s.
 Philadelphia epP = +10m.52s., ePP = +12m.44s., ePPP = +14m.38s., i = +20m.32s., i = +20m.56s., eSS = +23m.24s., eSSS = +26m.10s.
 Pennsylvania i = +11m.19s.
 St. Louis iEN = +10m.53s., ipPN = +11m.5s., iN = +11m.17s., eS = +19m.55s., eSSPN = +20m.40s., eN = +21m.15s., eSSN = +22m.51s.
 Florissant iZ = +11m.1s., ipPNZ = +11m.6s., eN = +19m.22s., eNZ = +19m.26s., iN = +19m.37s., iSSN = +19m.58s., eSZ = +20m.1s.
 Weston ipNZ = +11m.0s., ipPNZ = +11m.13s., isP?NZ = +11m.23s., i = +11m.53s., iPPN = +13m.37s., eSSN = +23m.51s.
 Oak Ridge ipPZ = +11m.23s., iSZ = +19m.58s.
 Williamstown ipP = +11m.25s., i? = +11m.54s.
 Buffalo ipP = +11m.31s., e = +13m.38s., eSP = +20m.38s.
 Chicago e = +20m.4s., ePS = +20m.59s.
 Toronto SSS = +27m.18s.
 Tucson e = +20m.36s., +21m.5s., and +21m.35s., eSS = +24m.54s.
 East Machias ePP = +13m.23s., ePS = +20m.45s., e = +26m.36s.
 Ottawa PSE = +20m.52s., eE = +28m.18s.
 Pasadena iEN = +21m.38s.
 Santa Barbara eE = +21m.37s.
 Cape Town iPPN = +15m.16s., iPPPN = +16m.44s., iPS = +21m.56s., iSSE = +26m.16s., iSSN = +26m.20s., iSSSE = +29m.46s., iSSSN = +30m.6s.
 Lick eN = +22m.21s., eE = +22m.25s.
 Berkeley ePE = +12m.11s., iSKSE = +22m.6s.
 Butte e = +12m.43s. and +13m.40s.
 Victoria PP = +16m.10s.
 Ivigtut +23m.19s., +23m.58s., SS = +29m.6s.
 Toledo IP = +13m.17s., PS = +24m.15s.
 Christchurch ipPZ? = +13m.58s., eSKS = +23m.12s., iEN = +24m.29s., iSSE = +25m.48s., GN = +33m.48s.
 Wellington SKS = +23m.59s., PS? = +25m.13s., i = +27m.32s., eLq? = +36.3m.
 Algiers PS = +24m.18s.
 Honolulu S = +28m.1s.
 Kew iSPEZ = +26m.30s.
 Stonyhurst i = +26m.30s. and +37m.27s.
 Sitka e = +26m.38s.
 Edinburgh i = +24m.48s. and +26m.41s.
 Aberdeen e = +24m.47s., +26m.57s., and +32m.7s.
 Uccle iSKKSE = +24m.59s.
 Strasbourg ePPZ = +17m.42s., iPPS = +27m.7s.
 Scoresby Sund +27m.5s., SS = +31m.24s.
 Stuttgart ePP = +18m.28s., ePS = +27m.18s.
 Trieste i = +25m.14s., +25m.50s., +27m.31s., +36m.59s., and +33m.0s.
 Hamburg eE = +33m.18s.
 Prague e = +26m.18s., +27m.48s., and +33m.24s.
 Copenhagen SN = +26m.18s., PSEZ = +27m.57s., SSN = +33m.18s.
 College eKKS = +25m.54s., e = +43m.48s.
 Melbourne i = +26m.48s., +28m.18s., and +34m.15s.
 Upsala eN = +26m.42s.
 Bucharest e = +25m.26s., +25m.44s., eE = +26m.10s.
 Belwan SKKS = +26m.18s., PS = +29m.0s., PPS = +30m.0s.

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Ksara ipPP = +20m.8s., PPP = +22m.28s.† PS = +29m.38s., SPP = +30m.28s.,
 SS = +35m.34s.†
 Pulkovo PP = +19m.55s., eS = +27m.37s., PS = +29m.32s., PPS = +30m.57s.,
 SS = +35m.54s.
 Yalta e = +20m.53s., e = +22m.16s.
 Theodosia e = +27m.27s.
 Moscow eP = +15m.40s., PP = +20m.25s., PPP = +22m.55s., eSS = +36m.6s.,
 SSS = +43m.12s.
 Tiflis ePPN = +20m.45s., eN = +21m.3s., PPPZ = +36m.6s., SSN = +37m.15s.
 Baku PP = +21m.36s., PKS = +22m.29s., PS = +31m.39s., SSS = +44m.42s.
 Sverdlovsk iPP = +21m.51s., iPS = +31m.42s., iPPS = +33m.34s., iSS =
 +39m.18s., iSSS = +44m.6s.
 Tashkent ePP = +23m.4s., ePPP = +26m.14s., ePS = +33m.10s., PPS =
 +36m.6s., SS = +41m.24s.
 Bombay i = +20m.3s., iE = +29m.51s., eEN = +33m.34s., eSSE = +41m.27s.
 Kodalkanal eE = +38m.4s.
 Colombo PP = +29m.53s.
 Vladivostok e = +20m.13s., PKS = +23m.30s.
 Osaka B PP = +23m.54s.
 Agra iE = +20m.26s., ePP = +23m.26s., SSE = +42m.33s.
 Irkutsk PP = +23m.41s., SKKS = +30m.19s., SKSP = +34m.18s.† SS =
 +42m.42s.
 Medan i = +20m.36s.
 Sumoto ePE = +19m.58s., ePN = +19m.59s., iNZ = +20m.26s., iE = +20m.30s.,
 eE = +23m.57s.
 Calcutta eN = +36m.34s. and +42m.33s.
 Chufeng PKPN = +20m.12s., iNZ = +20m.35s., PPNZ = +24m.44s., PPPZ =
 +28m.29s., SKKSZ = +31m.20s., P_oPPKSZ = +32m.56s., iN = +33m.23s.,
 SKSPN = +35m.21s., iN = +38m.43s., SSN = +45m.14s.
 Manila iPE = +19m.13s., iZ = +21m.5s., iEN = +24m.67s.
 Zhi-ka-wei iZ = +21m.18s., +21m.45s., and +25m.45s.
 Phu-Lien e = +40m.24s.
 Hong Kong † = +29m.51s., PS† = +32m.49s., SS† = +37m.7s.
 Long waves were also recorded at Riverview, Sydney, Budapest, and Hyderabad.

Mar. 14d. Readings also at 1h. (Adelaide, Melbourne, Riverview, Christchurch, Wellington, and Manila), 2h. (Hong Kong, Andijan, Tashkent, Baku, Tiflis, Sverdlovsk, Pulkovo, Scoresby Sund, Mount Wilson, Pasadena, and Tinemaha), 3h. (Copenhagen), 4h. (Mount Wilson, Pasadena, Tinemaha, La Plata, near Santiago, and San Javier), 7h. (Taikyū and near Mizusawa), 8h. (Alicante), 10h. (near Mizusawa and near San Javier), 11h. (Sumoto, near Hukuoka B and near Mizusawa), 16h. (Laibach), 17h. (Andijan), 21h. (Budapest), 22h. (Bucharest, Sebastopol, Ksara, Tiflis, near Simferopol, Theodosia, and Yalta).

Mar. 15d. 2h. 48m. 39s. Epicentre 36° 5N. 71° 0E.

A = +2623, B = +7619, C = +5922; δ = -1; A = 0;
 D = +946, E = -326; G = +193, H = +560, K = -806.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Andijan	4.4	15	1 10	0	2 0	- 2	—	2.7
Samarkand	4.5	317	1 12	+ 1	2 3	- 2	—	2.5
Tashkent	5.0	347	1 15	- 3	12 10	- 8	12.2	2.4
Tohinkent	5.9	349	e 1 23	- 8	12 30	- 10	12.1	—
France	7.0	23	e 1 43	- 3	—	—	—	3.5
Aimata	8.2	33	e 2 2	- 1	e 3 52	+ 14	—	—

Additional readings:—

France e = +2m.34s. and +2m.50s.
 Aimata e = +5m.26s.

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Mar. 15d. 5h. 55m. 26s. Epicentre 6°08. 103°8E.

A = -2372, B = +9659, C = -1038; $\delta = 0$; $h = +7$;
D = +971, E = +239; G = +025, H = -101, K = -995.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Batavia	3.0	93	i 0 48	- 2	i 1 24'	- 3	—	—
Medan	10.8	332	e 2 53	+14	—	—	—	—
Manila	26.6	40	5 46	+ 4	10 50	+34	—	—
Phu-Lien	26.8	5	—	—	e 10 54	+35	14.3	—
Colombo	27.1	297	—	—	10 31?	+ 7	—	16.1
Perth	28.2	157	4 34?	?	—	—	—	—
Hong Kong	29.9	19	6 13	+ 1	11 4	- 5	—	19.2
Kodaikanal	E. 30.8	302	6 34	+14	11 27	+ 4	13.8	—
Bombay	39.3	309	e 7 34	+ 2	13 29	- 5	—	—
Zi-ka-wei	Z. 40.6	23	e 7 42	- 1	—	—	—	24.8
Agra	E. 41.3	324	e 8 6	+17	14 27	+23	—	—
Kumamoto	46.3	31	8 29	0	—	—	—	—
Chiufeng	47.2	12	8 35a	- 1	15 26	- 3	—	28.0
Melbourne	49.0	136	—	—	i 15 44	-11	25.3	30.1
Wakayama	49.8	34	8 28	-28	—	—	—	—
Kameyama	51.0	35	9 4	- 2	—	—	—	—
Kohu	52.7	36	9 18	0	—	—	—	—
Wazima	53.1	33	9 20	- 1	—	—	—	—
Oiwake	53.2	35	9 21	- 1	—	—	—	—
Nagano	53.3	34	9 22	- 1	—	—	—	—
Almata	54.7	337	e 9 41	+ 8	—	—	—	—
Andijan	54.7	330	9 32	- 1	17 14	+ 1	—	—
Vladivostok	55.1	26	e 9 35	- 1	e 17 11	- 7	30.2	37.3
Samarkand	56.7	326	e 9 46	- 2	e 17 34	- 6	—	—
Tashkent	56.7	330	e 9 39	- 9	i 17 36	- 4	e 27.4	40.1
Tchinkent	57.3	331	e 9 50	- 2	—	—	—	—
Irkutsk	58.0	0	e 9 55	- 2	e 17 58	- 1	e 29.6	38.6
Baku	67.6	318	e 11 27	+26	e 20 2	+ 5	e 33.6	37.3
Grozny	71.7	319	e 11 14	-12	e 20 32	-13	—	—
Tiflis	71.7	317	11 25	- 1	20 45	0	43.7	—
Sverdlovsk	71.8	337	11 23	- 3	i 20 41	- 5	32.6	39.0
Ksara	75.3	306	i 11 50	+ 3	e 21 38	+12	—	43.6
Sotchi	75.8	317	e 11 51	+ 1	—	—	—	—
Theodosia	79.3	317	e 12 12	+ 3	—	—	—	—
Yalta	79.9	316	e 12 22	+10	—	—	—	—
Simferopol	80.1	317	e 12 13	0	e 22 34	+16	—	—
Sebastopol	80.4	316	e 12 22	+7	—	—	—	—
Moscow	81.9	328	12 24	- 1	22 34	- 2	47.1	56.2
Pulkovo	86.9	331	12 46	- 2	23 22	- 4	50.6	55.8
Tinemaha	Z. 131.5	45	e 19 14	[- 1]	—	—	—	—
Mount Wilson	Z. 132.2	48	i 19 14	[- 2]	—	—	—	—
Pasadena	Z. 132.2	48	e 19 9	[- 7]	—	—	—	—
Florissant	Z. 144.9	19	e 19 36	[- 5]	—	—	—	—

Additional readings: —

Bombay ePP = +9m.8s.

Chiufeng ePPNZ = +10m.33s., i = +19m.40s.

Tiflis eZ = +11m.47s., eZ = +14m.9s.

Ksara ePP = +14m.46s.

Sebastopol e = +15m.25s.

Pulkovo PP = +16m.24s.

Tinemaha eZ = +22m.34s.

Pasadena iZ = +19m.16s., eZ = +22m.51s.

Mount Wilson eZ = +22m.36s.

Florissant eN = +19m.39s.

Long waves were also recorded at Philadelphia, Hyderabad, Copenhagen, Scoresby Sund, Wellington, and La Paz.

Mar. 15d. Readings also at 2h. (Grozny), 5h. (Ksara, Haiwee, Mount Wilson, and Tinemaha), 8h. (Padova, Grosny, Tiflis, and near Erevan), 9h. (near Tiflis), 12h. (Almata and Reykjavik), 16h. (Tucson), 17h. (Husan, Taikyū, near Heizyo, Keizyo, Zinsen, and near Wellington), 18h. (Frunse, Tchinkent, Almata, near Tiflis, Andijan, Samarkand, and Tashkent).

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Mar. 16d. 15h. 45m. 38s. Epicentre 18°-0N. 120°-0E.

Felt in the North of Luzon and feebly at Manila. See "Seismological Bulletin for 1937, January-December," "Weather Bureau, Manila, 1938."

A = -4758, B = +8242, C = +3071; $\delta = 0$; $h = +5$;
D = +866, E = +500; G = -154, H = +266, K = -952.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Manila	3.5	165	i 1 2a	+ 5	1 45	+ 5	—	—
Kosyun	4.0	10	1 6	+ 2	1 51	- 1	—	—
Takao	4.6	4	1 17	+ 5	2 3	- 4	2.6	—
Tainan	5.0	3	1 24	+ 6	—	—	—	—
Arisan	5.5	8	1 29	+ 4	2 31	+ 1	2.9	—
Karenko	6.1	13	1 36	+ 2	2 39	- 6	—	—
Taityu	6.2	6	1 38	+ 3	2 52	+ 4	—	—
Giran	6.9	12	1 48	+ 3	3 2	- 3	—	—
Hong Kong	6.9	309	1 51	+ 6	3 6	+ 1	3.5	4.4
Taihoku	7.1	10	1 53	+ 5	—	—	—	—
Isigakizima	7.4	30	1 51	- 1	—	—	—	—
Naha	10.8	40	2 32	- 7	—	—	—	—
Phu-Lien	13.0	285	3 12	+ 3	5 48	+ 13	6.4	—
Zi-ka-wei	N. 13.2	5	3 12	+ 1	—	—	—	—
Kagosima	16.5	33	3 54	0	—	—	—	—
Tomie	18.6	27	3 54	- 2	7 5	+ 5	—	—
Nagasaki	17.2	29	4 2k	- 1	7 12	- 2	—	—
Miyazaki	17.3	35	4 1k	- 3	7 14	- 2	8.9	—
Unzendake	17.3	30	3 31	- 33	—	—	—	—
Kumamoto	17.6	31	4 8	0	—	—	—	—
Palau	17.7	125	4 9	- 1	7 23	- 3	—	—
Hukuoka	18.1	30	e 3 53	- 21	e 7 21	- 14	—	—
Hukuoka B	18.1	30	i 4 15k	+ 1	7 40	+ 5	e 9.8	—
Husan	18.8	23	4 25	+ 2	e 5 49	?	—	—
Taikyu	19.4	22	4 31	+ 1	7 53	- 11	—	—
Matuyama	19.5	34	4 29	- 2	—	—	—	—
Koti	19.7	36	4 30	- 4	8 10	0	—	—
Zinsen	N. 20.3	14	i 4 38k	- 2	e 8 27	+ 4	—	—
Keizyo	20.4	16	i 4 41k	0	e 8 23	- 2	—	—
Tokusima	20.6	36	4 45	+ 2	—	—	—	—
Siomisaki	20.9	41	4 44	- 2	8 35	0	—	—
Sumoto	21.0	37	i 4 44k	- 3	8 37	0	—	—
Wakayama	21.1	37	4 46	- 2	8 39	0	—	—
Kobe	21.4	37	4 50	- 1	8 43	- 2	—	—
Osaka	21.5	37	4 54	+ 2	9 28	SS	10.7	—
Osaka B	21.5	37	4 51	- 1	8 31	- 16	9.8	—
Toyooka	21.9	35	e 4 55k	- 2	e 8 56	+ 2	—	—
Kyoto	22.0	37	4 57	- 1	—	—	—	—
Chiufeng	22.2	352	1 5 3k	+ 3	i 9 6	+ 6	11.5	—
Tu	22.2	38	4 57	- 3	9 2	+ 2	—	—
Kameyama	22.3	38	5 0k	- 1	9 7	+ 5	—	—
Titizima	22.4	62	6 58	?	—	—	—	—
Hikone	22.4	37	5 6	+ 4	—	—	—	—
Nagoya	22.8	39	(5 6)	+ 1	5 6	P	—	—
Gihu	22.9	39	5 0k	- 6	9 5	- 8	—	—
Hamamatu	22.9	42	5 9	+ 3	—	—	—	—
Numadu	23.9	42	5 13	- 3	—	—	—	—
Husiki	24.0	35	5 33	+ 16	—	—	—	—
Toyama	24.0	35	5 17	0	10 2	+ 30	—	—
Misima	24.0	42	5 19	+ 2	—	—	—	—
Hunatu	24.1	41	5 4	- 14	—	—	—	—
Kohu	24.1	41	5 17	- 1	9 55	+ 21	—	—
Mera	24.4	43	6 18	PPP	—	—	—	—
Wazima	24.4	34	5 15	- 6	—	—	—	—
Nagano	24.6	38	5 23	0	9 59	+ 17	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Oiwake	24.6	39	5 24	+ 1	9 22	- 20	—	—
Tokyo	24.8	41	5 41	+16	10 15	+29	—	—
Kumagaya	24.9	39	5 27	+ 1	10 3	+16	—	—
Maebasi	24.9	39	5 23	- 3	10 21	+34	—	—
Medan	25.3	238	15 33	+ 3	—	—	—	—
Tukubasan	25.4	41	4 29	-62	—	—	—	—
Kakioka	25.5	41	5 15	-17	—	—	—	—
Hukusima	26.6	40	5 14	-28	—	—	—	—
Vladivostok	27.0	20	15 13	-32	—	—	—	—
Sendai	27.2	39	6 37	PP	11 24	+59	—	—
Batavia	27.3	210	15 50	+ 2	10 24	- 3	—	—
Mizusawa	27.9	37	(5 55)	+ 1	5 55	P	—	—
Calcutta	N. 30.0	284	e 5 43	-29	11 2	- 8	14.7	—
Irkutsk	36.4	344	7 9	+ 1	12 49	- 1	19.4	—
Hyderabad	39.5	276	7 53	+19	14 16	+39	19.6	27.1
Agra	E. 39.7	291	17 34	- 2	14 7	+27	—	26.5
C Colombo	40.6	259	7 46	+ 3	14 21	+27	20.4	25.7
Kodakanal	41.9	266	17 56	+ 2	14 39	+26	21.0	22.9
Almata	44.1	315	8 17	+ 5	—	—	—	—
Bombay	E. 44.7	279	18 22	+ 6	—	—	22.4	31.0
Semipalatinsk	45.2	326	8 22	+ 2	—	—	—	—
Frunse	45.6	313	8 12	-12	e 18 12	SS	26.4	—
Andjian	46.6	309	8 36	+ 4	—	—	—	—
Tashkent	49.0	309	18 51	+ 1	115 56	+ 1	e 25.8	30.5
Tchikent	49.0	311	8 53	+ 3	—	—	—	—
Samarkand	50.4	306	e 11 4	PP	—	—	—	—
Sverdlovsk	58.5	327	19 58	- 2	117 58	- 5	27.9	36.7
Melbourne	60.3	157	—	—	118 17	- 9	—	—
Baku	63.5	307	110 38	+ 4	119 14	+ 7	33.4	43.9
Grozny	66.6	310	10 58	+ 4	e 19 43	+ 3	e 38.4	—
Tifis	67.3	308	111 1a	+ 2	119 56	+ 2	35.4	43.4
Erevan	67.7	307	e 11 6	+ 5	—	—	—	—
Platigorsk	68.4	311	e 11 8	+ 2	e 20 8	+ 1	e 39.4	—
Sotchi	70.9	311	e 11 22	+ 1	—	—	—	—
Moscow	71.1	324	11 21	- 1	20 32	- 6	34.9	44.2
Theodosia	73.7	313	11 39	+ 1	21 8	0	46.4	—
Pulkovo	74.5	329	11 41	- 1	21 10	- 7	42.4	46.4
Simferopol	74.6	313	11 45	+ 2	e 21 19	+ 1	—	—
Yalta	74.7	312	11 44	+ 1	e 21 17	- 2	e 44.9	—
College	74.8	26	e 19 52	?	e 20 52	-28	e 35.9	—
Sebastopol	75.1	313	e 11 48	+ 2	—	—	47.4	—
Ksara	75.4	300	e 11 50	+ 3	e 21 32	+ 5	—	—
Helwan	80.1	298	12 15	+ 2	22 18	0	—	55.6
Bucharest	80.3	315	e 12 21	+ 7	e 22 22	+ 2	—	—
Upsala	80.7	330	e 12 16	0	122 17	- 7	e 42.4	51.0
Belgrade	84.1	315	112 35k	+ 1	e 22 50	- 8	e 53.2	—
Copenhagen	84.8	327	12 38	+ 1	23 2	- 3	44.4	—
Vienna	85.5	319	e 12 42	+ 1	—	—	—	—
Prague	86.0	322	12 43k	0	e 23 5	-12	—	58.4
Zagreb	86.7	317	e 12 48	+ 1	e 23 8	-16	—	—
Scoresby Sund	87.9	348	13 6	+13	23 32	- 3	62.4	—
Triest	88.2	318	112 53a	- 1	123 33	- 5	—	—
Stuttgart	89.6	322	e 13 3	+ 2	e 23 50	- 1	e 48.4	56.6
Chur	90.3	320	e 11 32	?	—	—	—	—
Strasbourg	90.5	322	—	—	e 24 1	+ 2	47.4	—
Zurich	90.5	321	e 13 5	0	—	—	—	—
Basle	91.1	321	e 13 8a	0	—	—	—	—
Neuchatel	91.8	321	e 13 11	0	—	—	—	—
Tinemaha	Z. 102.5	44	e 18 16	PP	—	—	—	—
Mount Wilson	Z. 104.2	47	e 17 10	?	—	—	—	—
Pasadena	Z. 104.2	47	e 17 8	?	—	—	—	—
Riverside	Z. 104.8	47	e 18 24	PP	—	—	—	—
Huancayo	164.0	70	e 20 10	[+ 6]	—	—	e 75.6	—
La Paz	172.1	80	120 20k	[+10]	—	—	80.4	95.7

For Notes see next page.

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NOTES TO MARCH 16d. 15h. 45m. 38s.

Additional readings:—

Kosyun PP = +1m.14s., i = +1m.36s.
 Isigakizima PP = +2m.9s.
 Osaka PPP = +5m.29s.
 Osaka B PP = +5m.13s., PPP = +6m.17s.
 Chiufeng pPNZ = +5m.23s., iPPe = +5m.26s., isSZ = +9m.42s.
 Nagoya +5m.55s.
 Tokyo PP = +6m.11s., PPP = +6m.29s.
 Tukubasan PPP = +5m.25s., S₀S = +16m.24s.
 Kakloka PP = +5m.47s., PPP = +6m.15s.
 Hukushima PP = +5m.45s.
 Vladivostok PP = +5m.56s., SS = +39m.46s.
 Mizusawa eP = +4m.33s.
 Agra ePP = +9m.18s., SSS = +17m.30s.
 Kodaikanal PPE = +9m.37s., PPPE = +9m.59s.
 Almata e = +10m.20s.
 Bombay iE = +9m.4s., iPPe = +10m.11s.
 Samarkand e = +18m.22s.
 Melbourne i = +16m.9s., +18m.41s., and +20m.0s.
 Tiflis eZ = +11m.17s., PPPZ = +15m.11s., PSN = +20m.13s., eSSN = +24m.21s., eN = +25m.25s., eSSSN = +27m.55s.
 Theodosia e = +14m.35s.
 Pulkovo L_a = +38.4m.
 Simferopol e = +14m.35s.
 Yalta e = +14m.35s.
 Sebastopol e = +15m.2s.
 Helwan pP = +12m.40s., PP = +15m.34s., sS = +23m.7s.
 Vienna P = 13m.19s., e = +13m.30s., and +14m.29s., eS = +14m.39s.
 Scoresby Sund = +29m.28s.
 Stuttgart eP₀PZ = +13m.16s.
 Mount Wilson eZ = +18m.9s.
 Huancayo ePKP = +21m.1s., eSKP = +23m.37s., ePP = +24m.43s.
 La Paz iPPZ = +25m.27s.
 Long waves were also recorded at Uccle, De Bilt, Kew, Cheb, Cape Town, Edinburgh, Perth, W.A., and Paris.

Mar. 16d. 22h. 31m. 9s. Epicentre 2° 2N. 126° 9E.

A = -0600, B = +7991, C = +0382; δ = +2; h = +7;
 D = +800, E = +600; G = -023, H = +031, K = -999.

	Δ Az.		P.		O-C.		S.		O-C.		L.	M.
	°	'	m.	s.	m.	s.	m.	s.	m.	s.		
Palau	9.0	58	2	16	+ 3		3	50	- 8			
Manila	13.6	335	i 3	26 _a	+ 9		6	3	+13			
Kosyun	20.6	344	4	46	+ 3		8	30	+ 1			
Taito	21.2	345	4	53	+ 4		8	51	+10			
Batavia	21.7	248	4	53	- 2		8	53	+ 2			
Arisan	22.0	345	—	—	—		8	54	- 2			+
Isigakizima	22.1	354	4	57	- 2		—	—	—			—
Hong Kong	22.5	329	5	13	+ 1		9	22	- 1	11.4		—
Medan	E. 28.2	274	i 5	57	+ 1		—	—	—			—
Oiwake	35.6	16	7	0	- 1		—	—	—			—
Nagano	35.8	15	7	0	- 3		—	—	—			—
Hukushima	37.5	17	7	13	- 4		11	51	-76			—
Chiufeng	38.9	347	e 7	27	- 2		13	12	-16			—
Calcutta	N. 42.5	301	e 9	2	+63		14	21	- 1			—
Melbourne	43.2	159	—	—	—		i 14	3	-29	23.4		—
Agra	E. 52.9	303	i 9	16	- 4		116	37	-11			—
Irkutsk	53.3	343	e 9	17	- 6		116	45	- 9	e 26.9		—
Bombay	55.4	291	9	36	- 2		117	12	-10			—
Almata	60.3	321	10	12	- 1		18	21	- 5			—
Fruse	61.6	318	e 10	37	+15		—	—	—			—
Semipalatinsk	62.1	329	e 10	27	+ 2		—	—	—			—
Andijan	62.3	316	10	22	+ 4		18	45	- 7			—
Tashkent	64.4	315	10	38	- 4		i 19	8	-10	e 32.7		35.4
Tchinkent	64.8	317	e 10	51	+ 9		e 19	13	-10			—
Samarkand	65.7	313	e 10	51	+ 3		e 19	24	-10			—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sverdlovsk	75.3	329	11 40	- 7	i 21 7	-19	35.9	—
Baku	78.7	311	e 12 2	- 4	i 21 56	- 7	39.9	—
Grozny	82.0	313	e 12 29	+ 6	i 22 28	- 9	—	—
Tifis	82.6	311	e 12 25	- 1	i 22 29	-14	e 45.9	—
Erevan	82.8	310	e 12 31	+ 4	e 22 32	-13	—	—
Moscow	87.8	326	e 12 44	- 8	23 0	[-18]	—	—
Theodosia	89.5	315	—	—	e 23 13	[-17]	—	—
Ksara	89.6	304	e 13 18	+17	31 2	SS	—	—
Simferopol	90.4	315	—	—	e 23 19	[-16]	—	—
Yalta	90.4	314	—	—	i 23 17	[-18]	—	—
Sebastopol	90.9	315	—	—	e 23 21	[-17]	—	—
Pulkovo	91.4	330	—	—	e 23 18	[-23]	53.8	—
Helwan	93.7	300	—	—	i 23 33	[-21]	—	—

Additional readings:—

Batavia iPZ = +4m.58s.

Medan iN = +6m.5s.

Oiwake e = +9m.31s.

Chiufeng iEN = +7m.47s., iN = +8m.5s., i = +17m.21s.

Melbourne i = +17m.21s. and +19m.41s.

Andijan e = +10m.44s.

Tifis eP_cPZ = +13m.7s.

Ksara epP = +13m.34s., PS = +25m.36s.

Pulkovo e = +33m.1s.

Mar. 16d. Readings also at 1h. (Sverdlovsk, Branner, Lick, San Francisco, and near Berkeley), 2h. (Melbourne, near Hastings, and Wellington), 3h. (Batavia), 7h. (near Apia, near Samarkand, and near San Javier (2)), 10h. (Frunse and near Andijan), 12h. (La Paz, near Andijan, near Kobe, and Sumoto), 14h. (Tucson), 15h. (Christchurch, Simferopol, and near La Paz), 16h. (near Sotchi), 20h. (Almata), 22h. (Balboa Heights and near Mizusawa (3)).

Mar. 17d. 13h. 59m. 51s. Epicentre 9°-0N. 83°-4W. (as on 1937 Mar. 9d.).

A = +1135, B = -9813, C = +1554; $\delta = -2$; $h = +7$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	3.8	89	e 1 6	+ 5	i 2 9	—	—	—
Merida	N. 13.3	334	2 47	-26	e 5 23	S _g -19	2.8	—
San Juan	19.2	59	i 4 33	+ 5	e 8 24	+25	—	—
Huancayo	22.4	158	e 4 59	- 3	9 11	+ 7	9.2	—
Columbia	25.0	5	e 5 25	- 2	e 9 45	- 4	—	—
Little Rock	26.9	344	e 5 53	+ 8	—	—	12.2	—
La Paz	29.5	147	e 6 15	+ 7	—	—	11.5	18.8
St. Louis	30.2	350	e 6 44	+30	e 11 45	+32	e 13.7	—
Philadelphia	31.7	13	e 6 30	+ 3	i 11 43	+ 6	e 15.6	—
Chicago	33.0	354	e 7 42	PP	e 12 0	+ 3	—	—
Madison	34.4	353	—	—	e 12 23	+ 4	—	—
Ottawa	36.9	9	e 7 15	+ 3	e 13 1	+ 3	—	24.2
East Machias	38.3	19	e 9 12	PPP	e 13 17	- 2	e 19.4	—
La Jolla	N. 39.2	313	e 7 26	- 5	—	—	—	—
Seven Falls	39.5	14	e 9 9?	PP	i 13 48	+11	e 20.1	—
Riverside	Z. 39.9	314	i 7 32	- 5	—	—	—	—
Mount Wilson	Z. 40.5	314	e 7 40	- 2	—	—	—	—
Pasadena	E. 40.6	314	e 7 40	- 3	i 13 54	0	e 19.1	—
Tinemaha	42.1	317	e 7 52	- 3	—	—	—	—
Butte	44.6	331	e 9 9?	+53	—	—	—	—
Berkeley	45.3	316	—	—	15 9?	+ 7	—	—
Rio de Janeiro	E. 50.5	128	i 16 27	S	(1 16 27)	+11	e 27.3	—
Victoria	51.6	328	e 9 9?	-1	e 16 33	+ 2	e 25.2	—
College	71.2	336	e 10 10	?	e 19 18	?	—	—
Scoresby Sund	72.2	18	—	—	20 48	- 3	30.2	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o.		m. s.	s.	m. s.	s.	m.	m.
Copenhagen	85.9	34	—	—	22 21	-55	48.2	—
Triest	88.6	44	e 18 35	PP	i 23 51	+ 9	—	—
Pulkovo	93.8	28	e 17 4	PP	e 23 54	[- 11]	47.2	54.8
Moscow	98.6	29	—	—	e 23 39	[-41]	e 45.7	—
Helwan	106.4	55	—	—	e 24 59	[+ 3]	—	—
Sverdlovsk	108.0	19	—	—	e 25 5	[+ 1]	56.2	—
Ksara	108.4	50	e 16 40	?	e 19 2	PP	—	66.2
Tiflis	110.8	39	e 19 13	PP	e 28 48	PS	e 57.7	—
Baku	114.7	37	e 19 40	[+58]	e 29 27	?	e 42.2	—
Irkutsk	118.6	354	e 19 9?	[+19]	e 25 9?	[-36]	e 66.2	—
Tashkent	124.0	24	e 20 49	PP	e 26 5	[+ 2]	e 59.8	77.0
Chiufeng	128.0	340	e 21 13	PP	—	—	—	82.3
Calcutta	N. 147.6	13	e 19 15	[-28]	—	—	—	—

Additional readings :—

San Juan e = +4m.48s., +6m.24s., and +6m.37s.
 Huancayo e = +5m.44s., +6m.35s., and +7m.58s.
 Little Rock eEN = +9m.3s.
 St. Louis eEN = +12m.59s. and +13m.21s.
 Philadelphia e = +7m.17s., iPP = +7m.30s., eSS = +13m.59s., e = +15m.17s.
 Ottawa e = +8m.45s., eE = +16m.9s.
 East Machias e = +13m.29s.
 Pulkovo e = +5m.55s., e = +25m.50s.
 Moscow e = +38s., e = +5m.59s., e = +7m.45s., e = +8m.9s.
 Helwan e = +28m.9s.
 Ksara ePS = +28m.43s.? ePPS = +29m.48s.?
 Irkutsk e = +29m.9s.? e = +61m.9s.?
 Tashkent e = +21m.21s., e = +27m.45s., e = +30m.45s., e = +32m.15s.; e = +37m.33s., e = +39m.19s., e = +40m.45s.
 Chiufeng eN = +22m.28s., eZ = +22m.36s., ePPN = +26m.18s., eN = +28m.13s.
 Long waves were also recorded at Uccle, De Bilt, Strasbourg, Paris, Stuttgart, Bozeman, Ukiah, Sitka, Ivigtut, Kew, Vladivostok, and Cheb.

Mar. 17d. Readings also at 1h. (near La Paz), 8h. (near Samarkand), 9h. (Andijan, Semipalatinsk, Tashkent, Baku, Tiflis, Sverdlovsk, Pulkovo, Triest, Irkutsk, and Chiufeng), 11h. (Malabar and near Manila), 12h. (Samarkand, near Frunse, and near Kobe), 13h. (Calcutta), 15h. (Calcutta), 16h. (La Plata), 18h. (Tiflis), 20h. (near Mizusawa), 21h. (Samarkand, Tashkent, Semipalatinsk, Sverdlovsk, near Almata, and Frunse).

Mar. 18d. Readings at 2h. (Scoresby Sund), 6h. (Sverdlovsk, Irkutsk, and Tashkent), 7h. (Mizusawa and near La Paz), 8h. (Baku, Irkutsk, and Vladivostok), 9h. (Tiflis, Sverdlovsk, and Moscow), 10h. (Malabar), 15h. (Andijan (2) and near Samarkand), 18h. (Frunse and near Andijan), 19h. (near La Paz), 21h. (Florence).

Mar. 19d. 18h. 11m. 48s. Epicentre 29° 5S. 71° 5W.

Damage to buildings at Vallenar and Serena. Intensity VI. Felt at Santiago, Coquienko, Ovalle, Copiapo. See Buletin de Servicio Sismologico de la Univ. de Chile, Observaciones de 1937. Santiago de Chile. P. 75.

A = +.2766, B = -.8267, C = -.4899; δ = -.6; h = +.2;
 D = -.948, E = -.317; G = -.155, H = +.465, K = -.871.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o.		m. s.	s.	m. s.	s.	m.	m.
Santiago	4.0	169	0 54	-10	1 40	-12	—	—
San Javier	6.1	182	1 22	-12	2 38	-7	—	—
Montezuma	7.2	19	e 2 20	P _r	—	—	i 4.0	—
La Plata	12.7	119	2 56	-9	5 13	-15	6.2	—
La Paz	13.3	14	i 3 23 _a	+10	i 5 53'	+11	i 7.2	10.3
Huancayo	17.8	347	i 4 19	+ 8	i 7 48	+20	—	—
Rio de Janeiro	26.2	82	i 5 54	+16	i 10 2	-7	i 13.2	—
San Juan	47.9	7	e 8.44	+ 2	e 15 37	-2	e 25.8	—
Little Rock	66.9	342	e 10 57	+ 1	e 19 39	-10	—	—
St. Louis	70.0	345	i 11 17	+ 2	e 20 26	0	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Florissant	70.2	345	e 11 17	0	e 20 28	0	—	—
Weston	71.5	1	i 11 26	+ 2	e 21 14	+ 31	36.3	—
Oak Ridge	71.7	1	i 11 27	+ 1	—	—	e 38.2	—
Tucson	71.9	326	e 11 28	+ 1	e 20 48	0	e 34.7	—
Williamstown	71.9	0	i 11 28	+ 1	—	—	—	—
Toronto	73.2	355	11 35	0	20 56	- 6	36.2	—
Cape Town	74.2	120	—	—	i 21 6	- 8	e 33.3	—
Ottawa	74.6	358	11 42	- 1	21 20	+ 2	e 34.2	—
La Jolla	76.3	322	i 11 51	- 1	—	—	—	—
Seven Falls	76.3	2	—	—	21 30	- 7	36.2	—
Riverside	76.6	322	i 11 53	- 1	—	—	—	—
Mount Wilson	77.1	323	i 11 58	+ 1	—	—	—	—
Pasadena	77.2	323	i 11 57	0	—	—	—	—
Santa Barbara	78.2	321	i 12 9	+ 6	—	—	—	—
Haiwee	78.6	324	i 12 6	+ 1	—	—	—	—
Tinemaha	79.4	324	i 12 10	+ 1	—	—	—	—
Christchurch	86.6	221	i 12 55	+ 9	i 22 58	+ 33	39.5	—
Paris	102.0	41	e 18 12?	FP	—	—	52.2	—
Uccle	104.1	39	—	—	e 25 8	[+ 22]	44.2	59.2
De Bilt	105.2	38	e 27 36	PS	—	—	e 54.2	57.2
Stuttgart	105.9	43	e 18 54	PP	—	—	e 52.2	63.2
Triest	107.4	47	e 29 1	PPS	—	—	—	65.3
Copenhagen	110.6	37	e 19 30	PP	28 48	PS	48.2	—
Helwan	114.8	68	—	—	e 26 57	{+ 19}	—	70.9
Ksara	119.2	66	e 18 53?	[+ 2]	e 36 37	SS	—	—
Pulkovo	120.9	35	e 19 2	[+ 8]	26 4	[+ 11]	56.2	71.0
Moscow	124.4	40	19 2	[+ 1]	—	—	63.7	70.7
Tiflis	127.9	58	e 18 41	[- 27]	—	—	e 61.2	77.9
Grozny	128.8	58	e 10 13	[+ 3]	—	—	—	—
Baku	131.5	60	19 16	[+ 1]	28 40	{+ 11}	e 62.2	78.4
Sverdlovsk	136.9	36	19 24	[0]	—	—	56.2	80.3
Samarkand	144.6	62	e 19 37	[- 1]	—	—	—	—
Bombay	145.9	100	i 19 43	[+ 3]	—	—	—	—
Tashkent	146.2	58	19 40	[- 1]	35 42	PPS	e 61.2	77.2
Andijan	148.6	60	e 19 47	[+ 2]	—	—	—	—
Frunse	149.8	54	e 20 8	[+ 21]	—	—	—	—
Sempalatinsk	150.2	36	e 19 46	[- 2]	—	—	—	—
Vladivostok	156.9	311	e 19 54	[- 2]	—	—	—	—
Irkutsk	157.0	7	e 19 58	[+ 1]	27 38	[+ 36]	e 81.2	—
Calcutta	N. 160.6	106	e 20 23	[+ 22]	—	—	—	—
Mantla	161.2	220	20 2	[0]	—	—	—	—
Chiufeng	167.7	331	i 20 7	[0]	i 32 13	{+ 22}	—	89.6

Additional readings: —

La Paz ISN = +5m.59s.
 Huancayo I = +4m.34s., +6m.40s., and +7m.44s.
 San Juan ePP = +11m.6s., eSS = +19m.16s., eSSS = +20m.26s.
 Little Rock eE = +11m.46s.
 St. Louis iPPEN = +11m.30s., iEN = +11m.44s., eSE = +20m.29s., esSN = +20m.50s.
 Florissant eE = +11m.22s.
 Weston iEN = +12m.19s., ePPN = +14m.38s.
 Tucson eSS = +25m.48s.
 Ottawa SSN = +26m.12s., e = +30m.12s.?
 Pasadena iZ = +12m.12s.
 Christchurch SS = +28m.22s., GN = +35m.35s.
 Uccle eE = +27m.45s.
 Stuttgart ePS = +28m.17s., ePPS = +29m.19s., eSS = +33m.32s.
 Helwan e = +40m.2s.
 Ksara iPP = +20m.12s., ePS = +30m.7s., PPS = +31m.19s.
 Pulkovo PP = +20m.22s., PS = +30m.12s., SS = +37m.0s.
 Mantla iEN = +24m.35s.
 Chiufeng iNZ = +25m.3s., iZ = +31m.28s.
 Moscow PP = +20m.43s., e = +24m.53s., PPS = +32m.9s.
 Tiflis PPZ = +21m.1s., ePKSE = +22m.27s., eSKSPE = +31m.25s., ePSE = +31m.45s., SSE = +38m.30s.

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Baku PKS = +22m.48s., SS = +40m.12s.
 Sverdlovsk i = +19m.35s., iPP = +22m.8s.
 Bombay i = +20m.4s., iEN = +23m.24s., e = +41m.52s.
 Tashkent PP = +22m.52s., PKS = +23m.24s., SS = +41m.36s.
 Vladivostok e = +20m.28s.
 Irkutsk eSKSP = +34m.18s., eSSS = +49m.54s.

Long waves were also recorded at East Machias, Ivigtut, Scoresby Sund, Hong Kong, and other European stations.

Mar. 19d. 19h. 24m. 40s. Epicentre 39°-9N. 75°-7E.

Given by Central Asia Stations U.S.S.R.

A = +1900, B = +7454, C = +6389; $\delta = -9$; $h = -2$;
 D = +969, E = -247; G = +158, H = +619, K = -769.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Andijan	2.7	288	0 44	- 1	1 25	S _s	1.6
Frunse	3.1	344	e 0 59	P _r	1 51	S _s	2.2
Almata	3.5	15	1 5	P*	2 2	S _s	2.2
Tashkent	5.1	288	e 1 34	P*	i 2 44	S _s	4.0
Tchikent	5.2	299	e 1 37	P*	e 2 25	+ 3	—
Samarkand	6.7	271	e 1 41	- 1	e 2 46	-14	—

Additional readings: —

Andijan P_s = +48s., PP = +53s., e = +57s.

Frunse PP = +1m.14s.

Almata P_s = +1m.13s.

Tchikent e = +2m.56s.

Long waves were also recorded at Semipalatinsk.

Mar. 19d. Readings also at 1h. (Fresno), 2h. (Perth), 5h. (Mizusawa, near Santiago (2), and San Javier (2)), 9h. (Mount Wilson, Pasadena, Tinemaha, and Riverside), 10h. (near Santiago and San Javier), 13h. (Granada, Tiflis, Tashkent, Sverdlovsk, Baku, Hong Kong, and Manila), 14h. (Mizusawa), 16h. (Tacubaya (2)), 19h. (Vladivostok and Tashkent), 20h. (Santiago).

Mar. 20d. Readings at 1h. (Sverdlovsk, Grozny, Tashkent, and Manila), 4h. (Sverdlovsk and Tashkent), 7h. (near Sumoto), 14h. (Almeria and Medan), 15h. (San Juan, Santiago, and Scoresby Sund), 17h. (Oak Ridge and near Balboa Heights), 18h. (Oak Ridge and near Williamstown), 20h. (Almata, Frunse, and near Andijan), 21h. (Malabar), 23h. (near San Javier).

Mar. 21d. 7h. 34m. 19s. Epicentre 42°-0N. 78°-0E.

A = +1550, B = +7291, C = +6666; $\delta = -3$; $h = -2$;
 D = +978, E = -208; G = +139, H = +652; K = -745.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata	1.5	329	0 28	0	0 57	+ 8	—	1.1
Frunse	2.7	289	0 42	- 3	1 26	S*	—	1.7
Andijan	4.4	255	e 1 12	+ 2	2 5	+ 3	—	2.6
Tchikent	6.3	276	e 1 56	P*	3 18	S*	—	3.6
Tashkent	6.5	267	e 1 52	P*	i 3 24	S _s	—	4.3
Semipalatinsk	8.5	10	e 2 40	+33	e 4 28	S*	+	—
Samarkand	8.7	258	e 2 6	- 4	4 9	+19	—	5.0
Sverdlovsk	18.6	329	e 4 27	+ 6	e 7 51	+ 5	i 10.0	11.4
Baku	21.2	276	—	—	e 9 27	SSS	e 12.2	—
Ksara	34.0	270	e 5 10	?	—	—	—	—

Additional readings: —

Almata P_s = +31s.

Frunse e = +45s., iP* = +46s., P_s = +49s., iPP = +54s., i = +1m.1s., i =

+1m.10s., iSS = +1m.28s.

Andijan i = +1m.16s., P_s = +1m.27s., iPP = +1m.35s., i = +1m.40s., +1m.52s.,

and +2m.16s., S_s = +2m.20s.

Tchikent ePP = +2m.17s.

Samarkand e = +3m.21s., eSS = +4m.41s.

Ksara e = +2m.50s.

Long waves were also recorded at Pulkovo, Moscow, Vladivostok, Tiflis, and

Copenhagen.

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Mar. 21d. 16h. 12m. 2s. Epicentre 25° 5N. 94° 0E.

Felt Force VI at Jalpaiguri, Shillong, Dibrugarh, Gauhati, Dhubri; Force V at Salona. See "India Weather Review, 1937," "Meteorological Department Annual Summary, Part D., Seismic Records," pp. D.47.

A = -0630, B = +9015, C = +4281; $\delta = -6$; $h = +3$;
D = +998, E = +070; G = -030, H = +427, K = -904.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N. 6.0	241	1 33	+ 1	2 39	- 4	3.1	—
Phu-Lien	12.5	110	2 51	-11	e 5 18	- 5	—	6.9
Agra	14.4	280	i 3 15	-12	i 5 53	-16	6.7	—
Dehra Dun	14.9	292	3 28	- 6	5 48	-32	7.6	—
Hyderabad	16.5	244	4 3	+ 9	7 21	+23	9.1	10.0
Hong Kong	18.7	96	4 8	-14	7 37	-11	—	10.4
Bombay	20.7	256	e 4 43	- 1	i 8 33	+ 2.	10.1	—
Kodaikanal	E. 21.8	231	i 4 54	- 2	i 9 2	+10	—	—
Medan	22.3	169	i 4 54	- 8	i 8 54	- 8	12.9	—
Almata	22.6	327	e 5 1	- 2	e 9 33	+26	—	—
Colombo	22.9	219	5 3	- 3	9 13	0	—	16.9
Chiufeng	23.5	46	5 2 _a	-10	9 11	-12	—	—
Frunse	23.5	323	e 5 10	- 2	e 9 16	- 7	—	—
Andijan	23.6	316	e 5 3	-10	e 8 19	-66	—	—
Taiyu	z. 24.3	88	9 19	S	(9 19)	-18	—	—
Zi-ka-wel	24.8	70	e 5 30	+ 5	9 52	+ 6	—	15.8
Taito	24.9	91	5 33	+ 7	—	—	—	—
Tashkent	25.9	315	i 5 42	+ 7	i 9 44	-20	i 14.5	15.3
Tchinkent	26.1	317	e 5 28	- 9	e 10 23	+16	—	—
Manila	27.5	109	5 58	+ 8	11 49	SS	16.0	—
Irkutsk	27.9	14	e 5 45	- 9	10 43	+ 6	15.3	—
Hukuoka B	32.6	68	e 6 40	+ 5	—	—	—	—
Batavia	N. 33.9	157	e 6 54	+ 7	—	—	—	—
Vladivostok	35.5	52	e 7 23	+23	—	—	—	19.6
Nagoya	38.1	65	e 7 26	+ 4	—	—	—	—
Nagano	39.2	63	7 40	+ 9	—	—	—	—
Oiwake	39.4	64	7 40	+ 7	—	—	—	—
Sverdlovsk	39.4	333	i 7 26	- 7	i 13 25	-10	19.0	22.0
Baku	39.5	304	7 44	+10	e 13 36	- 1	e 22.0	—
Yokohama	40.3	65	11 27	?	—	—	—	—
Hatidoyzima	40.4	67	10 40	?	—	—	—	—
Mera	40.4	66	11 12	?	—	—	—	—
Utunomiya	40.5	63	11 26	?	—	—	—	—
Grozny	43.0	308	e 8 16	+13	e 14 23	- 6	—	—
Erevan	43.5	303	e 8 28	+21	e 14 56	+20	—	—
Tifis	43.5	305	e 8 2	- 5	14 30	- 6	23.4	—
Moscow	50.5	324	8 55	- 7	15 59	-17	25.5	31.8
Theodosia	50.5	309	e 8 53	- 9	—	—	—	—
Ksara	50.6	294	i 8 57	- 5	e 16 15	- 2	—	—
Simferopol	51.4	309	e 9 15	+ 6	16 21	- 7	—	—
Yalta	51.4	308	e 9 14	+ 5	i 16 20	- 8	—	—
Sebastopol	51.8	309	—	—	e 16 49	+16	—	—
Helwan	55.1	290	—	—	e 17.10	- 8	—	—
Pulkovo	55.1	327	9 33	- 3	17 7	-11	26.0	34.2
Copenhagen	64.7	323	10 47	+ 5	19 13	- 9	36.0	—
Jena	66.0	317	e 10 58	+ 8	—	—	—	—
Bergen	67.6	329	—	—	e 28 58?	?	—	—
Stuttgart	68.0	316	e 11 5	+ 2	e 19 51	-11	e 38.0	—
Zurich	68.7	314	e 11 9	+ 2	—	—	—	—
Strasbourg	68.9	316	e 11 16	+ 7	e 20 25	+12	e 35.4	39.5
De Bilt	69.6	320	—	—	e 20 31	+10	e 35.0	39.4
Uccle	70.5	319	—	—	e 26 41	+ 9	e 36.0	—
Paris	72.2	316	—	—	e 20 58?	+ 7	41.0	—
Oxford	73.5	321	—	—	21 17	+11	e 39.5	44.7
Scoresby Sund	74.3	343	—	—	21 32	+17	—	—

For Notes see next page.

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NOTES TO MARCH 21d. 16h. 12m. 2s.

Additional readings :-

Phu-Lien SS? = +6m.33s.
 Hong Kong SS = +7m.58s.
 Bombay ipP = +4m.51s., PPPN = +5m.12s., isS = +8m.48s., P_cPN = +8m.53s.,
 SS = +9m.4s.
 Almata e = +6m.5s.
 Chiufeng i = +5m.14s., ipP = +5m.19s., iS = +9m.14s., isS = +9m.43s.
 Batavia PEN = +7m.12s.
 Vladivostok +11m.24s.
 Sverdlovsk iP = +7m.39s., iS = +13m.39s.
 Tifis iZ = +8m.14s., ePPZ = +10m.3s., eSSE = +17m.30s.
 Ksara ipP = +9m.12s., esP = +9m.22s., e = +11m.14s., esS = +16m.43s.,
 eSS = +20m.23s.
 Copenhagen +19m.36s. and +23m.40s.
 Stuttgart ePS = +20m.6s., eSSEN = +24m.28s.
 Long waves were also recorded at Taihoku, Kosyun, Arisan, Zinsen, Cheb,
 Prague, Stonyhurst, Edinburgh, and Kew.

Mar. 21d. 18h. 8m. 12s. Epicentre 1°·0N. 123°·3E.

A = -5489, B = +8357, C = +0173 ; δ = -2 ; h = +7 ;
 D = +836, E = +549 ; G = -009, H = +014, K = -1.000.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	12.8	60	3 10	+ 4	6 33	S*	—	—
Manila	13.7	351	i 3 34 ^a	+16	6 17	+25	—	—
Batavia	17.9	246	5 9	+57	—	—	—	—
Kosyun	21.0	354	4 50	+ 3	8 43	+ 6	—	—
Taito	21.7	355	5 0	+ 5	—	—	—	—
Arisan	22.5	354	5 6	+ 4	—	—	—	—
Karenko	22.9	357	5 7	+ 1	—	—	—	—
Hong Kong	23.0	338	5 9	+ 2	—	—	10.3	11.6
Isigakizima	23.2	3	4 58	-11	—	—	—	—
Kumamoto	32.4	12	6 1	-33	—	—	—	—
Matuyama	33.9	14	6 47	0	—	—	—	—
Sumoto	34.9	18	6 53 ^a	- 2	—	—	—	—
Wakayama	34.9	18	6 55 ^a	0	—	—	—	—
Kobe	35.3	18	6 57	- 2	—	—	—	—
Osaka B	35.4	18	6 57	- 3	—	—	—	—
Kameyama	35.9	19	6 3	-61	—	—	—	—
Toyooka	36.0	16	7 3	- 2	—	—	—	—
Hikone	36.2	18	7 9	+ 3	—	—	—	—
Nagoya	36.3	20	e 7 6	- 1	—	—	—	—
Gihu	36.5	20	7 7	- 2	—	—	—	—
Hunatu	37.2	22	6 58	-17	—	—	—	—
Toyama	37.8	19	7 20	0	—	—	—	—
Oiwake	37.9	20	7 20	0	—	—	—	—
Nagano	38.1	19	7 21	- 1	—	—	—	—
Wazima	38.3	17	7 22	- 2	—	—	—	—
Chiufeng	39.4	351	7 32 ^a	- 1	—	—	—	—
Calcutta	N. 40.2	305	e 8 41	+61	i 13 42	- 6	—	—
Vladivostok	42.6	10	e 12 12	?	—	—	—	—
Agra	E. 50.6	305	e 9 1	- 1	—	—	—	—
Bombay	52.6	293	e 9 48?	+30	e 16 35	- 9	—	—
Almata	58.6	323	10 3	+ 2	—	—	—	—
Erunse	60.2	321	e 10 9	- 3	—	—	—	—
Andijan	60.7	317	e 10 7	- 8	e 18 25	- 7	—	—
Tashkent	63.0	317	i 10 27	- 4	18 44	-17	—	37.1
Tchinkent	63.2	318	e 10 28	- 4	—	—	—	—
Sverdlovsk	74.5	329	i 11 37	- 5	20 56	-21	33.8	—
Baku	78.7	311	—	—	e 21 29	-12	e 32.8	—
Grozny	80.3	314	e 12 14	0	e 22 3	-17	—	—
Tifis	80.8	312	e 12 14	- 3	e 22 8	-17	—	—
Moscow	86.8	326	e 12 42	- 5	—	—	—	25.5
Ksara	87.3	303	i 12 48	- 2	e 23 29	0	—	—
Pulkovo	90.7	330	e 12 58	- 8	e 23 35	[- 2]	23.8	—

For Notes see next page.

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NOTES TO MARCH 21d. 18h. 8m. 12s.

Additional readings:—

Manila iN = +7m.48s.
 Batavia eSN? = +16m.27s.
 Hong Kong ? = +6m.9s.
 Wakayama PP = +7m.57s.
 Osaka B PPP = +8m.27s.
 Oiwake e = +8m.25s.
 Chiufeng iZ = +8m.13s., iNZ = +8m.34s. and +9m.11s.
 Bombay iEN = +17m.48s.
 Almata e = +10m.55s.
 Moscow e = +13m.48s., ePP = +16m.13s.
 Tiflis eZ = +16m.30s., eE = +23m.21s. -
 Ksara ePP = +16m.11s.

Mar. 21d. 19h. 29m. 23s. Epicentre 40°-2N. 142°-2E.

Felt very strongly at Hatinohe, Morioka, Mizusawa, Miyako, moderately at Onahama, Hakodate, Aomori, Sendai, and Tanabu. Radius greater than 300kms. See "Seismological Bulletin of the Central Meteorological Observatory, Japan," for the year 1937, Japan, Tokyo, 1937, pp. 31-33 Macroseismic Chart, p. 33.

A = -.6052, B = +.4694, C = +.6429; $\delta = -8$; $h = -2$;
 D = +.613, E = +.790; G = -.508, H = +.394, K = -.766.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Hatinohe	0.6	303	0 14k	- 1	0 23	- 3	—	—
Morioka	0.9	238	0 21k	+ 1	0 36	+ 2	—	—
Aomori	1.2	300	0 24k	0	0 41	+ 0	—	—
Mizusawa	1.3	218	1 0 27	+ 2	0 45	+ 1	—	—
Akita	1.7	253	0 30	- 1	0 55	+ 1	—	—
Hakodate	1.9	325	0. 23k	-11	0 50	- 9	—	—
Iainomaki	1.9	201	0 34	0	0 59	0	—	—
Urakawa	2.0	13	0 41	+ 6	1 9	+ 7	—	—
Sendai	2.2	208	0 38k	0	1 8	+ 2	—	—
Muroran	2.3	337	0 39a	- 1	1 4	- 5	—	—
Yamagata	2.4	216	0 42a	+ 1	1 13	+ 1	—	—
Hukusima	2.8	209	0 47a	0	1 23	+ 1	—	—
Obihiro	2.8	15	0 59a	P _r	1 53	+31	—	—
Sapporo	2.9	348	0 49k	+ 1	1 20	- 4	—	—
Niigata	3.3	227	1 1	P*	1 51	S _r	—	—
Asahigawa	3.6	2	0 59	+ 1	1 39	- 3	—	—
Mito	4.0	201	1 3k	- 1	1 56	+ 4	—	—
Nemuro	4.0	38	0 57a	- 7	1 39	-13	—	—
Utunomiya	4.1	207	1 4k	- 1	2 9	+14	—	—
Haboro	4.2	355	0 51	-16	1 49	- 8	—	—
Kakioka	4.3	203	1 5	- 3	2 7	+ 7	—	—
Tukubasan	4.3	204	1 5	- 3	1 56	+ 4	—	—
Maebasi	4.6	214	1 11a	0	2 2	- 3	—	—
Kumagaya	4.6	210	1 12k	0	2 12	+ 5	—	—
Tyosai	4.6	194	1 9	- 3	2 12	+ 5	—	—
Nagano	4.7	223	1 17	+ 3	2 19	+ 9	—	—
Oiwake	4.8	218	1 17a	+ 2	2 19	+ 7	—	—
Tokyo	4.9	205	1 14	- 3	2 22	+ 7	—	—
Wazima	5.0	238	1 19a	+ 1	2 26	+ 8	—	—
Yokohama	5.2	204	1 18	- 3	2 22	0	—	—
Huski	5.3	231	1 25	+ 3	2 33	+ 8	—	—
Katsuura	5.3	198	1 23	+ 1	2 26	+ 7	—	—
Toyama	5.3	230	1 23	+ 1	2 32	+ 7	—	—
Hunafu	5.4	211	1 23	- 1	2 31	+ 3	—	—
Kohu	5.4	213	1 24	0	2 26	- 2	—	—
Mera	5.6	201	1 27	0	2 46	+13	—	—
Takayama	5.6	225	1 33	+ 6	3 19	+ 1	—	—
Kanazawa	5.7	231	1 23a	- 5	2 39	+ 1	—	—
Misima	5.7	209	1 28	+ 1	—	—	—	—
Numafu	5.7	208	1 32	+ 4	2 50	S*	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Iida	5-8	218	1 32	+ 3	2 42	+ 4	—	—
Ito	5-8	207	1 32	+ 3	2 32	- 6	—	—
Gihu	6-4	222	1 38	0	3 1	+ 8	—	—
Omaesaki	6-4	211	1 39	+ 1	3 13	S*	—	—
Hamamatu	6-5	214	1 40	+ 1	2 40	-15	—	—
Nagoya	6-5	221	1 40	+ 1	3 2	+ 7	—	3-6
Ibukisan	6-7	226	1 45	+ 3	3 8	+ 8	—	—
Hikone	6-8	226	1 48k	+ 4	3 12	+ 9	—	—
Kamayama	7-0	222	1 50	+ 4	3 15	+ 7	—	—
Tu	7-2	221	1 53	+ 4	3 22	+ 9	—	—
Kyoto	7-3	225	1 51	+ 1	3 22	+ 7	—	—
Toyoooka	7-5	234	1 51	- 2	3 24	+ 4	—	4-5
Yagi	7-6	224	1 55	0	3 25	+ 2	—	—
Osaka	7-7	224	1 58	+ 2	3 52	S*	—	—
Osaka B	7-7	224	1 56	0	3 26	+ 1	—	—
Kobe	7-8	228	e 1 58	0	3 33	+ 5	—	5-4
Wakayama	8-2	225	1 56	- 7	3 52	+14	—	—
Sumoto	8-3	227	2 4a	0	3 35	- 5	4-4	4-8
Vladivostok	8-3	294	1 53	-11	1 3 37	- 3	4-2	4-6
Sakai	8-5	239	2 9	+ 2	—	—	—	—
Siomitsaki	8-5	220	2 11	+ 4	—	—	—	—
Tokusima	8-6	227	2 13	+ 4	4 50	S*	—	—
Koti	9-6	229	2 19	- 2	4 17	+ 5	—	—
Matuyama	9-9	233	2 26a	+ 1	5 18	S*	—	—
Simidu	10-5	228	2 33	- 2	4 44	+ 9	—	—
Ooita	11-0	234	2 43	+ 1	—	—	—	—
Hukuoka B	11-5	239	e 2 49	+ 1	e 5 10	+11	—	—
Husan	11-6	248	i 2 49?	- 1	—	—	e 8-0	—
Taikyu	11-7	252	2 50	- 1	—	—	—	—
Kumamoto	11-8	235	2 50k	- 3	5 57	S*	—	—
Miyazaki	12-0	230	3 4a	+ 9	5 9	- 2	—	—
Keiyo	12-2	262	e 2 58	0	e 5 24	+ 8	e 6-8	—
Nagasaki	12-4	237	2 43	-18	5 40	+19	—	—
Zinsen	12-4	263	—	—	(15 24)	+ 3	15-4	—
Kagosima	12-8	231	3 11	+ 5	—	—	—	—
Titizima	13-1	180	5 24	S	(5 24)	-14	—	—
Tomie	13-2	239	3 9	- 2	—	—	—	—
Zi-ka-wei	Z. 19-1	249	e 4 42	+15	8 42	SSS	—	12-6
Chufeng	19-9	280	i 4 29a	- 7	8 8	- 7	9-8	11-8
Kosyun	25-7	233	5 23	-10	—	—	—	—
Irkutsk	28-5	308	5 53	- 6	e 10 40	- 6	15-6	17-9
Manila	31-6	222	6 21	- 5	11 37	+ 2	—	—
Almata	47-7	297	8 34	- 6	—	—	—	—
Calcutta	N. 48-5	266	e 8 48	+ 2	1 15 41	- 7	—	—
Frunse	49-4	297	8 48	- 5	e 16 18	+18	—	—
Sverdlovsk	53-2	318	i 9 14	- 8	16 43	- 9	33-3	34-4
Tashkent	53-7	297	e 9 14	-12	e 16 46	-13	—	33-7
Agra	E. 53-9	277	e 9 20	- 7	i 16 50	-12	—	—
Bombay	62-5	273	e 10 21	- 7	e 18 44	-10	—	—
Moscow	65-1	323	i 10 38	- 7	19 18	- 9	29-1	41-4
Pulkovo	65-8	330	10 40	- 9	19 24	-11	36-6	41-8
Baku	67-0	305	e 10 52	- 5	—	—	34-6	42-7
Grozny	67-9	309	e 10 59	- 3	e 20 18	+17	—	—
Piatigorsk	69-0	311	e 10 56	-13	—	—	—	—
Tiflis	69-4	308	11 5a	- 7	e 20 6	-12	e 34-0	45-4
Tinemaha	Z. 73-5	57	e 11 31	- 5	—	—	—	—
Halwee	E. 74-2	57	e 11 37	- 3	—	—	—	—
Pasadena	Z. 75-3	59	e 11 47	0	—	—	—	—
Copenhagen	75-4	334	11 40	- 7	21 43	+16	36-6	—
Mount Wilson	Z. 75-4	59	e 11 48	+ 1	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Riverside	z. 76.0	79	e 11 45	- 6	—	—	—	—
Ksara	79.8	306	e 12 6a	- 6	e 22 24	+10	—	—
Cheb	79.9	330	—	—	e 21 37?	-39	—	—
De Bilt	80.8	336	—	—	e 22 43	+18	e 38.6	47.9
Stuttgart	82.2	331	e 12 17	- 7	e 22 51	+12	e 44.6	—
Uccle	82.2	336	—	—	e 22 58	+19	e 39.6	—
Strasbourg	82.8	332	e 12 19	- 8	e 23 7	PS	e 45.6	—
Paris	84.5	335	e 11 29	?	—	—	47.6	53.6
Florissant	87.8	40	e 12 50	- 2	e 22 48	[-31]	—	—
St. Louis	88.0	40	—	—	e 23 23	[+ 3]	—	—
Seven Falls	88.2	22	—	—	e 23 11	[-11]	e 46.6	—
Ottawa	88.3	26	—	—	e 23 21	[- 2]	e 43.6	—

Additional readings :-

Toyooka SZ = +3m.28s.
 Kobe SN = +3m.36s., SE = +3m.38s.
 Sumoto eSNZ = +3m.39s.
 Zinsen IN = +5m.45s.
 Chiufeng iPPeZ = +4m.46s.
 Irkutsk e = +6m.8s., +10m.25s., +12m.37s., and +14m.35s.
 Almata e = +9m.58s.
 Sverdlovsk L_q = +26.2m.
 Agra PSE = +17m.20s., eSSE = +20m.30s., eSSSE = +22m.10s.
 Baku ePS = +20m.26s., SS = +24m.43s.
 Tifis eZ = +11m.20s., ePSE = +20m.26s.
 Copenhagen +11m.54s.
 Ksara PS = +23m.10s.
 Stuttgart eP_cPZ = +12m.28s.
 Florissant eZ = +13m.3s., IE = +23m.27s., eE = +23m.47s., eE = +49m.13s.
 St. Louis eE = +23m.55s.
 Long waves were also recorded at Hong Kong, Scoresby Sund, Prague, Kew, and Budapest.

March 21d. Readings also at 3h. (Almata, Andijan, Frunse, Samarkand, Grozny, Bozeman, Tucson, Mount Wilson, La Jolla, Pasadena, Riverside, Tinemaha, Oaxaca, Tacubaya, and near Balboa Heights), 9h. (new Plymouth), 11h. (near Branner, Fresno, and Lick), 13h. (Almeria, near Granada, and Malaga), 15h. (near Nagoya), 16h. (Simferopol and Yalta), 17h. (Kodakanal and Florissant), 19h. (Andijan), 20h. (New Plymouth and near Medan).

Mar. 22d. 8h. 37m. 5s. (I) } Epicentre 27° 0N. 131° 0E.
 9h. 58m. 42s. (II) }

A = - .5853, B = + .6734, C = + .4516; $\delta = -1$; $h = +3$;
 D = + .755, E = + .656; G = - .296, H = + .341, K = - .892.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.
I Hukuoka B	6.6	356	e 1 40	- 1	e 2 58	0	—
II	6.6	356	1 34	- 7	2 43	-15	—
I Sumoto	8.0	24	2 4	+ 4	4 5	S*	4.2
II	8.0	24	1 59	- 1	3 37	+ 4	4.3
II Husan	8.3	348	—	—	e 3 9	-31	—
I Kobe	8.5	24	e 2 3	- 4	e 4 0	+15	—
II	8.5	24	e 2 5	- 2	e 3 51	+ 6	4.4
II Zi-ka-wei	z. 9.3	298	e 2 56	+39	—	—	6.9
I Nagoya	9.6	31	e 2 23	+ 2	e 3 2	-70	—
II	9.6	31	e 2 25	+ 4	—	—	—
II Kelzyo	11.0	343	e 2 40	- 2	e 4 38	- 9	—
II Chiufeng	18.0	320	e 4 16	+ 3	e 7 32	0	12.0

Additional readings :-

Sumoto II eSN = +3m.42s., eSZ = +4m.5s.
 Kobe I ePZ = +2m.6s., II ePN = +2m.13s., eSZ = +3m.57s.
 Chiufeng II I = +4m.27s.
 Long waves were recorded at Hong Kong, Ksara, Scoresby Sund, Ivigtut, and other Russian and European stations.

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Mar. 22d. 13h. 39m. 11s. Epicentre 32°5S. 70°0W.

A = +.2890, B = -.7940, C = -.5347; $\delta = -14$; $h = +1$;
D = -.940, E = -.342; G = -.183, H = +.502, K = -.845.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Santiago	1.1	210	0 22	0	0 33	- 6	—	—
San Javier	3.5	204	0 44	-13	1 11	-29	—	—
La Plata	10.3	106	2 31	- 1	4 23	- 7	5.0	—
La Paz	16.0	6	13 50	+ 2	16 55	+ 9	8.2	10.8

Mar. 22d. 16h. Epicentre off the coast of China.

Hukuoka B eP = 59m.59s., S = 60m.26s.
Sumoto ePN = 60m.30s., ePE = 60m.38s., ePZ = 60m.44s., eSN = 61m.18s.,
eSE = 61m.24s., eSZ = 61m.44s., M = 61m.46s.
Husan eP = 60m.36s., eS = 61m.30s.
Nagoya eP = 60m.52s., S = 61m.45s.
Kobe eP/E = 61m.9s., eP/Z = 61m.12s., eSN = 61m.42s., M = 61m.50s.
Kelzo ePEN = 62m.6s.
Long waves were also recorded at Sverdlovsk, Tashkent, and Tiflis.

Mar. 22d. Readings also at 2h. (Andijan, Frunse, and Samarkand), 5h. (Medan and near Batavia), 6h. (Manila, Hong Kong, Irkutsk, Baku, Tashkent, Sverdlovsk, and Ksara), 7h. (Pulkovo), 8h. (Vladivostok), 9h. (Nagoya), 11h. (De Bilt (2), Scoresby Sund (3) and Ivigtut (3)), 12h. (San Francisco, near Berkeley, Branner, and near New Plymouth), 13h. (De Bilt, Paris, Ivigtut, and Scoresby Sund), 16h. (Mizusawa), 17h. (near Nagoya), 20h. (near Sumoto and Kobe), 21h. (Tucson), 23h. (Durham).

Mar. 23d. 0h. 44m. 21s. Epicentre 36°5S. 98°5W.

A = -.1191, B = -.7969, C = -.5922; $\delta = -6$; $h = 0$;
D = -.989, E = +.148; G = +.088, H = +.586, K = -.806.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Santiago	23.0	90	5 22	+15	9 37	+23	12.0	—
Huancayo	32.1	46	16 27	- 4	11 40	- 3	e 13.6	—
La Plata	32.8	99	6 33	- 4	—	—	11.5	—
La Paz	33.5	61	16 42 ^a	- 1	1 11 10	-55	14.0	17.8
Rio de Janeiro	E. 49.3	89	e 8 51	- 2	e 15 55	- 4	i 21.6	—
Tacubaya	55.6	359	9 44	+ 4	—	—	—	—
San Juan	62.6	35	e 10 21	- 7	e 18 45	-11	—	—
Wellington	64.9	235	i 10 45	+ 2	e 19 39	+15	e 30.0	32.6
Christchurch	65.3	232	i 10 47 ^a	+ 1	1 19 27	- 2	e 30.3	—
Tucson	69.4	348	e 11 23	+11	e 20 19	+ 1	e 29.7	—
La Jolla	Z. 71.2	343	e 11 24	+ 1	—	—	—	—
Riverside	Z. 72.9	343	i 11 29	0	—	—	—	—
Pasadena	72.6	343	e 11 31	0	i 21 0	+ 4	e 33.0	—
Mount Wilson	72.7	343	e 11 31	- 1	—	—	—	—
Santa Barbara	Z. 73.3	342	e 11 37	+ 2	—	—	—	—
Haiwee	E. 74.5	*343	e 11 46	+ 4	—	—	—	—
St. Louis	75.2	7	i 11 43	- 3	e 21 28	+ 3	—	—
Florissant	75.3	7	e 11 50	+ 3	e 21 18	- 8	e 31.8	40.2
Fresno	N. 75.5	342	e 11 48	0	—	—	—	—
Tinemaha	75.5	343	i 11 47	- 1	—	—	—	—
Lick	N. 76.5	340	e 11 52	- 2	—	—	—	—
Berkeley	77.2	340	i 12 1k	+ 4	e 21 57	+10	—	—
Chicago	78.7	8	—	—	e 21 53	-10	e 32.8	—
Philadelphia	79.1	18	e 12 6	- 2	21 59	- 8	e 33.0	—
Toronto	81.7	13	—	—	i 22 31	- 3	e 34.1	—
Williamstown	82.1	18	i 12 21	- 3	19 34	?	—	50.6
Weston	82.3	20	i 12 24 ^a	- 1	e 22 40	0	37.9	—
Oak Ridge	82.4	20	i 12 22	- 3	—	—	e 39.7	—
Ottawa	84.1	16	—	—	e 23 3	+ 5	e 34.7	—
Melbourne	85.6	224	—	—	i 23 16	+ 3	40.2	44.6

Continued on next page

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m. s.	o.	m. s.	s.	m. s.	s.	m.	m.
East Machias	85.7	21	—	—	e 23 9	- 5	e 36.2	—
Seven Falls	86.9	18	—	—	e 23 39?	+13	e 35.7	—
Victoria	87.4	343	—	—	e 23 21	- 9	e 36.7	—
Cape Town	88.5	132	—	—	(1 23 34)	- 7	i 23.6	—
Adelaide	91.3	222	—	—	e 21 31	?	—	44.5
Sitka	98.3	341 (e21 39)	—	?	—	—	e 21.6	—
San Fernando	112.1	61 e 28 59	—	PP	e 35 4	?	e 56.7	—
Toledo	115.2	58 e 19 45	—	PP	—	—	e 51.1	—
Rathfarnham Castle	119.4	43	—	—	e 30 39	PS	58.7	63.7
Scoresby Sund	119.7	22 30 3	—	PS	—	—	45.7	—
Bidston	121.3	44	—	—	e 41 57	SSS	e 56.7	64.6
Oxford	121.8	46 30 34	—	PS	—	—	—	65.6
Kew	122.3	46 e 30 33	—	PS	e 37 28	SS	e 57.7	61.4
Paris	123.1	51 e 20 39	—	PP	—	—	59.7	—
Uccle	E. 124.9	48 e 30 39	—	PS	e 37 39	SS	e 59.7	—
De Bilt	125.7	47 e 31 1	—	PS	38 12	SSP	e 59.7	62.8
Stuttgart	127.3	52 e 21 15	—	PP	—	—	e 64.7	—
Triest	129.5	57	—	—	e 39 3	SSP	—	68.2
Cheb	129.6	51 e 18 39?	—	[-32]	—	—	—	—
Copenhagen	130.6	44 21 23	—	PP	31 33	PS	63.7	—
Batavia	N. 131.4	215 22 44	—	?	—	—	—	—
Helwan	137.9	84	—	—	e 24 14	PPP	—	76.7
Pulkovo	140.0	37 19 37	—	[+ 6]	28 49	SKKS	67.7	72.0
Ksara	142.9	81 i 19 38	—	[+ 3]	—	—	—	—
Yalta	143.5	62 e 19 29	—	[- 8]	—	—	—	—
Simferopol	143.6	61 e 19 45	—	[+ 8]	—	—	—	—
Theodosia	144.5	61 e 19 45	—	[+ 7]	—	—	—	—
Moscow	144.8	42 e 19 39	—	[+ 1]	e 26 39	PPP	70.2	80.4
Zi-ka-wei	Z. 146.6	273 e 20 12	—	[+ 30]	—	—	—	108.7
Erevan	150.9	71 e 19 55	—	[+ 7]	—	—	—	—
Tiflis	151.2	68 e 19 52	—	[+ 3]	—	—	e 73.7	82.6
Grozny	151.9	64 e 19 58	—	[+ 8]	—	—	—	—
Chiufeng	Z. 152.7	289 e 19 57	—	[+ 6]	—	—	—	—
Baku	155.0	71 e 20 3	—	[+ 9]	e 24 0	PP	68.7	84.9
Irkutsk	157.5	322 e 20 31	—	[+ 34]	—	—	74.7	80.2
Bombay	160.9	154 e 19 26	—	[- 35]	e 24 21	PP	—	—
Calcutta	N. 164.9	205 e 26 59	—	PP	—	—	e 72.4	77.2
Tashkent	169.3	57 e 19 30	—	[- 39]	—	—	—	—
Andijan	171.7	56 e 20 48	—	[+ 88]	—	—	—	—

Additional readings:—

Huancaayo ePP = +7m.20s., ePPP = +7m.33s., iS = +11m.46s.
 Tacubaya PSN = +13m.27s.
 San Juan e = +14m.28s.
 Christchurch GN = +26m.19s.
 Tucson e = +21m.25s.
 St. Louis iN = +12m.15s. and +12m.39s.
 Florissant eN = +11m.57s., iSEN = +21m.30s.
 Lick eE = +11m.59s.
 Berkeley iZ = +15m.13s., eN = +26m.57s.
 Chicago eSP = +22m.26s., e = +24m.53s.
 Philadelphia e = +24m.39s., eSS = +26m.58s., e = +27m.22s., eSSS = +30m.17s.
 Williamstown e = +14m.49s. and +20m.15s.
 Weston iZ = +13m.57s.
 Ottawa e = +27m.39s.
 Melbourne i = +24m.18s., e = +28m.54s.
 Seven Falls e = +29m.39s.?
 Adelaide e = +38m.18s.
 Toledo e = +24m.44s., i = +29m.4s.
 Oxford +37m.26s.
 Kew eSSSEN = +41m.58s.
 Uccle e = +42m.24s.
 Trieste i = +43m.50s.
 Copenhagen +22m.39s. and +24m.57s.
 Batavia PE = +22m.47s.
 Pulkovo PP = +22m.35s., PPP = +25m.36s., PPS = +35m.20s., SS = +41m.33s., SSS = +46m.3s.
 Keara iPP = +22m.45s., PPS = +35m.26s., SSS = +46m.50s.
 Simferopol e = +23m.17s.

Continued on next page.

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Moscow ePP = +22m.45s., e = +30m.5s., e = +32m.5s.
 Tiflis eZ = +19m.59s., ePPZ = +22m.6s., eE = +33m.45s., ePSSN = +41m.56s.,
 eE = +48m.27s.
 Chiufeng PPZ = +23m.44s.
 Baku e = +37m.25s., e = +43m.36s., e = +49m.15s., e = +50m.45s. and
 +55m.45s.
 Irkutsk e = +22m.17s., PKS = +23m.59s., PPP = +30m.31s., e = +39m.11s.
 and +44m.3s.
 Tashkent i = +20m.13s., i = +20m.40s., i = +25m.19s., i = +26m.36s., i =
 +31m.29s., i = +32m.1s., e = +36m.12s., e = +38m.39s., i = +46m.13s.,
 e = +51m.0s.
 Long waves were also recorded at Hamburg, Edinburgh, Butte, Ukiah,
 Granada, Vladivostok, Hong Kong, Stonyhurst, and Strasbourg.

Mar. 23d. 19h. 0m. 45s. Epicentre 1°1N. 29°4W.

A = +.8710, B = -.4908, C = +.0190; δ = -11; h = +7;
 D = -.491, E = -.871; G = +.017, H = -.009, K = -1.000.

	Δ	Az.	P.	P.	O-C.	S.	O-C.	L.	M.
	m.	m.	m.	m.	s.	m.	s.	m.	m.
Rio de Janeiro	e 27.4	208	e 11 25	SS	(e 11 25)	SS			
La Paz	z 42.0	244	7 55	+ 1	14 22	+ 8	22.2	25.3	
Huancayo	47.5	253	e 8 38	0	e 15 31	- 3	e 24.3		
Paris	54.9	26	—	—	e 17 15?	- 1	25.2	29.2	
Oxford	55.8	21	—	—	e 17 31	+ 3	—	30.2	
Oak Ridge	z 55.9	324	i 9 42	0	—	—	—	—	
Philadelphia	56.8	319	e 6 15	?	—	—	—	—	
Strasbourg	57.1	29	e 9 55	+ 5	e 17 45	0	e 23.2	—	
Uccle	57.2	24	—	—	e 17 47	+ 1	e 24.2	—	
Stuttgart	57.9	29	e 9 53	- 3	e 17 54	- 1	e 29.2	—	
De Bilt	58.5	24	—	—	e 18 10	+ 7	e 25.2	30.2	
Copenhagen	64.1	24	—	—	19 15	+ 1	29.2	—	
Ksara	69.0	55	i 11 9	0	e 20 36	+22	—	—	
Yalta	70.6	43	e 11 17	- 2	—	—	—	—	
Simferopol	70.7	42	e 11 32	+12	—	—	—	—	
Pulkovo	74.3	27	e 11 45	+ 4	—	—	36.2	—	
Moscow	76.3	33	e 11 51	- 1	—	—	37.7	—	
Grozny	78.5	46	e 12 16	+12	—	—	—	—	
Baku	81.1	49	—	—	e 22 33	+ 5	e 41.2	—	
Sverdlovsk	89.1	33	—	—	e 23 50	+ 4	39.2	—	

Additional readings :-

Huancayo e = +18m.49s.
 Ksara ePPP = +15m.30s., eSSS = +28m.24s.
 Baku e = +28m.21s. and +35m.21s.

Long waves were also recorded at Malaga, San Juan, San Fernando, Scoresby Sund, Durham, Florissant, Cape Town, Helwan, Cheb, Hamburg, and Irkutsk.

Mar. 23d. Readings also at 1h. (Andijan and near Samarkand), 13h. (Seattle), 14h. (Almata, Frunse, Tchinkent, near Andijan, and Samarkand), 15h. (near Batavia), 16h. (Taikyū), 18h. (near Batavia), 19h. (Balboa Heights), 20h. (Oak Ridge, near San Juan, and near Sumoto), 21h. (Medan and Seattle), 22h. (Upsala).

Mar. 24d. Readings at 0h. (Mizusawa), 1h. (Irkutsk, Tashkent, Sverdlovsk, Moscow, Pulkovo, Ksara, Copenhagen, Uccle, De Bilt, Paris, Scoresby Sund, Ivigtut, East Machias, Columbia, Chicago, Oak Ridge, Weston, Philadelphia, Madison, Florissant, St. Louis, Bozeman, Tucson, Berkeley, Ukiah, Victoria, Sitka, College (2), and San Juan), 2h. (East Machias, Philadelphia, Cheb, Strasbourg, Hong Kong, and Stuttgart), 4h. (College), 6h. (near Kobe and Sumoto (2)), 8h. (Oaxaca, Tacubaya, and near Granada), 9h. (Phu-Lien, Haiwee, La Jolla, Mount Wilson, Butte, College, Philadelphia, and Sitka, Pasadena, Riverside, Tinemaha, and Tucson), 12h. (Santiago (2)), 13h. (Santiago and near Balboa Heights), 14h. (Huancayo, La Paz, Santiago (2), San Juan, Mount Wilson, Pasadena, Tinemaha, Philadelphia, Riverside, East Machias, Rathfarnham Castle, Kew, Scoresby Sund, Uccle, De Bilt, Paris, Copenhagen, Strasbourg, Stuttgart, and Sverdlovsk), 15h. (Baku, Tiflis, and Tashkent), 16h. (Tanarive), 17h. (Frunse, near Andijan, near Christchurch, New Plymouth, and near Wellington), 18h. (Haiwee, Mount Wilson, Pasadena, Riverside, near Hukuoka, Hukuoka B, Kobe, and Sumoto), 19h. (near Andijan), 20h. (Mizusawa, near Nagoya, near Batavia, and near Wellington), 23h. (Baku, Sverdlovsk, and Tashkent),

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Mar. 25d. 16h. 49m. 5s. Epicentre 33°-5N. 116°-6W.

Felt Force VI at Borego, Palm Springs, etc. Macroseismic Area 30,000 sq. miles. (See paper by H. O. Wood, "Terwilliger Valley Earthquake," in Bulletin Seismological Society, America, Vol. 27. No. 4, P. 312).

A = -3741, B = -7472, C = +5493; $\delta = -1$; $h = +1$;
D = -894, E = +448; G = -246, H = -491, K = -836.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o.	o.	m. s.	s.	m. s.	s.	m.	m.
La Jolla	0.8	221	i 0 15k	- 3	0 26?	- 5	—	—
Riverside	0.8	307	i 0 16a	- 2	i 0 27	- 4	—	—
Mount Wilson	E. 1.4	301	e 0 25	- 2	—	—	—	—
Pasadena	1.5	296	i 0 26a	- 2	i 0 50	+ 1	—	—
Haiwee	z. 2.8	337	i 0 46	- 1	—	—	—	—
Santa Barbara	z. 2.8	290	e 0 45	- 2	—	—	—	—
Tinemaha	3.8	343	i 0 59	- 2	—	—	—	—
Tucson	5.0	102	e 1 16	- 4	e 2 10	- 8	—	—
Lick	5.6	316	e 1 28	+ 1	e 2 40	+ 7	—	—
Branner	6.0	313	e 1 35	+ 3	e 3 11	+28	—	—
Berkeley	6.4	315	e 1 37	- 1	e 3 2	+ 9	—	—
San Francisco	6.4	314	e 0 55?	-43	—	—	—	—
Ukiah	7.7	321	—	—	e 3 42	+17	5.5	—
Denver	11.2	53	e 2 58	+14	e 4 50	- 2	e 5.7	6.1
Butte	12.9	13	e 3 2	- 5	e 5 41	+ 8	6.6	—
Bozeman	12.9	17	e 3 0	- 7	e 5 46	SS	6.7	—
Mazatlan	N. 13.6	136	e 3 25?	+ 8	—	—	—	—
Victoria	15.7	343	3 50	+ 6	7 4	SSS	e 7.9	—
Des Moines	19.8	58	i 4 38	+ 3	i 8 32	SS	i 10.3	—
Saskatoon	20.0	18	—	—	e 8 15	- 2	e 9.9	—
Little Rock	20.1	81	e 4 31	- 7	e 8 24	+ 5	e 8.6	10.6
Tacubaya	N. 20.9	128	e 4 52	+ 6	e 8 8?	-27	—	—
Florissant	21.8	69	e 4 52	- 4	e 8 56	+ 4	e 11.0	—
St. Louis	21.9	69	e 4 54	- 3	e 9 3	+ 9	e 10.8	12.8
Madison	23.3	57	i 5 13	+ 3	e 9 29	+ 9	e 12.0	—
Chicago	24.3	61	e 5 19	- 1	e 9 38	+ 1	e 12.3	—
Chicago (Loyola)	24.3	61	i 5 23	+ 3	e 9 51	+14	i 12.8	—
Sitka	26.8	339	e 8 10	?	e 10 35	+16	e 12.0	—
Toronto	30.6	60	—	—	e 12 37	+77	e 15.9	—
Ottawa	33.4	57	—	—	e 12 7	+ 4	e 16.9	—
Williamstown	35.0	63	i 6 57	+ 1	12 36	+ 8	e 17.8	20.9
Vermont	35.1	59	—	—	e 14 42	SS	e 17.9	—
Oak Ridge	36.3	62	i 7 10	+ 3	e 13 1	+13	e 18.9	—
Weston	36.4	62	i 7 12k	+ 4	e 12 57	+ 7	17.9	—
Seven Falls	36.9	54	—	—	e 13 25	+27	19.4	—
East Machias	39.3	59	—	—	e 13 40	+ 6	e 19.9	—
San Juan	47.4	96	e 8 37	- 1	e 15 25	- 7	e 23.4	—
Scoresby Sund	60.4	23	—	—	18 31	+ 3	28.9	—
Oxford	78.0	36	—	—	21 59	+ 4	e 39.9	44.2
De Bilt	80.7	33	—	—	e 22 36	+12	e 38.9	45.4
Copenhagen	81.1	27	—	—	22 31	+ 3	40.9	—
Pulkovo	83.1	17	e 12 32	+ 3	e 22 52	+ 4	41.9	47.7
Toledo	84.0	46	i 12 35	+ 1	—	—	e 41.4	—
Stuttgart	84.9	34	e 12 43	+ 5	e 23 16	+10	e 43.9	—
Cheb	85.3	31	—	—	e 21 55?	?	e 42.9	46.9
Triest	89.3	33	i 14 58	?	—	—	e 39.9	46.5
Sverdlovsk	90.0	2	e 12 4	-59	e 23 54	0	39.9	—
Tiflis	103.2	14	—	—	e 26 55	PS	e 40.3	69.2
Tashkent	105.2	355	—	—	i 25 0	[+ 9]	e 53.6	69.4
Ksara	108.2	24	e 19 5	PP	e 28 35	PS	—	—

Additional readings:—

Tucson e = +1m.22s., +1m.28s., +1m.37s., +2m.34s., and +2m.41s.
Lick iE = +1m.40s., iN = +2m.3s., iN = +2m.9s., iE = +2m.22s., eE = +2m.50s., eE = +2m.56s., eN = +3m.0s.

Branner eE = +2m.1s.

Berkeley iPZ = +1m.40s., eN = +1m.46s., iZ = +2m.7s.

Ukiah e = +4m.1s. and +4m.18s.

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Butte e = +3m.50s.
 Denver eE = +3m.12s., eN = +3m.48s., eSE = +4m.53s., eSSE = +5m.15s.,
 eEN = +5m.33s.
 Florissant 1E = +4m.54s., eSN = +9m.1s., 1E = +9m.10s., eGE = +9m.32s.
 St. Louis 1PP = +5m.17s., eE = +7m.6s., eSSE = +9m.29s., eE = +11m.21s.
 Chicago eSS = +10m.46s., eSSS = +11m.32s.
 Toronto e = +14m.43s.
 Ottawa e = +14m.55s.?
 Weston ePPZ = +8m.39s., ePcSNZ = +13m.30s., eSSN = +15m.11s.
 Seven Falls e = +16m.13s.
 East Machias eS = +14m.6s., eSS = +16m.27s.
 Tashkent 1 = +26m.13s., e = +27m.49s.
 Ksara ePPS = +29m.28s.

Long waves were also recorded at Pennsylvania, Bidston, Paris, Strasbourg, Malaga, Kew, College, Columbia, Honolulu, Hamburg, Göttingen, Edinburgh, Durham, San Fernando, Prague, Ivigtut, Uccle, La Paz, Baku, and Moscow.

Mar. 25d. Readings also at 2h. (La Paz), 4h. (Seattle), 5h. (Tashkent, Tiflis, Baku, and Ksara), 6h. (Andijan and Samarkand), 9h. (Andijan, Frunse, Haiwee, Pasadena, Riverside, and Tinemaha), 12h. (La Paz, Riverside, Tinemaha, Montezuma, Pasadena, near Santiago, and San Javier), 14h. (Tiflis), 20h. (Tananarive and Tucson), 22h. and 23h. (near Santiago).

Mar. 26d. 9h. 48m. 55s. Epicentre 12°4S, 65°3E.

A = +4083, B = +8876, C = -2135; $\delta = +12$; $h = +6$;
 D = +909, E = -418; G = -089, H = -194, K = -977.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Tananarive	18.3	247	14 18	+ 1	e 7 55	+16	18.2	9.8
Colombo	24.0	37	5 12	- 5	9 47	+15	15.2	16.0
Kodaikanal	E. 25.6	27	e 5 35	+ 3	11 5	+ 8	—	15.9
Bombay	32.0	13	e 6 32	+ 2	11 50?	+ 8	15.7	20.5
Hyderabad	32.4	23	—	—	12 8	+20	14.4	18.3
Medan	36.8	65	e 7 9	- 2	—	—	—	—
Agra	41.2	18	e 7 48	0	14 6	+ 4	—	23.9
Batavia	41.4	85	e 7 53	+ 3	e 15 31	?	—	—
Calcutta	N. 41.4	33	e 7 58	+ 8	14 20	+15	20.4	24.6
Perth	50.2	121	15.35?	S	(15 35?)	-36	24.1	24.8
Andijan	53.3	6	e 9 51	+28	—	—	e 29.1	—
Helwan	53.3	322	—	—	e 17 5	+11	—	—
Tashkent	53.6	4	9 25	0.	i 17 3	+ 5	27.1	32.2
Ksara	53.8	329	i 9 32	+ 6	e 17 21	+20.	26.2	30.8
Baku	54.4	346	e 9 48	+17	17 25	+16	26.1	30.0
Frunse	55.7	9	e 9 40	0	—	—	—	—
Almata	56.4	11	e 10 1	+16	—	—	—	—
Tiflis	57.1	342	e 9 45	- 5	e 17 39	- 6	e 27.3	44.2
Grozny	58.3	343	e 10 14	+15	—	—	—	—
Hong Kong	59.0	55	18 6	S	(18 6)	- 4	—	32.8
Yalta	63.3	336	e 10 26	- 7	—	—	—	—
Smferopol	63.7	336	e 10 45	+ 9	—	—	—	—
Sverdlovsk	69.1	358	11 6	- 4	20 17	+ 2	31.1	39.0
Moscow	71.8	344	e 11 28	+ 2	e 20 50	+ 4	33.6	47.6
Irkutak	72.7	24	e 12 9	+37	20 56	- 1	35.1	—
Pulkovo	77.2	343	12 2	+ 5	21 48	+ 1	37.1	44.1
Copenhagen	80.9	333	—	—	22 36	+16	35.1	—

Additional readings:—

Tananarive EN = +7m.49s.
 Bombay PPPN = +7m.37s.
 Agra SSSS = +17m.30s.
 Calcutta SSN = +16m.53s.
 Perth PP = +16m.5s., S = +20m.5s., eS = +20m.25s., SS = +22m.5s.
 Ksara ePcP = +10m.34s., ePS = +17m.51s., eSS = +22m.13s.
 Tiflis eSSSZ = +24m.8s.
 Hong Kong ? = +22m.10s., S? = +24m.27s.
 Irkutak e = +25m.42s.

Long waves were also recorded at Stuttgart, La Paz, Cape Town, De Bilt, Tucson, San Fernando, Phu-Lien, Scoresby Sund, and Rio de Janeiro.

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Mar. 26d. 15h. 11m. 2s. Epicentre 36°·7N. 139°·7E.

(Epicentre quoted from report of Earthquake Institute, Tokyo Imperial University).

A = -·6129, B = +·5198, C = +·5951; $\delta = -2$; $h = 0$.

	Δ	Az.	P.	O-C.	S.	O-C.		
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tukubasan	0·6	146	0 18	+ 3	0 26	0	—	—
Titibu	0·9	215	0 31	+11	0 40	+ 6	—	—
Tokyo	1·0	177	0 20	— 1	0 29	— 7	—	—
Komaba	1·1	181	0 21	— 1	0 30	— 9	—	—
Mitaka	1·1	187	0 21	— 1	0 30	— 9	—	—
Kamakura	1·4	185	0 26	— 1	0 36	— 10	—	—
Koyama	1·5	203	0 31	+ 3	0 45	— 4	—	—
Misaka	1·5	182	0 26	— 2	0 37	— 12	—	—
Kiyosumi	1·6	176	0 31	+ 1	0 46	— 5	—	—
Nagoya	2·7	235	e 0 54	+ 9	1 26	+ 7	—	—

Mar. 26d. 15h. 43m. 7s. Epicentre 7°·5N. 124°·5E.

A = -·5616, B = +·8172, C = +·1297; $\delta = +3$; $h = +7$;
D = +·824, E = +·566; G = -·073, H = +·107, K = -·992.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	7·8	334	2 2	+ 4	3 35	+ 7	—	—
Hong Kong	17·7	326	4 13	+ 3	7 33	+ 7	—	11·8
Phu-Lien	21·8	309	e 4 56	0	e 9 14	+22	—	—
Batavia	22·3	233	5 0	— 1	9 7	+ 5	—	—
Zi-ka-wei	Z. 23·7	353	e 5 13	— 1	9 25	— 2	—	17·0
Medan	26·0	263	e 5 31	— 5	—	—	—	—
Calcutta	N. 37·9	297	—	—	e 10 39	?	—	—
Irkutsk	47·6	343	—	—	e 14 53?	-42	e 23·9	—
Agra	E. 48·1	300	e 8 46	+ 3	e 15 38	— 4	—	—
Tashkent	59·2	314	i 10 5	0	i 18 11	— 1	e 26·6	36·4
Sverdlovsk	69·6	328	11 12	— 1	20 20	— 1	30·9	—
Baku	73·4	309	—	—	e 21 10	+ 5	e 38·9	—
Grozny	76·7	312	e 12 29	+34	—	—	—	—
Tiflis	77·4	311	e 11 58	0	e 21 48	— 1	e 47·9	54·2
Moscow	82·1	325	e 23 26	PS	—	—	—	—
Ksara	84·7	302	i 12 39	+ 2	e 23 9	+ 5	—	—
Simferopol	85·0	314	e 12 39	+ 1	—	—	—	—
Yalta	85·0	313	e 12 39	+ 1	—	—	—	—
Pulkovo	85·7	329	—	—	e 23 44	+30	46·9	54·3

Additional readings :-

Baku e = +31m.42s.

Moscow e = +26m.21s.

Long waves were also recorded at Florissant, Copenhagen, Balboa Heights, and De Bilt.

Mar. 26d. 21h. 9m. 7s. Epicentre 40°·3N. 126°·6W.

A = -·4560, B = -·6140, C = +·6443; $\delta = +5$; $h = -2$;
D = -·803, E = +·596; G = -·384, H = -·517, K = -·765.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ukiah	2·9	114	0 46	— 2	1 31	+ 7	1·7	—
Berkeley	4·1	125	e 1 3	+ 2	i 1 50	— 5	—	—
Branner	4·5	128	e 1 9	— 2	e 1 58	— 7	—	—
Lick	4·8	125	e 1 17	+ 2	i 2 9	— 3	—	—
Fresno	N. 6·4	121	e 1 37	— 1	e 2 51	— 2	—	—
Tinemaha	7·2	113	i 1 53	+ 4	i 3 24	+11	—	—
Haiwee	E. 8·0	119	e 2 2	+ 2	e 3 45	+12	—	—
Santa Barbara	8·0	135	e 2 11	+11	e 3 29	— 4	—	—
Victoria	8·4	14	e 2 5	— 1	—	—	e 3·9	—
Mount Wilson	Z. 9·1	129	i 2 14	0	—	—	—	—

For Notes see next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Pasadena	9-1	131	e 2 16	+ 2	i 3 54	- 6	—	—
Riverside	z. 9-7	127	i 2 21	- 1	i 4 6	- 9	—	—
Butte	11-7	56	e 2 58	+ 7	e 5 11	+ 7	e 7-4	—
Bozeman	12-6	59	e 2 59	- 4	e 5 22	- 4	e 6-5	—
Tucson	15-0	117	e 3 37	+ 2	—	—	e 8-5	—
Sitka	17-7	345	e 4 11	+ 1	—	—	e 7-6	—
Saskatoon	18-1	42	e 3 53?	- 21	—	—	e 7-9	—
Little Rock	27-6	91	e 5 57	+ 6	—	—	e 15-4	—
Madison	27-8	71	e 5 55	+ 2	—	—	—	—
Flouissant	27-9	81	e 5 47	- 7	e 10 31	- 6	—	14-9
St. Louis	28-0	81	e 5 56	+ 1	—	—	—	14-8
Chicago	29-2	74	—	—	e 9 42	- 76	e 16-0	—
Toronto	34-9	68	—	—	e 12 35	+ 8	e 17-3	—
Ottawa	37-1	64	—	—	e 12 59	- 2	e 15-4	—
Philadelphia	38-9	72	e 10 25	?	e 13 31	+ 3	20-5	—
Seven Falls	40-1	61	—	—	e 13 53?	+ 7	21-9	—
East Machias	43-1	63	—	—	e 15 37	?	e 21-3	—
Ksara	104-5	15	e 19 27	PP?	e 28.42	PS	—	61-9

A additional readings:—

Ukiah e = +53s.

Berkeley eZ = +1m.7s., iZ = +1m.14s., iN = +2m.14s., iE = +2m.21s.

Branner iSEN = +2m.1s.

Lick iN = +1m.48s.

Pasadena iZ = +2m.56s.

Butte ePP = +3m.18s., e = +6m.16s.

Flouissant eE = +5m.57s., eN = +10m.49s., eZ = +15m.53s.

Philadelphia +16m.46s. and +18m.52s.

East Machias eSS = +16m.53s.

Long waves were also recorded at De Bilt, Copenhagen, Pulkovo, Tiflis, Sverdlovsk, Baku, Irkutsk, Tashkent, Ivigtut, Strasbourg, Paris, Oak Ridge, Columbia, Scoresby Sund, and Stuttgart.

Mar. 26d. Readings also at 0h. (Merida, Oaxaca, and Tacubaya), 1h. (Andijan, Frunse, Tashkent, Grozny, Tiflis, Sverdlovsk, Ksara, Manila, and near Santiago), 2h. (Helwan and Baku), 4h. (near Manila and near Andijan), 5h. (Bucharest and La Paz), 6h. (Sverdlovsk, Tashkent, and near Balboa Heights (2)), 8h. (Malabar), 9h. (Seattle, Almata, Frunse, and near Andijan Heights (2)), 10h. (Almata, Samarkand, near Andijan, Tchinkent, and Frunse), 11h. (San Juan), 12h. (Oak Ridge, Williamstown, and Tiflis), 13h. (Tiflis, Sumoto, and near Kobe), 16h. (Mount Wilson, Pasadena, Riverside, Tine-maha, and Tucson), 17h. (Sverdlovsk and Tashkent), 19h. (De Bilt), 21h. (Malabar).

Mar. 27d. 21h. 10m. 30s. Epicentre 35°6N. 139°7E.

Given by Japanese stations.

A = -.6216, B = +.5271, C = +.5795; $\delta = +4$; h = 0;
D = +.647, E = +.763; G = -.442, H = +.375, K = -.815.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Komaha	0-1	345	0 5	- 3	0 9	- 4	—	—
Mitaka	0-1	299	0 7	- 1	0 12	- 1	—	—
Tokyo Cent. Met. Obs.	0-1	33	10 7k	- 1	i 0 12	- 1	0-2	—
Tokyo, I.U.	0-1	33	0 8	0	0 13	0	—	—
Kamakura	0-3	203	0 9	- 2	0 14	- 4	—	—
Titibu	0-4	307	0 19	+ 6	0 29	+ 8	—	—
Kiyosumi	0-6	139	0 19	+ 4	0 28	+ 2	—	—
Koyama	0-6	247	0 19	+ 4	0 29	+ 3	—	—
Tukubasan	0-7	28	0 16	- 1	0 25	- 3	—	—
Yosiwara	0-9	259	0 19	- 1	0 30	- 4	—	—
Susaki	1-1	212	0 19	- 3	0 32	- 7	—	—
Nagoya	2-3	259	0 39	- 1	1 10	+ 1	1-5	—
Mizusawa	3-7	19	e 1 4	P*	1 46	+ 1	—	—
Kobe	3-8	257	e 1 33	?	e 1 54	?	2-1	—
Toyooka	4-0	271	1 9	+ 5	2 2	?	2-2	—
Sumoto	4-2	254	e 2 0	S	e 2 13	?	2-4	—

A Additional readings:—

Kobe eE = +1m.49s.

Toyooka SE = +2m.7s.

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Mar. 27d. Readings also at 0h. (near Kobe, Sumoto, and Nagoya), 3h. (Tacubaya and Tucson), 4h. (Sverdlovsk, Tashkent, and Mizusawa), 5h. (Irkutsk, Tashkent, and near Almata), 6h. (near Andijan), 7h. (Lick), 8h. (near Branner and Lick), 9h. (Andijan), 10h. (Malabar), 13h. (Oak Ridge, San Juan, and near Port au Prince), 16h. (near Apia), 19h. (near Berkeley, Branner (2), Lick (2), and Fresno), 20h. (Tiflis), 21h. (Fresno), 22h. (Batavia, Medan, Hong Kong, Phu-Lien, Bombay, Calcutta, Sverdlovsk, Tashkent, near Santiago, and San Javier), 23h. (Baku, Irkutsk, and Vladivostok).

Mar. 28d. Readings at 1h. (near Tiflis), 4h. (Agra, Calcutta, Irkutsk, Almata, Andijan, Frunse, Samarkand, Tashkent, Grozny, Tiflis, Sverdlovsk, and Pulkovo), 7h. (Irkutsk and near Mizusawa), 8h. (Baku, Tashkent, Tiflis, Sverdlovsk, and Vladivostok), 9h. (Apia, Christchurch, Wellington, Sebastopol, Simferopol, and Yalta), 11h. (Oaxaca and Tacubaya (2)), 12h. (Tacubaya, Oak Ridge, Williamstown, Mount Wilson, Pasadena, Riverside, Tinemaha, San Juan, La Paz, Tashkent, Tiflis, Baku, Pulkovo, Sverdlovsk, Irkutsk, Vladivostok, and near Mizusawa), 17h. (Scoresby Sund, De Bilt, Paris, Strasbourg, and Stuttgart), 18h. (Scoresby Sund), 19h. (Tashkent, Tiflis, Sverdlovsk, Pulkovo, Copenhagen, De Bilt, Edinburgh, Kew, Bidston, Durham, Uccle, Chev, Paris, Strasbourg, Stuttgart, and Ksara).

Mar. 29d. 6h. 18m. 47s. Epicentre 9°-0N. 83°-4W. (as on Mar. 17d.).

A = +.1135, B = -.9813, C = +.1554, $\delta = -2$; $h = +7$;
D = -.993, E = -.115; G = +.018, H = -.154, K = -.988.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	3.8	89	10 55	- 6	1 37	-10	2.3	—
San Juan	19.2	59	e 4 26	- 2	e 8 5	+ 6	e 9.4	—
Huancayo	22.4	158	e 5 0	- 2	19 4	0	e 12.0	—
Columbia	25.0	5	—	—	e 10 1	+12	e 12.2	—
La Paz	N. 29.5	147	6 11	+ 3	11 15	+13	14.6	18.9
Florissant	N. 30.3	350	e 7 6	+51	e 10 49	-26	—	—
Philadelphia	31.7	13	e 6 30	+ 3	e 11 40	+ 3	e 15.4	—
Tucson	34.4	317	e 6 50	- 1	e 12 35	+16	e 16.7	—
Toronto	N. 34.7	5	e 8 21	PPP	e 12 43	+19	e 19.2	—
Williamstown	34.8	13	1 6 55	+ 1	—	—	19.7	22.7
Weston	34.9	16	1 6 55k	0	e 12 37	+10	17.2	—
Ottawa	36.9	9	e 8 43	PP	e 13 1	+ 3	e 18.2	—
East Machias	38.3	19	e 7 26	+ 2	e 13 19	0	e 19.5	—
Seven Falls	39.5	14	e 8 19	+45	e 12 49	-48	e 18.7	—
Mount Wilson	z. 40.5	314	1 7 43	+ 1	—	—	—	—
Pasadena	40.6	314	e 7 42	- 1	—	—	e 19.0	—
Tinemaha	z. 42.1	317	e 7 56	+ 1	—	—	—	—
Paris	80.6	42	e 12 13?	- 3	—	—	39.2	41.2
Uccle	81.7	40	e 15 43	PP?	—	—	e 38.2	—
Stuttgart	85.0	42	e 12 35	- 3	e 23 13?	+ 6	e 41.2	—
Sverdlovsk	108.0	19	—	—	e 24 59	[- 5]	51.2	—
Ksara	108.4	50	e 18 17	PKP	e 29 45	PPS	57.2	—

Additional readings:—

San Juan PP = +4m.30s., i = +4m.37s.
Huancayo ISS = +9m.11s., e = +11m.0s.
Columbia e = +11m.55s.
Florissant eZ = +7m.16s., eN = +7m.20s.
Philadelphia ePP = +7m.34s., e = +14m.26s.
Tucson e = +15m.49s.
Weston IPPNZ = +8m.19s.
East Machias e = +16m.47s.
Seven Falls e = +15m.49s.
Stuttgart eSS = +20m.13s.†

Long waves were also recorded at Rio de Janeiro, Oak Ridge, Scoresby Sund, Calcutta, Bombay, Hong Kong, Phu-Lien, and other stations in Europe and U.S.S.R.

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Mar. 29d. 7h. 49m. 43s. Epicentre 16°4S. 71°0W.

Felt at Arequipa and Ilo. See Seismological Notes, Bulletin of the Seismological Society of America, Vol. 27, p. 255. Berkeley, 1937.

A = +.3125, B = -.9075, C = -.2806; $\delta = -5$; $h = +5$;
D = -.946, E = -.328; G = -.091, H = +.265, K = -.960.

A depth of focus 0.010 has been assumed.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
La Paz	2.8	92	i 0 47 _a	+ 3	11 20	+ 3	—	2.2
Huancayo	6.0	315	i 11 31	+ 3	12 27	- 9	13.1	—
Montezuma	6.5	162	i 11 40	+ 5	12 56	+ 8	—	—
Santiago	17.0	179	e 3 28	- 25	7 39	+ 42	—	—
La Plata	21.8	149	4 42	- 3	8 33	- 2	11.4	—
San Juan	34.9	8	e 6 32	- 12	11 58	- 9	—	—
Little Rock	54.8	339	e 9 19	- 3	e 16 49	- 5	—	—
Philadelphia	56.2	357	—	—	e 17 11	- 1	—	—
Florissant	z. 57.8	343	e 9 43	- 1	e 17 31	- 2	—	—
St. Louis	58.3	343	e 9 45	- 2	e 17 29	- 11	—	—
Weston	58.5	0	19 47 _k	- 1	e 17 38	- 4	27.0	—
Oak Ridge	58.6	0	19 48	- 1	—	—	—	—
Williamstown	58.9	359	19 49	- 2	—	—	—	—
Chicago	60.0	345	—	—	e 17 38	- 24	—	—
Toronto	60.3	354	—	—	e 18 5	- 1	e 29.3	—
Ottawa	61.6	357	e 10 17?	+ 7	e 18 17	- 5	e 26.3	—
Tucson	61.6	322	e 10 10	0	e 18 26	+ 4	e 26.3	—
Seven Falls	63.2	1	—	—	1 18 39	- 3	e 25.9	—
Mount Wilson	67.4	319	i 10 47	0	—	—	—	—
Pasadena	67.4	319	i 10 47 _k	0	i 19 39	+ 5	—	—
Halwee	E. 68.6	321	e 10 55	+ 1	—	—	—	—
Santa Barbara	Z. 68.6	318	e 10 53	- 1	—	—	—	—
Tinemaha	68.4	321	i 11 0	0	e 19 58	+ 1	—	—
Fresno	N. 70.1	320	e 11 5	+ 1	—	—	—	—
Berkeley	72.3	320	i 11 16	- 1	e 20 39	+ 8	—	—
Ukiah	73.1	321	—	—	(e 20 17?)	- 23	e 20.3	—
Victoria	79.5	328	e 12 36	+ 37	e 21 53	+ 3	e 37.3	—
Toledo	83.7	46	i 12 18	- 1	—	—	—	—
Jersey	89.1	38	—	—	e 23 7?	[+ 3]	—	—
Bldston	90.5	34	—	—	e 23 19	[+ 6]	—	—
Stonyhurst	91.0	34	—	—	i 23 19	[+ 3]	—	—
Kew	91.2	37	—	—	e 23 17	[0]	—	—
Edinburgh	91.6	32	—	—	e 23 17?	[+ 2]	—	—
Paris	91.7	40	e 12 17?	- 41	23 20	[+ 1]	44.3	—
Scoresby Sund	93.0	15	—	—	23 31	[+ 4]	—	—
Uccle	93.6	38	—	—	i 23 33	[+ 5]	e 41.3	—
Char	95.5	43	e 13 14	- 1	—	—	—	—
Stuttgart	95.9	41	e 13 56	+ 39	e 23 43	[0]	—	—
Hamburg	E. 97.8	36	—	—	e 23 54	[+ 1]	—	—
Cheb	98.3	40	—	—	e 24 2	[+ 7]	—	—
Copenhagen	99.7	35	—	—	24 4	[+ 2]	—	—
Helwan	103.5	65	—	—	e 24 50	[+ 7]	—	—
Pulkovo	109.7	32	e 18 53	[+ 24]	e 24 48	[+ 1]	48.8	—
Yalta	112.1	49	e 19 10	PP	e 24 59	[+ 2]	—	—
Ksara	113.8	61	19 15?	PP	e 34 57	SS	53.8	69.8
Tiflis	120.1	52	e 19 49	[+ 69]	e 25 28	[+ 1]	e 57.3	—
Grozny	120.5	50	e 18 17	[+ 14]	—	—	—	—
Sverdlovsk	125.8	31	e 19 18	[+ 37]	—	—	49.3	—
Tashkent	137.8	46	e 23 33	PP	—	—	—	81.7
Bombay	145.5	81	e 19 33	[+ 5]	—	—	—	—
Manila	168.3	262	20 55	[+ 40]	24 31	PP	—	—

For Notes see next page.

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NOTES TO MARCH 29d. 7h. 49m. 43s.

Additional readings:—

Huancayo i = +1m.37s., iSP = +1m.59s.
 Montezuma iSP = +2m.5s., i = +2m.35s. and +2m.40s.
 San Juan ePP = +7m.50s., e = +8m.9s., +13m.1s., +16m.56s.
 Little Rock epPN = +9m.24s., eE = +9m.56s., iN = +12m.49s., isSEN = +16m.59s., iEN = +17m.39s.
 Philadelphia e = +16m.56s.
 Florissant iN = +17m.36s.
 St. Louis ipPEN = +10m.16s., iSEN = +17m.33s., iSSSEN = +18m.20s., eE = +19m.22s., eN = +20m.3s.
 Weston iPPNZ? = +10m.18s.
 Oak Ridge iZ = +10m.13s., iN = +10m.17s.
 Williamstown ipP? = +10m.21s.
 Chicago e = +15m.57s.
 Tucson i = +10m.38s., +10m.46s., eSS = +22m.41s., ePKPPKP = +39m.27s.
 Seven Falls i = +19m.25s.
 Mount Wilson iZ = +11m.14s.
 Pasadena iZ = +11m.13s., +11m.25s., eZ = +11m.59s., iN = +20m.23s.
 Tinemaha iZ = +11m.28s., ePKPPKPZ = +39m.6s.
 Berkeley iZ = +11m.47s., iN = +21m.26s.
 Toledo i = +13m.0s.
 Jersey L? = +23m.57s.
 Bidston e = +24m.13s.
 Stonyhurst i = +24m.9s., e = +25m.39s.
 Kew e = +24m.8s. and +25m.40s.
 Scoresby Sund +29m.17s.?
 Uccle i = +24m.23s.
 Stuttgart eS = +24m.37s.
 Helwan e = +25m.37s., i = +29m.17s.
 Copenhagen +24m.56s.
 Pulkovo e = +25m.39s., e = +28m.11s.
 Yalta e = +26m.0s., e = +26m.53s., e = +28m.37s.
 Ksara PS = +28m.44s.
 Tiflis eE = +26m.17s., +26m.57s., +29m.54s., +35m.52s.
 Sverdlovsk e = +27m.29s., e = +28m.18s., i = +32m.10s., e = +33m.23s., e = +33m.54s.
 Tashkent e = +23m.7s., i = +28m.47s., e = +34m.20s., e = +36m.11s., e = +42m.27s., e = +45m.33s., e = +48m.5s., e = +56m.47s., e = +63m.41s.
 Long waves were also recorded at Irkutsk, De Bilt, and Hong Kong.

Mar. 29d. 12h. 7m. 33s. Epicentre 5°-0N. 82°-5W.

A = +1300, B = -9877, C = +0866; δ = -5; h = +7;
 D = -991, E = -131; G = +011, H = -086, K = -996.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.		m. s.	s.	m.	m.
Balboa Heights	4.9	35	i 1 24	+ 7	e 2 8	- 7	2.7	—
Huancayo	18.7	157	e 5 32	+70	—	—	e 9.6	—
San Juan	20.8	48	e 4 48	+ 3	e 8 35	+ 2	—	—
La Paz	z. 25.7	146	e 5 33.	0	—	—	17.0	18.6
Philadelphia	35.4	9	e 12 5	S	(e 12 5)	-29	e 21.3	—
Tucson	37.9	319	e 7 20	0	—	—	e 18.4	—
Weston	38.5	13	i 7 20k	- 6	e 13 27	+ 5	19.4	—
Williamstown	38.5	11	i 7 23	- 3	—	—	—	—
Ottawa	40.7	7	—	—	e 13 27?	-28	e 19.4	—
Mount Wilson	z. 43.9	316	i 8 13a	+ 3	—	—	—	—
Pasadena	44.0	316	i 8 13a	+ 2	—	—	—	—
Haiwee	E. 44.9	318	e 8 20	+ 2	—	—	—	—
Tinemaha	45.7	319	i 8 28	+ 4	—	—	—	—

Additional readings:—

San Juan ePP = +5m.6s., e = +6m.3s.
 Philadelphia e = +14m.35s. and +17m.30s.
 Weston iNZ = +7m.44s.

Long waves were also recorded at Tashkent, Strasbourg, De Bilt, Scoresby Sund, Sverdlovsk, Stuttgart, Paris, Uccle, and East Machias.

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Mar. 29d. Readings also at 0h. (Cape Town and Ksara), 2h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, La Paz, La Plata, and Irkutsk), 3h. (Mount Wilson and Pasadena), 5h. (Hong Kong, Manila, Calcutta, Batavia, Tashkent, Sverdlovsk, Chicago, and Balboa Heights), 6h. (Cheb, Tifis, and Irkutsk), 7h. (Berkeley), 10h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, Irkutsk, Sverdlovsk, Tifis, near Nagoya, and Mizusawa), 11h. (near Chur), 12h. (Tifis), 15h. (San Juan, Mount Wilson, Pasadena, Riverside, Tinemaha, Balboa Heights, and La Paz), 17h. (Mount Wilson, Pasadena, Riverside, Tinemaha, La Paz, Montezuma, Stuttgart, near Basle, Chur, Neuchatel, and Zurich), 18h. (Williamstown), 19h. (Medan and Oak Ridge), 20h. (Mount Wilson, Pasadena, Riverside, Branner, and near Ferndale), 21h. (Tifis), 22h. (Ksara).

Mar. 30d. 11h. 33m. 2s. Epicentre $24^{\circ}6'N$. $121^{\circ}1'E$. (given by Taihoku).

A = -4702, B = +7794, C = +4140; $\delta = -5$; $h = +3$;
D = +856, E = +517; G = -214, H = +354, K = -910.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.		m. s.		m.	m.
Taihoku	0.6	31	10 7	- 8	10 17	- 9	—	0.3
Zi-ka-wei	z. 6.5	2	—	—	e 2 52	- 3	—	4.5
Hong Kong	6.8	252	2 48	+64	3 26	S*	3.7	4.4
Manila	10.0	182	2 26	- 1	4 26	+ 4	5.6	—
Hukuoka B	12.1	40	e 2 57	0	e 6 52	L	(e 6.9)	—
Chiufeng	16.0	346	e 2 44	-64	—	—	e 7.2	9.5
Irkutsk	30.4	339	—	—	e 10 59	+17	16.0	—
Sverdlovsk	53.7	324	e 9 25	- 1	—	—	27.0	—
Tifis	N. 64.2	306	e 10 50	+11	—	—	e 47.6	—

Long waves were also recorded at Zinsen, Phu-Lien, Vladivostok, Baku, and Tashkent.

Mar. 30d. 14h. Shock in Western Pacific:—

Apia eP = 49m.4s., iP_g = 49m.46s., iS_g = 51m.16s., e = 51m.53s. and 53m.16s.
Sydney e = 54m.5s., L = 67m.30s., M = 70m.20s.
Christchurch PN = 57m.37s., SN = 61m.1s., GE = 61m.51s., LNZ = 63m.13s.
Pasadena ePZ = 59m.34s., eEN = 59m.54s.
Manila P = 59m.38s., S = 69m.41s.
Mount Wilson ePZ = 59m.39s.
Riverside ePZ = 59m.40s.
Tinemaha ePZ = 59m.47s.
Haiwee eE = 59m.51s.
Ukiah eL = 60m.
Chiufeng eP = 60m.1s., SKSEN = 70m.31s., iS = 70m.50s.
Tucson eP = 60m.3s., eS = 70m.18s., eL = 87m.42s.
Honolulu e = 60m.54s., eL = 66m.
Tifis eN = 67m.50s., 71m.4s. and 80m.0s., eLN = 124m.
Yalta e = 67m.56s.
Ksara ePKP = 68m.4s., ePP = 71m.36s., eSKSP = 81m.48s., eSS = 90m.44s.,
M = 140m.
Simferopol e = 68m.6s.
Sverdlovsk eP = 69m.52s., L = 98m. and 119m.
Victoria e = 70m.12s., L = 87s.
Vladivostok e = 70m.20s. and 70m.49s.
Tashkent e = 75m.53s. and 78m.45s., i = 80m.48s., e = 88m.52s. and 101m.12s.,
M = 122.5m.
Baku e = 92m.54s. and 115m.6s., eL = 120m.
Long waves also at Riverview, Wellington, Perth, Hong Kong, La Paz, and Paris.

Mar. 30d. Readings also at 0h. (near Ucele and near Tifis), 1h. (Hong Kong), 2h. (Christchurch, Wellington, and New Plymouth), 3h. (near Nagoya), 4h. (near Nagoya and near Santiago), 5h. (near San Javier), 7h. (Wellington), 14h. (near Balboa Heights), 18h. (Oaxaca, Tacubaya, Ksara, and near Helwan), 17h. (Almata, Frunse, and Tashkent), 20h. (Almata, Frunse, Tashkent, Tchinkent, and near Samarkand).

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Mar. 31d. 10h. 36m. 6s. Epicentre 28°-0N. 90°-5E.

A = -0077, B = +8843, C = +4670; $\delta = +13$; $h = +2$;
 D = +1000, E = +009; G = -004, H = +467, K = -884.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N. 6.0	201	1 29	- 3	2 44	+ 1	—	4.8
Agra	E. 11.1	269	e 2 42	- 1	i 4 42	- 7	—	—
Bombay	18.6	245	e 4 15	- 6	e 7 34	-12	9.2	11.3
Chinfeng	24.3	53	e 5 20	0	e 9 44	+ 7	—	15.5
Irkutsk	26.7	19	—	—	e 10 39	+22	16.2	16.7
Sverdlovsk	35.7	332	1 7 4	+ 2	—	—	20.9	—
Tifis	39.5	303	7 39	+ 5	e 13 50	+13	e 33.4	—

Additional readings:—

Agra eE = +6m.1s.

Irkutsk e = +14m.35s.

Long waves were also recorded at Tashkent and Hyderabad.

Mar. 31d. Readings also at 2h. (Mizusawa, Tifis, Tashkent, Sverdlovsk, and Irkutsk), 3h. (near San Javier), 8h. (near Mizusawa and Nagoya), 9h. (Oak Ridge), 11h. (near Reykjavik), 13h. (near Batavia), 14h. (Ksara and Tifis (2)), 16h. (Perth, Christchurch, and near Tashkent), 17h. (Ottawa), 20h. (Oak Ridge and Santiago), 22h. (near Erevan).

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