The International Seismological Summary.

1939 January, February, March.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

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

There are no new points of procedure in the current volume of the Summary. The lay-out and methods used are the same as those used in the volume for 1938, but the large series of Japanese repetitions dealt with in the November and December part of that year have ceased to recur, rendering the present number more normal. There are 105 determinations of epicentre, of which 54 are repetitions from previous shocks. In the case of 11, abnormal focal depth has been suspected, while definite determination with deep focus is made for 8.

Jan.	18d.	1h.	29°·5S.	71°·5W.	Base of Superficial Layers.
	18d.	12h.	22·6S.	68·8W.	0·015
	20d.	20h.	12·9N.	91·4W.	Suggested Deep
	24d.	19h.	28·0S.	63·5W.	0·070
	30d.	23h.	5·6S.	147·0E.	0·025
Feb.	15d.	2h.	18·5N.	99·0W.	Suggested Deep.
	24d.	14h.	54·0N.	162·4W.	Suggested Deep.
Mar.	2d.	7h.	3·8S.	143·1E.	0·010
	5d.	15h.	23·1N.	69·4W.	0·020
	20d.	3h.	32·4N.	131·8E.	Base of Superficial Layers.
	31d.	7h.	42·0N.	145·2E.	0·015

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

KEW OBSERVATORY,
RICHMOND,
SURREY,

June, 1950.

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1939 JANUARY, FEBRUARY, MARCH.

Jan. 1d. Readings at 1h. (Andijan), 3h. (La Plata and La Paz), 4h. (Tucson), 6h. (Tucson), 8h. (Weston and San Juan), 11h. (near Sofia, Grozny, and Tiflis (2)), 12h. (Tiflis and Mizusawa), 13h. (Tchimkent, Samarkand, Frunse, and Andijan), 14h. (Erevan, Tiflis, and Grozny), 16h. (Tucson, Mount Wilson, Pasadena, Collmberg, and Apia), 18h. (Mizusawa), 19h. (Tiflis), 20h. (Baku, Erevan, Tiflis, and Grozny), 21h. (Tiflis), 22h. (Tiflis, Phu-Lien, and Calcutta).

Jan. 2d. 4h. 35m. 22s. Epicentre 36°·3N. 30°·7E. (as on 1937, May 29d.).

Izmir (Smyrna), Turkey—heavy damage was reported when a severe earthquake shook this Asia Minor port for 10 seconds.

Epicentre approximately 39°·0N. 29°·0E. (Strasbourg).

See " Seismological Notes," Bulletin of the Seismological Society of America, Vol. 29, Berkeley, 1939, p.416.

$A = +\cdot6946$, $B = +\cdot4124$, $C = +\cdot5894$; $\delta = -6$; $h = 0$;
$D = +\cdot511$, $E = -\cdot860$; $G = +\cdot507$, $H = +\cdot301$, $K = -\cdot808$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		4·9	346	1 23	+ 6	2 4	−11	—	—	—
Helwan	z.	6·5	175	e 4 48	?	—	—	—	—	—
Sofia		8·5	321	e 1 57	−10	i 3 10	−35	—	—	i 3·3
Bucharest		8·8	338	e 2 56	+45	3 50	− 3	—	—	—
Belgrade		11·5	321	e 3 50a	+62	i 4 54	− 5	—	—	—
Erevan		11·5	66	e 4 33	S	(e 4 33)	−26	—	—	—
Grozny		13·5	54	e 3 25	PP	—	—	—	—	—
Kecskemet	z.	13·5	326	e 5 58	S	(e 5 58)	+11	—	—	—
Budapest		14·1	326	e 4 38?	+75	—	—	—	—	—
Rome		15·2	297	e 2 12	?	e 5 53	−35	—	—	e 7·4
Baku		15·6	69	5 57	S	(5 57)	−40	—	—	e 10·6
Triest		15·8	311	e 3 45	0	e 6 56	+14	i 7 26	SSS	8·0
Florence		16·6	302	3 58	+ 2	8 38	L	—	—	(8·6)
Prague		18·1	326	—	—	e 7 26	− 9	—	—	—
Chur		19·0	312	e 4 23	− 3	—	—	—	—	—
Cheb		19·2	323	e 6 24	?	—	—	—	—	e 7·6
Collmberg		19·6	327	i 4 32	0	—	—	i 4 38	PP	e 8·9
Zurich		19·8	311	e 4 29	− 6	—	—	—	—	e 9·5
Moscow		20·0	14	—	—	e 8 40	SS	—	—	10·1
Stuttgart		20·1	316	e 4 52	+14	—	—	—	—	e 9·1
Basle		20·5	311	e 4 41	− 1	—	—	—	—	—
Pulkovo		23·5	0	e 6 22	+70	e 9 23	0	—	—	e 10·7
Uccle		23·8	317	e 5 17	+ 2	—	—	—	—	e 11·1
Sverdlovsk		28·7	36	—	—	e 11 48	SS	—	—	14·6

Additional readings:—
Istanbul PS = +1m.53s.
Helwan iZ = +5m.32s.
Sofia iE = +2m.3s.
Belgrade eZ = +4m.33s., eNW = +4m.44s.
Erevan e = +8m.27s.
Rome e = +5m.3s.
Baku e = +8m.22s. and +8m.50s.
Collmberg e = +5m.11s.
Sverdlovsk e = +12m.6s.
Long waves were also recorded at Vladivostok, Ksara, Paris, Tiflis, Moncalieri, Kew, Strasbourg, De Bilt, and Bidston.

Jan. 2d. Readings also at 1h. (La Paz, Riverside, Mount Wilson, Pasadena, and Tucson), 2h. (Bombay, Grozny, and Fort de France), 3h. (Grozny, Irkutsk, Sverdlovsk, Calcutta (2), Agra, Samarkand, Tchimkent, Frunse, and Andijan), 6h. (Andijan and Fort de France), 7h. (near Apia, Andijan, Frunse, Tchimkent, Samarkand, and Almata), 8h. (La Plata and Tucson), 9h. (near Almeria, Granada, Toledo, and Erevan), 11h. (Almata), 12h. (Huancayo, Tucson, Mount Wilson, Pasadena, Mizusawa, and Tiflis), 13h. (Tucson, Samarkand, and Andijan), 15h. (Agra, New Plymouth, Christchurch, and Wellington), 16h. (Samarkand, Andijan, and Tchimkent), 17h. (Almata), 18h. (Tiflis), 19h. (Andijan and Frunse), 21h. (Wellington), 22h. (Tucson and Mizusawa).

Jan. 3d. 6h. 46m. 5s. Epicentre 43°·2N. 16°·4E. (as on 1937, July 20d.).

$A = +\cdot7015$, $B = +\cdot2065$, $C = +\cdot6821$; $\delta = 0$; $h = -3$;
$D = +\cdot282$, $E = -\cdot959$; $G = +\cdot654$, $H = +\cdot193$, $K = -\cdot731$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	3·1	322	0 51	0	—	—	i 0 56	P*	—
Rome	3·2	246	—	—	e 1 25?	− 7	—	—	—
Florence	3·8	278	e 0 55	− 6	—	—	—	—	—
Chur	6·0	307	e 1 34	+ 2	e 2 42	− 1	—	—	—
Moncalieri	6·5	289	e 1 50	P*	—	—	—	—	—
Zurich	6·9	309	e 1 39	− 6	e 3 6	+ 1	e 2 0	P*	—
Stuttgart	7·5	320	e 2 55	+62	e 3 27	+ 7	—	—	—
Basle	7·6	307	e 2 0	+ 5	e 3 40	S*	—	—	—
Strasbourg	8·1	315	—	—	e 3 25	−10	i 4 4	S*	—
Jena	8·4	338	e 2 7	+ 1	—	—	—	—	—
Collmberg	8·5	344	i·2 5	− 2	e 3 25	−20	—	—	—
Göttingen	9·4	335	—	—	e 3 31	−36	—	—	—

Additional readings :—
Triest $P_gP_g = +1$m.5s.
Chur $eP_g? = +1$m.36s.
Stuttgart $e = +3$m.30s.
Strasbourg $iS_g = +3$m.51s., $i = +4$m.27s.
Collmberg $iZ = +2$m.10s., $eZ = +2$m.16s., $iZ = +2$m.25s., $eZ = +2$m.35s. and $+2$m.43s., $iZ = +2$m.53s., $+3$m.0s., and $+3$m.4s.

Jan. 3d. 17h. 18m. 34s. Epicentre 49°·2N. 129°·9W. (as on 1938, April 22d.).

$A = -\cdot4199$, $B = -\cdot5040$, $C = +\cdot7548$; $\delta = +6$; $h = -5$;
$D = -\cdot768$, $E = +\cdot640$; $G = -\cdot483$, $H = -\cdot580$, $K = -\cdot656$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Victoria		4·4	98	i 0 56	−14	—	—	—	—	e 2·0
Sitka		8·6	339	e 2 0	− 9	e 3 39	− 9	e 2 13	PP	e 4·1
Ukiah		11·1	153	e 2 47	+ 4	e 4 48	− 1	e 5 9	SS	6·0
Butte		12·1	91	e 2 54	− 3	—	—	—	—	i 6·7
Berkeley		12·6	152	e 3 4	+ 1	e 5 33	+ 7	—	—	e 6·7
Bozeman		13·2	100	e 3 15	+ 4	—	—	—	—	e 7·1
Lick		13·2	151	e 3 15	+ 4	—	—	—	—	—
Fresno	N.	14·4	146	e 3 33	+ 6	—	—	—	—	—
Tinemaha		14·7	141	e 3 34	+ 3	e 6 45	SSS	i 3 40	PP	—
Saskatoon		15·0	70	e 3 36	+ 1	—	—	—	—	8·4
Salt Lake City		15·2	117	e 3 41	+ 3	e 6 41	SS	e 6 52	SSS	e 7·9
Haiwee		15·7	142	e 3 48	+ 4	—	—	i 3 55	PP	—
Santa Barbara	E.	16·5	148	i 4 16	PPP	—	—	—	—	—
Mount Wilson		17·3	146	e 4 7	+ 3	e 7 45	SS	—	—	—
Pasadena		17·3	146	e 4 6	+ 2	e 7 15	− 1	i 4 22	PP	—
Riverside		17·8	144	i 4 13	+ 2	e 7 37	+ 9	e 8 1	SS	—
College		18·4	336	e 4 17	− 1	e 7 42	+ 1	—	—	e 9·6
La Jolla		18·8	145	e 4 23	0	—	—	e 4 36	PP	—
Tucson		22·1	133	i 5 0_a	+ 1	i 8 58	0	i 5 28	PP	i 10·0
Chicago		30·1	89	—	—	e 11 33	+21	—	—	e 12·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cape Girardeau		31·4	97	e 6 18	− 7	—	—	—	—	e 17·1
Ottawa		36·2	75	e 7 3	− 3	—	—	—	—	18·4
Williamstown		39·1	77	e 7 26	− 5	i 19 10	L	—	—	i 23·4
Philadelphia		39·2	82	e 9 3	PP	e 13 21	−11	—	—	e 20·1
Fordham		39·6	81	e 7 31	− 4	—	—	i 9 6	PP	e 20·4
East Machias		41·8	72	—	—	e 17 55	S_cS	—	—	e 21·0
San Juan		59·1	98	e 13 53	PPP	e 18 5	− 6	—	—	e 24·5
Vladivostok		63·6	306	—	—	i 19 12	+ 4	i 19 17	PS	e 29·9
Pulkovo		70·2	12	—	—	e 30 26	?	—	—	—
Sverdlovsk		74·0	355	11 35	− 4	21 14	+ 3	—	—	34·4
Moscow		74·9	9	e 11 53	+ 9	—	—	—	—	—
Collmberg	z.	75·0	23	e 11 42	− 3	—	—	—	—	—
Strasbourg		75·9	28	e 15 4	PP	—	—	—	—	e 36·4
Frunse		85·8	343	e 13 6	+24	—	—	—	—	—
Andijan		88·3	344	e 12 45	−10	—	—	—	—	—
Tashkent		88·3	347	—	—	e 23 39	0	—	—	—
Samarkand		90·3	348	e 13 11	+ 7	—	—	—	—	—
Ksara		96·4	12	e 19 26?	PPP	—	—	—	—	—

Additional readings :—
Sitka eS = +3m.55s.
Pasadena iE = +7m.50s.
Riverside iZ = +4m.20s.
College eS = +7m.16s.
Tucson i = +5m.4s., +6m.7s., and +6m.13s., iS = +9m.11s.
Chicago eS = +11m.37s.
Cape Girardeau ePN = +6m.22s.
Vladivostok e = +24m.52s.
Collmberg eZ = +11m.55s.
Tashkent e = +33m.39s. and +50m.17s.
Long waves were also recorded at Honolulu, Baku, Irkutsk, and other European and American stations.

Jan. 3d. Readings also at 0h. (Samarkand, Tchimkent, Andijan, Tashkent, and Frunse), 2h. (Hukuoka, Grozny, and Tucson), 4h. (Frunse, Andijan, and Mizusawa), 6h. (Mizusawa, Tucson, San Juan, La Paz, Tinemaha, Mount Wilson, Adelaide, and Huancayo), 7h. (Wellington (2), New Plymouth, Christchurch, and Cheb), 10h. (near Medan), 14h. (San Juan), 15h. (Riverside, Pasadena, Vladivostok, Branner, Tinemaha, Tucson, Mizusawa, Sverdlovsk, and Irkutsk), 20h. (near Fresno), 21h (Tucson), 23h. (Manila, Hong Kong, Sverdlovsk, Irkutsk, and Tashkent).

Jan. 4d. Readings at 0h. (Samarkand, Tchimkent, Frunse, and Andijan), 1h. (Cape Town and Ksara), 4h. (Mizusawa), 6h. (Mizusawa), 7h. (Florence), 9h. (Mizusawa), 10h. (Riverside, Mount Wilson, Pasadena, Malabar, Batavia, Tucson, and Tinemaha), 12h. (Tacubaya, Manzanillo, Guadalajara, and Oaxaca), 13h. (Haiwee, La Jolla, Pasadena, Mount Wilson, Riverside, Tinemaha, Tucson, and Tacubaya), 15h. (Zurich, near Calcutta, Ebingen, and Stuttgart), 17h. (Andijan), 19h. (La Paz, near Malabar and Batavia), 21h. (Fordham, Harvard, Weston, Tucson, Pasadena, and Mount Wilson).

Jan. 5d. 3h. The readings for at least two small Pacific shocks have been confused : Compare William C. Repetti, " Seismological Bulletin," for 1939, Manila Central Observatory, Manila, 1940, p.7.

Manila iP_g = 24m.8s.k, S_gEN = 24m.25s.
Apia iP = 26m.10s.k, iS = 27m.9s.
Phu-Lien e = 27m.12s.
Christchurch ePEZ = 30m.41s.a, S = 34m.42s., L_qN = 35m.7s., eL = 37m.12s.
Calcutta eN = 32m.48s.
Moscow e = 34m.18s., 42m.26s., 44m.56s., 45m.20s., and 46m.41s.
Pulkovo e = 35m.36s., 38m.34s., and 45m.53s., i = 46m.14s., L = 65m.42s.
Mount Wilson iP = 35m.52s.k, ipPZ = 37m.15s.
Pasadena iP = 35m.52s.k, ipPZ = 37m.15s.

Continued on next page.

La Jolla iP = 35m.53s.
Riverside iP = 35m.55s.k, iZ = 36m.8s., epPZ = 37m.16s.
Haiwee ePEN = 36m.1s.
Tinemaha ePEN = 36m.1s.
Tucson iP = 36m.18s.k, i = 36m.35s., 36m.49s., 37m.19s., 37m.43s., 39m.4s., 45m.50s., 46m.35s., and 63m.12s.
Sverdlovsk e = 43m.3s. and 49m.28s., L = 55m.
Tashkent e = 43m.30s.
Jena ePZ = 43m.45s.
Uccle eP = 43m.49s., e = 45m.24s.
Ksara iPKP = 43m.53s., ipPKP = 45m.23s., ePP = 47m.27s., PPS = 60m.0s.
Stuttgart eP = 43m.53s., iZ = 45m.26s., eZ = 51m.27s., eL = 80m.
Basle eP = 43m.53s., e = 43m.57s.
Zurich eP = 43m.53s., e = 43m.58s.k and 52m.51s.
Chur eP = 43m.54s., e = 43m.58s.
Strasbourg iPKP = 43m.54s., i = 44m.14s., 44m.25s., 44m.36s., and 45m.14s., ipPKP = 45m.27s.
Neuchatel eP = 43m.57s.
Triest iP = 43m.59s., e = 45m.37s. and 54m.33s.
Clermont Farrand e = 44m.2s.
Vladivostok i = 45m.12s., 45m.43s., and 45m.47s.
Göttingen e = 45m.45s.
Tiflis ePEZ = 46m.32s., eZ = 55m.36s., eLZ = 68m.
Long waves were also recorded at Baku and Stonyhurst.

Jan. 5d. 11h. 19m. 18s. Epicentre 22°·0S. 170°·5E. (as on 1938 May 20d.).

$A = -\cdot 9154$, $B = +\cdot 1532$, $C = -\cdot 3724$; $\delta = +11$; $h = +4$
$D = +\cdot 165$, $E = +\cdot 986$; $G = +\cdot 367$, $H = -\cdot 061$, $K = -\cdot 928$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·8	247	i 4 0	+ 2	i 7 12	+ 7	i 7 18	SS	—
Wellington		19·6	172	i 4 31	− 1	8 7	− 1	4 52	PP	10·6
Riverview		20·7	232	e 4 45	+ 1	i 8 40	+ 9	i 8 49	SS	e 10·3
Sydney		20·7	232	i 4 42	− 2	i 8 39	+ 8	—	—	e 10·7
Christchurch		21·5	176	i 4 51a	− 1	i 8 53	+ 6	e 16 9	S_cS	10·9
Melbourne		27·1	228	e 5 56	+10	e 10 19	− 5	—	—	13·6
Perth		49·3	246	—	—	i 15 57	− 2	—	—	i 26·4
Mount Wilson	z.	87·9	52	e 12 54	+ 1	—	—	—	—	—
Pasadena		87·9	52	e 12 57	+ 4	—	—	—	—	e 42·0
Riverside	z.	88·3	52	e 12 57	+ 2	—	—	—	—	—
Tucson		92·5	56	13 16a	+ 2	—	—	39 18	P'P'	41·7
Sverdlovsk		118·7	324	e 18 52	[+ 2]	e 36 27	SS	e 20 7	PP	52·7
Tiflis		130·7	307	e 22 2	PP	—	—	—	—	e 64·7
Ksara		138·5	294	e 19 41	[+13]	—	—	—	—	—

Additional readings:—
Wellington i = +8m.27s., L_q = +9m.47s.
Riverview iE = +4m.52s.
Christchurch L_qE = +9m.9s., P_cSE = +12m.24s.
Melbourne i = +10m.49s.
Perth i = +23m.30s.
Tucson P = +13m.24s., iP = +13m.37s.
Sverdlovsk e = +28m.10s.
Tiflis eE = +22m.54s.
Long waves were also recorded at Baku.

Jan. 5d. Readings also at 0h. (La Paz), 2h. (Stonyhurst and Wellington), 3h. (New Plymouth, Tucson, and Sverdlovsk), 5h. (Zurich), 6h. (San Juan), 7h. (Huancayo), 8h. (Mizusawa and La Paz), 9h. (Piatigorsk, Tchimkent, Mizusawa, and Andijan), 10h. (Tucson), 11h. (Collmberg and Mizusawa), 12h. (Tucson), 13h. (Mizusawa), 14h. (Tchimkent, Frunse, Andijan, and Almata), 15h. (Mizusawa and Huancayo), 16h. (Fordham and Tacubaya), 17h. (Huancayo), 18h. (La Plata, Pasadena, Fordham, Tacubaya, Tucson, Sverdlovsk, and La Paz), 19h. (Tashkent, La Paz, Tiflis, and Baku), 20h. (Weston and Mizusawa), 21h. (Almata and Wellington).

Jan. 6d. 18h. Local Japanese quake. Tokyo Imperial University gives epicentre as 36°·59N. 141°·16E.

Tokyo, Imp. Univ. P = 6m.42s., S = 6m.59s.
Komaba P = 6m.44s., S = 7m.1s.
Kiyosumi P = 6m.45s., S = 7m.6s.
Koyama P = 6m.45s., S = 7m.10s.
Mitaka P = 6m.45s., S = 7m.4s.
Okiziku P = 6m.45s., S = 6m.57s.
Titibu P = 6m.45s., S = 7m.7s.
Tukubasan P = 6m.45s., S = 6m.57s.
Susaki P = 7m.0s., S = 7m.34s.
Mizusawa ePE = 7m.1s., iSE = 7m.29s.

Jan. 6d. Readings also at 0h. (Algiers (2), 1h. (Andijan, Tchimkent, Frunse, and Samarkand), 3h. (La Paz), 15h. (Mizusawa), 16h. (Andijan and Tchimkent), 18h. (Triest), 19h. (Moncalieri), 21h. (Osaka), 22h. (Wellington (2), Christchurch, and New Plymouth).

Jan. 7d. 20h. 21m. 48s. Epicentre 36°·0N. 117°·7W. (given by Pasadena).

A = −·3769, B = −·7180, C = +·5852; δ = +4; h = 0;
D = −·885, E = +·465; G = −·272, H = −·518, K = −·811.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		0·3	302	i 0 7	− 4	—	—	—	—	—
Tinemaha		1·2	338	i 0 23k	− 1	i 0 40	− 1	—	—	—
Mount Wilson		1·8	189	i 0 32k	0	i 0 59	+ 3	—	—	—
Fresno	N.	1·9	289	i 0 34	0	i 0 58	− 1	—	—	—
Pasadena		1·9	192	i 0 34k	0	i 1 0	+ 1	—	—	—
Riverside		2·0	173	i 0 35k	0	i 1 5	+ 3	—	—	—
Santa Barbara		2·3	226	i 0 39	− 1	e 1 11	+ 2	—	—	—
Lick	N.	3·4	294	i 1 0	+ 5	1 44	S*	—	—	—
Santa Clara		3·7	295	e 1 22	+22	e 2 16	+31	—	—	—
Branner		3·9	295	e 1 4	+ 2	i 2 15	S_g	i 1 14	P*	—
Berkeley		4·1	298	e 1 7	+ 2	i 2 9	S*	2 24	S_g	—
Ukiah		5·3	308	—	—	e 2 47	S*	—	—	e 3·2
Tucson		6·8	121	i 1 42k	− 2	i 3 21	S*	i 2 14	P_g	i 4·9
Ferndale	E.	6·9	314	—	—	e 3 44	S_g	—	—	—
Columbia		30·0	83	—	—	e 10 40	−30	—	—	e 15·0

Additional readings :—
Berkeley iNZ = +1m.18s., iE = +1m.21s., iN = +1m.25s., iE = +1m.35s. and +1m.42s.
Ukiah eS = +3m.6s.
Tucson iP = +2m.1s. and +2m.41s., iS = +3m.28s. and +3m.37s., iS_g = +3m.52s.
Ferndale eN = +4m.0s.
Long waves were also recorded at Bozeman, Butte, and Salt Lake City.

Jan. 7d. Readings also at 0h. (Huancayo), 1h. (Osaka, Andijan, Frunse, Tchimkent, and Samarkand), 5h. (Sofia), 7h. (Semipalatinsk), 9h. (Ksara, Tiflis, Andijan, and Frunse), 10h. (Andijan), 12h. (San Juan), 13h. (Mizusawa (2)), 18h. (Fordham), 19h. (Fordham, Andijan, Frunse, Samarkand, Tchimkent, and Williamstown), 20h. (Grozny (2) and near Tiflis), 21h. (Williamstown and Fordham (2)).

Jan. 8d. Readings at 1h. (Mizusawa), 4h. (Malabar and Batavia), 6h. (Mizusawa), 8h. (Haiwee, Tinemaha, Riverside, Mount Wilson, Pasadena, La Paz, and Tucson), 9h. (Tucson, Irkutsk, Sverdlovsk, Hong Kong, Fordham, Paris, De Bilt, Uccle, Phulien, Stuttgart, Semipalatinsk, Göttingen, Medan, Tiflis, Strasbourg, Baku, Calcutta, Grozny, Ksara, Tashkent, Pulkovo, Moscow, Agra, and near San Fernando, Toledo, near Almeria and Granada (2)), 10h. (Tucson and near Granada, near Almeria and Toledo), 14h. (Mizusawa), 15h. (East Machias), 16h. (Irkutsk and Sverdlovsk), 18h. (Hukuoka), 20h. (Lick and Branner), 21h. (La Paz).

Jan. 9d. 3h. Pacific earthquake :—

Perth iP = 7m.35s., iS = 14m.55s., i = 19m.12s., iL = 21m.38s.
Batavia P†E, = 8m.39s.
Manila ePEN = 10m.32s., S = 14m.48s.
Medan PEN = 11m.17s., eSE = 16m.0s., eL†N = 20m.
Andijan e = 15m.37s. and 27m.42s.
Frunse e = 15m.46s.
Ksara e = 15m.50s.
Tchimkent e = 15m.53s
Samarkand e = 16m.3s. and 28m.50s.
Brisbane eN = 16m.30s. and 21m.6s.
Sverdlovsk P = 17m.8s., e = 20m.19s., L = 40m.
Tiflis ePE = 17m.29s., eE = 27m.34s., eN = 28m.13s.
Grozny eP = 17m.31s.
Melbourne e = 19m.38s., i = 23m.42s., L = 27m.2s.
Calcutta iN = 20m.13s.
Vladivostok e = 21m.4s.
Sydney e = 22m.0s. ?
Riverview eN = 22m.24s., eSN = 24m.46s., eL = 25m.42s.
La Paz ePZ = 24m.41s.
Baku e = 26m.27s. and 35m.21s., eL = 54m.
Long waves recorded at Irkutsk.

Jan. 9d. Readings also at 0h. (East Machias and Grozny), 1h. (Tucson), 2h. (Agra), 4h. (Samarkand, Frunse, Andijan, and Almata), 7h. (Tashkent, Samarkand, Frunse, Andijan, and Tchimkent), 11h. (Ksara, Almata, Tchimkent, Andijan, Frunse, Samarkand, Istanbul, and Tiflis), 14h. (Apia and Wellington), 15h. (Bermuda, Moncalieri), 16h. (San Fernando), 17h. (Weston and Harvard), 18h. (Huancayo), 21h. (Fordham), 22h. (Fordham).

Jan. 10d. 2h. 50m. 40s. Epicentre 6°·5N. 94°·5E. (as on 1937 March 12d.).

$A = -\cdot0780$, $B = +\cdot9906$, $C = +\cdot1125$; $\delta = +3$; $h = +7$;
$D = +\cdot997$, $E = +\cdot078$; $G = -\cdot009$, $H = +\cdot112$, $K = -\cdot994$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		5·1	124	e 1 30	P*	2 47	S_g	i 1 45	P_g	—
Calcutta	N.	17·0	340	—	—	i 7 13	+ 3	—	—	—
Bombay		24·4	303	—	—	e 9 35	− 4	—	—	—
Agra	E.	25·8	326	5 34	0	10 4	+ 2	—	—	—
Andijan		39·4	334	e 7 29	− 4	e 13 36	+ 1	—	—	—
Almata		39·7	340	e 7 38	+ 2	—	—	—	—	—
Samarkand		41·3	327	e 7 50	+ 1	—	—	—	—	—
Tashkent		41·3	331	—	—	e 17 51	SSS	—	—	—
Tchimkent		41·9	333	e 7 53	− 1	—	—	e 9 40	PP	—
Sverdlovsk		56·8	339	e 9 46	− 2	—	—	—	—	28·3
Ksara		60·4	304	e 9 0	?	e 17 58	−30	—	—	—

Additional readings :—
Medan iEN = +3m.4s. and +4m.4s.
Calcutta e = +12m.46s.
Tashkent e = +18m.23s.
Sverdlovsk i = +9m.49s.
Long waves were also recorded at Vladivostok and Colombo.

Jan. 10d. 10h. 7m. 3s. Epicentre 6°·5N. 94°·5E. (as at 2h.).

$A = -\cdot0780$, $B = +\cdot9906$, $C = +\cdot1125$; $\delta = +3$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		5·1	124	e 1 33	P*	2 51	S_g	i 1 42	P_g	—
Calcutta	N.	17·0	340	—	—	1 7 20	+10	—	—	—
Bombay		24·4	303	—	—	e 9 37	− 2	—	—	—
Agra	E.	25·8	326	e 5 32	− 2	10 5	+ 3	—	—	—
Andijan		39·4	334	e 7 33	0	e 13 28	− 7	—	—	—
Almata		39·7	340	e 7 37	+ 1	—	—	—	—	—
Samarkand		41·3	327	e 7 51	+ 2	—	—	—	—	—
Tchimkent		41·9	333	e 7 57	+ 3	—	—	—	—	—
Sverdlovsk		56·8	339	e 9 42	− 6	e 17 33	− 8	—	—	27·0
Ksara		60·4	304	e 9 8	−65	e 18 51	+23	—	—	—
Tucson		134·5	30	i 22 47a	PP	—	—	—	—	—

Additional readings :—
Medan iEN = +3m.9s. and +4m.3s.
Calcutta e = +12m.56s.
Sverdlovsk i = +9m.51s.
Long waves were also recorded at Irkutsk, Phu-Lien, and Colombo.

Jan. 10d. 11h. 7m. 30s. Epicentre 12°·0S 176°·0W.

$A = -\cdot9760$, $B = -\cdot0682$, $C = -\cdot2066$; $\delta = -9$; $h = +6$;
$D = -\cdot070$, $E = +\cdot998$; $G = +\cdot206$, $H = +\cdot014$, $K = -\cdot978$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		4·5	113	e 1 12	+ 1	e 2 22	S*	—	—	—
Brisbane		32·9	238	—	—	i 10 48	−68	—	—	—
Christchurch		32·9	194	6 34	− 4	10 36	?	—	—	12·7
Riverview		37·0	228	—	—	e 14 44	SS	—	—	e 16·7
Melbourne		43·3	226	e 12 13	?	e 15 46	+73	—	—	21·2
Mount Wilson	Z.	71·7	48	e 11 26	0	—	—	—	—	—
Haiwee	Z.	72·7	46	e 11 41	+ 9	—	—	—	—	—
Tucson		76·2	52	11 55a	+ 3	—	—	—	—	—
Ksara		143·7	312	e 19 31	[− 6]	—	—	e 23 5	PP	—

Additional readings :—
Apia i = +4m.37s.
Brisbane eN = +12m.30s.
Tucson i = +12m.1s. and +12m.37s.
Long waves were also recorded at Tiflis and Wellington.

Jan. 10d. 12h. Local Japanese shock.

Tokyo Imp. Univ. gives epicentre as 34°·55N. 138°·95E.

Osaka P = 8m.59s., S = 9m.42s.
Susaki P = 9m.19s., S = 9m.21s.
Kiyosumi P = 9m.38s., S = 9m.57s.
Koyama P = 9m.38s., S = 9m.51s.
Titibu P = 9m.38s., S = 9m.58s.
Mitaka P = 9m.39s., S = 9m.59s.
Tukubasan P = 9m.39s., S = 10m.4s.
Komaba P = 9m.41s., S = 10m.0s.
Tokyo Imp. Univ. P = 9m.41s., S = 9m.59s.
Mizusawa ePE = 10m.31s., ePN = 10m.35s., iSE = 11m.31s.

Jan. 10d. 20h. Undetermined shock.

Vladivostok eP = 5m.54s., eS = 11m.58s., iL = 15·7m.
Irkutsk e = 11m.35s., 11m.52s., and 16m.1s., L = 18·9m.
Fordham i = 11m.48s.
Sverdlovsk e = 15m.10s. and 25m.43s., L = 30·5m.
Andijan eP = 15m.39s., e = 31m.36s.
Tinemaha eEN = 17m.46s.
Collmberg iZ = 17m.54s.
Mount Wilson iP = 17m.54s.
Tucson iP = 18m.27s.k, i = 18m.56s.
Weston iPZ = 19m.8s.
Ksara e = 26m.9s., L = 51·5m.
Calcutta eN = 26m.57s.
Semipalatinsk e = 27m.4s.
Almata e = 30m.10s.
Frunse e = 30m.47s.
Samarkand e = 32m.20s.
Grozny eP = 32m.41s.
Baku e = 32m.56s. and 37m.18s., eL = 42·3m.
Long waves were also recorded at Rome, Cheb, and Tiflis.

Jan. 10d. Readings also at 1h. (near Medan), 2h. (Chur, Zurich, Helwan, and Ksara), 3h (Chur), 4h. (La Paz), 6h. (La Plata, Samarkand, Andijan, and Almata), 7h. (Mizusawa), 9h. (New Plymouth and Wellington), 10h. (Chur), 11h. (Irkutsk and Sverdlovsk), 12h. (Collmberg, Cheb, Baku, Calcutta, Irkutsk, Sverdlovsk, Tchimkent, Zurich, Medan, and Tiflis), 13h. (Tiflis), 19h. (Tchimkent (2), Andijan (2), Almata, Frunse (2), and Tashkent), 21h. (Hukuoka and Tiflis).

Jan. 11d. 2h. 52m. 36s. Epicentre 37°·1N. 141°·8E. (as on 1938, Dec. 23d.).

$A = -·6283$, $B = +·4944$, $C = +·6006$; $\delta = -9$; $h = -1$;
$D = +·618$, $E = +·786$; $G = -·471$, $H = +·371$, $K = -·800$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Mizusawa	2·1	346	e 0 55	P_g	i 1 29	S_g	—
Osaka	5·6	247	1 28	+ 1	2 31	− 2	—
Vladivostok	9·7	312	e 2 22	0	e 4 48	S*	5·5
Almata	48·8	300	e 8 50	+ 1	—	—	—
Andijan	52·8	297	e 9 17	− 2	e 17 5	+18	—
Sverdlovsk	55·3	319	i 9 38	0	—	—	26·4
Baku	68·4	305	e 4 10	?	—	—	40·4

Long waves were also recorded at Irkutsk, Tiflis, Ksara, Cheb, and Rome.

Jan. 11d. 21h. Undetermined shock.

La Paz iPZ = 15m.12s.k, iSZ = 21m.8s., LZ = 25·9m.
Tucson P = 18m.33s., 18m.37s., iPP = 18m.52s.
Mount Wilson eP = 18m.52s.
Riverside eP = 18m.52s.
Pasadena iP = 18m.53s.
Tinemaha ePEZ = 19m.14s.
Tashkent e = 20m.7s. and 34m.33s., eL = 78·1m.
Huancayo eP = 23m.0s., ePP = 25m.12s.
Cheb e = 27m.0s.
Sverdlovsk e = 27m.47s. and 51m.41s., L = 72m.
Tiflis eZ = 27m.42s., eLZ = 28·0m.

Continued on next page.

Ksara ePKP = 29m.19s., ePP = 32m.34s.
Strasbourg e?Z = 35m.30s., eL = 75·5m.
Baku e = 38m.55s. and 53m.20s., eL = 86·2m.
Rome e = 54m.7s., eL = 72·3m.
Long waves were also recorded at Fort de France, Collmberg, Vladivostok, Irkutsk, Edinburgh, Uccle, Kew, and Moncalieri.

Jan. 11d. 22h. 0m. 15s. Epicentre 38°·6N. 119°·5W.

Intensity VI at Coleville (California) and at Gardnerville (Nevada). 38°·6N. 119°·5W.

Macroseismic area 8000 square miles.

R. Bodle :

United States Earthquakes, 1939 ; Washington, 1941 ; p.11, Chart p.63.

$A = -\cdot3858$, $B = -\cdot6819$, $C = +\cdot6213$; $\delta = -16$; $h = -1$;
$D = -\cdot870$, $E = +\cdot492$; $G = -\cdot306$, $H = -\cdot541$, $K = -\cdot784$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tinemaha		1·8	147	i 0 34	+ 2	i 1 4	S_g	—	—
Fresno	N.	1·9	187	i 0 35	+ 1	i 0 59	0	—	—
Lick		2·2	233	i 0 37	− 1	i 1 3	− 3	—	—
Berkeley		2·3	251	i 0 36	− 4	i 1 5	− 4	—	—
Santa Clara	N.	2·3	237	i 1 1	+21	i 1 26	+17	—	—
Branner		2·4	241	e 0 41	0	i 1 9	− 3	—	—
San Francisco		2·5	250	e 0 39	− 4	i 1 8	− 6	—	—
Haiwee		2·8	154	i 0 52	+ 5	i 1 29	S*	—	—
Ukiah		2·9	280	e 0 52	+ 4	e 1 28	+4	e 1 3	P_g
Santa Barbara		4·0	183	i 1 13	P*	i 2 7	S*	—	—
Ferndale	N.	4·2	302	—	—	e 1 45	−12	—	—
Mount Wilson		4·5	164	i 1 11	0	e 2 21	S*	—	—
Pasadena		4·5	164	e 1 12	+ 1	i 2 18	S*	i 2 25	S_g
Riverside	Z.	4·9	158	e 1 20	+ 3	i 2 36	S*	—	—
Tucson		9·5	129	2 21	+ 1	i 4 9	− 1	i 4 51	S*

Additional readings :—
San Franciso iZ = +43s.
Tucson iP = +2m.32s., i = +5m.8s., +5m.19s., +5m.24s., +5m.28s., +5m.35s., +5m.45s., +5m.53s., and +6m.4s.

Jan. 11d. Readings also at 0h. (Baku, Sverdlovsk, Andijan, Tchimkent, and Samarkand), 1h. (College and Tananarive), 5h. (Mizusawa), 10h. (Tiflis), 11h. (Riverview), 15h. (Tucson), 17h. (Paris and Edinburgh), 18h. (Cheb, Tucson, Bidston, Stuttgart, Pulkovo, Kew, Baku, and Sverdlovsk), 19h. (Irkutsk, Balboa Heights, and Vladivostok), 20h. (Vladivostok and Sverdlovsk), 21h. (Christchurch and Wellington), 23h. (Edinburgh).

Jan. 12d. Readings at 0h. (Edinburgh), 2h. (Andijan, Tchimkent, and Samarkand), 3h. (Mount Wilson and Tucson), 5h. (Moncalieri), 6h. (Mizusawa and near Malabar), 10h. (Tiflis), 12h. (Grozny), 15h. (Rome), 17h. (Tucson), 18h. (Tucson), 21h. (Almata, Andijan (2), Tchimkent (2), Samarkand, and Frunse (2)), 22h. (Andijan, Tchimkent, and Frunse), 23h. (Pasadena, Riverside, Tucson, Mizusawa, and Mount Wilson).

Jan. 13d. 22h. 21m. 46s. Epicentre 41°·6N. 142°·0E. (as on 1937, Dec. 15d.).

$A = -\cdot5910$, $B = +\cdot4617$, $C = +\cdot6614$; $\delta = -10$; $h = -2$;
$D = +\cdot616$, $E = +\cdot788$; $G = -\cdot521$, $H = +\cdot407$, $K = -\cdot750$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		2·6	195	0 48	+ 4	i 1 15	− 2	—	—	—
Osaka		8·6	218	2 17	+ 8	4 5	SS	—	—	—
Irkutsk		27·6	307	e 5 56	+ 5	e 10 27	− 5	—	—	13·4
Andijan		51·1	295	e 9 7	+ 1	—	—	e 11 48	PPP	—
Sverdlovsk		52·1	316	9 12	− 2	16 37	− 1	—	—	25·2
Tashkent		52·9	297	—	—	e 16 44	− 4	—	—	e 25·7
Moscow		63·9	324	e 10 30	− 7	—	—	—	—	33·2
Pulkovo		64·5	330	e 11 16	+35	—	—	—	—	34·2
Tiflis		68·4	308	e 11 3	− 3	—	—	—	—	e 36·2
Tinemaha		72·8	56	e 11 53	pP	—	—	—	—	—
Haiwee	z.	73·4	57	e 11 53	pP	—	—	—	—	—
Pasadena	z.	74·7	58	e 11 42	− 1	—	—	e 12 3	pP	—
Riverside	z.	75·3	58	e 11 46	− 1	—	—	e 12 5	pP	—
Ksara		78·9	305	e 12 5	− 2	e 22 23	PS	—	—	—
Tucson		80·6	56	e 12 15	− 1	—	—	—	—	—
Weston	z.	91·2	24	i 13 7k	− 1	—	—	—	—	—

Additional readings :—
Tiflis eZ = +34m.3s.
Tucson i = +12m.30s. and +12m.42s.
Long waves were also recorded at Baku, Stuttgart, Uccle, De Bilt, Bidston, Kew, and Paris.

Jan. 13d. Readings also at 0h. (Williamstown, near San Francisco, near Tiflis, and Grozny), 1h. (Tchimkent and Andijan), 2h. (Mizusawa), 4h. (Riverside), 5h. (Tashkent, Frunse, Samarkand, and Andijan), 6h. (Christchurch, Andijan, Samarkand, and Frunse), 7h. (Tucson), 8h. (Wellington, New Plymouth, and Christchurch), 9h. (Andijan), 10h. (Tananarive), 11h. (Batavia and Medan), 14h. (Pasadena, Riverside, Mount Wilson, and Tinemaha), 15h. (Columbia), 16h. (Butte, Pulkovo, Andijan, Frunse, Sverdlovsk, and Moscow), 20h. (Baku, Ksara, Sverdlovsk, Moscow, Tiflis (3), Grozny, Piatigorsk (2), Sotchi (2), and Erevan (2)), 21h. (Riverside, Mount Wilson, Tinemaha, and Tucson), 23h. (Tiflis (2)).

Jan. 14d. Readings at 1h. (Riverside, Mount Wilson, and Tucson), 4h. (Andijan), 8h. (Ksara, Grozny, Ottawa, and Tiflis), 9h. (Tiflis, Pasadena, Tinemaha, Mount Wilson, Tucson, and Christchurch), 10h. (Mizusawa), 11h. (Mizusawa, La Paz, Batavia, and Malabar), 13h. (Apia), 14h. (Mizusawa and Tucson), 15h. (Seattle, Berkeley, Osaka, Haiwee, Tucson, Mount Wilson, Pasadena, Tinemaha, and Riverside), 18h. (Mizusawa and Tiflis), 19h. (La Paz), 20h. (La Paz, Samarkand, Agra, and Andijan), 21h. (Baku and Sverdlovsk).

Jan. 15d. Readings at 1h. (Tinemaha, Riverside, Mount Wilson, Tucson, Ottawa, and Shawinigan Falls), 7h. (Arapuni and Wellington), 8h. (Brisbane, Sydney, Riverview, Melbourne, Adelaide, Ksara, and Tucson), 10h. (near Taihoku), 11h. (Tucson), 13h. (College, Almata, Tchimkent, Samarkand, Haiwee, Tucson, Sverdlovsk, Baku, Pasadena, Tinemaha, Riverside, Mount Wilson, Andijan, and Frunse), 14h. (Weston) 16h. (Mizusawa), 19h. (Tiflis), 21h. (Agra, Branner, Andijan, and Frunse), 22h. (Mizusawa), 23h. (Tucson).

Jan. 16d. 0h. Epicentre probably in the Arctic, but not determinable from the readings.

Vladivostok i = 12m.38s., e = 38m.32s.
Pulkovo eP = 16m.21s., e = 20m.48s., eL = 22m.30s.
Sverdlovsk P = 17m.17s., S = 22m.35s., L = 25m.30s.
Moscow e = 17m.24s., L = 23m.30s.
Collmberg e = 17m.28s., i = 17m.35s.
Weston ePZ = 19m.37s., eSZ = 24m.24s., LN = 36m.20s.
Andijan e = 20m.2s. and 22m.38s.
Tiflis ePNZ = 20m.52s., eLNZ = 36m.
Frunse e = 21m.6s.
Tinemaha eP = 21m.15s.
Haiwee ePN = 21m.29s.

Continued on next page.

Mount Wilson iPZ = 21m.33s., iZ = 21m.42s.
Pasadena ePZ = 21m.33s., eLE = 43m.36s.
Riverside iPZ = 21m.33s.
Tucson iP = 21m.39s. and 21m.42s., i = 21m.47s., iP_cP = 22m.8s.
Irkutsk e = 31m., L = 33m.
Agra eE = 41m.37s.
Long waves were also recorded at Baku and Philadelphia.

Jan. 16d. 2h. 13m. 25s. Epicentre 9°·0N. 146°·0E.

Recorded and felt at Agana Guam. Also felt in the Yigo district about 13 miles east of Agana. Epicentre in the Nero Deep.

W. C. Repetti.

Seismological Bulletin for 1939. Manila Central Observatory, Manila, 1940, p. 7.

A = −·8190, B = +·5524, C = +·1554; δ = +6; h = +7;
D = +·559, E = +·829; G = −·129, H = +·087, K = −·988.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		25·1	285	i 5 27	+ 1	9 54	+ 3	—	—	12·8
Zi-ka-wei	Z.	31·8	318	e 5 59	−29	—	—	e 7 9	PP	—
Phu-Lien		39·7	292	e 9 1	PP	—	—	—	—	—
Riverview		42·9	174	e 11 29	?	e 18 47	SSS	—	—	e 21·2
Melbourne		46·6	181	e 12 29	?	—	—	—	—	24·9
Calcutta	N.	56·8	291	—	—	e 16 28	?	—	—	—
Agra	E.	66·4	296	e 10 34	−19	19 24	−19	11 1	pP	—
Frunse		70·3	312	e 12 42	?	—	—	—	—	—
Bombay	E.	71·3	287	—	—	i 20 30	−11	i 21 25	PS	—
Andijan		71·8	310	e 11 39	+13	—	—	—	—	—
Sverdlovsk		80·0	327	12 5	− 8	21 51	−26	—	—	32·7
Baku		88·8	311	e 12 58	+ 1	e 23 25	[0]	—	—	48·6
Tinemaha		89·2	53	e 13 1	+ 2	—	—	—	—	—
Pasadena		89·8	55	e 13 6	+ 4	e 23 47	−6	—	—	e 44·2
Mount Wilson	Z.	89·9	55	e 13 7	+ 5	—	—	—	—	—
Riverside		90·5	55	i 13 8	+ 3	—	—	—	—	—
Tiflis		92·3	313	—	—	e 23 28	[−18]	—	—	e 46·6
Tucson		96·2	56	e 13 38	+ 7	—	—	17 22	PP	e 41·0
Ksara		101·3	307	e 13 58	+ 4	25 12	−19	e 17 50	PP	—
La Paz	Z.	145·9	106	e 20 7	[+27]	—	—	—	—	—

Additional readings :—
Manila iPN = +5m.31s.
Melbourne i = +13m.21s. and +21m.29s.
Agra pPE = +13m.21s., SSE = +20m.21s. and +23m.53s.
Tiflis eZ = +23m.52s.
Tucson P = +13m.41s. and +13m.45s., PPP = +19m.38s.
Ksara PPS = +27m.56s.
Long waves were also recorded at Philadelphia, Moscow, Pulkovo, Cheb, Berkeley, and Fordham.

Jan. 16d. Readings also at 0h. (Mizusawa), 3h. (near Tananarive), 4h. (Collmberg, Tucson and Cheb), 6h. (near Medan), 7h. (Tucson), 10h. (Tucson), 11h. (Tchimkent, Samarkand, Andijan, Frunse, and Mizusawa), 13h. (Almata and Frunse), 18h. (La Paz and Tiflis), 19h. (Tiflis (2)), 20h. (Tiflis).

Jan. 17d. Readings at 8h. (Riverside, Tinemaha, Mount Wilson, Pasadena, and Tucson), 9h. (Almata, Butte, Ksara, Grozny, Tiflis, Baku, Sverdlovsk, Agra, Frunse, Samarkand, Tchimkent, Andijan, and Helwan), 10h. (Cape Town, Irkutsk, and Helwan), 12h. (Wellington and Andijan), 13h. (Tashkent, Tchimkent, Samarkand, and Frunse), 15h. (Collmberg, Bucharest, Sofia, Rome, Triest, and Cheb), 16h. (Sverdlovsk and Baku), 18h. (Apia, Baku, Sverdlovsk, Cheb, Tiflis, Grozny, and Ksara), 19h. (Fordham (2), Andijan, and Tucson), 21h. (Agra and Bombay).

Jan. 18d. 1h. 44m. 18s. Epicentre 29°·5S. 71°·5W. (as on 1937 Mar. 19d.).

$A = +\cdot2766$, $B = -\cdot8267$, $C = -\cdot4899$; $\delta = -6$; $h = +2$;
$D = -\cdot948$, $E = -\cdot317$; $G = -\cdot155$, $H = +\cdot465$, $K = -\cdot871$.

Pasadena suggests depth 90-100kms.

A focus at the base of the superficial layers has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata		12·7	119	2 58a	− 3	5 9	−13	—	—	6·0
La Paz		13·3	14	i 3 11a	+ 2	i 6 0	+23	i 6 8	SSS	6·8
Huancayo		17·8	347	i 4 10	+ 3	e 7 28	+ 6	i 4 29	PP	e 8·6
Rio de Janeiro		26·2	82	e 5 37	+ 4	i 10 1	0	—	—	i 12·7
Fort de France		45·1	16	e 8 27	+12	—	—	—	—	—
San Juan		47·9	7	e 8 44	+ 7	e 15 8	−23	18 52	SS	i 19·7
Little Rock		66·9	342	e 10 46	− 5	e 19 32	− 8	e 10 53	pP	—
Cape Girardeau	E.	68·6	345	i 10 58	− 4	e 19 53	− 8	i 11 16	pP	—
Fordham		70·0	0	i 11 8k	− 2	—	—	i 11 27	pP	—
St. Louis		70·0	345	i 11 7	− 3	e 20 11	− 6	i 11 27	pP	—
Florissant		70·2	345	i 11 9	− 2	i 20 15	− 4	i 11 27	pP	—
Weston		71·5	1	i 11 18	− 1	—	—	i 11 22	pP	—
Harvard		71·7	1	i 10 19a	−61	—	—	—	—	—
Tucson		71·9	326	i 11 21k	− 1	20 38	− 1	i 11 42	pP	34·4
Williamstown		71·9	0	i 11 22	0	—	—	i 11 40	pP	—
Riverside		76·6	322	i 11 49k	0	e 21 27	− 5	—	—	—
Mount Wilson		77·1	323	i 11 51k	− 1	e 21 38	+ 1	i 12 18	pP	—
Pasadena		77·2	323	i 11 52k	0	i 21 38	0	i 12 13	pP	—
Santa Barbara		78·2	321	i 11 58k	0	—	—	—	—	—
Haiwee		78·6	324	i 11 59k	− 1	—	—	—	—	—
Tinemaha		79·4	324	i 12 4k	0	i 22 1	− 1	—	—	—
Lick		81·4	323	e 12 20	+ 5	—	—	—	—	—
Berkeley		82·1	323	e 12 18a	− 1	—	—	—	—	—
San Francisco		82·2	323	e 12 19	0	—	—	—	—	—
Helwan	E.	114·8	68	—	—	i 25 14	[− 8]	—	—	—
Ksara		119·2	66	e 20 13	PP	e 30 0	PS	e 36 5	SS	—
Tiflis		127·9	58	e 19 22	[+19]	e 31 0	PS	e 21 19	PP	e 60·7
Grozny		128·8	56	e 19 25	[+21]	—	—	e 21 27	PP	—
Baku		131·5	60	e 21 36	PP	e 31 59	PS	—	—	64·7
Sverdlovsk		136·9	36	e 19 42	[+23]	—	—	—	—	58·7
Samarkand		144·6	62	e 19 33	[0]	—	—	—	—	—
Tchimkent		146·3	56	e 19 36	[0]	—	—	—	—	—
Frunse		149·8	54	e 19 45	[+ 4]	—	—	—	—	—

Additional readings :—
La Paz iZ = +6m.39s.
San Juan eP = +8m.51s., iS = +15m.19s.
Cape Girardeau esSE = +20m.25s.
Fordham i = +11m.35s.
St. Louis iP_cP = +11m.34s., eEN = +11m.40s., isSE = +20m.42s.
Florissant iN = +11m.35s., isS = +20m.47s.
Weston iZ = +11m.36s. and +11m.44s., eZ = +12m.11s. and +15m.6s.
Tucson iP_cP = +11m.38s., isP = +11m.52s., iPP = +14m.0s., ipPP = +14m.21s., isPP = +14m.53s., PPP = +16m.4s., isS = +21m.8s.
Williamstown iP_cP = +11m.49s., i = +11m.59s.
Pasadena isPEZ = +12m.17s., eEN = +22m.5s.
Helwan iE = +26m.28s.
Ksara iPPS = +31m.6s.
Tiflis eZ = +22m.16s.
Baku i = +22m.31s., e = +28m.2s., +41m.21s., and +52m.42s.
Sverdlovsk e = +28m.50s.
Tchimkent e = +19m.57s.

Jan. 18d. 12h. 40m. 9s. Epicentre 22°·6S. 68°·8W. (as on 1937 Sept. 24d.).

$A = +\cdot3342$, $B = -\cdot8616$, $C = -\cdot3821$; $\delta = +4$; $h = +4$;
$D = -\cdot932$, $E = -\cdot361$; $G = -\cdot138$, $H = +\cdot356$, $K = -\cdot924$.

A depth of focus 0·015 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		0·0	—	i 0 24	+ 7	i 0 40	+ 9	—	—	i 1·1
La Paz		6·1	5	i 1 28a	− 1	i 2 34	− 4	—	—	i 2·9
Huancayo		12·2	328	e 2 44	− 7	e 4 49	−15	—	—	e 5·9
La Plata		15·5	145	3 58	PP	—	—	—	—	7·2
Rio de Janeiro		23·6	95	e 4 51	− 9	9 51	SS	—	—	—
Fordham		63·3	356	i 10 20k	+ 3	—	—	—	—	—
Weston	z.	64·7	358	i 10 30k	+ 3	—	—	e 10 45	pP	—
Harvard		64·8	358	i 10 31a	+ 4	—	—	—	—	—
Williamstown		65·1	357	i 10 32	+ 3	—	—	—	—	—
Tucson		67·7	322	i 10 46k	0	—	—	i 10 51	pP	32·8
Riverside		72·8	319	i 11 16k	0	—	—	i 11 31	pP	—
Mount Wilson		73·4	319	i 11 21k	+ 1	—	—	i 14 0	PP	—
Pasadena		73·4	319	i 11 22	+ 2	i 20 40	+ 3	i 11 36	pP	—
Haiwee	z.	74·6	321	i 11 24k	− 3	—	—	—	—	—
Santa Barbara		74·6	318	i 11 28	+ 1	—	—	—	—	—
Tinemaha		75·5	321	i 11 24k	− 8	i 21 30	+30	—	—	—
Ksara		114·0	62	e 19 49	PP	e 29 24	PS	i 30 31	PPS	—
Tiflis	z.	122·0	54	—	—	e 30 29	PS	—	—	e 61·9
Sverdlovsk		130·7	33	—	—	e 38 46	SS	—	—	56·9
Andijan		142·7	52	e 19 39	[+22]	—	—	e 22 1	PP	—
Irkutsk		149·9	8	e 19 47	[+17]	—	—	—	—	—

Additional readings:—
Montezuma iS = +47s.
Huancayo eS = +4m.55s.
Rio de Janeiro iPE = +5m.21s.
Tucson iPP = +13m.6s., iPKP,PKP = +39m.23s.
Pasadena iPPZ = +14m.2s., iN = +21m.7s.
Long waves were also recorded at Fort de France.

Jan. 18d. Readings also at 0h. (Balboa Heights, Mizusawa, and San Francisco), 1h. (Andijan (2)), 3h. (Fort de France), 6h. (Christchurch and Wellington), 10h. (Tiflis), 11h. (Mount Wilson, Pasadena, and Tucson (2)), 12h. (Tucson (2)), 13h. (Tucson and near Tananarive), 14h. (Mount Wilson, Tinemaha, College, Sitka, Tucson, Pasadena, Mizusawa, Weston, and Fordham), 15h. (Tiflis, near Sofia, Baku, Irkutsk, Vladivostok, Ksara, Sverdlovsk, Tashkent, and Collmberg), 19h. (Sofia and Fordham), 20h. (Vladivostok and Irkutsk), 21h. (Weston, near Williamstown, and Harvard), 22h. (Tucson).

Jan. 19d. 10h. 2m. 35s. Epicentre 18°·0N. 106°·5W.

$A = -\cdot2703$, $B = -\cdot9125$, $C = +\cdot3071$; $\delta = +3$; $h = +5$;
$D = -\cdot959$, $E = +\cdot284$; $G = -\cdot087$, $H = -\cdot294$, $K = -\cdot952$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo	N.	2·3	63	0 42	+ 2	—	—	—	—	—
Guadalajara	N.	4·0	47	1 7	+ 3	—	—	—	—	—
Mazatlan	N.	5·2	1	e 1 36	P*	—	—	—	—	—
Tacubaya	N.	7·0	78	1 42	− 4	—	—	—	—	—
Oaxaca	N.	9·3	94	2 13	− 4	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		14·7	346	i 3 34k	+ 3	6 33	SS	i 3 43	PP	i 7·2
Riverside		18·7	331	i 4 23k	+ 1	—	—	—	—	—
Mount Wilson	z.	19·2	331	i 4 28k	0	—	—	—	—	—
Pasadena		19·2	331	e 4 29k	+ 1	i 8 30	SS	—	—	i 9·7
Santa Barbara	z.	20·2	328	i 4 41	+ 2	—	—	—	—	—
Haiwee		20·7	334	i 4 44	0	—	—	—	—	—
Little Rock		20·9	36	i 4 44	− 2	i 8 49	+14	i 5 0	PP	i 11·6
Tinemaha		21·7	335	i 4 55k	0	—	—	—	—	—
Fresno	N.	22·0	331	e 5 1	+ 3	e 9 52	− 4	—	—	—
Salt Lake City		23·2	350	e 5 16	+ 7	9 42	−36	e 5 31	PP	12·1
Lick		23·4	330	e 5 14	+ 3	—	—	e 5 36	PP	—
Santa Clara		23·6	330	e 5 17	+ 4	i 9 55	+30	—	—	e 13·4
Berkeley		24·1	330	i 5 22	+ 4	i 9 55	+21	e 10 31	SS	i 14·9
Cape Girardeau		24·3	35	e 5 17	− 3	e 10 5	+28	—	—	—
St. Louis		25·0	32	e 5 19	− 8	e 9 38	−11	—	—	e 12·9
Florissant		25·1	32	e 5 24	− 4	e 9 49	− 2	—	—	i 13·2
Ukiah		25·6	330	e 5 32	0	e 9 47	−12	e 6 3	PP	e 11·0
Columbia		27·8	50	e 5 51	− 2	e 10 32	− 3	—	—	e 17·4
Bozeman		27·9	354	e 6 10	+16	e 10 41	+ 4	—	—	e 15·0
Butte		28·4	353	e 7 8	PPP	—	—	—	—	e 14·5
Chicago		28·8	29	—	—	10 52	+ 1	—	—	e 12·1
Toronto		34·3	36	—	—	e 12 15	− 2	—	—	18·4
Fordham		36·1	44	—	—	i 12 47	+ 2	—	—	19·9
Ottawa		37·4	37	e 7 13	− 3	e 13 3	− 2	—	—	e 17·9
East Machias		42·2	42	—	—	e 14 33	+16	—	—	e 21·1
Huancayo		42·9	132	e 8 0	− 2	14 25	− 2	e 9 45	PP	e 18·0
Honolulu		48·3	284	e 8 38	− 7	e 16 3	+18	e 11 57	PPP	e 20·6
La Paz	z.	51·0	130	9 6	0	15 44	−38	—	—	—
Tiflis		114·9	24	—	—	e 29 23	PS	—	—	e 56·4
Ksara		117·2	35	e 18 2	[−45]	—	—	—	—	55·4
Baku		117·9	20	—	—	e 31 25	PPS	—	—	55·7

Additional readings :—
Tucson iPPP = +4m.12s., i = +5m.32s., iS = +6m.36s. and +6m.44s.
Little Rock i = +9m.4s.
Berkeley iSN = +12m.13s., eSEZ = +12m.55s., eE = +13m.6s.
Cape Girardeau eE = +11m.34s.
St. Louis eE = +9m.55s.
Florissant iSE = +9m.56s.
Ukiah eS = +10m.25s.
Columbia eS = +10m.40s.
Huancayo eSS = +16m.34s.
Honolulu eP = +9m.31s., eS_cS = +18m.32s., eSS = +18m.44s.
Long waves were also recorded at Sitka, Philadelphia, College, Kew, Harvard, Weston, Cheb, Irkutsk, Edinburgh, Strasbourg, and Paris.

Jan. 19d. Readings also at 0h. (Tucson and near Mizusawa), 5h. (near Mizusawa), 7h. (La Paz, College, La Plata, Irkutsk, and Vladivostok), 11h. (Wellington), 12h. (Mount Wilson, Pasadena, and Riverside), 13h. (La Paz, Frunse, Samarkand, and near Andijan), 16h. (near Mizusawa), 17h. (near Samarkand), 19h. (College and Malabar), 20h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Sitka, Collmberg, Weston, Ksara (2), Sverdlovsk, Irkutsk, Grozny (2), Vladivostok, Andijan, Samarkand, Baku, Tiflis, and near Erevan), 21h. (Tiflis and near Mizusawa), 22h. (Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, and Collmberg).

Jan. 20d. 1h. 24m. 21s. Epicentre 31°·8N. 16°·8E.

Strongly felt at Misurata (Tripolitania).

Epicentre 31°·8N. 16°·8E. (Strasbourg).

See "Annales de l'Institut de Physique du Globe de Strasbourg," Tome IV, 2e partie 1939, p. 2.

$A = +·8152$, $B = +·2461$, $C = +·5244$; $\delta = +11$; $h = +1$;
$D = +·289$, $E = -·957$; $G = +·502$, $H = +·152$, $K = -·852$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tunis		7·4	314	e2 6	P*	e 3 9	− 9	i4 16	S_q	6·6
Rome		10·6	343	2 51	P*	—	—	5 4	L_q	—
Sofia		12·0	23	e 2 57	+ 2	—	—	—	—	e 7·6
Algiers		12·4	298	2 55	− 6	i 5 19	− 2	—	—	8·1
Helwan		12·6	95	e 3 15	PP	i 5 39	SS	—	—	7·6
Florence		12·7	342	3 20	PP	5 49	SSS	—	—	7·1
Belgrade		13·3	8	e 3 19	+ 6	i 6 8	SS	e 3 27	PP	9·2
Triest		14·0	353	e 3 44	PPP	e 6 53	?	—	—	8·4
Marseilles		14·6	325	—	—	e 6 39	SSS	—	—	—
Moncalieri		15·0	335	e 2 41	−54	6 6	−17	—	—	9·5
Ksara		16·2	78	e 3 57	+ 7	7 12	+21	e 7 45	SS	—
Almeria		16·6	293	e 3 40	−16	e 6 46	−14	—	—	e 9·2
Zurich		16·8	340	e 3 51	− 7	e 7 5	0	—	—	—
Neuchâtel		16·9	337	e 3 54	− 5	—	—	—	—	—
Basle		17·2	339	e 3 54	− 9	e 7 14	0	—	—	—
Granada		17·6	294	i 3 53a	−15	i 6 58	−25	—	—	i 11·6
Clermont Farrand		17·6	326	i 4 3	− 5	e 7 25	+ 2	—	—	—
Stuttgart		17·9	345	e 4 9	− 3	e 7 22	− 8	e 4 31	PP	e 10·6
Strasbourg		18·1	342	e 4 11	− 3	i 7 36	+ 1	—	—	e 8·6
Prague		18·3	356	—	—	e 7 33	− 6	—	—	e 9·0
Cheb		18·5	352	—	—	e 7 39?	− 5	—	—	—
Toledo		18·7	302	e 4 8	−14	e 7 40	− 8	—	—	—
San Fernando	E.	19·6	290	e 4 53	PP	e 7 48	−20	—	—	10·6
Collmberg		19·7	353	i 4 28	− 6	e 8 17	+ 7	i 4 57	PP	e 10·6
Paris		20·1	333	e 6 8	?	e 8 15	− 4	—	—	13·6
Göttingen		20·4	349	e 4 39	− 2	e 7 39?	?	—	—	e 10·6
Uccle		21·1	338	e 4 49	+ 1	i 8 36	− 3	—	—	e 9·6
De Bilt		22·0	342	—	—	i 8 51	− 5	—	—	15·6
Hamburg	E.	22·3	350	e 7 39?	?	—	—	—	—	—
Copenhagen		24·1	355	e 5 28	+10	9 39	+ 5	—	—	—
Tiflis		24·4	58	e 5 22	+ 1	9 52	+13	e 5 42	PP	e 12·0
Grozny		25·5	55	e 5 36	+ 4	—	—	e 5 54	PP	—
Stonyhurst		26·0	335	—	—	i 9 41	−25	—	—	—
Baku		28·0	62	—	—	e 10 54	+16	—	—	16·6
Moscow		28·0	26	e 5 29	−26	e 10 1	−37	—	—	e 14·1
Pulkovo		29·4	14	e 6 33	+26	e 11 9	+ 8	—	—	e 12·1
Sverdlovsk		39·1	37	e 7 30	− 1	—	—	—	—	14·6
Agra	E.	52·9	78	—	—	e 21 23	SSS	—	—	—
Calcutta	N.	63·3	78	—	—	e 23 18	SS	—	—	—
Colombo	E.	63·5	98	e 10 9	−25	—	—	—	—	—
Weston	Z.	68·1	307	e 10 50	−14	—	—	—	—	—
Rio de Janeiro		79·1	234	—	—	e 30 39	SSS	—	—	75·6

Additional readings :—
Tunis i = +4m.39s. ?
Rome iE ≐ +3m.43s.
Algiers PP = +3m.57s., SS = +6m.55s.
Helwan iZ = +4m.46s.
Belgrade i = +6m.47s.
Granada PP = +4m.4s.
Stuttgart eSS = +7m.55s., eL_qE = +9m.9s.
Strasbourg iZ = +5m.56s.
Toledo e = +7m.23s.
San Fernando iSN = +7m.52s.

Continued on next page.

Collmberg iP = +4m.32s., i = +5m.13s., iZ = +5m.39s., i = +5m.52s., e = +6m.19s., i = +6m.45s. and e = +9m.44s.
Uccle i = +8m.42s.
De Bilt iSN = +8m.54s.
Tiflis eE = +5m.39s., eSE = +9m.56s., iZ = +10m.4s.
Stonyhurst i = +10m.41s.
Sverdlovsk e = +8m.18s.
Long waves were also recorded at Tananarive, Bombay, Aberdeen, Durham, Istanbul, Kew, Bucharest, Edinburgh, Cape Town, Bidston, La Paz, and Huancayo.

Jan. 20d. 14h. 22m. 30s. Epicentre 31°·8N. 16°·8E. (as at 1h.).

A = +·8152, B = +·2461, C = +·5244 ; δ = +11 ; h = +1.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tunis		7·4	314	e 1 51	− 1	i 4 21	S_g	—	—	5·5
Rome		10·6	343	2 42$_a$	+ 6	i 4 38	+ 1	i 5 52	L_q	—
Sofia		12·0	23	e 3 0	+ 5	e 5 24	SS	—	—	(7·2)
Algiers		12·4	298	2 59	− 2	6 49	L	—	—	(6·8)
Helwan		12·6	95	3 6	+ 3	7 30	L	3 38	PPP	(e 7·5)
Florence		12·7	342	2 53	−12	5 52	SSS	—	—	—
Belgrade		13·3	8	e 3 20$_a$	+ 7	i 6 0	SS	—	—	9·1
Istanbul		13·5	42	4 56	?	8 17	?	—	—	e 12·1
Triest		14·0	353	e 3 32	PP	e 6 40	SSS	—	—	8·7
Bucharest		14·5	27	e 3 38	+10	6 28	SS	—	—	9·0
Marseilles		14·6	325	e 3 0	−30	e 7 30	L	—	—	(e 7·5)
Kecskemet	Z.	15·2	6	e 3 44	+ 6	—	—	—	—	—
Budapest		15·8	5	e 3 57	PP	e 7 0	SS	—	—	—
Chur		16·0	342	e 3 52	+ 4	e 7 2	SS	—	—	—
Ksara		16·2	78	e 3 59	+ 9	i 7 15	+24	—	—	—
Almeria		16·6	293	i 3 45	−11	—	—	—	—	e 9·7
Zurich		16·8	340	e 3 55	− 3	e 7 14	+ 9	—	—	—
Neuchatel		16·9	337	e 3 58	− 1	e 7 7	0	—	—	—
Basle		17·2	339	e 4 3	0	—	—	—	—	—
Granada		17·6	294	i 3 59$_a$	− 9	i 7 35	+12	—	—	11·7
Cernauti		17·9	20	e 4 6	− 6	—	—	—	—	7·5
Stuttgart		17·9	345	e 4 11	− 1	e 7 55	SS	—	—	e 9·6
Strasbourg		18·1	342	e 4 14	0	e 7 36	+ 1	e 4 32	PP	—
Prague		18·3	356	e 4 59	PPP	e 7 48	+ 9	—	—	—
Cheb		18·5	352	—	—	e 7 30?	−14	—	—	—
Toledo		18·7	302	e 4 12	−10	e 7 44	− 4	—	—	—
Jena		19·5	352	e 4 30	− 1	—	—	—	—	—
San Fernando		19·6	290	e 4 20	−12	e 7 52	−16	—	—	11·0
Collmberg		19·7	353	e 4 31	− 3	e 8 18	+ 8	i 5 5	PPP	e 9·5
Paris		20·1	333	(e 5 30?)	PPP	—	—	—	—	e 5·5
Göttingen		20·4	349	e 5 0	PP	e 8 30?	+ 5	—	—	e 11·5
Uccle		21·1	338	e 4 52	+ 4	i 8 38	− 1	—	—	e 10·5
Sotchi		21·5	50	e 4 55	+ 3	—	—	—	—	—
De Bilt		22·0	342	—	—	i 9 2	+ 6	—	—	11·5
Hamburg	E.	22·3	350	—	—	e 9 30?	SS	—	—	—
Copenhagen		24·1	355	e 5 26	+ 8	—	—	—	—	—
Tiflis		24·4	58	5 24	+ 3	9 59	+20	e 5 47	PP	e 13·5
Grozny		25·5	55	e 5 34	+ 2	i 10 24	+27	—	—	—
Baku		28·0	62	e 6 36	PP	e 10 50	+12	12 11	SS	16·6
Moscow		28·0	26	e 6 7	+12	e 11 1	+23	—	—	16·0
Upsala		28·1	0	—	—	e 9 30?	−70	—	—	—
Pulkovo		29·4	14	e 6 10	+ 3	e 11 8	+ 7	—	—	e 13·1
Sverdlovsk		39·1	37	7 35	+ 4	13 36	+ 5	—	—	20·5
Tchimkent		42·8	60	e 8 8	+ 7	—	—	—	—	—
Andijan		45·0	62	e 8 36	+17	—	—	—	—	—
Agra	E.	52·9	78	—	—	e 18 12	?	22 38	SSS	—
Calcutta	N.	63·3	78	—	—	e 18 54	−10	—	—	—
Weston		68·1	307	e 10 58	− 6	—	—	—	—	—

For Notes see next page.

NOTES TO JAN. 20d. 14h. 22m. 30s.

Additional readings :—
Tunis e = +2m.51s.
Rome iE = +3m.12s. and +4m.0s., iZ = +4m.55s., iE = +5m.8s., iZ = +5m.44s., iZ = +6m.12s.
Helwan iZ = +4m.27s.
Belgrade iNW = +6m.43s.
Bucharest eN = +4m.38s.
Kecskemet e = +4m.36s.
Strasbourg i? = +5m.32s.
San Fernando eSE = +7m.54s.
Collmberg iP = +4m.35s., e = +7m.13s.
Uccle i = +8m.47s.
Sotchi e = +5m.51s.
De Bilt iE = +9m.12s.
Tiflis ePPPZ = +6m.1s., iZ = +10m.7s., iN = +10m.21s., eSSE = +11m.1s., eSSN = +11m.17s.
Baku e = +7m.15s. and +13m.54s.
Andijan e = +13m.5s.
Long waves were also recorded at Tashkent, Jersey, Irkutsk, Vladivostok, Huancayo, La Paz, Bidston, Cape Town, Kew, Tananarive, Colombo, Stonyhurst, and Aberdeen.

Jan. 20d. 20h. 40m. 16s. Epicentre 12°·9N. 91°·4W.

Pasadena suggests depth 70km.

A = −·0238, B = −·9748, C = +·2218 ; δ = 0 ; h = +6 ;
D = −·1000, E = +·024 ; G = −·005, H = −·222, K = −·975.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Salvador		2·3	68	i 1 18	?	i 1 51	?	—	—	—
Oaxaca	N.	6·6	309	1 42	+ 1	—	—	—	—	—
Merida	N.	8·2	13	2 10	+ 7	—	—	—	—	—
Puebla	N.	9·0	312	2 12	− 1	—	—	—	—	—
Tacubaya	N.	9·9	312	2 27	+ 2	—	—	—	—	—
Balboa Heights		12·2	107	i 3 3	+ 5	—	—	—	—	e 7·6
Guadalajara	N.	13·8	306	e 3 21	+ 2	—	—	—	—	—
Manzanillo	E.	13·8	298	—	—	e 6 8	SS	—	—	—
Port au Prince		19·2	71	e 3 50	−38	i 7 23	−36	—	—	10·0
Little Rock		21·8	359	i 4 56	0	i 8 46	− 6	i 5 3	pP	11·7
Columbia		23·0	22	e 5 8	+ 1	9 14	0	—	—	e 11·4
Cape Girardeau		24·4	3	e 5 19	− 2	e 9 39	0	i 5 28	pP	e 14·4
San Juan		24·9	74	5 25	− 1	i 9 55	+ 8	—	—	i 10·7
St. Louis		25·7	2	e 5 34	+ 1	e 10 4	+ 3	e 5 54	pP	e 12·7
Florissant		25·8	2	e 5 33	− 1	i 10 7	+ 5	i 5 55	pP	13·6
Tucson		26·2	321	i 5 38k	0	i 10 15	+ 6	i 6 24	PP	i 12·0
Georgetown		28·8	24	i 6 0	− 2	i 10 51	0	—	—	—
Chicago		29·1	5	e 5 59	− 5	e 10 47	− 9	e 6 41	PP	e 11·8
Fort de France		29·4	84	i 6 10	+ 3	e 11 44	+43	7 14	PPP	e 16·1
Huancayo		29·5	146	6 4	− 4	i 11 13	+11	—	—	i 13·4
Philadelphia		30·5	26	i 6 16	− 1	e 11 15	− 3	e 7 12	PP	e 12·3
Riverside		31·6	317	i 6 25k	− 1	e 13 20	SS	e 9 16	P_cP	—
Fordham		31·8	26	i 6 27k	− 1	i 11 38	0	—	—	—
Mount Wilson		32·2	317	i 6 31k	− 1	e 11 49	+ 4	e 7 48	PP	—
Pasadena		32·2	317	i 6 31k	− 1	e 11 57	+12	i 7 46	PP	e 14·8
Toronto		32·4	16	6 30	− 4	11 41	− 7	13 4	SS	e 14·2
Salt Lake City		33·1	332	e 6 46	+ 6	e 12 7	+ 8	—	—	e 14·7
Haiwee		33·3	319	i 6 41k	0	e 12 2	0	—	—	—
Santa Barbara		33·5	315	i 6 42	− 1	—	—	e 8 0	PP	—
Williamstown		33·6	26	i 9 40	P_cP	—	—	—	—	—
Tinemaha		34·0	321	i 6 46k	− 2	i 17 22	S_cS	e 7 59	PP	—
Harvard		34·1	27	i 6 49k	+ 1	i 12 14	0	i 8 9	PP	e 17·7
Weston		34·2	27	i 6 48k	− 1	i 12 13	− 3	12 54	P_cS	† 16·1
Fresno	N.	34·8	319	i 6 55	+ 1	—	—	—	—	—
Ottawa		35·0	19	i 6 55	− 1	i 12 26	− 2	8 1	PP	e 17·7

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Lick		36·4	318	e 7 8	0	—	—	—	—	—
Santa Clara		36·5	318	i 7 10	+ 1	e 12 56	+ 5	—	—	e 19·2
Bozeman		36·7	339	e 7 12	+ 2	e 12 52	− 2	e 8 51	PPP	e 23·0
Branner		36·8	318	e 7 14	+ 3	—	—	—	—	—
Berkeley		37·1	318	i 7 11k	− 3	e 13 1	0	i 8 39	PP	e 20·4
Shawinigan Falls		37·1	22	7 12	− 2	12 56	− 5	—	—	e 17·7
La Paz		37·2	140	i 7 15k	0	i 13 25	+23	i 8 48	PP	19·2
Butte		37·6	338	i 7 17	− 1	i 13 8	0	e 8 48	PP	e 18·2
East Machias		37·8	28	e 7 20	0	13 13	+ 2	e 8 48	PP	e 15·9
Seven Falls		38·2	23	7 38	+15	13 26	+ 9	—	—	18·7
Ukiah		38·4	319	e 7 33	+ 8	e 13 24	+ 4	e 9 4	PP	e 16·2
Saskatoon		41·0	347	e 7 44	− 2	e 13 44?	−15	e 9 26	PP	e 28·7
Seattle		43·3	331	e 7 48	−17	14 37	+ 4	9 32	PP	e 18·0
Victoria		44·2	331	e 8 6	− 6	14 40	− 6	18 20	SSS	e 21·7
Sitka		55·3	334	—	—	i 17 26	+ 5	—	—	e 31·7
La Plata		57·2	147	9 53	+ 2	17 47	+ 1	—	—	23·7
Ivigtut		57·4	23	15 6	?	—	—	—	—	—
Rio de Janeiro		59·1	126	e 10 7	+ 3	i 19 15	+64	—	—	e 29·9
College		64·5	338	e 10 40	− 1	e 19 26	+ 7	22 15	SS	26·7
San Fernando		78·6	55	e 12 8	+ 3	—	—	—	—	43·7
Toledo		79·9	52	i 12 12	0	—	—	—	—	—
Granada		80·6	54	i 12 14a	− 2	21 58	−25	—	—	—
Uccle		83·7	39	e 12 32	0	—	—	—	—	e 42·7
Neuchatel		86·3	43	e 12 46	+ 1	—	—	—	—	—
Hamburg	z.	86·4	36	i 12 47	+ 2	—	—	—	—	—
Strasbourg		86·4	41	e 12 46	+ 1	e 23 32	+11	—	—	e 47·7
Basle		86·6	42	e 12 47	+ 1	e 21 31	?	—	—	—
Göttingen		87·0	37	e 12 50	+ 2	—	—	—	—	—
Copenhagen		87·1	33	i 12 50	+ 1	23 34	+ 6	—	—	—
Stuttgart		87·3	41	i 12 50	0	e 23 38	+ 9	—	—	e 46·7
Zurich		87·3	42	e 12 50	0	—	—	e 16 38	PP	—
Chur		88·0	43	e 12 55k	+ 2	—	—	—	—	—
Jena		88·1	38	e 12 54	0	—	—	—	—	—
Upsala		88·2	28	—	—	e 23 19	[− 2]	e 23 34	S	—
Collmberg		88·8	37	i 12 57k	0	—	—	i 16 24	PP	—
Cheb		88·9	38	e 12 44?	−14	e 23 44?	0	—	—	e 49·7
Florence		90·0	45	13 0	− 3	23 14	[−19]	—	—	—
Triest		91·2	42	i 13 9	+ 1	e 23 44	[+ 4]	13 31	pP	—
Rome		91·6	47	i 13 10k	0	i 24 8	− 1	14 48	pP	—
Pulkovo		93·9	26	13 21	0	24 0	[+ 5]	e 17 23	PP	45·2
Moscow		99·4	26	e 13 47	+ 1	e 24 27	[+ 3]	—	—	48·2
Sverdlovsk		106·8	15	—	—	i 25 6	[+ 8]	28 9	PS	46·2
Helwan		110·3	51	i 19 8	PP	i 25 20	[+ 7]	—	—	—
Vladivostok		111·0	327	e 19 20	PP	e 29 4	PS	i 21 47	PPP	—
Ksara		111·6	46	i 14 49	P	26 29	{+13}	e 19 20	PP	—
Grozny		111·7	31	e 19 56	PP	—	—	—	—	—
Tiflis		112·3	33	e 14 51	P	e 25 28	[+ 7]	i 19 25	PP	e 51·7
Irkutsk		113·7	350	19 34	PP	e 28 44?	PS	e 35 44	SS	61·7
Baku		116·0	31	i 19 49	PP	29 21	PS	e 31 25	PPS	58·7
Semipalatinsk		116·5	5	e 19 8	[+22]	—	—	—	—	—
Tashkent		123·2	17	i 20 41	PP	e 27 41	{+ 6}	e 42 44	SSS	e 59·7
Melbourne		124·3	234	e 20 49	PP	e 30 44	PS	i 38 19	SSP	59·2
Manila		137·9	309	e 19 29	[+ 2]	24 31	?	—	—	—
Agra	E.	138·9	14	e 18 8	?	—	—	—	—	—
Calcutta	N.	144·0	0	e 19 44	[+ 7]	—	—	—	—	—
Bombay		144·8	27	e 19 39	[0]	—	—	—	—	—
Colombo	E.	158·5	26	e 19 44?	[−15]	—	—	—	—	—
Batavia		160·8	289	19 50	[−11]	—	—	—	—	—
Medan		160·8	327	20 25	[+24]	—	—	—	—	—

For Notes see next page.

NOTES TO JAN. 20d. 20h. 40m. 16s.

Additional readings :—
Balboa Heights eN = +4m.22s., iE = +4m.24s.
Little Rock iPP = +5m.13s., i = +6m.52s., isS = +8m.59s.
Cape Girardeau isSE = +10m.2s.
St. Louis iPPN = +6m.4s., isSEN = +10m.31s.
Florissant iZ = +9m.59s., isSN = +10m.39s.
Tucson iP = +5m.50s., iPPP = +6m.33s., i = +6m.41s. and +7m.7s., iP_cP = +8m.31s., i = +8m.48s. and +9m.6s., iS = +10m.26s., i = +10m.31s.
Chicago eP_cP = +8m.40s., eS = +11m.23s.
Fort de France PPP = +7m.38s., SS = +13m.32s., SSS = +14m.0s.
Huancayo iP = +6m.9s., iS = +11m.20s.
Philadelphia iS = +11m.19s.
Mount Wilson iP_cPZ = +9m.20s., iS_cPZ = +13m.23s.
Pasadena iP_cPZ = +9m.20s., iS_cPZ = +13m.20s.
Santa Barbara iP_cPZ = +9m.24s.
Tinemaha iP_cPZ = +9m.24s.
Harvard eSSZ = +14m.44s.?
Ottawa PPP = +8m.20s., e = +15m.6s.
Lick eN = +7m.19s.
Berkeley P = +7m.14s., iZ = +10m.45s., eN = +17m.14s.
La Paz P_cP = +9m.36s., iSSE = +15m.53s.
Saskatoon e = +17m.32s.
Seattle eP = +8m.40s., ePPP = +10m.35s., S = +14m.57s., eSS = +17m.5s.
Strasbourg i = +13m.2s.
Stuttgart iZ = +12m.56s.
Collmberg i = +13m.10s., iZ = +13m.20s., e = +13m.32s.
Triest iS = +24m.5s.
Rome iZ = +13m.17s., iN = +13m.21s., iEN = +13m.36s., iN = +13m.56s., iPPZ = +16m.54s.
Pulkovo eS = +24m.30s.
Sverdlovsk SS = +33m.56s.
Helwan iE = +26m.14s.
Vladivostok e = +30m.58s.
Ksara PS = +28m.53s., PPS = +29m.53s., SS = +35m.9s.
Tiflis eZ = +18m.57s., ePPE = +19m.15s., ePPPZ = +22m.48s., eZ = +25m.53s., ePSZ = +28m.28s., eN = +28m.48s., eZ = +28m.59s., eE = +30m.2s.
Tashkent iPKS = +22m.12s.
Bombay iEN = +20m.1s. and +20m.6s., iEN = +21m.11s.
Batavia iEZ = +20m.4s., eE = +20m.23s., iZ = +20m.44s., iN = +21m.31s.
Medan iN = +21m.21s.
Long waves were also recorded at Moncalieri, Bidston, Cape Town, De Bilt, Kew, Jersey, and Stonyhurst.

Jan. 20d. Readings also at 0h. (Osaka), 4h. (New Plymouth, Wellington, and Christchurch), 8h. (Piatigorsk, Cape Girardeau, Tacubaya, Puebla, Oaxaca, Tucson, Tinemaha, Pasadena, Mount Wilson, and Riverside), 9h. (Hukuoka), 11h. (Moncalieri, Weston, Mount Wilson, Pasadena, Tinemaha, and Tucson), 12h. (Helwan, Manila, Riverside, Tucson, Tinemaha, Pasadena, and Mount Wilson), 13h. (Cheb, Columbia, and Manila), 17h. (Andijan, Tchimkent, Frunse, and Samarkand), 18h. (Andijan, Tchimkent, Frunse, and Samarkand), 19h. (Balboa Heights, Port au Prince, and La Paz), 20h. (La Paz), 22h. (Mizusawa (2)), 23h. (Mizusawa).

Jan. 21d. Readings at 1h. (San Juan, Fordham, and Weston), 4h. (Bozeman), 7h. (Agra, Andijan, and Lick), 8h. (Andijan and Tchimkent), 9h. (Andijan), 11h. (La Paz), 12h. (Helwan), 15h. (La Paz), 16h. (Harvard), 18h. (near Mizusawa), 21h. (Fordham), 22h. (2) and 23h. (Tucson).

Jan. 22d. 4h. 41m. 4s. Epicentre 55°·0N. 130°·0E.

A = −·3704, B = +·4414, C = +·8173 ; δ = +1 ; h = −7 ;
D = +·766, E = +·643 ; G = −·525, H = +·626, K = −·576.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Vladivostok		12·0	173	e 3 12	PPP	i 6 8	?	—	—	i 7·1
Mori		14·7	147	4 3	+32	8 30	?	—	—	—
Irkutsk		15·5	270	e 3 44	+ 2	6 43	+ 8	—	—	i 8·0
Mizusawa	E.	17·5	150	e 4 32	PP	9 44	L	—	—	(9·7)
Tokyo Cen. Met. Ob.		20·5	157	4 44	+ 2	11 1	L	—	—	(11·0)
Miyazaki		23·1	177	7 44	?	14 35	?	—	—	—
Zi-ka-wei	N.	24·6	197	e 5 34	+11	—	—	—	—	—
Semipalatinsk		30·0	283	6 17	+ 5	e 11 25	+15	—	—	e 15·5
Hong Kong		34·7	206	12 45	S	(12 45)	+21	—	—	19·4
Frunse		37·4	275	e 7 20	+ 4	—	—	—	—	e 19·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		37·4	303	i 7 14	− 2	12 58	− 7	—	—	19·1
Phu-Lien		38·4	217	—	—	e 13 37	+17	—	—	—
Andijan		40·0	274	e 7 43	+ 5	e 13 57	+13	—	—	e 21·1
Tchimkent		40·6	278	e 7 41	− 2	—	—	—	—	e 21·2
Manila		40·9	194	e 7 11	−35	14 19	+21	—	—	22·9
Tashkent		41·4	277	—	—	e 17 28	SSS	—	—	e 20·9
Samarkand		43·8	277	e 8 23	+14	—	—	—	—	e 22·2
Calcutta	N.	44·8	241	e 8 39	+22	i 15 3	+ 8	e 17 43	SS	—
Agra	E.	46·6	255	i 15 24	S	(i 15 24)	+ 3	—	—	(25·5)
Moscow		48·7	311	e 8 45	− 3	e 15 39	−11	—	—	e 26·4
Pulkovo		49·0	320	e 8 50	0	e 15 46	− 9	—	—	e 21·6
Baku		52·9	290	e 9 22	+ 2	e 16 57	PS	—	—	e 27·4
Grozny		53·1	296	9 21	0	e 16 49	− 2	—	—	—
Upsala	N.	53·5	325	e 8 56?	−28	—	—	—	—	—
Tiflis		54·6	294	e 9 32	0	e 17 21	+10	—	—	e 31·8
Bombay		56·0	254	e 15 46	?	e 17 46	+16	—	—	e 30·7
Sotchi		56·0	300	e 9 44	+ 1	—	—	—	—	—
Collmberg		61·8	322	i 10 18k	− 5	—	—	i 12 29	PP	e 31·6
Cheb		63·1	321	—	—	e 19 56?	PPS	—	—	e 34·9
Ksara		65·3	293	e 10 49	+ 3	e 20 9	PS	e 13 12	PP	—
Stuttgart		65·3	322	e 10 47	+ 1	—	—	—	—	e 37·9
Uccle		65·3	327	e 10 46	0	—	—	—	—	e 35·9
Zurich		66·7	322	e 10 51	− 4	—	—	—	—	—
Chur		66·8	321	e 10 52	− 4	—	—	—	—	—
Rome		69·8	315	i 11 11	− 3	—	—	i 15 32	PPP	—
Helwan	Z.	70·8	295	i 11 19	− 1	—	—	—	—	—
Ottawa		77·6	18	e 11 56	− 4	—	—	—	—	36·9
Tucson		78·7	49	e 10 34	?	—	—	—	—	—
Harvard	Z.	81·2	16	e 12 27	+ 8	—	—	—	—	e 47·9
Weston	Z.	81·3	16	i 12 17	− 3	e 22 28	− 2	—	—	—
Fordham		82·4	17	—	—	e 22 36	− 5	—	—	e 52·9

Additional readings :—
Vladivostok e = +3m.26s. and +4m.18s.
Hong Kong PP? = +13m.24s., S? = +17m.21s.
Tashkent e = +18m.59s. and +20m.14s.
Calcutta eN = +18m.33s.
Agra i = +18m.26s. and +22m.48s.
Grozny e = +19m.6s.
Tiflis ePN = +9m.35s., eSSSZ = +27m.56s.?
Bombay eE = +25m.42s.
Collmberg iZ = +10m.24s., e = +26m.5s.
Tucson i = +10m.47s., +11m.35s., +12m.6s., +12m.11s., +12m.34s., +12m.51s., +13m.16s., +13m.22s., and +13m.30s.
Long waves were also recorded at Medan, Colombo, and other American and European stations.

Jan. 22d. 11h. North Pacific.
Osaka P = 11m.50s., S = 13m.4s.
Mizusawa PE = 13m.18s., PN = 13m.22s.
Hong Kong P? = 14m.30s., S? = 18m.14s.
Manila P = 14m.54s., SEN = 18m.39s.
Phu-Lien e = 16m.5s.
Vladivostok e = 16m.5s., i = 16m.37s., L = 17m.18s.
Medan PEN = 18m.25s., SEN = 24m.36s., LE = 37m.
Tashkent e = +19m.31s., 20m.5s., 25m.0s., 27m.0s., 36m.11s., and 36m.59s., eL = 38m.30s.
Sverdlovsk eP = 20m.3s., L = 36m.
Calcutta eN = 20m.22s.
Ksara e = 21m.8s.
Baku e = 21m.16s. and 30m.5s., L = 45m.30s.
Grozny eP = 21m.32s., L = 48m.
Tiflis eZ = 21m.40s., eN = 31m.10s., eZ = 31m.18s., eLZ = 46m.
Collmberg i = 22m.54s., e = 23m.4s., i = 23m.8s.
Tinemaha iP = 23m.12s.
Haiwee e = 23m.19s.
Mount Wilson iPZ = 23m.22s.k
Pasadena iPZ = 23m.22s.
Riverside ePZ = 23m.23s.
Tucson iP = 23m.51s.k, i = 24m.8s., 24m.44s., and 27m.35s.
Bombay eE = 27m.43s.
Long waves were also recorded at Irkutsk, Uccle, Cheb, Paris, Stuttgart, Moscow, and Pulkovo.

Jan. 22d. 13h. 31m. 47s. Epicentre 7°·0S. 149°·0E.

$A = -\cdot8508$, $B = +\cdot5112$, $C = -\cdot1211$; $\delta = -15$; $h = +7$;
$D = +\cdot515$, $E = +\cdot857$; $G = +\cdot104$, $H = -\cdot062$, $K = -\cdot993$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·7	170	i 4 37	− 7	i 8 37	+ 6	—	—	—
Riverview		26·8	176	e 4 47	−57	i 10 27	+ 8	12 28	SSS	e 14·5
Sydney		26·8	176	e 5 11	−33	e 10 25	+ 6	e 6 34	PP	e 14·9
Adelaide		29·4	197	e 5 46	−21	i 10 57	− 4	i 12 13	SS	i 17·5
Melbourne		30·9	185	e 7 35	PPP	10 22	−62	i 13 16	SS	17·2
Manila		35·1	308	i 6 50	− 7	13 7	+37	—	—	—
Perth		39·6	227	6 43	−52	13 33	− 5	13 45	PS	21·0
Wellington		41·1	150	e 7 42	− 5	13 35	−26	8 41	PP	19·2
Batavia		41·9	269	7 51	− 3	e 13 57	−16	—	—	e 28·2
Christchurch		41·9	154	i 7 51a	− 3	14 20	+ 7	i 10 11	PPP	e 20·8
Siomisaki		42·2	344	7 34	−22	—	—	—	—	—
Koti		42·9	341	10 10	PPP	15 14	+47	—	—	—
Tokyo, Cen. Met. Ob.		43·3	350	8 59	+54	—	—	—	—	—
Hukuoka		44·1	338	e 18 5	SS	—	—	—	—	(21·6)
Hong Kong		44·9	312	8 21	+ 3	14 35	−21	—	—	—
Phu-Lien		50·0	305	e 10 20	PP	—	—	—	—	—
Medan		51·3	281	9 15	+ 7	16 27	+ 1	—	—	e 25·2
Vladivostok		52·3	345	i 9 9	− 6	i 15 23	?	—	—	19·6
Honolulu		59·3	60	e 10 9	+ 3	18 23	+ 9	—	—	e 24·0
Calcutta	N.	66·2	298	e 10 51	− 1	i 19 35	− 5	—	—	—
Irkutsk		70·2	333	e 11 11	− 6	e 20 23	− 5	21 15	PS	38·2
Colombo	E.	70·3	279	11 17	0	20 27	− 2	—	—	45·6
Bombay		79·3	291	i 12 6	− 3	i 22 4	− 5	e 15 0	PP	38·0
Frunse		83·5	315	e 12 25	− 6	—	—	—	—	—
Andijan		84·5	312	e 12 44	+ 8	e 23 3	+ 1	—	—	—
College		85·3	22	—	—	e 23 4	[+ 1]	e 29 20	SS	e 35·5
Tashkent		86·9	312	12 39	− 9	e 23 9	[− 5]	23 43	S	—
Tchimkent		86·9	313	e 12 16	−32	—	—	—	—	—
Ukiah		92·7	51	—	—	e 23 51	[+ 3]	e 34 26	SSS	—
Santa Clara		93·4	52	e 24 10	S	(e 24 10)	−14	—	—	—
Victoria		93·6	42	—	—	e 23 43	[−10]	—	—	e 38·2
Sverdlovsk		94·9	327	e 17 48	PP	23 53	[− 8]	e 31 44	SSP	42·2
Pasadena		96·2	56	e 13 30	− 1	—	—	—	—	e 40·7
Mount Wilson	Z.	96·3	56	i 13 31	− 1	—	—	—	—	—
Tinemaha	Z.	96·4	53	e 13 37	+ 5	—	—	—	—	—
Baku		101·4	310	e 18 29	PP	27 2	PS	—	—	54·2
Tucson		102·3	58	17 35	?	e 24 1	[−37]	i 27 3	PS	—
Tiflis		105·2	311	e 18 30	PP	e 24 47	[− 4]	e 27 23	PS	e 54·2
Ksara		113·0	303	e 19 34	PP	e 29 17	PS	—	—	—
Collmberg	Z.	122·9	329	—	—	i 32 40	PPS	—	—	—
Cheb		123·9	328	—	—	e 26 13?	[+11]	—	—	—
Ottawa		125·7	37	e 31 13?	?	e 38 13?	SS	—	—	e 63·2
Stuttgart		126·3	328	e 48 31	?	—	—	—	—	e 73·2
Seven Falls		127·0	33	e 23 43	PPP	—	—	—	—	57·2
Philadelphia		128·7	42	—	—	e 36 13	?	—	—	e 72·4
Weston	N.	130·0	38	e 11 36	?	e 38 45	SS	e 22 31	PP	—
La Paz		136·5	123	e 19 44	[+20]	40 34	SSP	23 6	PP	72·2
San Juan		144·0	67	e 20 3	[+26]	e 41 25	SS	e 26 12	PPP	e 77·8
Rio de Janeiro		148·0	158	e 19 43	[− 1]	—	—	—	—	—
Fort de France		149·4	73	i 19 47	[+ 1]	—	—	—	—	—

Additional readings :—
Riverview eN = +5m.38s., eZ = +5m.42s., SSS?N = +13m.27s.
Sydney e = +8m.51s.
Adelaide i = +6m.34s., +7m.29s., and +14m.31s.
Melbourne i = +14m.15s. and +16m.25s.
Perth P_cS = +12m.13s., i = +16m.13s., SS = +17m.18s., i = +20m.38s.
Wellington P_cP = +11m.55s., L_q = +17m.23s.
Christchurch e = +14m.33s., eL_q = +17m.30s.
Hong Kong SS? = +17m.13s.?
Irkutsk e = +23m.13s.

Continued on next page.

Bombay eEN = +12m.38s., iPSEN = +22m.36s., iE = +27m.3s.
Frunse e = +13m.47s.
College ePPS = +24m.35s., ePSPS = +29m.32s.
Tashkent e = +25m.1s. and +27m.13s.
Ukiah eS = +24m.7s.
Santa Clara ePPPSE = +28m.55s.
Baku e = +29m.51s.
Tiflis eZ = +20m.32s., eN = +22m.5s., ePPSZ = +27m.7s., eSSZ = +33m.18s., eSSSN = +37m.47s.
Stuttgart e = +63m.13s.?
Weston SSN = +58m.46s.
La Paz iZ = +24m.25s., SSS = +45m.50s.

Long waves were also recorded at La Plata, Cape Town, Moscow, Pulkovo, Semipalatinsk, Arapuni, and other European and American stations.

Jan. 22d. 18h. 40m. 48s. Epicentre 6°·2S. 154°·8E. (as on 1938 Dec. 7d.).

$A = -\cdot8997$, $B = +\cdot4233$, $C = -\cdot1073$; $\delta = +16$; $h = +7$;
$D = +\cdot426$, $E = +\cdot905$; $G = +\cdot097$, $H = -\cdot046$, $K = -\cdot994$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	21·2	184	i 4 48	− 1	i 8 48	+ 7	—	—	—
Riverview		27·7	187	e 6 14	+22	e 10 59	+26	—	—	e 14·0
Sydney		27·7	187	e 7 12	PPP	e 10 48	+15	—	—	—
Adelaide		32·3	205	—	—	i 11 39	− 7	e 14 32	SSS	i 18·6
Melbourne		32·7	194	—	—	i 12 52	+60	i 14 16	SS	—
Manila		39·4	303	i 7 30	− 3	13 48	+13	—	—	—
Christchurch		40·3	160	8 22	+42	13 50	+ 1	—	—	e 17·7
Perth		44·5	230	i 10 37	PPP	i 14 47	− 4	i 18 7	SS	—
Batavia		47·7	268	i 8 36	− 4	15 25	−11	—	—	—
Vladivostok		53·3	340	e 9 18	− 5	i 16 48	− 6	—	—	24·7
Medan		56·9	280	9 57	+ 8	e 17 57	PS	i 18 18	PPS	—
Calcutta	N.	70·9	297	e 11 6	−15	e 20 23	−13	—	—	—
Irkutsk		72·3	330	e 11 52	+23	e 20 40	−12	e 24 54	SS	e 42·2
Bombay		84·4	290	i 12 35	− 1	i 23 1	0	—	—	—
Frunse		87·1	314	e 13 10	+21	—	—	—	—	—
Andijan		88·3	311	e 13 11	+16	e 23 38	− 1	—	—	—
Tashkent		90·7	312	i 13 2	− 4	23 42	[+ 5]	25 12	PS	—
Pasadena		91·0	56	i 13 8a	+ 1	—	—	—	—	e 42·1
Mount Wilson		91·1	56	i 13 9	+ 1	—	—	—	—	—
Tinemaha		91·3	53	i 13 11	+ 2	—	—	—	—	—
Haiwee		91·4	54	e 13 10	+ 1	—	—	—	—	—
Riverside	Z.	91·6	56	e 13 8	− 2	—	—	—	—	—
Tucson		97·0	58	e 13 43	+ 8	—	—	17 28	PP	44·5
Sverdlovsk		97·4	327	—	—	e 27 19	PPS	—	—	40·8
Tiflis		109·0	312	e 18 52	PP	—	—	—	—	e 54·2
La Paz	Z.	131·9	118	e 19 29	[+14]	—	—	—	—	64·2

Additional readings:—
Perth i = +26m.34s.
Batavia iE = +8m.51s.
Bombay eEN = +12m.58s., iEN = +23m.19s.
Tashkent iS = +23m.55s., S_cS = +24m.17s.
Pasadena iZ = +13m.38s.
Mount Wilson iZ = +13m.39s.
Riverside iZ = +13m.40s.
Tucson iPP = +18m.39s.
Long waves were also recorded at Berkeley and Baku.

Jan. 22d. Readings also at 0h. (La Paz), 1h. (Bombay, near Agra, Calcutta, and Andijan), 2h. (Andijan, Istanbul, Chur, Uccle, Samarkand, and Frunse), 3h. (Fordham, Göttingen, and Mizusawa), 4h. (Sverdlovsk), 5h. (Tucson (2) and Andijan), 7h. (Tashkent, Tchimkent, Samarkand, Frunse, and Andijan), 9h. (Manila), 10h. (Andijan, Sverdlovsk, Tchimkent, Frunse, Mizusawa, and Vladivostok), 11h. (Mizusawa, Tucson, Christchurch, Wellington, Pasadena, Mount Wilson, Tinemaha, Tiflis, Riverside, Collmberg, Grozny, Weston, Neuchatel, Basle, Irkutsk, and New Plymouth), 12h. (Huancayo), 16h. (Semipalatinsk and Frunse), 17h. (Columbia), 19h. (Frunse, Tchimkent, and Andijan), 20h. (Hukuoka), 22h. (Bagnères, Melbourne, Ksara, Tinemaha, Mount Wilson, Wellington, Christchurch, and Tucson), 23h. (Baku, Sverdlovsk, and Pasadena).

Jan. 23d. 2h. 22m. 52s. Epicentre 31°·8N. 16°·8E. (as on Jan. 20d.).

$A = +\cdot 8152$, $B = +\cdot 2461$, $C = +\cdot 5244$; $\delta = +11$; $h = +1$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tunis		7·4	314	e 1 54	+ 2	i 4 11	S_g	e 2 26	P_g	7·1
Rome		10·6	343	e 2 38	+ 2	i 4 32	− 5	—	—	e 5·6
Algiers		12·4	298	i 3 2	+ 1	i 6 28	L	—	—	(6·5)
Helwan		12·6	95	i 3 3k	0	7 32	L	3 50	PPP	(7·5)
Florence		12·7	342	3 8	+ 3	5 58	SSS	—	—	—
Belgrade		13·3	8	e 3 12a	− 1	i 6 13	SSS	i 3 39	PPP	9·0
Triest		14·0	353	i 3 24	+ 2	6 8	+ 9	3 31	PP	—
Laibach		14·3	355	e 3 31a	+ 5	e 6 14	+ 8	e 3 56	PPP	9·4
Bucharest		14·5	27	e 3 32	+ 4	6 28	SS	3 42	PP	—
Marseilles		14·6	325	e 2 38	−52	e 6 23	+10	i 3 44	PP	e 7·4
Moncalieri		15·0	335	3 18	−17	6 27	+ 4	—	—	9·2
Kecskemet	z.	15·2	6	e 3 44	+ 6	e 4 53	?	—	—	e 7·0
Budapest		15·8	5	3 51	+ 6	e 7 5	SS	i 7 15	SSS	12·0
Chur		16·0	342	e 3 46	− 2	e 6 59	+13	—	—	—
Almeria		16·6	293	i 3 40	−16	e 7 3	+ 3	—	—	e 9·4
Zurich		16·8	340	e 3 56	− 2	e 7 4	− 1	—	—	—
Neuchatel		16·9	337	e 3 57	− 2	e 7 14	+ 7	—	—	—
Basle		17·2	339	e 4 2	− 1	e 7 21	+ 7	—	—	—
Bagnères		17·3	315	e 3 59	− 5	e 7 19	+ 3	e 4 18	PP	e 9·6
Besançon		17·5	335	e 4 8	+ 1	i 7 28	+ 7	—	—	—
Granada		17·6	294	e 3 59k	− 9	8 29	SSS	i 4 29	PP	—
Clermont Farrand		17·6	326	e 3 48	−20	e 7 38	SS	—	—	e 9·6
Cernauti		17·9	20	e 4 8?	− 4	—	—	—	—	—
Stuttgart		17·9	345	e 4 9	− 3	e 7 31	+ 1	i 7 54	SS	e 9·6
Strasbourg	z.	18·1	342	e 4 10	− 4	e 7 39	+ 4	i 4 28	PP	—
Prague		18·3	356	e 4 18	+ 1	e 7 48	+ 9	—	—	e 9·9
Cheb		18·5	352	e 4 8?	−11	e 7 52	+ 8	—	—	e 9·1
Toledo		18·7	302	i 4 12k	−10	e 7 42	− 6	e 4 30	PP	—
Jena		19·5	352	e 4 31	0	e 8 8	+ 2	—	—	e 9·1
San Fernando		19·6	290	e 4 35	+ 3	i 7 58	−10	—	—	11·6
Collmberg		19·7	353	i 4 32k	− 2	i 8 16	+ 6	i 5 15	PPP	e 11·1
Paris		20·1	333	—	—	8 15	− 4	—	—	11·1
Göttingen		20·4	349	e 4 39	− 2	e 8 24	− 1	—	—	e 12·1
Uccle		21·1	338	—	—	i 8 42	+ 3	—	—	e 10·1
De Bilt		22·0	342	—	—	i 8 58	+ 2	—	—	12·8
Hamburg		22·3	350	e 5 0	− 1	i 9 3	+ 1	—	—	e 11·1
Jersey		22·4	327	e 3 36	?	e 9 26	+22	—	—	e 11·4
Kew		23·3	334	—	—	i 9 17	− 3	—	—	e 11·1
Oxford		23·9	333	—	—	9 26	− 4	—	—	e 11·6
Piatigorsk		23·9	51	e 5 18	+ 2	—	—	—	—	e 12·5
Copenhagen		24·1	355	e 5 18	0	9 36	+ 2	—	—	—
Tiflis		24·4	58	e 5 22	+ 1	e 9 46	+ 7	—	—	e 14·6
Grozny		25·5	55	e 5 37	+ 5	e 10 10	+13	—	—	—
Bidston		25·9	333	—	—	i 9 34	−30	—	—	e 12·1
Baku		28·0	62	e 6 16	+21	10 49	+11	—	—	13·8
Moscow		28·0	26	5 57	+ 2	e 10 48	+10	—	—	14·6
Upsala		28·1	0	—	—	i 10 53	+13	—	—	—
Aberdeen		28·5	340	—	—	i 12 11	SS	—	—	i 17·5
Pulkovo		29·4	14	e 6 6	− 1	e 11 9	+ 8	—	—	e 14·6
Sverdlovsk		39·1	37	i 7 30	− 1	13 35	+ 4	—	—	19·1
Samarkand		41·0	64	e 7 56	+10	—	—	e 10 2	PPP	—
Tashkent		42·6	62	e 9 38	PP	i 14 25	+ 2	—	—	—
Tchimkent		42·8	60	e 8 9	+ 8	—	—	—	—	—
Andijan		45·0	62	e 8 33	+14	—	—	—	—	32·1
Bombay		51·7	90	e 10 48	PP	—	—	e 12 58	PPP	—
Calcutta	N.	63·3	78	—	—	e 18 46	−18	—	—	—
Colombo	E.	63·5	98	9 46	−48	—	—	—	—	36·6
Irkutsk		64·1	43	e 10 56	+18	e 19 16	+ 2	e 13 41	PP	35·1
Cape Town		65·4	178	—	—	i 29 57	?	—	—	i 34·0
Weston	z.	68·1	307	i 10 54	−10	—	—	—	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Ottawa	69·8	311	e 11 7	− 7	—	—	— —	e 38·1
Rio de Janeiro	79·1	234	e 30 36	S	(e 30 36)	SSS	— —	—
Vladivostok	84·7	42	—	—	e 37 12	?	— —	48·5
La Paz	94·4	253	e 14 31	+68	—	—	— —	46·1
Tucson	99·3	317	e 13 39	− 6	—	—	17 45 PP	e 51·9
Wellington	160·0	124	e 28 8?	PPP	—	—	— —	—

Additional readings :—
Tunis i = +2m.44s. and +4m.20s.
Algiers i = +4m.3s.
Helwan iZ = +4m.23s.
Belgrade iP = +3m.15s.
Triest PPP = +3m.35s., e = +6m.50s.
Marseilles e = +4m.22s.
Budapest i = +7m.43s.
Bagnères iP = +4m.8s., i = +4m.30s. and +4m.48s.
Granada iN = +6m.17s., iE = +6m.29s.
Stuttgart e = +4m.58s., eE = +9m.2s.
Jena ePE = +4m.38s., eSN = +8m.22s.
San Fernando eN = +4m.38s.
Collmberg i = +5m.25s., +5m.51s., +5m.59s., +6m.12s., +6m.49s., +8m.34s., +9m.43s. and +10m.6s.
Paris e = +7m.5s.
Copenhagen i = +5m.22s. and +9m.44s.
Grozny i = +5m.52s.
Upsala eS = +11m.2s.
Irkutsk e = +15m.8s.?, +23m.32s., and +26m.8s.?
Weston iZ = +10m.58s.
Tucson P = +14m.23s.
Long waves were also recorded at Tananarive, Bergen, Fort de France, Stonyhurst, and Pasadena.

Jan. 23d. Readings also at 0h. (near Balboa Heights and Vladivostok), 1h. (Samarkand, Tchimkent, Andijan, Tucson, Frunse, and Huancayo), 2h. (San Juan, Erevan, Piatigorsk, Helwan, Tiflis (2), Baku, and Ksara), 3h. (Mizusawa), 5h. (Tucson, Mount Wilson, Tacubaya, Tinemaha, and Haiwee), 8h. (Frunse and Andijan), 9h. (Andijan), 10h. (Apia and Tashkent), 11h. (Huancayo and Samarkand), 12h. (San Francisco, Berkeley, Branner, Lick, Fort de France, Pasadena, San Juan, Mount Wilson, Ksara, Tiflis, Tucson, La Plata, La Paz, Rio de Janeiro, and Sverdlovsk), 13h. (Pulkovo, Baku, Mizusawa, Tiflis, Irkutsk, Wellington, and Kew), 15h. (La Paz), 16h. (Wellington, Mizusawa, and Vladivostok), 17h. (Tchimkent, Andijan, and Helwan), 18h. (Mizusawa, Tchimkent, Vladivostok, Irkutsk, Tiflis, Tashkent, and Sverdlovsk), 19h. (Baku), 21h. (Rio de Janeiro), 22h. (Rome), 23h. (Tucson).

Jan. 24d. 4h. 1m. 38s. Epicentre 37°·1N. 141°·8E. (as on Jan. 11d.).

Intensity III Onahama, Mito, Hukusima, Kakioka, Sendai, Tukubasan, Utunomiya, and Tyosi; II Mizusawa, Miyako, Morioka, and Hatinohe; I Katuura, Yamagata, Kumagaya, Tokyo, Yokohama, Kohu, Iida, and Karuizawa.

Epicentre 37°·0N. 141°·4E. Shallow.

See Bulletin of the Central Met. Obs. Japan for the year 1939, Tokyo, 1949, pp. 6-7.

$A = -\cdot6283$, $B = +\cdot4944$, $C = +\cdot6006$; $\delta = -9$; $h = -1$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Onahama	0·8	257	0 18$_a$	0	0 25	S_g	— —	—
Hukusima	1·2	302	0 25k	+ 1	0 37	− 4	— —	—
Mito	1·3	236	0 24k	− 1	0 36	− 8	— —	—
Sendai	1·3	329	0 29k	+ 4	0 43	− 1	— —	—
Kakioka	1·5	236	0 28k	0	0 40	− 9	— —	—
Tukubasan	1·6	237	0 29k	− 1	0 43	− 8	— —	—
Utunomiya	1·7	250	0 28	− 3	0 41	−13	— —	—
Kumagaya	2·1	244	0 37k	0	0 57	− 7	— —	—
Mizusawa	2·1	346	i 0 41	P_g	i 1 7	+ 3	— —	—
Tokyo Cen. Met. Ob.	2·1	229	0 38	+ 1	0 58	− 6	— —	—
Tokyo Imp. Univ.	2·1	229	0 37	0	0 57	− 7	— —	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Komaba		2·2	230	0 37	− 1	0 56	−10	—	—	—
Kiyosumi		2·3	214	0 40	0	1 6	− 3	—	—	—
Maebasi		2·3	252	0 38k	− 2	1 1	− 8	—	—	—
Mitaka		2·3	232	0 40	0	1 3	− 6	—	—	—
Yokohama		2·4	226	0 42k	+ 1	1 4	− 8	—	—	—
Kamakura		2·5	226	0 40	− 3	1 8	− 6	—	—	—
Titibu		2·5	243	0 40	− 3	1 3	−11	—	—	—
Miyako		2·6	3	0 48	+ 4	1 19	+ 2	—	—	—
Mera		2·7	216	0 48	+ 3	1 25	+ 6	—	—	—
Hunatu		2·9	237	0 48	0	1 18	− 6	—	—	—
Koyama		2·9	232	0 40	− 8	1 12	−12	—	—	—
Nagano		2·9	261	0 48k	0	1 30	S*	—	—	—
Misima		3·0	229	0 50k	0	1 35	S*	—	—	—
Osima		3·1	220	0 53	+ 2	1 22	− 7	—	—	—
Yosiwara		3·2	232	0 40	−12	1 18	−14	—	—	—
Susaki		3·3	225	0 54	+ 1	1 32	− 3	—	—	—
Hatinohe		3·5	356	1 0a	+ 3	1 32	− 8	—	—	—
Aomori		3·8	348	1 7	P*	1 54	S*	—	—	—
Wazima		3·9	277	1 1k	− 1	2 6	S_g	—	—	—
Gihu		4·4	250	1 9k	− 1	1 58	− 4	—	—	—
Nagoya		4·4	245	1 9	− 1	—	—	—	—	—
Kameyama		4·9	245	1 16	− 1	2 22	+ 7	—	—	—
Mori		5·1	349	1 25a	+ 5	2 27	+ 7	—	—	—
Kyoto		5·3	249	1 22	0	2 36	S*	—	—	—
Osaka		5·6	247	1 26	− 1	2 41	+ 8	—	—	—
Toyooka		5·8	257	1 28a	− 1	2 27	−11	—	—	—
Kobe		5·9	249	1 28	− 3	2 48	+ 8	—	—	—
Sapporo		6·0	356	1 36a	+ 4	2 47	+ 4	—	—	—
Siomisaki		6·1	236	1 33	− 1	2 54	+ 9	—	—	—
Sumoto		6·2	247	1 34a	− 1	3 9	S*	—	—	—
Nemuro		6·8	24	1 47	+ 3	3 4	+ 1	—	—	—
Muroto		7·3	241	1 49	− 1	3 8	− 7	—	—	—
Koti		7·6	245	1 56	+ 1	3 17	− 6	—	—	—
Matuyama		8·1	249	1 56	− 6	3 54	S*	—	—	—
Hamada		8·2	256	2 2	− 1	3 40	+ 2	—	—	—
Simidu		8·4	242	2 6	0	3 52	+ 9	—	—	—
Izuka		9·7	254	2 23	+ 1	3 49	−26	—	—	—
Hukuoka		9·9	253	2 27	+ 2	4 44	S*	—	—	—
Yakusima		11·5	238	2 48a	0	5 0	+ 1	—	—	—
Zinsen		12·1	277	2 56	− 1	5 35	SS	—	—	—
Zi-ka-wei	z.	17·9	258	e 4 8	− 4	7 26	− 4	i 4 26	PP	—
Manila		29·1	225	e 6 42	PP	10 50	− 6	—	—	—
Irkutsk		30·2	312	e 6 11	− 3	e 11 4	− 9	e 7 33	PPP	15·4
Phu-Lien		34·6	253	e 6 51	− 2	—	—	—	—	—
Semipalatinsk		45·1	308	8 17	− 3	—	—	—	—	—
Frunse		50·6	300	e 9 1	− 1	—	—	—	—	—
Andijan		52·8	297	e 9 18	− 1	e 17 1	+15	—	—	—
Agra	E.	54·0	279	9 22	− 6	16 50	−13	9 41	pP	—
Tchimkent		54·3	300	e 9 23	− 7	e 17 10	+ 3	—	—	—
Tashkent		54·8	299	e 9 31	− 3	e 17 2	−12	e 17 31	PS	—
Bombay		62·3	274	i 10 22	− 4	i 18 42	−10	—	—	—
Moscow		67·4	323	e 10 59	0	e 19 49	− 6	e 13 27	PP	e 36·9
Pulkovo		68·3	330	11 2	− 3	e 18 58	−68	e 14 13	PP	28·9
Baku		68·4	305	e 11 2	− 4	e 20 53	PPS	—	—	e 36·9
Grozny		69·6	309	e 11 8	− 5	—	—	—	—	—
Tiflis		71·0	308	e 11 19	− 3	—	—	—	—	e 35·4
Berkeley	z.	72·4	56	i 11 34	+ 4	—	—	—	—	—
Tinemaha		75·5	54	i 11 50	+ 2	—	—	—	—	—
Santa Barbara	z.	76·1	57	i 11 56	+ 5	—	—	—	—	—
Haiwee		76·3	54	e 11 54	+ 2	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mount Wilson		77·3	57	i 12 3k	+ 5	—	—	—	—	—
Pasadena		77·3	57	e 12 2	+ 4	—	—	—	—	—
Riverside		77·9	57	i 12 5k	+ 4	—	—	—	—	—
Copenhagen		78·0	334	i 12 1	− 1	—	—	—	—	—
Collmberg		81·2	331	i 12 17a	− 2	—	—	—	—	—
Ksara		81·4	305	i 12 19a	− 1	e 22 26	− 5	e 23 11	PS	—
Jena		82·0	331	e 12 22	− 1	—	—	—	—	—
Tucson		83·3	54	i 12 34a	+ 4	i 23 4	+14	16 0	PP	e 40·3
Chur		86·1	330	e 12 43	− 1	—	—	—	—	—
Zurich		86·1	330	e 12 41	− 3	—	—	—	—	—
Basle		86·3	330	e 12 44	− 1	—	—	—	—	—
Helwan	z.	86·9	305	i 12 46k	− 2	—	—	e 16 8	PP	—
Neuchatel		87·0	330	e 12 47	− 1	—	—	—	—	—
Weston	z.	95·3	23	e 13 27	0	—	—	—	—	—
La Paz	z.	146·5	60	i 19 48k	[+ 6]	—	—	—	—	—

Additional readings :—
Zi-ka-wei iZ = +4m.34s.
Irkutsk e = +6m.25s. and +8m.0s.
Agra E. sS = +17m.23s., SSE = +20m.28s.
Tashkent e = +21m.22s.?
Moscow e = +11m.13s.
Tiflis ePN = +11m.22s., eN = +33m.5s.
Berkeley eN = +11m.40s., iZ = +11m.48s.
Tinemaha i = +12m.4s.
Santa Barbara iZ = +12m.10s.
Mount Wilson iZ = +12m.17s.
Pasadena i = +12m.16s.
Riverside iZ = +12m.19s.
Collmberg i = +12m.33s., +12m.37s., and +13m.2s.
Tucson iP = +12m.48s., i = +13m.2s., iPPP = +17m.47s.
Chur e = +12m.57s.
Helwan eZ = +13m.6s.
La Paz iZ = +20m.5s.
Long waves were also recorded at De Bilt, Sverdlovsk, and Vladivostok.

Jan. 24d. 18h. 8m. 28s. Epicentre 37°·1N. 141°·8E. (as at 4h.).

A = −·6283, B = +·4944, C = +·6006; $\delta = -9$; $h = -11$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Okizuku	1·6	242	0 38	+ 8	0 53	+ 2
Tukubasan	1·6	237	0 38	+ 8	0 55	+ 4
Mizusawa	2·1	346	e 0 48	+11	1 13	S_g
Tokyo Imp. Univ.	2·1	229	0 35	− 2	0 57	− 7
Komaba	2·2	230	0 37	− 1	0 59	− 7
Kiyosumi	2·3	214	0 38	− 2	1 2	− 7
Mitaka	2·3	232	0 38	− 2	1 2	− 7
Kamakura	2·5	226	0 38	− 5	1 3	−11
Titibu	2·5	243	0 38	− 5	1 3	−11
Koyama	2·9	232	0 38	−10	1 10	−14
Yosiwara	3·2	232	0 38	−14	1 23	− 9
Susaki	3·3	225	0 55	+ 2	1 28	− 7
Osaka	5·6	247	1 34	P*	2 46	S*

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

Jan. 24d. 19h. 48m. 45s. Epicentre 28°·0S. 63°·5W.

$A = +\cdot3946$, $B = -\cdot7914$, $C = -\cdot4670$; $\delta = +11$; $h = +2$;
$D = -\cdot895$, $E = -\cdot446$; $G = -\cdot208$, $H = +\cdot418$, $K = -\cdot884$.

A depth of focus 0·070 has been assumed.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		7·2	317	e 1 59	+10	i 3 22	+ 7	—	—	—
La Plata		8·4	147	1 59	− 2	3 17	−21	—	—	4·2
La Paz	z.	12·2	338	i 2 44	+ 2	i 4 56	+ 4	i 5 5	sS	—
Rio de Janeiro		19·0	79	i 3 53	+ 2	i 6 46	−11	—	—	—
Huancayo		19·4	324	e 3 55	0	i 7 2	− 2	7 48	P_cP	8·2
San Juan		46·2	358	e 7 39	− 3	e 13 37	−16	e 9 21	pP	—
Fordham		69·1	353	i 10 14k	− 5	—	—	—	—	—
Weston	z.	70·4	355	i 10 21k	− 5	—	—	i 10 32	pP	—
Harvard		70·5	355	i 10 23k	− 4	—	—	e 12 17	PP	—
Tucson		74·9	320	i 10 49k	− 3	i 19 46	− 4	i 12 57	pP	—
Riverside	z.	80·0	317	i 11 17k	− 3	—	—	i 13 18	PP	—
Mount Wilson		80·6	317	i 11 20k	− 3	—	—	e 13 22	PP	—
Pasadena		80·6	317	i 11 20k	− 3	—	—	e 13 22	PP	—
Haiwee		81·8	319	i 11 27	− 2	—	—	—	—	—
Santa Barbara	z.	81·8	316	i 11 26	− 3	—	—	—	—	—
Tinemaha		82·7	319	i 11 30k	− 4	e 20 59	−12	i 13 32	PP	—
Tchimkent		139·6	57	e 18 20	[−13]	e 22 4	PP	—	—	—
Andijan		141·8	60	e 18 31	[− 6]	—	—	e 22 14	PP	—
Frunse		143·2	55	e 17 34	[−66]	—	—	—	—	—
Semipalatinsk		144·6	41	e 18 37	[− 4]	—	—	—	—	—

Additional readings :—
Huancayo esP = +6m.18s.
San Juan $ePcP$ = +8m.39s., $eScP$ = +11m.57s., esPP = +12m.6s.
Tucson $iPcP$ = +10m.57s., sP = +14m.34s., ipPP = +15m.40s., sPP = +17m.20s., i = +18m.23s., iSP = +21m.9s.

Jan. 24d. Readings also at 2h. (Tashkent, Helwan, Ksara, Cape Town, Tiflis, Baku, and Sverdlovsk), 3h. (Montezuma), 7h. (Erevan), 8h. (Rome), 11h. (Lick), 12h. (Tashkent, Samarkand, Frunse, Tchimkent, and Andijan), 13h. (near Mizusawa and Hukuoka), 14h. (Andijan), 17h. (Andijan), 19h. (Branner), 22h. (Tucson).

Jan. 25d. 3h. 32m. 6s. Epicentre 36°·5S. 72°·6W.

Intensity XI at Chillan and Cauquenes, X at Quirihue, Concepcion, Bulnes, IX at Parral, Arauco, VIII at Talca, Linares, San Carlos, VII at Valparaiso, Santiago, etc., III at Arica, 2000km. from the epicentre.

Macroseismic epicentre 36°·4S. 72°·4W.

Sevasola, Simon S. J.
"The Chilean earthquake of January 25, 1939, G.M.T.," Bulletin of the Seismological Society of America, vol. 29, No. 3, 509-512, 3 fig. Berkeley, July, 1939.

Saita, Tokitaro.
"The great Chilean earthquake of January 24, 1939," Bulletin Earthquake Research Institute, vol. 18, Part 3, 446-459, 22 fig., Tokyo, Sept., 1940.

Mugge, R.
Erdbeben-Katastropher einst und jetzt," Natur und Volk, vol. 70, No. 11, 542-549, Frankfurt a. M., Nov., 1940.

Photographies des destructions provoquees a Conception (Chili) par le Seisme du 25 Janvier, 1939.

J. Bustos Navarrette.
Etude du seisme du 24 Janvier, 1939, Revue pour l'Etude des calamites, tome II, No. 5, pp. 125-128, Geneve, 1939.

A. Komischke.
Observaciones sobre el terremoto del 24 de Enero de 1939, en Chili Central, Universidad Technica, Revista Scientia vol. IV, annee 1939, pp. 1-15.

Continued on next page.

Anonyme, El Terremoto del 24 de Enero de 1939, Boletin del servicio seismologico de la Universidad de Chile No. XXVI Observaciones de 1935, 1936, 1937, Prensas de la Universidad de Chile, 1939.

Navarrette Bustos Julio.
" Earthquake of January 24, 1939, and the eruption of the volcano Quizapur." Earthquake Notes, vol. II, No. 4, pp. 9-10. Washington, April, 1940.

Rhodes, Jean.
" Le tremblement de terre du Chile," La Native No. 3048, pp. 268—271, 13 illus, Paris, May 1, 1939.

Rothe, J. P.
" Seismes et Volcans," Presses Universitaires de France, 132 pages, Paris, 1946. Voir p. 21 la carte macroseismique du seisme du 25 Janvier, 1939.

Kizawa.
Study on the Chilean Earthquake of January 25, 1939, " Kensin Ziho," vol. II, Tokyo, 1941.

$A = +\cdot2410$, $B = -\cdot7689$, $C = -\cdot5922$; $\delta = -1$; $h = 0$;
$D = -\cdot954$, $E = -\cdot299$; $G = -\cdot177$, $H = +\cdot565$, $K = -\cdot806$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata		12·0	87	2 54	− 1	5 6	− 5	—	—	6·0
Montezuma		14·2	14	3 33	+ 9	i 5 46	−18	i 3 41	PPP	—
La Paz	Z.	20·3	13	i 4 43k	+ 3	i 8 34	+11	i 4 52	PP	i 10·8
Huancayo		24·5	354	i 5 27	+ 5	9 38	− 2	i 8 44	PcP	—
Rio de Janiero	E.	28·8	69	i 6 0	− 2	i 10 38	−13	—	—	i 12·8
	N.	28·8	69	i 6 3	+ 1	i 10 41	−10	—	—	i 12·8
Balboa Heights		45·7	350	i 8 26	+ 2	i 15 2	− 6	i 10 1	PP	19·1
Fort de France		52·1	14	i 9 10	− 4	i 16 20	−18	10 50	PP	e 24·1
Port au Prince		54·8	1	e 9 29	− 5	i 17 5	− 9	11 34	PP	e 25·8
San Juan		54·9	8	9 35k	0	i 17 4	−12	11 45	PP	—
Oaxaca	N.	57·9	334	e 9 54	− 2	—	—	—	—	—
Merida	N.	59·4	343	e 10 2	− 4	—	—	—	—	—
Vera Cruz	N.	59·7	335	i 10 9	0	—	—	—	—	—
Tacubaya	N.	61·0	332	e 10 19	+ 1	—	—	—	—	—
Manzanillo	N.	62·9	326	e 10 25	− 5	—	—	—	—	—
Guadalajara	N.	63·9	328	e 10 32	− 5	—	—	—	—	—
Mazatlan	N.	67·4	326	i 10 49	−10	—	—	—	—	—
Columbia		70·6	354	e 11 19	0	24 38	SS	e 14 16	PP	e 30·8
Cape Town Univ.		71·5	118	i 11 23	− 1	i 20 34	− 9	—	—	i 35·8
Chihuahua	Z.	72·0	330	e 11 26	− 2	—	—	—	—	—
Little Rock		73·3	344	e 11 36	+ 1	i 20 58	− 6	i 11 52	pP	—
Chatham Ils.		74·4	226	11 54	+12	21 18	+ 2	i 13 54	PP	30·9
Cape Girardeau		75·1	347	e 11 44	− 2	e 21 15	− 9	i 12 0	pP	—
Georgetown		75·1	358	i 11 45	− 1	i 21 17	− 7	i 14 45	PP	—
Cincinnati		76·1	352	i 11 35	−16	21 16	−19	i 14 53	PP	e 36·9
St. Louis		76·5	346	e 11 52	− 2	i 21 33	− 6	i 12 21	pP	—
Florissant		76·7	346	i 11 53	− 2	i 21 33	− 8	i 12 19	pP	—
Fordham		77·0	0	i 11 55k	− 1	i 21 41	− 4	i 13 36	pP	i 36·7
Tucson		77·2	329	i 11 57	0	21 19	−28	i 17 1	PPP	—
Weston		78·5	2	i 12 5	+ 1	i 21 59	− 2	i 15 7	PP	37·7
Harvard		78·6	2	i 12 5k	0	i 22 0	− 2	e 26 54	SS	e 37·9
Williamstown		78·8	0	i 12 8	+ 2	—	—	i 12 35	pP	—
Ann Arbor		79·1	352	e 12 12	+ 4	23 16	PPS	e 27 3	SS	—
Chicago		79·2	349	e 12 4	− 4	e 21 24	−44	e 15 18	PP	e 33·6
Chicago, Loyola		79·2	349	e 12 11	+ 3	i 22 2	− 6	—	—	—
Toronto		80·0	355	e 12 10	− 3	i 22 8	− 9	27 42	SS	e 36·9
Christchurch		80·8	222	e 12 16k	− 1	i 22 26	+ 1	i 15 29	PP	e 37·9
East Machias		81·0	5	e 12 17	− 1	i 21 39	−48	i 15 51	PP	e 33·7
Wellington		81·0	225	12 20	+ 2	22 47	+20	15 19	PP	37·5
Halifax		81·3	7	12 24	+ 4	22 30	0	15 30	PP	37·9
Denver		81·4	335	e 12 23	+ 3	i 22 30	− 1	i 12 52	pP	—
Ottawa		81·6	358	e 12 19	− 2	e 22 28	− 5	23 14	PS	e 37·9
Riverside		81·6	324	i 12 21k	0	—	—	e 39 1	P′P′	—
Mount Wilson		82·1	324	i 12 25k	+ 1	e 22 41	+ 3	i 39 4	P′P′	—
Pasadena		82·1	324	i 12 24k	0	i 22 41	+ 3	e 15 49	PP	e 35·0
Arapuni		82·6	228	e 11 54?	−32	22 42	− 1	26 54?	SS	37·4

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shawinigan Falls		82·7	0	12 26	− 1	22 44	0	27 42	SS	40·9
Johannesburg		82·8	117	i 12 28	+ 1	e 22 37	− 8	i 23 17	PS	—
New Plymouth		82·9	226	e 12 23	− 5	22 50	+ 4	22 21	S_cS	33·9
Santa Barbara		83·1	323	i 12 31	+ 2	e 22 50	+ 2	—	—	—
Seven Falls		83·3	2	12 24	− 6	22 36	−14	—	—	36·9
Tinemaha		84·6	325	e 12 35	− 1	e 23 3	0	i 23 31	PS	—
Salt Lake City		84·9	331	e 12 43	+ 5	22 54	−12	12 47	P_cP	36·0
Fresno	N.	85·0	323	e 12 41	+ 3	e 23 25	PS	—	—	e 40·9
Lick		86·4	323	e 12 48	+ 3	e 23 25	+ 4	—	—	—
Santa Clara		86·5	323	e 12 49	+ 3	i 23 19	− 3	i 23 54	PS	—
Branner		86·7	323	e 12 51	+ 4	i 23 25	+ 1	—	—	e 41·5
Berkeley		87·1	323	e 12 48k	− 1	i 23 30	+ 2	—	—	e 41·7
San Francisco		87·1	323	e 12 50	+ 1	e 23 24	− 4	—	—	—
Ukiah		88·5	324	13 1	+ 5	i 23 42	+ 1	e 16 34	PP	36·4
Bozeman		88·7	335	e 12 57	0	e 22 19	[−66]	e 16 47	PP	39·6
Apia		89·1	254	e 13 1	+ 3	e 23 37?	− 9	i 13 39	pP	—
Ferndale		90·2	323	e 13 10	+ 6	e 23 54	− 2	—	—	e 40·9
Saskatoon		93·1	340	e 13 16	− 1	i 24 24	+ 2	17 12	PP	41·9
Seattle		94·8	329	e 14 7	+42	24 13	[+13]	18 36	pPP	i 39·7
San Fernando		95·2	48	e 13 33	+ 6	i 24 1	[− 1]	21 42	PPP	—
Victoria		95·8	329	e 13 19	−10	i 24 33	−12	17 15	PP	45·9
Granada		97·2	49	i 13 47a	+11	26 50	PS	18 0	PP	40·4
Almeria		97·7	50	i 13 44	+ 6	i 24 8	[− 7]	e 18 8	PP	e 41·1
Melbourne		98·3	210	e 13 44	+ 3	24 9	[− 9]	18 4	PP	48·0
Honolulu		98·7	290	e 13 41	− 1	e 24 50	−20	e 18 7	PP	e 39·5
Toledo		98·7	47	i 13 46	+ 4	i 24 19	[− 1]	i 17 50	PP	—
Riverview		99·0	216	e 13 49	+ 5	i 24 28	[+ 6]	i 17 45	PP	e 45·7.
Sydney		99·0	216	e 13 39	− 5	e 24 0	[−22]	e 27 24	PPS	e 38·9
Ivigtut		99·4	12	—	—	24 18	[− 6]	31 55	SS	—
Algiers		101·1	53	e 14 4	+11	i 24 29	[− 3]	18 9	PP	42·9
Tananarive		101·1	123	14 22	pP	24 30	[− 2]	i 18 4	PP	48·3
Adelaide		103·2	206	e 14 5	+ 2	i 24 46	[+ 4]	i 18 6	PP	e 43·1
Bagnères		103·2	46	e 14 11	+ 8	i 24 42	[0]	e 18 24	PP	e 43·6
Brisbane	N.	103·2	221	i 14 6	+ 3	i 24 42	[0]	i 18 24	PP	—
Jersey		105·7	39	e 13 44	P	i 24 50	[− 4]	18 3	PKP	e 44·9
Tunis		105·7	57	e 18 39	PP	i 24 54?	[0]	e 29 14	PPS	45·9
Marseilles		106·4	48	e 14 26	P	e 24 47	[− 9]	e 33 40	SS	e 44·5
Clermont Farrand		106·4	45	e 14 38	P	i 25 1	[+ 5]	—	—	e 37·3
Sitka		107·1	330	e 19 52	PP	i 25 54	S	i 28 54	PPS	—
Oxford	N.	107·7	38	14 45	P	i 24 59	[− 3]	i 18 14	PP	e 39·9
Bidston		107·8	36	i 19 12	PP	i 24 59	[− 4]	i 33 32	SS	42·9
Paris		107·9	42	e 14 7	P	i 25 2	[− 1]	18 30	PP	44·9
Kew		108·0	39	i 14 25k	P	i 24 59	[− 5]	i 14 47	pP	43·9
Stonyhurst		108·3	36	14 14	P	i 25 4	[− 1]	i 18 49	PP	44·9
Moncalieri		108·7	47	e 16 22	?	28 33	PS	—	—	e 42·6
Besançon		109·0	45	e 18 54	PP	e 25 54	{− 4}	—	—	46·9
Durham		109·3	35	e 14 26	P	i 25 4	[− 5]	i 19 4	PP	45·3
Edinburgh		109·3	34	i 19 25	PP	i 25 5	[− 4]	i 28 23	PS	39·9
Neuchatel		109·4	45	e 14 33	P	e 25 7	[− 2]	—	—	—
Basle		110·0	45	e 14 36	P	—	—	e 19 22	PP	—
Rome		110·0	53	14 37	P	i 25 8	[− 4]	i 19 12	PP	e 46·9
Uccle		110·0	40	14 41	P	i 25 9	[− 3]	i 19 26	PP	e 46·9
Florence		110·2	50	18 20	[−13]	31 0	?	i 19 54	PP	—
Aberdeen		110·5	33	i 19 30	PP	i 25 6	[− 8]	i 28 36	PS	45·9
Chur		110·5	46	e 14 38	P	—	—	e 19 41	PP	—
Zurich		110·5	45	e 14 39	P	—	—	e 19 31	PP	—
Strasbourg		110·7	44	e 14 33	P	i 25 12	[− 3]	e 15 0	pP	e 47·7
De Bilt		111·2	40	i 14 44	P	i 25 17	[0]	i 19 22	PP	46·0
Perth		111·5	188	19 19	PP	29 4	PS	i 21 26	PPP	53·4
Stuttgart		111·6	45	i 14 45	P	e 28 5	PS	i 19 39	PP	e 52·9
Scoresby Sund		112·7	16	15 12	P	25 20	[− 2]	19 29	PP	—
Triest		112·7	49	18 54	[+16]	25 20	[− 2]	19 50	PP	—
Göttingen		113·4	42	e 14 47	P	i 25 29	[+ 4]	e 19 11	PP	e 47·9
Laibach		113·4	49	18 51	[+12]	i 25 28	[+ 3]	e 19 26	PP	35·5
Heligoland		113·6	39	e 19 47	PP	e 25 25	[− 1]	i 29 17	PS	e 43·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hof		113·9	44	e 19 10	PP	e 29 10	PS	—	—	e 37·9
Cheb		114·0	44	e 14 36	P	e 26 30	{− 3}	e 20 5	PP	e 51·9
Jena		114·0	44	e 14 54	P	e 25 27	[− 1]	e 19 54	PP	e 38·9
Collmberg		114·4	43	e 15 5	P	i 25 31	[+ 2]	i 20 6	PP	52·9
Hamburg		114·4	40	e 15 2	P	i 25 29	[0]	e 19 38	PP	e 47·9
Prague		115·2	45	e 18 24	[−19]	e 25 30	[− 2]	e 20 6	PP	e 43·9
Bergen		115·5	32	e 18 54	[+10]	e 25 27	[− 6]	i 19 57	PP	e 45·9
Belgrade		116·5	53	18 47	[+ 1]	i 26 50	{ 0}	i 19 33	PP	50·2
College		116·6	333	e 14 56	P	26 15	{−36}	e 20 0	PP	—
Copenhagen		116·7	39	15 18	P	25 28	[−10]	20 19	PP	47·9
Budapest		116·8	50	18 49	[+ 3]	29 40	PS	e 20 8	PP	e 49·9
Kecskemet	Z.	116·9	51	e 18 57	[+11]	e 29 27	PS	e 22 38	PPP	e 55·9
Sofia		117·5	56	e 18 54	[+ 6]	25 41	[+ 1]	26 58	SKKS	e 49·9
Helwan		117·5	72	e 15 21	P	28 3	?	20 4	PP	—
Bucharest		120·0	55	e 18 54	[+ 1]	i 25 50	[0]	20 8	PP	52·9
Istanbul		120·7	60	14 9	P	28 48	?	—	—	—
Upsala		120·9	36	e 19 20	[+26]	i 27 18	{− 1}	e 36 54	SS	e 47·9
Cernauti		121·4	51	e 19 0	[+ 5]	—	—	20 6	PP	51·9
Ksara		122·7	70	e 15 37	P	32 7	PPS	20 41	PP	—
Pulkovo		127·0	38	e 15 57	P	26 11	[− 1]	e 21 2	PP	45·5
Sotchi		129·0	59	e 19 16	[+ 6]	—	—	e 22 14	PP	—
Moscow		129·9	44	e 16 15	P	26 18	[− 1]	21 32	PP	58·4
Erevan		131·4	65	e 19 19	[+ 5]	—	—	e 22 0	PP	—
Piatigorsk		131·4	59	e 18 54	[−20]	—	—	e 22 7	PP	—
Tiflis		132·1	64	e 16 7	P	i 28 31	{− 1}	i 21 40	PP	e 54·9
Grozny		133·2	62	19 23	[+ 5]	—	—	—	—	—
Baku		135·5	67	e 19 25	[+ 3]	—	—	e 22 9	PP	—
Malabar		136·5	180	19 6	[−18]	—	—	i 22 40	PP	e 63·9
Batavia		137·5	180	e 19 24	[− 2]	i 40 21	SS	—	—	e 47·9
Colombo	E.	141·3	133	19 30	[− 2]	29 25	{− 4}	40 57	SS	69·2
Palau		141·9	227	19 41	[+ 8]	—	—	—	—	—
Sverdlovsk		142·9	41	e 17 19	P	26 45	[+ 2]	i 22 48	PP	62·4
Bombay		145·0	111	e 19 34	[− 5]	i 29 47	{− 3}	i 33 17	PS	68·9
Medan		146·3	164	19 48	[+ 7]	—	—	—	—	68·9
Hyderabad	N.	147·3	119	19 52	[+ 9]	30 5	{+ 2}	23 29	PP	—
Samarkand		148·2	72	19 29	[−15]	—	—	e 38 22	SS	—
Tashkent		150·1	68	19 49	[+ 2]	26 54	[0]	34 34	PS	81·5
Tchimkent		150·4	66	19 55	[+ 8]	e 27 45	[+51]	—	—	67·9
Andijan		152·4	70	i 20 8	[+18]	—	—	—	—	55·1
Tyosi		153·0	279	20 0	[+ 8]	—	—	—	—	70·3
Mizusawa		153·2	286	20 2	[+10]	29 59	{−37}	—	—	69·6
Agra		153·4	103	e 19 54	[+ 2]	30 32	{− 5}	43 11	SS	—
Sendai		153·4	284	20 0	[+ 8]	30 20	{−17}	23 54	PP	70·9
Mito		153·5	282	19 53	[+ 1]	45 14	SSP	24 21	PP	71·2
Tokyo, Cen. Met. Ob.		153·9	278	20 8	[+16]	44 29	SS	e 23 44	PP	70·7
Dehra Dun	N.	154·8	96	e 20 6	[+13]	e 43 31	SS	—	—	e 67·1
Manila		155·0	213	i 19 59k	[+ 5]	—	—	—	—	—
Nagano		155·3	279	19 55	[+ 1]	—	—	24 18	PP	—
Nagoya		156·0	276	20 18	[+22]	—	—	24 16	PP	72·4
Semipalatinsk		156·0	45	e 19 0	[−56]	—	—	—	—	67·9
Osaka		157·1	273	19 58	[+ 1]	44 2	SS	23 55	PP	73·4
Kobe		157·4	273	19 57	[0]	—	—	24 48	PP	—
Calcutta	N.	158·4	125	i 20 8	[+10]	e 27 1	[− 2]	i 24 33	PP	i 77·0
Koti		158·4	269	20 2	[+ 4]	46 2	SS	24 51	PP	e 71·9
Hamada		159·9	272	20 3	[+ 3]	30 18	{−53}	24 57	PP	73·9
Vladivostok		160·1	296	20 0	[− 1]	30 40	{−32}	i 24 32	PP	46·7
Hukuoka		161·0	268	e 19 51	[−11]	—	—	—	—	e 46·6
Taihoku		163·4	231	e 21 2	[+58]	—	—	—	—	—
Phu-Lien		164·3	177	e 20 9	[+ 4]	26 54	[−14]	24 49	PP	83·9
Zinsen		164·6	279	20 6	[+ 1]	32 14	{+38}	29 9	PPP	72·2
Hong Kong		164·7	204	20 12	[+ 7]	45 14	SS	24 44	PP	62·9
Irkutsk		164·9	7	20 8	[+ 3]	26 56	[−12]	i 24 49	PP	67·9
Zi-ka-wei		167·2	250	i 20 6a	[− 1]	i 32 28	{+39}	i 25 14	PP	48·2

For Notes see next page.

NOTES TO JAN. 25d. 3h. 32m. 6s.

Additional readings :—

Montezuma i = +6m.21s., +6m.33s., +6m.38s., +7m.8s., +7m.53s., and +8m.20s., iP_cP = +8m.53s.
Huancayo iP = +5m.32s., iSP = +7m.34s., S = +9m.14s., iS_cP = +12m.4s., iP_cS = +12m.44s., iS_cS = +15m.49s.
Balboa Heights ePN = +8m.30s., eN = +9m.37s., iE = +9m.40s., eN = +9m.53s., iE = +10m.52s., iN = +11m.8s., iE = +17m.1s.
Fort de France PPP = +11m.47s., PS = +16m.56s., SS = +19m.34s., SSS = +21m.0s.
Port au Prince ePNE = +9m.36s., PPP = +12m.15s., PS = +18m.0s.
San Juan ipPP = +12m.51s., i = +17m.10s.
Columbia esPP = +16m.23s., iS_cS = +20m.31s., sS = +22m.42s., SSS = +27m.53s.
Cape Town iE = +11m.28s., iN = +11m.31s., iSSSE? = +29m.58s., iSSSN? = +30m.12s.
Little Rock iPP = +13m.59s., isS = +21m.32s., iS_cS = +22m.10s., SS = +26m.24s.
Chatham Ils. i = +22m.42s. and +17m.42s., SKS = +22m.12s., i = +23m.42s., +27m.24s., and +29m.30s.
Cape Girardeau iP_cPN = +11m.53s., iN = +12m.17s., iPPN = +14m.43s., ipPPN = +14m.58s., iSE = +21m.19s., isSE = +21m.55s.
Cincinnati ePPP = +16m.13s., e = +26m.6s.
St. Louis iP_cPEN = +12m.9s., iPPEN = +14m.56s., isS = +22m.10s., iPPSEN = +22m.44s.
Florissant iP_cPZ = +12m.10s., iS_cSE = +22m.3s., isSE = +22m.14s.
Fordham iZ = +14m.7s., iPP = +15m.18s., iEN = +22m.35s., +22m.57s., and +23m.12s.
Tucson iP = +11m.59s., ipPP = +16m.36s., i = +19m.8s., +19m.50s., and +20m.41s., S_cS = +21m.32s., iSP = +22m.17s., i = +22m.59s.
Weston iPPPZ = +16m.53s., iPSE = +22m.33s., iL_qE = +33m.21s.
Harvard iEN = +12m.10s., $iPKP_1PKPZ$ = +39m.10s.
Williamstown iPP = +15m.8s., i = +21m.34s. and +22m.20s.
Chicago eP = +12m.13s., eP_cP = +12m.29s., epPP = +16m.36s., ePPP = +17m.5s., iSP = +22m.2s., pS = +22m.58s., sS = +23m.34s., sSP = +24m.40s., eSS = +26m.53s., SSS = +31m.7s., eSKSP = +32m.4s.
Chicago, Loyola, i = +12m.43s.
Toronto PP = +15m.20s., SSS = +31m.0s.
Christchurch iP = +12m.21s., iEZ = +12m.53s., L_qN = +34m.2s.
East Machias iP = +12m.22s., eP_cP = +12m.29s., i = +12m.38s. and +12m.43s., iSP = +22m.33s., eSS = +27m.41s., iSSS = +31m.38s., eSKSP = +32m.20s.
Wellington PPP = +17m.44s., S_cS = +23m.18s., SKS = +23m.41s., SS = +27m.23s., L_q = +34·4m.
Halifax PS = +23m.13s., SS = +27m.36s., SSSE = +30m.54s. ?
Denver iN = +12m.34s., ipPN = +12m.52s., iN = +12m.57s. and +13m.17s., eE = +13m.36s., iN = +13m.55s., eN = +16m.16s., eE = +19m.38s., isSEN = +23m.10s., iN = +23m.27s.
Ottawa SS = +27m.42s., e = +32m.24s.
Riverside $iPKP_1PKPZ$ = +39m.10s., $iPKP_1PKP_1PKPZ$ = +59m.6s.
Mount Wilson $iPKP_1PKP_1PKP$ = +59m.9s.
Pasadena eN = +22m.18s., iPSE = +23m.19s., iSSN = +28m.0s., $ePKKPZ$ = +30m.54s., $ePKP_1PKPZ$ = +38m.45s., $iPKP_1PKPZ$ = +39m.5s., $eSKP_1PKPZ$ = +42m.15s., $ePKP_1PKP_1PKPZ$ = +59m.8s.
Arapuni i = +23m.42s., +24m.12s., and +25m.54s., L_q = +34m.18s.
Johannesburg iN = +22m.53s.
New Plymouth i = +12m.35s. and +13m.14s.
Tinemaha $ePKKPZ$ = +30m.48s., $ePKP_1PKPZ$ = +38m.53s., $ePKP_1PKP_1PKPZ$ = +59m.17s.
Salt Lake City ePP = +16m.10s., SP = +23m.32s., SS = +28m.45s., PKKP = +29m.17s., isSS = +30m.34s., eSSS = +32m.24s.
Branner iPE = +12m.54s., eSN = +23m.30s., eL_qN = +36m.30s.
Berkeley iPZ = +12m.51s., iZ = +13m.22s., iE = +13m.57s., iZ = +16m.51s., eE = +23m.22s., iSZ = +23m.24s., eL_qE = +36m.12s.
San Francisco ePN = +12m.56s., iN = +13m.5s.
Ukiah P = +13m.27s., i = +23m.49s., SP = +24m.22s., iSS = +30m.16s., SSS = +33m.54s., i = +35m.45s.
Bozeman eSP = +23m.59s., eSS = +29m.19s., eSSS = +33m.49s.
Apia sP = +13m.56s., i = +16m.26s., PPN = +16m.40s., ipPPZ = +17m.14s.
Ferndale ePN = +13m.4s., eE = +36m.54s. ?
Saskatoon SS = +31m.24s., SSS = +34m.54s. ?
Seattle sPP = +19m.26s., S = +24m.19s., SP = +25m.17s., i = +39m.12s.
Victoria SS = +30m.54s. ?
Granada iE = +15m.42s., SSE = +31m.38s.
Almeria SSZ = +32m.16s.
Melbourne SKKS = +24m.54s., i = +25m.14s. and +25m.34s., PS = +26m.27s., SS = +32m.24s., SSS = +37m.37s., i = +41m.46s.
Honolulu iPS = +26m.2s. and +27m.15s., eSS = +31m.1s., iSSS = +35m.58s.
Toledo i = +20m.56s., iPS = +26m.29s., eSS = +31m.56s.
Riverview iPPEN? = +17m.25s ,,iZ = +17m.58s., iE = +18m.18s., iPPPN = +20m.20s., iN = +24m.24s., SKKSEN = +25m.4s., SE = +25m.51s., ePSEN = +26m.55s., PPSEN = +27m.24s., SSEN = +32m.22s., SSSN? = +36m.25s., eL_qEN = +41m.54s.

Continued on next page,

Ivigtut +25m.14s. and +27m.0s.
Algiers PP = +18m.37s., S = +25m.27s., SS = +32m.35s.
Tananarive SPN = +14m.37s., EN = +17m.58s., ipPPEN = +18m.33s., SEN = +25m.30s., N = +26m.26s., PSEN = +27m.4s., eN = +28m.28s., E = +31m.4s., SSN = +32m.31s., SSE = +32m.37s.
Adelaide i = +27m.30s.
Bagnères e = +14m.30s., +16m.58s., +18m.48s., and +19m.2s., iSKKS = +25m.26s.; ePS = +27m.15s., eSS = +33m.2s., iSS = +33m.6s., eSSS = +37m.11s., e = +37m.24s., i = +37m.28s.
Brisbane iSKKSN = +25m.6s., iPPSN = +28m.0s., iSSN = +32m.36s.
Jersey eS = +26m.14s., PS = +27m.49s., i = +28m.24s., iSS = +33m.42s., SSS = +38m.9s.
Tunis e = +19m.33s., eS = +26m.45s.
Marseilles e = +19m.11s. and +19m.26s., eSKKS = +25m.38s., ePPS = +28m.38s., eSSS = +38m.8s.
Sitka i = +25m.47s., iS = +27m.14s., iPS = +30m.1s.
Oxford iPP = +19m.17s.
Bidston isPP = +19m.26s., iSP = +28m.6s., isSP = +28m.29s., isSS = +33m.59s., i = +34m.54s., +38m.59s., and +42m.7s.
Paris SKKS = +25m.53s., PS = +28m.10s., eSS = +33m.54s. ?
Kew ePKPZ = +18m.33s., iPPZ = +18m.55s., ipPPNE = +19m.13s., iZ = +19m.21s., isPP = +19m.26s., isSKSZE = +25m.47s., iSP = +28m.8s., isSP = +28m.42s., iEZ = +30m.25s., iSS = +33m.47s., isSS = +34m.7s., i = +34m.57s., iE = +35m.41s. iNZ = +38m.3s., iSSSE = +38m.33s., iEZ = +38m.49s., iNZ = +39m.3s., i = +42m.19s.
Stonyhurst i = +19m.24s., +28m.11s., +28m.27s., +28m.55s., +33m.44s., +34m.47s., +35m.12s., +38m.4s., and +38m.34s.
Moncalieri iPP = +16m.51s.
Durham eE = +15m.8s., iE = +19m.12s., iEN = +19m.33s. and +19m.40s., iN = +26m.36s., iEN = +28m.23s. and +34m.18s., iE = +34m.50s.
Edinburgh i = +19m.37s., +19m.47s., +19m.55s., +22m.0s., +25m.32s., +26m.1s., +26m.24s., +29m.2s., +34m.43s., +35m.10s., and +39m.21s.
Basle ePPP = +22m.13s.
Rome iZ = +19m.45s., iPPP = +21m.43s., and +21m.53s., iSKKSE = +26m.10s., iSN = +26m.51s., iPSE = +27m.51s., iPPSE = +28m.33s., iN = +29m.21s., iE = +30m.21s.
Uccle iPKPE = +18m.38s., iSKKS = +26m.8s., iPS = +28m.28s., iPPSN = +29m.10s., iN = +29m.50s., iSSN = +34m.32s., iE = +34m.50s., iSSSE = +38m.56s.
Aberdeen iEN = +19m.40s., iE = +26m.45s., +29m.14s., and +34m.20s., iN = +34m.33s., iE = +42m.20s.
Chur ePKP = +18m.37s.
Zurich ePKP = +18m.21s., ePPP = +21m.54s.
Strasbourg iPPZ = +19m.11s., iSKKSN = +26m.8s., iSKKSE = +26m.12s., eS = +26m.48s., ePSZ = +28m.33s., iE = +28m.37s., PPSN = +29m.17s., iSSE = +34m.38s., SSSN = +38m.56s.
De Bilt PPZ = +19m.1s., iE = +21m.53s., i = +28m.42s., iN = +34m.26s., iE = +34m.39s.
Perth PP = +23m.56s., i = +25m.22s. and +26m.54s., PS = +29m.29s., SS = +35m.4s., SSS = +40m.16s.
Stuttgart ePKP = +18m.34s., ePPP = +22m.4s., iSKKS = +26m.19s., iPS = +28m.44s., eSS = +35m.5s., e = +38m.0s., eSSS = +39m.36s., e = +45m.30s., eN = +47m.24s., e = +50m.36s.
Scoresby Sund +19m.58s., PPP = +22m.2s., SKKS = +26m.29s., PS = +29m.5s., eN = +29m.40s., SS = +35m.5s.
Triest i = +20m.14s., PPP = +21m.55s., SKKS = +26m.26s., i = +27m.24s., PS = +29m.8s., PPS = +30m.23s., SS = +35m.21s., i = +35m.38s., SSS = +39m.56s., i = +48m.0s. and +54m.22s.
Göttingen iSE = +26m.35s., iSSE = +36m.5s.
Laibach iNW = +20m.21s., +22m.12s., +26m.35s., and +29m.21s.
Heligoland SS = +35m.18s., eSSSN = +39m.22s.
Hof eNE = +20m.40s., +21m.59s., and +34m.54s.
Cheb e = +22m.6s., eSPS = +25m.22s., eS ? = +27m.25s., ePPS = +28m.46s.
Jena eN = +18m.42s., eN = +19m.3s., eZ = +19m.6s., eE = +19m.9s., eN = +20m.6s., eN = +22m.31s., e = +26m.28s., eE = +26m.39s., e = +29m.7s., eN = +30m.54s., +34m.54s., and +35m.24s., eZ = +35m.30s.
Collmberg e = +15m.22s., iPKP = +18m.48s., i = +18m.59s., +19m.12s., +19m.35s., and +19m.46s., iPP = +20m.12s., ePPP = +22m.5s., iSKKS = +26m.43s., i = +27m.9s., e = +27m.14s., eS = +27m.44s., i = +28m.32s., iPS = +29m.15s., e = +29m.20s., iPKKP = +29m.36s., i = +29m.43s. and +30m.3s., iPPSZ = +30m.33s., iE = +30m.36s., e = +31m.14s., iZ = +33m.11s., eSS = +35m.36s., e = +36m.17s., eSSS = +40m.3s., e = +45m.18s. and +47m.6s.
Hamburg eZ = +18m.43s., ePPE = +19m.42s., iPPPEZ = +22m.33s., iSKKSEN = +26m.41s., ePSE = +29m.5s., ePSZ = +29m.17s., iPPSE = +30m.0s., iSS = +35m.28s., eSSS = +39m.6s. and +40m.29s.
Prague ePKP = +18m.54s., ePPP = +22m.35s., eSKKS = +26m.42s., ePS = +29m.18s., eSS = +35m.54s., eSSS = +40m.24s.
Bergen eSKKS = +26m.45s., iPS = +29m.24s., eSS = +35m.54s. ?
Belgrade iZ = +19m.3s. and +19m.17s., iPPZ = +19m.21s., iNW = +23m.5s., iPPPNW = +25m.38s., iScPNW = +29m.27s., i = +31m.35s.

Continued on next page.

College iS = +27m.32s., ePS = +29m.53s., epPS = +30m.50s., ePPS = +31m.1s., eSS = +35m.58s., esSS = +36m.45s.
Copenhagen ePKP = +18m.50s., e = +19m.54s., +22m.33s., +26m.57s., +29m.28s., +29m.34s., and +33m.9s.
Budapest PPN = +20m.16s., eN = iE = +23m.8s., iN = +24m.8s., e = +30m.8s., iE = +30m.40s., e = +31m.29s., eN = +32m.14s., SSN = +35m.50s., eSSE = +35m.54s., iSKKS = +36m.41s., eN = +38m.14s.
Kecskemet eZ = +20m.14s., ePPZ = +23m.51s., eSKKSZ = +30m.37s., eZ = +32m.57s., ePSZ = +33m.23s., ePKKSZ = +36m.51s., eZ = +39m.15s.
Sofia eN = +19m.54s., iE = +20m.9s., PP = +20m.39s., iEN = +29m.48s., iSSN = +36m.21s.
Helwan PKP = +18m.54s., iEZ = +19m.21s. and +20m.44s., iE = +25m.42s., SKKS = +26m.59s., PSE = +29m.47s.
Bucharest eE = +19m.6s., eEN = +19m.21s., eE = +20m.28s., PPPE = +22m.42s., iSKKS = +27m.16s., SKSPEN = +30m.16s., SS?N = +36m.50s., SS?E = +36m.57s.
Istanbul PKP = +17m.41s., PP = +19m.9s.
Upsala eE = +19m.42s. and +20m.28s., iE = +20m.39s., iN = +20m.50s., iSKSE = +25m.46s., iSKKSE = +26m.29s., eE = +28m.54s.
Pulkovo PKP = +19m.5s., SKKS = +27m.56s., PS = +30m.57s., SS = +37m.24s.
Ksara ePKP = +19m.1s., ipPKP = +19m.25s.
Moscow PKP = +19m.15s., PKS = +22m.48s., ePPP = +24m.57s., SKKS = +28m.18s., SKSP = +32m.13s., ePPS = +33m.47s., SS = +39m.6s.
Piatigorsk e = +22m.36s.
Tiflis ePKPZ = +19m.8s., iPKPN = +19m.23s., eE = +20m.21s., iE = +21m.52s., iZ = +22m.17s., iE = +22m.28s., iN = +22m.37s., iE = +23m.14s. and +25m.3s., iZ = +25m.12s., iE = +28m.33s., iZ = +31m.3s., iE = +31m.50s., iN = +32m.6s., iZ = +33m.32s., iE = +33m.42s., eE = +34m.59s., iE = +36m.14s., iN = +38m.11s., iSSN = +39m.11s., iSSE = +39m.38s.
Grozny i = +19m.53s., +22m.56s., +23m.7s., and +23m.15s.
Baku e = +22m.40s., PPP = +24m.48s.
Batavia iE = +19m.37s. and +23m.44s.
Colombo ? E = +58m.43s.
Sverdlovsk iPKP = +19m.30s., iPPP = +26m.1s., iSKKS = +29m.37s., SS = +41m.18s.
Bombay ePKPEN = +19m.40s., iEN = +19m.52s., +20m.5s., and +20m.21s., PKSEN = +23m.23s., sPKSE = +23m.53s., eN = +29m.57s., iEN = +30m.22s., iE = +34m.2s., PPSE = +35m.57s., iSSEN = +41m.39s., iE = +42m.18s., sSSE = +42m.24s., SSSEN = +47m.17s., L_qEN = +59m.13s.
Hyderabad SKSPN = +33m.39s., SSN = +42m.16s.
Tashkent ePPS = +37m.5s., SS = +43m.0s., SSS = +47m.54s.
Mizusawa ePN = +20m.5s.
Agra iE = +20m.28s., SKPE = +23m.29s., iN = +23m.35s., PSKS = +34m.1s., SS = +42m.39s.
Sendai PPP = +26m.0s.
Mito PPP = +25m.30s.
Tokyo, Cent. Met. Ob. SSS = +48m.43s.
Dehra Dun eN? = +30m.32s. and +34m.22s.
Osaka SSS = +48m.44s.
Calcutta N ePKP$_2$ = +20m.53s., eSKP = +23m.41s., iPPP = +28m.20s., iSKKS = +31m.16s., iPSKS = +35m.5s., iPPS = +38m.32s., iSS = +44m.54s., iSSS = +51m.17s.
Koti ePPP = +28m.32s.
Hamada PPP = +27m.39s., SS = +46m.38s., SSS = +50m.10s.
Vladivostok PKS = +23m.52s., iPS = +35m.28s., iPPS = +37m.56s.
Phu-Lien SS? = +45m.9s.
Zinsen SKP = +25m.50s., PP = +25m.57s., SS = +44m.26s., SSS = +51m.21s.
Hong Kong = +38m.56s. and +51m.41s.
Irkutsk PPP = +28m.26s., iSKKS = +31m.29s., PS = +36m.2s., eSS = +44m.24s., SSS = +50m.54s.
Zi-ka-wei iE = +25m.44s., iN = +25m.58s., iE = +29m.36s.
Long waves were also recorded at Frunse.

Jan. 25d. 11h. 2m. 19s. Epicentre 30°·3N. 50°·8E.

A = +·5466, B = +·6702, C = +·5020; δ = −6; h = +2;
D = +·775, E = −·632; G = +·317, H = +·389, K = −·865.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku	10·1	356	e 2 42	PP	e 4 29	+ 5	—	—	e 6·9
Erevan	11·1	334	e 3 19	+36	—	—	—	—	—
Tiflis	12·4	339	3 0	− 1	5 20	− 1	3 8	PP	—
Ksara	13·1	289	e 3 17	+ 7	e 5 54	SS	—	—	—
Grozny	13·6	344	e 3 21	+ 4	—	—	—	—	e 7·6
Sotchi	15·9	329	e 3 41	− 6	—	—	—	—	—
Helwan	16·9	274	i 3 56k	− 3	e 6 59	− 8	4 23	PPP	e 8·3
Tashkent	18·6	49	i 4 19	− 2	7 52	+ 6	—	—	e 10·5
Tchimkent	19·3	46	e 4 30	+ 1	—	—	—	—	e 10·6
Andijan	20·4	54	e 4 43	+ 2	e 8 43	+18	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		20·6	308	e 7 14	?	10 18	L	—	—	(10·3)
Frunse		22·7	51	e 3 10	?	—	—	—	—	—
Bombay		23·0	116	e 5 14	+ 7	i 9 27	+13	—	—	—
Bucharest		24·0	314	e 5 23	+ 6	—	—	—	—	9·5
Agra	E.	24·1	91	5 19	+ 1	9 47	+13	5 28	pP	—
Sofia	E.	25·2	308	e 5 41?	+12	e 10 29	SS	—	—	—
Moscow		27·1	345	e 5 43	− 3	e 10 17	− 7	—	—	15·2
Sverdlovsk		27·4	12	i 5 46	− 3	10 27	− 1	—	—	15·7
Pulkovo		32·6	342	e 6 32	− 3	e 11 40	−11	—	—	e 15·1
Triest		32·6	309	—	—	e 11 51	0	—	—	e 18·3
Calcutta	N.	34·4	95	—	—	e 10 26	?	—	—	—
Cheb		34·9	317	—	—	e 12 41?	+14	—	—	—
Collmberg		35·0	320	e 6 51	− 5	—	—	—	—	—
Chur		35·8	311	e 7 0	− 3	—	—	—	—	—
Colombo	E.	35·9	126	10 11	?	—	—	—	—	—
Stuttgart		36·5	314	e 6 41	−28	—	—	—	—	e 20·7
Irkutsk		44·6	45	e 8 15	− 1	e 14 53	+ 1	—	—	24·7

Additional readings :—
Tiflis eN = +5m.26s., iE = +6m.46s.
Ksara iP_g = +4m.18s., iS_g = +7m.22s.
Helwan eZ = +5m.31s., SN = +7m.41s.
Agra sSE = +10m.3s.
Collmberg i = +6m.55s.
Long waves were also recorded at La Paz, Fordham, Paris, and Strasbourg.

Jan. 25d. 17h. 19m. 28s. Epicentre 6°·2S. 147°·7E. (as on 1938 May 12d.).

A = −·8404, B = +·5313, C = −·1073 ; δ = +7 ; h = +7 ;
D = +·534, E = +·845 ; G = +·091, H = −·057, K = −·994.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		27·7	173	—	—	e 10 14	−19	e 11 56	SSS	e 14·3
Sydney		27·7	173	—	—	e 11 2	+29	—	—	e 15·5
Adelaide		29·8	194	e 6 6	− 5	e 12 46	SS	—	—	i 15·9
Melbourne		31·6	183	—	—	i 11 35	0	—	—	14·9
Manila		33·6	309	6 49	+ 5	12 0	− 6	—	—	15·9
Perth		39·2	224	14 27	S	(14 27)	+55	17 52	SSS	19·5
Batavia		40·6	268	e 7 19	−24	—	—	—	—	—
Hong Kong		43·4	312	14 17	S	(14 17)	−18	16 39	SS	—
Vladivostok		51·2	346	—	—	i 16 25	0	i 19 12	SS	21·8
Calcutta	N.	64·7	299	—	—	e 19 5	−17	—	—	—
Irkutsk		68·9	334	e 11 16	+ 7	e 20 8	− 5	—	—	e 28·5
Bombay		77·8	291	—	—	e 21 32	−21	—	—	—
Frunse		82·0	315	e 11 21	−62	—	—	—	—	—
Andijan		83·0	312	e 12 28	0	e 22 40	− 7	—	—	—
Tashkent		85·4	313	e 13 20	+40	i 23 14	+ 3	—	—	e 41·8
Tchimkent		85·4	314	e 12 36	− 4	e 22 58	[− 5]	—	—	—
Samarkand		86·8	310	e 12 52	+ 5	—	—	—	—	—
Sverdlovsk		93·5	326	e 13 16	− 3	e 24 24	− 1	i 17 11	PP	36·5
Pasadena		96·9	56	e 13 43	+ 9	—	—	—	—	—
Mount Wilson	Z.	97·0	56	e 13 42	+ 7	—	—	e 17 50	PP	—
Tiflis	Z.	103·7	311	e 17 13	?	—	—	—	—	e 57·5
Moscow		106·4	327	e 18 45	PP	—	—	—	—	—
Pulkovo		108·9	332	e 19 6	PP	—	—	—	—	—
Ksara		111·5	303	e 20 5	PP	—	—	—	—	67·5
Ottawa		125·8	35	—	—	e 34 5	?	—	—	66·5

Additional readings :—
Melbourne i = +10m.55s.
Batavia iE = +8m.47s.
Vladivostok i = +18m.55s.
Tashkent i = +28m.47s., e = +33m.59s.
Sverdlovsk i = +13m.25s. and +30m.21s.
Pasadena iEZ = +13m.51s.
Mount Wilson iZ = +13m.50s.
Long waves were also recorded at Strasbourg, Stuttgart, Cheb, Baku, Tucson, Christchurch, and Wellington,

Jan. 25d. 20h. Undetermined shock.

Apia eP = 27m.41s., iS = 28m.44s.
Pasadena eP = 37m.33s., ipPNZ = 38m.27s.
Batavia iPZ = 37m.34s., iN = 38m.17s.
Mount Wilson iP = 37m.35s., iZ = 37m.45s., 38m.2s., ipP = 38m.28s.
Riverside iPZ = 37m.38s., ipPZ = 38m.31s.
Haiwee iPEZ = 37m.42s., ipP = 38m.36s.
Tinemaha iPEZ = 37m.43s., eEZ = 37m.59s., epPEZ = 38m.36s.
Vladivostok i = 37m.48s., e = 39m.6s., e = 47m.27s., i = 47m.46s.
Tucson P = 37m.59s., iP = 38m.9s., 38m.23s., i = 38m.52s., iPP = 40m.34s., S = 47m.54s., PKP_1PKP = 64m.49s.
Sverdlovsk e = 44m.42s., 46m.28s., 64m.35s., and 75m.45s., L = 78m.
Grozny eP = 45m.7s., e = 48m.27s.
Jena eN = 45m.29s., eE = 46m.54s., eN = 47m.6s.
Collmberg eZ = 45m.23s., i = 45m.26s., iZ = 45m.35s., i = 46m.23s., 46m.26s., e = 48m.44s.
Basle eP = 45m.32s.
Chur eP = 45m.32s., e = 45m.39s.
Ksara iPKP = +45m.33s.k, pPKP = 46m.27s., PP = +49m.4s., e = 59m.5s.
Zurich eP = 45m.38s.
Neuchatel eP = 45m.40s.
Strasbourg e?Z = 45m.44s.
Andijan e = 46m.1s.
Moscow e = 47m.41s., 47m.59s., 49m.58s., and 51m.38s.
Tashkent e = 47m.52s., 48m.24s., 64m.1s., 66m.9s., and 83m.12s.
Tiflis eZ = 48m.5s., eE = 48m.11s., eN = 48m.23s., eZ = 48m.39s. and 60m.37s.
Pulkovo e = 48m.16s. and 48m.34s., eL = 75·5m.
Baku e = 48m.18s., L = 75·2m.
Frunse e = 57m.50s.

Jan. 25d. Readings also at 1h. (Vera Cruz, Tucson (2), Tacubaya, Merida, and Oaxaca), 2h. (Lick), 3h. (Tucson, Riverside, Mount Wilson, Pasadena, Fordham, and Weston), 4h. (Tinemaha), 5h. (Basle), 6h. (Tiflis, Tchimkent, Erevan, and Andijan), 9h. (Mizusawa), 10h. (Manila and Andijan, 12h. (Mizusawa), 14h. (Mizusawa and Tucson), 16h. (Tiflis, Baku, Colombo, Sverdlovsk, and Calcutta), 17h. (Andijan and near Mizusawa), 19h. (Andijan, Sverdlovsk, and Tashkent), 21h. (Erevan, Tiflis, Sotchi, Ksara, and Grozny), 23h. (Almata).

Jan. 26d. 17h. 26m. 54s. Epicentre 2°·5S. 131°·0E. (as on 1937 Sept. 27d.).

$A = -\cdot6555$, $B = +\cdot7540$, $C = -\cdot0433$; $\delta = +7$; $h = +7$;
$D = +\cdot755$, $E = +\cdot656$; $G = +\cdot028$, $H = -\cdot033$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		19·7	330	e 4 20	−14	8 35	SS	—	—	11·5
Batavia		24·4	260	e 4 58	−23	9 38	− 1	—	—	—
Perth		32·6	204	i 8 13	PPP	i 11 23	−28	—	—	i 15·2
Medan		32·9	281	5 0	?	—	—	—	—	e 22·1
Melbourne		37·4	162	e 10 33	?	i 12 34	−31	—	—	i 18·4
Vladivostok		45·4	1	—	—	i 15 6	+ 2	i 18 16	SSS	19·7
Calcutta	N.	48·5	303	—	—	i 15 36	−12	—	—	—
Irkutsk		59·0	342	—	—	18 13	+ 3	—	—	29·1
Frunse		67·9	319	e 11 16	+14	—	—	—	—	—
Andijan		68·5	316	e 11 7	+ 1	e 20 9	+ 1	—	—	—
Tashkent		70·8	315	—	—	i 20 21	−14	e 25 5	SS	e 38·8
Sverdlovsk		81·5	329	12 20	− 1	e 22 28	− 4	—	—	36·1
Baku		84·8	311	e 12 36	− 1	23 9	+ 4	24 13	PS	47·3
Tiflis		88·8	312	e 12 56	− 1	23 44	0	—	—	e 45·1
Ksara		95·6	303	e 11 8	?	—	—	—	—	—

Additional readings :—
Batavia iN = +9m.20s.
Medan iE = +15m.32s.
Vladivostok i = +18m.32s.
Tashkent e = +30m.29s.
Baku SSS = +38m.36s.
Tiflis eZ = +13m.12s.
Long waves were also recorded at Pulkovo, Christchurch, Riverview, and Uccle.

Jan. 26d. Readings also at 0h. (Mizusawa), 1h. (near Triest), 2h. (La Paz, Huancayo, and Tucson), 4h. (Tucson), 5h. (Tucson), 6h. (Vladivostok, New Plymouth, and Wellington), 7h. (New Plymouth, Wellington, Tiflis (2), Sverdlovsk, and Irkutsk), 8h. (Piatigorsk), 10h. (Riverview, Melbourne, Manila, New Plymouth, and Wellington), 11h. (Tiflis), 12h. (Mizusawa), 13h. (Tucson), 15h. (Calcutta and Mizusawa), 18h. (Colombo and Christchurch), 21h. (Ksara, Tashkent, Tiflis, and Sverdlovsk).

Jan. 27d. 10h. Epicentre off coast of Japan, but no determination seems possible.

Osaka P = 39m.6s., S = 40m.6s.
Mizusawa ePE = 39m.21s., SE = 40m.45s.
Zi-ka-wei eZ = 41m.58s.
Irkutsk e = 42m., L.52m.
Manila eP = 44m.8s., S?EN = 49m.30s.
Sverdlovsk P = 47m.53s., eS = 55m.48s., L = 65m.
Tinemaha eZ = 50m.0s.
Pasadena ePZ = 50m.5s.
Mount Wilson ePZ = 50m.6s.
Riverside ePZ = 50m.9s.
Tucson P = 50m.37s., P_cP = 51m.29s.
Ksara e = 56m.26s., 72m.48s., L = 85m.
Pulkovo e = 66m.40s. and 73m.32s.
Cheb e = 68m.
Long waves were also recorded at Phu-Lien and other European and Russian stations.

Jan. 27d. 14h. 11m. 48s. Epicentre 13°·1N. 89°·5W.

Felt strongly in the western part of El Salvador. Intensity VI at San Salvador.

See Seismological Notes, Bulletin of the Seismological Society of America, vol. 29, Berkeley. 1939, p. 416.

$A = +\cdot0085$, $B = -\cdot9743$, $C = +\cdot2252$; $\delta = +5$; $h = +6$;
$D = -1\cdot000$, $E = -\cdot009$; $G = +\cdot002$, $H = -\cdot225$, $K = -\cdot974$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida	N.	7·8	359	i 2 16	P*	—	—	—	—	—
Oaxaca	N.	8·0	300	e 2 3	+ 3	—	—	—	—	—
Vera Cruz	N.	8·8	315	i 2 16	+ 5	—	—	—	—	—
Puebla	N.	10·2	306	i 2 36	+ 5	—	—	—	—	—
Balboa Heights		10·6	112	e 2 44	PP	—	—	—	—	—
Tacubaya	E.	11·2	305	i 2 46	+ 2	—	—	—	—	—
Little Rock		21·7	354	e 3 57	−58	i 7 52	−59	9 15	SS	—
Columbia		22·2	19	e 5 2	+ 2	e 9 2	+ 2	—	—	e 13·7
Cape Girardeau		24·1	0	e 5 19	+ 1	e 9 36	+ 2	i 5 32	pP	—
St. Louis		25·4	359	e 5 30	− 1	e 10 1	+ 5	—	—	e 11·7
Florissant		25·6	359	e 5 27	− 5	—	—	i 6 34	PPP	—
Tucson		27·3	319	i 5 45a	− 3	10 29	+ 2	i 6 28	PP	13·8
Fort de France		27·6	83	e 6 1	+10	e 11 5	+33	—	—	—
Chicago		28·7	3	e 5 57	− 4	e 10 41	− 9	e 6 44	PP	e 15·8
Huancayo		28·7	149	e 6 1	0	10 55	+ 5	—	—	12·9
Philadelphia		29·6	24	—	—	e 11 4	0	—	—	e 15·2
Fordham		30·8	25	e 6 19	− 1	e 11 19	− 4	—	—	16·8
Williamstown		32·7	23	i 6 36	0	—	—	—	—	—
Riverside		32·8	314	i 6 32a	− 5	—	—	i 9 20	P_cP	—
Harvard		33·2	25	i 6 39k	− 1	—	—	—	—	e 21·7
Weston		33·2	25	i 6 39a	− 1	e 12 3	+ 3	i 7 25	PP	19·0
Mount Wilson		33·4	314	i 6 39a	− 3	i 13 5	P_cS	i 9 21	P_cP	—
Pasadena		33·4	314	i 6 39a	− 3	i 12 0	− 3	e 9 19	P_cP	16·2
Ottawa		34·3	17	6 45	− 5	e 14 12?	SS	—	—	e 20·2
Haiwee		34·4	317	i 6 48	− 3	—	—	—	—	—
Santa Barbara	Z.	34·6	313	i 6 52	− 1	—	—	—	—	—
Tinemaha		35·1	318	i 6 55	− 2	i 13 13	P_cS	i 9 38	P_cP	—
La Paz	Z.	36·2	142	e 7 5	− 1	e 13 53	+66	—	—	19·7
East Machias		36·8	26	e 6 59	−12	—	—	—	—	e 15·8
Seven Falls		37·4	21	—	—	e 12 48	−17	—	—	17·2
Santa Clara	Z.	37·7	316	e 7 30	+11	—	—	—	—	—
Berkeley		38·2	316	e 7 20	− 3	—	—	—	—	i 21·3
Ukiah		39·5	318	—	—	e 17 40	S_cS	—	—	19·6
Rio de Janeiro	E.	57·7	128	e 17 57	S	(17 57)	+ 4	—	—	—
Pulkovo		92·9	26	—	—	e 25 40	PS	—	—	—
Sverdlovsk		106·0	16	—	—	e 24 52	[− 4]	e 27 57	PS	33·2
Ksara		110·2	46	e 14 34	P	e 28 42	PS	—	—	—
Irkutsk		113·8	350	—	—	e 28 12?	?	—	—	—

For Notes see next page.

Additional readings :—
San Salvador ($\Delta = 0°{\cdot}7$) iP = +11m.0s., iS = +11m.22s.
Columbia eS = +9m.9s.
Cape Girardeau iN = +5m.43s., eSN = +9m.43s., eN = +11m.6s., eE = +13m.11s.
St. Louis iN = +5m.42s., iE = +10m.24s.
Florissant iNZ = +5m.42s.
Tucson iP = +5m.50s., i = +5m.57s., +6m.2s., and +6m.10s., iPPP = +6m.45s., iP_cP = +8m.5s. and +8m.37s., i = +9m.10s., iS = +11m.2s.
Fort de France e = +16m.2s.
Philadelphia eS = +11m.12s.
Fordham eSN = +11m.53s.
Riverside iZ = +9m.29s.
Harvard iZ = +6m.53s.
Pasadena iS_cPZ = +13m.6s.
Ottawa e = +17m.36s.
Tinemaha iP_cPNZ = +9m.28s.
Long waves were also recorded at Baku, Tashkent, Tiflis, Vladivostok, San Juan, and other American and European stations.

Jan. 27d. 20h. 10m. 13s. Epicentre 38°·5N. 14°·7E.

Intensity VII in the islands of Salino and Filicudi ; VI at Lipari, Vulcano, and Alicudi ; V at Panareo. Epicentre 38°·30′N. 14°40′E.

F. Dalmasso.
"Sul terremoto delle Isole Eolie del 27-13-9," Geofisica Pura e Applicata, vol. I, 80-98 Messina, 1939.

$A = +{\cdot}7589$, $B = +{\cdot}1991$, $C = +{\cdot}6199$; $\delta = -15$; $h = -1$.
$D = +{\cdot}254$, $E = -{\cdot}967$; $G = +{\cdot}600$ $H = +{\cdot}157$, $K = -{\cdot}785$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		3·9	334	i 1 4	+ 2	i 1 46	− 4	i 1 7	P*	—
Florence		5·9	334	1 20	−11	3 7	S*	—	—	—
Triest		7·2	355	e 1 50	+ 1	4 4	S_g	e 3 5	− 8	—
Belgrade		7·7	32	—	—	e 3 18	− 7	e 4 7	S_g	—
Sofia		7·8	54	e 1 56	− 2	e 4 30	+62	—	—	—
Moncalieri		8·4	324	e 0 27	?	6 4	?	—	—	—
Chur		9·2	337	e 2 17	+ 1	—	—	—	—	—
Kecskemet	z.	9·2	22	—	—	e 4 51	S_g	—	—	—
Budapest		9·6	18	e 2 44	PPP	e 4 57	S_g	—	—	6·4
Zurich		10·0	335	e 2 30	+ 3	—	—	—	—	—
Neuchatel		10·2	329	e 2 31	0	—	—	—	—	—
Bucharest		10·4	51	e 2 31	− 3	5 45	P_g	2 43	PP	i 7·6
Basle		10·5	332	e 2 33	− 2	—	—	—	—	—
Stuttgart		11·0	341	e 2 42	0	—	—	—	—	e 5·9
Strasbourg		11·3	336	e 2 47	+ 1	—	—	e 3 2	PPP	e 3·1
Istanbul		11·4	72	e 3 43	+56	—	—	—	—	e 6·4
Cheb		11·7	352	—	—	e 4 47?	−17	—	—	—
Jena		12·6	351	e 3 1	− 2	—	—	e 3 17	PP	e 6·8
Cernauti		12·7	36	e 2 17	−48	—	—	—	—	7·8
Collmberg		12·8	355	i 3 4k	− 2	—	—	—	—	e 7·4
Paris		13·6	323	i 3 27	PP	—	—	—	—	7·8
Uccle		14·3	333	e 3 29	+ 3	e 6 17	+11	—	—	e 7·3
Toledo		14·6	281	e 3 38	+ 8	—	—	—	—	e 7·6
Hamburg		15·4	349	e 3 45	+ 5	e 6 48	SS	—	—	e 8·9
Helwan	z.	16·2	117	e 3 44	− 6	—	—	i 3 53	PP	—
Copenhagen		17·3	356	4 9	+ 5	—	—	—	—	9·8
Ksara		17·7	101	i 4 7	− 3	e 7 37	+11	—	—	8·4
Bergen		22·7	348	—	—	e 9 17	+ 8	—	—	—
Moscow		23·1	34	e 5 7	− 1	e 9 7	− 9	—	—	13·3
Tiflis		23·2	72	e 5 7	− 2	9 20	+ 2	5 51	PPP	13·8
Pulkovo		23·5	19	e 5 13	+ 1	e 9 23	0	—	—	e 11·6
Grozny		23·9	68	e 5 16	0	—	—	—	—	—
Baku		27·2	74	—	—	e 11 51	SS	—	—	e 16·9
Sverdlovsk		35·1	43	6 56	− 1	12 28	− 2	—	—	16·8
Tashkent		41·4	68	—	—	e 14 1	− 4	—	—	e 24·5
Andijan		43·8	68	e 8 32	+23	—	—	—	—	—
Frunse		44·8	64	e 8 58	PP	—	—	—	—	—

For Notes see next page.

NOTES TO JAN. 27d. 20h. 10m. 13s.

Additional readings :—
Belgrade e = +4m.35s.
Sofia eEN = +5m.47s.
Bucharest iSSE = +6m.35s.
Jena eE = +3m.5s.
Collmberg i = +3m.15s.
Tiflis eN = +5m.14s., eZ = +10m.11s., eN = +10m.19s.
Tashkent e = +20m.33s.
Andijan e = +12m.21s.
Long waves were also recorded at Vladivostok, Irkutsk, and other European stations.

Jan. 27d. Readings also at 3h. (La Paz, Huancayo, Tinemaha, Riverside, Pasadena, Mount Wilson, and Tucson), 5h. (Christchurch, Perth, Sydney, Melbourne, Adelaide, Brisbane, Moscow, Manila, Ksara, Harvard, and Riverview), 6h. (Vladivostok, Irkutsk, Sverdlovsk, and Riverview), 9h. (Tucson), 10h. (Port au Prince and Balboa Heights), 11h. (Piatigorsk), 12h. (Prague), 13h. (Frunse and Andijan (2)), 14h. (Balboa Heights), 16h. (Harvard), 18h. (Prague), 19h. (Harvard), 20h. (Tucson, Balboa Heights and Weston), 23h. (Mount Wilson, Pasadena, Riverside, Collmberg, and Andijan).

Jan. 28d. Readings at 1h. (Grozny), 4h. (Andijan, Frunse, and Tashkent), 7h. (Tucson), 8h. (Tucson, Tashkent, Sverdlovsk, Huancayo, Apia, Irkutsk, La Paz, near Triest, and near Tananarive), 9h. (Andijan), 10h. (Tucson), 11h. (Almata, Andijan, Frunse, and Mizusawa), 15h. (Tiflis, Ksara, Medan, Sverdlovsk, Baku, and Osaka), 16h. (Samarkand, Baku, Tiflis, Andijan, Frunse, Tashkent, Grozny, Harvard, and Weston), 17h. (Sverdlovsk and Ksara), 18h. (Medan and Mizusawa), 20h. (Ukiah, Upsala, Ferndale, San Francisco, near Granada, Berkeley, Lick, and Branner), 23h. (Fordham, Pasadena, Riverside, Collmberg, Mizusawa, Sverdlovsk, Weston (2), Harvard, Frunse, Andijan, Tiflis, and Tucson).

Jan. 29d. 15h. 25m. 41s. Epicentre 5°·6N. 95°·7E. (as on 1937 July 12d.).

$A = -\cdot0989$, $B = +\cdot9904$, $C = +\cdot0969$; $\delta = +6$; $h = +7$;
$D = +\cdot995$, $E = +\cdot099$; $G = -\cdot010$, $H = +\cdot096$, $K = -\cdot995$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		3·6	123	i 1 6	P*	1 47	+ 5	i 2 0	S_g	—
Colombo	E.	15·8	275	3 44	− 1	6 41	+ 1	—	—	9·1
Batavia		16·1	136	i 3 51	+ 2	—	—	—	—	—
Calcutta	N.	18·3	339	e 4 9	− 8	i 7 27	−12	e 4 24	PP	e 8·7
Phu-Lien		18·5	34	e 4 23	+ 4	10 19	L	—	—	(10·3)
Hyderabad		20·6	308	4 42	− 1	8 26	− 3	5 4	PP	10·3
Hong Kong		24·4	45	5 45	PP	9 49	+10	—	—	—
Bombay		25·9	304	e 5 38	+ 3	i 9 57	− 7	i 5 57	PP	—
Manila		26·4	68	e 6 16	PP	11 56	SSS	—	—	—
Agra	E.	27·2	326	e 6 7	+20	10 51	+26	6 16	pP	—
Andijan		40·8	333	e 7 46	+ 1	i 13 45	−11	—	—	—
Almata		41·0	340	e 7 47	+ 1	—	—	—	—	—
Frunse		41·6	337	e 7 56	+ 5	e 13 37	−31	—	—	—
Samarkand		42·7	327	7 55	− 5	14 10	−14	—	—	—
Tashkent		42·7	331	—	—	e 18 46	?	—	—	e 20·6
Grozny		57·7	320	9 53	− 2	e 17 39	−14	—	—	—
Tiflis		57·7	317	e 9 49	− 6	17 37	−16	e 12 15	PPP	—
Sverdlovsk		58·1	340	9 50	− 8	e 17 43	−15	—	—	27·3
Ksara		61·9	306	e 10 45	+21	e 19 26	PS	—	—	—
Helwan	Z.	65·0	301	e 10 40	− 4	i 19 11	−15	—	—	—
Collmberg	Z.	81·1	322	i 12 13	− 5	—	—	—	—	—

Additional readings :—
Calcutta iPPPN = +4m.27s., eSSN = +8m.0s.
Hyderabad SSN = +9m.1s.
Agra sSE = +11m.9s., SP?E = +6m.25s., SSE = +12m.21s., iE = +12m.40s.
Andijan e = +8m.44s.
Tiflis eZ = +10m.14s., ePPPZ? = +13m.25s.
Helwan eZ = +11m.16s.
Long waves were also recorded at Vladivostok.

Jan. 29d. 18h. 50m. 22s. Epicentre 13°·1N. 89°·5W. (as on Jan. 27d.).

Felt in El Salvador, very strongly in the western part, strongly in the Central and slightly in the eastern part. Slight damage, few injured. Felt VI at San Salvador. See "Seismological Notes, Bulletin of the Seismological Society of America," vol. 29, Berkeley, 1939, p. 416.

$A = +·0085$, $B = -·9743$, $C = +·2252$; $\delta = +5$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida	N.	7·8	359	e 2 8	P*	—	—	—	—	—
Oaxaca	N.	8·0	300	i 2 3	+ 3	—	—	—	—	—
Balboa Heights		10·6	112	e 2 42	+ 6	—	—	—	—	—
Tacubaya	N.	11·2	305	i 2 45	+ 1	—	—	—	—	—
Guadalajara	E.	15·2	301	e 3 40	+ 2	—	—	—	—	—
Little Rock		21·7	354	(e 4 58)	+ 3	e 4 58	P	—	—	—
Columbia		22·2	19	e 5 11	+11	e 9 2	+ 2	—	—	e 12·6
San Juan		23·1	73	e 5 8	0	e 9 15	− 1	—	—	i 10·6
Cape Girardeau		24·1	0	e 5 12	− 6	e 9 37	+ 3	—	—	—
St. Louis		25·4	359	e 5 29	− 2	e 10 0	+ 4	—	—	e 12·7
Florissant		25·6	359	e 5 20	−12	e 9 57	− 2	—	—	—
Tucson		27·3	319	i 5 45k	− 3	i 10 29	+ 2	i 6 37	PP	e 12·2
Fort de France		27·6	83	e 5 51	0	e 10 55	+23	—	—	e 15·7
Chicago		28·7	3	e 7 15	PPP	e 10 44	− 6	—	—	—
Huancayo		28·7	149	e 6 1	0	e 10 55	+ 5	—	—	e 12·2
Philadelphia		29·6	24	e 6 7	− 2	e 10 57	− 7	—	—	—
Fordham	N.	30·8	25	e 6 30	+10	e 11 20	− 3	e 7 17	PP	—
Toronto		31·7	14	e 6 38	+11	e 11 38?	+ 1	—	—	—
La Jolla		32·1	313	e 6 29	− 2	—	—	—	—	—
Williamstown		32·7	23	e 6 34	− 2	—	—	—	—	—
Riverside		32·8	314	e 6 33	− 4	—	—	—	—	—
Harvard		33·2	25	i 6 39	− 1	e 14 8	SS	—	—	e 21·6
Weston		33·2	25	e 6 39	− 1	—	—	—	—	11·9
Mount Wilson		33·4	314	i 6 38	− 4	e 13 6	S_cP	e 9 16	P_cP	—
Pasadena		33·4	314	e 6 37	− 5	—	—	e 9 21	P_cP	e 15·0
Ottawa		34·3	17	e 6 46	− 4	e 12 8	− 9	14 26	SS	e 16·6
Haiwee		34·4	317	i 6 48	− 3	—	—	—	—	—
Santa Barbara	Z.	34·6	313	i 7 2	+ 9	—	—	—	—	—
Tinemaha		35·1	318	i 6 52	− 6	i 13 10	S_cP	e 9 24	P_cP	—
Fresno	N.	35·9	317	e 7 1	− 3	—	—	—	—	—
La Paz		36·2	142	e 7 11	+ 5	14 0	?	—	—	17·7
East Machias		36·8	26	e 8 40	PP	e 12 51	− 5	—	—	e 19·2
Seven Falls		37·4	21	e 10 38?	?	e 14 38?	?	—	—	21·6
Lick		37·5	316	i 7 15	− 2	—	—	—	—	—
Victoria		45·0	329	—	—	e 14 50	− 8	—	—	20·6
Rio de Janeiro		57·7	128	e 9 41	−14	e 17 38	−15	—	—	e 29·4
San Fernando		77·0	55	—	—	e 20 38?	−67	—	—	37·1
Stuttgart		85·9	41	—	—	e 37 38?	?	—	—	45·6
Collmberg	Z.	87·5	38	e 12 47	− 4	—	—	—	—	—
Cheb		87·5	39	—	—	e 22 38	−53	—	—	e 45·6
Rome		90·0	47	e 13 7	+ 4	e 25 15	PS	—	—	e 35·6
Pulkovo		92·9	26	—	—	e 43 36	?	—	—	—
Christchurch		104·5	228	e 19 12	PP	e 24 58	[+10]	e 33 38?	SS	e 48·6
Sverdlovsk		106·0	16	—	—	e 24 51	[− 4]	e 27 57	PS	43·6
Ksara		110·2	46	e 19 23	PP	e 28 59	PS	—	—	58·6
Tiflis	Z.	111·1	35	e 18 46	[+11]	—	—	—	—	e 54·6

Additional readings :—
San Salvador ($\Delta = 0°·7$) iP = 18h.49m.49s., iS = 18h.50m.3s.
Balboa Heights eE = +6m.42s.
Little Rock eP = +1m.8s., i = +1m.20s.
San Juan P = +5m.22s., iS = +9m.24s.
Cape Girardeau iN = +5m.23s. and +5m.33s., eN = +10m.1s.
St. Louis iN = +5m.42s. and +10m.6s., iE = +10m.27s.
Florissant eZ = +5m.31s., eN = +10m.12s., iZ = +10m.25s.
Tucson iP = +5m.50s., i = +6m.9s. and +6m.53s., PPP = +6m.59s., i = +7m.8s.
Chicago eS = +11m.0s.
Huancayo eS = +11m.1s.
Weston eZ = +7m.16s.
Fresno eN = +7m.24s.
Sverdlovsk e = +33m.59s. and +37m.38s.
Long waves were also recorded at Vladivostok, La Plata, Moscow, Irkutsk, and other European and American stations.

Jan. 29d. Readings also at 0h. (Manila (2)), 1h. (Christchurch and Wellington), 2h. (Tucson and Manila), 3h. (Frunse and Andijan), 4h. (Tucson), 5h. (Manila (2)), 7h. (La Paz, Ottawa, Philadelphia, Tucson, San Juan, Harvard, and Mizusawa), 8h. (Tucson), 11h. (Mizusawa), 15h. (Tucson), 16h. (Mizusawa), 17h. (Triest and Rome), 18h. (Tashkent), 19h. (Harvard, Port au Prince, and San Juan), 20h. (Harvard, Colombo, and Andijan), 21h. (Andijan), 23h. (Tiflis (2) and Tucson).

Jan. 30d. 2h. 18m. 24s. Epicentre 7°·2S. 155°·3E.

$A = -\cdot 9014$, $B = +\cdot 4146$, $C = -\cdot 1245$; $\delta = -8$; $h = +7$;
$D = +\cdot 418$, $E = +\cdot 909$; $G = +\cdot 113$, $H = -\cdot 052$, $K = -\cdot 992$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·3	185	4 36	− 4	i 8 30	+ 7	—	—	—
Riverview		26·8	187	e 5 42k	− 2	i 10 18	− 1	i 6 22	PP	e 12·7
Sydney		26·8	187	i 5 45	+ 1	i 10 24	+ 5	—	—	12·9
Adelaide		31·6	205	i 6 24	− 2	i 11 23	−12	i 7 27	PP	i 13·6
Apia		33·0	103	i 6 38a	− 1	e 11 55	− 2	7 42	PP	—
Arapuni		35·9	151	7 6	+ 2	12 48	+ 6	8 36	PP	15·4
New Plymouth		35·9	153	7 14	+10	12 48	+ 6	—	—	—
Wellington		38·1	155	i 7 24	+ 2	13 9	− 7	8 55	PP	16·3
Christchurch		39·2	159	i 7 31k	0	i 13 38	+ 6	i 9 11	P_cP	i 18·9
Manila		40·3	302	i 7 41a	+ 1	13 49	0	—	—	19·3
Isigakizima		43·6	317	8 7	− 1	14 37	− 1	—	—	—
Perth		44·2	230	8 12	0	14 44	− 2	10 6	PP	20·9
Tokyo, Cen. Met. Ob.		45·1	342	8 20	0	14 42	−17	—	—	—
Osaka		45·6	337	8 22	− 2	13 59	−67	9 48	PP	21·3
Gihu		45·8	340	8 22	− 3	14 45	−24	—	—	—
Taihoku		45·9	316	e 8 26k	0	15 10	− 1	—	—	—
Matuyama		46·1	334	8 36	+ 8	15 18	+ 4	—	—	—
Nagsaki		46·5	331	8 31	0	15 18	− 1	—	—	—
Hukuoka		46·9	332	e 8 32	− 2	15 21	− 4	—	—	e 20·0
Sendai		47·2	345	8 30	− 6	15 19	−10	—	—	—
Malabar		47·3	267	e 8 38	+ 1	i 15 33	+ 2	i 18 43	SS	e 20·6
Mizusawa		47·9	345	8 44	+ 2	15 36	− 3	—	—	19·3
Batavia		48·1	268	e 8 44	+ 1	15 40	− 2	i 15 31	PS	22·6
Hong Kong		49·8	307	8 57k	+ 1	16 7	+ 1	19 51	SS	—
Zi-ka-wei		50·1	322	e 8 54	− 5	15 52	−18	10 38	PP	22·5
Mori		50·9	347	9 10	+ 5	16 13	− 8	—	—	—
Nemuro		51·1	351	10 10	+64	17 33	+69	—	—	—
Zinsen		51·9	330	9 10	− 2	16 30	− 5	—	—	—
Honolulu		54·0	57	i 9 24	− 4	i 16 55	− 8	21 6	SS	i 22·2
Papeete		54·6	106	i 9 30	− 2	i 17 23	+12	—	—	—
Phu-Lien		55·3	302	i 9 36a	− 2	i 17 23	+ 2	12 48	PP	26·6
Medan		57·5	279	e 9 54	+ 1	17 59	+ 9	i 13 36	PPP	33·6
Calcutta	N.	71·8	297	i 11 31a	+ 5	i 20 52	+ 6	e 14 14	PP	e 35·5
Irkutsk		73·4	331	i 11 34	− 2	i 21 1	− 4	—	—	31·6
Colombo	E.	76·5	278	12 6	+12	21 46	+ 7	30 16	SSS	40·1
Hyderabad		79·7	289	12 10	− 1	22 9	− 5	15 19	PP	34·2
Agra		82·1	298	e 12 21	− 3	i 22 33	− 5	15 30	PP	—
Dehra Dun	N.	82·7	302	e 12 17	−10	e 22 33	−11	e 27 36	SS	i 34·6
College		83·2	20	e 12 26	− 3	e 22 41	− 8	e 23 31	PS	e 33·7
Sitka		85·0	30	e 12 38	0	i 23 2	[+ 1]	e 15 56	PP	i 34·6
Bombay		85·2	290	i 12 39	0	i 23 1	[− 1]	35 28	L_q	39·6
Ferndale		87·4	49	e 17 36?	PPP	—	—	—	—	—
Ukiah		87·9	50	e 12 53	0	23 32	− 3	e 24 26	PS	36·0
Frunse		88·1	313	12 53	− 1	23 29	[+ 8]	—	—	36·2
San Francisco		88·3	52	e 12 54	− 1	e 23 18	[− 4]	e 24 54	PS	e 35·3
Berkeley		88·4	52	i 12 53	− 2	e 23 20	[− 2]	e 38 0	L_q	e 41·1
Branner		88·4	52	e 12 54	− 1	e 23 24	[+ 2]	e 36 6	L_q	e 43·4
Santa Clara		88·6	52	i 12 56	0	e 23 51	+ 9	—	—	e 43·9
Lick		88·8	52	e 12 59	+ 2	e 23 23	[− 3]	—	—	—
Andijan		89·3	311	13 0	+ 1	e 23 30	[+ 1]	e 23 54	S	36·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Victoria		89·6	41	e 12 48	−13	23 36	[+ 6]	16 48	PP	36·6
Santa Barbara	Z.	89·9	55	i 13 2	0	—	—	—	—	—
Fresno	N.	90·2	53	e 13 6	+ 2	e 23 51	− 5	e 26 7	PPS	—
Seattle		90·2	42	—	—	i 25 2	PS	i 32 39	SSS	i 37·1
Pasadena		91·1	56	e 13 7a	− 1	i 23 38	[− 1]	i 16 50	PP	e 37·0
Mount Wilson		91·2	56	i 13 8a	0	e 23 35	[− 5]	e 25 36	PPS	—
Tinemaha		91·4	53	i 13 9	0	e 24 11	+ 4	—	—	—
Haiwee		91·6	54	i 13 9	− 1	e 23 37	[− 6]	e 24 4	S	—
La Jolla		91·7	57	i 13 10	0	e 23 40	[− 3]	i 24 11	S	—
Tashkent		91·7	311	i 14 10	+60	e 24 41	+31	i 17 47	PP	e 42·6
Riverside		91·8	56	i 13 9	− 2	e 23 39	[− 5]	e 25 33	PS	—
Samarkand		93·2	309	13 21	+ 4	—	—	e 18 9	?	—
Butte		96·6	44	e 13 42	+ 9	24 10	[0]	e 17 15	PP	e 38·8
Salt Lake City		96·8	49	e 13 43	+ 9	24 26	[+15]	e 17 40	PP	39·0
Tucson		97·1	58	i 13 36a	+ 1	i 24 4	[− 8]	i 17 19	PP	i 40·1
Bozeman		97·7	45	e 13 43	+ 5	e 25 0	− 1	e 18 18	?	40·4
Sverdlovsk		98·5	326	i 13 38	− 4	i 24 16	[− 3]	i 17 21	PP	43·6
Saskatoon		100·6	38	e 13 50	− 1	24 21	[− 9]	17 56	PP	e 46·6
Tananarive		104·3	248	18 13	PP	i 24 49	[+ 2]	27 39	PS	49·1
Tacubaya	N.	107·0	72	i 18 38	PP	—	—	—	—	—
Grozny		109·1	313	e 14 32	P	e 26 13	S	e 18 59	PP	45·6
Tiflis		110·0	312	14 32	P	i 25 7	[− 5]	18 55	PP	e 45·6
Erevan		110·5	310	e 14 34	P	—	—	e 19 14	PP	—
Piatigorsk		110·9	315	e 13 56	P	e 26 4	{− 7}	e 18 16	PKP	35·6
Moscow		111·3	327	14 42	P	e 25 5	[−12]	18 50	PKP	49·1
Little Rock		112·4	55	e 14 46	P	25 16	[− 5]	e 18 25	PKP	—
Pulkovo		113·3	333	e 14 50	P	e 25 23	[− 2]	e 19 32	PP	56·2
Florissant		113·4	50	e 14 47	P	e 25 22	[− 3]	e 18 30	PKP	—
Sotchi		113·4	315	e 19 36	PP	—	—	—	—	—
St. Louis		113·5	50	e 18 10	[−30]	e 26 27	{− 2}	e 19 32	PP	—
Cape Girardeau	E.	114·3	52	e 18 19	[−22]	i 29 6	PS	e 19 14	PP	e 53·6
Chicago		114·8	47	e 18 34	[− 8]	25 40	[+ 9]	e 19 34	PP	e 47·1
Merida	E.	115·9	70	e 20 0?	PP	—	—	—	—	—
Scoresby Sund		116·8	359	15 6	P	25 40	[+ 2]	18 30	PKP	—
Cincinnati		117·8	48	e 15 8	P	25 37	[− 5]	i 18 51	PKP	—
Ksara		118·3	304	e 15 10	P	e 29 43	PS	i 19 55	PP	—
Upsala		118·5	337	i 20 1	PP	i 25 45	[+ 1]	i 29 57	PS	51·6
Johannesburg	E.	119·0	234	e 20 15	PP	e 25 51	[+ 4]	e 36 41	SKSP	—
Toronto		120·1	43	i 20 10	PP	25 48	[− 2]	30 3	PS	50·6
Cernauti		120·9	324	e 20 17	PP	—	—	—	—	52·6
Columbia		121·8	54	e 15 26	P	e 25 51	[− 5]	e 20 28	PP	i 51·3
Cape Town		122·2	222	i 20 32	PP	i 26 1	[+ 4]	i 30 17	PS	i 50·8
Bergen		122·3	343	i 19 1	[+ 4]	26 4	[+ 6]	i 20 33	PP	e 53·1
Bucharest		122·4	319	e 19 0	[+ 3]	26 5	[+ 7]	e 20 37	PP	52·6
Ottawa		122·6	39	18 55	[− 3]	25 56	[− 2]	20 26	PP	50·6
Helwan		122·9	300	e 15 33	P	30 41	PS	20 36	PP	—
Shawinigan Falls		123·2	37	19 0	[+ 1]	30 48	PS	20 39	PP	57·6
Ivigtut		123·3	14	20 39	PP	i 30 33	PS	31 54	PPS	—
Copenhagen		123·4	336	i 18 59	[0]	27 40	{+ 4}	20 18	PP	50·6
Georgetown		123·4	47	i 19 2	[+ 3]	i 27 23	{−13}	i 20 40	PP	—
Williamstown		123·4	42	i 19 0	[+ 1]	e 28 36	{+60}	i 20 45	PP	e 55·6
Seven Falls		124·1	36	18 30	[−31]	25 20	[−43]	19 46	?	50·6
Philadelphia		124·4	45	e 15 35	P	i 26 2	[− 2]	i 20 44	PP	i 51·7
Fordham		125·0	44	i 19 5k	[+ 3]	i 26 9	[+ 3]	i 20 48	PP	52·8
Sofia		125·0	318	e 19 8	[+ 6]	e 37 49	SS	e 20 56	PP	e 51·6
Kecskemet	Z.	125·2	324	i 19 5	[+ 3]	e 29 35	?	e 24 9	PPP	e 59·6
Budapest		125·3	325	19 6	[+ 4]	30 49	PS	i 20 55	PP	57·6
Balboa Heights		125·7	84	e 19 5	[+ 2]	—	—	—	—	—
Prague		125·7	331	e 19 2	[− 1]	e 26 42	[+34]	e 20 57	PP	e 49·6
Belgrade		125·8	321	i 19 6k	[+ 3]	i 26 32	[+24]	i 21 1	PP	50·8
Harvard		125·8	41	e 15 40	P	e 26 4	[− 4]	e 20 48	PP	e 61·6
Hamburg		125·9	336	e 19 5	[+ 2]	e 30 23	PS	e 20 49	PP	e 52·3
Collmberg		126·1	333	e 15 46	P	i 27 56	{+ 2}	i 20 58	PP	57·1
Huancayo		126·1	110	e 19 11	[+ 7]	e 31 6	PS	e 20 51	PP	52·3
Weston		126·1	41	e 15 42	P	i 26 8	[− 1]	i 20 56	PP	60·1

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Heligoland	126·7	338	e 19 11	[+ 6]	e 30 55	PS	e 20 58	PP	e 54·6
East Machias	127·0	37	e 19 8	[+ 2]	e 26 14	[+ 2]	21 6	PP	53·2
Jena	127·0	332	e 19 6	[0]	30 54	PS	20 56	PP	e 51·6
Aberdeen	127·1	345	i 21 5	PP	i 28 0	{ 0}	i 38 17	SS	51·8
Cheb	127·3	332	e 19 11	[+ 5]	e 32 40	PPS	e 38 27	SS	e 58·6
Göttingen	127·6	334	i 19 10	[+ 3]	i 22 27	PKS	i 21 11	PP	e 57·6
Edinburgh	128·5	345	i 21 18	PP	i 38 41	SS	—	—	54·6
La Plata	128·5	145	13 54	?	26 6	[−10]	31 18	PS	52·7
Laibach	128·7	326	e 19 16	[+ 7]	—	—	i 23 59	PPP	e 59·0
De Bilt	129·0	337	e 16 0	P	i 30 34	PS	i 21 22	PP	58·1
Durham	129·1	344	e 19 32	[+22]	i 28 16	{+ 3}	i 21 18	PP	—
Triest	129·3	327	e 19 30	[+20]	26 31	[+13]	e 21 21	PP	e 53·6
Halifax	129·7	35	20 24	?	30 24	PS	21 36	PP	53·6
Stuttgart	129·7	332	e 16 0	P	e 28 18	{+ 1}	e 21 16	PP	59·6
Stonyhurst	130·1	344	i 21 31	PP	i 28 18	{− 2}	i 33 34	PPS	53·6
Strasbourg	130·1	333	e 19 15	[+ 3]	28 36	{+16}	i 19 36	pPKP	e 53·6
Uccle	130·3	337	e 16 3	P	i 28 25	[+ 3]	i 21 28	PP	e 57·6
Bidston	130·6	344	i 21 31	PP	i 28 0	{−24}	i 22 29	PKS	e 53·6
Chur	130·8	331	e 19 2	[−11]	—	—	e 22 40	?	—
Zurich	130·9	331	e 16 0	P	—	—	e 21 28	PP	—
La Paz	131·0	119	i 19 18k	[+ 4]	34 31	PPS	54 31	L_q	61·3
Kew	131·5	340	i 19 19k	[+ 4]	i 28 30	{+ 1}	i 21 37	PP	e 53·6
Oxford	131·6	341	e 19 24	[+ 9]	i 31 34	PS	i 21 31	PP	e 49·1
Basle	131·7	331	e 19 13	[− 2]	—	—	e 21 34	PP	—
Florence	131·9	325	19 22	[+ 6]	i 39 12	SS	22 37	SKP	43·6
Neuchatel	132·0	331	e 19 12	[− 4]	—	—	e 21 36	PP	—
Besançon	132·3	332	e 19 18	[+ 2]	—	—	i 22 48	SKP	61·6
Port au Prince	132·3	71	e 22 46	SKP	—	—	—	—	68·3
Rome	132·3	322	16 12a	P	i 26 23	[− 2]	i 21 28	PP	e 57·6
Paris	132·6	336	e 19 14	[− 3]	28 37	{+ 1}	31 46	PS	54·6
Moncalieri	133·0	329	19 22	[+ 4]	34 31	PPS	i 22 41	SKP	54·1
Jersey	134·0	341	i 22 45	PP	e 28 9	{−36}	e 33 4	PS	e 57·6
Clermont Farrand	134·8	333	i 19 25	[+ 5]	—	—	i 21 50	PP	e 61·1
Marseilles	135·4	329	e 19 27	[+ 6]	e 28 36	{−17}	e 21 55	PP	e 54·8
Bagnères	138·1	332	19 34	[+ 7]	e 26 50	[+14]	i 19 54	pPKP	e 55·6
San Juan	138·1	70	i 19 14	[−13]	—	—	i 22 18	PP	—
Algiers	141·2	329	e 18 58	[−34]	30 20	{+52}	22 32	PP	e 55·6
Toledo	142·6	333	e 19 28	[− 7]	i 34 46	PPS	i 22 59	SKP	—
Fort de France	143·5	75	e 19 31	[− 5]	e 26 51	[+ 7]	22 3	PP	35·3
Almeria	144·2	329	i 19 35	[− 2]	41 49	SS	23 13	PP	e 55·4
Granada	144·5	331	i 19 37k	[− 1]	29 45	{− 2}	20 43	pPKP	—
Rio de Janeiro	145·0	149	i 19 33	[− 6]	i 28 33	?	i 22 40	PP	41·7
San Fernando	146·3	333	i 19 42	[+ 1]	30 33	{+35}	39 53	SS	56·6

Additional readings :—

Riverview i = +5m.51s., PPPN = +6m.35s., iP_cPN = +9m.3s., iN = +9m.25s., iSSE = +11m.16s., iE = +11m.35s.
Adelaide i = +6m.29s., +9m.6s., and +13m.10s.
Apia PPP = +8m.4s., e = +11m.44s., SS = +13m.46s.
Arapuni i = +14m.24s.
Wellington iZ = +7m.59s. and +8m.17s., P_cP = +9m.48s., iZ = +11m.0s. and +11m.28s., i = +13m.22s., +13m.43s., and +14m.44s., L_q = +16m.11s.
Christchurch iP_cS = +13m.29s., iS_cSZ = +16m.44s., L_q = +18m.18s.
Perth PPP = +10m.51s., i = +11m.41s., +14m.24s., and +16m.14s., SS = +17m.50s., SSS = +18m.56s., SSSS = +19m.29s.
Osaka SS = +16m.7s.
Taihoku i = +8m.32s.
Hukuoka eS = +18m.32s.
Malabar iPNE = +8m.42s.
Hong Kong SSS = +12m.16s.
Zi-ka-wei iE = +9m.0s., +9m.6s., and +11m.14s., PPPE? = +11m.26s., PSN = +16m.4s., iN = +18m.52s.
Honolulu eP = +9m.27s., iP = +9m.32s.
Phu-Lien SSS = +23m.36s.
Medan iEN = +10m.42s., iE = +13m.44s.
Calcutta N ePPP = +15m.45s., iSS = +25m.38s., eSSS = +28m.22s.
Hyderabad SSE = +27m.7s.

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Agra PPPE = +17m.11s., PSE = +23m.15s., sSEN = +23m.35s., SSE = +27m.35s., SSN = +27m.39s., sSSE = +28m.11s., SSSE = +31m.52s., iN = +34m.19s., iE = +36m.20s.
College eSSS = +32m.2s.
Sitka iP = +12m.42s. and +12m.54s.
Bombay iSE = +23m.14s., iE = +24m.0s.
Ukiah S = +23m.56s., PPS = +24m.44s.
Berkeley ePE = +12m.57s., ePN = +13m.1s., iN = +26m.0s.
Andijan e = +13m.58s.
Victoria PPPN = +18m.42s., SS = +30m.12s., SSS = +33m.36s. ?
Pasadena iSN = +24m.4s., iE = +25m.33s.
Mount Wilson eSN = +24m.7s.
Tashkent PPP = +20m.1s.
Riverside eSN = +24m.8s.
Samarkand e = +14m.25s.
Salt Lake City eS = +24m.53s., S = +25m.19s., PPS = +26m.31s., PSPS = +32m.7s., SSS = +35m.14s.
Tucson i = +14m.40s., +15m.22s., +16m.41s., and +17m.28s., iPP = +17m.58s., i = +18m.54s., iPPP = +19m.16s., i = +19m.54s. and +20m.6s., iS = +25m.0s., i = +25m.7s. and +26m.27s., iPPS = +26m.41s., i = +27m.20s., iSS = +31m.34s. and +31m.49s., iPSPS = +32m.5s., iSSS = +35m.21s., i = +35m.48s.
Bozeman eSS = +30m.53s.
Sverdlovsk iS = +24m.55s., iPS = +26m.32s.
Saskatoon SN = +25m.23s., PSE = +26m.54s., SS = +32m.18s.
Tananarive SKSEN = +24m.54s., SEN = +26m.0s., E = +28m.54s., N = +32m.27s., E = +32m.39s., SSN = +33m.12s., iSSE = +33m.32s., E = +36m.43s., SSSN = +37m.25s., N = +40m.45s.
Grozny e = +29m.23s.
Tiflis PKPEZ = +18m.8s., ePPN = +19m.6s., ePPE = +19m.10s., ePPN = +19m.17s., iPPPE = +21m.7s., iSN = +26m.46s., iSEZ = +27m.1s., iPPSE = +28m.36s., iSSE = +33m.16s.
Moscow PP = +19m.11s., SKKS = +26m.19s., eS = +26m.53s., PS = +28m.39s., PPS = +30m.0s., SS = +34m.24s.
Little Rock eP = +14m.50s., SKKS = +26m.11s.
Florissant ePEZ = +14m.51s., ePPE = +19m.23s., ePPPPE = +23m.15s., iSKKSE = +26m.32s., iPSE = +28m.49s., iN = +29m.18s.
Pulkovo ePPP = +22m.22s., eSKKS = +26m.24s., ePS = +29m.8s., ePPS = +30m.5s., eSS = +35m.6s.
St. Louis iSN = +27m.12s., eSPEN = +29m.19s., ePPSEN = +29m.56s., eSSEN = +35m.4s.
Chicago ePKP = +18m.44s., ePP = +20m.0s., ePPP = +22m.25s., SKKS = +26m.38s., eS = +27m.27s., ePS = +29m.16s., ePPS = +30m.26s., SS = +35m.27s., ePSPS = +36m.12s., eSSS = +39m.51s.
Scoresby Sund i = +19m.55s., +25m.55s., +26m.56s., +27m.40s., +29m.36s., +30m.51s., and +36m.30s.
Cincinnati ePP = +20m.2s., iSKKS = +26m.58s., iPS = +29m.49s., eSS = +36m.10s., ePPSS = +36m.40s.
Upsala iE = +21m.50s. and +26m.32s., iSKKS = +27m.2s., eE = +32m.36s., iSS = +36m.26s., eN = +39m.57s., eSSSE = +41m.0s.
Johannesburg eSKSPE = +29m.55s.
Toronto PPS = +31m.47s., SS = +37m.12s.
Cernauti eE = +20m.39s.
Columbia eS = +28m.11s., SS = +36m.51s.
Cape Town iE = +20m.35s. and +27m.30s., iN = +30m.23s., iE = +37m.26s., iN = +37m.30s.
Bergen PS = +30m.28s., PPS? = +31m.44s., eSS = +37m.21s., eSSS = +42m.36s.
Bucharest ePPN = +20m.40s., eSKPEN = +21m.57s., PPPN? = +23m.2s., PPPE? = +23m.14s., iE = +23m.34s. and +24m.40s., SKKSEN = +27m.28s., SKSPE = +30m.10s., iSSE = +37m.19s., iSSN = +37m.22s., iSSS = +41m.49s.
Ottawa SKP = +21m.40s., PPPE = +23m.6s., SKKS = +27m.26s., eS? = +28m.28s., PS = +30m.28s., PPS = +32m.16s., SS = +37m.0s., SSS = +41m.0s.
Helwan iEZ = +15m.52s., PKPEZ = +19m.1s., eE = +19m.18s., SKPE = +22m.6s., iE = +22m.51s.
Shawinigan Falls SS = +37m.12s.
Ivigtut +29m.3s. and +32m.48s.
Copenhagen iPKP = +19m.2s. and +20m.36s., eZ = +21m.36s., eE = +22m.12s., e = +30m.13s., eZ = +30m.30s., eEN = +30m.36s., eN = +31m.59s., eE = +32m.53s. and +34m.6s., eZ = +36m.19s., eN = +37m.12s., eE = +37m.30s., e = +38m.54s. and +41m.18s.
Georgetown ePPP = +23m.38s., eSP = +30m.41s., iPPS = +31m.58s., eSS = +36m.13s.
Williamstown iSKP = +21m.54s., iPPS? = +31m.51s., iSS = +37m.19s.
Seven Falls PS = +29m.46s., SS = +36m.36s., SSS = +40m.50s.
Philadelphia ePKP = +19m.21s., i = +20m.15s., iPS = +30m.49s., eSS = +37m.28s., iPSPS = +38m.19s., eSSS = +41m.56s., i = +46m.10s.
Fordham iSS = +37m.44s.
Sofia ePPN = +21m.1s., SKPE = +22m.19s., SKPN = +22m.23s., eN = +28m.6s., eE = +31m.6s.

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Kecskemet iZ = +20m.57s., ePKPZ = +22m.16s., eZ = +26m.49s., iZ = +28m.3s., eSKKSZ? = +30m.54s., eZ = +32m.36s., ePSKSZ = +33m.59s., ePKKSZ = +36m.19s., eSSZ = +40m.58s.
Budapest eN = +22m.39s., iN = +27m.57s., i = +29m.49s., S_cSP = +30m.28s., eN = +31m.43s., eE = +32m.11s., iE = +33m.41s., eN = +34m.53s., iE = +35m.49s., eSSE = +38m.9s., iN = +38m.57s., PKKSE = +39m.10s., iN = +42m.36s.
Prague ePPP = +23m.51s., eSKKS = +27m.48s., ePS = +30m.53s., ePPS = +32m.12s., eSS = +38m.6s.
Belgrade iZ = +22m.42s., iNW = +23m.33s., iP_cSNW = +30m.57s., iNW = +43m.6s. and +46m.32s.
Harvard ePKPZ = +19m.4s., ePKSEZ = +22m.8s., eSKKSE = +28m.0s., eSKSPZ = +30m.48s., eSSE = +38m.6s.
Hamburg eZ = +22m.11s., iE = +22m.23s., iN = +22m.26s., eZ = +32m.23s., eN = +42m.12s.
Collmberg e = +19m.4s., iPKP = +19m.7s., iZ = +21m.4s., iPKS = +22m.17s., iZ = +22m.55s., i = +23m.26s., ePPP = +23m.53s., iZ = +28m.11s., eS = +29m.36s., iSKSP = +30m.52s., iPS = +31m.20s., iPPS = +32m.26s., eZ = +36m.1s., e = +36m.54s., eSS = +38m.48s., iSSS = +42m.28s., e = +44m.28s. and +53m.12s.
Huancayo iPP = +21m.3s., ePKS = +22m.29s., ePPP = +23m.22s., eSS = +38m.12s., ePSPS = +38m.36s.
Weston ePKPZ = +19m.4s., iSKKSZ = +27m.43s., iNZ = +30m.55s., iSKSPN = +31m.7s., iPPSEN = +32m.43s., iPPPS = +33m.47s., PPPPEN = +39m.42s., eSSSE = +42m.55s., eSSSSE = +47m.57s., iL_qEN = +52m.17s.
Heligoland eN = +21m.3s., eE = +22m.19s., iN = +22m.29s., eN = +31m.0s., eN = +42m.36s.
East Machias ePKS = +22m.23s., ePPP = +24m.13s., SKSP = +31m.6s., SS = +38m.3s., SSS = +42m.51s.
Jena eZ = +19m.9s. and +20m.36s., eN = +21m.4s., eZ = +22m.22s., eZ = +32m.21s., e = +32m.36s.
Aberdeen iEN = +22m.25s. and +31m.7s. iN = +37m.50s.
Cheb e = +21m.51s. and +53m.29s.
Göttingen eE = +41m.0s.
Edinburgh i = +22m.30s. and +41m.10s.
La Plata = +17m.0s., +22m.30s., +24m.30s., and +38m.24s.
Laibach i = +22m.42s.
De Bilt iZ = +19m.14s., iN = +38m.44s., i = +45m.46s.
Durham iEN = +22m.28s., iSKKSN = +29m.15s., iEN = +33m.32s.
Triest i = +19m.52s., e = +21m.10s., i = +21m.36s., iSKP = +22m.33s., PPP = +24m.50s., e = +31m.24s., and +34m.37s., SS = +38m.31s.
Halifax SS = +37m.36s.
Stuttgart ePKP = +19m.12s., iPKPZ = +19m.15s., iPP = +21m.24s., iPKS = +22m.38s., ePPP = +23m.58s., eS? = +29m.48s., ePS = +32m.14s., eSS = +38m.48s., $eSKSP_3$ = +40m.54s., e = +53m.42s., eL_g = +57m.36s.
Stonyhurst iPKS = +22m.33s., i = +31m.20s. and +37m.22s., iSS = +38m.13s., iSSS = +38m.48s., i = +41m.18s.
Strasbourg ePZ = +16m.8s., iZ = +19m.16s., iPPZ = +21m.30s., ipPP = +21m.52s., iSKP = +22m.39s., iPPSE = +33m.21s., iSSE = +39m.7s.
Uccle ePKP = +19m.11s., i = +19m.16s., i = +19m.36s. and +21m.48s., iSKP = +22m.38s., i = +22m.42s., iPPS = +33m.11s., SS = +38m.59s.
Bidston i = +22m.54s., iSS = +31m.14s., i = +38m.26s.
Zurich ePKP = +19m.5s., e = +22m.39s.
La Paz PZ = +14m.38s., iSKSZ = +21m.33s., iSKSN? = +21m.43s., SSSN = +39m.26s.
Kew iPKS = +22m.39s., iEN = +23m.2s., iSKSP = +31m.36s., iPPSEZ = +34m.22s., iE = +37m.48s. and +38m.30s., iSSEN = +38m.49s., iPSSE = +39m.18s., iEN = +41m.20s. and iE = +46m.26s.
Oxford i = +21m.38s. and +22m.29s.
Basle e = +22m.42s.
Florence i = +22m.29s., PPP = +25m.21s.
Neuchatel e = +22m.44s.
Rome ePKPZ = +19m.16s., iPKPZ = +19m.20s., iZ = +21m.43s. and +21m.56s., iE = +22m.39s., iSKP = +22m.43s., iZ = +24m.21s., iSKKS = +28m.9s., SS = +39m.1s.
Paris iSKP = +22m.45s.
Jersey e = +47m.41s.
Marseilles e = +19m.32s., +20m.52s., and +20m.55s., ipPP = +22m.3s., eSKP = +22m.50s., ipSKP = +22m.58s., isSKP = +23m.19s., e = +23m.35s., i = +23m.37s. and +23m.59s., ePPP = +24m.24s., e = +25m.0s. and +27m.45s., ePS = +32m.25s., ePPS = +34m.0s., e = +39m.11s., eSS = +39m.27s., eSSS = +39m.58s., i = +45m.51s., e = +46m.47s.
Bagnères e = +17m.6s. and +19m.19s., iPP = +22m.21s., eSKP = +23m.7s., iSKPE = +23m.10s., ipSKPN = +23m.31s., iPPP = +24m.34s., ipPPP = +25m.3s., eSKKS = +28m.37s., e = +29m.24s., eSE = +29m.38s., ePSKSN = +32m.24s., eSS = +39m.54s. and +40m.30s.
San Juan iPKS = +23m.1s.
Algiers P = +19m.28s., S = +30m.43s., PPS = +32m.29s.
Toledo iPKP = +19m.35s., i = +21m.47s.
Fort de France PP = +21m.19s., PS = +27m.27s., SS = +29m.57s., SSS = +31m.43s.
Granada i = +19m.42s., iN = +20m.11s., PPE = +22m.41s., SKSP = +33m.11s., SSE = +40m.27s., SSSS = +51m.11s., i = +61m.51s.
Rio de Janeiro iPPE = +22m.46s., iSE = +28m.36s., iSSN = +33m.6s.
San Fernando PPPE = +26m.39s., PSE = +33m.28s.
Long waves were also recorded at Guadalajara and Oaxaca.

Jan. 30d. 5h. 23m. 47s. Epicentre 7°·2S. 155°·3E. (as at 2h.).

$A = -\cdot 9014$, $B = +\cdot 4146$, $C = -\cdot 1245$; $\delta = -8$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·3	185	i 4 37	− 3	i 8 31	+ 8	—	—	—
Riverview		26·8	187	e 5 57	+13	e 9 50	−29	—	—	e 13·3
Adelaide		31·6	205	e 8 8	PPP	i 11 35	0	—	—	15·6
Manila		40·3	302	7 40	0	13 52	+ 3	—	—	—
Batavia		48·1	268	e 8 37	− 6	15 33	− 9	—	—	e 28·2
Medan		57·5	279	—	—	17 52	+ 2	i 18 23	PS	e 28·2
Irkutsk		73·4	331	e 11 43	+ 7	e 20 57	− 8	—	—	32·2
Agra	E.	82·1	298	e 12 29	+ 5	22 24	−14	27 35	SS	—
Bombay		85·2	290	e 12 41	+ 2	i 23 2	[+ 1]	—	—	—
Frunse		88·1	313	e 13 12	+18	—	—	—	—	—
Andijan		89·3	311	e 13 2	+ 3	e 23 49	+ 1	—	—	—
Pasadena		91·1	56	i 13 4	− 4	—	—	—	—	—
Mount Wilson		91·2	56	i 13 5	− 3	—	—	—	—	—
Tinemaha	Z.	91·4	53	e 13 7	− 2	—	—	—	—	—
Riverside	Z.	91·8	56	i 13 7	− 4	—	—	—	—	—
Ottawa		122·6	39	18 51	[− 7]	—	—	—	—	50·2
La Paz	Z.	131·0	119	19 24	[+10]	—	—	—	—	—

Additional readings:—
Batavia iN = +9m.19s.
Bombay eE = +16m.45s., iE = +23m.26s.
Long waves were also recorded at Stuttgart, East Machias, Prague, Cape Town, Tananarive, Sverdlovsk, and Honolulu.

Jan. 30d. 23h. 50m. 29s. Epicentre 5°·6S. 147°·0E.

$A = -\cdot 8347$, $B = +\cdot 5421$, $C = -\cdot 0969$; $\delta = -1$; $h = +7$;
$D = +\cdot 545$, $E = +\cdot 839$; $G = +\cdot 081$, $H = -\cdot 053$, $K = -\cdot 995$.

A depth of focus 0·025 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		17·9	316	3 59	+ 1	8 15	+ 7	—	—	—
Riverview		28·4	173	i 5 39	0	e 10 6	− 4	i 6 34	PP	—
Sydney		28·4	173	e 4 49	−50	e 9 37	−33	—	—	e 11·8
Adelaide		30·2	194	i 5 56	+ 1	i 10 42	+ 4	i 6 53	PP	13·2
Melbourne		32·1	183	e 6 14	+ 3	10 51	−17	—	—	13·1
Manila		32·7	308	i 6 15a	− 1	11 32	+15	—	—	—
Taihoku		39·2	322	7 12	+ 1	12 26	−30	—	—	—
Batavia	Z.	40·0	268	e 7 9	− 9	—	—	i 7 54	pP	—
Apia		41·4	104	i 7 27a	− 2	e 13 37	+ 8	i 8 51	pP	—
Tokyo, Cen. Met. Ob.		41·6	351	7 31	0	13 9	−23	—	—	—
Kyoto		41·8	347	7 34	+ 2	—	—	—	—	—
Gihu		41·9	349	7 33	0	13 30	− 6	—	—	—
Hukuoka		42·0	340	e 8 14	+40	—	—	—	—	—
Hong Kong		42·4	313	7 0	−37	13 48	+ 4	17 2	SS	—
Wellington		43·3	150	i 7 41	− 3	i 13 56	− 1	i 8 38	pP	19·5
Christchurch		44·0	153	i 7 51a	+ 1	i 14 9	+ 2	i 8 44	pP	e 20·8
Sendai		44·0	354	7 53	+ 3	—	—	—	—	—
Mizusawa		44·8	354	7 58	+ 2	i 14 21	+ 3	—	—	19·0
Zinsen		46·9	338	8 11	− 2	14 0	−48	—	—	—
Phu-Lien		47·5	305	9 0	+42	15 0	+ 4	—	—	—
Sapporo		48·7	355	9 6	+39	15 14	+ 1	—	—	—
Medan		49·1	281	9 13	+43	16 46	PPS	—	—	—
Vladivostok		50·4	346	8 39	− 1	i 15 36	− 1	i 9 15	pP	20·8
Honolulu		60·3	62	e 9 53	+ 2	17 49	+ 1	e 10 59	pP	24·8
Calcutta	N.	63·8	299	10 21	+ 7	i 20 0	sS	i 11 3	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	68·1	280	e 10 41	0	19 26	+ 2	i 11 26	pP	—
Irkutsk		68·1	334	10 40	− 1	i 19 23	− 1	i 11 22	pP	27·5
Hyderabad		71·4	291	10 59	− 2	20 3	+ 1	11 46	P_cP	33·3
Agra	E.	74·1	300	e 11 16	− 1	i 20 27	− 5	i 11 57	pP	—
Dehra Dun	N.	74·9	304	e 11 31?	+10	—	—	—	—	e 21·2
Bombay		77·0	292	e 11 36	+ 3	e 21 1	− 3	i 12 5	pP	—
Frunse		81·1	315	e 11 58	+ 3	e 21 46	− 1	—	—	—
Andijan		82·1	313	e 12 5	+ 5	e 23 19	PS	e 12 38	pP	—
Tashkent		84·5	313	i 12 12	− 1	i 22 21	0	e 12 52	pP	—
College		84·8	23	e 13 2	pP	e 22 19	− 5	e 23 49	PS	e 34·6
Sitka		88·0	32	i 12 27	− 2	i 22 39	[+ 1]	e 13 17	pP	e 35·7
Sverdlovsk		92·6	327	i 12 49	− 2	i 22 59	[− 6]	i 13 35	pP	37·5
Ukiah		93·3	50	e 17 11	PP	e 23 6	[− 3]	e 24 47	PS	e 38·5
Victoria		93·9	41	e 17 1	PP	e 23 37	−10	e 24 49	PS	—
Berkeley		94·0	52	e 12 55	− 2	e 24 55	+ 7	—	—	e 41·9
Santa Barbara		95·8	56	i 13 7	+ 2	—	—	—	—	—
Pasadena		97·1	56	e 13 10	− 1	(e 25 19)	+65	i 13 57	pP	e 25·3
Tananarive		97·1	250	19 31	PPP	e 23 25	[− 3]	23 55	S	—
Tinemaha		97·1	53	e 13 13	+ 2	—	—	—	—	—
Mount Wilson		97·2	56	e 13 10	− 2	—	—	i 13 55	pP	—
Haiwee		97·3	54	i 13 11	− 1	—	—	—	—	—
La Jolla		97·8	57	i 13 16	+ 2	—	—	—	—	—
Riverside		97·8	56	e 13 13	− 1	—	—	i 14 2	pP	—
Baku		99·0	310	e 14 40	pP	i 25 9	+39	i 27 3	PS	39·6
Butte		101·3	43	—	—	e 23 46	[− 3]	e 26 16	?	e 41·5
Grozny		102·0	313	14 13	+40	e 25 23	+28	e 18 31	PP	—
Tiflis		102·8	311	e 13 37	0	i 23 57	[+ 1]	i 14 23	pP	e 48·5
Tucson		103·3	58	i 13 40	+ 1	i 23 9	[−49]	i 14 31	pP	i 42·0
Moscow		105·5	326	e 14 37	pP	25 37	+13	e 18 19	PKP	45·0
Pulkovo		108·0	331	e 14 48	pP	25 13	[+53]	19 13	PP	35·6
Ksara		110·6	303	e 14 56	P	29 14	PS	e 15 34	pP	—
Upsala		113·7	334	e 19 31	PP	e 26 46	SKKS	e 29 21	PS	e 53·5
Scoresby Sund		114·5	356	19 57	PP	26 3	SKKS	—	—	—
Istanbul		114·6	312	e 12 51	?	—	—	e 17 47	PKP	—
Helwan		115·0	300	e 15 21	P	29 41	PS	18 58	PP	—
Bucharest		115·7	317	e 20 15	PP	29 45	PS	—	—	(29·7)
Capetown		117·5	227	e 25 35	SKS	(i 25 35)	[+38]	i 28 43	PS	56·5
Bergen		118·2	340	e 20 31?	pPP	e 27 31?	?	—	—	e 54·5
Sofia		118·2	315	e 20 1	PP	29 55	PS	—	—	(29·9)
Copenhagen		118·4	33	i 18 26	PKP	e 29 25	PS	19 26	PP	—
Florissant		118·7	48	e 19 41	PP	e 26 26	SKKS	e 30 26	pPS	—
St. Louis		118·8	48	e 20 27	PP	i 26 11	SKKS	e 29 26	PS	e 47·5
Belgrade		119·3	318	e 20 33a	PP	e 30 26	PS	e 22 59	PPP	40·8
Prague		120·5	326	e 21 43	?	e 31 49	PPS	—	—	e 51·5
Collmberg		120·6	328	i 18 29	PKP	e 25 31	[+23]	e 20 41	PP	e 57·5
Hamburg		120·8	332	e 19 53	PP	—	—	—	—	e 50·5
Cheb		121·6	327	e 20 18	PP	e 31 3	PS	—	—	e 58·5
Jena		121·6	327	e 18 31	PKP	—	—	e 20 31	PP	—
Göttingen		122·0	330	e 19 31?	?	—	—	—	—	e 58·5
Aberdeen		122·5	339	e 21 1	PP	i 26 49	SKKS	i 30 51	PS	51·3
Triest		123·2	322	e 21 1	PP	26 49	SKKS	31 1	PS	e 61·5
De Bilt		124·0	332	i 20 25	PP	i 32 48	PPS	—	—	39·5
Stuttgart		124·1	327	e 18 36	PKP	e 28 4	?	i 21 6	PP	e 59·5
Edinburgh		124·5	339	—	—	e 26 31?	SKKS	—	—	51·5
Durham		124·8	338	i 21 15	PP	—	—	—	—	—
Strasbourg		125·0	327	i 21 13	PP	e 30 11	PS	e 24 1	PPP	e 54·5
Uccle		125·2	332	e 18 39	PKP	e 23 40	SKP	i 32 35	PPS	e 59·5
Zurich		125·2	326	e 18 37	PKP	e 23 11	SKP	e 21 13	PP	—
Basle		125·7	327	e 18 39	PKP	—	—	e 21 16	PP	—
Ottawa		125·7	35	18 38	PKP	e 26 55	SKKS	e 21 13	PP	51·5

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome	125·8	318	e 16 5a	P	e 27 51	?	e 21 12	PP	50·5
Stonyhurst	125·9	338	i 21 20	PP	e 37 23	SS	—	—	e 59·5
Neuchatel	126·4	327	e 18 26	PKP	—	—	—	—	—
Bidston	126·5	338	i 21 21	PP	e 32 11	PPS	—	—	e 52·5
Kew	126·8	335	i 21 29	PP	e 32 55	PPS	e 23 21	PPP	e 55·5
Oxford	127·0	335	e 21 22	PP	—	—	—	—	e 59·0
Seven Falls	127·4	30	—	—	e 26 37	SKKS	e 31 31?	PS	51·5
Paris	127·5	330	e 18 41	PKP	e 32 45	PPS	e 21 37	PP	64·5
Clermont Farrand	129·3	327	e 21 5	PP	—	—	—	—	e 53·0
Fordham	129·4	39	i 21 41	PP	i 38 3	SS	i 23 31	PPP	—
Weston	130·1	36	i 18 47	PKP	—	—	i 21 49	PP	—
La Plata	133·4	151	22 7?	PP	—	—	—	—	67·5
Balboa Heights	133·7	82	e 18 58	PKP	—	—	—	—	—
Huancayo	134·4	113	e 19 12	PKP	e 31 26	PS	e 20 21	pPKP	—
Toledo	137·1	326	e 21 45	PP	—	—	i 22 39	pPP	e 56·5
Almeria	138·1	321	e 20 10	?	—	—	i 23 0	?	—
La Paz	138·9	123	i 18 55k	PKP	i 28 49	SKKS	i 19 55	pPKP	71·5
San Fernando	140·7	324	e 24 17	PPP	e 33 43	PS	—	—	—
San Juan	145·3	65	i 19 14	[0]	e 40 59	SS	20 44	pPKP	e 61·9
Fort de France	150·9	70	e 18 49	[−35]	—	—	—	—	—

Additional readings :—
Riverview iZ = +6m.23s., iN = +9m.19s.
Adelaide i = +7m.12s., +11m.53s., and +12m.52s.
Melbourne i = +9m.51s.
Apia isP = +9m.9s., PPP? = +10m.9s., isPP = +10m.44s., esS = +15m.33s., SS? = +17m.3s.
Hong Kong PP = +8m.18s.
Wellington PP = +8m.57s., P_cP = +9m.41s., PPP = +10m.1s., i = +15m.8s., SS = +16m.26s., S_cS = +16m.33s., L_q = +17m.41s.
Christchurch iP_cP = +10m.15s., iS_cPN = +13m.26s., iNZ = +15m.15s., iE = +15m.20s., iEN = +15m.42s., iS_cSEN = +17m.23s., iZ = +17m.59s., L_q = +18m.11s., iZ = +18m.58s.
Phu-Lien iS = +16m.17s.
Honolulu epPP = +12m.59s., S_cS = +18m.41s., eSSS = +24m.44s., eSKKP = +30m.52s.
Calcutta isSN = +21m.19s.
Colombo SSE = +20m.53s.
Irkutsk pPP = +13m.40s.
Hyderabad S_cSE = +20m.46s.
Agra iE = +12m.28s., +21m.27s., and +25m.21s.
Bombay eN = +12m.10s., iE = +12m.42s., eE = +14m.57s., iE = +21m.50s., iEN = +22m.29s., eEN = +23m.16s.
Andijan e = +13m.29s.
Tashkent ipS = +23m.18s., sS = +23m.42s., eSS = +28m.1s., eSSS = +31m.19s.
College epS = +23m.27s.
Sitka iS = +22m.56s., iSP = +23m.53s., ipS = +24m.16s., iPS = +24m.23s.
Sverdlovsk ipPP = +17m.11s., iS = +23m.40s., ipS = +24m.30s., iPS = +25m.8s., PPS = +25m.50s.
Ukiah epS = +24m.52s., esS = +25m.55s., eSS = +29m.48s., SS = +30m.6s., eSSS = +36m.15s.
Victoria e = +30m.7s.
Pasadena eZ = +17m.4s.
Mount Wilson i = +13m.13s., iZ = +13m.58s.
Riverside iZ = +17m.13s.
Baku iPPS = +28m.28s., iSS = +31m.31s., sSS = +32m.43s.
Tiflis PP = +17m.37s., epPPZ = +18m.23s., epPPN = +18m.27s., esPPE = +18m.51s., iEZ = +19m.9s., PPPZ = +19m.55s., eZ = +20m.51s. +22m.17s., SE = +25m.3s., iE = +25m.28s., ipPSEZ = +27m.24s., esPSN = +27m.42s., sPSE = +27m.52s., eEN = +18m.16s., iSSE = +31m.55s., eSSZ = +32m.4s., esSSE = +33m.5s., esSSN = +33m.31s., eZ = +33m.55s., eSSSE = +36m.3s., eSSSZ = +37m.16s.
Tucson iPP = +17m.50s., +17m.58s., ipPP = +18m.37s., isPP = +19m.18s., iPPP = +19m.56s., pS = +25m.57s., iSP = +26m.7s., i = +26m.48s., PS = +26m.56s., SPP = +27m.21s., pPS = +27m.48s., iPPS = +28m.1s., PKKP = +29m.57s., iSS = +32m.19s., isSS = +33m.37s., SSS = +37m.14s.
Moscow PP = +18m.54s., pS = +26m.49s., sS = +27m.5s., PPS = +28m.39s., SSS = +37m.19s.
Pulkovo PPP = +21m.13s., SKKS = +25m.44s., pS = +27m.35s., sS = +27m.57s., ePS = +28m.31s., SS = +33m.19s., sSS = +34m.47s.
Ksara ePKP = +18m.36s., iPP = +19m.35s., ipPP = +20m.10s., PPS = +30m.16s.
Upsala eN = +28m.57s., e = +34m.31s. ? and +36m.31s. ?
Scoresby Sund +27m.23s. and +28m.49s.

Continued on next page.

Helwan eZ = +15m.31s., eE = +19m.36s., PPEZ = +20m.1s., eE = +26m.58s., SE = +27m.51s.
Cape Town ePN = +25m.54s., iPPPN = +30m.42s., iSKS = +36m.2s.
Sofia eEN = +20m.35s.
Copenhagen = +26m.31s., eN = +30m.47s. and +35m.43s.
Florissant eZ = +20m.25s., iZ = +29m.21s., eEN = +35m.46s.
St. Louis eE = +35m.25s.
Prague e = +37m.43s.
Collmberg i = +19m.17s. and +19m.47s., eZ = +21m.3s. and +22m.13s., i = +28m.36s., e = +31m.1s. and +35m.37s.
Hamburg eZ = +20m.42s.
Triest ePPP = +23m.28s., eSKKS = +27m.56s., eS = +29m.28s., PPS = +32m.3s., SS = +38m.19s., iSSS = +42m.27s.
De Bilt iZ = +21m.6s.
Stuttgart eZ = +20m.1s., +21m.30s., ePKS = +22m.12s., ePPP = +23m.44s., ePPS = +32m.43s., e = +35m.37s.
Strasbourg e = +22m.31s.?, epPPS = +32m.26s.
Uccle iPKPZ = +21m.14s., iSKS = +28m.14s., eSS = +39m.31s.
Ottawa e = +33m.1s., +37m.13s., and +38m.31s.
Rome eSZ = +30m.21s., ePSZ = +31m.42s., iPPSZ = +32m.45s.
Bidston e = +22m.51s.
Kew eZ = +27m.37s., iEN = +53m.10s.
Seven Falls e = +36m.55s.
Huancayo ePP = +21m.15s., ipPP = +22m.31s.
La Paz iPKP$_3$Z = +19m.7s., isPKPZ = +20m.29s., iPPZ = +21m.58s., SKPZ? = +24m.21s., iPPPZ = +25m.9s., PPSZ = +35m.37s.
San Juan eP = +23m.12s. eSSS = +45m.2s.
Long waves were also recorded at Jersey and Cernauti.

Jan. 30d. Readings also at 2h. (Tucson (3), La Jolla (2), Santa Barbara, Haiwee (2), Pasadena (3), Mount Wilson (3), Tinemaha (3), and Riverside (3)), 3h. (La Paz), 4h. (Mizusawa), 6h. (Mizusawa, Riverside, Tinemaha, Mount Wilson, and Pasadena), 7h. (Malabar and Batavia), 8h. (Brisbane and Riverview), 9h. (Tucson, Christchurch (2), Ottawa, Harvard, Malabar, Pasadena, Mount Wilson, Tinemaha, Riverside, Haiwee, Santa Barbara, Tashkent, Samarkand, and Sverdlovsk), 10h. (Frunse and Andijan), 12h. (Manila, Tinemaha, Mount Wilson, Pasadena, Riverview, and Wellington), 13h. (Vladivostok and Sverdlovsk), 14h. (Wellington), 17h. (Frunse, Andijan, and Samarkand), 18h. (Agra, Piatigorsk, Grozny, Sverdlovsk, and Tashkent), 19h. (Tucson, La Paz, and Mizusawa (2)), 23h. (Arapuni).

Jan. 31d. 4h. 14m. 8s. Epicentre 7°·2S. 155°·3E. (as on 1939, Jan. 30d.).

$A = -\cdot 9014$, $B = +\cdot 4146$, $C = -\cdot 1245$; $\delta = -8$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Brisbane	N.	20·3	185	i 4 46	+ 6	i 8 34	+11	—	—	—
Riverview	N.	26·8	187	—	—	e 10 44	+25	—	—	e 14·7
Melbourne		31·9	195	—	—	e 12 4	+24	i 14 16	SSS	15·4
Manila		40·3	302	7 41	+ 1	13 49	0	—	—	—
Calcutta	N.	71·8	297	—	—	i 20 49	+ 3	—	—	—
Irkutsk		73·4	331	—	—	e 20 52?	−13	—	—	e 32·9
Agra	E.	82·1	298	—	—	i 22 27	−11	—	—	—
Pasadena	Z.	91·1	56	e 13 6	− 2	—	—	—	—	—
Mount Wilson	Z.	91·2	56	i 13 7	− 1	—	—	—	—	—
Tinemaha		91·4	53	e 13 7	− 2	—	—	—	—	—
Haiwee		91·6	54	e 13 10	0	—	—	—	—	—
Riverside	Z.	91·8	56	i 13 9	− 2	—	—	—	—	—
Sverdlovsk		98·5	326	—	—	e 31 59	SS	—	—	40·9
Ksara		118·3	304	e 20 11	PP	e 31 57	PPS	—	—	—
Ottawa		122·6	39	18 54	[− 4]	—	—	—	—	64·9

Long waves were also recorded at Vladivostok and Wellington.

Jan. 31d. Readings also at 1h. (Christchurch), 2h. (Tucson, Manila, and near Branner), 3h. (Tinemaha, La Jolla, La Plata, Tucson, Pasadena, Mount Wilson, and Riverside), 5h. (Melbourne, Riverside, Mount Wilson, Pasadena, Mizusawa, and Wellington), 7h. (Tucson), 11h. (Wellington), 15h. (Wellington, New Plymouth, and Christchurch), 16h. (Mizusawa and Tucson), 17h. (Vladivostok), 18h. (Sverdlovsk), 19h. (Ottawa), 21h. (Wellington and Ottawa).

Feb. 1d. 1h. 39m. 20s. Epicentre 6°·8S. 127°·5E. (as on 1938 April 4d.).

$A = -\cdot6045$, $B = +\cdot7878$, $C = -\cdot1176$; $\delta = -12$; $h = +7$;
$D = +\cdot793$, $E = +\cdot609$; $G = +\cdot072$, $H = -\cdot093$, $K = -\cdot993$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Malabar		19·7	267	—	—	e 8 36	SS	—	—	—
Batavia		20·5	271	4 45	+ 3	8 41	+14	i 5 55	PP	—
Manila		22·2	344	i 5 4a	+ 4	i 9 14	+14	—	—	11·7
Perth		27·3	201	i 6 3	+15	i 10 20	− 7	i 12 2	SSS	i 15·3
Adelaide		29·8	161	e 6 14	+ 3	i 11 10	+ 3	7 7	PP	13·4
Medan	E.	30·6	290	e 5 58	−20	i 10 29	−51	—	—	—
Hong Kong		31·7	336	7 34	PP	11 31	− 6	7 59	PPP	13·8
Brisbane		31·8	133	e 6 46	+18	—	—	—	—	i 15·9
Phu-Lien		34·3	325	6 53	+ 3	—	—	—	—	—
Melbourne		34·7	155	11 45	S	(11 45)	−39	14 40	SS	15·6
Riverview		34·7	143	e 6 40	−14	e 13 32	SS	i 14 11	SS	—
Sydney		34·7	143	e 10 56	?	e 16 35	?	—	—	e 18·7
Calcutta	N.	48·2	309	e 10 52	PP	—	—	—	—	—
Vladivostok		49·9	5	i 8 27	−30	i 14 56	?	—	—	19·7
Christchurch		53·8	140	e 15 24	?	21 53	SSS	24 14	L_Q	27·9
Wellington		54·2	137	e 14 40?	?	21 40?	SS	16 52	P_cP	27·6
Agra	E.	58·2	308	e 13 8	PPP	i 18 1	+ 2	—	—	—
Bombay		59·6	297	e 10 6	− 2	i 18 16	− 1	e 13 25	PPP	—
Almata		67·6	323	e 10 55	− 6	—	—	—	—	—
Tashkent		71·5	318	i 11 21	− 3	i 20 41	− 2	—	—	e 32·7
Tchimkent		71·8	319	i 20 45	S	(i 20 45)	− 1	—	—	—
Samarkand		72·4	315	e 20 53	S	(e 20 53)	0	—	—	—
Sverdlovsk		83·3	330	i 12 25	− 5	i 22 39	−11	—	—	36·7
Baku		85·0	311	e 12 37	− 1	e 22 58	[− 3]	23 59	PS	42·8
Grozny		88·6	314	e 12 53	− 3	e 23 15	[− 9]	—	—	—
Tiflis		89·1	312	12 57	− 1	i 23 21	[− 6]	e 28 50	SS	e 48·7
Ksara		95·1	303	e 15 59	?	e 26 8	PS	—	—	49·7
Moscow		95·5	325	—	—	e 23 53	[−11]	—	—	—
Tinemaha	z.	113·4	53	i 19 5	PP	—	—	—	—	—
Pasadena	z.	113·9	56	i 18 28	[−13]	—	—	—	—	—
Mount Wilson	z.	114·0	56	i 18 30	[−11]	—	—	i 19 17	PP	—
Riverside	z.	114·6	56	i 19 22	PP	—	—	—	—	—
Tucson		120·3	57	i 18 42a	[−11]	—	—	i 20 8	PP	—
La Paz	z.	152·2	150	19 47	[− 4]	—	—	—	—	—
Balboa Heights		153·1	82	e 19 47	[− 5]	—	—	—	—	—

Additional readings :—
Perth i = +10m.50s.
Adelaide i = +6m.26s., +11m.42s., and +12m.58s.
Hong Kong SS = +11m.57s.
Medan iE = +11m.53s.
Brisbane eN = +6m.52s.
Riverview eZ = +6m.58s.
Wellington S_eS = +23m.56s.
Bombay eN = +11m.0s.
Tiflis iSEZ = +23m.48s., ePPSN = +24m.33s.
Tucson i = +18m.51s., +19m.3s., +19m.38s., +19m.59s., +20m.54s., +21m.49s., +22m.9s., and +28m.57s.

Feb. 1d. 5h. Local shock.
Kamakura P = 25m.32s., S = 25m.46s.
Kiyosumi P = 25m.32s., S = 25m.47s.
Komaba P = 25m.32s., S = 25m.41s.
Koyama P = 25m.32s., S = 25m.49s.?
Mitaka P = 25m.32s., S = 25m.42s.
Titibu P = 25m.32s., S = 25m.41s.
Tokyo Imp. Univ. P = 25m.32s., S = 25m.41s.
Tukubasan P = 25m.32s., S = 25m.38s.
Susaki P = 25m.43s., S = 26m.6s.
Mizusawa ePE = 26m.9s., SE = 26m.45s.
Osaka P = 26m.21s., S = 27m.16s.

Feb. 1d. Readings also at 1h. (Malabar), 2h. (Tucson), 3h. (Mount Wilson), 5h. (Salt Lake City), 6h. (Sofia and Tiflis), 7h. (Pasadena, Tinemaha, Manila, Mount Wilson, and Tucson (2)), 10h. (Harvard, Weston, and Osaka), 11h. (Fresno and Mizusawa (2),) 14h. (Mizusawa), 15h. (Tucson and Ottawa), 17h. (Cape Girardeau), 18h. (Mount Wilson and Tucson), 19h. (Florence), 23h. (near Ksara).

Feb. 2d. 7h. 8m. 46s. Epicentre 4°·7N. 128°·3E. (as on 1938 June 29d.).

$A = -\cdot6177$, $B = +\cdot7822$, $C = +\cdot0814$; $\delta = +2$; $h = +7$;
$D = +\cdot785$, $E = +\cdot620$,; $G = -\cdot050$, $H = +\cdot064$, $K = -\cdot997$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		12·2	323	i 3 2a	+ 4	5 43	SSS	—	—	7·4
Hong Kong		22·2	325	5 1	+ 1	8 56	− 4	9 42	SS	—
Batavia		24·0	243	e 5 4	−13	10 21	SS	—	—	—
Phu-Lien		26·4	310	e 5 37	− 3	—	—	—	—	—
Medan	E.	29·6	270	e 6 15	+ 6	12 27	SS	—	—	—
Vladivostok		38·4	5	—	—	i 13 33	+13	—	—	—
Calcutta	N.	42·5	299	9 18	PP	—	—	—	—	—
Agra	E.	52·8	301	i 9 13	− 6	—	—	—	—	—
Andijan		61·5	314	e 10 21	0	18 39	− 3	—	—	—
Tashkent		63·9	315	i 10 34	− 3	—	—	e 12 51	PP	27·2
Tchimkent		64·0	316	e 10 38	0	—	—	—	—	—
Samarkand		65·1	311	e 10 44	− 1	—	—	—	—	—
Sverdlovsk		74·0	328	i 11 40	+ 1	20 58	−13	—	—	32·2
Baku		78·1	310	12 3	+ 1	e 21 56	0	—	—	41·2
Tiflis		82·0	311	e 12 21	− 2	e 22 34	− 3	—	—	e 36·2
Moscow		86·5	326	—	—	e 23 9	[− 2]	—	—	—
Ksara		89·4	303	e 12 9	−51	—	—	e 15 5	?	—
Pulkovo		90·0	330	13 3	0	23 33	[0]	e 23 46	S	46·7
Stuttgart		105·1	323	—	—	e 42 26	?	—	—	63·2

Additional readings :—
Vladivostok i = +13m.48s.
Tashkent e = +10m.56s. and +11m.40s.
Tiflis eZ = +22m.44s.
Long waves were also recorded at Uccle, De Bilt, and Strasbourg.

Feb. 2d. 12h. 49m. 45s. Epicentre 42°·8N. 17°·9E. (as on 1938 July 2d.).

Intensity V at Janjina; IV at Makarska and Vrgorac. Epicentre Dubrovnik 42°38′N. 18°07′E. Belgrade.

J. Mihailovic.

Annuaire microsiesmique et macroseismique, 1939, Beograde, 1940.

$A = +\cdot7004$, $B = +\cdot2262$, $C = +\cdot6770$; $\delta = +6$; $h = -3$;
$D = +\cdot307$, $E = -\cdot952$; $G = +\cdot644$, $H = +\cdot208$, $H = +\cdot736$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		2·8	42	i 0 37a	−10	i 1 27	S*	i 1 31	S_g	—
Sofia		4·0	89	e 1 15	P*	—	—	—	—	—
Rome		4·1	259	e 1 12	P*	2 1	+ 6	—	—	2·1
Triest		4·1	316	e 0 59	− 6	1 51	− 4	—	—	—
Kecskemet	Z.	4·3	17	e 2 13	S	(e 2 13)	S*	—	—	—
Budapest		4·8	10	e 1 9	− 6	2 29	S*	e 1 21	P*	—
Florence		4·9	283	1 45	P_g	—	—	—	—	—
Moncalieri		7·7	290	e 0 50	−66	—	—	—	—	—
Zurich		8·0	308	e 1 55	− 5	e 3 18	−15	—	—	—
Stuttgart		8·5	316	e 3 0	P_g	e 4 15	S*	—	—	—
Basle		8·7	307	e 2 15	+ 5	e 3 44	− 6	—	—	—
Neuchatel		8·8	302	2 6	− 5	—	—	—	—	—
Jena		9·2	334	e 3 40	?	e 4 4	+ 1	e 4 40	SSS	—
Strasbourg		9·2	313	e 3 18	+62	e 4 5	+ 2	4 39	S*	—
Göttingen		10·2	331	—	—	4 15?	−12	—	—	—

For Notes see next page.

NOTES TO FEB. 2d. 12h. 49m. 45s.

Additional readings :—
Belgrade $iP_g = +45s.$
Triest $P_g = +1m.6s.$
Kecskemet $e = +3m.12s.$
Budapest $iE = +2m.21s.$ and $+2m.31s.$, $i = +2m.39s.$, $eN = +2m.58s.$, $eE = +3m.2s.$
Stuttgart $e = +4m.20s.$ and $+4m.29s.$
Jena $eE = +3m.43s.$

Feb. 2d. 14h. 5m. 9s. Epicentre 1°·5N. 92°·0E.

$A = -\cdot0349$, $B = +\cdot9991$, $C = +\cdot0260$; $\delta = +9$; $h = +7$;
$D = +\cdot999$, $E = +\cdot035$; $G = -\cdot001$, $H = +\cdot026$, $K = -1\cdot000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		7·0	72	1 43	− 3	i 2 55	−13	i 3 22	S*	—
Colombo	E.	13·2	294	e 3 11	0	—	—	—	—	—
Batavia		16·6	118	4 35	PPP	—	—	—	—	—
Calcutta	N.	21·2	352	e 4 35	−14	i 8 8	−33	—	—	e 11·6
Phu-Lien		23·9	35	e 5 5	−11	e 10 59	SSS	—	—	—
Bombay		25·5	314	i 5 52	+20	e 10 0	+ 3	—	—	—
Agra	E.	28·8	335	e 6 10	+ 8	e 11 11	+20	—	—	—
Tashkent		44·6	336	8 21	+ 5	e 17 59	SS	e 10 8	PP	e 25·9
Tiflis	Z.	58·3	320	e 10 3	+ 4	—	—	—	—	e 30·9
Sverdlovsk		60·6	342	i 10 22	+ 7	e 18 29	− 1	—	—	e 28·9
Ksara		61·4	308	e 7 44	?	—	—	—	—	—

Ksara also gives $e = +10m.39s.$
Long waves were also recorded at Vladivostok.

Feb. 2d. 23h. 16m. 50s. Epicentre 8°·5S. 156°·0E. (as on 1938 Feb. 22d.).

$A = -\cdot9037$, $B = +\cdot4023$, $C = -\cdot1468$; $\delta = +7$; $h = +7$;
$D = +\cdot407$, $E = +\cdot914$; $G = +\cdot134$, $H = -\cdot060$, $K = -\cdot989$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	19·1	188	i 4 34	+ 7	i 8 16	SS	—	—	—
Riverview	N.	25·6	189	i 6 15	+43	i 10 35	+36	—	—	e 13·6
Adelaide		30·8	208	e 4 16	?	i 11 30	+ 7	—	—	16·4
Melbourne		30·9	197	—	—	e 10 30	−54	i 12 53	SS	14·4
Wellington		36·6	156	e 7 10?	0	i 13 14	+21	8 58	PP	e 19·2
Christchurch		37·8	160	e 7 33a	+13	13 35	+24	16 25	L_q	19·0
Manila		41·6	303	7 42	− 9	13 56	−12	—	—	—
Perth		44·0	231	i 9 2	+51	i 14 45	+ 2	i 18 10	SS	i 23·1
Hong Kong		51·2	307	—	—	16 10	−15	18 57	SS	—
Phu-Lien		56·6	302	e 9 17	−30	e 17 27	−11	—	—	—
Medan		58·4	280	e 11 2	+62	i 18 28	PS	—	—	—
Calcutta	N.	73·0	297	e 14 17	PP	i 20 48	−12	—	—	—
Agra	E.	83·3	298	e 12 23	− 7	—	—	—	—	—
Bombay		86·3	289	e 15 6	?	i 23 6	[− 3]	—	—	—
Andijan		90·7	310	e 13 7	+ 1	e 23 54	− 7	—	—	—
Pasadena		91·3	56	e 13 10	+ 1	—	—	—	—	e 48·2
Tinemaha		91·7	53	e 13 18	+ 8	—	—	—	—	—
Haiwee		91·8	54	e 13 15	+ 4	—	—	—	—	—
Sverdlovsk		100·0	327	e 17 46	PP	e 25 7	−13	—	—	41·2
Tiflis	Z.	111·4	312	e 19 20	PP	26 38	{+23}	e 21 35	PPP	—
La Paz		129·8	120	e 22 58	?	—	—	—	—	89·2
Rome		133·7	322	e 22 25	PP	—	—	—	—	—

Additional readings :—
Adelaide $i = +14m.23s.$
Wellington $iZ = +7m.48s.$, $SS = +16m.14s.$
Christchurch $iZ = +7m.43s.$, $S_cS = +16m.43s.$
Perth $i = +11m.17s.$ and $+11m.53s.$, $iS = +15m.55s.$, $i = +19m.25s.$ and $+20m.50s.$
Andijan $e = +14m.14s.$
Pasadena $iZ = +13m.18s.$
Sverdlovsk $e = +18m.45s.$
Long waves were also recorded at Vladivostok.

Feb. 2d. 23h. 50m. 44s. Epicentre 31°·8N. 16°·8E. (as on 1939 Jan. 23d.).

$A = +·8152$, $B = +·2461$, $C = +·5244$; $\delta = +11$; $h = +1$;
$D = +·289$, $E = -·957$; $G = +·502$, $H = +·152$, $K = -·852$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome	10·6	343	−0 59	?	—	—	—	—	5·4
Algiers	12·4	298	—	—	e 4 53	−28	—	—	7·4
Helwan	12·6	95	e 3 4	+ 1	7 31	L	—	—	(7·5)
Florence	12·7	342	e 3 11	+ 6	—	—	—	—	—
Triest	14·0	353	e 3 19	− 3	e 5 58	− 1	—	—	—
Moncalieri	15·0	335	e 1 25	?	e 6 36	SS	—	—	11·7
Chur	16·0	342	e 3 48	0	e 6 57	+11	—	—	—
Ksara	16·2	78	e 3 59	+ 9	e 7 31	SSS	—	—	—
Zurich	16·8	340	e 3 54	− 4	e 7 12	+ 7	—	—	—
Neuchatel	16·9	337	e 3 55	− 4	—	—	—	—	—
Basle	17·2	339	e 3 59	− 4	—	—	—	—	—
Granada	17·6	294	e 4 14a	+ 8	e 7 29	+ 6	i 4 35	PP	i 9·8
Clermont Ferrand	17·6	326	e 4 1	− 7	e 9 46	L	—	—	(e 9·8)
Stuttgart	17·9	345	e 4 26	+14	e 7 33	+ 3	e 9 28	L_q	—
Strasbourg	18·1	342	e 4 10	− 4	e 7 34	− 1	—	—	—
Toledo	18·7	302	e 4 10	−12	—	—	e 4 38	PP	e 10·2
Jena N.	19·5	352	e 4 28	− 3	—	—	—	—	—
Paris	20·1	333	e 4 42	+ 4	8 16?	− 3	—	—	—
Uccle	21·1	338	—	—	e 8 46	+ 7	—	—	—
Hamburg	22·3	350	e 7 16?	?	—	—	—	—	—
Tiflis	24·4	58	e 5 22	+ 1	(e 9 56)	+17	—	—	e 9·9
Grozny	25·5	55	e 5 41	+ 9	—	—	—	—	—
Moscow	28·0	26	e 6 20	+25	—	—	—	—	—
Pulkovo	29·4	14	e 7 11	PP	—	—	—	—	—

Additional readings:—
Algiers eSS = +6m.49s.
Helwan eE = +4m.11s., eEN = +7m.22s.
Granada i = +4m.53s.
Stuttgart e = +5m.29s.
Long waves were also recorded at San Fernando, Stonyhurst, De Bilt, Kew, Edinburgh, and Cape Town.

Feb. 2d. Readings also at 1h. (Andijan), 3h. (Bombay, Andijan, Sverdlovsk, Baku, Hyderabad, Colombo, Calcutta, Tashkent, and Agra), 4h. (Basle and Zurich), 5h. (Mizusawa and near Taihoku), 7h. (Tiflis), 8h. (Florence and La Plata), 9h. (near Apia), 11h. (Ksara), 12h. (Tinemaha, Mount Wilson, Berkeley, La Jolla, Tucson, and Pasadena), 13h. (Copenhagen, Jena, Göttingen, Pulkovo, Moscow, Tucson (2), Tiflis, Sverdlovsk, Basle, and Zurich), 14h. (Basle, Zurich, and Tucson), 15h. (Brisbane, Wellington, Mizusawa, and Pasadena), 16h. (La Paz and Mizusawa), 22h. (Florence), 23h. (Tucson).

Feb. 3d. 5h. 26m. 20s. Epicentre 9°·2S. 159°·5E.

$A = -·9248$, $B = +·3458$, $C = -·1589$; $\delta = +8$; $h = +7$;
$D = +·350$, $E = +·937$; $G = +·149$, $H = -·056$, $K = -·987$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	19·2	198	i 4 22	− 6	i 7 58	− 1	—	—	—
Riverview	25·7	196	e 5 33	0	i 9 51	−10	10 25	SS	e 11·3
Sydney	25·7	196	e 3 40	?	i 9 37	−24	—	—	13·8
Apia	28·5	102	e 5 55	− 4	i 11 10	+24	i 12 51	SSS	—
Palau	29·9	303	6 18	+ 6	—	—	—	—	—
Melbourne	31·4	203	e 5 27	−58	e 10 27	−65	—	—	12·3
Adelaide	32·0	214	i 6 29	− 1	i 11 18	−24	i 14 2	SSS	i 15·0
Arapuni	32·2	156	—	—	11 46	+ 1	13 4	SS	16·5
Wellington	34·7	160	i 6 50	− 4	12 16	− 8	8 13	PP	17·3
Christchurch	36·1	164	i 7 2	− 3	i 12 37	− 8	i 8 31	PP	17·0

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Titizima		39·8	337	7 49	+13	—	—	—	—	—
Manila		44·9	302	i 8 19k	+ 1	14 45	−11	—	—	—
Perth		46·3	235	8 38	+ 9	15 12	− 4	10 23	PP	21·6
Isigakizima		48·0	316	8 20	−23	—	—	—	—	—
Siomisaki		48·0	334	8 43	0	—	—	—	—	—
Tokyo, Cen. Met. Ob.		48·5	338	8 49	+ 3	15 43	− 5	—	—	—
Miyazaki		48·9	328	8 51	+ 1	15 47	− 6	—	—	—
Nagoya		49·0	336	8 51	+ 1	15 56	+ 1	—	—	—
Osaka		49·2	335	8 43	− 9	15 57	− 1	11 0	PP	—
Sumoto		49·2	335	8 51	− 1	15 53	− 5	—	—	—
Matuyama		49·8	331	8 56	0	16 5	− 1	—	—	—
Kumamoto		50·0	329	8 58	0	16 18	+ 9	—	—	—
Taihoku		50·3	315	e 9 17	+17	—	—	—	—	—
Hukuoka		50·8	329	9 6	+ 2	16 26	+ 6	—	—	e 24·0
Hamada		51·0	331	9 5	− 1	16 23	+ 1	—	—	—
Mizusawa		51·0	343	e 9 1	− 5	16 18	− 4	—	—	22·2
Malabar		51·4	269	9 14	+ 5	16 28	0	i 19 35	SS	27·7
Morioka		51·5	343	9 10	+ 1	—	—	—	—	—
Honolulu		51·7	54	i 9 14	+ 3	i 16 36	+ 4	—	—	i 21·8
Batavia		52·2	270	i 9 19	+ 4	16 31	− 8	—	—	23·7
Mori		53·9	344	9 28	+ 1	17 18	+16	—	—	—
Hong Kong		54·3	307	9 30k	0	17 8	+ 1	20 47	SS	25·8
Zi-ka-wei		54·3	320	i 9 30	0	17 6	− 1	11 52	PP	26·8
Zinsen		55·7	329	9 41	+ 1	—	—	—	—	—
Vladivostok		57·8	337	i 9 56	+ 1	i 17 54	0	—	—	24·2
Phu-Lien		59·9	301	i 10 9	− 1	i 18 20	− 1	12 28	PP	28·7
Medan		61·9	280	10 30	+ 6	i 18 43	− 4	i 19 47	?	34·7
Calcutta	N.	76·5	297	i 12 3k	+ 9	i 21 48	+ 9	e 14 57	PP	e 36·7
Colombo	E.	80·9	278	12 16	− 1	i 22 24	− 2	—	—	43·4
College		83·6	20	e 12 29	− 3	e 22 49	− 4	e 31 44	SSS	e 34·9
Hyderabad		84·3	289	12 37	+ 2	22 57	− 3	16 1	PP	39·1
Sitka		84·6	30	12 41	+ 5	23 2	− 1	e 28 47	SS	e 35·4
Ukiah		86·0	50	e 12 50	+ 7	23 23	+ 6	24 31	PS	e 35·1
Berkeley		86·4	52	i 12 19	−26	e 23 9	[− 1]	—	—	e 43·1
Santa Clara		86·5	52	i 12 50	+ 4	i 23 52	+30	—	—	e 43·0
Agra		86·7	298	12 43a	− 4	23 7	[− 5]	15 56	PP	—
Lick		86·8	52	e 12 49	+ 2	e 23 26	+ 1	—	—	—
Dehra Dun	N.	87·3	302	e 12 50	0	e 22 51	[−25]	—	—	e 35·5
Santa Barbara		87·6	55	i 12 53a	+ 2	e 23 32	0	e 24 10	PS	—
Fresno	N.	88·1	52	e 12 40	−14	e 23 40	+ 3	—	—	—
Victoria		88·4	41	e 12 40?	−15	e 23 28	[+ 5]	24 52	PS	e 40·7
Pasadena		88·8	56	i 12 58a	+ 1	i 23 36	− 8	i 24 57	PS	e 36·0
Mount Wilson		88·9	56	i 12 59a	+ 1	e 23 32	[+ 6]	e 23 44	S	—
Seattle		88·9	42	e 13 21	+23	24 17	+33	e 16 30	PP	e 36·3
La Jolla		89·3	57	i 13 1a	+ 2	e 23 39	[+10]	e 23 50	S	—
Haiwee		89·4	54	i 13 3a	+ 3	e 23 53	+ 4	—	—	—
Riverside		89·4	56	e 13 2	+ 2	e 23 49	0	—	—	—
Tinemaha		89·4	53	i 13 2a	+ 2	e 23 46	− 3	—	—	—
Bombay		89·8	291	i 12 59	− 3	i 23 29	[− 3]	e 29 11	SS	e 41·4
Almata		90·9	314	e 13 14	+ 7	—	—	—	—	—
Frunse		92·5	313	e 13 16	+ 2	i 23 46	[− 1]	—	—	56·1
Andijan		93·8	310	e 13 23	+ 3	e 23 54	[0]	—	—	52·7
Tucson		94·6	58	i 13 25a	+ 1	i 23 47	[−12]	17 6	PP	i 39·6
Salt Lake City		94·9	50	e 13 40	+15	e 24 11	[+11]	e 17 45	PP	40·3
Butte		95·1	44	e 14 17	+51	e 24 18	[+16]	24 53	S	e 40·4
Tchimkent		96·0	312	e 13 52	+22	—	—	—	—	—
Bozeman		96·1	45	—	—	e 23 52	[−15]	—	—	e 37·4
Tashkent		96·2	311	i 13 28	− 3	e 23 51	[−17]	e 17 25	PP	—
Sverdlovsk		102·5	326	i 13 58	− 2	i 24 38	[− 1]	i 18 4	PP	43·2
Baku		110·8	310	19 15	PP	i 25 26	[+11]	i 34 52	SS	56·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florissant	E.	111·3	52	e 14 44	P	i 25 26	[+ 9]	e 19 15	PP	—
Cape Girardeau		112·2	53	e 19 22	PP	e 28 56	PS	e 30 24	PPS	e 63·7
Chicago		113·2	48	e 14 30	P	e 25 33	[+ 8]	e 19 28	PP	e 45·8
Grozny		113·5	314	e 19 18	PP	—	—	—	—	—
Tiflis	Z.	114·4	312	e 14 54	P	—	—	e 19 32	PP	—
Moscow		115·2	328	e 14 59	P	25 29	[− 4]	19 22	PP	49·2
Pulkovo		116·9	334	14 54	P	25 37	[− 2]	e 20 1	PP	e 46·2
Toronto		118·7	45	e 20 40	PP	e 25 58	[+13]	e 29 55	PS	58·7
Scoresby Sund		118·8	1	20 13	PP	25 57	[+11]	29 46	PS	—
Columbia		119·5	56	e 20 11	PP	e 25 50	[+ 2]	e 30 0	PS	e 46·6
Ottawa		120·6	42	18 54	[0]	25 56	[+ 4]	20 20	PP	e 56·7
Georgetown		121·6	49	e 16 0	P	i 26 2	[+ 7]	i 20 28	PP	—
Huancayo		121·6	110	e 19 2	[+ 6]	e 25 39	[−16]	20 30	PP	e 51·1
U.S.C.G.S Test		121·6	50	e 19 27	[+31]	e 26 36	?	e 27 36	SKKS	53·7
Upsala		122·0	338	e 22 40?	PPP	e 25 40	[−17]	e 36 37	SS	e 53·7
Philadelphia		122·7	49	e 20 35	PP	e 26 8	[+ 9]	e 37 26	SS	e 53·4
Ksara		122·9	304	e 19 2	[+ 4]	e 30 41	PS	e 20 39	PP	—
Seven Falls		123·1	38	20 31	PP	30 38	PS	37 58	SS	56·7
Cape Town		123·4	219	e 20 50	PP	(i 26 0)	[− 1]	i 41 48	SS	57·9
Fordham		123·4	46	19 0	[+ 1]	e 26 16	[+15]	20 38	PP	e 57·7
La Plata		123·6	143	20 40	PP	27 40	{+ 2}	39 10	SS	52·7
Harvard		124·5	43	e 19 5	[+ 4]	e 37 49	SS	e 20 45	PP	e 60·0
Weston		124·7	43	e 15 50	P	e 26 19	[+14]	i 20 47	SS	e 58·0
Bergen		125·4	345	e 20 40?	PP	—	—	—	—	e 56·7
Istanbul		126·0	315	19 15	[+11]	—	—	21 0	SS	—
East Machias		126·4	40	e 20 56	PP	e 26 26	[+16]	e 31 46	PS	e 51·7
La Paz		126·4	118	i 19 7	[+ 2]	27 40	{−16}	i 21 2	PP	59·8
Bucharest		126·7	320	e 21 4	PP	—	—	—	—	42·7
Copenhagen		126·8	337	21 4	PP	e 26 28	[+17]	e 31 22	PS	—
Helwan		127·5	301	i 19 8k	[+ 1]	28 0	{− 3}	21 7	PP	—
Halifax		128·8	38	e 22 28	?	e 38 52	SS	—	—	e 57·7
Sofia		129·2	319	e 19 14	[+ 4]	e 22 38	?	e 21 24	PP	—
Budapest		129·3	326	e 19 13	[+ 2]	—	—	21 21	PP	65·7
Kesckemet	Z.	129·3	325	e 19 13	[+ 2]	—	—	—	—	—
Hamburg		129·4	338	e 19 12	[+ 1]	e 38 54	SS	—	—	e 55·7
Prague		129·5	332	e 21 25	PP	e 32 58	PPS	—	—	—
Heligoland		129·7	339	e 21 17	PP	e 38 48	SS	—	—	e 57·7
Collmberg		129·8	334	e 21 27	PP	e 28 4	{−15}	30 58	PS	e 57·7
Belgrade		130·0	322	e 19 13a	[+ 1]	e 26 3	[−17]	—	—	60·3
Aberdeen		130·1	348	i 21 22	PP	e 30 34	PS	i 38 47	SS	e 54·2
Jena		130·7	329	e 19 16	[+ 3]	—	—	e 21 40	PP	e 55·7
Göttingen		131·0	336	e 19 14	[0]	—	—	e 22 39	PKS	e 57·7
Edinburgh		131·4	347	i 22 43	PKS	i 39 7	SS	i 39 29	SSP	e 55·7
Durham	N.	132·1	346	i 22 47	PKS	—	—	—	—	—
De Bilt		132·4	339	i 19 17a	[+ 1]	—	—	i 21 40	PP	69·7
Stonyhurst		133·2	346	21 51	PP	i 39 44	SS	—	—	e 54·7
Triest		133·2	328	e 18 26	?	28 36	{− 3}	e 21 56	PP	—
Stuttgart		133·4	334	e 16 20	P	e 26 45	[+17]	e 21 33	PP	e 70·7
Bidston		133·7	347	i 21 52	PP	i 26 18	[−10]	i 22 50	PKS	e 54·7
Uccle		133·7	340	e 19 20	[+ 1]	i 39 37	SS	e 21 47	PP	58·7
Strasbourg		134·1	335	e 16 26	P	39 31	SS	e 21 50	PP	—
Chur		134·6	333	e 19 21	[+ 1]	—	—	—	—	—
Kew		134·7	343	e 19 24	[+ 3]	i 26 31	[+ 1]	i 21 56	PP	e 54·7
Oxford	E.	134·7	344	e 19 38	[+17]	—	—	i 21 58	PP	58·7
Zurich		134·7	334	e 19 21	[0]	—	—	e 22 10	PP	—
San Juan		134·9	73	e 19 21	[0]	i 22 50	PKS	e 21 56	PP	e 55·3
Basle		135·0	334	e 19 30	[+ 9]	—	—	e 22 1	PP	—
Neuchatel		135·7	334	e 21 41	PP	—	—	—	—	—
Besançon		135·9	334	e 22 52	SKP	—	—	—	—	68·7
Florence		135·9	327	18 29	[−54]	i 31 54	PS	—	—	—
Paris		136·1	339	e 19 21	[− 2]	29 7	{+10}	22 4	PP	62·7
Rome		136·4	324	i 19 24a	[0]	i 40 9	SS	i 22 6	PP	e 63·8
Moncalieri		136·8	331	18 6	?	39 55	SS	i 22 37	PP	e 62·7
Jersey		137·3	344	e 23 5	PP	e 39 43	SS	—	—	e 63·7
Clermont Ferrand		138·4	336	e 22 4	SKP	—	—	—	—	e 63·7

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Fort de France	139·9	78	e 19 23	[− 7]	i 22 29	PP	— —	e 23·8
Rio de Janeiro	141·1	146	e 19 29	[− 3]	e 22 30	PP	— —	i 41·3
Bagnères	141·7	336	e 15 55	P	e 26 43	[+ 1]	e 22 43 PP	e 71·2
Algiers	145·2	326	e 19 47	[+ 8]	e 27 40?	[+53]	e 41 40? SS	—
Toledo	146·1	338	e 19 42	[+ 1]	e 23 14	SKP	i 22 34 PP	—
Almeria	148·0	333	e 19 56	[+12]	—	—	— —	e 79·2
Granada	148·2	336	i 19 54k	[+10]	—	—	20 20 pPKP	e 63·9
San Fernando	149·9	336	e 19 52	[+ 5]	e 43 17	SS	— —	85·7

Additional readings :—
Brisbane iPE = +4m.28s.
Riverview iPEN = +5m.42s., iSEN = +9m.58s.
Apia i = +7m.0s.
Melbourne i = +6m.47s., +9m.13s., and +10m.40s.
Arapuni L_q = +14m.10s.
Wellington iZ = +7m.9s., P_cP = +8m.42s., i = +12m.32s., SS = +13m.37s., L_q = +14m.46s.
Christchurch iZ = +15m.13s., iN = +15m.22s.
Perth P_cP = +10m.0s., PPP = +10m.58s., P_cS = +13m.45s., PS = +15m.23s., SS = +18m.40s., SSS = +19m.28s. and +20m.8s.
Osaka PPP = +11m.36s., SS = +19m.39s., SSS = +20m.44s.
Hukuoka S = +22m.11s.
Mizusawa SN = +16m.21s.
Batavia iSN = +16m.35s.
Hong Kong S_cS = +19m.6s.
Zi-ka-wei iZ = +10m.4s. and +10m.31s., PPP = +12m.42s. and +13m.20s., iZ = +17m.20s., SS = +21m.14s., iZ = +21m.54s., SSSZ = +22m.52s., SSSSZ = +23m.32s., iZ = +25m.34s.
Phu-Lien SS = +22m.20s., SSS = +24m.40s.
Medan iE = +18m.32s. and +19m.8s.
Calcutta N. ePPP = +16m.35s., iPS = +22m.25s., eSS = +26m.52s., eSSS = +29m.54s.
Hyderabad PSE = +23m.25s., SSE = +28m.7s.
Berkeley iPEZ = +12m.41s. and +12m.47s., iSN = +23m.12s., eE = +23m.28s., iSEZ = +23m.46s., iZ = +25m.16s.
Agra P_cP = +13m.16s., iSE = +23m.21s., PSE = +24m.0s., PPS = +24m.22s., SSE = +29m.21s., iE = +42m.56s.
Victoria SS = +29m.40s., SSS = +32m.52s.
Pasadena iN = +23m.48s., iE = +24m.0s.
Seattle ePS = +24m.42s., PS = +25m.4s., PPS = +25m.14s., eSSS = +34m.2s.
Bombay ePN = +13m.3s., iE = +17m.31s., iSEN = +23m.59s.
Andijan e = +14m.15s.
Tucson iP = +13m.33s., i = +14m.23s. and +14m.52s., iPP = +17m.12s., iPPP = +19m.4s., iSKKS = +24m.13s., iS = +24m.42s. and +24m.55s., iPS = +25m.26s., i = +26m.0s. and +26m.4s., SS = +30m.32s., iPSPS = +31m.29s., i = +31m.35s., SSS = +34m.25s., PKP,PKP = +38m.38s.
Salt Lake City S = +24m.49s., PS = +26m.11s., SSS = +34m.33s.
Tashkent PS = +25m.42s., eSS = +30m.46s.
Sverdlovsk iSKKS = +25m.15s., iS = +25m.39s., iPS = +27m.22s., iPPS = +28m.17s., SS = +32m.16s., SSS = +37m.52s.
Baku i = +22m.41s., e = +29m.13s., eSSS = +39m.34s.
Florissant iPPZ = +19m.19s., iSKKSE = +26m.34s., iPSE = +28m.52s.
Chicago eS = +27m.13s., ePS = +29m.4s., eSS = +35m.2s.
Tiflis ePKPZ = +18m.27s., ePPPZ = +22m.58s.
Moscow SKKS = +26m.43s., PS = +29m.22s., eSS = +35m.28s.
Pulkovo PKP = +19m.10s., SS = +35m.58s.
Toronto e = +36m.10s.
Scoresby Sund +27m.16s., +28m.2s., +35m.4s., and +36m.34s.
Ottawa SKKS = +27m.30s., SS = +37m.10s., SSS = +42m.10s., e = +50m.40s.?
Georgetown iSKKS = +27m.40s., i = +30m.11s., iPS = +30m.21s.
Huancayo iPS = +30m.32s., iSS = +36m.55s.
USCGS Test e = +30m.8s., +36m.26s., +41m.14s., and +45m.32s.
Philadelphia eSKKKS = +27m.40s., eSSS = +41m.44s.
Ksara PPS = +31m.56s.
Seven Falls PPS = +32m.34s., SSS = +41m.58s., e = +51m.58s.
Cape Town iPPPN = +27m.44s., iE = +29m.18s., iN = +36m.31s., iPPSE = +37m.34s., iPPSN = +37m.40s., iSSE = +42m.1s., iSSSN = +44m.56s., iSSSE = +45m.6s.; reading entered as SKS is given as PP.
Fordham iPS = +30m.54s., eN = +38m.6s.
Harvard eL_qE = +59m.58s.
Weston iPKPZ = +19m.1s., eSKSPN = +30m.45s., ePSN = +31m.1s., ePPSZ = +32m.23s., ePPPSZ = +33m.21s., eSSN = +37m.43s., eSSSN = +42m.33s., eSSSSN = +46m.33s., eL_q = +52m.3s.
Istanbul PP = +24m.24s.
East Machias ePPP = +24m.9s., eSS = +37m.59s., SS = +38m.5s., eSSS = +42m.3s.

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La Paz eP?Z = +15m.52s., SKPZ = +22m.19s., PSZ = +31m.16s., PPSZ = +32m.40s., eSSN = +38m.20s.
Copenhagen e = +22m.28s., +32m.40s., and +37m.34s., eN = +38m.20s.
Helwan eE = +21m.40s. and +23m.5s., PSE = +31m.16s., SSEN = +38m.12s.
Halifax eE = +47m.40s.?
Sofia eN = +19m.20s.
Budapest iN = +22m.18s. and +41m.7s.
Kecskemet eZ = +20m.21s.
Hamburg eZ = +21m.17s. and +22m.30s., iEN = +22m.36s., eE = +46m.52s.
Prague e = +20m.22s., +22m.35s., and +38m.22s.
Heligoland eEN = +22m.36s.
Collmberg e = +22m.34s., +34m.10s., +38m.46s., +41m.12s., and +48m.16s.
Belgrade e = +19m.20s. and +21m.43s., i = +22m.35s. and +22m.55s., i = +33m.40s.
Aberdeen iEN = +22m.33s., iE = +24m.33s., iN = +32m.13s., +38m.58s., +44m.5s., and +50m.3s.
Jena eEN = +22m.40s.
Edinburgh i = +23m.51s. and +39m.21s.
De Bilt iZ = +21m.22s. and +22m.41s., iN = +22m.47s.
Triest ePKP = +19m.38s., iSKP = +22m.47s., ePPP = +24m.5s., e = +25m.46s., SS = +39m.26s.
Stuttgart ePKPZ = +19m.18s.a, ePKP$_2$Z = +20m.32s., iPP = +21m.48s., iPKS = +22m.47s., e = +23m.21s. and +23m.54s., eS? = +31m.40s., ePPS = +34m.2s., eSKKS = +35m.49s., eSS = +39m.12s., eSPSEN = +40m.34s., eEN = +41m.40s., e = +46m.40s., eEN = +50m.34s. and +54m.16s., eL$_{Lq}$ = +62m.40s.
Bidston e = +25m.12s., iSKSP = +32m.5s., iPPS = +33m.47s., iSS = +39m.52s., eSSS = +44m.37s.
Uccle ePPZ = +21m.50s., iSKPZ = +22m.49s., iN = +23m.53s.
Strasbourg iPKP = +19m.20s., iSKP = +22m.47s., i = +23m.50s.
Oxford i = +22m.53s., e = +33m.21s., eN = +33m.45s., e = +39m.48s.
Kew iPKS = +22m.55s., iPPPZ = +25m.15s., eZ = +26m.7s., eE = +30m.23s., iSKSPEN = +32m.7s., iPPS = +33m.53s., iSS = +39m.57s., eSSS = +44m.43s.
San Juan PPS = +34m.21s.
Paris SKP = +23m.0s., e = +25m.55s. and +32m.20s.
Rome iN = +19m.30s., iSKPN = +22m.58s., i = +23m.2s., iZ = +23m.36s., i = +23m.58s., iE = +25m.19s. and +29m.6s., iN = +41m.53s.
Fort de France PPP = +19m.39s., SSS = +22m.37s.
Bagnères ePKPE = +19m.10s., iE = +19m.34s., ePPE = +20m.48s., eSKPE = +22m.12s., eE = +23m.18s., eN = +23m.28s., eE = +24m.21s., +39m.25s., and +41m.13s.
Algiers eS = +29m.40s.
Toledo e = +25m.11s., eSS = +42m.8s.
Granada iN = +20m.57s., PPE = +24m.9s., PPP = +27m.56s.
San Fernando ePKPN = +19m.56s.
Long waves were also recorded at Cernauti and Tananarive.

Feb. 3d. 20h. 13m. 13s. Epicentre 24°·0S. 175°·0W.

A = −·9111, B = −·0797, C = −·4045; δ = +8; h = +4;
D = −·087, E = +·996; G = +·403, H = +·035, K = −·915.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		10·6	17	i 2 30	− 6	i 4 21	−16	—	—	5·1
Wellington		19·2	205	4 27	− 1	7 36	−23	—	—	9·5
Christchurch		22·0	204	4 58k	0	9 3	+ 7	8 37	P$_c$P	e 11·1
Brisbane	E.	29·0	258	i 6 53	PP	e 10 53	− 1	—	—	—
	N.	29·0	258	e 7 5	PPP	i 11 29	+35	—	—	—
Sydney		31·0	244	e 6 17	− 4	e 11 7	−19	—	—	e 16·1
Riverview		31·1	244	e 7 22	PP	e 11 18	−10	7 53	PPP	e 13·5
Melbourne		36·7	239	i 7 4	− 6	i 13 5	+11	i 8 47	PPP	18·7
Adelaide		41·5	244	—	—	e 15 57	?	—	—	21·3
Perth		60·7	247	—	—	i 16 47	?	—	—	32·1
Manila		73·3	295	i 11 34a	− 1	21 47	PS	—	—	—
Berkeley	N.	79·0	41	e 12 5	− 2	—	—	—	—	—
Pasadena		79·1	46	i 12 10	+ 2	—	—	—	—	e 39·8
Mount Wilson	Z.	79·2	46	i 12 9	+ 1	—	—	—	—	—
Tinemaha		80·9	43	e 12 19	+ 2	—	—	—	—	—
Zi-ka-wei	Z.	81·9	310	e 12 25	+ 2	—	—	—	—	—
Vladivostok		82·7	325	e 12 30	+ 3	i 22 52	+ 8	—	—	e 39·4
Tucson		82·9	51	i 12 30k	+ 2	i 22 57	+11	i 15 40	PP	i 37·7
Medan	E.	88·1	275	e 13 0	+ 6	—	—	—	—	—
Huancayo		93·8	105	e 13 27	+ 7	e 24 1	[+ 7]	e 30 49	SS	e 42·4

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	Z.	98·1	112	i 13 42k	+ 2	32 1	SS	i 17 39	PP	48·8
Calcutta	N.	104·6	289	—	—	e 24 56	[+ 7]	—	—	—
Ottawa		113·0	49	e 18 39	[0]	e 28 53	PS	—	—	56·8
San Juan		114·1	80	e 19 55	PP	e 25 27	[− 2]	e 28 54	PS	60·4
Agra	E.	114·9	291	—	—	i 25 30	[− 2]	—	—	—
Andijan		122·0	304	e 19 1	[+ 4]	—	—	—	—	—
Tchimkent		124·2	306	e 19 2	[+ 1]	—	—	—	—	—
Tashkent		124·4	305	i 19 3	[+ 2]	30 56	PS	e 20 47	PP	e 64·5
Sverdlovsk		128·4	325	i 19 12	[+ 3]	26 19	[+ 3]	i 21 14	PP	53·8
Baku		139·1	306	e 19 36	[+ 7]	23 12	PKS	35 14	PPS	58·8
Pulkovo		140·1	341	e 19 32	[+ 1]	—	—	e 22 53	PP	72·3
Moscow		140·3	332	e 19 35	[+ 4]	—	—	e 22 15	PP	e 67·3
Grozny		141·5	310	e 19 37	[+ 4]	e 42 19	SSP	—	—	—
Tiflis		142·5	308	i 19 41	[+ 6]	22 47	PKS	e 33 39	PS	e 76·8
Copenhagen		147·9	353	i 19 48	[+ 4]	—	—	—	—	76·8
Hamburg		150·3	355	e 19 49	[+ 1]	—	—	—	—	e 90·8
Ksara		151·3	297	i 19 52k	[+ 3]	37 7	PPS	i 23 39	PP	78·8
De Bilt		152·0	359	e 19 50	[0]	—	—	—	—	e 85·8
Collmberg		152·1	348	i 19 53	[+ 3]	—	—	—	—	—
Jena		152·7	349	e 19 47	[− 4]	—	—	—	—	—
Uccle		153·3	2	e 19 55	[+ 3]	e 34 11	PS	e 23 47	PP	e 80·8
Stuttgart		155·1	352	e 19 55	[0]	e 30 32	{−14}	e 23 57	PP	e 85·8
Paris		155·2	4	e 19 57	[+ 2]	—	—	23 54	PP	79·8
Strasbourg		155·4	354	e 19 55	[0]	e 37 9	PPS	e 23 51	PP	e 82·8
Helwan		155·8	290	i 19 57	[+ 2]	—	—	i 23 56	PP	—
Neuchatel		157·0	355	e 20 0	[+ 3]	—	—	—	—	—
Triest		157·3	345	e 20 31	[+33]	—	—	—	—	e 68·6
Clermont Ferrand		158·2	3	e 19 58	[− 1]	—	—	—	—	e 89·8
Rome		161·1	342	19 39	[−23]	31 26	{+ 8}	24 26	PP	e 85·6
Toledo		162·4	23	'i 20 5k	[+ 2]	—	—	e 24 37	PP	—

Additional readings :—
Wellington i = +7m.52s.
Christchurch L_g = +9m.15s., P_cPZ? = +12m.48s., iS_cSE = +16m.17s.
Melbourne i = +15m.41s.
Perth i = +20m.12s.
Berkeley iZ = +12m.9s.
Tucson iP = +12m.39s., i = +13m.6s., +13m.24s., +13m.37s., and +13m.45s., iPPS = +23m.58s., PSPS = +29m.6s.
Huancayo eS = +24m.44s.
San Juan eS = +28m.3s., ePPS = +30m.21s.
Tashkent eSS = +38m.59s.
Sverdlovsk PS = +31m.32s.
Tiflis ePKSEN = +22m.51s.
Copenhagen i = +20m.33s.
Ksara PSKS = +34m.1s.
Collmberg i = +19m.58s., iZ = +20m.25s.
Jena eZ = +19m.59s., eN = +20m.3s. and +20m.55s.
Uccle eSSSN = +49m.29s.
Stuttgart ePKP$_2$Z = +20m.52s., e = +33m.5s.
Strasbourg ePKP$_2$Z = +20m.23s.
Helwan iZ = +20m.8s., iEZ = +20m.24s.
Rome PKP$_2$ = +20m.47s., SKP = +23m.26s., SKS = +25m.45s., PPP = +28m.16s., PSKS = +34m.57s., e = +38m.37s., SS = +44m.6s.
Toledo i = +20m.53s.
Long waves were also recorded at East Machias, Weston, Chicago, Philadelphia, San Fernando, Florence, Bidston, Stonyhurst, Kew, Harvard, Edinburgh, La Plata, Fordham, Ukiah, and College.

Feb. 3d. Readings also at 0h. (Uccle and Tucson), 4h. (Monowai and Andijan), 5h. (Mount Wilson (2), Pasadena, and Tinemaha), 6h. (Mount Wilson and Pasadena), 7h. (Mount Wilson), 8h. (Medan), 9h. (Andijan, Samarkand, and Tchimkent), 15h. (Tucson, Perth, Melbourne, Riverview, and Brisbane), 16h. (Andijan), 17h. (Ottawa) 18h. (Medan), 23h. (Rio de Janeiro).

Feb. 4d. 5h. 19m. 24s. Epicentre 9°·2S. 159°·5E. (as on 1939 Feb. 3d.).

$A = -\cdot 9248$, $B = +\cdot 3458$, $C = -\cdot 1589$; $\delta = +8$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	19·2	198	i 4 18	−10	i 7 48	−11	—	—	—
Riverview		25·7	196	e 5 38	+ 5	e 9 54	− 7	10 22	SS	e 11·6
Sydney		25·7	196	e 3 42	?	—	—	e 7 36	?	—
Melbourne		31·4	203	e 8 28	?	i 11 29	− 3	i 13 18	SS	14·4
Adelaide		32·0	214	i 3 20	?	e 11 32	−10	—	—	14·7
Wellington		34·7	160	e 6 46	− 8	12 32	+ 8	8 8	PP	16·1
Christchurch		36·1	164	e 6 47	−18	12 45	0	15 29	L_q	17·6
Manila		44·9	302	e 8 18	0	15 12	+16	—	—	—
Perth		46·3	235	i 6 51	?	i 15 11	− 5	i 18 41	SS	i 22·9
Zi-ka-wei		54·3	320	e 9 30	0	i 21 50	SS	—	—	28·1
Vladivostok		57·8	337	i 13 0	PPP	—	—	—	—	19·2
Medan	E.	61·9	280	e 11 26	+62	—	—	—	—	—
Calcutta	N.	76·5	297	e 17 4	PPP	i 21 28	−11	—	—	—
Hyderabad	E.	84·3	289	—	—	22 59	− 1	—	—	—
Agra	E.	86·7	298	12 43	− 4	i 23 7	[− 5]	i 24 17	PS	—
Santa Barbara	Z.	87·6	55	e 12 50	− 1	—	—	—	—	—
Pasadena		88·8	56	e 12 55	− 2	e 23 48	+ 4	e 25 7	PS	e 40·3
Mount Wilson	Z.	88·9	56	i 12 55	− 3	—	—	—	—	—
Riverside	E.	89·4	56	e 12 59	− 1	—	—	—	—	—
Tinemaha		89·4	53	e 12 57	− 3	—	—	—	—	—
Bombay		89·8	291	e 13 1	− 1	i 23 44	− 9	—	—	—
Andijan		93·8	310	e 13 29	+ 9	e 23 46	[− 8]	—	—	—
Tucson		94·6	58	i 13 21k	− 3	23 58	[− 1]	16 53	PP	i 43·2
Tashkent		96·2	311	e 14 1	+30	24 2	[− 6]	17 12	PP	e 38·6
Sverdlovsk		102·5	326	e 18 0	PKP	24 41	[+ 2]	e 27 25	PS	42·6
Baku		110·8	310	e 20 7	PP	e 25 15	[0]	e 28· 51	PS	54·8
Grozny		113·5	314	e 19 33	PP	—	—	—	—	—
Tiflis		114·4	312	e 19 5	[+23]	e 29 24	PS	—	—	e 58·6
Ottawa		120·6	42	e 18 48	[− 6]	e 29 36?	PS	—	—	52·6
Huancayo		121·6	110	e 20 36	PP	e 26 13	[+18]	e 30 39	PS	e 51·0
Ksara		122·9	304	e 18 48	[−10]	32 14	PPS	e 20 42	PP	—
La Paz	Z.	126·4	118	e 19 11	[+ 6]	—	—	—	—	59·6
Triest		133·2	328	e 22 49	?	—	—	—	—	—
Uccle		133·7	340	—	—	e 39 42	SS	—	—	e 58·6
Strasbourg		134·1	335	e 19 25	[+ 5]	e 34 12	PPS	e 39 48	SS	e 54·6
Zurich		134·7	334	e 22 43	PKS	—	—	—	—	—
San Juan		134·9	73	e 22 35	PKS	—	—	e 24 54	PPP	e 58·3
Basle		135·0	334	e 22 49	PKS	—	—	—	—	—
Paris		136·1	339	e 22 51	PKS	—	—	—	—	72·6
Toledo		146·1	338	e 19 40	[− 1]	—	—	—	—	75·6

Additional readings :—
Riverview iSEN = +10m.2s.
Melbourne i = +11m.47s.
Adelaide i = +7m.51s.
Wellington P_cP = +9m.23s., L_q = +14m.41s.
Perth i = +7m.39s., +13m.51s., and +21m.36s.
Pasadena eEN = +13m.1s.
Mount Wilson i = +13m.3s.
Tinemaha iZ = +13m.4s.
Tucson iP = +13m.27s., iPP = +17m.6s., iPPP = +19m.24s., iPPS = +26m.9s., iSS = +31m.28s., iSSS = +35m.20s.
Tashkent eS = +24m.48s., eSS = +30m.54s., eSSS = +35m.0s.
Sverdlovsk S = +25m.52s.
Baku e = +33m.29s., +35m.55s., and +39m.37s.
Huancayo eSS = +37m.10s.
Triest e = +45m.48s.
San Juan ePKS = +22m.58s., ePPPS = +35m.28s.
Toledo i = +19m.45s.
Long waves were also recorded at Honolulu, Moscow, Pulkovo, and other American and European stations.

Feb. 4d. 6h. 7m. 26s. Epicentre 9°·2S. 159°·5E. (as at 5h.).

A = −·9248, B = +·3458, C = −·1589; δ = +8; h = +7.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	19·2	198	i 4 22	− 6	i 7 58	− 1	—	—	—
Riverview		25·7	196	e 5 33	0	e 9 55	− 6	—	—	e 12·6
Sydney		25·7	196	e 7 34	?	—	—	—	—	—
Adelaide		32·0	214	—	—	i 11 33	− 9	e 12 54	SS	15·8
Wellington		34·7	160	—	—	12 14	−10	—	—	e 16·6
Perth		46·3	235	—	—	i 18 34	SS	—	—	i 25·5
Colombo	E.	80·9	278	15 55	PP	19 49	?	—	—	21·2
Pasadena		88·8	56	e 12 58	+ 1	—	—	—	—	—
Mount Wilson		88·9	56	i 12 57k	− 1	—	—	—	—	—
Tinemaha		89·4	53	i 13 0	0	—	—	—	—	—
Bombay		89·8	291	—	—	e 23 54	+ 1	e 23 31	SKS	—
Tucson		94·6	58	13 24a	0	—	—	—	—	—
Rome		136·4	324	23 56	?	26 16?	[−17]	40 6?	PPS	—

Additional readings:—
Riverview SN = +10m.2s.
Perth i = +22m.29s. and +23m.29s.
Rome SKKS = +34m.56s.
Long waves were also recorded at Melbourne.

Feb. 4d. 11h. 34m. 5s. Epicentre 7°·2N. 126°·3E. (as on 1938 March 10d.).

A = −·5874, B = +·7997, C = +·1245; δ = +6; h = +7;
D = +·806, E = +·592; G = −·074, H = +·100, K = −992.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		9·0	325	2 31	PPP	4 25	S*	—	—	—
Hong Kong		19·0	324	4 35	+ 9	8 15	+20	8 42	SSS	—
Phu-Lien		23·3	308	e 5 15	+ 5	—	—	—	—	—
Batavia		23·6	236	5 5	− 8	9 17	− 8	i 5 29	PP	—
Zi-ka-wei	Z.	24·3	350	e 5 25	+ 5	9 55	+18	—	—	—
Medan		27·6	264	5 54	+ 3	i 10 8	−24	i 11 15	SS	—
Calcutta	N.	39·6	297	e 7 42	+ 7	e 13 12	−26	—	—	—
Riverview	N.	47·1	151	e 12 58	?	—	—	—	—	—
Melbourne		48·3	160	—	—	i 15 36	− 9	e 18 39	SS	—
Agra	E.	49·8	300	9 55	+59	17 5	+59	—	—	—
Bombay	E.	53·2	288	e 9 18	− 4	e 16 48	− 4	e 13 1	PP	—
Frunse		57·6	318	e 9 31	−23	—	—	—	—	—
Tchimkent		60·6	315	e 10 13	− 2	—	—	—	—	—
Tashkent		60·7	313	i 10 14	− 1	e 18 31	− 1	—	—	e 29·9
Samarkand		62·0	311	e 9 55	−29	—	—	—	—	—
Sverdlovsk		70·8	328	i 11 19	− 1	i 20 36	+ 1	—	—	31·9
Baku		75·0	310	—	—	i 21 27	+ 4	—	—	e 41·9
Grozny		78·2	313	e 12 3	0	e 22 26	PS	—	—	—
Tiflis		78·9	311	i 12 4	− 3	e 21 57	− 8	—	—	e 41·9
Moscow		83·4	326	e 12 27	− 3	e 23 9	+18	e 16 42	PP	—
Ksara		86·4	303	i 12 44a	− 1	e 23 31	+10	24 29	PS	—
Pulkovo		86·8	330	e 12 45	− 2	e 23 25	0	—	—	—
Collmberg		98·4	324	e 13 38	− 3	—	—	—	—	—
Rome		102·7	316	—	—	e 24 27	[−13]	—	—	51·3
La Paz	Z.	163·1	125	e 20 15	[+11]	—	—	—	—	60·9

Additional readings:—
Baku e = +27m.9s., i = +30m.58s.
Tiflis eSE = +22m.1s.
Collmberg e = +13m,59s,

Feb. 4d. Readings also at 0h. (La Paz), 1h. (La Plata), 2h. (Samarkand, Frunse, Tashkent, and Andijan), 3h. (Colombo), 4h. (Andijan), 5h. (Kobe, Koti, Yokohama), 7h. (Andijan), 8h. (Agra, Calcutta, Bombay, Baku, Perth, Medan, Hyderabad, Tashkent, Tiflis, Ksara, and Sverdlovsk), 9h. (near Fresno, Lick, Berkeley, Branner, and Rio de Janeiro), 10h. (Malabar), 12h. (near Moncalieri and Tucson), 13h. (Sverdlovsk, Huancayo, Mount Wilson, Tucson, Ksara, and La Paz), 14h. (Baku and Tiflis), 15h. (Andijan and Ksara), 19h. (Tacubaya).

Feb. 5d. 22h. 0m. 19s. Epicentre 45°·2N. 14°·5E.

Intensity VI in the Isle of Krk, V at Fiume, III at Triest, in Venetie Julienne, and in Dalmatia.

Epicentre the Isle of Krk 45° 15′N. 14° 33′E.

J. Mihailovic.

Annuaire Microséismique et Macroséismique, 1939, Beograd, 1940, pp. 76-86.

$A = +\cdot6845$, $B = +\cdot1770$, $C = +\cdot7072$; $\delta = 0$; $h = -4$;
$D = +\cdot250$, $E = -\cdot968$; $G = +\cdot685$, $H = +\cdot177$, $K = -\cdot707$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		0·7	311	e 0 11	− 6	i 0 24	− 4	i 0 17	P	—
Laibach		0·8	1	i 0 16	− 2	i 0 23	S_g	i 0 28	S*	—
Florence		2·7	239	0 44	− 1	1 17	− 2	—	—	—
Rome		3·6	202	1 2	+ 4	1 49	+ 7	i 2 7	S_g	—
Chur		3·8	297	e 1 1	0	e 1 48	+ 1	—	—	—
Budapest		3·9	53	e 1 20	P_g	i 1 47	− 3	—	—	e 2·2
Kecskemet		4·0	63	e 1 24	P_g	e 1 50	− 2	—	—	e 4·7
Belgrade		4·2	92	1 15	P*	i 2 13	S*	i 2 23	S_g	—
Zurich		4·7	300	e 1 11	− 3	e 2 28	S*	e 1 27	P*	—
Moncalieri		4·8	270	1 17	+ 2	2 35	S_g	—	—	—
Cheb		5·1	345	—	—	e 2 13	− 7	e 2 46	S_g	—
Basle		5·3	299	e 1 19	− 3	e 2 31	+ 6	e 2 56	S_g	—
Neuchatel		5·5	292	e 1 22	− 3	e 3 4	S_g	—	—	—
Strasbourg		5·7	309	e 1 41	P*	i 2 36	+ 1	i 3 5	S_g	—
Jena		6·1	341	e 1 29	− 5	—	—	e 1 55	P_g	e 2·6
Besançon		6·2	292	—	—	e 2 59	+11	—	—	—
Collmberg		6·2	348	i 1 31k	− 4	i 2 46	− 2	i 2 3	P_g	i 3·4
Sofia		6·8	108	e 2 12	P_g	e 2 59	− 4	—	—	—
Göttingen		7·0	335	e 1 43	− 3	—	—	—	—	—
Clermont Farrand		8·0	278	—	—	e 3 36	+ 3	—	—	—
Paris		9·0	298	—	—	e 4 38	S*	—	—	—
De Bilt	z.	9·2	322	—	—	i 5 15	S_g	—	—	—

Additional readings :—
Budapest ePN = +1m.30s.
Kecskemet e = +2m.37s.
Belgrade iP* = +1m.19s., e = +1m.24s.
Cheb e = +2m.22s.
Strasbourg i = +2m.26s., i = +2m.41s.
Collmberg i = +1m.34s., e = +1m.48s., i = +1m.57s., +2m.26s., +2m.35s., +3m.1s., +3m.13s., e = +3m.20s.
Sofia eN = +2m.27s., eEN = +3m.42s., eE = +4m.11s.
Long waves were also recorded at Hamburg, Uccle, and Ksara.

Feb. 5d. Readings also at 7h. (Frunse, Mount Wilson, Lick (2), Pasadena, Samarkand, Tiflis, and Andijan), 11h. (Medan and near Moncalieri), 14h. (near Christchurch, Wellington, and Monowai), 16h. (Tucson), 17h. (Moncalieri), 18h. (Mizusawa, Andijan, and Samarkand), 20h. (Andijan), 22h. (Triest (6)), 23h. (Triest (2) and Tiflis).

Feb. 6d. 7h. 23m. 17s. Epicentre 45°·2N. 14°·5E. (as on Feb. 5d.).

Intensity VI in the Isle of Krk, V at Susak, IV at Fiume and Loubliana, III at Triest and Zagreb. Epicentre Isle of Krk 45°13′N. 14°33′E.

J. Mihailovic.

Annuaire microséismique et macroséismique, 1939, Beograd, 1940, p. 79-80.

$A = +\cdot6845$, $B = +\cdot1770$, $C = +\cdot7072$; $\delta = 0$; $h = -4$.

		△	Az.	P.	O+C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		0·7	311	0 14	− 3	i 0 25	− 3	—	—	—
Laibach		0·8	1	i 0 18	0	i 0 33	+ 2	i 0 27	S_g	—
Florence		2·7	239	0 43	− 2	1 16	− 3	—	—	—
Rome		3·6	202	e 1 5	P*	i 1 39	− 3	1 9	P_g	—
Chur		3·8	297	i 1 3	+ 2	i 1 50	+ 3	—	—	—
Budapest		3·9	53	1 17	P_g	i 2 3	S*	i 2 7	S_g	2·2
Kecskemet	Z.	4·0	63	e 1 20	P_g	1 53	+ 1	e 2 11	S_g	—
Belgrade		4·2	92	e 1 14a	P*	i 1 50	− 7	1 30	P_g	—
Ravensburg		4·2	309	e 1 19	P*	e 2 0	+ 3	e 1 26	P_g	—
Zurich		4·7	300	i 1 13k	− 1	e 2 30	S_g	e 1 30	P_g	—
Ebingen		4·8	310	e 1 33	P_g	e 2 28	S*	e 2 41	S_g	—
Moncalieri		4·8	270	i 1 19	+ 4	1 56	−16	—	—	—
Cheb		5·1	345	e 1 51	P_g	e 2 17	− 3	e 2 50	S_g	—
Basle		5·3	299	e 1 22	0	e 2 59	S_g	—	—	—
Neuchatel		5·5	292	e 2 26	+61	e 3 7	S_g	2 50	S*	—
Strasbourg	E.	5·7	309	e 1 40	P*	2 37	+ 2	2 54	S*	—
Jena	E.	6·1	341	e 1 31	− 3	e 2 11	−34	—	—	e 2·8
	N.	6·1	341	e 1 24	−10	e 2 39	− 6	—	—	e 2·8
Besançon		6·2	292	e 1 13	−22	i 3 33	S_g	—	—	—
Collmberg		6·2	348	i 1 35	0	i 2 43	− 5	i 2 4	P_g	i 3·4
Sofia		6·8	108	e 1 43	− 1	i 4 16	?	—	—	—
Göttingen		7·0	335	e 1 46	0	—	—	—	—	—
Clermont Ferrand		8·0	278	e 1 56	− 4	i 4 16	S_g	—	—	—
Bucharest		8·3	93	—	—	e 4 43?	S_g	—	—	5·7
Cernauti		8·5	64	—	—	e 2 43?	−62	—	—	e 5·0
Uccle		8·8	313	—	—	e 4 37	S*	—	—	—
Paris		9·0	298	—	—	e 4 31	S*	—	—	5·7
De Bilt		9·2	322	—	—	e 5 2	S_g	—	—	i 8·1
Heligoland	N.	10·0	337	—	—	e 4 49	S*	—	—	—
Copenhagen		10·6	353	i 2 35	− 1	—	—	—	—	—
Bidston		14·1	312	—	—	i 6 2	0	i 6 23	SS	i 7·1
Ksara		20·0	118	e 4 45	+ 8	8 21	+ 4	—	—	—

Additional readings :—
Triest $iP_g = +21s.$
Rome $iN = +1m.28s.$, $iS_gN = +1m.51s.$, $i = +2m.9s.$
Kecskemet $eP_g = +1m.36s.$, $eS_g = +2m.44s.$
Belgrade $i = +1m.17s.$, $+1m.45s.$, and $+2m.17s.$, $iS = +2m.28s.$
Ravensburg $eS_g = +2m.21s.$, $e = +2m.24s.$
Strasbourg $+3m.6s.$
Collmberg $i = +1m.55s.$, $iZ = +2m.12s.$, $+2m.29s.$, $+2m.32s.$, $+2m.37s.$, and $+3m.0s.$, $e = +3m.11s.$
Sofia $eN = +3m.55s.$
Paris $i = +5m.19s.$
De Bilt $iSN = +5m.22s.$, $iSZ = +5m.15s.$
Bidston $i = +6m.35s.$ and $+6m.53s.$
Long waves were also recorded at Hamburg, Edinburgh, Jersey, Kew, Sverdlovsk, and Tashkent.

Feb. 6d. 10h. 39m. 19s. Epicentre 45°·2N. 14°·5E. (as at 7h.).

$A = +\cdot6845$, $B = +\cdot1770$, $C = +\cdot7072$; $\delta = 0$; $h = -4$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	0·7	311	e 0 20	+ 3	0 31	+ 3	—	—	—
Laibach	0·8	1	i 0 35	S	(0 35)	+ 4	—	—	—
Florence	2·7	239	0 43	− 2	1 23	+ 4	—	—	—
Zurich	4·7	300	e 1 30	P_g	—	—	—	—	—
Moncalieri	4·8	270	e 1 1	−14	i 1 55	−17	—	—	—
Stuttgart	5·1	317	—	—	e 2 11	− 9	e 2 39	S*	—
Basle	5·3	299	e 1 32	P*	—	—	—	—	—
Neuchatel	5·5	292	e 1 29	+ 4	—	—	—	—	—
Jena	6·1	341	—	—	e 2 41	− 4	—	—	—
Collmberg	6·2	348	e 1 39	+ 4	e 2 47	− 1	i 3 21	S_g	i 3·7
Paris	9·0	298	—	—	e 4 53	S_g	—	—	—
Kew	11·7	308	e 2 41?	−10	—	—	—	—	e 8·7
Bidston	14·1	312	e 2 41?	−42	—	—	—	—	e 7·7
Toledo	14·6	255	e 4 26	+56	—	—	—	—	e 9·2
Edinburgh	15·5	321	—	—	e 6 41?	+ 6	—	—	—
Sverdlovsk	30·7	50	9 17	?	—	—	—	—	25·7

Additional readings :—
Triest $iP_g = +25$s.
Laibach $i = +44$s.
Stuttgart $eS_g = +2$m.54s.
Collmberg $e = +2$m.51s., $i = +2$m.59s., +3m.26s., and +3m.36s.
Long waves were also recorded at Strasbourg, Clermont Ferrand, Uccle, De Bilt, Stonyhurst, Ksara, Tiflis, Baku, and Tashkent.

Feb. 6d. 21h. 10m. 8s. Epicentre 36°·3N. 71°·0E. (as on 1938 April 6d.).

Intensity VI at Drosh, IV at Cherat. Epicentre 35°·5N. 71°·0E.

S. K. Banerji.

Seismological Bulletin Meteorological Department of the Government of India, Jan.-March, 1939, p. 22.

$A = +\cdot2630$, $B = +\cdot7638$, $C = +\cdot5894$; $\delta = -5$; $h = 0$;
$D = +\cdot946$, $E = -\cdot326$; $G = +\cdot192$, $H = +\cdot557$, $K = -\cdot808$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		4·6	14	1 13	+ 1	i 2 3	− 4	1 45	S_g	—
Samarkand		4·6	319	i 1 13	+ 1	2 3	− 4	i 1 39	S_g	—
Tashkent		5·2	347	i 1 21	0	i 2 14	− 8	—	—	2·3
Tchimkent		6·1	351	1 34	0	2 16	?	i 2 7	P_g	—
Frunse		7·1	22	e 1 59	P*	e 3 3	− 7	e 2 34	P_g	—
Almata		8·3	32	e 2 12	+ 8	i 4 0	S*	4 24	S_g	—
Agra	E.	10·9	145	2 37	− 3	4 28	−16	—	—	—
Baku		17·0	290	e 3 57	− 4	e 7 1	− 9	—	—	—
Bombay		17·4	174	e 4 2	− 4	e 7 16	− 3	—	—	—
Calcutta	N.	20·4	127	e 4 38	− 3	i 8 16	− 9	e 4 52	PP	—
Grozny		20·6	299	e 4 33	−10	e 8 12	−17	—	—	—
Tiflis		21·0	295	e 4 2	−45	—	—	5 14	PP	—
Sverdlovsk		21·7	345	4 42	−13	8 32	−19	—	—	—
Platigorsk		22·6	300	e 4 22	−41	—	—	—	—	8·6
Collmberg		43·3	310	i 7 48	−17	—	—	e 9 40	PP	—

Additional readings :—
Andijan $P_g = +1$m.21s.
Samarkand $i = +1$m.31s., $S^* = +1$m.52s., $i = +1$m.55s. and +2m.1s.
Tchimkent $P_g = +1$m.46s., $i = +1$m.50s., $S^* = +2$m.21s., $S_g = +2$m.36s.
Frunse $i = +2$m.53s., +2m.56s., and +2m.59s.
Almata $e = +2$m.54s. and +3m.29s.
Tiflis $eN = +6$m.46s.
Collmberg $e = +8$m.53s., +10m.22s., and +10m.36s.

Feb. 6d. Readings also at 0h. (Florence, Zurich, San Francisco, Branner, Berkeley, Lick, Collmberg, Strasbourg, Triest (3), and Laibach), 1h. (Collmberg, Strasbourg, Triest (2), Laibach, and Tucson), 2h. (Triest (2)), 3h. (Ksara), 4h. (Lick), 5h. (Ottawa and Sotchi), 6h. (Tucson and Tiflis), 7h. (Malabar and Triest), 8h. (Triest (2)), 9h. (Tucson, Pasadena, Riverside, Mount Wilson, and Tinemaha), 10h. (Pasadena, Mount Wilson, Riverside, Tucson, Tinemaha, Triest (3), near San Salvador, Weston. Collmberg, Uccle ,and Stuttgart), 11h. (Triest), 12h. (Tiflis and Triest), 13h. (Triest), 14h. (Triest), 17h. (Tiflis, Ksara, near Mizusawa, Baku, Sverdlovsk, Tashkent, and near Wellington), 20h. (Salt Lake City), 22h. (Columbia and Tucson).

Feb. 7d. 4h. 9m. 24s. Epicentre 29°·0N. 142°·0E.

$A = -\cdot6903$, $B = +\cdot5393$, $C = +\cdot4823$; $\delta = -3$; $h = +2$;
$D = +\cdot616$, $E = +\cdot788$; $G = -\cdot380$, $H = +\cdot297$, $K = -\cdot876$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		16·3	333	3 14	−38	e 6 58	+ 5	—	—	7·4
Zi-ka-wei	z.	17·9	282	4 14	+ 2	7 34	+ 4	—	—	10·0
Manila		24·2	238	e 5 19	0	10 10	+35	—	—	13·4
Hong Kong		25·9	262	5 49	+14	10 29	+25	6 30	PPP	13·8
Calcutta	N.	48·4	276	e 8 39	− 7	—	—	—	—	—
Agra	E.	55·9	285	e 9 38	− 4	—	—	—	—	—
Andijan		57·0	302	e 10 2	+12	—	—	—	—	—
Tashkent		59·1	303	—	—	e 24 30	SS	—	—	e 28·1
Sverdlovsk		61·6	323	10 16	− 6	18 31	−12	—	—	29·6
Bombay		63·3	278	e 10 36	+ 3	e 19 4	0	—	—	—
Baku		73·3	308	e 11 32	− 3	e 21 4	0	—	—	36·6
Moscow		74·1	326	e 11 48	+ 8	e 21 10	− 2	—	—	36·1
Grozny		74·9	312	e 11 42	− 2	—	—	—	—	e 42·6
Pulkovo		75·4	331	e 11 45	− 2	e 21 17	−10	—	—	36·1
Tinemaha	z.	80·1	54	e 12 12	− 1	—	—	—	—	—
Pasadena		81·6	56	e 12 23	+ 2	—	—	—	—	e 38·6
Mount Wilson	z.	81·7	56	e 12 20	− 2	—	—	e 15 59	PP	—
Riverside	z.	82·3	56	i 12 23	− 2	—	—	i 16 1	PP	—
Ksara		86·3	306	e 12 46	+ 1	e 23 21	+ 1	e 24 14	PS	—
Tucson		87·9	54	e 12 53	0	—	—	16 23	PP	i 42·9
Collmberg		88·3	331	e 12 51	− 4	—	—	e 16 24	PP	—
La Paz	z.	149·6	72	e 20 8	[+21]	—	—	—	—	—

Additional readings:—
Vladivostok e = +6m.4s.
Hong Kong SS = +11m.43s.
Mount Wilson iZ = +12m.26s.
Tucson iP = +12m.57s., +13m.15s., and +13m.26s.
Collmberg i = +13m.1s.
Long waves were also recorded at Phu-Lien, Tiflis, and European stations.

Feb. 7d. Readings also at 0h. (Agra and Triest), 1h. (Grozny, Tiflis, Basle, Chur, Laibach, Moncalieri, Jena, Stuttgart, Göttingen, Rome, Collmberg, near Florence, and Triest), 3h. (Collmberg and Triest (2)), 4h. (Rome and Tucson), 5h. (Mount Wilson, Pasadena, Tucson (2), and Sverdlovsk), 6h. (Baku and Andijan, Neuchatel, and Tucson), 7h. (Collmberg, Baku, Andijan, Sverdlovsk, Zurich, Calcutta, Bombay, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson (2), La Paz, Brisbane, Melbourne, Riverview, Perth, and Wellington), 8h. (La Paz), 9h. (Tucson), 10h. (near Mizusawa), 11h. (Triest), 13h. (Balboa Heights and Triest), 14h. (near Mizusawa), 15h. (Copenhagen, Zurich, near Basle, and Moncalieri), 16h. (Calcutta, Agra, Kodaikanal, and Tashkent), 17h. (Sverdlovsk), 18h. (Tiflis and near Mizusawa), 19h. (near Wellington), 22h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Tucson), 23h. (Collmberg, Tucson (2), New Plymouth (2), near Hastings, and Wellington (2)).

Feb. 8d. 6h. 39m. 21s. Epicentre 48°·5N. 130°·0W.

$A = -\cdot4275$, $B = -\cdot5095$, $C = +\cdot7467$; $\delta = -9$; $h = -5$;
$D = -\cdot766$, $E = +\cdot643$; $G = -\cdot480$, $H = -\cdot572$, $K = -\cdot665$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sitka		9·1	341	e 2 20	+ 6	e 4 0	0	i 4 10	SS	i 5·1
Berkeley		12·0	150	i 4 27	?	i 5 9	− 2	i 5 27	SS	—
Lick		12·7	148	e 2 50	−15	—	—	—	—	—
Fresno	N.	13·9	144	e 3 25	+ 4	—	—	—	—	—
Tinemaha		14·2	139	e 3 26	+ 2	—	—	—	—	—
Haiwee		15·2	139	e 3 42	+ 4	—	—	—	—	—
Santa Barbara		16·0	147	e 3 42	− 6	—	—	—	—	—
Mount Wilson		16·8	143	e 3 59	+ 1	—	—	—	—	—
Pasadena		16·8	143	e 4 1	+ 3	i 7 5	0	—	—	—
Riverside		17·3	143	e 4 2	− 2	—	—	—	—	—
College		19·0	337	e 4 31	+ 5	e 8 10	+15	e 4 48	PP	e 9·3
Tucson		21·7	130	i 4 51k	− 4	8 56	+ 5	i 5 11	PP	10·4
Florissant		30·0	94	—	—	e 11 3	− 7	—	—	—
Chicago		30·3	87	e 6 15	0	e 11 10	− 5	—	—	e 15·2
Ottawa		36·5	73	e 7 1	− 8	(12 39?)	−12	—	—	12·6
Fordham		39·8	78	e 7 27	− 9	—	—	—	—	i 21·4
Vladivostok		63·9	307	—	—	e 26 30	SSS	—	—	31·7
Sverdlovsk		74·7	354	e 11 44	+ 1	21 23	+ 4	—	—	35·6
Collmberg		75·7	23	e 11 49	0	—	—	—	—	—
Stuttgart		76·9	26	—	—	e 32 45	?	e 39 39	L_g	—
Ksara		97·1	12	—	—	e 26 57	PS	—	—	—

Additional readings :—
Lick eE = +3m.7s.
Tucson iPPP = +5m.33s., iP_cP = +7m.51s., iS = +9m.3s.
Florissant eEN = +16m.24s., eE = +17m.50s.
Long waves were recorded at Honolulu, Fort de France, Kew, De Bilt, and Russian and American stations.

Feb. 8d. 10h. 26m. 29s. Epicentre 12°·4S. 65°·3E. (as on 1937 March 26d.).

$A = +\cdot4083$, $B = +\cdot8876$, $C = -\cdot2135$; $\delta = +12$; $h = +6$;
$D = +\cdot909$, $E = -\cdot418$; $G = -\cdot089$, $H = -\cdot194$, $K = -\cdot977$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	24·0	37	5 9	− 8	11 8	?	—	—	16·4
Kodaikanal	E.	25·5	27	e 5 28	− 4	i 9 55	− 2	—	—	i 12·5
Bombay		32·0	13	e 6 29	− 1	e 11 33	− 9	e 7 27	PP	—
Hyderabad		32·4	23	e 6 31	− 3	11 36	−12	—	—	14·6
Medan		36·8	65	e 7 9	− 2	12 49	− 7	—	—	e 17·5
Agra	E.	41·2	18	e 7 52	+ 4	i 13 57	− 5	—	—	—
Batavia	E.	41·4	85	e 7 39	−11	—	—	—	—	—
Calcutta	N.	41·4	33	e 7 52	+ 2	i 13 48	−17	—	—	—
Andijan		53·3	6	e 9 26	+ 3	e 17 42	PPS	—	—	—
Tashkent		53·6	4	i 9 24	− 1	i 17 19	PS	—	—	e 26·1
Ksara		53·8	329	i 9 32a	+ 6	e 16 42	−19	10 38	pP	—
Sverdlovsk		69·1	358	11 7	− 3	20 9	− 6	—	—	31·5
Moscow		71·8	344	e 11 23	− 3	—	—	—	—	—
Chur		77·2	325	e 11 59	+ 2	—	—	—	—	—
Collmberg		77·9	330	e 12 7	+ 6	—	—	—	—	—
Tucson		160·0	351	i 20 44	[+43]	—	—	i 24 36	PP	—

Additional readings :—
Bombay e = +11m.27s.
Ksara sP = +11m.12s.
Collmberg i = +12m.13s. and +12m.22s., e = +12m.45s.
Tucson iPKP = +21m.6s.
Long waves were also recorded at Cape Town, Tiflis, Huancayo, and La Paz.

Feb. 8d. 20h. 45m. 29s. Epicentre 31°·5N. 40°·8W.

$A = +\cdot6466$, $B = -\cdot5582$, $C = +\cdot5199$; $\delta = -3$; $h = +1$;
$D = -\cdot653$, $E = -\cdot757$; $G = +\cdot394$, $H = -\cdot340$, $K = -\cdot854$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		20·4	278	e 4 38	− 3	8 32	+ 7	e 5 38	PPP	—
Fort de France		25·0	231	e 5 34	+ 7	e 10 10	+21	—	—	e 10·9
San Juan		26·3	246	e 5 40	+ 1	e 10 38	+27	e 5 53	PP	e 11·3
Weston	z.	26·6	304	e 5 41	− 1	—	—	—	—	—
Ottawa		30·4	308	e 6 11	− 5	—	—	—	—	14·5
Toledo		30·8	65	e 6 19	− 1	—	—	—	—	—
Clermont Ferrand		36·7	55	e 7 1	− 9	—	—	—	—	e 13·9
Uccle		38·4	47	e 7 43	+18	i 13 33	+13	—	—	e 17·5
Chicago		38·5	300	e 8 47	PP	e 13 24	+ 2	—	—	e 16·5
Neuchatel		39·5	53	e 7 34	0	—	—	—	—	—
Moncalieri		39·8	56	7 45	+ 9	—	—	—	—	—
Basle		39·9	54	e 7 38	+ 1	—	—	—	—	—
Strasbourg		40·2	51	e 7 31	− 9	—	—	—	—	—
Zurich		40·6	53	e 7 42	− 1	e 13 42	−12	—	—	—
St. Louis	E.	40·7	295	—	—	e 13 57	+ 2	—	—	e 19·0
Florissant	E.	40·8	295	—	—	i 14 0	+ 4	—	—	i 19·5
Stuttgart		41·1	51	e 7 46	− 1	e 14 9	+ 8	e 9 21	PP	e 19·5
Hamburg		42·3	43	e 7 56	− 1	—	—	—	—	e 20·5
Florence		42·4	57	e 8 26	+28	—	—	—	—	—
Jena		42·9	48	e 8 7	+ 5	—	—	—	—	—
Rome		43·4	61	e 8 9	+ 3	i 14 45	+10	9 33	PP	22·2
Triest		44·1	55	e 8 11	− 1	—	—	e 10 40	PPP	—
Huancayo		54·5	223	e 9 25	− 7	e 17 13	+ 3	e 20 53	SS	—
La Paz		54·5	212	i 9 31a	− 1	17 31	PS	10 39	pP	29·0
Tucson		58·4	291	i 10 0k	0	—	—	i 10 41	P_cP	28·6
Helwan	z.	61·0	71	i 10 17k	− 1	—	—	—	—	—
Ksara		63·1	66	i 10 32k	0	e 19 18	+16	e 13 4	PP	—
Piatigorsk		64·8	52	e 10 31	−12	—	—	—	—	—
Tiflis		66·8	55	e 10 54	− 2	e 19 39	− 9	—	—	e 30·5
Grozny		66·9	52	e 10 59	+ 3	—	—	—	—	—
Sverdlovsk		70·0	35	e 11 13	− 2	e 20 35	+ 9	—	—	29·5
Baku		70·9	54	11 23	+ 2	e 19 50	−46	—	—	e 33·5
Tashkent		83·0	45	i 12 32	+ 4	—	—	—	—	e 40·7
Andijan		85·3	44	e 12 50	+10	—	—	—	—	—

Additional readings:—
Stuttgart eSSE = +17m.10s.
Jena eN = +8m.22s.
Rome e = +9m.8s., i = +11m.41s., eS = +17m.58s.?, L_q = 20m.53s.
Triest i = +8m.34s.
Huancayo eP = +9m.39s.
Tucson iP = +10m.17s., i = +11m.11s., iPP = +12m.20s.
Helwan iZ = +10m.28s.
Tiflis ePN = +10m.58s.
Sverdlovsk i = +11m.27s.
Long waves were also recorded at Paris, Edinburgh, Harvard, San Fernando, Almeria, Kew, De Bilt, Philadelphia, East Machias, Fordham, Pasadena, and Sitka.

Feb. 8d. Readings also at 1h. (Collmberg and Frunse), 2h. (Andijan and Tucson), 4h. (near Rome), 6h. (Riverview, Brisbane, Perth, Tinemaha (2), Haiwee, Mount Wilson (2), Riverside (2), Tucson, and Pasadena (2), 7h. (Butte, Ukiah, Santa Barbara, Tucson (3), Tinemaha, Haiwee, Mount Wilson, Riverside, and Pasadena), 8h. (Andijan), 9h. (Moncalieri, Florence, Mount Wilson, and Tucson), 13h. (Andijan), 15h. (Sverdlovsk, Tashkent, Vladivostok, Osaka, near Mizusawa, and Baku), 18h. (Triest), 19h. (Tchimkent, Andijan, and Frunse), 21h. (Tiflis), 22h. (Tiflis and Collmberg).

Feb. 9d. 2h. 31m. 6s. Epicentre 6°·5S. 159°·0E.

A = −·9277, B = +·3561, C = −·1125; δ = +9; h = +7;
D = +·358, E = +·934; G = +·105, H = −·040, K = −·994.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		21·6	194	i 4 42	−12	i 8 18	−31	—	—	—
Riverview	N.	28·1	193	e 5 59	+ 4	e 10 19	−21	6 33	PP	e 13·5
Sydney		28·2	193	e 8 54	?	—	—	—	—	—
Melbourne		33·7	200	—	—	e 11 41	−27	i 14 5	SS	15·5
Wellington		37·4	160	7 13	− 3	13 0	− 5	8 27	PP	16·0
Christchurch		38·8	164	7 30	+ 2	13 29	+ 3	9 22	P_cP	e 18·4
Perth		47·5	232	i 7 26	?	i 16 16	+42	i 12 24	?	—
Batavia		51·8	268	7 52	?	e 17 54	?	—	—	—
Vladivostok		55·2	337	e 9 38	+ 1	e 17 20	0	—	—	27·6
Berkeley	Z.	85·1	51	i 12 40	+ 1	—	—	—	—	—
Pasadena		87·7	55	i 12 52	0	—	—	—	—	e 41·4
Mount Wilson		87·8	55	e 12 53	+ 1	—	—	—	—	—
Tinemaha		88·1	53	i 12 54	0	—	—	—	—	—
Haiwee		88·2	53	e 12 56	+ 2	—	—	—	—	—
Riverside		88·3	55	i 12 54	− 1	—	—	—	—	—
Bombay		88·5	289	e 16 42	PP	e 23 34	− 7	—	—	—
Frunse		90·3	313	13 0	− 4	—	—	—	—	—
Andijan		91·7	311	e 13 10	0	e 24 5	− 5	—	—	—
Tucson		93·6	58	i 13 20a	+ 1	—	—	—	—	43·1
Samarkand		95·6	309	e 13 26	− 2	—	—	—	—	—
Sverdlovsk		100·0	326	—	—	e 24 23	[− 4]	—	—	42·9
Ksara		121·0	305	i 20 25	PP	e 29 57	PS	—	—	—
Copenhagen		124·2	338	i 18 58	[− 3]	—	—	—	—	—
Helwan		125·5	302	i 19 0	[− 3]	—	—	i 20 54	PP	—
Triest		130·7	329	e 19 22	[+ 9]	—	—	—	—	—
Zurich		132·1	334	e 19 13	[− 3]	—	—	—	—	—
Basle		132·4	334	e 19 14	[− 2]	—	—	e 22 6	PP	—
Neuchatel		133·1	335	e 19 15	[− 3]	—	—	—	—	—
Toledo		143·4	338	e 19 34a	[− 2]	—	—	—	—	—

Additional readings:—
Brisbane iPPN = +4m.48s., iSN = +8m.24s.
Wellington PPP = +9m.2s.
Christchurch iP_cSZ = +13m.18s., eNZ = +16m.19s., L_q = +16m.29s.
Berkeley iZ = +12m.54s.
Pasadena iZ = +13m.6s. and +13m.39s.
Tucson iP = +13m.25s.
Ksara i = +20m.44s., e = +30m.33s.
Helwan eEZ = +21m.13s.
Triest e = +22m.35s.
Long waves were also recorded at Baku and Sitka.

Feb. 9d. 11h. 45m. 16s. Epicentre 0°·4S. 98°·8E. (as on 1938 July 29d.).

A = −·1530, B = +·9882, C = −·0069; δ = 0; h = +7;
D = +·988, E = +·153; G = +·001, H = −·007, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		4·0	359	i 1 9	P*	i 1 54	+ 2	—	—	—
Batavia		9·8	126	e 2 36	+12	i 4 26	+ 9	5 8	S*	—
Malabar		11·1	128	e 2 45	+ 2	4 39	−10	—	—	—
Colombo	E.	20·2	291	4 44	+ 5	8 40	SS	—	—	14·6
Phu-Lien		22·4	20	e 5 3	+ 1	e 9 1	− 3	—	—	—
Kodaikanal	E.	23·7	298	i 5 21k	+ 7	i 9 39	+12	i 5 50	PP	i 12·1
Calcutta	N.	25·0	337	i 5 22a	− 5	i 9 44	− 5	i 5 53	PP	e 12·1
Hong Kong		26·4	32	5 52	+12	10 42	+30	6 36	PPP	—
Manila		26·5	53	e 5 38	− 3	10 52	+38	—	—	14·8
Bombay		31·9	308	e 6 31	+ 2	i 11 40	0	e 13 16	SS	e 15·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Agra	E.	33·9	326	6 44	− 3	12 8	− 3	i 15 4	SSS	—
Perth		35·3	153	—	—	i 12 42	+ 9	i 15 2	SS	17·3
Zi-ka-wei	Z.	38·1	32	e 7 18	− 4	—	—	i 9 8	PPP	21·1
Andijan		47·5	332	8 39	+ 1	e 15 32	− 2	—	—	—
Almata		47·7	339	e 8 43	+ 3	—	—	—	—	—
Frunse		48·3	336	e 8 42	− 3	e 15 42	− 3	—	—	—
Samarkand		49·3	327	e 8 54	+ 1	e 15 9	−50	—	—	—
Tchimkent		50·0	332	8 56	− 2	i 16 3	− 6	—	—	—
Melbourne		56·5	135	—	—	i 17 33	− 4	—	—	30·2
Riverview	N.	59·3	129	e 12 55	PP	—	—	—	—	e 31·8
Baku		60·2	318	e 10 13	+ 1	e 19 17	PPS	i 25 26	SSS	e 29·7
Tiflis		64·2	317	e 10 34	− 5	19 11	− 5	—	—	e 30·7
Sverdlovsk		64·8	338	i 10 41	− 2	19 16	− 7	—	—	29·7
Ksara		68·0	306	i 11 4a	+ 1	e 20 13	+11	e 13 37	PP	—
Helwan		70·7	301	11 20	0	20 30	− 4	21 0	PS	—
Christchurch		78·0	134	i 12 0	− 2	i 21 51	− 4	33 4	L_g	38·9
Wellington		79·2	131	e 12 9	+ 1	21 57	−11	26 43	SS	—
Pulkovo		79·7	331	—	—	e 31 21	SSS	—	—	e 43·8
Collmberg	Z.	87·7	321	e 12 51a	− 1	—	—	—	—	—
Chur		89·8	317	e 13 1	− 1	—	—	—	—	—
Tinemaha		130·0	40	e 19 13	[+ 1]	—	—	e 22 27	SKP	—
Haiwee		130·7	40	e 19 14	[+ 1]	—	—	e 22 33	SKP	—
Mount Wilson	Z.	131·8	42	i 19 16	[+ 1]	—	—	e 22 32	SKP	—
Pasadena	Z.	131·8	42	e 19 16	[+ 1]	—	—	e 22 36	SKP	—
Riverside	Z.	132·4	42	e 19 11	[− 5]	—	—	e 22 38	SKP	—
Tucson		137·7	39	i 19 28a	[+ 2]	—	—	i 22 56	PKS	—
La Paz	Z.	158·8	218	e 20 14	[+15]	—	—	—	—	—
Huancayo		166·3	205	—	—	e 31 41	{− 3}	—	—	—

Additional readings :—
Medan iE = +1m.37s.
Batavia iN = +3m.25s. and +5m.15s., iEN = +6m.16s.
Malabar S?E = +4m.46s.
Phu-Lien e = +8m.44s.
Kodaikanal iSSE = +11m.3s.
Calcutta ePPPN = +6m.5s., iSSN = +10m.44s.
Hong Kong P_gP? = +9m.51s., SS = +12m.0s.
Bombay iE = +14m.30s.
Tiflis eZ = +21m.25s.
Ksara ePS = +20m.47s.
Helwan iE = +21m.25s.
Pulkovo e = +38m.55s.
Collmberg i = +13m.8s. and +13m.23s.
Tucson iPKP = +20m.9s.
Long waves were also recorded at Cape Town and Sitka.

Feb. 9d. 15h. 30m. 35s. Epicentre 11°·2N. 86°·1W.

$A = +·0667$, $B = -·9789$, $C = +·1930$; $\delta = -6$; $h = +6$;
$D = -·998$, $E = -·068$; $G = +·013$, $H = -·193$, $K = -·981$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida	N.	10·3	341	i 2 27	− 5	—	—	—	—	—
Tacubaya	N.	15·0	304	e 3 38	+ 3	—	—	—	—	—
San Juan		20·6	67	e 4 44	+ 1	8 37	+ 8	i 4 54	PP	e 8·8
Columbia		23·2	10	e 4 25?	−44	i 9 25	+ 7	—	—	e 11·4
Huancayo		25·5	154	e 5 34	+ 2	e 10 2	+ 5	—	—	e 13·1
Cape Girardeau	N.	26·2	354	e 5 37	− 1	e 10 24	+15	i 6 16	PP	—
St. Louis	E.	27·6	352	e 5 56	+ 5	e 10 48	+16	—	—	e 13·9
Cincinnati		27·9	2	e 5 51	− 3	e 11 7	+30	6 41	PP	14·9
Bermuda		28·7	40	e 6 1	0	e 11 24	+34	e 6 55	PP	e 12·0
Georgetown		28·7	15	i 6 5	+ 4	i 11 12	+22	6 53	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Philadelphia		30·2	17	i 6 16	+ 2	e 11 40	+27	e 6 55	PP	e 14·0
Chicago		30·6	356	e 6 15	− 3	e 11 51	+31	e 7 8	PP	e 15·4
Tucson		31·0	317	i 6 20	− 1	i 12 8	+42	i 7 20	PP	e 12·6
Fordham		31·4	18	i 6 24a	− 1	e 12 8	+36	i 7 50	PPP	17·6
La Paz	z.	32·8	145	i 6 37	0	12 13	+19	—	—	16·8
Toronto		32·9	8	—	—	e 10 55	−61	—	—	17·4
Weston		33·6	20	i 6 45a	+ 1	i 12 14	+ 8	e 7 48	PP	i 16·7
Harvard		33·7	20	i 6 46	+ 1	—	—	—	—	e 17·6
Ottawa		35·2	12	i 6 57	− 1	e 12 55	+24	8 17	PP	18·4
Riverside		36·5	313	i 7 8	− 1	i 13 32	S_cP	i 9 32	P_cP	—
Shawinigan Falls		37·0	15	e 7 13	0	—	—	e 8 42	PP	21·4
East Machias		37·1	22	e 7 17	+ 3	e 12 59	− 2	e 8 42	PP	e 14·0
Mount Wilson	z.	37·1	313	i 7 14	0	i 13 40	S_cP	i 9 34	P_cP	—
Pasadena		37·1	313	i 7 15	+ 1	i 13 19	+18	e 8 44	PP	e 17·9
Haiwee		38·0	317	i 7 22	+ 1	e 13 40	+26	e 9 36	P_cP	—
Seven Falls		38·1	17	e 7 18	− 4	e 13 49	+33	—	—	18·4
Santa Barbara		38·4	312	i 7 25	0	—	—	—	—	—
Tinemaha		38·7	317	i 7 28	+ 1	i 17 40	S_cS	e 9 1	PP	—
Fresno	N.	39·6	315	e 7 51	+16	—	—	—	—	—
Lick		41·2	315	e 7 48	0	—	—	—	—	—
Santa Clara		41·4	315	i 7 52	+ 2	—	—	—	—	—
Berkeley		41·8	315	i 7 53	0	i 17 43	S_cS	i 9 49	P_cP	e 22·7
Saskatoon		44·1	342	e 8 7	− 5	—	—	—	—	26·4
La Plata		53·1	150	9 17	− 4	16 46	− 5	—	—	30·4
Rio de Janeiro		54·0	128	—	—	i 17 57	PPS	—	—	e 28·4
Sitka		59·2	331	e 12 10	PP	e 18 34	PPS	e 22 36	SS	e 30·9
Toledo		76·8	51	e 12 5	+10	—	—	—	—	e 41·0
Granada		77·4	54	i 12 6	+ 8	—	—	—	—	43·9
Stuttgart		85·1	41	e 13 5	+26	—	—	e 39 55	L_q	e 43·4
Collmberg		87·0	38	e 12 43	− 5	—	—	e 16 16	PP	—
Rome		88·9	47	—	—	e 24 12?	+28	—	—	—
Triest		88·9	43	e 13 27	+29	e 23 41	− 3	—	—	—
Pulkovo		93·1	27	—	—	e 26 26	PPS	—	—	—
Christchurch		105·8	228	e 18 19	PKP	28 45	PPS	e 43 41	L_q	49·6
Sverdlovsk		106·8	17	e 18 40	PP	e 25 1	[+ 3]	e 28 15	PS	45·4
Ksara		109·0	48	e 14 33	P	e 28 34	PS	e 19 2	PP	—
Baku		114·5	35	—	—	e 29 43	PS	—	—	e 52·5
Tashkent		123·0	21	—	—	e 41 13	SSS	—	—	e 59·2
Calcutta		146·0	9	e 19 39	[− 2]	—	—	—	—	—

Additional readings :—
Cape Girardeau eN = +10m.47s.
Cincinnati e = +9m.4s.
Georgetown SS = +13m.9s.
Philadelphia eS = +11m.51s.
Tucson iP = +6m.23s. and +6m.31s., i = +6m.37s., +6m.54s., and +7m.28s., iPPP = +7m.36s., i = +7m.46s. and +8m.9s., iP_cP = +8m.42s., i = +9m.16s. and +10m.4s.
Fordham iN = +14m.50s. and +16m.2s.
Weston ePPPZ = +8m.14s., eP_cPZ = +8m.54s., eP_cSN = +12m.54s., iL_qZ = +15m.29s.
Harvard i = +6m.55s.
Ottawa SS = +15m.25s.?
Pasadena iP_cPZ = +9m.34s., iZ = +9m.43s., eS_cPZ = +13m.40s., eS_cSN = +17m.29s., iN = +17m.48s.
Tinemaha eP_cPZ = +9m.40s., eS_cPZ = +13m.40s., iEN = +17m.59s.
Berkeley iPEZ = +7m.55s.
Collmberg e = +13m.14s. and +26m.35s.
Rome e = +31m.27s.
Pulkovo e = +39m.38s. and +44m.33s.
Christchurch iZ = +28m.55s., iP_cSS_cPE = +34m.3s.
Sverdlovsk e = +34m.45s.
Ksara PPS = +29m.33s.
Tashkent e = +45m.39s. and +49m.59s.
Long waves were also recorded at Butte, Bozeman, Branner, Florissant, De Bilt, Almeria, Prague, Moscow, Ukiah, College, Kew, Cape Town, Upsala, Paris, Vladivostok, Bombay, Strasbourg, Agra, Tiflis, Stonyhurst, Clermont Ferrand, Hamburg, and San Fernando.

Feb. 9d. Readings also at 0h. (Tiflis and Mizusawa), 3h. (Tananarive), 4h. (Collmberg), 5h. (Frunse, Andijan, and Tacubaya), 7h. (Tiflis), 10h. (Riverside), 11h. (Mizusawa, Malabar (2), and Batavia (2)), 12h. (Malabar (3) and Batavia), 13h. (Malabar), 15h. (Malabar, Batavia, Balboa Heights, Ottawa, and Wellington), 16h. (Malabar, Neuchatel, Basle, Zurich, and Chur), 19h. (Upsala, Collmberg, Triest, and Stuttgart), 20h. (Port au Prince, Triest, Stuttgart, and Collmberg), 21h. (Tacubaya), 22h. (Collmberg and Malabar).

Feb. 10d. Readings at 0h. (Columbia), 3h. (Ksara), 4h. (San Francisco, Branner, and Berkeley), 5h. (Triest), 8h. (Christchurch, New Plymouth, and Wellington), 9h. (Triest), 12h. (Collmberg, La Paz, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, and Mizusawa), 15h. (Monawai, Mizusawa, Tucson, Wellington, New Plymouth, Christchurch, and Ksara), 18h. (Bucharest, Almata, Frunse, and Andijan), 19h. (Tucson, Riverside, Guadalajara, Oaxaca, Puebla, and Tacubaya), 20h. (Tananarive), 21h. (Tchimkent and Andijan), 22h. (Lick).

Feb. 11d. 11h. 16m. 54s. Epicentre 44°·1N. 11°·6E.

Intensity VI-VII at the Epicentre near Marradi in the Province of Florence.

Epicentre 44° 4′·4 ± 1′·6N., 11° 38′·7 ± 0′·8E.

P. Caloi.

Il terremoto dell' Appennino toscoromagnolo dell' 11 febbraio 1939-XVII. La Ricerca scientifica, anno X No. 11, pp. 998 et suivantes 1939 et Publicazioni dell' Instituto Nazionale di Geofisica del Consiglio Nazionale delle Ricerche.

No. 28 Roma, annee MCMXXXIX-XVIII, 7 pages, 3 figures, and 1 isoseismic chart.

$A = +\cdot7058$, $B = +\cdot1449$, $C = +\cdot6935$; $\delta = +9$; $h = -3$;
$D = +\cdot201$, $E = -\cdot980$; $G = +\cdot679$, $H = +\cdot139$, $K = -\cdot720$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florence		0·4	219	i 0 6	P_g	i 0 10	S_g	—	—	—
Triest		2·2	44	0 40a	+ 2	1 19	S_g	—	—	—
Rome		2·3	164	e 0 41a	+ 1	i 1 10	+ 1	0 47	P_g	—
Laibach		2·8	47	i 0 50	P*	i 1 28	S*	—	—	—
Moncalieri		2·9	288	i 0 52	P*	1 15	− 9	—	—	—
Chur		3·1	332	e 0 52	+ 1	—	—	e 1 4	P_g	—
Zurich		3·9	327	e 1 3	+ 1	e 2 4	S*	e 1 21	P_g	—
Neuchatel		4·3	313	e 1 9	+ 1	e 2 24	S_g	—	—	—
Basle		4·4	323	e 1 8	− 2	e 2 9	+ 7	e 2 24	S_g	—
Stuttgart		4·9	342	e 1 18	+ 1	i 2 14	− 1	i 1 40	P_g	—
Besançon		5·0	311	—	—	e 2 6?	−12	—	—	—
Strasbourg		5·2	331	e 1 22	+ 1	i 2 21	− 1	e 1 40	P_g	—
Budapest		6·2	55	e 2 29	+54	3 27	S_g	3 1	S*	—
Kecskemet	z.	6·3	61	e 2 21	+45	—	—	—	—	—
Prague		6·3	18	e 2 36	+60	e 3 36	S_g	—	—	—
Belgrade		6·4	80	e 2 11k	P_g	i 3 26	S_g	e 2 49	P*	—
Clermont Ferrand		6·4	288	e 2 2	P_g	i 3 39	S_g	—	—	—
Collmberg		7·2	7	i 1 49	0	i 3 17	+ 4	2 6	P*	i 3·9
Göttingen		7·5	352	—	—	e 3 30	+10	—	—	—
Paris		7·8	310	—	—	e 4 19	S_g	—	—	—
Sofia		8·6	95	e 2 17	+ 8	e 4 16	S*	—	—	—
Ksara		21·4	110	e 5 15	PP	e 9 17	SS	—	—	—

Additional readings :—
Florence i = +26s.
Triest P_g = +50s., iP_gP_g = +59s., S_g = +1m.30s.
Rome iN = +51s., +1m.13s., and +1m.23s.
Laibach i = +1m.20s.
Stuttgart iS* = +2m.18s., e = +2m.26s. and +2m.32s., iS_g = +2m.49s. and i = +2m.53s.
Besançon eS = +2m.19s.
Strasbourg i = +1m.49s., iPS = +2m.0s., iSS = +2m.46s., iSSS = +3m.2s.
Budapest ePN = +2m.36s., iN = +3m.44s., iE = +3m.56s.
Kecskemet eZ = +3m.44s. and +4m.16s.
Belgrade i = +3m.30s., +30m.40s., and +4m.2s.
Collmberg iP* = +1m.52s., i = +1m.59s., iP* = +2m.9s., iZ = +2m.13s., eP_g = +2m.24s., e = +3m.9s., i = +3m.29s., iS* = +3m.44s.
Long waves were also recorded at Uccle, Baku, Sverdlovsk, and Hamburg.

Feb. 11d. 20h. 30m. 10s. Epicentre 35°·4N. 136°·6E.

Intensity IV at Kyoto, III at Hukui, Ibukisan, Hikone, Kameyama, Miyadu, and Tsuruga, II at Gihu, Nagoya, Tu, Kasiwara, Hamamatu, Toyooka, Iida, I at Osaka, Takayama, Kohu, Numadu, Misima, Odaig awarayama, Kobe, and Kanazawa.

Epicentre 35°·4N. 136°·6E. Shallow.

See Seismolgocal Bulletin of the Central Met. Obs., Japan, for the year 1939, Tokyo 1949, p. 7.

$A = -\cdot5936$, $B = +\cdot5613$, $C = +\cdot5767$; $\delta = 0$; $h = 0$;
$D = +\cdot687$, $E = +\cdot727$; $G = -\cdot419$, $H = +\cdot396$, $K = -\cdot817$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Gihu		0·2	90	0 8k	− 2	0 12	− 4	—	—	—
Hikone		0·3	245	0 10k	− 1	0 16	− 2	—	—	—
Nagoya		0·3	128	0 13a	+ 2	0 20	+ 2	—	—	—
Kameyama		0·6	191	0 14a	− 1	0 22	S*	—	—	—
Kyoto		0·8	242	0 17a	− 1	0 28	S*	—	—	—
Osaka		1·1	229	0 22	0	0 37	− 2	—	—	—
Kobe		1·3	238	0 26a	+ 1	0 36	− 8	—	—	—
Toyama		1·4	21	0 27a	0	0 41	− 5	—	—	—
Toyooka		1·5	275	0 27a	− 1	0 45	− 4	—	—	—
Omaesaki		1·6	121	0 31a	+ 1	0 53	+ 2	—	—	—
Hunatu		1·8	87	0 33	+ 1	0 48	− 8	—	—	—
Nagano		1·8	46	0 34a	+ 2	0 57	+ 1	—	—	—
Sumoto		1·8	233	0 31a	− 1	0 42	−14	—	—	—
Misima		2·0	98	0 35a	0	1 4	+ 2	—	—	—
Wazima		2·0	7	0 35	0	1 1	− 1	—	—	—
Siomisaki		2·1	199	0 35a	− 2	1 1	− 3	—	—	—
Maebasi		2·3	63	0 42	+ 2	1 15	+ 6	—	—	—
Yokohama		2·5	89	0 45	+ 2	1 16	+ 2	—	—	—
Tokyo Cen. Met. Ob.		2·6	83	0 45	+ 1	1 22	+ 5	—	—	—
Mera		2·7	100	0 50	P*	1 30	S_g	—	—	—
Muroto		3·0	223	0 46a	− 4	1 19	− 8	—	—	—
Koti		3·1	234	0 50	− 1	1 25	− 4	—	—	—
Mito		3·3	73	0 54	+ 1	1 30	− 5	—	—	—
Hirosima		3·6	254	0 56	− 2	1 48	S*	—	—	—
Matuyama		3·6	244	0 56a	− 2	1 51	S*	—	—	—
Hamada		3·8	264	1 0	− 1	1 46	− 1	—	—	—
Sendai		4·5	49	1 15	+ 4	—	—	—	—	—
Akita		5·2	32	1 27	+ 6	3 10	S_g	—	—	—
Mizusawa		5·2	42	e 1 23	+ 2	2 28	+ 6	—	—	—
Hukuoka		5·4	253	1 24	0	e 2 38	+10	—	—	2·8
Kumamoto		5·5	244	1 26a	+ 1	2 51	S*	—	—	—
Miyazaki		5·6	233	1 24	− 3	—	—	—	—	—
Husan		6·2	269	2 10	P_g	3 3	S*	—	—	—
Vladivostok		8·5	336	e 3 20	?	e 3 38	− 7	e 4 54	S_g	5·5
Tinemaha	z.	79·9	52	e 12 9	− 3	—	—	—	—	—
Mount Wilson	z.	81·7	54	i 12 19	− 3	—	—	—	—	—
Pasadena	z.	81·7	54	e 12 18	− 4	—	—	—	—	—
Riverside	z.	82·3	54	i 12 20	− 5	—	—	—	—	—
Ottawa	z.	94·4	22	—	—	i 29 33	?	—	—	—

Additional reading :—
Hukuoka ? = +1m.47s.

Feb. 11d. Readings also at 0h. (Mizusawa), 1h. (near Hukuoka), 3h. (Mizusawa), 4h. (Tucson, Kodaikanal, and Collmberg), 8h. (Sotchi), 10h. (Florence), 11h. (Florence (2)), 12h. (Florence, Riverview, Basle, Brisbane, and Triest), 13h. (East Machias), 15h. (Haiwee, La Jolla, Almeria, Riverside, Pasadena, Mount Wilson, Tinemaha, Brisbane, Tucson, and Stuttgart), 16h. (Tucson and Toledo), 17h. (Sofia), 18h. (Manila, near Calcutta, Vladivostok, near Osaka, and Florence), 19h. (Sverdlovsk), 21h. (Florence), 22h. (Stuttgart, Triest (2), Tacubaya, and Collmberg).

Feb. 12d. Readings at 0h. (Mizusawa), 1h. (Tucson), 3h. (Tacubaya), 5h. (Hukuoka), 6h. (near Wellington and Collmberg), 7h. (Tiflis and Ksara), 8h. (Mizusawa), 11h. (Florence and Jena), 13h. (Mizusawa), 15h. (Triest and Florence), 16h. (Florence), 21h. (Mizusawa and Florence), 23h. (East Machias).

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Feb. 13d. Readings at 2h. (Frunse and Andijan), 3h. (Wellington and New Plymouth), 5h. (near Lick, Andijan, Samarkand, and Almata), 6h. (Piatigorsk and Sotchi), 7h. (near Wellington), 8h. (Florence, Butte (2), Andijan, Harvard, and Weston), 10h. (Tchimkent, Florence, Andijan, Almata, Samarkand, Frunse, Malabar, Baku, and Tashkent), 11h. (Florence, Sverdlovsk, and Andijan), 12h. (near Malabar), 13h. (Mizusawa), 14h. (Triest and Tucson), 15h. (Helwan and Ksara), 17h. (Sotchi), 18h. (Mizusawa), 20h. (Ksara, Andijan, Sverdlovsk, Tashkent, Baku, Samarkand, and Grozny), 22h. (Medan, Batavia, and Malabar), 23h. (Fordham, Grozny, Andijan, Weston, and Harvard).

Feb. 14d. Readings at 2h. (Collmberg and Fort de France), 3h. (Tananarive, Apia, Zurich, Ksara, Pasadena, Mount Wilson, Piatigorsk, and Tucson), 4h. (Rome and Piatigorsk), 5h. (near Taihoku, Tucson (2), Collmberg, and Fort de France), 6h. (Frunse, Andijan, Tchimkent, and Samarkand), 7h. (College and Tucson), 9h. (Branner, Fresno, near Lick, Berkeley, Medan, and Batavia), 10h. (Basle), 11h. (Sotchi), 14h. (Mizusawa), 16h. (Wellington), 17h. (Grozny, Helwan, Copenhagen, Tiflis (2), La Paz, La Jolla, Tinemaha, Tucson, Collmberg, Mount Wilson, Pasadena, and Ksara (2)), 18h. (Samarkand, Tchimkent (2), Andijan (2), and Frunse), 19h. (Harvard, near Weston, and Sotchi), 20h. (Tucson), 22h. (Branner).

Feb. 15d. 2h. 31m. 19s. Epicentre 18°·5N. 99°·0W. (as on 1938 May 3d.).

Pasadena suggests depth 80kms.

A = −·1485, B = −·9373, C = +·3154 ; δ = +6 ; h = +5 ;
D = −·988, E = +·156 ; G = −·049, H = −·312, K = −·949.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Puebla	N.	0·9	54	0 27	+ 7	—	—	—	—	—
Tacubaya	N.	0·9	349	0 30	+10	—	—	—	—	—
Vera Cruz	N.	2·8	76	0 50	P*	—	—	—	—	—
Guadalajara	N.	4·6	296	1 20	P*	—	—	—	—	—
Little Rock		17·3	19	i 5 4	+60	e 8 51	L	i 5 24	pP	(e8·9)
Tucson		17·3	323	i 4 8k	+ 4	i 7 31	+15	i 4 25	PP	i 8·0
St. Louis		21·5	19	e 4 50	− 2	i 8 45	− 2	i 5 3	pP	—
Florissant		21·6	19	e 4 51	− 3	i 8 48	− 1	e 5 8	pP	—
La Jolla		21·7	314	i 4 54	− 1	—	—	i 5 15	sP	—
Riverside		22·5	317	e 5 3	+ 1	—	—	—	—	—
Pasadena		23·1	316	i 5 8k	0	i 9 26	+10	i 5 29	sP	—
Mount Wilson		23·2	316	e 5 7	− 2	—	—	e 5 28	sP	—
Cincinnati		24·1	29	i 5 9	− 9	e 9 22	−12	i 5 34	PP	—
Santa Barbara		24·3	316	e 5 19	− 1	—	—	e 5 42	sP	—
Salt Lake City		24·8	338	e 5 41?	PP	—	—	—	—	13·7
Tinemaha		25·1	321	e 5 26	− 2	—	—	i 5 40	pP	—
Chicago		25·3	19	e 5 37	+ 7	e 9 52	− 2	e 5 51	PP	—
Williamstown		32·6	37	i 6 33	− 2	—	—	6 53	PP	—
Ottawa		33·1	30	i 6 34	− 6	—	—	—	—	11·7
Weston		33·4	38	i 6 38	− 4	—	—	i 7 7	PP	e 21·5
La Paz	Z.	46·2	136	18 33	S	(18 33)	SS	—	—	24·7

Additional readings :—
Tucson iP = +4m.15s., i = +4m.29s., +5m.23s., +5m.58s., and +6m.23s.
St. Louis iSPEN = +5m.16s., isSEN = +9m.12s.
Florissant eN = +4m.56s., i = +5m.11s., iEN = +5m.18s., isSZ = +9m.24s.
Cincinnati ePPP = +5m.48s., eZ = +9m.0s., e = +9m.50s. and +10m.19s.
Tinemaha isP = +5m.50s.

Feb. 15d. Readings also at 0h. (Tchimkent, Andijan, and Samarkand), 2h. (Cape Girardeau), 6h. (Tiflis (2) and Erevan), 7h. (Tiflis (2)), 8h. (La Paz), 9h. (Mizusawa, Andijan, and Tacubaya), 10h. (Frunse, Samarkand, and Andijan), 11h. (Fresno (2), Berkeley, near Lick (2), and Branner (2)), 12h. (Andijan), 13h. (Fort de France), 14h. (Sotchi and Andijan), 16h. (Grozny (2), Collmberg, Ksara, Erevan, and Tiflis (2)), 17h. (Tiflis (2)), 18h. (Tiflis and Tananarive (2)), 22h. (La Plata and Malabar), 23h. (Malabar, near Wellington, and Cheb).

Feb. 16d. 18h. 51m. 3s. Epicentre 37°·1N. 141°·8E. (as on 1939 Jan. 24d.).

Intensity III at Sendai and Hukusima; II at Onahama, Mito, Kakioka, Tukubasan, Utunomiya, Miyako, and Morioka; I at Yamagata, Kumagaya, Tokyo, Kohu, Mizusawa, Takada, and Hatinohe.

Epicentre 36°·8N. 141°·5E. Shallow.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1939, Tokyo, 1949, p. 8.

$A = -\cdot6283$, $B = +\cdot4944$, $C = +\cdot6006$; $\delta = -9$; $h = -1$;
$D = +\cdot618$, $E = +\cdot786$; $G = -\cdot471$, $H = +\cdot371$, $K = -\cdot800$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Onahama	0·8	257	0 18k	0	0 30	− 1	—	—	—
Hukusima	1·2	302	0 27	+ 3	0 46	+ 5	—	—	—
Mito	1·3	236	0 24k	− 1	0 40	− 4	—	—	—
Sendai	1·3	329	0 28k	+ 3	0 47	+ 3	—	—	—
Tyosi	1·5	209	0 32k	+ 4	0 49	0	—	—	—
Okiziku	1·6	242	0 40	+10	0 58	+ 7	—	—	—
Tukubasan	1·6	237	0 29k	− 1	0 47	− 4	—	—	—
Utunomiya	1·7	250	0 30k	− 1	0 49	− 5	—	—	—
Mizusawa	2·1	346	i 0 39	+ 2	i 1 6	+ 2	i 1 9	S_g	—
Tokyo Cen. Met. Ob.	2·1	229	0 39k	+ 2	1 4	0	—	—	—
Tokyo Imp. Univ.	2·1	229	0 37	0	1 4	0	—	—	—
Komaba	2·2	230	0 39	+ 1	1 3	− 3	—	—	—
Kiyosumi	2·3	214	0 40	0	1 11	+ 2	—	—	—
Maebasi	2·3	252	0 41k	+ 1	1 7	− 2	—	—	—
Mitaka	2·3	232	0 40	0	1 8	− 1	—	—	—
Yokohama	2·4	226	0 43a	+ 2	1 13	+ 1	—	—	—
Kamakura	2·5	226	0 40	− 3	1 9	− 5	—	—	—
Titibu	2·5	243	0 40	− 3	1 9	− 5	—	—	—
Miyako	2·6	3	0 46a	+ 2	1 17	0	—	—	—
Mera	2·7	216	0 47	+ 2	1 14	− 5	—	—	—
Hunatu	2·9	237	0 50	+ 2	1 17	− 7	—	—	—
Koyama	2·9	232	0 40	− 8	1 15	− 9	—	—	—
Nagano	2·9	261	0 52k	P*	1 29	S*	—	—	—
Akita	3·0	334	0 56k	P*	1 38	S_g	—	—	—
Misima	3·0	229	0 51	+ 1	1 39	S_g	—	—	—
Susaki	3·3	225	0 50	− 3	1 25	−10	—	—	—
Hatinohe	3·5	356	0 58	+ 1	1 58	S_g	—	—	—
Omaesaki	3·8	231	1 1	0	2 16	S_g	—	—	—
Aomori	3·8	348	1 7k	P*	1 55	S*	—	—	—
Wazima	3·9	277	1 3k	+ 1	2 2	S*	—	—	—
Nagoya	4·4	245	1 12a	+ 2	2 7	+ 5	—	—	—
Hikone	4·8	250	1 17a	+ 2	2 13	+ 1	—	—	—
Mori	5·1	349	1 25k	+ 5	2 32	S*	—	—	—
Osaka	5·6	247	i 1 28	+ 1	i 2 58	S_g	—	—	—
Toyooka	5·8	257	1 27a	− 2	2 35	− 3	—	—	—
Kobe	5·9	249	1 31	0	2 58	S*	—	—	—
Sapporo	6·0	356	1 36k	+ 4	2 49	+ 6	—	—	—
Siomisaki	6·1	236	1 33	− 1	3 13	S*	—	—	—
Nemuro	6·8	24	1 43	− 1	2 55	− 8	—	—	—
Koti	7·6	245	1 55	0	3 31	+ 8	—	—	—
Hirosima	8·1	254	2 1	− 1	3 49	+14	—	—	—
Hamada	8·2	256	2 5	+ 2	3 50	+12	—	—	—
Ootomari	9·6	4	2 31	+10	4 18	+ 6	—	—	—
Izuka	9·7	254	2 24	+ 2	4 34	+19	—	—	—
Vladivostok	9·7	312	i 2 26	+ 4	i 4 19	+ 4	—	—	4·7
Hukuoka B	9·9	253	2 34	+ 9	4 48	S*	—	—	5·3
Titizima	10·0	179	2 32	+ 5	—	—	—	—	—
Yakusima	11·5	238	2 47a	− 1	5 5	+ 6	—	—	—
Tomie	11·6	251	2 51	+ 1	5 47	SSS	—	—	—
Zinsen	12·1	277	2 59a	+ 2	5 25	+11	—	—	—
Sikka	12·2	4	2 58	0	5 32	SS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	Z.	17·9	258	i 4 9	− 3	7 25	− 5	4 27	PP	10·2
Taito		22·9	239	5 1	− 5	9 2	−11	—	—	—
Hong Kong		28·0	246	5 54k	− 1	10 35	− 3	6 27	PP	14·3
Manila		29·1	225	e 6 19	+15	12 27	SS	—	—	—
Palau		30·4	195	6 34	+18	11 14	− 2	—	—	—
Phu-Lien		34·6	253	6 50	− 3	12 17	− 5	—	—	16·9
Semipalatinsk		45·1	308	i 8 17	− 3	14 55	− 4	—	—	—
Calcutta	N.	48·0	268	i 8 40k	− 3	i 15 47	+ 6	e 10 27	PP	e 23·5
Almata		48·8	300	e 8 50	+ 1	—	—	—	—	—
College		48·9	32	—	—	e 15 51	− 2	e 18 37	S_cS	e 23·1
Frunse		50·6	300	e 8 54	− 8	—	—	—	—	—
Medan		51·7	241	e 9 11	0	e 16 31	− 1	—	—	e 29·9
Andijan		52·8	297	9 21	+ 2	e 16 56	+ 9	—	—	29·9
Agra	E.	54·0	279	i 9 22a	− 6	16 49	−14	9 34	pP	—
Batavia		54·1	225	i 9 26	− 3	16 59	− 6	—	—	—
Tchimkent		54·3	300	9 27	− 3	e 17 17	+10	—	—	30·9
Tashkent		54·8	299	i 9 32	− 2	17 15	+ 1	—	—	e 28·9
Sverdlovsk		55·3	319	i 9 38	0	17 20	− 1	26 57	L_q	32·9
Samarkand		57·1	298	e 9 52	+ 2	e 17 57	+12	—	—	—
Hyderabad		58·6	269	9 57	− 4	17 59	− 5	12 7	PP	29·0
Bombay		62·3	274	10 23	− 3	i 18 53	+ 1	i 12 38	PP	e 29·9
Kodaikanal	E.	63·5	263	i 10 34	0	—	—	—	—	—
Colombo	E.	63·6	258	10 33	− 2	19 18	+10	—	—	35·4
Brisbane		65·1	169	—	—	i 19 21	− 6	i 20 39	PPS	—
Victoria		66·3	46	—	—	e 19 33	− 9	e 28 9	?	40·9
Moscow		67·4	323	e 10 57	− 2	e 19 50	− 5	—	—	34·4
Pulkovo		68·3	330	11 5	0	20 3	− 3	—	—	e 32·4
Baku		68·4	305	i 11 5	− 1	20 27	PS	25 33	SS	34·9
Grozny		69·6	309	11 8	− 5	e 20 35	PS	—	—	38·9
Tiflis		71·0	308	i 11 19	− 3	e 20 20	−17	e 21 15	PS	e 35·9
Riverview		71·1	172	—	—	e 20 35	− 3	—	—	e 39·1
Ukiah		71·1	55	—	—	e 20 38	0	—	—	e 29·0
Erevan		72·0	307	e 11 26	− 2	—	—	—	—	—
Berkeley		72·4	56	i 11 19	−11	e 20 51	− 2	—	—	e 29·6
Santa Clara		72·9	56	e 11 41	+ 8	i 21 5	+ 6	—	—	e 34·7
Melbourne		74·6	177	—	—	i 21 13	− 5	e 25 46	SS	36·9
Tinemaha		75·5	54	i 11 57	+ 9	—	—	—	—	—
Santa Barbara	Z.	76·1	57	e 11 52	+ 1	—	—	—	—	—
Pasadena		77·3	57	i 11 57	− 1	i 21 46	− 2	—	—	e 35·1
Mount Wilson		77·3	57	i 12 0	+ 2	—	—	—	—	—
Cernauti		77·6	322	e 11 57?	− 3	—	—	—	—	40·9
Copenhagen		78·0	334	e 12 0	− 2	—	—	—	—	—
Hamburg		80·6	334	e 12 14	− 2	—	—	—	—	e 41·9
Collmberg		81·2	331	i 12 18	− 1	—	—	e 15 21	PP	e 43·0
Ksara		81·4	305	i 12 20a	0	e 22 37	+ 6	15 26	PP	30·9
Budapest		81·5	325	e 12 18	− 3	—	—	e 15 18	PP	e 44·9
Jena		82·0	331	e 12 22	− 1	—	—	—	—	e 41·9
Göttingen		82·2	332	e 12 21	− 3	—	—	—	—	e 43·9
Cheb		82·4	331	e 12 51	+26	e 22 50	+ 9	—	—	e 43·9
Belgrade		82·8	321	e 12 26k	− 1	e 22 47	+ 2	—	—	e 49·5
Sofia		82·8	319	e 12 28	+ 1	e 22 32	−13	e 29 57	SSS	e 42·9
Tucson		83·3	54	i 12 30	0	22 47	− 3	15 32	PP	e 34·1
De Bilt		83·4	335	e 18 57	?	i 25 24	?	—	—	e 41·9
Wellington		83·6	156	—	—	e 21 57?	−56	e 28 10	SS	42·9
Stuttgart		84·7	330	12 37a	0	e 23 0	− 4	e 23 19	PS	e 44·0
Uccle		84·8	335	i 12 38	+ 1	e 23 5	0	—	—	e 41·9
Bidston		84·9	340	—	—	i 23 22	+16	—	—	e 41·9
Christchurch		85·0	158	18 43a	?	28 15	SS	38 20	L_q	41·3
Triest		85·3	327	e 12 36	− 4	i 22 58	[− 5]	—	—	e 45·1
Strasbourg		85·4	331	i 12 40	0	e 23 2	[− 1]	e 15 21	PP	e 43·7

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Kew		85·9	337	i 12 41a	− 2	i 23 19	+ 3	—	—	e 40·9
Chur		86·1	330	e 12 43	− 1	e 47 21	L	e 15 55	PP	(e47·3)
Zurich		86·1	330	e 12 41	− 3	e 23 5	[− 3]	—	—	—
Basle		86·3	330	e 12 44	− 1	e 23 17	− 3	—	—	—
Helwan		86·9	305	i 12 47k	− 1	23 9	[− 5]	13 9	pP	—
Paris		87·1	335	—	—	e 29 31?	SS	—	—	46·9
Moncalieri		88·4	330	e 12 48	− 7	—	—	—	—	55·6
Rome		88·8	323	i 12 55a	− 2	i 23 37	− 7	i 16 27	PP	e 41·8
Chicago		89·3	35	e 19 49	?	e 31 14	?	—	—	e 34·9
Florissant		90·5	38	—	—	e 23 31	[− 5]	i 23 59	S	40·4
St. Louis		90·7	38	—	—	i 23 57	− 4	e 30 6	SS	e 40·9
Ottawa		91·2	25	e 13 9	+ 1	e 23 57	− 8	33 57?	SSS	e 44·9
Seven Falls		91·2	21	—	—	e 24 3	− 2	—	—	36·9
Toronto		91·3	28	—	—	e 23 57?	− 9	—	—	e 45·9
Algiers		97·1	327	11 57?	?	21 57?	?	—	—	54·0
Toledo		97·2	334	e 17 33	PP	—	—	—	—	e 45·9
San Juan		118·8	30	e 19 52	PP	e 28 8	{+62}	36 26	SS	i 60·2
Cape Town		134·4	256	i 22 53	PP	—	—	—	—	e 67·9
Huancayo		138·4	63	e 19 4	[−23]	e 27 33	[+57]	e 22 27	PP	e 53·4
La Paz	z.	146·5	60	i 19 45a	[+ 3]	—	—	—	—	69·9

Additional readings :—
Zi-ka-wei iZ = +5m.9s., +5m.35s., and +5m.45s., SSZ = +7m.54s., SSSZ = +8m.3s.
Hong Kong S = +10m.51s., SS = +12m.44s., S_cS = +16m.6s.
Calcutta N ePPP = +11m.16s., eSS = +19m.5s., eSSS = +20m.24s.
Agra PPE = +11m.17s., sSE = +17m.11s., SSE = +20m.15s., SSSE = +21m.59s.
Hyderabad SSE = +22m.0s.
Bombay iEN = +19m.13s., eL_qEN = +26m.37s.
Tiflis eSZE = +20m.39s., eSSN = +25m.47s., eSSSZ = +28m.31s., eSSSN = +28m.35s., eN = +33m.52s., eEZ = +33m.59s.
Pasadena iZ = +13m.11s., eZ = +13m.46s.
Collmberg iZ = +12m.30s., i = +13m.13s. +15m.41s., eZ = +17m.3s., e = +17m.9s.
Ksara PPP = +17m.22s., ePS = +23m.22s., eSS = +28m.6s.
Budapest ePN = +12m.26s., eE = +15m.6s., eN = +27m.7s.
Jena eE = +12m.27s.
Belgrade i = +12m.38s.
Sofia eEN = +22m.48s.
Tucson iP = +12m.38s., i = +12m.44s., +13m.29s., +14m.23s., iPP = +15m.50s., iPPP = +17m.24s., i = +19m.14s., iS = +22m.50s., S_cS = +23m.7s., iPS = +23m.33s., iPPS = +24m.17s., SS = +28m.12s.
Wellington L_q = +37m.57s. ?
Strasbourg ePS = +23m.42s., e = +25m.7s. and +29m.57s.
Helwan PPZ = +16m.12s., pPPZ = +16m.36s., sSE = +23m.46s., PSE = +24m.12s., sSSE = +29m.22s.
Rome iZ = +18m.10s., iE = +23m.24s., eE = +29m.35s., iSSN = +29m.47s., eN = +30m.51s., iSSSE = +33m.34s., iSSSN = +33m.44s.
Florissant iSKKSE = +23m.54s.
St. Louis iE = +24m.2s., ePPSN = +25m.39s., eN = +35m.3s.
San Juan ePP = +20m.19s., SS = +36m.54s.
Huancayo ePKS = +23m.3s., ePPP = +26m.9s., eSKSP = +32m.40s., eSS = +40m.22s., eSSS = +44m.44s.
Long waves were also recorded at Rio de Janeiro, Philadelphia, Jersey, Prague, Bucharest, Heligoland, Almeria, San Fernando, Fort de France, Stonyhurst, Besançon, and Clermont Ferrand.

Feb. 16d. Readings also at 0h. (Vladivostok and Sverdlovsk), 4h. (Tacubaya), 5h. (Tashkent, Tchimkent, Frunse, Vladivostok, and Andijan), 6h. (Rio de Janeiro, Ksara, Tucson, Cape Town, and Huancayo), 7h. (Tiflis and Andijan), 8h. (Tiflis), 10h. (Ksara), 11h. (Fort de France), 12h. (Helwan, Pasadena, Cape Town, Tucson, and La Paz), 15h. (Moncalieri, Chur, La Paz, Huancayo, and Oaxaca), 16h. (Tucson), 17h. (Ottawa), 18h. (near Medan), 19h. (San Juan and Tucson), 20h. (Tucson), 22h. (Oaxaca, Tacubaya, and Mizusawa), 23h. (Tiflis, Mizusawa, and La Paz).

Feb. 17d. 3h. 24m. 24s. Epicentre 42°·1N. 23°·4E.

Intensity V at Rila, Razlog, Bansko, and Beliza; radius of macroseismic area 120km. Also felt in Yugoslavia.

Epicentre Rhodope 42°·1 ± 0°·1N., 23°·4 ± 0°·1E.

K. T. Kirof.

Tremblements de terre en Bulgarie. Liste des tremblements de terre ressentis pendant les annees, 1931-1940. Sofia 1941, p. 76-78.

$A = +\cdot6830$, $B = +\cdot2956$, $C = +\cdot6679$; $\delta = -4$; $h = -2$;
$D = +\cdot397$, $E = -\cdot918$; $G = +\cdot613$, $H = +\cdot265$, $K = -\cdot744$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		0·6	355	i 0 16	+ 1	i 0 28	+ 2	—	—	—
Bucharest		3·0	40	e 1 3	P_g	i 1 45	S_g	—	—	—
Belgrade		3·5	324	e 0 57	0	i 1 32	− 8	i 1 8	P_g	—
Sarajevo		4·0	298	e 1 20	P_g	e 2 13	S_g	—	—	—
Budapest		6·2	332	1 37	+ 2	i 2 52	+ 4	3 24	S_g	e 3·5
Laibach		7·5	305	—	—	e 3 55	S*	e 4 6	S_g	e 4·7
Triest		7·8	300	e 1 59	0	3 28	0	i 2 26	P_g	—
Rome		8·1	272	e 2 17	P*	i 4 2	S*	i 4 35	S_g	i 4·8
Florence		9·1	285	e 3 51	S	(e 3 51)	− 9	5 21	L	(5·3)
Chur		11·0	300	e 2 42	0	—	—	—	—	—
Collmberg		11·6	322	e 2 52	+ 2	—	—	—	—	—
Zurich		11·8	301	e 2 54	+ 1	e 5 42	−24	—	—	—
Jena		12·0	321	—	—	e 6 6	− 5	—	—	e 10·6
Stuttgart		12·0	309	—	—	e 5 6	− 5	e 5 41	SSS	—
Basle		12·4	301	e 3 4	+ 3	e 5 54	SSS	—	—	e 7·1
Ksara		12·8	126	e 2 58	− 8	—	—	e 7 9	SS	—
Strasbourg		12·8	307	i 3 39	+33	e 5 46	SS	—	—	—
Helwan	z.	13·8	150	i 3 18	− 1	—	—	—	—	—

Additional readings:—
Bucharest $iP^*EN = +1m.8s.$, $iP_gEN = +1m.15s.$, $S^*EN = +1m.53s.$, $iEN = +10m.27s.$ and $+10m.30s.$
Belgrade $i = +1m.5s.$, $iS_g = +1m.55s.$, $iSS = +1m.59s.$
Sarajevo $e = +1m.30s.$
Budapest $SSN = +3m.10s.$
Triest $S_g = +4m.23s.$
Jena $eE = +8m.48s.$
Stuttgart $e = +6m.51s.$ and $+7m.4s.$
Strasbourg $e = +4m.30s.$, $+4m.45s.$, $+4m.47s.$, $+5m.18s.$, and $+5m.59s.$, $eS_g = +7m.0s.$, $eSS = +7m.8s.$, $e = +7m.22s.$
Long waves were also recorded at Moncalieri and Cheb.

Feb. 17d. Readings also at 0h. (Mizusawa), 4h. (Mizusawa and Tucson), 6h. (Mizusawa, Tucson, Sofia, and Andijan), 7h. (Andijan, Frunse, Tchimkent, and Almata), 8h. (Samarkand, Balboa Heights, Andijan, and Tucson), 9h. (Grozny and Tiflis), 10h. (Irkutsk, Grozny, Ksara, Helwan, Mizusawa, and Baku), 11h. (Collmberg, Grozny, Ksara, Helwan, Baku, Tiflis, and Sverdlovsk (2)), 13h. (Sofia, Tucson, and Manila), 14h. (Paris and Triest), 15h. (Wellington, Christchurch, Melbourne, Apia, Huancayo, Strasbourg, Tucson, Ksara, Tchimkent, and Vladivostok), 16h. (Pasadena, Kew, Tiflis, and Baku), 17h. (Tchimkent, Andijan, and Frunse), 19h. (Salt Lake City, Mizusawa, Port au Prince, Sverdlovsk, Vladivostok, and Manila), 20h. (Rome, Tiflis, Baku, and Mizusawa), 21h. (Fordham and Mizusawa), 22h. (Tiflis), 23h. (Tiflis and Manila).

Feb. 18d. Readings at 0h. (Sofia and Malabar), 2h. (Fort de France and Tacubaya), 3h. (near Ferndale), 4h. (Pasadena, Mount Wilson, Tinemaha, and Tucson), 5h. (Tucson and Chicago), 6h. (Grozny and Tiflis), 8h. (Ksara), 9h. (Almata, Frunse, and Mizusawa (2)), 11h. (Fordham and Mizusawa), 13h. (Mizusawa), 15h. (Platigorsk), 17h. (Hukuoka and Mizusawa), 20h. (Frunse, Samarkand, and Andijan), 21h. (Tacubaya).

Feb. 19d. Readings at 0h. (Moncalieri), 1h. (Tiflis), 2h. (Tiflis), 3h. (La Paz, Mount Wilson, and Tinemaha), 4h. (Cape Town), 8h. (Mizusawa, New Plymouth, and near Wellington), 11h. (Frunse, Almata, Andijan, and Tucson), 12h. (Ksara, Huancayo, La Paz, and Tiflis), 13h. (Samarkand, Weston, Williamstown, Fordham, La Jolla, Riverside, Andijan, Tucson, Mount Wilson, Tinemaha, and Pasadena), 15h. (Tucson), 16h. (Tucson (4), Riverside, Pasadena, Mount Wilson, and Tinemaha), 17h. (Chicago and Balboa Heights), 19h. (Tucson and Berkeley), 21h. (Medan), 23h. (Malabar).

Feb. 20d. 3h. 45m. 32s. Epicentre 7·2S. 154°·6E.

$A = -\cdot 8963$, $B = +\cdot 4256$, $C = -\cdot 1245$; $\delta = -1$; $h = +7$;
$D = +\cdot 429$, $E = +\cdot 903$; $G = +\cdot 112$, $H = -\cdot 053$, $K = -\cdot 992$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		20·2	184	i 4 34	− 5	i 8 22	+ 1	—	—	—
Riverview	N.	26·7	186	e 5 40	− 3	e 10 6	−11	i 6 11	PP	e 13·1
Sydney		26·7	186	e 4 49	−54	e 10 25	+ 8	—	—	—
Adelaide		31·3	206	e 6 18	− 6	12 26	+55	i 8 2	PPP	16·3
Melbourne		31·7	194	—	—	i 11 48	+11	i 13 35	SS	15·8
Wellington		38·4	156	e 7 28	+ 3	14 13	+53	i 8 56	PP	18·5
Manila		39·3	304	i 7 38k	+ 6	13 55	+21	—	—	—
Christchurch		39·5	159	7 42a	+ 8	13 34	− 3	16 57	SeS	19·3
Perth		43·7	231	i 11 36	?	14 33	− 6	17 34	SS	20·5
Batavia		47·4	269	8 36	− 2	e 15 40	+ 8	i 10 5	PP	—
Hong Kong		49·3	309	8 54	+ 1	16 8	+ 9	10 29	PP	—
Phu-Lien		54·7	303	e 9 33	0	17 21	+ 8	—	—	—
Medan	E.	56·8	280	e 9 50	+ 2	i 18 48	+67	i 13 39	PPP	—
Calcutta	N.	71·2	297	—	—	i 20 54	+14	—	—	—
Colombo	E.	75·8	279	11 51	+ 1	—	—	—	—	—
Kodaikanal	E.	78·4	283	e 12 28?	+24	—	—	—	—	—
Agra	E.	81·5	300	12 17	− 4	22 33	+ 1	—	—	—
Bombay		84·6	290	e 12 38	+ 2	i 23 3	0	—	—	—
Almata		86·0	315	e 12 39	− 4	—	—	—	—	—
Frunse		87·6	314	e 12 56	+ 5	23 38	+ 6	—	—	—
Andijan		88·8	312	—	—	e 23 53	+ 9	—	—	—
Santa Barbara		90·5	56	e 13 4	− 1	—	—	—	—	—
Pasadena		91·7	56	i 13 9k	− 1	—	—	—	—	e 41·7
Mount Wilson		91·8	56	i 13 9k	− 2	—	—	i 39 15	P'P'	—
Tinemaha		92·0	53	e 13 12	0	—	—	—	—	—
La Jolla		92·3	57	e 13 14	+ 1	—	—	—	—	—
Riverside	E.	92·4	56	e 13 12	− 2	—	—	—	—	—
Tucson		97·6	58	i 13 40	+ 2	—	—	i 17 32	PP	i 44·2
Sverdlovsk		98·2	326	13 37	− 3	—	—	17 41	PP	40·5
Tiflis		109·5	311	e 18 52	PP	e 28 28	PS	—	—	—
Ksara		117·8	303	i 20 6k	PP	—	—	e 21 40	PPP	62·5
Helwan	Z.	122·3	300	18 57	[0]	—	—	e 20 37	PP	—
Ottawa		122·3	39	e 18 55	[− 2]	—	—	—	—	57·5
Williamstown		125·1	41	i 19 2	[− 1]	—	—	—	—	e 59·5
Weston		125·6	41	i 19 4	[0]	e 26 5	[− 3]	e 37 27	SS	e 59·3
Collmberg		125·8	330	e 19 2	[− 2]	—	—	e 20 56	PP	—
Huancayo		126·8	110	e 15 13	P	e 32 51	PPS	e 20 47	PP	e 52·6
Strasbourg		130·1	331	e 19 28?	[+16]	—	—	—	—	—
Zurich		130·6	330	e 19 13	[0]	—	—	—	—	—
La Paz	Z.	131·6	119	19 14	[− 1]	—	—	i 22 44	?	—
Rome		131·9	321	i 19 16a	[0]	i 27 33	[+68]	i 21 38	PP	e 57·5
Toledo		142·2	332	e 19 33	[− 1]	—	—	—	—	—
Almeria		143·8	327	e 19 36	[− 1]	—	—	—	—	—
Fort de France		144·1	75	e 19 34	[− 4]	—	—	—	—	—
Granada	E.	144·2	329	i 19 41	[+ 3]	—	—	—	—	—
San Fernando		146·0	332	e 19 46	[+ 5]	—	—	—	—	—

Additional readings :—
Riverview eN = +10m.20s., SSN = +10m.31s.
Melbourne e = +10m.43s., i = +15m.10s.
Wellington i = +16m.8s.
Christchurch L_q = +16m.21s.
Perth i = +12m.3s. and +13m.6s., SSS = +18m.28s.

Continued on next page.

Batavia PE = +8m.40s., eE = +14m.32s.
Hong Kong SS = +18m.50s.
Tucson iPP = +17m.49s., iPPP = +19m.34s.
Tiflis eN = +19m.16s., eE = +23m.20s., ePSE = +28m.34s.
Ksara ePS = +31m.38s., PPS = +32m.58s.
Huancayo eSSS = +41m.5s.
Rome iSKPZ = +22m.45s., iZ = +23m.25s., iE = +23m.33s., iZ = +23m.49s., iN = +25m.0s., +30m.50s., +37m.34s., and +45m.24s.?
Toledo e = +19m.38s.
Granada iE = +21m.44s.
San Fernando eSN = +20m.27s.
Long waves were also recorded at Ukiah, Berkeley, Honolulu, East Machias, College, and Uccle.

Feb. 20d. Readings also at 2h. (Medan, Batavia, Manila, and Tucson), 3h. (Tucson), 5h, (near Fresno, Lick, Mount Wilson, Pasadena, and Tucson (2)), 8h. (Erevan, Grozny, and Tiflis), 9h. (Fort de France and Tiflis), 10h. (Grozny), 13h. (Basle, Neuchatel, and Zurich), 15h. (Tinemaha, Mount Wilson, and Pasadena), 16h. (Tananarive, Ksara, Bombay, Kodaikanal, and Colombo), 17h. (Vladivostok, Sverdlovsk, Agra, Wellington, and Tucson), 19h. (Merida, Tacubaya, and Tucson), 21h. (near Balboa Heights), 22h. (Grozny and Mizusawa), 23h. (Mizusawa, Mount Wilson, Fordham, Weston, and Riverside).

Feb. 21d. Readings at 0h. (Tucson), 3h. (Almata, Andijan, Frunse, Tiflis, Erevan, and Ksara), 4h. (Mizusawa), 6h. (Malabar), 7h. (Andijan), 8h. (Almata, Andijan, Tchimkent, and Samarkand), 9h. (Fresno, La Paz, Berkeley, near Lick, and Branner), 10h. (Fort de France), 12h. (Pasadena, Riverside, Tinemaha, Almata, and Mount Wilson), 13h. (Tucson), 16h. (Calcutta), 17h. (Christchurch), 19h. (Balboa Heights), 22h. (Apia, Tucson, and Mount Wilson).

Feb. 22d. Readings at 0h. (Mizusawa and Fort de France), 1h. (Andijan, Almata, Samarkand, Bombay, Kodaikanal, and Agra), 2h. (near Malabar), 4h. (San Juan), 9h. (near Apia), 10h. (Chicago and Tucson), 11h. (Mizusawa), 15h. (Tucson, Tinemaha, Riverside, Mount Wilson, and Pasadena), 17h. (Sofia), 22h. (near Medan).

Feb. 23d. 8h. 45m. 49s. Epicentre 34°·8N. 119°·0W. (given by Pasadena).

$A = -\cdot3990$, $B = -\cdot7199$, $C = +\cdot5681$; $\delta = +19$; $h = 0$;
$D = -\cdot875$, $E = +\cdot485$; $G = -\cdot275$, $H = -\cdot497$, $K = -\cdot823$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		0·7	238	i 0 16	− 1	—	—	—	—	—
Pasadena		0·9	133	i 0 21	+ 1	i 0 35	+ 1	—	—	—
Mount Wilson		1·0	127	i 0 21	0	i 0 36	0	—	—	—
Riverside		1·6	121	i 0 30	0	i 0 52	+ 1	—	—	—
Fresno	N.	2·0	342	i 0 35	0	i 1 0	− 2	i 0 41	P_g	—
La Jolla		2·4	143	i 0 43	+ 2	i 1 12	0	—	—	—
Tinemaha		2·4	14	i 0 42	+ 1	i 1 12	0	—	—	—
Lick		3·3	322	e 0 56	+ 3	e 1 33	− 2	—	—	—
Santa Clara		3·5	318	i 1 5	P*	e 1 44	+ 4	—	—	—
Branner		3·6	317	e 0 58	0	1 50	S*	i 1 16	P_g	—
Berkeley		4·0	321	e 1 2	− 2	i 1 50	− 2	e 1 17	P_g	—
San Francisco		4·1	319	e 1 22	P_g	i 1 50	− 5	i 2 17	S_g	—
Tucson		7·3	108	1 52	+ 2	i 3 29	S*	i 2 27	P_g	i 4·8

Additional readings :—
Branner iE = +2m.14s., iN = +2m.22s.
Berkeley eE = +1m.27s., iSE = +1m.59s., iN = +2m.17s., iE = +2m.23s. and +4m.40s.
Tucson iP = +2m.23s., i = +2m.34s., iS = +3m.44s., i = +3m.56s. and +4m.5s., iS_g = +4m.12s.

Feb. 23d. 9h. 18h. 44s. Epicentre 34°·8N. 119°·0W. (as at 8h.).

A = −·3990, B = −·7199, C = +·5681 ; δ = +19 ; h = 0.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		0·7	238	0 17	0	i 0 26	− 2	—	—	—
Pasadena		0·9	133	i 0 21$_a$	+ 1	i 0 35	+ 1	—	—	—
Mount Wilson		1·0	127	i 0 21	0	i 0 35	− 1	—	—	—
Riverside		1·6	121	i 0 31	+ 1	i 0 52	+ 1	—	—	—
Fresno	N.	2·0	342	i 0 36	+ 1	i 1 0	− 2	—	—	—
La Jolla		2·4	143	i 0 41	0	i 1 12	0	—	—	—
Tinemaha		2·4	14	e 0 41	0	i 1 13	+ 1	—	—	—
Lick		3·3	322	e 0 55	+ 2	i 1 48	S_g	—	—	—
Santa Clara	E.	3·5	318	e 1 24	+27	i 2 3	S_g	—	—	—
Branner		3·6	317	e 0 59	+ 1	i 2 9	S_g	1 14	P_g	—
Berkeley		4·0	321	e 1 3	− 1	e 1 50	− 2	i 1 12	P*	—
San Francisco		4·1	319	i 1 21	P_g	2 16	S_g	—	—	—
Tucson		7·3	108	e 1 48	− 2	3 15	0	i 2 5	P*	4·3

Additional readings :—
Branner iN = +1m.22s.
Berkeley eE = +1m.22s., iN = +1m.43s.
Tucson P = +1m.52s., iP = +1m.58s., iP$_g$ = +2m.24s., iS = +3m.43s., iS$_g$ = +4m.1s.

Feb. 23d. 10h. 7m. 0s. Epicentre 12°·8N. 146°·2E.

A = −·8106, B = +·5426, C = +·2201 ; δ = −7 ; h = +6 ;
D = +·556, E = +·831 ; G = −·183, H = +·122, K = −·975.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Miyakozima		23·1	304	4 40	−28	—	—	—	—	—
Tokyo Cen. Met. Ob.		23·5	347	5 21	+ 9	—	—	—	—	—
Osaka		23·8	338	5 16	+ 1	8 24	−64	—	—	—
Kumamoto		24·5	327	5 11	−11	—	—	—	—	—
Manila		24·6	277	e 5 24$_k$	+ 1	i 10 5	+23	—	—	13·0
Nagano		24·8	346	5 25	0	9 43	− 3	—	—	—
Zi-ka-wei	Z.	29·3	313	e 6 4	− 2	10 42	−17	i 7 0	PP	—
Hong Kong		31·9	292	6 28	− 1	11 49	+ 9	7 30	PP	—
Brisbane		40·6	170	—	—	i 14 0	+ 6	—	—	—
Riverview	N.	46·6	174	—	—	e 19 6	SSS	—	—	e 23·3
Melbourne		50·4	181	—	—	e 16 25	+11	—	—	27·3
Calcutta	N.	55·7	289	e 13 29	PPP	—	—	—	—	—
Bombay		70·4	285	e 11 18	0	e 20 28	− 2	e 21 21	PPS	—
Tashkent		71·9	309	i 11 23	− 4	—	—	e 14 0	PP	e 36·0
Sverdlovsk		77·0	326	e 12 0?	+ 4	e 22 0?	+15	—	—	37·0
Santa Barbara		86·2	56	e 12 47	+ 3	—	—	—	—	—
Baku		86·5	310	e 12 47	+ 1	e 23 25	+ 3	24 28	PS	46·0
Tinemaha		86·7	53	e 12 48	+ 1	—	—	—	—	—
Pasadena		87·5	55	i 12 51	0	—	—	—	—	e 43·0
Mount Wilson		87·6	55	i 12 51	0	—	—	—	—	—
Riverside		88·2	55	i 12 53	− 1	—	—	—	—	—
La Jolla		88·5	57	e 12 56	0	—	—	—	—	—
Tiflis		89·9	313	e 12 59	− 3	e 23 32	[0]	—	—	e 47·0
Tucson		93·9	55	13 21$_k$	0	—	—	17 5	PP	i 40·1
Ksara		99·2	307	e 17 28	PP	e 28 8	PPS	—	—	—
Rome		110·9	324	(e 18 33)	[− 2]	e 35 23?	SSP	e 38 30?	SSS	e 59·0
Huancayo		138·9	93	e 16 0?	P	—	—	—	—	—
La Paz	Z.	146·6	101	19 48	[+ 6]	—	—	—	—	64·0

Additional readings :—
Melbourne i = +23m.50s.
Tucson iP = +13m.28s., PP = +17m.18s.
Rome eS = +44m.3s.?, PKP reading has been reduced by 10m.
Long waves were also recorded at Pulkovo, Phu-Lien, and Wellington.

Feb. 23d. 15h. 40m. 46s. Epicentre 42°·5N. 82°·5E.

$A = +·0965$, $B = +·7332$, $C = +·6731$; $\delta = -4$; $h = -3$;
$D = +·991$, $E = -·131$; $G = +·088$, $H = +·667$, $K = -·740$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		4·2	284	i 1 4	− 3	1 51	− 6	1 12	P*	—
Frunse		5·8	266	1 28	− 1	2 34	− 4	1 43	P*	—
Andijan		7·8	260	1 58	0	e 3 26	− 2	e 2 15	P*	—
Semipalatinsk		8·1	351	2 4	+ 2	3 32	− 3	—	—	—
Tchimkent		9·6	275	2 19	− 2	e 4 49	S*	—	—	—
Tashkent		9·9	265	i 2 23	− 2	e 4 14	− 6	—	—	4·4
Samarkand		12·0	263	2 54	− 1	5 2	− 9	—	—	—
Dehra Dun	N.	12·6	197	e 5 44	SS	—	—	—	—	e 8·9
Agra	E.	15·8	195	e 3 45	0	i 6 32	−10	e 4 4	PP	—
Sverdlovsk		20·0	325	i 5 14?	PP	8 33	+16	10 26	L_q	12·0
Calcutta	N.	20·5	164	e 4 51	+ 9	i 8 31	+ 4	e 5 11	PPP	e 10·1
Baku		24·5	277	5 30	+ 8	i 9 44	+ 4	—	—	e 12·9
Bombay		24·9	202	i 5 31	+ 5	i 10 2	+15	i 6 7	PP	13·2
Hyderabad		25·2	190	5 35	+ 6	10 0	+ 8	—	—	12·8
Grozny		26·8	285	e 5 41	− 3	e 11 28	SS	e 7 7	PP	—
Tiflis		27·8	282	5 51	− 2	e 10 33	− 2	—	—	10·9
Erevan		28·4	279	e 3 50	?	e 9 50	−55	—	—	—
Moscow		31·6	311	e 6 23	− 3	11 28	− 7	—	—	15·7
Kodaikanal	E.	32·5	190	e 7 56	PP	i 13 24	SS	i 15 0	SSS	17·6
Zi-ka-wei	Z.	32·9	97	—	—	e 14 14	SS	—	—	—
Colombo	E.	35·5	185	—	—	e 12 44	+ 8	—	—	—
Pulkovo		35·9	318	e 7 1	− 3	e 12 37	− 5	—	—	e 16·0
Ksara		37·3	272	e 7 22	+ 6	e 13 26	+22	e 8 44	PP	—
Upsala		42·3	318	—	—	e 18 31	SSS	—	—	e 21·3
Helwan		42·6	271	e 8 5	+ 6	e 14 20	− 3	i 9 35	PP	—
Manila		43·2	119	14 3	S	(14 3)	−29	18 50	SS	—
Prague		46·2	306	—	—	e 21 38	?	—	—	e 23·4
Collmberg		46·6	307	i 8 30	− 2	e 18 56	SS	i 10 45	PPP	e 24·1
Cheb		47·4	306	—	—	e 12 14	?	—	—	e 24·2
Hamburg		47·7	311	—	—	e 20 14?	SSS	—	—	e 24·4
Triest		48·1	300	e 11 7	PPP	—	—	—	—	i 27·0
Rome		50·5	294	e 6 50	?	i 16 11	− 5	10 30	PP	29·6

Additional readings :—
Almata S = +1m.31s., S* = +1m.41s.
Frunse i = +1m.53s., +2m.6s., +2m.34s., and +2m.46s., S_g = +2m.51s.
Andijan e = +2m.23s., P_g = +2m.28s., e = +2m.46s., S_g = +3m.59s.
Tchimkent e = +3m.23s. and +3m.48s.
Dehra Dun iSN?. = +7m.23s.
Agra iE. = +7m.4s.
Calcutta iSSN = +9m.12s.
Bombay SSEN = +11m.17s., iEN = +11m.44s.
Grozny e = +14m.14s.
Tiflis eEN = +6m.17s., eZ = +6m.33s., eZ = +10m.25s., eE = +10m.37s.
Prague e = +22m.57s.
Collmberg i = +8m.39s. and +8m.52s., iZ = +9m.32s., i = +10m.55s., e = +11m.58s., +13m.43s., +14m.44s., and +22m.20s.
Rome PP = +8m.58s., i = +9m.58s., eS = +14m.54s., iSS = +19m.2s., i = +20m.3s.
Long waves were also recorded at De Bilt, Strasbourg, Stuttgart, Göttingen, Bergen, Jena, Uccle, Edinburgh, Kew, Cape Town, and Phu-Lien.

Feb. 23d. Readings also at 0h. (Ksara, Riverside, Mount Wilson, Pasadena, Tucson, Tinemaha, Christchurch, Wellington, Collmberg, and Melbourne), 3h. (Tucson), 5h. (Samarkand, Tchimkent, Andijan, and Mizusawa), 6h. (Andijan and Huancayo), 7h. (Andijan, Tchimkent, Samarkand, Tiflis, and Frunse), 8h. (Huancayo), 11h. (Andijan and Wellington), 13h. (La Plata and La Paz), 14h. (Göttingen), 15h. (Wellington), 16h. (Erevan and Ksara), 17h. (Helwan, East Machias, and Tiflis (2)), 18h. (Tiflis and Mizusawa), 19h. (Tiflis, Mizusawa, Stonyhurst, Weston, Tucson, and Fordham), 23h. (Balboa Heights, Hastings, Bunnythorp, Tuai, Stratford, New Plymouth, Brisbane, Riverview, Christchurch, Wellington, and Ksara).

Feb. 24d. 14h. 15m. 45s. Epicentre 54°·0N. 162°·4W.

Pasadena suggests depth 70kms.

$A = -\cdot5628$, $B = -\cdot1785$, $C = +\cdot8071$; $\delta = +2$; $h = -7$;
$D = -\cdot302$, $E = +\cdot953$; $G = -\cdot769$, $H = -\cdot244$, $K = -\cdot590$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		13·1	28	e 3 14	+ 4	e 5 43	+ 5	—	—	e 6·9
Sitka		15·6	68	i 3 44	+ 1	i 6 45	+ 8	—	—	i 7·1
Victoria		24·9	86	e 5 15	−11	9 45	− 2	10 39	SS	11·7
Seattle		25·8	87	e 6 35	PP	e 10 15	+13	—	—	11·7
Ukiah		30·3	102	e 7 40	PPP	e 11 25	+10	—	—	e 13·2
Honolulu		32·8	170	—	—	e 12 37	+43	—	—	e 14·4
Tinemaha		34·6	100	i 6 54	+ 1	e 13 22	+60	—	—	—
Santa Barbara		35·6	104	i 7 2	+ 1	—	—	—	—	—
Mount Wilson		36·7	103	e 7 11	+ 1	—	—	—	—	—
Pasadena		36·7	103	i 7 10	0	e 12 55	+ 1	i 9 47	P_cP	e 15·4
Riverside		37·3	103	i 7 17	+ 1	—	—	—	—	—
La Jolla		38·1	104	i 7 24	+ 2	—	—	—	—	—
Mizusawa		40·4	272	7 43	+ 2	10 35	?	—	—	—
Tucson		42·3	98	i 7 57k	0	i 14 19	0	i 8 27	pP	e 16·6
Vladivostok		43·3	284	i 9 6	PP	e 14 45	+12	i 19 7	SSS	21·0
Chicago		49·3	72	—	—	i 15 53	− 6	—	—	e 19·9
Florissant		49·8	77	i 8 54	− 2	—	—	i 9 8	pP	—
Cape Girardeau		51·3	78	e 9 0	− 8	e 16 14	−14	e 9 17	pP	—
Little Rock		51·4	82	e 9 5	− 4	—	—	e 9 27	pP	—
Ottawa		53·4	61	i 9 20	− 4	e 16 45	−10	e 20 15?	SS	26·2
Shawinigan Falls		54·1	58	e 9 25	− 4	e 17 21	+16	—	—	—
Seven Falls		54·7	56	e 9 21	−12	e 16 57	−16	e 20 45	SS	25·2
Vermont		55·3	60	—	—	e 16 55	−26	—	—	e 27·0
Williamstown		56·5	61	i 9 44	− 2	e 17 43	+ 6	i 11 48	PP	e 27·2
Philadelphia		57·4	65	—	—	e 17 34	−15	e 21 43	SS	e 24·4
Fordham		57·5	63	i 9 50	− 3	i 18 10	+20	i 10 3	pP	—
Harvard		57·5	61	i 9 50	− 3	—	—	—	—	e 32·2
Zi-ka-wei	z.	57·5	280	i 9 55	+ 2	—	—	—	—	29·6
Weston		57·7	61	i 9 52	− 3	e 17 45	− 8	i 10 5	pP	e 29·1
East Machias		58·0	56	—	—	e 18 13	PS	—	—	e 26·5
Sverdlovsk		64·1	336	i 10 15?	−23	e 18 33	−41	—	—	26·2
Pulkovo		66·1	353	e 10 52	+ 1	e 19 35	− 4	—	—	e 30·7
Hong Kong		68·5	278	—	—	20 9	+ 1	—	—	—
Moscow		69·4	348	e 11 11	− 1	20 13	− 5	—	—	36·7
Manila		70·5	268	e 11 3	−15	20 40	+ 8	—	—	—
Almata		70·6	319	e 11 19	0	—	—	—	—	—
Frunse		71·9	320	e 11 28	+ 1	20 50	+ 2	—	—	—
Kew		73·5	11	—	—	i 21 6	0	—	—	e 40·2
Tchimkent		74·2	323	11 40	0	i 21 13	− 1	—	—	—
Andijan		74·6	320	e 11 44	+ 1	21 20	+ 2	—	—	—
Collmberg		75·0	3	i 11 45	0	e 21 18	− 5	—	—	—
Uccle		75·0	9	i 11 48	+ 3	e 21 51	PS	—	—	e 34·2
Tashkent		75·2	323	e 11 44	− 2	e 21 23	− 2	—	—	e 36·7
Jena		75·3	4	e 11 45	− 2	—	—	—	—	—
Cheb		76·2	4	—	—	e 21 15?	−21	—	—	—
Samarkand		77·5	324	e 11 59	0	—	—	—	—	—
Basle		78·5	8	e 12 4	0	—	—	—	—	—
Zurich		78·7	7	e 12 3	− 3	—	—	—	—	—
San Juan		78·9	74	—	—	e 21 46	−19	e 22 50	PS	e 32·6
Chur		79·2	6	e 12 10	+ 2	—	—	—	—	—
Grozny		80·1	340	e 12 16	+ 3	e 22 16	− 2	—	—	—
Triest		80·7	3	e 12 18	+ 2	i 22 20	− 4	i 23 5	PS	—
Bucharest		81·7	354	—	—	i 22 31	− 3	—	—	—
Tiflis		81·8	340	i 12 24	+ 2	i 22 34	− 1	e 12 43	pP	e 38·2
Baku		82·0	336	i 12 28	+ 5	22 39	+ 2	—	—	39·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Agra	E.	83·9	309	12 30	− 3	i 22 50	− 6	—	—	—
Rome		84·4	4	e 18 54	?	e 22 50	[− 7]	i 23 36	PS	e 35·4
Fort de France		84·7	72	—	—	e 23 11	+ 7	—	—	—
Toledo		84·7	17	e 12 39	+ 2	—	—	—	—	—
Ksara		91·1	347	e 13 31	+23	e 25 55	PPS	—	—	—
Bombay		93·4	309	—	—	e 23 46	[− 6]	—	—	—
Helwan		95·6	348	—	—	e 24 39	− 4	—	—	—
La Paz	Z.	105·7	96	e 19 27	PP	e 24 37	[−17]	—	—	—

Additional readings :—
Ukiah esS = +11m.40s.
Pasadena iNZ = +7m.27s., iS_cPZ = +13m.16s.
Riverside iZ = +7m.30s.
La Jolla iZ = +7m.37s.
Mizusawa SN = +10m.42s.
Vladivostok e = +11m.17s., +12m.7s., and +15m.14s., i = +19m.28s. and +19m.33s.
Tucson iP = +8m.9s., i = +8m.51s. and +9m.13s., iPP = +9m.49s., ipPP = +9m.57s., iPPP = +10m.15s., iP_cS = +13m.38s., isS = +14m.41s., S_cS = +17m.54s.
Florissant ePPE = +10m.53s.
Cape Girardeau eP_cPN = +9m.49s., eN = +11m.14s. and +18m.47s.
Philadelphia eS = +17m.43s., esS = +18m.7s.
Fordham iSS = +21m.54s.
Harvard iEZ = +10m.4s.
Weston iPSN = +18m.12s., eSSN = +21m.47s., eL_qN = +26m.7s.
Manila iZ = +11m.19s.
Collmberg iZ = +11m.55s., +12m.6s. and +12m.17s., i = +12m.38s. and +12m.44s., e = +13m.4s. and +13m.49s.
Jena eN = +11m.49s.
Basle e = +12m.18s.
Zurich e = +12m.17s.
San Juan eS_cS = +21m.59s., esS = +22m.21s., eSPS = +13m.15s.
Toledo i = +12m.51s.
Long waves were also recorded at Melbourne, Riverview, Brisbane, Bidston, Stonyhurst, Santa Clara, Stuttgart, San Fernando, Paris, and De Bilt.

Feb. 24d. Readings also at 0h. (Weston, Fordham, and La Paz), 1h. (Mizusawa), 2h. (Tucson and Balboa Heights), 4h. (Christchurch and Monowai), 5h. (near Lick, Berkeley, San Francisco, Branner, near Fresno, Copenhagen, and Andijan), 6h. (Frunse, Andijan, Balboa Heights, Tchimkent, and Samarkand), 8h. (Balboa Heights), 9h. (near Mizusawa), 10h. (Tucson, Tananarive, and La Paz), 11h. (Pasadena, La Paz, Brisbane, Riverview, Melbourne, Samarkand, Almata, Tchimkent, Andijan, Sverdlovsk, and Tashkent), 12h. (Grozny, Tucson, Riverside, Pasadena, and Mount Wilson), 13h. (Mizusawa), 16h. (Mizusawa, Tiflis, and Grozny), 17h. (Tananarive), 18h. (Andijan and Samarkand), 19h. (near Taihoku), 20h. (Almata, near Malabar, Vladivostok, Baku, Semipalatinsk, Andijan (2), Samarkand, Tashkent, Sverdlovsk, and Tchimkent), 21h. (La Paz), 22h. (Tiflis, Tchimkent, Samarkand, and Andijan), 23h. (Andijan, Samarkand, Tchimkent, Tiflis (2), and Balboa Heights).

Feb. 25d. 5h. 5m. 8s. Epicentre 21°·0N. 60°·0E.

A = +·4672, B = +·8092, C = +·3563; δ = +3; h = +4;
D = +·866, E = −·500; G = +·178, H = +·309, K = −·934.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		12·2	98	—	—	e 5 47	+31	—	—	—
Agra	E.	17·5	66	—	—	e 6 34	−47	—	—	—
Samarkand		19·5	16	e 4 7	−24	7 26	−40	—	—	—
Baku		21·2	338	e 4 48	− 1	7 48	−53	—	—	9·6
Tashkent		21·7	20	e 4 37	−18	i 8 51	0	—	—	—
Andijan		22·4	26	e 4 58	− 4	e 9 37	+33	—	—	—
Tchimkent		22·7	19	4 44	−20	e 8 43	−26	—	—	—
Tiflis		24·3	331	5 11	− 9	—	—	—	—	e 10·7
Ksara		24·8	305	6 9	+44	10 1	+15	—	—	—
Frunse		25·0	27	e 5 28	+ 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grozny		25·2	335	e 5 31	+ 2	e 8 29	−·83	—	—	—
Almata		26·3	29	e 5 54	+15	—	—	—	—	—
Helwan		27·3	294	i 6 49a	+61	—	—	—	—	e 12·3
Semipalatinsk		33·4	24	e 6 55	+13	—	—	—	—	—
Sverdlovsk		35·8	0	i 7 1	− 2	11 28	?	15 28	L_q	17·6
Moscow		38·5	341	e 7 30	+ 4	—	—	—	—	20·4
Pulkovo		44·1	339	e 8 20	+ 8	—	—	—	—	20·4
Collmberg		47·4	320	i 9 1	+23	—	—	—	—	—

Additional readings :—
Tashkent e = +5m.18s., +7m.6s., +7m.48s., and +8m.17s.
Tiflis eEZ = +8m.13s.
Helwan eE = +11m.16s.
Long waves were recorded at Calcutta and Vladivostok.

Feb. 25d. Readings also at 1h. (Almata, Andijan, Frunse, and Samarkand), 3h. (Kodaikanal), 4h. (Tucson), 5h. (Balboa Heights), 6h. (near Mizusawa and near Semipalatinsk), 7h. (La Paz), 8h. (near Granada), 9h. (Balboa Heights), 10h. (Andijan, Samarkand, Semipalatinsk, Sverdlovsk, Tashkent, Almata, Tiflis, and Frunse), 11h. (Tucson, Haiwee, La Jolla, Pasadena, Mount Wilson, and Riverside), 12h. (Frunse, Samarkand, and near Andijan), 13h. (Riverside), 15h. (near Erevan and Tiflis), 17h. (Tiflis), 20h. (near Hukuoka and near La Paz), 21h. (Tucson), 22h. (near Mizusawa), 23h. (Tucson).

Feb. 26d. 10h. 28m. 59s. Epicentre 12°·4N. 141°·8E.

A = −·7678, B = +·6042, C = +·2134 ; δ = +11 ; h = +6 ;
D = +·618, E = +·786 ; G = −·168, H = +·132, K = −·977.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		20·4	278	i 4 42a	+ 1	8 57	SS	—	—	11·7
Yakusima		20·9	333	4 42	− 4	8 39	+ 4	—	—	—
Miyazaki		21·6	336	4 58	+ 4	8 53	+ 4	—	—	—
Muroto		21·9	343	4 58	+ 1	8 43	−11	—	—	—
Sumoto		22·7	348	5 4	0	9 14	+ 5	—	—	—
Nagoya		23·1	352	5 27	+19	—	—	—	—	—
Hamada		24·1	340	5 24	+ 6	9 37	+ 3	—	—	—
Hukusima		25·3	358	5 27	− 3	10 3	+ 9	—	—	—
Zi-ka-wei	Z.	26·5	319	i 5 43	+ 2	i 10 49	SS	—	—	i 13·8
Hong Kong		28·1	295	5 54	− 1	10 51	+11	6 42	PP	14·5
Phu-Lien		34·7	289	6 54	0	e 12 30	+ 6	—	—	—
Batavia		39·4	245	e 7 31	− 2	i 16 22	SS	i 9 42	PPP	—
Brisbane	N.	41·1	164	—	—	i 14 7	+ 6	e 17 37	SSS	—
Medan	E.	43·5	263	e 5 51	?	—	—	—	—	—
Calcutta	N.	51·7	289	i 9 14	+ 3	i 16 30	− 2	—	—	—
Kodaikanal	E.	63·0	276	e 8 1?	?	—	—	—	—	—
Almata		63·3	313	e 10 31	− 2	—	—	—	—	—
Frunse		65·0	312	e 10 45	+ 1	—	—	—	—	—
Andijan		66·4	310	e 10 58	+ 5	—	—	—	—	—
Bombay		66·4	286	e 10 54	+ 1	e 19 53	+10	—	—	—
Tchimkent		68·6	311	e 11 11	+ 4	—	—	—	—	—
Tashkent		68·8	310	i 11 8	0	e 20 24	+13	—	—	e 34·0
College		70·5	25	—	—	e 20 59	PS	—	—	—
Samarkand		70·5	308	e 11 40	+22	—	—	—	—	—
Sverdlovsk		74·9	326	e 11 44	0	21 15	− 7	—	—	35·0
Baku		83·5	310	i 12 34	+ 3	e 22 19	−33	—	—	e 45·0
Tiflis		86·9	312	e 12 49	+ 1	—	—	e 15 58	PP	e 45·0
Moscow		87·7	327	e 12 48	− 4	—	—	—	—	—
Pulkovo		89·8	332	e 12 58	− 4	—	—	—	—	—
Mount Wilson	Z.	91·3	55	i 13 10	+ 1	—	—	—	—	—
Pasadena	Z.	91·3	55	e 13 9	0	—	—	—	—	—
Riverside	Z.	91·9	55	i 13 12	+ 1	—	—	—	—	—
Ksara		96·0	306	e 13 31	+ 1	e 26 29	PS	i 17 31	PP	—
La Paz	Z.	150·8	102	e 20 7	[+19]	—	—	—	—	—

Additional readings :—
Hong Kong ? = +11m.10s., SS = +12m.42s.
Ksara ePPS = +27m.15s.

Feb. 26d. 23h. 27m. 25s. Epicentre 28°·0N. 114°·5W. (Epicentre as given by J.S.A.).

$A = -\cdot3667$, $B = -\cdot8047$, $C = +\cdot4670$; $\delta = +10$; $h = +2$;
$D = -\cdot910$, $E = +\cdot415$; $G = -\cdot194$, $H = -\cdot425$, $K = -\cdot884$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		5·3	37	i 1 11k	−11	i 1 29	−56	—	—	i 2·1
La Jolla		5·4	335	e 1 35	P*	i 3 9	S_g	—	—	—
Riverside		6·5	339	i 1 33	− 6	e 3 4	+ 9	—	—	—
Mount Wilson		6·9	334	e 1 52	+ 7	e 3 22	S*	—	—	—
Pasadena		6·9	334	i 1 50	+ 5	—	—	—	—	e 3·0
Haiwee		8·6	341	e 2 26	P*	e 4 26	S*	—	—	—
Tinemaha		9·6	342	i 2 30	+ 9	e 4 54	S*	—	—	—
Fresno	N.	9·8	334	e 2 35	+11	—	—	—	—	e 5·4
Berkeley		11·8	328	e 3 41	+48	e 5 41	SSS	—	—	e 5·9
Salt Lake City		12·9	10	e 3 10	+ 3	e 4 31	−62	—	—	e 6·3
Ukiah		13·3	329	—	—	e 5 35?	− 7	—	—	—
Denver		14·1	32	e 2 21	−62	e 6 20	SS	—	—	i 6·8
Tacubaya	N.	16·4	118	e 4 13?	PP	—	—	—	—	—
Bozeman		17·9	9	e 4 9	− 3	—	—	—	—	e 9·7
Butte		18·0	7	e 4 12	− 1	e 7 30	− 2	—	—	e 9·3
Little Rock		20·0	65	i 5 41	+64	i 9 30	?	—	—	—
Victoria		21·5	345	—	—	e 8 35	−12	—	—	11·6
Florissant		22·8	56	i 5 5	0	e 9 7	− 4	e 5 30	PP	—
Cape Girardeau	E.	22·9	60	e 5 3	− 3	e 9 12	− 1	i 10 39	SS	—
Chicago		25·9	50	—	—	e 9 5	−59	—	—	e 13·0
Toronto		32·2	51	—	—	e 14 17	SSS	—	—	17·1
Ottawa		35·2	49	i 6 59	+ 1	e 12 39	+ 8	—	—	e 17·9
Seven Falls		38·9	48	e 6 35	−54	—	—	—	—	20·6
East Machias		40·9	53	e 7 49	+ 3	e 14 2	+ 4	—	—	e 20·5
Huancayo		55·0	131	e 14 22	?	—	—	—	—	e 22·7
Ksara		112·4	26	e 19 31	PP	e 33 19	?	—	—	—

Additional readings :—
Tucson iS = +1m.37s., i = +2m.0s.
Denver ? = +2m.35s., iN = +3m.11s., eE = +5m.54s.
Florissant eN = +8m.58s., eZ = +9m.19s., iE = +11m.30s.
Toronto iE = +16m.32s.
Long waves were also recorded at Santa Clara, Santa Barbara, Lick, Sitka, Philadelphia, Columbia, and Vermont.

Feb. 26d. Readings also at 3h. (Tucson), 5h. (Tucson, Mount Wilson, Pasadena, and Riverside), 6h. (Balboa Heights, New Plymouth, and Tucson), 7h. (Tchimkent, Frunse, Andijan, and La Paz), 9h. (Lick), 10h. (Frunse, Andijan, Rome, Mount Wilson, Pasadena, Riverside, Sverdlovsk, Samarkand, Tashkent, Almata, Calcutta, Zi-ka-wei, and Manila), 11h. (Riverside (2), Tucson (2), Tiflis, and Fresno), 12h. (San Juan), 13h. (near Apia), 14h. (San Francisco, Branner, Erevan, Grozny, Berkeley, Fresno, Tiflis, La Paz, Lick, Mizusawa, and Ksara), 15h. (Hukuoka, Ksara, Tucson, Riverside, Mount Wilson, and Pasadena), 16h. (Mizusawa), 18h. (Tucson), 20h. (Malabar and Batavia), 21h. (Bucharest, near Sofia, and Andijan), 22h. (Wellington), 23h. (Harvard, Williamstown, Fordham, Tucson, and near La Paz).

Feb. 27d. 17h. 32m. 45s. Epicentre 0°·0 17°·5W.

$A = +\cdot9537$, $B = -\cdot3007$, $C = \cdot0000$; $\delta = -4$; $h = +7$;
$D = -\cdot301$, $E = -\cdot954$; $G = \cdot000$, $H = \cdot000$, $K = -1\cdot000$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rio de Janeiro	33·8	226	—	—	e 11 59	−11	—	—	e 15·6
Toledo	41·6	16	e 7 52	+ 1	—	—	—	—	—
Rome	49·7	30	i 8 57a	+ 1	i 16 10	+ 6	i 10 38	PP	e 24·5
Neuchatel	51·5	21	e 9 9	0	—	—	—	—	—
Basle	52·2	21	e 9 14	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	z.	52·5	249	e 9 19	+ 2	—	—	—	—	23·2
Strasbourg		53·1	21	e 9 20	− 1	e 17 1	+10	—	—	e 27·7
Triest		53·2	27	9 22	0	e 17 13	PS	e 11 47	PP	—
Helwan		55·1	53	i 9 36k	0	e 17 35	+17	11 48	PP	28·5
Cheb		56·0	22	—	—	e 18 15?	PPS	—	—	e 28·2
Huancayo		58·6	256	—	—	e 17 53	−11	—	—	e 23·6
Ksara		60·2	51	e 10 14	+ 2	e 19 43	?	e 12 59	PP	—
Ottawa		68·2	321	e 10 58	− 6	—	—	—	—	27·2
Tiflis		69·6	45	11 13	0	e 20 52	PS	e 16 37	PP	—
Sverdlovsk		83·5	33	12 47	+16	e 23 47	PS	—	—	32·2
Tashkent		87·6	49	e 12 52	+ 1	—	—	—	—	e 44·2
Andijan		89·9	50	e 13 12	+10	e 25 2	PS	—	—	—
Bombay		90·3	72	—	—	e 23 35	[0]	—	—	—
Tucson		92·8	302	i 13 13	− 3	—	—	—	—	—

Additional readings :—
Rome iZ = +11m.3s.
Basle e = +10m.11s.
Triest e = +16m.35s.
Helwan iZ = +9m.46s. and +10m.35s., eZ = +12m.55s.
Tashkent e = +13m.5s.
Bombay eN = +32m.15s., eEN = +37m.15s.?
Tucson iP = +13m.20s.
Long waves were also recorded at Algiers, La Plata, Cape Town, Calcutta, and other European stations.

Feb. 27d. Readings also at 0h. (Malabar ,near Tananarive, Andijan, Samarkand, Batavia, and La Paz), 1h. (Tucson), 2h. (Batavia and Samarkand), 3h. (Tucson), 4h. (Ksara), 6h. (near Apia, Mount Wilson, Tucson, Ksara, Tinemaha, Pasadena, and Riverside), 7h. (Ksara, La Paz, Tucson, Rio de Janeiro, Vladivostok, Sverdlovsk, and Huancayo), 8h. (Berkeley and Tucson), 11h. (Ksara), 13h. (Moncalieri and Andijan), 15h. (Christchurch and Wellington), 16h. (Tucson), 17h. (Tucson), 18h. (Tinemaha, Pasadena, and Riverside), 20h. (Tinemaha, Pasadena, Riverside, Tucson, and near Lick), 22h. (Andijan, Samarkand, and near Sofia).

Feb. 28d. 2h. 35m. 45s. Epicentre 4°·2S. 152°·2E. (as on 1938 Jan. 7d.).

Intensity VI at Katawi and Kokapo (New Britain).

Epicentre 5°·4S. 151°·7E. (U.S.C.G.S.).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome 4, 2e partie Seismologie, 1939, pp. 14.

$A = -\cdot8822$, $B = +\cdot4652$, $C = -\cdot0728$; $\delta = -1$; $h = +7$;
$D = +\cdot466$, $E = +\cdot885$; $G = +\cdot064$, $H = -\cdot033$, $K = -\cdot997$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	23·2	182	i 4 57	−12	i 8 57	−21	i 5 15	PP	—
Riverview	29·5	182	i 6 9a	+ 1	10 37	−25	—	—	e 15·2
Sydney	29·5	182	e 4 51	?	e 11 15	+13	e 13 18	SSS	—
Adelaide	33·1	200	e 6 13	−27	i 11 37	−22	—	—	—
Melbourne	34·1	190	i 8 28	PPP	i 12 18	+ 4	—	—	14·1
Manila	36·1	302	i 7 6a	+ 1	12 50	+ 5	—	—	17·9
Arapuni	39·9	151	e 7 15	−22	23 15	L	—	—	(23·2)
Koti	41·5	336	8 17	+27	—	—	—	—	—
Wellington	42·1	155	i 7 47	− 8	i 14 12	− 4	i 9 46	PP	23·2
Nagano	42·7	343	8 9	+ 9	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		43·1	158	i 8 3a	− 1	i 14 27	− 3	i 9 45	P_cP	20·6
Perth		43·8	226	9 22	PP	i 14 48	+ 8	10 3	PP	—
Mizusawa	E.	44·3	348	8 13	0	11 51	?	—	—	—
	N.	44·3	348	8 10	− 3	12 3	?	—	—	—
Batavia		45·2	266	8 11	− 9	—	—	—	—	—
Hong Kong		45·6	307	8 23k	− 1	15 5	− 1	18 29	SS	—
Zi-ka-wei	Z.	45·9	323	e 8 28	+ 2	15 0	−11	10 15	PP	22·7
Zinsen		47·8	332	8 44	+ 3	—	—	—	—	—
Sapporo		48·1	350	7 34	−69	—	—	—	—	—
Vladivostok		50·6	341	e 9 1	− 1	i 16 18	+ 1	—	—	e 22·6
Phu-Lien		51·1	301	9 5	− 1	e 16 20	− 4	—	—	—
Medan	E.	54·0	278	e 9 18	−10	—	—	—	—	—
Calcutta	N.	67·8	296	e 13 31	PP	e 20 30	PS	e 15 14	PPP	e 27·9
Colombo	E.	73·6	278	11 24	−13	—	—	—	—	—
Agra	E.	77·9	309	11 55	− 6	27 19	SS	—	—	38·3
Bombay		81·3	290	e 12 17	− 3	e 22 16	−14	e 22 55	PS	—
Andijan		85·0	311	e 12 41	+ 3	e 23 4	[+ 3]	—	—	—
Tashkent		87·4	312	i 12 48	− 2	e 23 17	[0]	e 16 19	PP	e 39·2
Samarkand		89·0	310	e 13 36	+38	—	—	—	—	—
Santa Clara		89·2	53	i 13 4	+ 5	e 23 35	[+ 7]	—	—	e 42·6
Victoria		90·6	42	e 15 21	?	e 23 57	− 3	—	—	41·2
Santa Barbara		90·8	56	e 13 10	+ 4	—	—	—	—	—
Pasadena		92·0	56	i 13 14a	+ 2	e 23 56	[+12]	—	—	e 32·6
Mount Wilson		92·1	56	i 13 15a	+ 3	—	—	—	—	—
Tinemaha		92·1	54	i 13 14	+ 2	—	—	—	—	—
Haiwee		92·3	54	e 13 14	+ 1	—	—	—	—	—
La Jolla		92·7	58	e 13 18	+ 3	—	—	—	—	—
Riverside		92·7	56	i 13 17a	+ 2	—	—	—	—	—
Sverdlovsk		94·3	327	—	—	23 50	[− 7]	25 55	PS	46·2
Tucson		98·1	58	i 13 43	+ 3	26 26	PS	i 17 44	PP	44·9
Baku		102·1	310	e 18 12	PP	e 24 55	[+18]	27 45	PS	e 51·2
Tiflis		105·8	312	e 17 36	?	e 28 1	PS	e 18 35	PP	e 51·2
Moscow		107·2	328	e 18 49	PP	e 28 28	PS	19 28	PP	52·7
Ksara		114·1	305	i 19 40	PP	e 29 40	PS	e 30 49	PPS	61·7
Helwan		118·7	301	i 18 48	[− 2]	e 26 9	[+24]	i 20 9	PP	—
Ottawa		121·5	38	i 18 53	[− 3]	30 45	PS	37 15?	SSP	51·2
Cheb		123·1	331	—	—	e 30 36	PS	e 37 15?	SSP	e 65·2
Stuttgart		125·6	331	e 23 15	PPP	—	—	—	—	e 66·2
Weston		125·8	38	i 23 4	PKS	e 33 58	?	—	—	53·1
Strasbourg		126·4	332	—	—	e 39 48	SSP	—	—	e 65·2
Rome		127·9	321	i 22 27	PP	34 1	?	43 57	SSS	68·2
Huancayo		130·1	110	e 19 17	[+ 5]	i 22 39	PKS	e 21 25	PP	—
La Paz		135·2	118	19 24	[+ 3]	—	—	i 22 54	PP	—
San Juan		140·0	66	e 19 25	[− 6]	e 23 8	PKS	e 22 2	PP	—
Fort de France		145·5	70	i 19 41	[+ 1]	—	—	—	—	—

Additional readings :—
Riverview SSN = +12m.0s.
Adelaide i = +6m.37s. and +11m.53s.
Melbourne i = +9m.45s. and +11m.55s.
Wellington PP = +9m.6s., P_cS = +13m.42s., iS = +13m.57s., SS = +17m.2s., S_cS = +17m.19s., L_q = +17m.22s.
Christchurch iP_cS = +14m.13s., iS_cS = +17m.38s., iZ = +18m.5s.
Perth PPP = +10m.13s., P_cP = +12m.15s., S = +14m.15s., SS = +15m.40s.
Batavia iPE = +8m.15s., iE = +9m.16s.
Hong Kong ? = +14m.5s.
Zi-ka-wei iZ = +8m.45s., +8m.50s., +10m.32s., and +15m.48s.
Calcutta eN = +16m.0s.
Tashkent iS = +23m.25s., ePS = +24m.21s., eSS = +29m.15s., eSSS = +33m.15s.
Pasadena iEZ = +13m.28s.
Mount Wilson iZ = +13m.30s.
Riverside iZ = +13m.31s.
Sverdlovsk e = +24m.10s., SS = +31m.3s., SSS = +34m.39s., L_q = +40m.15s.
Tucson iP = +13m.57s., iPP = +17m.54s., SS = +30m.36s.
Baku eSS = +33m.15s.
Tiflis eZ = +21m.16s., eE = +25m.16s., eE = +33m.4s., eZ = +34m.43s., eE = +37m.29s.

Continued on next page.

Ksara SKKP = +32m.5s.
Helwan iZ = +20m.25s.
Cheb e = +42m.0s.
Rome iPKPZ = +26m.9s., S = +34m.58s.
Huancayo ePKP = +19m.22s.
San Juan ePKP = +19m.40s.
Fort de France e = +20m.5s.
Long waves were also recorded at Berkeley, Triest, Cape Town, Bidston, Philadelphia, College, Ukiah, Sitka, Uccle, Jersey, Kew, La Plata, Stonyhurst, Pulkovo, and Paris.

Feb. 28d. 13h. 37m. 13s. Epicentre 44°·0N. 16°·8E.

Intensity IV at Prekaja and Lajce; III at Sarajevo. Epicentre 44°03′N. 16°51′E.

J. Mihailovic.

Annuaire microséismique et macroséismique, 1939, Beograd, 1940.

$A = +\cdot6909$, $B = +\cdot2086$, $C = +\cdot6922$; $\delta = 0$; $h = -3$;
$D = +\cdot289$, $E = -\cdot957$; $G = +\cdot663$, $H = +\cdot200$, $K = -\cdot722$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sarajevo		1·2	96	i 0 22	− 2	i 0 38	− 3	i 0 25	PP	—
Laibach		2·6	322	e 0 48	+ 4	i 1 28	S_g	—	—	—
Belgrade		2·7	73	e 0 43$_a$	− 2	i 1 27	S*	—	—	—
Triest		2·7	307	0 44	− 1	1 26	S*	0 49	P*	—
Kecskemet	z.	3·5	32	i 1 3	P*	i 2 19	+39	—	—	—
Rome		3·8	238	1 7	P*	i 2 3	S_g	1 15	P_g	i 2·2
Florence		4·0	269	1 17	P_g	2 7	S*	—	—	—
Sofia	E.	4·9	104	e 1 28	P*	i 2 50	S_g	—	—	—
Chur		5·8	301	e 1 26	− 3	e 3 20	S_g	—	—	—
Moncalieri		6·6	281	e 1 23	−18	—	—	—	—	—
Zurich		6·6	303	e 1 37	− 4	e 3 23	S*	e 2 4	P*	—
Stuttgart		7·1	315	e 1 42	− 6	i 3 59	S_g	e 2 13	P_g	4·2
Basle		7·4	303	e 1 46	− 6	e 3 54	S*	—	—	—
Collmberg		7·7	343	i 1 54	− 2	i 3 26	+ 1	e 2 28	P_g	—
Strasbourg	E.	7·8	310	e 2 27	P_g	i 3 28	0	e 3 53	S*	—
Jena		7·8	334	e 2 17	P*	—	—	e 2 27	P*	—
Göttingen		8·8	331	e 1 47?	−24	e 4 52	S_g	—	—	—
Ksara		18·0	118	e 4 15	+ 2	e 8 34	SSS	—	—	e 11·6

Additional readings:—
Sarajevo i = +0m.31s., +0m.34s., and +0m.40s.
Laibach i = +0m.53s., +1m.16s., and +1m.24s.
Belgrade i = +0m.47s., iP_g = +0m.50s., i = +1m.35s.
Triest iS_g = +1m.28s.
Stuttgart e = +1m.51s. and +3m.21s.
Collmberg i = +1m.58s., e = +2m.57s. and +3m.12s., i = +3m.19s., +3m.32s., +3m.48s., +4m.2s., +4m.8s., and +4m.26s.
Strasbourg eE = +3m.1s., +3m.9s., and +3m.39s., iE = +3m.57s., eE = +4m.9s., eS_g = +4m.19s.
Long waves were also recorded at De Bilt.

Feb. 28d. Readings also at 0h. (Sofia), 1h. (Berkeley (2), Branner, near Lick, Columbia, Fordham, Harvard, Fort de France, Honolulu, Riverside, Tucson, Huancayo, Ukiah, Philadelphia, Merida, Tacubaya, Mount Wilson, Tinemaha, Pasadena, and San Juan), 2h. (Sofia), 3h. (Manila and Sofia), 5h. (Ksara), 7h. (Weston, Tucson, San Juan, Pasadena, Tinemaha, Mount Wilson, Tacubaya, and Merida), 8h. (Samarkand), 9h. (Tacubaya), 10h. (Wellington and New Plymouth), 15h. (near Göttingen and Jena), 16h. (Andijan, Tiflis, and Samarkand), 17h. (near Mizusawa), 19h. (Sofia and Manila), 21h. (Tucson, Merida, San Juan, and Philadelphia).

March 1d. 11h. 33m. 36s. Epicentre 48°·2N. 9°·2E. (as on 1937 June 17d.).

Intensity IV-V near Ebingen.

Epicentre 48°.12′·8 ± 0′·5N. 9°.3′·3 ± 0′·8E.

P. Caloi.

Caratteristiche sismiche fondamentali dell'Europa centrale quali risultano dallo studio di 17 terremoti centro-europei.

Estratto dal " Bolletino della Societa Sismolog, Italiana, vol. XL, No. 3-4, Anno 1942, pp. 26 et publie de L'Institut Geophysique de Rome, No. 107, Roma-Scuola Tipogr Pio X.

$A = +·6605$, $B = +·1070$, $C = +·7432$; $\delta = +6$; $h = -5$;
$D = +·160$, $E = -·987$; $G = +743$, $H = +·119$, $K = -·669$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ebingen	0·2	264	e 0 5	− 5	i 0 7	S_g	—	—	—
Ravensburg	0·5	146	e 0 15	+ 1	i 0 23	0	—	—	—
Stuttgart	0·6	0	e 0 13	− 2	i 0 25	− 1	0 20	S*	—
Strasbourg	1·0	292	e 0 20	− 1	e 0 32	− 4	—	—	—
Zurich	1·0	206	i 0 20	− 1	i 0 33	− 3	—	—	—
Basle	1·3	238	e 0 26	+ 1	e 0 42	− 2	—	—	—
Chur	1·4	171	e 0 30	+ 3	e 0 49	+ 3	—	—	—
Neuchatel	1·9	232	e 0 38	+ 4	e 1 0	+ 1	—	—	—
Jena	3·2	29	—	—	e 1 24	− 8	—	—	—
Göttingen	3·4	8	—	—	e 1 48	S*	—	—	—
Collmberg	4·0	36	i 1 18	P_g	e 1 58	+ 6	1 2 8	S_g	i 2·2

Additional readings :—
Collmberg $iP^* = +1$m.21s. and $+1$m.25s., $e = +1$m.32s., $i = +2$m.11s.

March 1d. Readings also at 0h. (Tucson and Manila), 1h. (Rio de Janeiro, Cape Town, and Huancayo), 2h. (Tucson), 3h. (Tucson, Kew, Bidston, and Balboa Heights), 4h, (Tucson), 6h. (Mizusawa), 9h. (Tucson and Andijan), 10h. (Andijan), 11h. (Tiflis, Samarkand, Tashkent, Frunse, Zi-ka-wei, Manila, Collmberg, Sverdlovsk, and Vladivostok), 12h. (Pulkovo, Cheb, Paris, and Strasbourg), 13h. (Sverdlovsk and Vladivostok), 15h. (Mizusawa (2)), 16h. (Medan), 17h. (Wellington, New Plymouth, Christchurch, and near Granada), 18h. (Columbia), 20h. (Williamstown).

March 2d. 7h. 0m. 28s. Epicentre 3°·8S. 143°·1E.

$A = -·7980$, $B = +·5991$, $C = -·0658$; $\delta = +5$; $h = +7$;
$D = +·600$, $E = +·800$; $G = +·053$, $H = -·040$, $K = -·998$.

A depth of focus 0·010 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		25·4	159	i 5 14	− 6	i 9 32	− 5	—	—	—
Manila		28·5	310	i 5 52k	+ 4	8 14	?	—	—	9·5
Riverview		30·8	166	e 6 8	− 1	10 57	− 7	i 7 7	PP	e 14·4
Sydney		30·8	166	e 5 32	−37	e 10 41	−23	—	—	e 15·5
Adelaide		31·3	186	i 7 3	PP	i 12 1	+49	—	—	14·3
Melbourne		33·9	176	i 7 54	PP	i 11 45	− 7	i 14 39	SSS	18·4
Batavia		36·2	265	6 55	0	i 15 3	SS	i 8 18	PP	—
Perth		37·1	218	12 50	S	(12 50)	+ 9	13 47	pS	(18·3)
Osaka		38·1	350	7 21	+10	9 13	PPP	—	—	—
Hong Kong		38·4	314	7 14	+ 1	12 52	− 9	i 7 45	pP	—
Zi-ka-wei	Z.	40·5	331	i 7 32	+ 1	i 14 32	+60	9 56	PPP	—
Mizusawa	E.	42·7	358	7 51	+ 2	13 53	−12	—	—	—
	N.	42·7	358	7 45	− 4	14 1	− 4	—	—	—
Phu-Lien		43·3	306	e 7 55	+ 1	e 14 16	+ 3	—	—	—
Medan		45·0	279	e 8 9	+ 2	14 38	0	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		45·2	143	—	—	14 44	+ 3	—	—	19·5
Wellington		46·9	146	8 24	+ 2	i 14 58	− 7	9 16	P_cP	19·1
Christchurch		47·4	150	e 8 30a	+ 4	i 15 10	− 2	i 8 52	pP	22·5
Calcutta	N.	59·5	299	e 9 54	− 1	i 18 2	+ 7	e 10 15	pP	—
Colombo	E.	64·0	279	10 25	0	18 53	+ 1	—	—	—
Kodaikanal	E.	66·8	283	10 43a	0	i 19 32	+ 6	i 13 13	PP	—
Hyderabad		67·2	291	e 10 36	−10	19 31	0	20 27	S_cS	31·9
Agra	E.	69·8	300	i 10 59a	− 3	20 33	PS	13 36	PP	34·4
Bombay		72·7	291	e 11 20	+ 1	i 20 34	− 1	—	—	—
Frunse		77·1	315	e 11 50	+ 6	—	—	—	—	—
Andijan		78·0	313	e 11 51	+ 2	22 31	PS	—	—	—
Tashkent		80·4	312	i 12 3	+ 1	22 44	PS	15 48	PP	—
Tchimkent		80·4	314	e 12 2	0	22 50	PS	—	—	—
Samarkand		81·8	310	e 12 11	+ 1	—	—	—	—	—
College		84·7	23	e 15 35	PP	e 23 27	PS	e 18 14	pPPP	—
Sverdlovsk		89·0	327	i 12 45	0	e 23 25	+ 2	i 16 50	PP	43·5
Victoria		94·6	42	—	—	e 24 20	+ 8	—	—	43·5
Baku		94·9	310	e 16 39	PP	25 40	PPS	—	—	48·5
Berkeley		96·0	53	—	—	e 23 44	[0]	e 31 32?	SS	—
Grozny		97·9	313	e 15 3	?	e 25 35	+55	e 17 15	PP	—
Santa Barbara		98·1	56	e 13 30	+ 3	—	—	—	—	—
Tiflis		98·6	311	13 28	− 1	e 24 49	+ 3	17 34	PP	—
Tinemaha		99·2	53	e 13 33	+ 1	—	—	—	—	—
Pasadena		99·3	56	i 13 31	− 1	i 24 3	[+ 3]	e 17 34	PP	e 45·5
Haiwee		99·4	54	e 13 34	+ 1	—	—	—	—	—
Mount Wilson		99·4	56	i 13 32	− 1	—	—	i 14 5	pP	—
Riverside	Z.	100·0	56	i 13 34	− 2	—	—	e 17 39	PP	—
Moscow		101·9	326	e 13 37	− 7	24 15	[+ 2]	e 17 54	PP	50·0
Pulkovo		104·6	331	e 15 37	?	24 23	[− 3]	18 17	PP	52·0
Tucson		105·6	57	i 14 4a	P	25 16	SKKS	i 18 23	PP	48·1
Ksara		106·4	303	i 18 35	PP	i 25 44	SKKS	e 28 12	PS	—
Collmberg		117·1	327	i 18 33	[− 1]	i 28 57	PS	e 20 14	pPP	—
Cheb		118·0	327	e 19 32?	PP	—	—	—	—	—
St. Louis	N.	120·5	46	—	—	e 27 44	SKKS	e 29 59	PS	—
Stuttgart		120·5	326	e 20 13	PP	e 30 54	PPS	e 20 45	pPP	e 62·5
De Bilt		120·6	332	—	—	e 29 44	PP	—	—	59·5
Chicago		121·0	42	—	—	e 29 44	PS	e 37 1	SSP	59·6
Chur		121·3	325	e 18 41	[− 1]	—	—	—	—	—
Strasbourg		121·4	327	—	—	e 31 0	PPS	—	—	e 57·5
Uccle		121·8	331	—	—	30 57	PPS	—	—	e 58·5
Rome		121·9	318	i 20 24	PP	30 0	PS	21 4	pPP	—
Ottawa		126·5	32	e 18 50	[− 2]	—	—	e 19 22	pPKP	51·5
Seven Falls		127·8	28	—	—	e 30 38	PS	(38 32)	SS	38·5
Williamstown		129·6	33	e 18 53	[− 5]	e 22 50	SS	i 22 7	PKS	—
Fordham		130·4	35	i 20 8	?	i 31 55	PS	e 39 15	SS	—
Harvard		130·6	33	e 22 12	?	—	—	—	—	—
La Paz		143·1	124	19 20	[− 3]	20 23	?	—	—	—
San Juan		147·8	60	e 19 27	[− 3]	e 30 0	SKKS	e 42 5	SS	—
Rio de Janeiro		152·8	169	e 23 32	PKS	—	—	—	—	—
Fort de France		153·8	64	e 19 43	[+ 4]	e 23 26	PP	—	—	—

Additional readings :—
Brisbane iPE = +5m.20s.
Riverview iN = +6m.57s. and +8m.39s., iE = +11m.58s.
Adelaide e = +8m.1s.
Melbourne i = +8m.42s.
Perth i = +15m.25s., L is given as S.
Hong Kong ? = +7m.53s., PP = +8m.44s., P_cP = +9m.18s., ? = +13m.50s., SS = +16m.29s.
Zi-ka-wei iZ = +7m.36s., +8m.4s., +8m.16s., +10m.28s., +18m.16s., and +19m.48s.
Medan iPE = +8m.15s.
Wellington iZ = +10m.58s. and +16m.7s., L_q = +16m.32s. ?, S_cS = +17m.59s.
Christchurch i = +11m.8s., iP_cSZ = +13m.42s., eE = +15m.19s., SS = +18m.24s., L_qE = +18m.44s.
Calcutta isSN = +18m.45s.
Kodaikanal iPSE = +20m.17s., iSSE = +24m.15s.

Continued on next page.

Agra PPPE = +15m.19s., PSE = +21m.4s., SSE = +24m.17s., SSSE = +28m.5s.
Tashkent SKKS = +22m.54s., eSS = +29m.32s., eSSS = +33m.32s.
College epS = +23m.34s.
Sverdlovsk eS = +23m.59s., eS_cS = +24m.17s., ePS = +25m.17s.
Baku ePPS = +26m.24s., SS = +31m.14s.
Berkeley eEZ = +43m.56s.
Tiflis eN = +13m.52s., eE = +14m.27s., eZ = +16m.37s., PPN = +17m.46s., iZ = +18m.14s., eE = +19m.53s., eZ = +20m.16s., eE = +21m.50s., eZ = +22m.4s., eE = +26m.56s., eZ = +27m.12s., eE = +28m.3s., eN = +32m.30s., eEZ = +32m.35s., eSSSN = +35m.54s.
Pasadena iEZ = +14m.3s., ePSE = +26m.38s.
Moscow SKKS = +24m.58s., ePS = +26m.58s., SS = +33m.2s.
Pulkovo PKP = +17m.41s., SKKS = +25m.17s., PS = +27m.30s., SS = +33m.38s., SSS = +39m.8s.
Tucson PKP = +17m.41s., iPKP = +18m.10s., ipPP = +19m.0s., isPP = +19m.30s., iPPP = +20m.23s., pPPP = +21m.22s., SP = +27m.11s., isPS = +28m.24s., iSS = +32m.28s., isSS = +34m.10s.
Collmberg i = 19m.4s., eZ = +19m.15s., iZ = +19m.47s., e = +20m.50s.
St. Louis eN = +36m.26s., iN = +37m.15s.
Chicago ePS = +30m.11s., ePPS = +31m.56s., esSS = +37m.18s.
Rome i = +31m.8s.
Ottawa eN = +20m.50s.
Williamstown i = +19m.29s.
Fordham iZ = +22m.46s. and +23m.45s.
San Juan esPKP = +21m.17s., esPP = +35m.17s., esSS = +42m.55s.
Long waves were also recorded at Paris, Bidston, Cape Town, Upsala, and Kew.

March 2d. Readings also at 1h. (La Paz), 4h. (Mizusawa and Fort de France), 7h. (Andijan and Medan), 16h. (Tucson and La Paz (2)), 17h. (La Paz, Wellington, Christchurch, New Plymouth, and Huancayo), 18h. (Wellington), 19h. (Ksara, Baku, and Sverdlovsk), 20h. (near Berkeley, San Francisco, Branner, and Lick), 21h. (Harvard, near Fordham, Ottawa, and Williamstown), 22h. (Mizusawa), 23h. (Mizusawa, La Plata, and Apia).

March 3d. Readings at 3h. (La Paz), 7h. (Andijan), 9h. (Tananarive), 10h. (Sofia, Triest, and Moncalieri), 16h. (Balboa Heights), 18h. (Tiflis), 19h. (Tchimkent, Andijan, and Samarkand), 20h. (Andijan and Samarkand), 21h. (Tucson), 22h. (Mizusawa), 23h. (Andijan).

March 4d. 9h. 9m. 20s. Epicentre 36°·0N. 139°·9E. (as on 1938, Sept. 1d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tokyo, Imp. Univ.	0·3	201	0 10	− 1	0 19	+ 1
Tukubasan	0·3	37	0 13	+ 2	0 19	+ 1
Okiziku	0·3	80	0 21	+10	0 27	+ 9
Komaba	0·4	207	0 11	− 2	0 20	− 1
Mitaka	0·5	220	0 13	− 1	0 23	0
Titibu	0·7	269	0 21	+ 4	0 30	+ 2
Kiyosumi	0·9	165	0 21	+ 1	0 36	+ 2
Koyama	1·0	229	0 21	0	0 37	+ 1
Yosiwara	1·3	230	0 21	− 4	0 40	− 4
Susaki	1·5	209	0 25	− 3	0 45	− 4

March 4d. 20h. 3m. 58s. Epicentre 5°·5N. 126°·0E. (as on 1937 Aug. 8d.).

$A = -\cdot5851$, $B = +\cdot8054$, $C = +\cdot0952$; $\delta = +7$; $h = +7$;
$D = +\cdot809$, $E = +\cdot588$; $G = -\cdot056$, $H = +\cdot077$, $K = -\cdot996$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		8·6	77	2 3	− 6	3 22	−26	—	—	—
Manila		10·3	332	e 2 41$_a$	PP	4 55	SSS	—	—	5·9
Miyakozima		19·2	359	4 14	−14	8 16?	+17	—	—	—
Hong Kong		20·2	327	4 42	+ 3	7 32	−49	4 54	PP	—
Batavia		22·4	240	5 7	+ 5	9 0	− 4	i 5 31	PP	—
Phu-Lien		24·2	311	e 5 22	+ 3	e 9 52	+17	—	—	—
Zi-ka-wei	z.	25·9	352	e 5 38	+ 3	10 10	+ 6	i 6 12	PP	—
Medan		27·3	268	5 54	+ 6	i 11 49	SS	—	—	i 13·5
Oiwake		32·8	18	6 41	+ 4	—	—	—	—	—
Hukusima		34·7	20	6 47	− 7	—	—	—	—	—
Calcutta	N.	40·1	299	e 8 19	+30	i 13 50	+ 4	—	—	—
Colombo	E.	45·9	274	—	—	e 14 32	−39	—	—	—
Melbourne		46·6	159	—	—	e 15 14	− 7	i 18 38	SS	i 27·3
Kodaikanal	E.	48·3	279	e 10 55	PP	i 15 52	+ 7	e 19 53	SS	25·7
Bombay		53·5	290	e 12 14	PPP	e 16 57	0	—	—	—
Almata		57·2	320	e 9 51	0	—	—	—	—	—
Frunse		58·6	318	e 10 2	+ 1	—	—	—	—	—
Semipalatinsk		58·8	328	e 10 0	− 2	—	—	e 12 19	PP	—
Andijan		59·3	315	e 10 7	+ 1	e 18 20	+ 6	—	—	—
Tashkent		61·7	315	i 10 17	− 5	i 18 22	−22	—	—	e 29·4
Tchimkent		61·8	316	e 10 21	− 2	e 18 41	− 5	—	—	—
Samarkand		62·9	312	e 10 30	0	—	—	—	—	—
Sverdlovsk		72·1	329	e 11 27	− 1	20 45	− 5	—	—	33·0
Baku		75·9	311	e 11 27	−23	i 21 35	+ 3	—	—	42·0
Grozny		79·2	313	e 12 12	+ 4	—	—	—	—	—
Tiflis		79·8	312	e 12 8	− 4	e 22 18	+ 4	—	—	e 43·0
Moscow		84·6	325	e 12 34	− 2	e 22 58	− 5	—	—	e 46·5
Ksara		87·1	303	e 12 43	− 6	—	—	—	—	—
Pulkovo		88·2	330	12 53	− 1	23 35	− 3	—	—	e 44·4
Collmberg		99·8	323	i 13 47	0	—	—	—	—	—
Cheb		100·6	323	—	—	e 26 2?	PS	—	—	e 59·0
Rome		103·5	315	—	—	e 33 10	SS	e 37 15	SSS	e 52·4
Williamstown		128·9	17	i 19 9	[− 1]	—	—	e 22 27	PKS	—
Harvard	z.	129·6	16	i 19 10$_k$	[− 1]	—	—	i 22 32	PKS	—
Balboa Heights		150·8	59	e 19 2?	[−46]	—	—	—	—	—
La Paz	z.	162·4	129	20 2	[− 1]	—	—	—	—	—

Additional readings :—
Batavia iE = +5m.50s., SN = +9m.21s.
Medan iE = +11m.17s. and +12m.49s., iN = +12m.59s.
Kodaikanal eE = +16m.26s.
Bombay eEN = +12m.44s.
Tiflis eP = +12m.14s., eSSS = +32m.2s.
Collmberg i = +14m.37s.
Rome e = +42m.54s.?
Long waves were also recorded at Berkeley, Aberdeen, Kew, Bidston, De Bilt, Uccle, Triest, Stuttgart, Wellington, Edinburgh, Paris, and Strasbourg.

March 4d. Readings also at 4h. (Tucson), 5h. (near Lick), 6h. (Adelaide, Riverview, Perth, Brisbane, Melbourne, Sydney, and Wellington), 7h. (Tucson and College), 8h. (Mizusawa), 9h. (Mizusawa, Tucson, Riverside, Mount Wilson, and La Paz), 10h. (Mizusawa and Andijan), 11h. (Tchimkent, Andijan, Frunse, and Almata), 12h. (Frunse, Almata, Andijan, Riverside, Mount Wilson, Wellington, Haiwee, Tinemaha, and Pasadena), 14h. (Tchimkent, Andijan, Almata, Frunse, Samarkand (2), Tashkent, Mizusawa, La Paz, near Fort de France, and Columbia), 15h. (Almeria and New Plymouth), 16h. (Frunse, Almata, Andijan, and Tchimkent), 17h. (Balboa Heights and College), 18h. (Ottawa, Tchimkent, Andijan, and Frunse), 19h. (Berkeley, Andijan, Tchimkent, Tashkent, and Samarkand), 20h. (Christchurch, Ottawa, New Plymouth, and Wellington).

March 5d. 2h. 13m. 45s. Epicentre 5°·0N. 126°·8E. (as on 1938 Sept. 7d.).

$A = -\cdot5967$, $B = +\cdot7977$, $C = +\cdot0866$; $\delta = -12$; $h = +7$;
$D = +\cdot801$, $E = +\cdot599$; $G = -\cdot052$, $H = +\cdot069$, $K = -\cdot996$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		11·1	329	i 2 46a	+ 3	4 58	+ 9	—	—	6·1
Hong Kong		21·1	327	4 49	+ 1	8 37	− 2	5 1	PP	—
Batavia		22·8	241	e 5 12	+ 7	e 9 26	+15	—	—	—
Phu-Lien		25·1	311	e 5 26	− 2	e 9 58	+ 7	—	—	—
Zi-ka-wei	z.	26·5	351	e 5 39	− 2	10 15	+ 1	—	—	—
Medan	E.	28·1	269	i 6 1	+ 6	i 13 14	?	—	—	—
Frunse		59·5	317	e 10 15	+ 8	—	—	—	—	—
Andijan		60·2	314	e 10 11	− 1	e 18 20	− 5	—	—	—
Tchimkent		62·7	316	e 10 25	− 4	—	—	—	—	—
Samarkand		63·8	312	e 10 34	− 2	—	—	—	—	—
Sverdlovsk		72·9	329	11 31	− 2	e 20 48	−11	—	—	31·8

Long waves were also recorded at Bidston, De Bilt, Kew, Rome, and Baku.

March 5d. 15h. 12m. 9s. Epicentre 23°·1N. 69°·4W.

$A = +\cdot3239$, $B = -\cdot8618$, $C = +\cdot3901$; $\delta = -21$; $h = +4$.
$D = -\cdot936$, $E = -\cdot352$; $G = +\cdot137$, $H = -\cdot365$, $K = -\cdot921$.

A depth of focus 0·020 has been assumed.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince	5·3	212	e 1 50	PPP	i 2 39	SSS	—	—	3·1
San Juan	5·7	146	i 1 10	−14	e 2 57	SSS	—	—	e 3·1
Bermuda	10·0	21	e 2 11	−10	e 3 59	−12	—	—	4·5
Columbia	14·9	320	—	—	e 6 31	SS	—	—	e 9·2
Balboa Heights	17·1	216	e 3 30	−21	—	—	—	—	—
Philadelphia	17·5	346	i 3 52	− 3	i 6 51	−12	—	—	e 7·8
Fordham	18·1	352	i 4 0a	− 2	i 7 2	−14	i 4 10	pP	—
Harvard	19·4	358	i 4 15a	− 1	i 7 37	− 5	i 4 19	pP	e 10·9
Williamstown	19·8	355	i 4 20	0	i 7 41	− 8	i 4 47	pP	e 9·0
East Machias	21·7	5	—	—	e 7 51	−33	—	—	e 9·0
Ottawa	22·8	349	i 4 51	+ 2	e 9 5	+22	i 5 1	pP	10·0
Huancayo	35·4	189	—	—	e 12 9	+ 5	e 12 13	pS	e 16·2
Tucson	37·6	295	i 7 1	0	—	—	i 7 11	pP	—
La Paz z.	39·4	178	7 16	0	i 12 59	− 6	—	—	27·9
Riverside	43·2	296	i 7 47	0	—	—	i 7 57	pP	—
Haiwee	43·8	299	i 7 52	+ 1	—	—	—	—	—
Mount Wilson	43·8	296	i 7 53	+ 2	—	—	i 8 2	pP	—
Pasadena	43·8	296	i 7 52	+ 1	—	—	i 8 2	pP	—
Tinemaha	44·1	300	i 7 54	0	—	—	—	—	—
Sverdlovsk	90·0	25	e 12 47	+ 5	—	—	i 12 59	pP	39·8

Additional readings:—
San Juan i = +1m.58s.
Fordham i = +4m.15s., +7m.22s., and +7m.31s.
Williamstown i = +4m.56s., +5m.7s., +7m.52s., +7m.58s., and +8m.19s., iP_cP? = +9m.4s.
Tucson iPP = +8m.28s., iPPP = +8m.46s.
Riverside iZ = +9m.36s.
Mount Wilson iZ = +9m.39s.
Pasadena eZ = +9m.38s.
Long waves were also recorded at St. Louis.

March 5d. Readings also at 1h. (Wellington), 5h. (Moncalieri, Tucson, and Mizusawa), 6h. (Mizusawa), 9h. (Andijan), 10h. (Andijan, Collmberg (2), College, Berkeley, and Branner), 12h. (Andijan), 13h. (Collmberg), 14h. (San Juan, Columbia, Samarkand, Tchimkent, Collmberg, and Andijan), 15h. (near Manila and Harvard), 16h. (Andijan), 21h. (Triest), 23h. (Strasbourg, Zurich, Basle, and Neuchatel).

March 6d. Readings at 0h. (Medan and Tucson (2)), 3h. (Mizusawa and Tacubaya), 4h. (Tucson, Mount Wilson, Riverside, La Jolla, Pasadena, Haiwee, and Tinemaha), 5h. (Andijan), 6h. (Oaxaca and Tacubaya), 7h. (Andijan and Samarkand), 8h. (Andijan (2), Tucson, Mount Wilson, Riverside, La Jolla, Pasadena, Haiwee, Tinemaha, Zurich, Almata, Tchimkent, Harvard, Ottawa, Williamstown, Fordham, College, Tiflis, Berkeley, Santa Barbara, and near Granada), 9h. (Andijan, Samarkand, near Algiers, Baku, Tashkent, and Pulkovo), 10h. (Andijan), 11h. (Andijan and Tucson), 13h. (Tucson), 14h. (Andijan, Frunse, Samarkand, Tchimkent, Almata, and Mizusawa), 15h. (Fort de France), 22h. (Mizusawa and Andijan), 23h. (Tucson).

March 7d. 1h. 54m. 4s. Epicentre 6°·2S. 147°·7E. (as on 1939 Jan. 25d.).

$A = -\cdot8404$, $B = +\cdot5313$, $C = -\cdot1073$; $\delta = +7$; $h = +7$;
$D = +\cdot534$, $E = +\cdot845$; $G = +\cdot091$, $H = -\cdot057$, $K = -\cdot994$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		18·8	315	4 17	− 6	7 58	+ 8	—	—	—
Brisbane	E.	21·8	165	e 5 2	+ 6	i 9 20	SS	—	—	—
	N.	21·8	165	i 5 8	+12	i 9 14	+22	—	—	—
Sydney		27·7	173	e 4 38	?	e 10 54	+21	—	—	13·2
Adelaide		29·8	194	e 7 36	PPP	i 13 32	SSS	—	—	18·3
Manila		33·6	309	e 6 42	− 2	12 7	+ 1	—	—	16·0
Perth		39·2	224	i 7 9	−22	13 51	+19	i 9 21	PP	21·4
Arapuni		40·6	145	—	—	14 8	+14	—	—	18·9
Batavia		40·6	268	e 7 42	− 1	i 13 49	− 5	i 9 45	PPP	—
Kobe		42·4	345	13 28	S	(13 28)	−52	—	—	—
Wellington		42·5	149	i 8 10k	+11	i 14 34	+12	i 8 18	pP	20·2
Christchurch		43·2	153	i 8 14a	+10	i 14 48	PS	19 12	L_q	21·4
Oiwake		43·2	350	8 7	+ 3	—	—	—	—	—
Hong Kong		43·4	312	8 11	+ 5	14 27	− 8	9 50	PP	—
Hamada		43·5	342	14 32	S	(14 32)	− 4	—	—	—
Zi-ka-wei	Z.	44·9	328	e 8 10	− 8	—	—	i 9 56	PP	i 22·4
Phu-Lien		48·4	345	e 8 46	0	e 15 43	− 3	—	—	—
Medan		49·9	280	e 9 11	+14	i 16 39	PPS	—	—	—
Calcutta	N.	64·7	299	e 11 29	+47	i 19 30	+ 8	i 23 28	SS	e 29·4
Colombo	E.	68·9	279	e 11 26	+17	—	—	—	—	—
Kodaikanal	E.	71·8	283	i 11 30k	+ 4	i 20 59	+13	14 5	PP	32·9
Hyderabad		72·3	290	e 11 32	+ 3	20 52	0	—	—	34·1
Bombay		77·8	291	e 12 3	+ 2	i 21 53	0	—	—	—
Almata		80·4	316	e 12 12	− 3	—	—	—	—	—
Semipalatinsk		80·7	324	e 11 25	−51	—	—	—	—	—
Frunse		82·0	315	12 14	− 9	—	—	—	—	—
Andijan		83·0	312	12 34	+ 6	22 58	+11	—	—	—
College		85·1	22	—	—	e 23 0	[− 1]	—	—	e 38·2
Tashkent		85·4	313	i 12 36	− 4	i 23 10	− 1	—	—	e 37·9
Tchimkent		85·4	314	12 45	+ 5	e 23 4	[+ 1]	—	—	—
Samarkand		86·8	310	e 12 54	+ 7	—	—	—	—	54·9
Ukiah		93·2	50	—	—	e 30 47	SS	—	—	e 40·7
Sverdlovsk		93·5	326	i 13 17	− 2	23 49	[− 4]	e 30 36	SS	46·7
Berkeley		93·8	52	e 13 18	− 2	e 25 44	PS	e 30 56	SS	e 45·9
Victoria		93·9	42	—	—	e 23 56?	[+ 1]	—	—	41·9
Santa Clara		94·0	52	i 17 7	PP	—	—	e 25 43	PS	—
Pasadena		96·9	56	i 13 33a	− 1	i 26 39	PS	i 17 23	PP	e 39·8
Tinemaha		96·9	53	e 13 35	+ 1	—	—	—	—	—
Mount Wilson		97.0	56	i 13 34a	− 1	—	—	e 17 23	PP	—
Haiwee		97·1	54	e 13 40	+ 5	—	—	—	—	—
Riverside		97·5	56	i 13 37a	0	—	—	—	—	—
Tananarive		97·5	250	—	—	e 41 2	?	—	—	e 48·3
La Jolla		97·6	58	e 13 37a	− 1	—	—	—	—	—
Baku		99·9	310	e 14 10	+22	24 27	[+ 1]	32 32	SS	46·9
Tucson		103·0	57	14 1	− 1	i 27 21	PS	17 51	PP	e 42·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tiflis		103·7	311	e 18 11	PP	24 47	[+ 3]	e 33 33	SSP	e 47·9
Moscow		106·4	327	—	—	e 25 0	[+ 4]	e 34 14	SS	—
Pulkovo		108·9	332	14 29	P	26 2	{+ 5}	e 28 29	PS	51·4
Ksara		111·5	303	e 15 10	P	e 30 15	PPS	e 19 33	PP	—
Helwan	E.	115·9	300	e 17 34	?	e 29 24	PS	e 19 50	PP	—
Cape Town		117·6	227	—	—	e 33 19	?	—	—	56·6
St. Louis	N.	118·7	49	—	—	e 36 5	SS	—	—	—
Cheb		122·5	328	e 20 43	PP	—	—	—	—	e 55·9
Triest		124·1	323	e 20 53	PP	e 42 4	SSS	—	—	e 55·6
Stuttgart		125·0	327	e 21 16	PP	—	—	e 59 56?	L_q	e 70·9
Ottawa		125·8	35	e 19 4	[+ 1]	e 37 56?	SS	—	—	56·9
Strasbourg		125·8	328	e 20 14	?	—	—	—	—	e 54·9
Rome		126·0	319	e 19 6	[+ 2]	e 31 7	PS	e 21 48	PP	59·1
Zurich		126·1	327	e 19 6	[+ 1]	—	—	—	—	—
Huancayo		133·5	113	22 56	PKS	e 27 24	[+56]	e 39 3	SS	e 54·2
Toledo		137·9	327	e 21 56	PP	—	—	—	—	e 77·9
La Paz	Z.	138·0	123	e 20 4	[+37]	—	—	23 6	PP	67·6

Additional readings :—
Brisbane iEN = +5m.56s.
Sydney e = +8m.26s.
Adelaide i = +8m.26s., +9m.38s., +15m.53s., and +16m.36s.
Perth i = +8m.13s., +9m.38s., and +11m.38s., SS = +17m.14s., i = +18m.16s.
Wellington PP = +9m.50s., P_cP? = +10m.3s., PPP = +10m.42s., i = +15m.42s. and +16m.33s., SS = +17m.23s., L_q = +17m.41s.
Calcutta iSSSN = +25m.20s.
Kodaikanal +27m.59s.
Sverdlovsk iS = +24m.25s., L_q = +38m.2s.
Berkeley eZ = +42m.56s.?
Tananarive eE = +41m.32s.
Baku PPS = +27m.58s., SSS = +36m.56s.
Tucson iP = +14m.9s., iPP = +18m.2s., i = +18m.11s., iPP = +18m.24s., PPP = +20m.23s., iPPS = +28m.17s., SS = +32m.51s.
Tiflis PPE = +18m.32s., ePPNZ = +18m.38s., eZ = +19m.36s., PPPZ = +20m.44s., eEZ = +27m.38s., ePPSE = +27m.51s.
Moscow ePPS = +29m.8s.
Pulkovo eSS = +34m.8s.
St. Louis eN = +46m.58s.
Long waves were also recorded at Clermont-Ferrand, Kew, Rio de Janeiro, Upsala, Bidston, Honolulu, Philadelphia, Uccle, San Fernando, De Bilt, Riverview, Florissant, and Collmberg.

March 7d. 15h. 16m. 45s. Epicentre 40°·6N. 142°·9E. (as on 1938 May 11d.).

$A = -·6073$, $B = +·4593$, $C = +·6482$; $\delta = -7$; $h = -2$;
$D = +·603$, $E = +·798$; $G = -·517$, $H = +·391$, $K = -·761$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		2·0	223	i 0 40	+ 5	i 1 10	S_g	—	—	—
Osaka		8·4	227	2 28	P*	4 32	S_g	—	—	—
Zi-ka-wei	Z.	19·7	248	e 4 26	− 8	8 28	SS	—	—	12·7
Hong Kong		30·4	242	6 26	+10	11 25	+ 9	—	—	16·7
Phu-Lien		36·6	249	—	—	e 17 38	?	—	—	20·2
College		44·7	34	—	—	e 14 54	0	—	—	e 18·4
Almata		48·0	297	e 9 32	+49	—	—	—	—	—
Calcutta	N.	49·1	266	e 8 59	+ 8	e 16 3	+ 7	e 19 18	SS	e 23·6
Andijan		52·1	294	e 9 14	0	—	—	—	—	32·2
Sverdlovsk		53·3	318	i 9 22	− 1	16 56	+ 2	—	—	27·2
Tashkent		54·0	297	i 9 27	− 1	e 17 26	PS	e 11 35	PP	e 27·4
Samarkand		56·3	296	e 9 58	+13	—	—	—	—	—
Bombay		63·0	272	e 10 28	− 3	e 19 4	+ 3	—	—	—
Moscow		65·1	323	e 11 52	+67	e 19 12	−15	—	—	36·7
Baku		67·2	304	—	—	e 19 59	+ 7	e 21 33	PPS	e 28·2
Grozny		68·0	309	e 11 10	+ 7	—	—	—	—	46·8
Tiflis		69·6	308	11 12	− 1	20 25	+ 4	—	—	e 38·2
Tinemaha		72·8	56	e 11 38	+ 6	—	—	—	—	—
Haiwee		73·6	57	e 11 39	+ 2	—	—	—	—	—
Pasadena	Z.	74·7	58	i 11 39	− 4	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	Z.	75·3	58	i 11 40	− 7	—	—	—	—	—
Collmberg		78·6	330	i 12 2	− 3	—	—	—	—	e 44·2
Cheb		79·8	331	—	—	e 21 15?	−59	—	—	e 43·2
Ksara		80·0	306	i 12 15k	+ 2	e 22 27	+10	e 15 26	PP	—
Tucson		80·6	56	e 12 11	− 5	—	—	15 5	PP	38·5
Stuttgart		82·1	331	e 12 20	− 4	—	—	—	—	e 46·2
Triest		82·8	327	e 13 9	+42	27 40	SS	—	—	—
Rome		86·4	325	12 52	+ 7	23 14?	[+ 4]	e 16 22?	PP	e 41·2

Additional readings :—
Tashkent eSS = +20m.45s.
Moscow e = +13m.15s.
Tiflis e = +11m.23s.
Collmberg e = +12m.10s. and +12m.19s., i = +12m.26s.
Ksara ePS = +23m.10s.
Tucson iP = +12m.20s. and +12m.36s.
Rome eEN = +13m.14s., SS = +28m.11s., i = +29m.28s.
Long waves were also recorded at other European stations, Pulkovo, and Kodaikanal.

March 7d. 17h. 16m. 22s. Epicentre 9°·2S. 159°·5E. (as on 1939 Feb. 4d.).

Intensity V at Kurudui and II at Kokapo (New Britain).

Epicentre 10°·0S. 159°·6E. (U.S.C.G.S.).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome 4, 2e partie, Seismologie, pp. 15.

$A = -·9248$, $B = +·3458$, $C = -·1589$; $\delta = +8$; $h = +7$;
$D = +·350$, $E = +·937$; $G = +·149$, $H = -·056$, $K = -·987$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	19·2	198	i 4 32	+ 4	i 8 2	+ 3	—	—	—
	N.	19·2	198	i 4 26	− 2	i 7 56	− 3	—	—	—
Riverview		25·7	196	—	—	i 9 58	− 3	—	—	e 11·2
Sydney		25·7	196	e 5 26	− 7	e 9 50	−11	—	—	—
Arapuni		32·2	156	—	—	11 50	+ 5	14 38	SS	e 16·6
Wellington		34·7	160	6 53	− 1	12 15	− 9	8 16	PP	17·0
Christchurch		36·1	164	i 7 5a	0	i 12 44	− 1	15 31	L_q	17·2
Manila		44·9	302	i 8 16	− 2	14 58	+ 2	—	—	21·6
Perth		46·3	235	—	—	i 15 11	− 5	—	—	24·8
Honolulu		51·7	54	e 14 47	P_cS	e 17 5	+33	e 20 57	SS	e 23·0
Batavia		52·2	270	9 12	− 3	e 16 40	+ 1	—	—	—
Hong Kong		54·3	307	9 37	+ 7	17 7	0	—	—	—
Zi-ka-wei	Z.	54·3	320	e 9 35	+ 5	—	—	—	—	—
Phu-Lien		59·9	301	—	—	e 18 22	+ 1	—	—	—
Calcutta	N.	76·5	297	e 14 30	PP	i 21 40	+ 1	—	—	—
Colombo	E.	80·9	278	—	—	e 22 38?	+12	—	—	—
Kodaikanal	E.	83·9	282	i 12 37a	+ 4	i 22 58	+ 2	i 15 57	PP	—
Santa Barbara	Z.	87·6	55	i 12 54	+ 3	—	—	—	—	—
Pasadena		88·8	56	i 13 0a	+ 3	—	—	—	—	e 40·6
Mount Wilson		88·9	56	e 13 0	+ 2	—	—	—	—	—
La Jolla		89·3	57	i 13 3	+ 4	—	—	—	—	—
Haiwee		89·4	54	i 13 4	+ 4	—	—	—	—	e 40·8
Riverside		89·4	56	i 13 3a	+ 3	—	—	—	—	—
Tinemaha		89·4	53	i 13 3	+ 3	—	—	—	—	—
Bombay		89·8	291	e 13 26	+24	e 23 27	[− 5]	—	—	—
Andijan		93·8	310	e 13 22	+ 2	e 23 53	[− 1]	—	—	—
Tucson		94·6	58	e 13 26	+ 2	i 23 4	[−55]	i 14 46	pP	e 40·5
Tchimkent		96·0	312	—	—	i 24 1	[− 6]	—	—	—
Tashkent		96·2	311	e 17 21	PP	e 24 0	[− 8]	e 26 12	PS	46·2
Sverdlovsk		102·5	326	e 18 18	PP	e 24 33	[− 6]	32 36	SS	44·6

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		110·8	310	e 19 24	PP	e 28 55	PS	—	—	58·6
Tiflis		114·4	312	e 19 48	PP	e 26 26	{−10}	—	—	e 60·6
Ottawa		120·6	42	e 18 54	[0]	—	—	—	—	61·6
Huancayo		121·6	110	e 19 33	[+37]	e 26 15	[+20]	e 19 45	pPKP	e 51·4
Ksara		122·9	304	e 20 43	PP	e 31 27	PPS	—	—	—
La Paz	z.	126·4	118	19 7	[+ 2]	—	—	—	—	60·6
Stuttgart		133·4	333	e 22 48	PP	—	—	—	—	e 72·6
Strasbourg		134·1	335	e 22 38?	PP	—	—	—	—	e 78·6
Rome		136·4	324	—	—	e 30 15	?	e 33 55	PPS	54·1

Additional readings :—
Riverview iN = +10m.4s.
Wellington iZ = +7m.2s., P_cP = +8m.45s., SS = +15m.2s., L_q = +15m.5s.
Perth i = +13m.0s., P_cS = +17m.48s., S = +18m.38s., SS = +21m.42s., SSS = +22m.38s., SSSS = +23m.3s.
Honolulu eSSS = +21m.27s.
Tucson iP = +13m.38s. and +13m.50s., iPP = +17m.13s., ipPP = +18m.10s., PS = +26m.11s., sS = +26m.43s.
Tashkent e = +29m.19s. and +30m.50s.
Sverdlovsk e = +25m.43s. and +37m.58s.
Huancayo ePPP = +24m.1s., epPPP = +24m.23s., iPS = +30m.43s.,
Ksara e = +32m.32s.
Long waves were also recorded at Philadelphia, Paris, Berkeley, Cheb, Uccle, De Bilt, and Moncalieri.

March 7d. Readings also at 5h. (Tucson), 6h. (Wellington), 8h. (near Berkeley), 10h. (Tucson), 11h. (Tinemaha, Riverside, Mount Wilson, Pasadena, Harvard, Fordham, San Juan (2), and Tucson), 13h. (Columbia and Tucson (2)), 15h. (Cernauti, near Taihoku, Manila, Andijan, Tchimkent, and Samarkand), 17h. (Samarkand and Andijan), 18h. (Ottawa), 19h. (near Fresno and Tucson), 20h. (Andijan and Tchimkent), 21h. (near Harvard and Tucson), 22h. (Harvard (2), Tucson, Ottawa, San Juan, Fordham, Fort de France, Williamstown, and Adelaide), 23h. (Mizusawa and Tucson).

March 8d. 21h. 58m. 19s. Epicentre 6°·2S. 154°·8E. (as on 1939 Jan. 22d.).

Intensity V at Buhu-Passage and Kieta (New Guinea), III at Nodup (New Britain).

Epicentre 6°·5S. 156°·6E.

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome 4, 2e partie Seismologie, pp. 15.

A = −·8997, B = +·4233, C = −·1073 ; δ = +16 ; h = +7 ;
D = +·426, E = +·905 ; G = +·097, H = −·046, K = −·994.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	21·2	184	e 4 53	+ 4	i 8 29	−12	—	—	—
Riverview		27·7	187	e 5 48	− 4	i 10 17	−16	6 26	PP	e 12·7
Sydney		27·7	187	e 5 17	−35	e 10 17	−16	—	—	e 14·0
Adelaide		32·3	205	i 9 21	?	i 13 31	SS	—	—	—
Melbourne		32·7	194	e 6 46	+10	i 11 46	− 6	i 14 8	SSS	14·8
Arapuni		36·9	153	6 41?	−31	12 47	−11	15 11	SS	18·7
Wellington		39·2	156	7 8	−23	13 6	−26	8 46	PP	20·5
Manila		39·4	303	i 7 35a	+ 2	i 13 35	0	—	—	19·2
Christchurch		40·3	160	i 7 29a	−11	i 13 49	0	8 57	PP	19·5
Miyazaki		44·0	331	8 13	+ 2	—	—	—	—	—
Tokyo Cen. Met. Ob.		44·0	343	8 17	+ 6	—	—	—	—	—
Perth		44·5	230	i 8 23	+ 8	14 41	−10	i 10 38	PPP	21·9
Gihu		44·7	341	8 40	+24	—	—	—	—	—
Nagano		45·4	343	8 26	+ 4	15 9	+ 5	—	—	—
Hirosima		45·6	335	8 23	− 1	15 0	− 6	—	—	—
Mizusawa		46·8	346	8 14	−19	15 49	PS	—	—	—
Batavia		47·7	268	e 8 38	− 2	15 25	−11	—	—	e 23·7
Hong Kong		48·8	308	8 50	+ 1	15 51	− 1	—	—	—
Zi-ka-wei	z.	49·0	322	i 8 52	+ 2	—	—	—	—	25·2
Honolulu		53·9	58	e 9 13	−14	e 16 59	− 3	e 12 12	PPP	e 22·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Phu-Lien		54·4	302	9 31	0	17 13	+ 4	—	—	—
Medan		56·9	280	9 47	− 2	i 17 40	− 2	—	—	e 35·7
Calcutta	N.	70·9	297	e 11 27	+ 6	i 20 37	+ 1	e 14 14	PP	e 33·8
Colombo	E.	75·5	279	11 49	+ 1	21 28	0	—	—	—
Kodaikanal	E.	78·7	283	i 12 7a	+ 1	i 22 2	− 1	i 22 44	PS	e 37·4
Hyderabad		78·9	290	12 6	− 1	22 2	− 3	22 36	PS	35·8
College		82·4	21	e 12 0	−25	e 22 28	−13	e 22 52	PS	e 34·3
Bombay		84·4	290	e 12 35	− 1	e 22 54	− 7	—	—	—
Sitka		84·4	32	e 12 31	− 5	e 22 57	− 4	e 15 46	PP	e 35·0
Almata		85·4	316	e 12 41	+ 1	—	—	—	—	—
Frunse		87·1	314	e 12 44	− 5	—	—	—	—	—
Ukiah		87·7	51	e 13 3	+11	e 23 29	− 4	e 24 51	PPS	e 35·7
Andijan		88·3	311	e 12 58	+ 3	e 23 42	+ 3	—	—	—
Victoria		89·2	42	e 21 5	?	(e 23 41)	− 6	25 5	PS	40·7
Santa Barbara		89·8	56	e 12 59a	− 3	—	—	—	—	—
Tchimkent		90·6	313	13 8	+ 3	e 24 22	+22	—	—	—
Tashkent		90·7	312	i 13 3	− 3	i 23 27	[−10]	e 16 44	PP	e 37·7
Pasadena		91·0	56	i 13 1a	− 6	—	—	i 16 22	PP	e 41·4
Mount Wilson		91·1	56	i 13 0a	− 8	—	—	—	—	—
Tinemaha		91·3	53	i 13 2	− 7	—	—	—	—	—
Haiwee		91·4	54	i 13 3	− 6	—	—	—	—	—
La Jolla		91·6	57	i 13 4	− 6	—	—	—	—	—
Riverside		91·6	56	i 13 3a	− 7	—	—	—	—	—
Samarkand		92·2	309	e 13 4	− 9	—	—	—	—	—
Tucson		97·0	58	i 13 28	− 7	e 23 58	[−14]	i 17 21	PP	i 38·7
Sverdlovsk		97·4	327	i 13 33	− 4	i 24 6	[− 8]	17 37	PP	52·5
Baku		105·3	310	e 18 34	PP	27 57	PS	33 59	SS	54·7
Grozny		108·1	314	e 18 37	PP	—	—	—	—	—
Tiflis		109·0	312	e 14 27	P	e 25 5	[− 3]	19 0	PP	e 46·2
Moscow		110·2	327	e 18 56	PP	28 27	PS	e 20 59	PPP	57·2
Pulkovo		112·2	333	e 19 1	PP	25 22	[+ 1]	e 28 39	PS	e 49·9
St. Louis	N.	113·7	50	—	—	e 28 58	PS	—	—	e 45·2
Chicago		114·5	46	e 30 12	PPS	e 35 3	SS	e 39 33	SSS	e 47·1
Ksara		117·4	304	i 18 47k	[0]	e 29 49	PS	i 20 2	PP	58·7
Cernauti		119·8	325	e 23 41?	PPP	—	—	—	—	64·7
Ottawa		121·4	319	i 18 49	[− 6]	e 27 41?	{+18}	e 36 41?	SS	56·7
Helwan		122·0	301	i 18 53	[− 4]	30 37	PS	20 35	PP	—
Copenhagen		122·3	336	i 18 54	[− 3]	—	—	i 20 35	PP	—
Cape Town		122·6	223	e 12 56	?	26 22	[+24]	30 17	PS	58·7
Seven Falls		123·6	34	—	—	e 32 23	PPS	e 37 17	SS	54·7
Williamstown		124·2	40	i 18 55	[− 6]	—	—	—	—	e 58·5
Fordham		124·6	43	i 18 55a	[− 7]	—	—	—	—	e 56·7
Harvard		125·4	40	i 18 57	[− 6]	—	—	e 21 7	PP	e 60·7
Cheb		126·1	331	e 22 21	?	e 28 41?	?	—	—	e 62·7
Huancayo		127·0	110	e 18 48	[−18]	e 22 14	PKS	e 20 54	PP	e 50·5
Triest		128·2	327	e 22 25	SKP	—	—	—	—	—
Stuttgart		128·6	332	e 19 5	[− 4]	—	—	—	—	e 70·7
Uccle		128·9	337	e 19 8	[− 2]	i 22 32	SKP	—	—	e 56·7
Strasbourg		129·4	332	e 19 4	[− 7]	e 28 21	{+ 5}	e 21 20	PP	e 64·7
Chur		129·7	330	e 18 59	[−12]	—	—	e 22 30	SKP	—
Zurich		129·8	331	e 19 8	[− 4]	—	—	e 22 31	SKP	—
Basle		130·2	331	e 19 8	[− 4]	—	—	e 22 35	SKP	—
Neuchatel		130·9	332	e 19 9	[− 5]	—	—	—	—	—
Rome		131·2	321	e 12 46	?	i 22 32	SKP	i 31 43	IS	59·1
Paris		131·5	336	e 22 57	SKP	—	—	—	—	69·7
La Paz	Z.	131·9	118	i 19 10	[− 5]	—	—	i 22 56	SKP	62·7
Bermuda		134·9	49	e 22 26	PKS	e 32 31	PS	—	—	e 56·8
San Juan		138·3	68	i 22 54	PKS	e 40 16	SS	e 41 7	PSPS	e 55·7
Toledo		141·5	334	i 19 26k	[− 7]	—	—	—	—	—
Almeria		143·1	329	e 19 27	[− 9]	—	—	—	—	e 81·6
San Fernando		145·2	333	i 19 36	[− 3]	—	—	—	—	73·7
Rio de Janeiro		146·2	149	e 11 41	?	—	—	—	—	—

For Notes see next page.

NOTES TO MARCH 8d. 21h. 58m. 19s.

Additional readings :—
Riverview ePZ = +5m.53s., iPN = +5m.58s., SS?N = +11m.14s., iE = +12m.0s.
Adelaide e = +9m.50s. and +10m.3s., i = +15m.49s.
Arapuni L_q = +15m.41s.?
Wellington iZ = +7m.47s., i = +13m.21s., SS = +15m.56s., L_q = +16m.13s.
Christchurch iP_cP = +9m.33s., iP_cS = +11m.29s., SS = +16m.37s., L_q = +16m.57s., S_cSZ = +17m.0s.
Perth i = +9m.21s. and +13m.29s., PS = +14m.58s., SS = +18m.4s., SSS = +19m.26s., SSSS = +20m.21s.
Mizusawa ePE = +8m.42s.
Batavia iSE = +15m.33s.
Zi-ka-wei iZ = +9m.6s.
Honolulu eP = +9m.51s., eSS = +19m.51s.
Calcutta ePSN = +20m.54s., eSSN = +24m.58s.
Kodaikanal iSSE = +27m.18s., iSSSE = +30m.41s.?
Hyderabad SSE = +27m.14s.
Bombay i = +23m.0s. and +36m.26s.
Sitka eSS = +28m.40s., eSSS = +32m.31s.
Ukiah ePS = +23m.33s.
Victoria S = +29m.41s., SSS = +37m.23s. ; true S is given as PP.
Tashkent S_cS = +24m.19s., iPPS = +25m.35s., eSS = +29m.59s.
Pasadena iZ = +13m.32s.
Tucson iP = +13m.50s., i = +17m.40s., iPPP = +18m.50s., ePS = +25m.17s., iPPS = +27m.10s., SS = +31m.19s., PSPS = +31m.30s., iPKP,PKP = +38m.25s.
Sverdlovsk iS = +24m.50s., eSS = +31m.35s., L_q = +43m.17s.
Baku ePPP = +21m.40s., SSS = +37m.41s.
Moscow e = +27m.12s.
Tiflis PPZ = +19m.3s., ePPN = +19m.15s., ePPPE = +20m.59s., ePPPZ = +21m.5s., eSKKSE = +25m.56s., PSEZ = +28m.28s., PPSE = +28m.48s., eSSZ = +33m.39s.
Pulkovo ePPP = +21m.55s., eSS = +35m.11s.
St. Louis eN = +41m.6s.
Ksara PPS = +31m.4s.
Cape Town SSN = +37m.14s., SSE = +37m.24s., SSSE = +41m.22s.
Huancayo ePSPS = +38m.12s.
Stuttgart eL_q = +64·7m.
Strasbourg e = +31m.22s., eSS = +38m.18s.
Rome e = +13m.46s., PKP = +15m.35s., SKP = +19m.0s., i = +22m.57s., SS = +35m.38s.
Long waves were also recorded at Berkeley, Kew, Upsala, Bidston, Philadelphia, East Machias, Vermont, Bozeman, De Bilt, Tananarive, Göttingen, and Collmberg.

March 8d. Readings also at 0h. (Collmberg), 2h. (Oaxaca), 3h. (Wellington), 4h. (Osaka), 5h. (Balboa Heights), 6h. (Mizusawa), 8h. (Monowai and Andijan), 10h. (Tucson), 11h. (Tucson), 12h. (Tucson), 15h. (New Plymouth), 16h. (Tucson and Mizusawa), 17h. (La Paz), 18h. (Riverside), 21h. (Samarkand and Andijan).

March 9d. 1h. Local Japanese shock. Tokyo Imp. Univ. gives Epicentre as 36°·77N. 141°·38E.

Tokyo Imp. Univ. P = 27m.4s., S = 27m.26s.
Kamakura P = 27m.6s., S = 27m.31s.
Kiyosumi P = 27m.6s., S = 27m.30s.
Komaba P = 27m.6s., S = 27m.27s.
Koyama P = 27m.6s., S = 27m.34s.
Mitaka P = 27m.6s., S = 27m.30s.
Okiziku P = 27m.6s., S = 27m.21s.
Titibu P = 27m.6s., S = 27m.34s.
Tukubasan P = 27m.6s., S = 27m.21s.
Mizusawa ePN = 27m.9s., iSN = 27m.32s.
Susaki P = 27m.23s., S = 27m.57s.
Osaka P = 28m.5s., S = 29m.15s.
Tucson iP = 39m.16s.a

March 9d. 18h. Local Japanese shock . Tokyo Imp. Univ. gives Epicentre as 36°·15N. 139°·91E.

Tokyo Imp. Univ. P = 12m.45s., S = 12m.53s.
Kamakura P = 12m.46s., S = 13m.0s.
Kiyosumi P = 12m.46s., S = 13m.0s.
Komaba P = 12m.46s., S = 12m.54s.
Koyama P = 12m.46s., S = 13m.0s.
Mitaka P = 12m.46s., S = 12m.55s.

Continued on next page.

Okiziku P =12m.46s., S =12m.52s.
Titibu P =12m.46s., S =12m.56s.
Tukubasan P =12m.46s., S =12m.52s.
Susaki P =13m.0s., S =13m.18s.
Mizusawa PE =13m.22s., iS =13m.58s.
Osaka P =13m.35s., S =14m.23s.
Tucson iP =25m.4s.

March 9d. Readings also at 0h. (Columbia, Andijan, Samarkand, and Tchimkent), 1h. (Frunse and Almata), 5h. (Mizusawa), 6h. (Tucson and Medan), 7h. (Wellington and La Paz), 8h. (Calcutta), 10h. (Tucson and Wellington), 16h. (Wellington), 18h. (Riverside, Collmberg, and New Plymouth), 19h. (Tucson and near Branner), 22h. (Mizusawa and Tucson), 23h. (Tiflis).

March 10d. Readings at 0h. (La Paz, Samarkand, Andijan, Frunse, Tchimkent, Almata, Tashkent, Tucson, Sverdlovsk, La Plata, and Apia), 1h. (La Paz, Samarkand, and Andijan), 2h. (Kameyama, Tacubaya, Puebla, Mount Wilson, La Jolla, Tinemaha, Andijan, Sverdlovsk, Mizusawa, Manila, Misima, Tokyo, Cen. Met. Obs., Mori, Riverside (2), and Tucson (2)), 3h. (Mizusawa, Nagano, Mori, Riverside, Tokyo, Cen. Met. Obs., Misima, Sverdlovsk, La Paz (2), and Tucson), 4h. (Tucson and Balboa Heights), 5h. (Manila), 7h. (Semipalatinsk, Sverdlovsk, Andijan, Tchimkent, and Frunse), 8h. (Tashkent, Almata, Baku, Tiflis, Cheb, Zi-ka-wei, Collmberg, Pulkovo, Ksara, Strasbourg, Hamburg, Stuttgart, Uccle, Kew, Moscow, Stonyhurst, and Paris), 9h. (Andijan and Samarkand), 11h. (Andijan), 13h. (Collmberg), 14h. (Collmberg), 15h. (La Paz), 18h. (Wellington), 19h. (Mizusawa), 21h. (near Moncalieri and Mizusawa), 22h. (Sverdlovsk, Tashkent, Baku, Tiflis, Cheb, Zi-ka-wei, Pulkovo, Ksara (2), Collmberg, and Manila), 23h. (Mizusawa, Grozny, Andijan, Samarkand, Tchimkent, Frunse, Tashkent, and Collmberg).

March 11d. Readings at 3h. (near Berkeley), 5h. (Frunse, Samarkand, and Andijan), 6h. (Batavia, Malabar, and Andijan), 8h. (Andijan), 9h. (Wellington), 10h. (Moncalieri and Malabar), 11h. (Wellington, Tiflis, Tucson, Mount Wilson, Riverside, Tinemaha, Haiwee, Pasadena, Collmberg, Riverview, Osaka, Christchurch, and Ksara), 12h. (Hukuoka), 13h. (Mizusawa), 15h. (Sofia), 16h. (La Paz and Wellington), 22h. (Tucson (2)), 23h. (Tucson and Tiflis).

March 12d. 22h. Local undetermined shock.
Ferndale iPEN =4m.45s., iSEN =5m.2s., iEN =5m.6s. and 5m.9s.
Berkeley iPZ =5m.25s., eEZ =5m.34s., iN =5m.43s., iSN =6m.6s., iEN =6m.12s., iZ =6m.46s.
San Francisco iPN =5m.27s., eE =5m.45s., iSN =6m.6s., iEN =6m.9s., iE =6m.1?s.
Branner iP =5m.31s., iN =6m.14s. and 6m.19s.
Ukiah e =5m.31s.
Lick iPEN =5m.36s., iSE =6m.25s.
Fresno iN =5m.59s.
Tinemaha iPEZ =6m.10s., eSN =7m.36s.
Haiwee iP =6m.19s., eSN =7m.56s.
Santa Clara iPN =6m.23s., iSN =6m.58s.
Pasadena iP =6m.34s., iS =8m.10s.
Mount Wilson iPZ =6m.35s.
Riverside iPZ =6m.43s.
Tucson P =7m.57s., i =8m.1s., 8m.51s., and 12m.32s.
Frunse e =9m.27s.
Tchimkent i =9m.38s.
Almata e =9m.46s.
Samarkand e =9m.50s.
Butte e =10m.5s.

March 12d. Readings also at 0h. (Christchurch, Wellington, and New Plymouth), 1h. (Triest and Ottawa), 4h. (Almata), 8h. (Andijan), 10h. (Andijan, Almata, Tashkent, Manila, Samarkand, Tchimkent, and Frunse), 11h. (Sverdlovsk and Tiflis), 12h. (Andijan), 15h. (Christchurch, Collmberg, and Triest), 16h. (near Rome and Mizusawa), 17h. (Baku, Sverdlovsk, and Tashkent), 19h. (Sverdlovsk and Medan), 20h. (Tiflis), 21h. (Balboa Heights, Tucson, Riverside, Mount Wilson, Pasadena, and Andijan), 22h. (Andijan).

March 13d. 3h. 36m. 45s. Epicentre 36°·0N. 29°·0E.

$A = +\cdot7092$, $B = +\cdot3931$, $C = +\cdot5852$; $\delta = -5$; $h = 0$;
$D = +\cdot484$, $E = -\cdot875$; $G = +\cdot512$, $H = +\cdot283$, $K = -\cdot811$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		6·1	109	i 1 34	0	2 46	+ 1	i 3 26	S_g	—
Helwan		6·4	162	i 1 57k	P*	3 21	S*	i 2 3	P_g	—
Sofia	N.	8·0	329	3 15?	?	i 4 27	S_g	—	—	—
Belgrade		10·9	326	—	—	e 5 25	SSS	—	—	i 6·7
Tiflis		13·6	61	e 3 1	−16	e 5 45	− 5	e 6 22	SSS	i 7·4
Rome		14·1	300	—	—	e 6 21	SS	—	—	e 9·3
Triest		15·0	315	—	—	e 6 33	+10	—	—	—
Florence		15·7	305	e 3 45	+ 1	—	—	—	—	9·7
Baku		17·0	69	e 3 51	−10	e 6 54	−16	—	—	9·0
Chur		18·1	314	e 4 19	+ 5	—	—	—	—	—
Cheb		18·5	325	—	—	e 6 15?	?	—	—	e 10·2
Zurich		19·0	314	e 4 25a	− 1	—	—	—	—	—
Stuttgart		19·3	319	e 4 30	+ 1	—	—	—	—	e 10·8
Basle		19·7	314	e 4 38	+ 4	—	—	—	—	—
Kew		25·9	318	—	—	e 8 15?	?	—	—	—
Bidston		28·3	319	—	—	e 8 15?	?	—	—	—
Sverdlovsk		29·7	36	—	—	e 10 59	− 7	—	—	18·2

Additional readings :—
Ksara i = +3m.40s.
Helwan P_gZ = +2m.22s.
Belgrade i = +6m.20s.
Tiflis eZ = +6m.43s.
Rome iZ = +8m.49s.
Long waves were also recorded at Strasbourg, Uccle, De Bilt, Christchurch, Riverview, and Moncalieri.

March 13d. 5h. 10m. 5s. Epicentre 24°·0S. 175°·0W. (1939, February 3d.).

$A = -\cdot9111$, $B = -\cdot0797$, $C = -\cdot4045$; $\delta = +8$; $h = +4$;
$D = -\cdot087$, $E = +\cdot996$; $G = +\cdot400$, $H = +\cdot035$, $K = -\cdot915$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		10·6	17	i 2 26a	−10	4 17	−20	e 4 48	SS	i 5·4
Arapuni		16·2	207	7 31	S	(7 31)	SSS	—	—	10·9
Wellington		19·2	205	4 25	− 3	e 8 55?	SSS	7 38	P_cP	—
Christchurch		22·0	204	e 4 44a	−14	9 18	+22	e 5 6	PP	11·6
Brisbane		29·0	258	e 7 1	PP	e 11 31	+37	i 7 13	PPP	—
Sydney		31·0	244	e 7 25	PP	e 11 55	+29	—	—	—
Riverview		31·1	244	e 7 34	PPP	—	—	—	—	e 14·4
Santa Barbara		78·3	45	e 12 3	0	—	—	—	—	—
La Jolla		78·9	47	i 12 7	0	—	—	—	—	—
Berkeley		79·0	41	i 12 3	− 4	—	—	—	—	e 35·9
Pasadena		79·1	46	i 12 8k	0	e 25 1	?	—	—	e 36·6
Mount Wilson		79·2	46	i 12 8k	0	—	—	—	—	—
Riverside		79·5	46	i 12 10k	0	—	—	—	—	—
Haiwee		80·6	44	i 12 16	0	—	—	—	—	—
Tinemaha		80·9	43	i 12 18k	+ 1	—	—	—	—	—
Tucson		82·9	51	i 12 29k	+ 1	22 49	+ 3	i 15 38	PP	37·5
Victoria		85·6	32	e 13 37	+56	e 23 7	[+ 2]	—	—	39·9
College		91·0	11	—	—	e 24 3	PS	—	—	e 42·6
Huancayo		93·8	105	e 13 39	+19	e 34 55	SSS	e 19 48	PPP	e 41·5
La Paz	z.	98·1	112	e 13 46	+ 6	—	—	—	—	48·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis	N.	100·7	51	—	—	e 25 40	+14	—	—	e 42·5
Kodaikanal	E.	110·0	273	—	—	e 23 55?	?	—	—	—
San Juan		114·1	80	—	—	e 25 31	[+ 3]	e 29 12	PS	—
Agra	E.	114·9	291	—	—	i 25 25	[− 7]	—	—	—
Tashkent		124·4	305	—	—	e 30 36	PS	—	—	e 78·5
Sverdlovsk		128·4	325	e 19 6	[− 3]	—	—	—	—	52·4
Baku		139·1	306	e 23 14	PP	e 26 42	[+ 4]	e 33 46	PS	66·9
Tiflis		142·5	308	e 19 31	[− 4]	23 24	PKS	e 22 26	PP	e 69·9
Copenhagen		147·9	353	i 19 46	[+ 2]	—	—	—	—	—
Hamburg	Z.	150·3	355	e 19 51	[+ 3]	—	—	—	—	—
Ksara		151·3	297	i 19 50	[+ 1]	33 42	PS	e 23 28	PP	—
De Bilt	Z.	152·0	359	i 19 51	[+ 1]	—	—	—	—	e 89·9
Collmberg		152·1	348	e 19 48	[− 2]	e 26 55	[− 1]	e 23 43	PP	—
Göttingen	Z.	152·2	354	e 19 55	[+ 4]	—	—	—	—	—
Jena		152·7	349	e 19 55	[+ 4]	—	—	—	—	—
Uccle		153·3	2	e 20 0	[+ 8]	—	—	—	—	e 79·9
Istanbul		153·7	317	—	—	e 28 35	?	—	—	—
Stuttgart		155·1	352	e 19 54	[− 1]	—	—	—	—	e 88·9
Strasbourg		155·4	354	e 20 25	[+30]	—	—	—	—	e 81·9
Helwan	Z.	155·8	290	e 19 55	[0]	—	—	—	—	—
Basle		156·4	356	e 19 56	[0]	—	—	—	—	—
Zurich		156·5	355	e 19 54k	[− 2]	—	—	—	—	—
Chur		156·9	353	e 19 55	[− 2]	—	—	—	—	—
Rome	Z.	161·1	342	i 18 48k	?	—	—	—	—	—
Toledo	Z.	162·4	23	e 20 5	[+ 2]	—	—	—	—	—
Almeria		165·7	24	e 19 52	[−14]	—	—	—	—	—

Additional readings :—
Arapuni iS? = +8m.43s.
Wellington S_cS = +16m.17s.
Christchurch L_q = +10m.11s.
Berkeley eNZ = +12m.7s.
Tucson iP = +12m.36s., i = +12m.45s. and +13m.0s.
Tashkent e = +52m.31s. and +69m.35s.
Sverdlovsk e = +22m.33s.
Tiflis iPKPZ = +19m.38s., eEN = +23m.15s., eE = +31m.59s.
Copenhagen e = +20m.12s.
Ksara PPS = +36m.44s.
Collmberg i = +19m.56s., +20m.10s., and +20m.30s., e = +20m.52s., i = +21m.0s., e = +21m.16s., +21m.32s., and +21m.56s.
Jena e = +20m.0s.
Helwan iZ = +21m.10s.
Rome iPKP$_2$Z = +19m.59s., ePPZ = +21m.37s., ePSKSZ = +34m.7s.
Toledo e = +21m.11s.
Long waves were also recorded at Perth, Paris, Pulkovo, Kew, Rio de Janeiro, San Fernando, Chicago, and Bidston.

March 13d. Readings also at 1h. (Tucson and La Paz), 4h. (Collmberg and Port au Prince), 5h. (Andijan, Frunse, Samarkand, and Grozny), 6h. (Tucson), 7h. (Andijan), 8h. (Andijan), 9h. (Tucson), 10h. (Tucson, Andijan, San Juan, and Columbia), 13h. (Christchurch and Wellington), 14h. (Andijan, Almata, and Frunse), 15h. (near Balboa Heights), 21h. (Samarkand, Frunse, Almata, Andijan, and Tashkent), 22h. (Sverdlovsk, Ksara, Tiflis, Kodaikanal, and Bombay), 23h. (Ottawa).

March 14d. Readings at 1h. (Andijan and Almata), 2h. (Tucson), 4h. (Tucson), 5h. (Zurich), 7h. (Andijan and La Paz), 11h. (Tucson), 12h. (near Balboa Heights), 13h. (Tucson, La Paz, and Riverside), 14h. (Tucson, Pasadena, Riverside, Tinemaha, and Wellington), 15h. (Rome and Perth), 16h. (Ksara and near Apia), 17h. (Balboa Heights, Batavia, and Malabar), 21h. (Collmberg and near Triest).

March 15d. Readings at 0h. (near Mizusawa), 1h. (near Mizusawa), 2h. (Tucson), 4h. (Sofia and Tucson), 5h. (Tucson, Ksara, Bombay, Agra, Kodaikanal, and Colombo), 6h. (Helwan), 11h. (Stuttgart, Ravensburg, Collmberg, Strasbourg, Jena, Chur, Zurich, Basle, near Göttingen, Neuchatel, and Triest), 12h. (Triest and Rathfarnham Castle), 14h. (near Manila), 18h. (Lick, Branner, Cheb, Berkeley, Fresno, and San Francisco), 19h. (Branner and Tiflis (2)), 20h. (Istanbul, Harvard, Helwan, Sofia, Tucson, and Ksara), 21h. (Tiflis), 22h. (Fort de France, Batavia, and Malabar), 23h. (Ksara).

March 16d. Readings at 5h. (Andijan and near Manila), 6h. (Andijan and Balboa Heights), 8h. (Christchurch, New Plymouth, and Wellington), 10h. (Moncalieri and Balboa Heights), 11h. (Andijan), 13h. (Columbia), 14h. (Rathfarnham Castle and near Misuzawa), 15h. (Triest), 16h. (Almata), 18h. (Tucson, Pasadena, Mount Wilson, Riverside, and Tinemaha), 19h. (Andijan and Almata), 20h. (Williamstown, Shawinigan Falls, and near Ottawa), 21h. (Strasbourg, Sverdlovsk, Paris, Stuttgart, Kew, Uccle, Cheb, De Bilt, and Bidston), 22h. (Tashkent and near Mizusawa).

March 17d. 12h. 12m. 24s. Epicentre 42°·5N. 82°·5E. (as on 1939, February 23d.).

$A = +\cdot0965$, $B = +\cdot7332$, $C = +\cdot6731$; $\delta = -4$; $h = -3$;
$D = +\cdot991$, $E = -\cdot131$; $G = +\cdot088$, $H = +\cdot667$, $K = -740$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		4·2	284	i 1 9	+ 2	2 2	+ 5	1 17	P*	—
Frunse		5·8	266	e 1 29	0	2 48	+10	e 1 44	P*	—
Andijan		7·8	260	e 1 56	− 2	e 3 48	S*	e 2 20	P*	—
Semipalatinsk		8·1	351	e 2 18	P*	3 54	S*	—	—	—
Tchimkent		9·6	275	i 2 54	+33	e 4 29	+17	e 4 43	S*	—
Tashkent		9·9	265	2 22	− 3	i 4 10	−10	—	—	4·7
Samarkand		12·0	263	e 2 55	0	e 4 50	−21	—	—	—
Agra	E.	15·8	195	e 3 39	− 6	e 6 7	−35	—	—	—
Sverdlovsk		20·0	325	e 4 44	+ 7	8 31	+14	—	—	10·1
Calcutta	N.	20·5	164	—	—	i 8 42	+15	e 10 14	?	e 12·3
Baku		24·5	277	e 5 28	+ 6	i 9 57	+17	—	—	12·8
Bombay		24·9	202	e 5 30	+ 4	e 9 42	− 5	e 6 31	PPP	—
Hyderabad		25·2	190	e 5 30	+ 1	9 46	− 6	—	—	11·4
Tiflis		27·8	282	5 55	+ 2	e 10 44	+ 9	—	—	e 16·6
Moscow		31·6	311	—	—	e 14 17	SSS	—	—	e 16·4
Kodaikanal	E.	32·5	190	—	—	e 11 40	− 9	—	—	e 17·1
Colombo	E.	35·5	185	—	—	e 17 6	?	—	—	—
Pulkovo		35·9	318	7 16	+12	e 13 27	+45	e 15 26	SSS	18·1
Ksara		37·3	272	e 7 4	−12	—	—	—	—	—
Prague		46·2	306	—	—	e 19 18	SSS	e 22 18	?	—
Collmberg	Z.	46·6	307	i 8 36	+ 4	—	—	—	—	e 25·0
Hamburg		47·7	311	—	—	e 23 16	?	—	—	e 25·0
Moncalieri		52·3	300	—	—	i 20 57	SS	—	—	—

Additional readings :—
Almata PP = +1m.12s., e = +1m.32s.
Frunse i = +1m.46s. and +1m.51s.
Andijan e = +2m.34s., +2m.44s., +3m.4s., and +4m.4s.
Tchimkent e = +3m.16s. and +3m.55s.
Tiflis eSE = +10m.48s., eZ = +14m.32s., eE = +15m.30s., eZ = +15m.36s.
Kodaikanal eE = +15m.27s.
Pulkovo e = +17m.6s.
Collmberg Z i = +8m.47s., +9m.7s., +9m.34s., and +10m.30s.
Long waves were also recorded at Cheb, De Bilt, Upsala, Stuttgart, Bergen, Edinburgh, Kew, Paris, Triest, Strasbourg, Bidston, and Stonyhurst.

March 17d. Readings also at 8h. (Andijan), 9h. (near Manila and Mount Wilson), 11h. (Rathfarnham Castle and Malabar), 13h. (Moncalieri, Mount Wilson, Berkeley, near Tucson, San Francisco, Branner, Lick, Fresno, Pasadena, Haiwee, Tinemaha, Riverside, Ferndale, and near Ukiah), 14h. (Malabar), 16h. (Christchurch), 18h. (Andijan and La Paz), 19h. (Andijan and near Fort de France (2)), 20h. (Fort de France, Oaxaca, and Tacubaya).

March 18d. Readings at 1h. (near Fort de France), 3h. (Bombay, Calcutta, Frunse, Samarkand, Andijan, and Tchimkent), 6h. (Tucson (2), Fort de France, and Merida), 13h. (Huancayo), 14h. (Frunse, Andijan, and Tchimkent), 16h. (Christchurch and Manila), 17h. (Haiwee, Triest (2), Riverview, Collmberg, Frunse, Andijan, Tchimkent, Huancayo, Tucson, Samarkand, Pasadena, Mount Wilson, Riverside, and Tinemaha), 18h. (Ksara and Wellington), 19h. (Tucson), 20h. (Tucson, Tinemaha, Riverside, Mount Wilson, and Pasadena), 21h. (Almata, Tchimkent, Andijan, and Frunse), 22h. (Sitka and near Tananarive).

March 19d. 9h. Local Japanese shock.

Tokyo Imperial Univ. gives epicentre as 35°·41N. 140°·23E.

Okiziku P =3m.26s., S =3m.37s.
Kiyosumi P =3m.26s., S =3m.31s.
Koyama P =3m.26s., S =3m.42s.
Titibu P =3m.26s., S =3m.42s.
Yosiwara P =3m.26s., S =3m.46s.
Tokyo, Imp. Univ. P =3m.42s., S =3m.50s.
Kamakura P =3m.43s.
Mitaka P =3m.43s., S =3m.53s.
Tukubasan P =3m.43s., S =3m.55s.
Komaba P =3m.49s., S =3m.58s.
Susaki P =3m.51s., S =4m.4s.
Mizusawa ePE =4m.43s., SE =5m.31s.

March 19d. 11h. Local Japanese shock.

Tokyo Imperial University gives epicentre as 35°·41N. 140°·23E.

Kiyosumi P =19m.45s., S =19m.50s.
Koyama P =19m.45s., S =20m.2s. ?
Okiziku P =19m.45s., S =19m.56s.
Titibu P =19m.45s., S =20m.5s.
Yosiwara P =19m.45s., S =20m.3s. ?
Komaba P =19m.59s., S =20m.8s.
Tokyo, Imp. Univ. P =19m.59s., S =20m.8s.
Susaki P =20m.5s., S =20m.22s.
Kamakura P =20m.45s.
Mitaka P =20m.45s., S =20m.56s.
Tukubasan P =20m.45s., S =20m.58s.
Mizusawa eP =20m.50s., SN =21m.42s.
Osaka P =21m.6s., S =22m.4s.

March 19d. Readings also at 2h. (Sitka), 3h. (Samarkand and Andijan), 8h. (Tucson), 11h. (Samarkand, Andijan, and Tucson), 13h. (Mizusawa), 14h. (Tucson, Riverside, and Andijan), 15h. (near Fort de France and Wellington), 16h. (Andijan, Tchimkent, and Frunse), 17h. (Fort de France), 20h. (Tchimkent (2), Andijan (2), Samarkand, and Almata), 21h. (Huancayo, La Paz, La Plata, and Rio de Janeiro).

March 20d. 1h. 56m. 53s. Epicentre 42°·5N. 82°·5E. (as on 1939 March 17d.).

$A = +\cdot0965$, $B = +\cdot7332$, $C = +\cdot6731$; $\delta = -4$; $h = -3$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		4·2	284	i 0 59	− 8	1 49	− 8	i 1 5	P_g	—
Frunse		5·8	266	1 21	− 8	2 41	+ 3	i 1 37	P_g	—
Andijan		7·8	260	1 51	− 7	3 11	−17	e 2 12	P*	—
Semipalatinsk		8·1	351	2 13	+11	3 50	S*	—	—	—
Tchimkent		9·6	275	e 2 45	PPP	4 28	SS	—	—	—
Tashkent		9·9	265	e 2 38	PP	i 4 45	SSS	—	—	e 5·2
Samarkand		12·0	263	e 3 1	+ 6	e 4 49	−22	—	—	—
Dehra Dun	N.	12·7	197	—	—	e 5 18	−10	—	—	—
Agra	E.	15·8	195	e 2 55	PP	e 5 57	−45	—	—	7·3
Sverdlovsk		20·0	325	i 4 37	0	8 30	+13	—	—	10·4
Calcutta	N.	20·5	164	e 3 20	?	i 8 25	− 2	e 9 56	SS	i 11·9
Baku		24·5	277	e 7 47	?	e 11 28	SSS	—	—	e 13·2
Bombay		24·9	202	e 5 20	− 6	e 9 35	−12	—	—	e 12·8
Tiflis		27·8	282	e 6 19	PP	e 10 25	−10	—	—	e 17·1
Kodaikanal	E.	32·5	190	—	—	e 11 37	−12	—	—	e 16·9
Colombo	E.	35·5	185	—	—	e 11 37	−59	—	—	—
Ksara		37·3	272	e 10 10	?	e 15 22	SS	—	—	e 19·4
San Juan		112·9	329	—	—	e 36 1	SS	—	—	—

Additional readings :—
Almata iPP = +1m.11s., e = +1m.35s.
Frunse e = +2m.1s., +2m.31s., and +2m.47s.
Andijan e = +2m.22s., +2m.54s., and +3m.41s.
Tchimkent e = +3m.0s., +3m.22s., and +3m.52s.
Tiflis ePEZ = +6m.38s., eE = +12m.42s.
Long waves were also recorded at Cheb and De Bilt.

March 20d. 3h. 3m. 35s. Epicentre 44°·6N. 6°·8E. (as on 1938 July 18d.).

Intensity V in the Upper Valley of Ubaye (Lower Alpes) and IV at Susa (Italy).

Epicentre 44°·6N. 7°·1E.

J. P. Rothé.

Seismicite des Alpes occidentales, Annales de l'Institut de Physique du Globe de Strasbourg, tome 3, 1938, 3e partie, Geophysique pp. 10 et pp. 72.

$A = +\cdot7094$, $B = +\cdot0846$, $C = +\cdot6998$; $\delta = +13$; $h = -3$;
$D = +\cdot118$, $E = -\cdot993$; $G = +\cdot695$, $H = +\cdot083$, $K = -\cdot714$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Moncalieri	0·7	58	i 0 13	− 4	—	—	—	—	—
Grenoble	1·0	307	e 0 22	+ 1	i 0 38	+ 2	—	—	—
Marseilles	1·6	218	e 0 38	+ 8	i 0 52	+ 1	0 55	S_g	—
Neuchatel	2·4	2	e 0 42	+ 1	e 1 20	S_g	e 0 49	P_g	—
Clermont Ferrand	2·9	293	—	—	e 1 44	S_g	—	—	—
Basle	3·0	10	e 0 49	− 1	e 1 22	− 5	e 1 36	S*	—
Chur	3·0	40	e 0 45	− 5	—	—	—	—	—
Zurich	3·0	24	e 0 53	+ 3	e 1 34	+ 7	—	—	—
Strasbourg	4·1	10	e 1 28	P_g	i 1 50	− 5	e 2 9	S*	—
Stuttgart	4·5	21	e 1 25	P*	e 2 24	S_g	—	—	—
Triest	5·0	76	—	—	e 2 16	− 2	—	—	—

Additional readings :—
Grenoble iPP = +27s., iS_g = +42s., iSS = +45s., i = +52s.
Marseilles i = +45s. and +58s., iPS = +1m.0s., iS_g = +1m.3s., iSS = +1m.6s., i = +1m.11s., iSS = +1m.17s., eSSS = +1m.45s.
Strasbourg eP_gP_g = +1m.38s., eS_g = +2m.15s., iSS = +2m.22s., iE = +2m.28s. and +2m.36s., iSSSE = +2m.40s.
Stuttgart e = +1m.45s. and +2m.34s.
Triest e = +3m.2s.

March 20d. 3h. 22m. 27s. Epicentre 32°·4N. 131°·8E.

Damage at Miyazaki and Ooita.

Epicentre 32°·4N. 131°·8E. (Tokyo Cen. Met. Obs.). Epicentre in the northern part of Hyuga-Nada. Felt throughout Sikoku, Kyusyu and Tyugoku, and also in Kinki district.

H. Kawasuni. Seismology in Japan, 1939-1947. Report of the Oslo Assembly, 1948.

See also Seismological Notes, Bulletin of the Seismological Society of America, Vol. 29, Berkeley, 1939, p. 418.

$A = -\cdot5639$, $B = +\cdot6307$, $C = +\cdot5333$; $\delta = +17$; $h = +1$;
$D = +\cdot745$, $E = +\cdot667$; $G = -\cdot355$, $H = +\cdot398$, $K = -\cdot846$.

Tables for focus at the base of the superficial layers have been used.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Miyazaki	0·6	213	0 13k	+ 1	0 23	+ 2	—	—	—
Kumamoto	1·0	294	0 17k	− 1	0 34	+ 3	—	—	—
Simidu	1·1	69	0 19k	0	—	—	—	—	—
Kagosima	1·3	232	0 28a	+ 6	0 46	+ 8	—	—	—
Unzendake	1·3	284	0 18	− 4	0 36	− 2	—	—	—
Izuka	1·5	324	0 26a	+ 1	0 40	− 4	—	—	—
Hukuoka	1·6	316	0 29	+ 3	0 56	+10	—	—	—
Matuyama	1·6	29	0 30k	+ 4	0 53	+ 7	—	—	—
Nagasaki	1·7	282	0 25a	− 3	0 53	+ 4	—	—	—
Koti	1·9	51	0 30	− 1	0 57	+ 3	—	—	—
Hirosima	2·0	15	0 35k	+ 3	1 8	+12	—	—	—
Muroto	2·2	67	0 36a	+ 1	1 1	0	—	—	—
Yakusima	2·2	210	0 35	0	1 2	+ 1	—	—	—
Tomie	2·5	275	0 41	+ 2	1 23	+14	—	—	—
Hamada	2·5	5	0 42	+ 3	0 59	−10	—	—	—
Husan	3·5	319	0 53	0	1 27	− 7	—	—	—
Siomisaki	3·5	71	0 53	0	1 33	− 1	—	—	—
Osaka	3·8	52	0 59	+ 1	1 53	SS	—	—	—
Toyooka	4·0	37	1 3k	+ 3	2 11	SSS	—	—	—
Kyoto	4·1	50	1 5a	+ 3	2 16	SSS	—	—	—
Taikyu	4·4	323	1 7	+ 1	2 21	SS	—	—	—
Nagoya	5·0	56	1 19k	+ 4	2 30	SS	—	—	—
Gihu	5·1	52	1 17	+ 1	2 16	+ 1	—	—	—
Omaesaki	5·7	66	1 28	+ 3	2 51	SSS	—	—	—
Toyama	6·2	44	1 35	+ 3	2 57	+15	—	—	—
Wazima	6·5	38	1 37	+ 2	3 10	SS	—	—	—
Hunatu	6·5	60	1 40	+ 5	3 42	SSS	—	—	—
Keizyo	6·5	323	1 40	+ 5	3 3	SS	—	—	—
Misima	6·5	63	1 37k	+ 2	3 3	SS	—	—	—
Zinsen	6·6	322	1 41k	+ 4	3 13	SS	—	—	—
Nagano	6·7	49	1 43	+ 4	3 18	SS	—	—	—
Osima	6·7	67	1 39	0	3 1	+ 6	—	—	—
Mera	7·1	67	1 47	+ 3	2 47	−18	—	—	—
Maebasi	7·2	54	1 51	+ 5	3 51	SSS	—	—	—
Kumagaya	7·2	57	1 51	+ 5	3 22	SS	—	—	—
Yokohama	7·2	63	1 49	+ 3	3 30	SSS	—	—	—
Tokyo Cen. Met. Ob.	7·3	61	1 52	+ 5	3 23	SS	3 34	?	—
Tukubasan	7·8	58	1 57	+ 3	3 32	SS	—	—	—
Utunomiya	7·8	56	1 54	0	4 18	SSS	—	—	—
Kakioka	7·9	59	1 57	+ 2	3 49	SS	—	—	—
Heizyo	8·2	325	2 5	+ 5	3 53	SS	—	—	—
Mito	8·2	58	2 0k	0	3 38	+ 6	—	—	—
Hukusima	8·8	50	2 12k	+ 4	4 17	SSS	—	—	—
Zi-ka-wei z.	8·9	270	i 2 7	− 2	3 49	0	i 2 17	PP	—
Sendai	9·4	49	2 21k	+ 5	4 36	SSS	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		10·1	46	i 2 30	+ 4	i 4 40	SS	—	—	—
Titizima		10·4	118	2 35k	+ 5	—	—	—	—	—
Isigakizima		10·5	222	2 36	+ 5	4 36	+ 7	—	—	—
Hatinohe		11·2	41	2 44	+ 3	4 59	SS	—	—	—
Taihoku		11·6	234	e 2 48	+ 2	e 5 12	SS	—	—	i 5·7
Mori		11·9	33	2 58	+ 8	6 1	L	—	—	(6·0)
Sapporo		13·0	32	3 12a	+ 7	5 57	SSS	—	—	—
Taito		13·4	227	3 18	+ 8	6 6	SS	—	—	—
Nemuro		15·4	41	3 43	+ 7	6 56	SS	—	—	—
Hong Kong		18·6	242	4 14	− 3	7 51	+11	4 24	PP	9·7
Sikka		18·8	23	4 1	−18	7 40	− 4	—	—	—
Manila		20·3	213	i 4 33a	− 3	8 18	+ 2	—	—	—
Palau		25·1	175	5 23	0	9 47	+ 4	—	—	—
Phu-Lien		25·2	250	i 5 22a	− 2	e 9 53	+ 8	—	—	12·5
Calcutta	N.	39·6	268	i 7 32k	+ 2	e 13 58	+28	e 9 1	PP	e 20·1
Semipalatinsk		41·7	313	7 46	− 1	—	—	—	—	—
Medan		42·2	235	i 7 54	+ 3	i 14 10	+ 1	—	—	e 22·5
Almata		44·0	302	8 4	− 2	—	—	—	—	22·7
Batavia		45·1	217	8 11	− 4	i 14 51	0	—	—	e 23·5
Dehra Dun	N.	45·5	283	e 7 37	−41	e 14 36	−21	—	—	e 23·0
Frunse		45·7	301	8 20	0	—	—	—	—	e 23·7
Agra	E.	46·6	279	8 22	− 5	15 0	−13	8 37	pP	—
Andijan		47·7	299	e 8 34	− 1	e 15 28	0	—	—	—
Tchimkent		49·4	302	8 48	− 1	—	—	—	—	27·5
Tashkent		49·9	300	i 8 50	− 2	i 15 55	− 4	—	—	e 25·0
Samarkand		51·9	298	e 9 7	0	—	—	—	—	—
Sverdlovsk		53·4	321	i 9 15	− 4	16 42	− 5	—	—	25·8
Kodaikanal	E.	54·3	260	i 9 21a	− 4	i 17 3	+ 4	i 17 29	PS	i 26·6
Bombay		54·4	272	i 9 21k	− 5	e 16 47	−13	i 9 40	pP	—
Colombo	E.	54·4	254	9 23	− 3	16 58	− 2	—	—	27·9
College		57·1	30	e 9 45	− 1	i 17 41	+ 5	—	—	e 24·2
Honolulu		62·8	81	e 12 47	PP	18 50	+ 1	14 5	PPP	e 26·4
Brisbane		62·9	159	—	—	i 18 51	0	—	—	i 30·8
Baku		64·2	304	i 10 33	− 1	i 19 9	+ 2	—	—	32·5
Perth		65·8	195	i 9 37	−67	i 19 27	0	i 19 58	PS	i 35·4
Grozny		66·0	308	e 10 43	− 2	e 19 49	+20	—	—	—
Moscow		66·1	323	i 10 44	− 2	e 19 31	+ 1	—	—	33·0
Adelaide		67·3	174	e 11 15	+22	i 21 40	?	—	—	—
Tiflis		67·3	307	i 10 50	− 3	i 19 42	− 3	13 30	PP	e 28·7
Piatigorsk		67·5	310	e 11 8	+13	—	—	—	—	e 29·6
Pulkovo		68·0	329	10 56	− 2	e 19 56	+ 3	—	—	e 32·7
Erevan		68·1	305	e 11 4	+ 6	—	—	—	—	—
Riverview		68·4	162	—	—	i 20 2	+ 4	i 20 29	PS	e 31·7
Sydney		68·4	162	e 17 45	?	e 20 57	PPS	e 27 33	SSS	e 33·5
Sotchi		69·9	310	e 11 9	− 1	—	—	—	—	—
Melbourne		70·9	169	—	—	20 32	+ 4	—	—	34·8
Upsala		73·4	332	—	—	e 20 51	− 5	e 25 49	SS	e 34·6
Victoria		75·3	42	11 45	+ 3	21 15	− 2	26 9	SS	33·6
Ksara		77·1	302	i 11 50a	− 2	e 21 59	+22	i 14 59	PP	38·6
Bucharest		77·8	316	e 11 55	− 1	21 36	− 9	14 39	PP	39·6
Istanbul		78·0	312	11 49	− 8	21 22	−25	14 48	PP	e 45·0
Copenhagen		78·2	331	i 11 56a	− 2	21 45	− 4	22 10	PS	37·6
Budapest		80·2	321	12 5	− 4	22 7	− 3	22 39	PS	41·5
Kecskemet	Z.	80·2	320	i 12 9	0	e 22 7	− 3	e 22 33?	PS	e 38·6
Ukiah		80·5	50	e 12 16	+ 6	22 18	+ 5	e 12 24	pP	e 33·8
Sofia		80·6	315	e 12 10	− 1	e 22 12	− 2	e 22 45	PS	38·6
Hamburg		80·7	330	i 12 9	− 2	—	—	e 15 13	PP	e 39·6
Prague		80·7	326	e 12 10	− 1	e 22 13	− 2	e 27 39	PS	e 39·6
Collmberg		80·8	327	—	—	e 22 15	− 1	—	—	e 41·3
Belgrade		81·1	318	i 12 11k	− 2	i 22 36	+17	i 24 19	?	43·2

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Jena	81·7	327	i 12 15	− 2	e 22 24	− 1	—	—	e 39·6
Berkeley	81·8	51	i 12 16a	− 1	i 22 17	− 9	—	—	e 34·6
Cheb	81·9	327	e 12 16	− 2	e 22 26	− 2	e 28 27	SS	e 42·6
Branner	82·1	51	e 12 19	0	—	—	—	—	—
Göttingen	82·1	329	i 12 15	− 4	—	—	—	—	e 43·6
Santa Clara	82·3	51	i 12 27	+ 7	i 22 38	+ 6	—	—	e 38·8
Helwan	82·5	301	i 12 18k	− 3	22 33	− 1	13 3	pP	—
Aberdeen	82·7	337	—	—	i 22 59	+23	—	—	e 40·4
Butte	82·7	38	e 12 21	− 1	e 22 39	+ 3	—	—	e 34·6
Bozeman	83·7	39	e 12 40	+13	e 22 49	+ 3	e 15 52	PP	e 35·8
De Bilt	83·8	331	i 19 22	?	i 22 33	−14	—	—	41·1
Edinburgh	84·0	337	—	—	i 22 49	0	i 23 6	PS	e 39·6
Fresno N.	84·1	50	e 12 30	+ 1	—	—	—	—	—
Triest	84·2	323	i 12 25a	− 4	i 22 40	−11	12 41	pP	e 41·8
Stuttgart	84·4	327	i 12 28a	− 2	22 48	− 5	e 15 44	PP	42·6
Tinemaha	84·9	49	i 12 34	+ 1	—	—	—	—	—
Uccle	85·0	331	i 12 31a	− 2	22 50	[− 2]	e 15 46	PP	e 39·6
Strasbourg	85·2	327	i 12 33a	− 1	i 22 50	[− 3]	i 12 49	pP	e 39·6
Stonyhurst	85·4	336	—	—	i 22 58	[+ 4]	i 28 42	SS	42·6
Chur	85·5	326	e 12 33	− 3	—	—	—	—	—
Santa Barbara	85·5	52	i 12 39	+ 3	—	—	—	—	—
Haiwee	85·6	49	i 12 36	0	—	—	—	—	—
Zurich	85·6	326	e 12 34	− 2	e 22 51	[− 4]	e 15 56	PP	—
Bidston	85·9	336	—	—	e 22 50	[− 8]	—	—	e 38·7
Basle	86·0	327	e 12 35	− 3	e 23 6	− 2	—	—	—
Kew	86·5	333	i 12 38	− 3	e 23 2	[0]	i 16 19	PP	e 43·6
Salt Lake City	86·5	44	e 12 38	− 3	e 23 0	[− 2]	e 12 52	P_cP	—
Oxford	86·6	334	15 52	PP	22 56	[− 6]	i 24 34	PS	e 38·6
Ivigtut	86·7	1	—	—	23 21	+ 6	—	—	42·6
Mount Wilson	86·7	51	i 12 41	− 1	—	—	—	—	—
Neuchatel	86·7	326	e 12 39	− 3	e 23 10	− 5	—	—	—
Pasadena	86·7	51	i 12 41a	− 1	i 23 5	[+ 2]	e 15 54	PP	e 40·2
Florence	86·8	321	12 37	− 5	23 13	− 3	—	—	43·6
Besançon	87·0	327	—	—	e 22 51	[−14]	—	—	—
Rathfarnham Castle	87·2	337	i 12 54	+10	i 23 27	+ 7	i 15 23	PP	e 41·8
Riverside	87·3	51	i 12 43	− 2	—	—	—	—	—
Paris	87·4	330	i 12 42	− 3	23 3	[− 5]	12 58	pP	42·6
Rome	87·4	320	i 12 43a	− 2	e 23 5	[− 3]	i 12 56	pP	e 41·7
Moncalieri	87·7	326	i 12 42	− 5	23 3	[− 6]	—	—	46·2
La Jolla	88·1	51	e 12 48	0	—	—	—	—	—
Grenoble E.	88·6	326	—	—	e 23 25	− 8	e 25 2	PS	e 45·8
Jersey	89·0	333	e 16 53	PP	e 23 59	+23	—	—	e 45·4
Clermont Ferrand	89·4	327	—	—	e 22 25	[−55]	—	—	e 42·4
Tucson	92·7	48	i 13 10k	0	23 17	[−22]	i 13 25	pP	e 37·1
Toledo	97·3	327	e 13 29	− 2	e 24 25	[+21]	—	—	—
Chicago	97·6	28	—	—	e 23 56	[−10]	e 32 0	SSP	e 41·6
Seven Falls	98·3	14	—	—	e 24 45	−12	e 31 39	SS	44·5
Ottawa	98·6	19	e 13 38	+ 1	e 24 3	[− 8]	e 31 33?	SS	43·6
Florissant	99·0	32	i 17 38	PP	i 24 11	[− 2]	i 26 57	PPS	43·6
Toronto	99·1	22	—	—	e 23 33?	[−40]	e 31 33?	SS	45·6
Granada	99·2	326	e 17 36a	PP	i 27 30	PS	—	—	i 50·6
St. Louis	99·2	32	e 17 33	PP	i 24 15	[+ 1]	e 27 2	PS	e 44·5
Vermont	100·2	17	—	—	e 25 10	− 3	e 32 5	SS	e 43·3
San Fernando	100·4	327	e 18 14	PP	e 24 22	[+ 2]	i 27 24	PS	51·6
Cape Girardeau E.	100·6	32	—	—	e 25 15	− 1	—	—	e 31·8
Cincinnati	101·2	27	e 17 55	PP	e 27 34	PPS	32 47	SS	54·0
East Machias	101·2	13	e 18 15	PP	e 25 44	+22	e 27 15	PS	e 41·8
Williamstown	101·2	17	e 18 1	PP	—	—	—	—	e 48·7
Halifax	102·1	10	—	—	e 24 33?	[+ 5]	—	—	48·6
Harvard	102·4	16	e 13 52	− 2	e 25 33	+ 1	e 18 9	PP	e 52·6

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fordham	103·4	19	e 18 28	PP	e 25 45	+ 5	—	—	—
Philadelphia	103·8	20	—	—	e 24 38	[+ 2]	e 32 49	SS	e 47·8
Bermuda	113·7	14	e 19 25	PP	e 26 51	?	e 35 55	?	e 47·6
Cape Town	125·1	249	e 20 43	PP	i 26 6	[+ 9]	i 38 1	SS	64·8
San Juan	126·7	20	e 20 59	PP	i 38 12	SS	e 21 40	pP	e 51·5
Huancayo	147·9	56	e 19 44	[+ 5]	e 42 16	SS	e 22 59	PP	e 61·6
La Paz	156·0	52	i 19 53$_a$	[+ 3]	30 21	SKKS	i 21 41	pPKP	75·6
Rio de Janeiro	169·6	334	e 21 31	?	e 31 36	SKKS	(e 46 38)	SS	88·6
La Plata	171·5	110	25 27	PP	32 57	?	—	—	79·1

Additional readings :—
Zi-ka-wei iE = +2m.11s., iZ = +3m.21s. and +3m.57s., iN = +4m.15s.
Taihoku i = +3m.26s.
Hong Kong SS = +8m.7s.
Calcutta N, iPPP = +9m.36s., iSS = +16m.42s., eSSS = +17m.32s.
Batavia PEN = +8m.14s., iN = +8m.17s., iSE = +14m.54s.
Dehra Dun e?N = +17m.59s.
Agra pPPE = +10m.10s., PPPE = +10m.27s., sSE = +15m.30s., S_cSE = +17m.35s., sSSE = +18m.41s., SSSE = +18m.55s.
Andijan e = +9m.2s.
Kodaikanal iSSSE = +21m.46s.
Bombay iPP = +11m.25s., iSE = +16m.58s., iE = +19m.30s. and +20m.6s.
Brisbane e = +17m.21s., iE = +17m.33s.
Adelaide i = +22m.13s. and +23m.11s.
Tiflis iZ = +11m.5s., iE = +11m.9s., iPPPEZ = +14m.59s., eN = +19m.55s., iEZ = +20m.0s., iPSE = +20m.7s., eSSN = +24m.0s., eSSEZ = +24m.11s., eSSSN = +27m.18s.
Riverview iE = +20m.6s. and +21m.4s., iN = +21m.9s., eE = +27m.39s.
Upsala eN = +22m.12s.
Istanbul PPP = +16m.42s.
Bucharest SPE = +22m.8s., PSEN = +22m.27s.
Copenhagen e = +22m.57s.
Budapest iS_eSN = +22m.25s., iS_eSE = +22m.31s.
Kecskemet eZ = +12m.22s.
Ukiah eSSS = +31m.54s.
Sofia eEN = +19m.40s., eE = +22m.38s.
Hamburg eZ = +15m.31s.
Collmberg e = +32m.23s.
Belgrade iP = +12m.30s.
Berkeley i = +12m.31s., iSN = +22m.24s.
Helwan iZ = +12m.36s. and +13m.45s., PPZ = +15m.48s., PPPZ = +17m.39s., iN = +22m.53s., sSEN = +23m.54s.
De Bilt iSE = +23m.8s., i = +34m.19s.
Triest PP = +15m.54s., i = +18m.45s., isS = +23m.7s.
Stuttgart eP_ePZ = +12m.41s., eZ = +13m.21s., iPPE = +16m.1s., e = +19m.3s., iS_eS = +23m.9s., ePPS = +24m.16s., eSS = +28m.51s., eSSS = +32m.33s.
Uccle iZ = +12m.51s. and +16m.6s., eZ = +19m.29s., iEN = +23m.16s., eE = +29m.24s.
Strasbourg iPPZ = +15m.48s., ipPPZ = +16m.5s., eZ = +19m.12s., isSE = +23m.18s.
Stonyhurst iZ = +23m.23s.
Chur e = +20m.50s.
Zurich eS = +23m.16s.
Kew ePPPZ = +18m.9s., ipSN = +23m.16s., iEN = +23m.34s., eSPZ = +24m.12s., isPSE = +24m.34s., iPPPZ = +39m.18s.
Salt Lake City S = +23m.4s.
Ivigtut +23m.33s.
Florence i = +23m.37s.
Rathfarnham Castle iPS = +24m.14s.
Paris PP = +16m.8s., sS = +23m.28s.
Rome ePP = +16m.5s., ePPPEZ = +18m.3s., iS = +23m.19s., isS = +23m.41s., PS = +24m.13s., SS = +29m.8s.
Grenoble esSE = +23m.48s., epPS?E = +25m.12s.
Jersey e = +26m.58s.
Tucson isP = +13m.42s., i = +13m.57s. and +14m.19s., iPP = +17m.0s., ipPP = +17m.8s., ipPPP = +19m.26s., iSKKS = +23m.45s., S = +24m.1s., iS = +24m.5s., ipS = +24m.41s., iPS = +25m.27s., ipPS = +25m.47s., SS = +30m.29s., sSS = +30m.51s., SSS = +34m.8s., iSSS = +34m.53s.
Chicago eS = +25m.18s.
Florissant ePKPZ = +17m.52s., iSKKSE = +25m.1s., eSE = +25m.23s., eSSE = +31m.57s.
Toronto eE = +25m.15s.
Granada e = +33m.8s.
St. Louis ePKPEN = +17m.52s., iE = +24m.36s., eSKKSN = +25m.6s., iSEN = +25m.29s., eSSEN = +32m.25s.

Continued on next page.

Cape Girardeau eE = +25m.25s., eSE = +25m.38s.
Cincinnati e = +28m.28s. and +30m.7s.
East Machias eSS = +32m.35s., SS = +32m.49s., eSSS = +36m.19s.
Harvard eZ = +27m.6s.
Fordham iE = +26m.4s.
Philadelphia eSKKS = +24m.57s., eS = +25m.45s., eSSS = +36m.51s.
Cape Town iSKPE = +22m.34s., E = +23m.2s., eSE = +30m.38s., eSSE = +39m.6s.
San Juan ePPP = +23m.51s., epPPP = +24m.34s., SSS = +42m.43s.
Huancayo ePPP = +27m.8s., eSPP = +36m.5s.
La Paz iPKP$_2$ = +20m.21s., iZ = +21m.7s., PPZ = +24m.11s.
Long waves were also recorded at Almeria, Fort de France, Bergen, Cernauti, Marseilles, and Algiers.

March 20d. 10h. 39m. 41s. Epicentre 1°·1N. 29°·4W. (as on 1937 Oct. 6d.).

A = +·8710, B = −·4908, C = +·0190; δ = −11; h = +7;
D = −·491, E = −·871; G = +·017, H = −·009, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rio de Janeiro	N.	27·4	208	e 5 51	+ 2	e 10 25	− 3	—	—	e 12·2
San Juan		39·9	298	e 8 2	+25	i 13 45	+ 2	i 16 58	SS	—
La Paz	Z.	42·0	244	i 7 57a	+ 3	—	—	—	—	22·6
Huancayo		47·5	253	e 9 44	+66	—	—	—	—	i 19·2
Harvard	Z.	55·9	324	i 9 37a	− 5	—	—	—	—	e 25·3
Vermont		58·0	324	—	—	e 24 1	SSS	—	—	—
Ksara		69·0	55	e 11 5	− 4	e 20 52	PS	—	—	—
Baku		81·1	49	e 12 25	+ 7	e 22 37	+ 9	—	—	e 39·3
Tucson		82·2	303	12 22a	− 2	—	—	—	—	—
Sverdlovsk		89·1	33	—	—	e 23 50	+ 4	—	—	38·3
Kodaikanal	E.	106·4	78	—	—	e 30 19?	?	—	—	—
Calcutta	N.	115·0	64	—	—	e 28 55	PS	—	—	—

Additional readings:—
Tucson i = +12m.35s., +13m.30s., and +15m.33s.
Long waves were also recorded at La Plata, Philadelphia, St. Louis, Pasadena, Tiflis, and De Bilt.

March 20d. 12h. 56m. 17s. Epicentre 14°·4N. 93°·7W.

A = −·0625, B = −·9670, C = +·2471; δ = +5; h = +6;
D = −·998, E = +·065; G = −·016, H = −·247, K = −·969.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz	N.	5·3	335	1 55	P_g	—	—	—	—	—
Tacubaya	N.	7·2	314	1 49	0	—	—	—	—	—
Balboa Heights		14·8	109	e 3 35	+ 3	—	—	—	—	—
Little Rock		20·3	3	i 4 36	− 4	i 8 35	+12	—	—	—
Columbia		22·6	27	e 5 7	+ 4	—	—	e 8 26	P_cP	e 12·9
Tucson		23·7	322	i 5 12k	− 2	i 9 34	+ 7	i 5 48	PP	i 12·1
St. Louis	N.	24·3	7	i 5 21	+ 1	i 9 41	+ 4	—	—	—
Florissant		24·5	7	i 5 18	− 4	e 9 38	− 2	—	—	—
San Juan		26·7	76	e 5 40	− 3	—	—	—	—	e 13·6
La Jolla		28·2	315	e 5 53	− 3	—	—	—	—	—
Riverside		29·0	316	i 5 59	− 5	—	—	i 9 8	P_cP	—
Mount Wilson		29·6	316	i 6 5	− 4	—	—	e 9 10	P_cP	—
Pasadena		29·6	316	i 6 6	− 3	i 11 6	+ 2	—	—	e 14·2
Haiwee		30·7	319	e 6 18	− 1	—	—	—	—	—
Tinemaha	N.	31·5	320	e 6 23	− 3	—	—	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toronto		31·6	19	—	—	e 11 43?	+ 8	13 43?	SS	17·7
Huancayo		32·0	144	e 6 24	− 6	e 11 43	+ 1	e 7 52	PPP	e 14·1
Santa Clara		33·9	318	e 6 52	+ 5	e 12 20	+ 9	—	—	—
Ottawa		34·4	21	e 6 49	− 2	—	—	—	—	17·7
Berkeley		34·5	318	i 6 49	− 3	e 12 15	− 5	—	—	18·2
Vermont		34·7	26	—	—	e 13 10	+46	—	—	e 19·0
Butte		35·3	339	e 6 58	− 1	—	—	—	—	e 17·9
Seven Falls		37·8	25	e 8 31	PP	—	—	—	—	17·7
La Paz	z.	39·8	138	7 38	+ 2	—	—	—	—	25·7
Victoria		41·8	331	—	—	e 14 1	−10	e 17 49	SSS	21·7
Rio de Janeiro		61·2	125	e 18 43	S	(e 18 43)	+ 5	—	—	—
Strasbourg		86·7	40	i 12 47	0	—	—	—	—	e 43·2
Stuttgart		87·6	40	e 12 53	+ 2	e 23 38	+ 6	—	—	e 49·7
Collmberg	z.	89·0	322	e 12 59	+ 1	—	—	—	—	—
Sverdlovsk		105·9	14	18 34	PP	e 25 0	[+ 6]	e 33 38	SS	48·7
Ksara		112·2	44	e 19 25	PP	e 28 57	PS	—	—	—
Baku		115·9	30	—	—	e 43 43	?	—	—	e 61·0

Additional readings :—
Tucson iP = +5m.23s., i = +5m.40s. and +5m.52s., iPPP = +6m.2s., i = +6m.41s., iP_cP = +7m.57s., iS = +9m.37s. and +9m.50s.
Huancayo eP = +6m.31s.
Berkeley eN = +11m.55s.
Long waves were also recorded at Tiflis, Fort de France, Philadelphia, De Bilt, Paris, Harvard, and East Machias.

March 20d. Readings also at 0h. (Guadalajara, Manzanillo, Tacubaya, Tucson, Mount Wilson, and Riverside), 2h. (Grozny and Tiflis), 3h. (Hukuoka, Batavia, and Medan), 4h. (Hukuoka), 5h. (Cheb, Rome, Strasbourg, Stuttgart, Paris, Uccle, De Bilt, Kew, Edinburgh, Bidston, Stonyhurst, Jersey, Sverdlovsk, Ksara, Tashkent, Baku, East Machias, Vermont, Tucson, Hukuoka, and near Osaka), 6h. (Baku, Tashkent, Harvard, and near Mizusawa), 7h. (Mizusawa), 8h. (near Wellington), 9h. (Tucson), 13h. (near Hukuoka and Osaka), 14h. (Hukuoka), 15h. (Andijan, Baku, Ksara, Sverdlovsk, and Tiflis), 16h. (Baku, Grozny, Tashkent, Sverdlovsk, near Tiflis, Helwan, Ksara, and near Istanbul), 17h. (Sverdlovsk and Tashkent), 18h. (Tiflis), 20h. (Baku, Sverdlovsk, Tiflis, Helwan, Ksara, Tashkent, and near Wellington), 21h. (Fordham and Tucson), 22h. (Manila, Fort de France, Adelaide, Melbourne, Sverdlovsk, Baku, Tashkent, and Hukuoka (2)).

March 21d. 1h. 11m. 12s. Epicentre 0°·8S. 89°·7E.

Strongly felt in South Colombo and mildly in other parts of Ceylon.

Epicentre 2°·5S. 89°·0E., depth 75kms. (Bombay).

S. K. Banerji.

Seismological Bulletin, Meteorological Department Government of India, Jan.-March, 1939, pp. 22.

A = +·0052, B = +·9999, C = −·0138 ; δ = +2 ; h = +7 ;
D = +1·000, E = −·005 ; G = ·000, H = −·014, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		10·0	64	i 2 32	+ 5	—	—	i 2 37	PP	—
Colombo	E.	12·4	308	2 54	− 7	5 4	−17	—	—	6·6
Kodaikanal	E.	16·4	312	i 3 48k	− 5	i 6 58	+ 2	i 7 31	SS	i 8·3
Batavia		17·9	109	i 4 9k	− 3	7 35	+ 5	i 8 15	SSS	—
Hyderabad	E.	21·2	329	4 54	+ 5	8 50	+ 9	—	—	10·1
Calcutta	N.	23·2	357	i 5 16k	+ 7	i 9 37	+19	i 5 46	PP	i 12·0
Bombay		25·7	321	i 5 32a	− 1	i 10 14	+13	i 5 47	pP	—
Phu-Lien		27·1	37	e 5 48	+ 2	i 10 40	+16	—	—	13·3
Agra		30·0	339	6 13	+ 1	i 11 17	+ 7	6 31	pP	i 14·3
Dehra Dun	N.	32·9	342	e 6 44	+ 6	i 11 52	− 4	—	—	i 15·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hong Kong		33·1	44	6 42	+ 2	12 9	+10	7 52	PP	15·3
Manila		34·5	62	i 6 54a	+ 2	i 12 40	+20	—	—	—
Perth		39·6	143	7 33	− 2	13 43	+ 5	9 11	PP	19·3
Zi-ka-wei		43·8	40	8 12	+ 3	14 46	+ 6	10 6	PP	22·9
Andijan		44·3	341	8 15	+ 2	14 57	+ 9	—	—	22·8
Tananarive		45·1	244	e 8 12	− 8	e 14 53	− 6	e 9 53	PP	i 18·4
Almata		45·3	347	8 24	+ 3	—	—	—	—	—
Samarkand		45·3	335	8 22	+ 1	15 17	+15	—	—	23·8
Palau		45·4	79	8 30	+ 8	13 49	?	—	—	—
Frunse		45·6	345	8 26	+ 2	e 15 31	+25	—	—	24·1
Tashkent		45·8	339	i 8 25	0	i 15 13	+ 4	—	—	e 21·8
Tchimkent		46·6	341	e 8 30	− 2	—	—	—	—	—
Yakusima		49·7	47	8 56	0	15 49	−15	—	—	—
Miyazaki		51·1	47	9 7	+ 1	16 28	+ 4	—	—	—
Hukuoka		51·3	44	e 9 9	+ 1	16 47	+21	—	—	21·7
Baku		54·7	323	i 9 38	+ 5	i 17 18	+ 5	—	—	—
Sumoto		54·9	46	12 54	PPP	21 0	SS	—	—	—
Kobe		55·3	46	9 30	− 8	17 26	+ 5	—	—	—
Osaka		55·5	46	9 37	− 2	17 16	− 8	10 22	pP	28·6
Gihu		56·7	46	9 49	+ 1	17 47	+ 7	—	—	—
Adelaide		56·8	132	i 11 51	PP	i 19 32	?	—	—	i 46·6
Wazima		57·8	43	9 56	+ 1	—	—	—	—	—
Erevan		57·9	321	10 3	+ 7	18 5	+10	—	—	—
Tiflis		58·6	322	i 9 58	− 3	i 18 4	0	i 11 54	PP	e 27·8
Grozny		58·9	324	10 3	0	e 18 7	− 1	—	—	—
Mito		59·8	45	10 8	− 1	18 27	+ 7	—	—	—
Piatigorsk		60·9	324	10 14	− 3	e 18 31	− 3	—	—	—
Ksara		61·1	309	i 10 17k	− 1	e 18 45	+ 8	12 36	PP	25·8
Mizusawa		61·6	43	e 10 15	− 7	18 43	0	—	—	25·9
Sverdlovsk		62·0	343	i 10 21	− 3	18 46	− 2	—	—	28·8
Hatinohe		62·5	42	10 25	− 3	18 56	+ 2	—	—	—
Melbourne		62·6	132	e 10 35	+ 7	e 18 55	− 1	i 12 48	PP	30·3
Sotchi		62·8	322	10 27	− 3	e 18 58	0	—	—	—
Helwan		63·3	304	i 10 30k	− 3	19 0	− 4	12 54	PP	30·2
Sapporo		63·6	39	10 39	+ 4	19 15	+ 7	—	—	—
Johannesburg		64·4	242	e 10 31	− 9	e 19 17	− 1	—	—	30·0
Brisbane		66·1	119	i 11 6	+15	i 19 36	− 3	i 27 6	SSS	—
Riverview		66·1	126	i 10 52a	+ 1	i 19 35	− 4	i 11 24	P_cP	e 28·2
Sydney		66·1	126	e 9 46	−65	e 19 15	−24	i 13 33	PP	26·6
Nemuro		66·4	41	11 1	+ 8	19 47	+ 4	—	—	—
Istanbul		68·8	316	10 59	− 9	20 59	PPS	13 54	PP	e 45·4
Moscow		70·4	333	11 17	− 1	20 31	+ 1	—	—	34·3
Bucharest		72·0	318	11 30a	+ 2	e 20 48	− 1	i 21 14	PS	34·8
Sofia		73·4	316	e 11 36	0	e 21 3	− 2	e 16 15	PPP	29·8
Cernauti		73·5	321	e 11 37a	+ 1	21 4	− 2	—	—	34·8
Cape Town	E.	74·0	235	i 11 35	− 4	21 3	− 8	14 16	PP	34·1
	N.	74·0	235	i 11 46	+ 7	21 6	− 5	14 9	PP	37·4
Pulkovo		75·8	334	e 11 48	− 2	i 21 32	+ 1	—	—	e 37·0
Belgrade		76·0	317	e 11 58k	+ 7	i 21 34	0	i 14 29	PP	38·6
Kecskemet	Z.	77·0	319	e 11 57	+ 1	i 22 5	+20	e 14 52	PP	35·8
Budapest		77·6	320	12 8	+ 8	21 50	− 1	22 36	PS	e 32·8
Triest		80·8	317	e 12 18	+ 1	i 22 33	+ 8	i 23 11	PS	e 39·1
Rome		81·0	313	i 12 18k	0	i 22 0	−27	i 12 25	pP	i 35·9
Prague		81·2	322	e 12 21	+ 2	e 22 30	+ 1	—	—	e 32·8
Upsala		81·8	332	e 12 16	− 6	i 22 34	− 1	e 27 48?	SS	e 36·8
Florence		82·2	315	e 12 29	+ 5	22 36	− 3	—	—	34·8
Collmberg		82·3	322	i 12 36	+11	e 22 34	− 6	e 15 38	PP	e 37·8
Cheb		82·5	321	e 12 28	+ 2	e 22 3	−39	e 15 45	PP	e 38·8
Jena		83·1	322	i 12 27	− 2	i 22 48	0	e 28 18	SS	e 33·8
Copenhagen		83·5	327	i 12 29	− 2	i 22 37	−15	15 49	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chur		83·8	318	e 12 29	− 3	e 23 0	+ 5	—	—	—
Göttingen	Z.	84·2	322	e 11 36	−58	—	—	e 15 2	PP	—
Christchurch		84·3	134	i 12 37a	+ 2	i 22 55	− 5	i 15 55	PP	39·1
Stuttgart		84·3	320	e 12 33	− 2	e 22 57	− 3	e 15 50	PP	40·8
Hamburg		84·5	324	e 12 34	− 2	e 23 0	− 2	e 23 58	PS	e 40·8
Zurich		84·6	318	e 12 35a	− 1	e 22 59	− 4	—	—	—
Moncalieri		84·9	316	i 12 45	+ 7	23 4	− 2	—	—	35·2
Strasbourg		85·2	320	e 12 38a	− 1	e 23 5	[+ 3]	i 16 1	PP	e 35·8
Basle		85·3	318	e 12 40	0	e 22 59	[− 4]	—	—	—
Neuchatel		85·6	317	e 12 41	0	e 23 13	0	—	—	—
Wellington		85·8	131	12 48	+ 6	23 1	[− 5]	15 58	PP	38·8
Arapuni		86·3	128	e 12 42	− 3	22 54	[−16]	28 12	SS	34·8
Grenoble		86·3	316	e 12 46	+ 1	i 23 8?	[− 2]	e 24 28	PS	e 43·3
De Bilt		87·2	323	i 12 48a	− 1	i 23 12	[− 3]	—	—	34·7
Uccle		87·7	321	13 1	+ 9	e 23 14	[− 4]	16 18	PP	37·8
Algiers		87·8	307	i 13 4	+12	i 23 30	− 4	i 16 20	PP	e 35·8
Bergen		87·9	331	e 13 6	+13	i 23 55	+20	e 28 48?	SS	e 39·8
Clermont Ferrand		88·2	316	e 13 5	+11	—	—	—	—	—
Paris		88·7	319	i 13 11a	+14	23 42	− 1	16 32	PP	36·8
Kew		90·6	322	i 13 19	+14	i 24 0	0	i 16 46	PP	44·8
Oxford		91·2	322	e 13 26	+18	e 23 38	[− 2]	e 16 36	PP	e 31·8
Durham		91·4	325	—	—	i 24 28	+21	—	—	—
Aberdeen		92·0	327	i 14 7	+55	i 23 35	[− 9]	17 7	PP	44·3
Almeria		92·2	307	e 13 30	+17	e 24 2	−12	17 14	PP	e 45·1
Bidston		92·3	324	—	—	e 23 51	[+ 5]	i 30 34	SS	45·8
Edinburgh		92·3	326	—	—	i 24 18	+ 3	i 25 24	PS	43·8
Stonyhurst		92·3	324	—	—	i 24 3	−12	—	—	51·8
Granada		93·1	307	i 13 30k	+13	24 16	− 6	17 33	PP	37·3
Toledo		93·4	310	e 13 28	+10	e 24 22	− 2	i 25 48	PS	—
San Fernando	N.	94·7	306	e 14 2	+38	e 24 36	0	e 17 52	PP	46·3
Scoresby Sund		97·9	342	17 48	PP	24 30	[+14]	26 36	PS	—
College		104·0	22	e 18 29	PP	e 24 51	[+ 5]	e 27 49	PS	e 41·6
Honolulu		111·2	67	e 14 50	P	25 18	[+ 1]	e 19 51	PP	45·2
Ivigtut		111·8	340	22 58	?	—	—	—	—	—
Sitka		113·4	24	e 15 21	P	e 27 3	{+34}	e 19 47	PP	e 46·6
Victoria		124·7	26	e 19 18	[+17]	37 48	SS	20 54	PP	52·8
Seattle		125·7	26	e 19 2	[− 1]	e 27 24	{−28}	38 26	SS	e 51·6
Saskatoon		127·0	12	e 22 48?	PKS	e 38 30	SS	—	—	52·8
Rio de Janeiro		128·5	241	e 21 10	PP	e 31 16	PS	i 38 49	SS	i 52·9
Ferndale		129·9	33	e 21 48	PP	—	—	—	—	—
Halifax		130·4	335	e 20 48	?	e 38 48?	SS	e 22 6	PP	60·8
Seven Falls		130·8	343	19 24	[+11]	38 53	SS	21 30	PP	54·8
Butte		130·9	19	e 19 34	[+20]	e 39 18	SS	e 21 46	PP	e 54·7
Ukiah		131·4	34	e 21 48	PP	e 28 18	{−10}	e 22 55	PKS	e 54·3
Bozeman		131·7	19	e 19 58	[+43]	e 27 33	[+69]	e 21 57	PP	e 53·0
East Machias		131·7	338	e 19 41	[+26]	e 39 19	SS	e 21 37	PP	—
Shawinigan Falls		131·9	344	e 21 40	PP	e 31 54	PS	—	—	54·8
Berkeley		132·8	35	e 19 19	[+ 2]	e 38 48	SS	e 21 49	PP	e 47·8
La Plata		133·3	218	22 30	PP	28 46	{+ 6}	39 36	SS	53·9
Santa Clara		133·4	35	e 19 34	[+16]	i 31 12	SKKP	i 22 12	PP	—
Lick		133·6	35	e 19 34	[+15]	—	—	e 22 17	PP	—
Ottawa		133·8	346	19 18	[− 1]	39 48	SS	e 21 48	PP	62·8
Vermont		133·9	343	e 21 57	PP	e 27 51	{−53}	e 23 13	PKS	e 54·4
Fresno	N.	135·0	33	e 19 54	[+33]	—	—	—	—	—
Harvard		135·2	340	e 19 23	[+ 1]	e 39 42	SS	e 21 56	PP	e 70·8
Tinemaha	E.	135·6	32	e 19 24	[+ 2]	—	—	—	—	—
Salt Lake City		135·7	23	e 22 31	PP	e 40 42	SS	e 22 59	PKS	e 60·2
Toronto		136·3	349	22 6	PP	40 32	SS	25 0	PPP	55·8
Haiwee	Z.	136·5	32	e 19 24	[0]	—	—	—	—	—
Fordham		137·4	341	i 19 43	[+17]	i 40 26	SS	i 22 24	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mount Wilson	z.	137·8	34	e 22 18	PP	—	—	— —	—	—
Pasadena		137·8	34	e 19 32	[+ 6]	e 31 22	SKKP	e 22 28	PP	—
Riverside		138·4	34	e 19 31	[+ 4]	—	—	e 22 18	PP	—
Philadelphia		138·7	342	e 20 4	[+36]	e 41 2	SS	e 22 14	PP	e 56·2
Chicago		139·0	358	e 20 6	[+37]	e 27 38	[+60]	e 22 34	PP	e 56·1
La Jolla	z.	139·2	35	e 19 31	[+ 2]	—	—	e 22 38	PP	—
Georgetown		140·2	343	e 19 36	[+ 5]	e 28 39	{−43}	i 22 32	PP	41·8
Bermuda		140·5	325	e 20 7	[+36]	e 29 17	{− 7}	e 22 27	PP	62·8
Cincinnati		141·5	351	e 19 43	[+10]	e 26 38	[− 4]	e 22 23	PP	65·3
Florissant		142·1	0	e 19 50	[+16]	e 42 53	SS	i 23 15	PP	56·8
St. Louis		142·3	0	e 19 48	[+13]	i 29 53	{+18}	e 22 47	PP	—
Tucson		143·2	29	i 19 33	[− 3]	i 27 55	[+71]	i 22 58	PP	e 57·0
Cape Girardeau	E.	143·7	358	e 19 57	[+20]	e 41 57	SS	e 23 57	PP	e 48·8
Columbia		145·9	347	e 19 37	[− 3]	41 56	SS	e 23 16	PP	e 59·6
Little Rock		146·1	3	e 19 44	[+ 3]	—	—	i 23 13	PP	—
Fort de France		148·0	297	e 19 47	[+ 3]	e 22 31	PP	—	—	e 23·8
San Juan		150·5	308	e 19 43	[− 5]	e 27 8	[+14]	e 36 58	PPS	e 60·6
La Paz	z.	152·2	232	i 19 53	[+ 2]	i 26 59	[+ 2]	i 21 45	pPKP	72·0
Huancayo		160·4	229	e 20 3	[+ 2]	e 30 49	{−25}	e 25 16	PP	e 63·7

Additional readings :—
Medan iN = +2m.47s.
Batavia iPEN = +4m.13s., iZ = +8m.46s.
Calcutta N. iPPP = +5m.58s., iSS = +10m.37s.
Bombay iEN = +9m.23s., +10m.31s., +10m.53s., and +11m.0s., iSSE = +11m.43s.
Agra iN = +6m.36s., sPE = +6m.51s., PP = +6m.58s., SPE = +10m.33s., sSE = +11m.56s., SSE = +12m.35s.
Hong Kong SE = +12m.19s., SS = +14m.19s.
Perth P = +7m.41s., P_cP = +9m.26s., PPP = +9m.40s., SS = +16m.21s., SSS = +17m.11s., i = +17m.53s.
Zi-ka-wei iZ = +8m.28s. and +8m.40s., PPPN = +10m.50s., iN = +12m.2s., iZ = +15m.20s. and +17m.18s., SSN = +18m.14s., SSSN = +19m.48s.
Adelaide i = +12m.18s., +12m.32s., +13m.28s., +18m.47s., +19m.48s., and +20m.13s.
Tiflis iN = +10m.4s., iEZ = +10m.11s., iN = +10m.14s., iPPPZ = +13m.11s., iSN = +18m.7s., iN = +18m.20s., eSSZ = +21m.55s., SSEN = +21m.58s.
Grozny i = +10m.24s., e = +10m.38s.
Ksara ePS = +19m.12s.
Melbourne i = +10m.53s., +14m.10s., +19m.18s., +19m.54s., and +25m.58s., L_q = +27·3m.
Sotchi i = +10m.43s.
Helwan iE = +14m.48s., SSN = +23m.24s.
Brisbane eN = +11m.48s.
Riverview iPSN = +19m.48s., SSN = +24m.3s., SSSN = +27m.8s.
Sydney e = +10m.51s.
Bucharest iSE = +20m.54s., iN = +21m.38s., iE = +22m.48s.
Sofia eN = +19m.30s., iN = +21m.18s.
Cernauti iN = +11m.48s. ?
Cape Town PPPE = +15m.58s., PPPN = +16m.11s., PSE = +21m.36s., PSN = +21m.39s., SSN = +25m.54s., SSE = +25m.57s., SSS = +28m.21s.
Belgrade iPZ = +12m.3s., iZ = +12m.6s., iPPPNE = +16m.44s., iPSNW = +22m.11s.
Kecskemet eP_cPZ = +12m.6s., eZ = +13m.3s. and +16m.8s., eS_cSZ = +22m.38s., eZ = +24m.44s., iSSZ = +28m.14s.
Budapest eN = +23m.56s., SS = +26m.56s., eE = +27m.44s.
Triest e = +17m.28s., SS = +27m.57s., i = +34m.3s.
Rome PPZ = +15fn.38s., PPP = +17m.17s., iSE = +22m.22s., iE = +22m.25s., iSN = +22m.29s., i = +23m.1s. and +23m.39s., SS = +27m.42s., SSS = +29m.26s.
Upsala ePE = +12m.20s., iE = +18m.48s. ? and +23m.40s., eSSE = +27m.48s. ?
Florence i = +13m.3s.
Collmberg eZ = +16m.38s., e = +18m.57s. and +20m.52s., i = +23m.12s., iPPS = +23m.56s., eSS = +27m.54s.
Cheb e = +28m.58s.
Jena iPZ = +12m.39s., iP = +12m.48s., iSN = +23m.7s., eE = +28m.48s.
Copenhagen iP = +12m.33s., i = +12m.42s., PPP = +17m.50s., iE = +22m.54s., iEN = +23m.15s., SS = +27m.12s.
Christchurch iPEZ = +12m.41s., iP_cP = +13m.0s., iZ = +13m.10s., iEZ = +13m.22s., iE = +13m.36s., iSKSEZ = +22m.37s., iPSE = +23m.34s., iEZ = +24m.15s., iSS = +28m.34s., L_qN = +34m.43s.
Stuttgart iPZ = +12m.36s., iPEZ = +12m.46s., i = +13m.15s., ePP = +16m.5s., e = +17m.3s. and +17m.28s., iSEN = +23m.21s., ePS = +24m.6s., eSS = +29m.6s., eSSS = +32m.48s., eSSSS = +35m.0s.

Continued on next page.

Hamburg eSSE = +28m.40s.
Zurich e = +15m.12s.
Strasbourg i = +12m.41s., iSE = +23m.13s., iN = +23m.30s., iSSE = +39m.8s.
Wellington iZ = +13m.13s. and +13m.33s., PPP = +18m.7s., iZ = +18m.34s., SKS = +23m.20s., PS = +23m.33s., PPS = +23m.58s., i = +25m.5s., +25m.45s., and +26m.52s., SS = +28m.8s., i = +30m.53s., SSS = +31m.58s., i = +33m.48s., L_q = +35·2m.
Arapuni SKS = +23m.18s., i = +23m.48s., +29m.12s., and +29m.48s.
Grenoble i = +12m.48s., iS = +23m.31s., eSS = +29m.23s., eSSS = +33m.42s.
De Bilt iZ = +13m.4s., iSE? = +23m.20s.
Uccle iSE = +23m.34s., iSKKSE = +23m.53s., iPSZ = +24m.42s., iSS = +29m.47s., iL_qN = +36m.17s.
Algiers eSS = +29m.9s.
Paris e = +23m.56s.
Kew iZ = +13m.40s., iEN = +23m.34s., iSN = +24m.20s., iPSE = +25m.9s., iPPSE = +25m.40s., iNZ = +29m.15s., iSSEN = +30m.18s., iPKKPE = +30m.40s., L_q = +36·8m.
Aberdeen iE = +24m.10s., iN = +24m.27s., iE = +25m.18s., +25m.45s., and +37m.7s.
Bidston iS = +24m.37s., i = +29m.23s., L_q = +37m.48s.
Edinburgh i = +25m.56s.
Granada eS = +24m.48s., PPS = +27m.8s., SS = +30m.58s., SSS = +34m.52s.
Toledo i = +13m.35s. and +24m.8s., eSS = +30m.39s.
San Fernando ePSN = +26m.46s.
Scoresby Sund +26m.54s. and +32m.6s.
College eS = +25m.55s., eSS = +33m.6s.
Honolulu ePS = +29m.12s., SS = +35m.10s.
Sitka ePPP = +22m.11s., ePS = +29m.18s., ePPS = +29m.54s., eSSS = +39m.33s.
Victoria PPS = +32m.18s., SSS = +42m.18s.
Seattle ePKP = +19m.47s., ePKS = +23m.6s., ePPP = +24m.51s., SKKKS = +28m.34s., eSSS = +42m.54s.
Seven Falls SKP = +22m.54s., PPS = +33m.24s.
Butte eSSS = +45m.8s.
Ukiah ePS = +32m.13s., SS = +39m.8s., PSPS = +40m.15s.
Bozeman ePKS = +22m.54s., eSSS = +44m.27s.
East Machias ePKS = +23m.17s., ePPS = +33m.34s.
Berkeley ePE = +19m.29s., eN = +19m.35s., eE = +19m.40s., ePP = +22m.48s., iPP = +23m.3s., eN = +23m.18s.
La Plata PPS = +34m.12s., SSS = +44m.18s.
Ottawa eN = +23m.18s. and +32m.6s., PPS = +34m.0s., e = +54m.48s. ?
Vermont eSKSP = +32m.3s., ePPS = +33m.57s., ePPPS = +35m.1s., eSS = +40m.11s., ePSPS = +41m.9s.
Harvard iZ = +19m.33s., eL_qE = +58m.48s.
Toronto PPS = +34m.14s.
Fordham iSKP = +23m.26s., iZ = +24m.54s., iN = +41m.13s.
Pasadena iEN = +23m.32s., eSKKPZ = +31m.50s.
Philadelphia iPKS = +23m.31s., eSSS = +46m.4s.
Chicago ePKS = +23m.33s., ePPP = +26m.6s., ePPS = +35m.2s., eSS = +41m.22s.
Bermuda ePKS = +23m.7s., ePPP = +25m.33s., ePPS = +35m.7s., ePSPS = +41m.54s.
Georgetown i = +19m.55s.
Cincinnati e = +23m.13s., +25m.55s., and +43m.13s.
Florissant iSKPZ = +23m.6s., iZ = +24m.56s., iE = +40m.57s.
St. Louis eSKPN = +23m.5s., iE = +24m.12s., eE = +28m.46s.
Tucson iPKP = +19m.47s., i = +19m.51s., +19m.56s., +20m.16s., +21m.2s., +21m.31s., +21m.44s., +21m.59s., +22m.19s., +23m.20s., +23m.34s., +24m.29s., +25m.26s., and +26m.17s., iPPP = +26m.27s., i = +27m.11s., i = +28m.32s., iSKKS = +29m.38s., i = +30m.44s., iSKSP = +32m.57s., iPPS = +35m.48s., iSS = +42m.26s., iSSS = +46m.42s.
Cape Girardeau eE = +25m.17s. and +40m.57s.
Columbia ePKP = +19m.53s.
Fort de France PP = +19m.55s., PPP = +19m.59s.
San Juan ePKP = +20m.4s.
La Paz iPKP$_2$Z = +20m.13s., iZ = +20m.17s., iSKPZ? = +23m.28s., iPPZ = +24m.22s., iZ = +26m.42s., iSKKSZ = +30m.21s., SKSPZ = +33m.48s.
Huancayo PKP$_2$ = +21m.0s., eSKSP = +34m.10s., eSS = +44m.22s., SSS = +50m.8s.
Long waves were also recorded at Rathfarnham Castle.

March 21d. 7h. 54m. 21s. Epicentre 11°·2S. 163°·9E. (as on 1938 September 28d.).

$A = -\cdot 9427$, $B = +\cdot 2721$, $C = -\cdot 1930$; $\delta = -3$; $h = +\beta$;
$D = +\cdot 277$, $E = +\cdot 961$; $G = +\cdot 185$, $H = -\cdot 054$, $K = -\cdot 981$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		19·2	211	i 4 21	− 7	i 8 9	+10	—	—	—
Apia		23·9	99	i 5 23k	+ 7	i 13 4	L	5 56	sP	(i 13·1)
Riverview		25·4	204	i 5 28a	− 3	9 56	0	—	—	e 12·8
Sydney		25·4	204	e 5 45	+14	e 10 0	+ 4	—	—	—
Melbourne		31·5	208	e 6 24	− 2	i 11 39	+ 5	—	—	14·2
Wellington		31·5	163	e 9 39?	?	—	—	—	—	e 14·6
Adelaide		33·0	220	i 13 51	SS	i 18 9	L	—	—	19·6
Christchurch		33·1	168	e 6 8	−32	i 12 0	+ 1	14 19	L_q	17·3
Perth		48·8	237	17 59	?	23 39	L	—	—	27·4
Manila		49·7	300	e 9 4	+ 8	19 39?	SS	—	—	—
Vladivostok		61·5	334	e 10 18	− 3	i 18 37	− 5	—	—	e 26·6
Berkeley		84·4	49	i 12 36	0	e 23 2	+ 1	i 31 39?	SSS	e 39·6
Santa Clara	E.	84·4	49	e 12 43	+ 7	e 23 19	+18	—	—	e 39·6
Pasadena		86·4	54	i 12 43a	− 2	—	—	—	—	e 39·6
Mount Wilson		86·5	54	i 12 45a	− 1	—	—	—	—	—
La Jolla	Z.	86·8	55	e 12 50	+ 3	—	—	—	—	—
Riverside	Z.	87·0	54	i 12 47	− 1	—	—	—	—	—
Haiwee	Z.	87·1	52	e 12 49	0	—	—	—	—	—
Tinemaha	E.	87·2	51	e 12 49	0	—	—	—	—	—
Victoria		87·2	39	—	—	e 23 9	[− 6]	—	—	35·6
Kodaikanal	E.	88·5	280	12 39?	−17	—	—	—	—	—
Agra	E.	91·4	297	e 17 6	PP	—	—	—	—	—
Tucson		91·9	57	13 11a	0	—	—	—	—	40·0
Tashkent		100·7	310	e 17 49	PP	i 24 26	[− 4]	—	—	e 40·2
Sverdlovsk		106·6	326	e 18 39	PP	e 26 2	−13	—	—	43·6
Tiflis		119·0	312	e 19 41	PP	29 55	PS	—	—	e 55·6
Ksara		127·6	304	e 21 7	PP	e 31 8	PS	—	—	68·2
San Juan		132·0	275	22 35	PKS	e 24 4	PPP	e 32 36	PPS	e 62·8

Additional readings :—
Brisbane ePE = +4m.27s.
Apia SSS? = +19m.20s.
Riverview iE = +10m.6s.
Melbourne e = +10m.50s.
Perth i = +18m.22s., +19m.14s., +19m.34s., and +21m.11s., SS = +24m.52s., i = +25m.51s.
Tucson iP = +13m.32s.
Tashkent i = +25m.18s., e = +32m.18s.
Sverdlovsk e = +27m.55s. and +33m.41s.
Tiflis eN = +20m.11s., eSKPE = +20m.49s., eSKPN = +20m.53s., eSKPZ = +21m.13s.
Ksara e = +32m.45s.
Long waves were also recorded at Honolulu, Harvard, and Pulkovo.

March 21d. Readings also at 0h. (Branner and Fort de France), 1h. (Triest), 4h. (Fort de France and Paris), 8h. (La Paz and Tucson), 9h. (Collmberg, Riverview, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Mizusawa), 10h. (near Mizusawa), 13h. (Tucson), 14h. (near Fort de France), 16h. (near Fort de France) 17h. (near Mizusawa), 18h. (Hukuoka), 20h. (Mount Wilson, Riverside, Tucson, Oaxaca, Puebla, Tacubaya, and Vera Cruz), 22h. (Hukuoka).

March 22d. 3h. 45m. 28s. Epicentre 5°·9S. 146°·7E. (as on 1937 Nov. 18d.).

$A = -\cdot8314$, $B = +\cdot5462$, $C = -\cdot1021$; $\delta = -2$; $h = +7$;
$D = +\cdot549$, $E = +\cdot836$; $G = +\cdot085$, $H = -\cdot056$, $K = -\cdot995$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		17·9	317	4 17	+ 5	7 42	+12	—	—	—
Brisbane	N.	22·3	163	i 5 2	+ 1	i 8 50	−12	i 5 44	PPP	—
Riverview		28·1	172	e 5 53	− 2	i 10 34	− 6	11 25	SS	e 15·0
Sydney		28·1	172	e 5 41	−14	e 10 30	−10	—	—	13·0
Adelaide		29·8	192	e 7 22	PPP	i 13 2	SSS	—	—	18·4
Melbourne		31·8	182	e 8 5	PPP	e 11 30	− 8	i 13 32	SS	17·0
Manila		32·6	309	i 6 35a	0	12 6	+15	—	—	14·2
Perth		38·8	224	9 4	PP	13 22	− 4	9 27	PPP	15·7
Batavia		39·6	267	7 35a	0	i 16 26	SS	i 9 7	PP	e 26·5
Numadu		41·4	350	7 52	+ 2	—	—	—	—	—
Tokyo Cen. Met. Ob.		41·9	352	7 54	0	14 56	+43	—	—	—
Hong Kong		42·4	312	7 59	+ 1	14 21	+ 1	9 36	PP	—
Mito		42·5	353	7 56	− 3	14 17	− 5	—	—	—
Hamada		42·9	342	8 2	0	14 23	− 4	—	—	—
Wellington		43·2	148	7 59	− 5	13 44	−48	9 59	PP	—
Zi-ka-wei	Z.	44·1	328	i 8 10k	− 2	14 36	− 9	10 0	PP	22·3
Mizusawa		45·1	•354	e 8 18	− 2	14 55	− 4	—	—	—
Akita		45·8	354	8 28	+ 3	15 10	+ 1	—	—	—
Hatinohe		46·4	353	8 16	−14	15 14	− 4	—	—	—
Zinsen		47·0	338	8 33	− 2	—	—	—	—	—
Phu-Lien		47·5	305	e 8 37	− 1	e 15 32	− 2	—	—	—
Mori		48·1	354	8 43	0	15 39	− 3	—	—	—
Medan		48·9	280	i 8 50	0	15 52	− 1	i 19 16	SS	—
Vladivostok		50·6	346	e 9 2	0	i 16 17	0	—	—	i 22·7
Honolulu		60·7	61	e 10 20	+ 5	e 18 14	−18	e 13 24	PPP	e 25·2
Calcutta	N.	63·7	298	i 10 42k	+ 6	i 19 14	+ 4	e 11 4	pP	e 30·9
Colombo	E.	67·9	280	11 7	+ 5	20 19	+18	—	—	—
Kodaikanal	E.	70·5	283	i 11 22	+ 4	i 20 34	+ 2	—	—	29·5
Hyderabad	N.	71·3	291	11 25	+ 2	20 40	− 1	—	—	34·5
Agra	E.	74·0	301	i 11 39a	0	21 28	+17	11 58	pP	35·8
Bombay		76·8	290	i 11 51	− 4	i 21 40	− 2	i 22 3	PS	38·5
Almata		79·5	317	e 12 35	+25	—	—	—	—	—
Andijan		82·1	312	e 12 19	− 5	e 21 10	?	—	—	—
Tashkent		84·5	312	i 12 31	− 5	e 22 48	−14	e 15 33	PP	e 51·8
College		85·2	22	e 12 21	−18	e 22 52	[−10]	e 15 35	PP	e 36·8
Samarkand		85·9	310	e 13 0	+17	—	—	—	—	—
Sitka		88·4	32	e 12 45	−10	e 23 2	[−21]	e 16 37	PP	e 35·8
Sverdlovsk		92·7	327	i 13 9	− 6	e 30 56	SSP	i 17 10	PP	40·0
Ukiah		93·8	51	—	—	e 25 7	PS	e 25 45	PPS	e 38·9
Berkeley		94·4	52	e 17 4	PP	e 23 48	[−10]	—	—	e 46·5
Victoria		94·4	42	24 2	SKS	(24 2)	[+ 4]	25 50	PS	39·5
Santa Clara	E.	94·6	52	e 17 15	PP	i 27 30	?	—	—	e 44·1
Pasadena		97·5	57	e 13 29	− 8	—	—	—	—	e 44·5
Mount Wilson	Z.	97·6	57	e 13 32	− 6	—	—	—	—	—
Riverside	Z.	98·2	57	e 13 34	− 6	—	—	—	—	—
Baku		99·0	310	17 54	PP	26 46	PS	—	—	—
Grozny		102·0	313	e 19 37	PPP	e 25 7	−30	—	—	—
Tiflis		102·8	312	e 18 0	PP	e 24 44	[+ 4]	e 20 16	PPP	e 51·5
Tucson		103·7	59	e 14 4	− 1	25 19	[+35]	18 6	PP	e 40·7
Moscow		105·6	327	18 39	PP	27 45	PS	38 56	PPS	e 55·0
Pulkovo		108·2	332	18 57	PP	34 38	SS	—	—	e 43·7
Helwan		114·9	300	e 19 42	PP	e 29 44	PS	—	—	—
Cape Town	E.	117·1	228	25 41	SKS	(25 41)	[+ 1]	29 43	PS	56·8
Cheb		121·7	328	e 20 32?	PP	—	—	—	—	e 62·5
Strasbourg		125·1	328	—	—	e 38 10	SSP	—	—	e 55·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome	z.	125·9	318	e 20 57	PP	(i 26 44)	[+35]	(e 31 13)	PS	—
Ottawa		126·8	35	e 19 2	[− 4]	—	—	e 23 32?	PPP	56·5
Vermont		128·1	35	—	—	e 38 26	SS	e 43 16	SSS	e 62·8
Philadelphia		129·4	42	e 22 32	PKS	e 38 39	SS	—	—	e 56·1
East Machias		131·2	32	e 22 36	PKS	e 28 37	{+10}	—	—	e 49·8
Huancayo		134·6	113	e 19 25	[+ 5]	e 28 47	{− 2}	i 22 55	PKS	e 49·2
La Paz	z.	139·0	124	19 20	[− 9]	—	—	i 22 28	PP	67·5
San Juan		145·7	66	19 39	[− 1]	e 29 6	{−48}	40 51	SS	e 55·6
Rio de Janeiro		149·8	162	e 19 54	[+ 7]	e 33 44	PS	—	—	e 73·5
Fort de France		151·3	70	e 19 46	[− 3]	e 23 46	PP	—	—	—

Additional readings :—
Riverview eE = +7m.32s.
Adelaide i = +8m.7s., +13m.22s., +13m.59s., and +17m.11s.
Melbourne i = +10m.11s. and +14m.34s.
Perth i = +10m.19s., P_cP = +12m.35s., i = +13m.40s.
Batavia iE = +9m.3s.
Hong Kong ? = +13m.11s., SS = +17m.43s.
Wellington iZ = +8m.14s. and +8m.29s., i = +16m.12s., S_cS = +17m.42s.
Zi-ka-wei iZ = +8m.36s. and +15m.8s., SSZ = +18m.16s., iZ = +19m.4s.
Medan iSE = +15m.58s., iE = +21m.16s.
Calcutta isSN = +19m.56s.
Agra PPE = +14m.25s., sSE = +22m.7s., SSE = +26m.27s.
Bombay ePN = +11m.59s., iE = +14m.47s.
Tashkent PPP = +17m.55s., PPS = +24m.2s., eSSS = +31m.20s.
College eSS = +28m.37s.
Sitka eS = +23m.17s.
Berkeley eN = +39m.32s., eE = +43m.32s.?
Victoria eSE = +31m.20s.
Baku e = +21m.55s.
Tiflis PPE = +18m.16s., eZ = +18m.35s.
Tucson iPP = +18m.40s., PPS = +28m.5s., iPKKP = +30m.15s., PKP_1PKP = +38m.12s.
Helwan e = +20m.14s.
Cape Town E = +36m.22s.
Rome ePPZ = +23m.35s., ePSZ = +32m.56s.
Huancayo ePKP = +20m.20s., eSS = +39m.57s., ePSPS = +40m.20s.
La Paz iZ = +19m.29s.
Long waves were also recorded at Prague, Stuttgart, Triest, Bidston, De Bilt, Göttingen, San Fernando, St. Louis, Chicago, Uccle, Hamburg, Kew, and Harvard.

March 22d. 7h. 21m. 18s. Epicentre 20°·0S. 174°·0W.

A = −·9352, B = −·0983, C = −·3400 ; δ = −14 ; h = +5 ;
D = −·105, E = +·995 ; G = +·338, H = +·036, K = −·940.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		6·5	19	1 45	+ 6	i 3 24	S*	—	—	—
Wellington		23·3	202	e 5 7	− 3	9 14	− 6	—	—	e 10·7
Christchurch		26·0	202	5 36a	0	i 10 2	− 4	11 6	L_q	12·9
Brisbane		31·0	249	i 7 42	+81	i 11 24	− 2	—	—	—
Riverview		33·8	238	e 6 59	+13	e 11 25	−45	—	—	e 15·0
Sydney		33·8	238	e 6 45	− 1	e 11 45	−25	—	—	15·6
Melbourne		39·7	234	i 7 32	− 4	i 13 32	− 8	e 16 42	SS	20·9
Honolulu		44·0	22	—	—	e 14 51	+ 8	e 18 8	S_cS	e 20·5
Adelaide		44·2	239	—	—	e 14 48	+ 2	—	—	e 22·5
Perth		63·2	243	19 4	S	(19 4)	+ 1	i 21 52	SS	33·0
Tokyo Cen. Met. Ob.		70·6	321	11 23	+ 4	—	—	—	—	—
Nagano		72·2	321	11 47	+18	—	—	—	—	—
Manila		72·6	293	e 11 31a	0	20 59	+ 3	—	—	33·7
Kobe		72·7	318	14 12	PP	—	—	—	—	—
Santa Barbara	z.	74·8	44	e 11 43	− 1	—	—	—	—	—
Santa Clara		75·2	40	i 12 6	+20	e 22 40	PPS	—	—	—
Berkeley		75·3	40	i 11 45a	− 2	e 21 30	+ 4	—	—	e 30·7
Lick		75·4	40	—	—	e 32 44	?	—	—	—
La Jolla	z.	75·5	46	i 11 47	− 1	—	—	—	—	—
Pasadena		75·6	45	i 11 48a	0	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ukiah		75·6	38	e 11 56	+ 8	e 21 26	− 3	—	—	e 31·6
Mount Wilson	Z.	75·8	45	i 11 48a	− 2	—	—	—	—	—
Riverside	Z.	76·1	45	i 11 50	− 1	—	—	—	—	—
Fresno	N.	76·2	41	e 11 49	− 3	—	—	—	—	e 37·8
Haiwee		77·0	43	e 11 55	− 1	—	—	—	—	—
Tinemaha		77·3	42	e 11 57	− 1	—	—	—	—	—
Batavia		77·8	268	11 59	− 2	21 51	− 2	—	—	—
Tucson		79·7	49	i 12 10	− 1	e 22 6	− 7	15 25	PP	34·7
Vladivostok		80·1	323	i 12 16	+ 3	e 22 30	+12	i 15 18	PP	i 27·4
Zi-ka-wei	Z.	80·2	308	12 15	+ 1	22 3	−16	—	—	—
Seattle		81·7	32	—	—	e 22 56	S_cS	—	—	e 37·1
Hong Kong		81·8	297	12 23	+ 1	22 42	+ 7	28 30	SS	—
Victoria		81·8	31	—	—	e 22 0	−35	—	—	38·7
Butte		86·0	37	e 24 17	PPS	—	—	—	—	e 37·2
Bozeman		86·7	38	—	—	e 23 27	PS	—	—	e 36·1
College		87·0	10	e 12 45	− 3	e 23 11	[− 3]	e 16 37	PP	e 35·8
Phu-Lien		87·6	293	e 12 50	− 1	e 23 19	[+ 2]	—	—	—
Medan		88·7	274	12 44	−13	23 19	[− 6]	—	—	e 49·7
Huancayo		93·9	104	e 13 39	+18	i 23 59	[+ 4]	e 25 19	PS	e 43·4
St. Louis		97·6	52	—	—	e 25 0	0	e 31 37	SS	—
La Paz	Z.	98·7	111	e 13 42	0	i 27 22	PPS	i 18 32	PP	47·7
Chicago		100·5	49	—	—	i 25 31	+ 6	e 35 52	SSS	e 43·5
Calcutta	N.	104·2	289	e 13 17	−50	—	—	—	—	—
Toronto		106·8	48	—	—	e 26 42	+25	e 34 0	SSP	49·7
Colombo	E.	108·1	271	e 15 12	P	—	—	—	—	—
Philadelphia		109·2	53	—	—	e 34 42	SSP	—	—	e 55·8
Ottawa		109·7	47	—	—	e 26 54	{+51}	e 34 24	SS	49·7
Kodaikanal	E.	110·4	274	e 13 42	?	—	—	—	—	—
Vermont		111·3	48	—	—	e 26 56	{+42}	e 29 31	PPS	51·9
San Juan		112·4	77	e 19 17	PP	e 25 14	[− 8]	e 28 50	PS	e 48·4
Fort de France		116·1	83	—	—	e 29 38	PS	—	—	—
Bombay		117·4	282	e 18 45	[− 2]	e 25 44	[+ 3]	e 19 46	PP	—
Sverdlovsk		125·7	327	e 19 2	[− 2]	26 11	[+ 3]	i 20 54	PP	52·7
Baku		137·5	309	19 31	[+ 5]	—	—	22 13	PP	65·2
Grozny		139·5	314	e 23 4	PP	—	—	—	—	—
Tiflis		140·8	312	19 25	[− 7]	e 30 7	{+41}	e 23 12	PKS	e 65·7
Hamburg	Z.	146·3	357	i 19 43	[+ 2]	—	—	—	—	e 91·7
Ksara		150·1	303	i 19 54a	[+ 7]	29 40	{−38}	i 20 28	pPKP	—
Stuttgart		151·2	356	e 19 42?	[− 7]	—	—	—	—	e 85·7
Istanbul		151·3	322	19 50	[+ 1]	—	—	—	—	—
Helwan		155·0	298	i 20 22	[+28]	—	—	i 23 54	PP	—
Rome	Z.	157·5	347	e 35 12	PS	e 44 52	SS	—	—	—

Additional readings :—
Honolulu eS = +14m.58s.
Perth i = +20m.32s. and +24m.4s., S = +25m.35s., i = +26m.40s., +28m.25s., and +29m.0s.
Berkeley eN = +11m.52s., eSE = +23m.8s.
Batavia iSE = +21m.54s.
Tucson iP = +12m.16s. and +12m.24s., i = +12m.33s. and +12m.53s., PPP = +16m.34s., iS = +22m.19s., iPPS = +22m.58s.
Vladivostok PS = +23m.18s.
College eS = +23m.20s., eS_cS = +23m.27s.
Huancayo eS = +24m.33s., ePPS = +26m.46s., SS = +31m.1s., iPSPS = +31m.9s.
Chicago eSKS = +24m.27s.
Vermont ePSPS = +34m.51s.
San Juan SKS = +25m.21s., PSPS = +35m.12s.
Sverdlovsk PKS = +22m.18s., SKKS = +27m.50s., PS = +30m.59s.
Baku e = +24m.56s., +33m.35s., +35m.25s., and +43m.55s.
Tiflis eE = +20m.21s., eN = +23m.20s.
Ksara ePP = +23m.34s., PPS = +36m.32s.
Helwan iEZ = +20m.48s.
Rome eZ = +39m.59s.
Long waves were also recorded at Branner, Harvard, Paris, De Bilt, Edinburgh, La Plata, Columbia, Kew, Uccle, San Fernando, Bidston, Triest, Rio de Janeiro, East Machias, Strasbourg, Cape Town, Pulkovo, and Sitka.

March 22d. Readings also at 1h. (Branner, Andijan, and Lick), 3h. (near Berkeley (2) San Francisco, Branner (2), Fresno, Lick, and Mizusawa), 4h. (Mizusawa), 7h. (Lick), 8h. (Philadelphia), 9h. (Fort de France and near Mizusawa), 13h. (Mizusawa), 15h. (near Mizusawa), 17h. (Helwan), 18h. (Balboa Heights), 19h. (Ottawa, Riverside, Mount Wilson, Pasadena, La Jolla, Haiwee, Tinemaha, and Tucson), 20h. (Tucson, Riverside, Mount Wilson, Pasadena, La Jolla, Haiwee, and Tinemaha), 21h. (Fordham), 22h. (near Mizusawa), 23h. (Mount Wilson and Tucson).

March 23d. 5h. 43m. 54s. Epicentre 47°·4N. 21°·9E.

Intensity V-VI at Nagyleta, Nagykerekin, Kokad, and Vertès.

Macroseismic epicentre 47°·4N. 21°·9E.

B. Simon.

Ungarischer Erdbebenkatalog für das Jahr, 1939, Budapest, p. 9-12.

$A = +\cdot6304$, $B = +\cdot2534$, $C = +\cdot7338$; $\delta = +8$; $h = -4$;
$D = +\cdot373$, $E = -\cdot928$; $G = +\cdot681$, $H = +\cdot274$, $K = -\cdot679$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kecskemet	Z.	1·6	252	e 0 31	+ 1	i 1 2	?	e 0 35	P_g	e 1·6
Szeged		1·7	226	e 0 30	− 1	i 0 59	S_g	e 0 36	P_g	e 1·3
Budapest		1·9	273	0 33	− 1	1 9	+10	0 39	P_g	—
Belgrade		2·8	201	e 0 48k	+ 1	i 1 41	S_g	i 0 53	P*	—
Bucharest		4·2	135	1 6?	− 1	2 4	+ 7	—	—	—
Sofia		4·8	168	e 1 16	+ 1	i 2 35	S_g	—	—	—
Triest		5·9	255	e 2 10	P_g	e 2 33	− 7	3 8	S_g	—
Collmberg	Z.	6·8	307	i 1 42	− 2	i 3 23	S*	i 2 19	P_g	i 4·0
Jena		7·6	301	—	—	e 3 36	+13	—	—	—
Stuttgart		8·6	285	—	—	e 3 48	0	—	—	—
Strasbourg	E.	9·5	283	—	—	e 4 12	+ 2	e 5 22	S_g	—

Additional readings :—
Kecskemet iPPS = +49s., iPS = +53s., eZ = +1m.10s.
Szeged e = +41s., ePPS = +49s., eSS = +1m.7s.
Budapest e = +37s., PPS = +0m.59s., PS = +1m.3s., S_gE = +1m.15s.
Belgrade i = +57s., +1m.7s., and +2m.14s.
Triest SS = +3m.27s.
Collmberg Z i = +1m.54s. and +1m.58s., iP* = +2m.5s., i = +2m.10s., iS* = +3m.41s.
Strasbourg eS*? = +4m.18s., e = +5m.4s.

March 23d. 16h. 20m. 31s. Epicentre 28°·2S. 177°·7W.

Pasadena suggests deep focus.

$A = -\cdot8819$, $B = -\cdot0354$, $C = -\cdot4701$; $\delta = -1$; $h = +2$;
$D = -\cdot040$, $E = +\cdot999$; $G = +\cdot470$, $H = +\cdot019$, $K = -\cdot883$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		11·3	208	—	—	5 29	SSS	—	—	e 6·5
Wellington		14·3	203	3 29	+ 3	5 48	−18	12 26	P_cS	—
Apia		15·3	22	e 3 43	+ 4	e 6 40	+10	e 3 50	PP	—
Christchurch		17·0	204	e 4 2	+ 1	e 6 50	−20	7 52	L_q	8·6
Brisbane	N.	25·9	265	i 6 5	+30	i 10 29	+25	—	—	—
Riverview		27·1	250	i 5 50	+ 4	i 11 0	+36	e 6 13	PP	e 12·9
Sydney		27·1	250	e 6 41	PPP	e 11 5	+41	—	—	14·0
Melbourne		32·5	244	i 6 3	−31	e 13 12	SS	i 8 1	PPP	15·8
Adelaide		37·6	248	i 10 37	?	i 15 29	SS	—	—	17·6
Manila		73·0	297	i 11 31a	− 2	21 18	+18	—	—	34·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		74·3	272	i 11 40	− 1	21 37	PS	i 15 31	PPP	—
Hong Kong		82·7	300	12 31	+ 4	22 39	− 5	—	—	—
Zi-ka-wei	Z.	82·8	312	12 27	0	—	—	i 16 3	PP	40·4
Santa Barbara		83·0	45	e 12 29	+ 1	—	—	i 12 46	pP	—
Branner	E.	83·5	42	e 12 32	+ 1	—	—	—	—	—
La Jolla		83·6	47	e 12 30	− 2	—	—	i 12 48	pP	—
San Francisco		83·6	42	i 13 44	?	—	—	—	—	—
Santa Clara		83·6	42	i 12 41	+ 9	i 23 5	+12	—	—	e 38·6
Berkeley		83·8	42	e 12 30a	− 2	i 22 49	− 6	—	—	e 38·5
Lick		83·8	42	e 12 34	+ 2	—	—	—	—	—
Pasadena		83·8	46	i 12 31a	− 1	i 22 43	−12	i 12 46	pP	e 34·4
Mount Wilson	Z.	83·9	46	i 12 32a	− 1	—	—	i 12 47	pP	—
Riverside	Z.	84·2	46	i 12 33	− 1	—	—	i 12 48	pP	—
Fresno	N.	84·5	43	e 11 41	?	—	—	—	—	—
Vladivostok		84·8	326	i 12 40	+ 3	e 23 1	− 4	e 24 4	PS	e 42·1
Haiwee		85·2	45	i 12 39	0	—	—	e 12 54	pP	—
Tinemaha		85·6	44	i 12 41	0	—	—	i 12 55	pP	—
Medan		86·1	277	e 12 43	− 1	23 32	+14	e 16 50	PP	—
Tucson		87·5	51	i 12 50	− 1	22 57	[−20]	i 13 5	pP	e 35·0
Victoria		90·5	33	e 13 11	+ 6	23 44	[+ 8]	—	—	41·5
Huancayo		95·0	106	e 13 5	−21	24 2	[+ 1]	e 17 29	PP	e 38·8
College		95·7	12	e 13 18	−11	e 24 41	− 3	e 25 55	PS	e 37·9
La Paz	Z.	98·7	114	i 14 4	+22	—	—	i 18 6	PP	—
Calcutta	N.	103·6	289	e 16 31	?	e 25 3	[+19]	—	—	—
Colombo	E.	104·2	270	e 18 59	PP	—	—	—	—	—
St. Louis		105·2	54	—	—	e 26 33	+29	—	—	—
Kodaikanal	E.	107·8	273	e 18 29?	PKP	—	—	—	—	—
Chicago		108·3	52	e 14 4	P	e 26 33	S	—	—	e 45·0
Rio de Janeiro		112·8	134	e 28 29	PS	—	—	—	—	e 52·5
Agra	E.	114·1	289	e 20 0	PP	i 25 25	[− 4]	—	—	—
Bombay		115·5	279	e 18 49	[+ 5]	e 29 29	PS	e 22 4	PPP	e 58·2
San Juan		117·1	82	e 18 24	[−23]	25 34	[− 6]	e 20 12	PP	e 45·6
Ottawa		117·6	50	e 18 44	[− 4]	e 29 49	PS	e 20 14	PP	51·5
Fordham		117·8	56	e 20 18	PP	—	—	—	—	—
Semipalatinsk		118·7	315	—	—	e 26 4	[+19]	—	—	—
Harvard	Z.	119·9	55	e 20 30	PP	—	—	—	—	e 58·5
Fort de France		120·0	89	e 20 5	PP	e 30 11	PS	—	—	—
Seven Falls		121·3	49	—	—	e 29 11	PS	—	—	56·5
Andijan		122·3	302	19 0	[+ 3]	e 26 1	[+ 4]	—	—	—
Tchimkent		124·6	304	e 19 3	[+ 2]	—	—	—	—	—
Tashkent		124·7	303	e 19 31	[+29]	e 30 45	PS	37 11	SS	e 57·6
Sverdlovsk		130·4	323	i 19 11	[− 2]	—	—	22 32	PKS	57·5
Baku		139·3	301	e 19 31	[+ 2]	e 41 35	SS	23 9	PKS	72·5
Grozny		142·1	305	e 19 26	[− 8]	e 23 31	PKS	—	—	—
Tiflis		142·9	303	i 19 31	[− 4]	—	—	e 22 43	PP	e 68·5
Sotchi		146·0	308	e 19 26	[−15]	—	—	—	—	—
Ksara		150·8	289	i 19 49a	[+ 1]	33 45	PS	i 20 11	pPKP	74·5
Copenhagen		151·7	349	e 19 50	[0]	—	—	23 35	PP	—
Helwan		154·7	281	i 19 53a	[− 1]	e 31 5	{+21}	—	—	—
Collmberg	Z.	155·7	343	e 19 55	[0]	e 30 17	{−32}	e 24 16	PP	—
Jena		156·2	344	19 41	[−15]	—	—	—	—	—
Uccle		157·5	359	e 20 32	[+34]	—	—	—	—	e 74·5
Stuttgart		158·8	348	e 19 58	[− 1]	—	—	—	—	e 90·5
Strasbourg		159·3	350	e 20 3	[+ 3]	—	—	—	—	e 87·5
Basle		160·4	349	e 20 42	[+41]	—	—	—	—	—
Zurich		160·4	349	e 20 16	[+15]	—	—	—	—	—
Chur		160·6	348	e 19 55	[− 6]	—	—	—	—	—
Toledo	Z.	167·4	22	e 20 10	[+ 3]	—	—	e 25 12	PP	—
Granada		169·9	27	20 10	[+ 1]	—	—	i 25 49	PP	—

For Notes see next page.

NOTES TO MARCH 23d. 16h. 20m. 31s.

Additional readings :—
Wellington S_cS = +16m.14s.
Apia eSS = +6m.47s.
Riverview eN = +11m.16s.
Adelaide i = +11m.48s. and +16m.59s.
Batavia iN = +22m.39s.
Santa Barbara i = +12m.42s.
Branner eE = +12m.44s., eN = +12m.47s.
San Francisco eE = +13m.54s.
Berkeley iN = +12m.33s., iZ = +12m.46s. and +12m.49s., eE = +13m.4s.
Pasadena isP = +12m.50s., ePPZ = +15m.45s., iZ = +16m.2s.
Mount Wilson isPEZ = +12m.50s., iPPZ = +15m.45s., iZ = +16m.3s.
Riverside isP = +12m.52s., eZ = +16m.4s.
Fresno eN = +11m.55s.
Vladivostok iSS = +29m.17s.
Haiwee iNZ = +12m.57s., eZ = +16m.11s.
Tinemaha iZ = +12m.58s.
Medan PEN = +12m.56s.
Tucson iP_cP = +12m.52s., i = +13m.11s. and +13m.20s., iSP = +13m.25s., i = +13m.33s. and +14m.5s., PP = +16m.31s., ipPP = +16m.46s., PPP = +18m.43s., iS = +23m.19s., iSS = +23m.35s., PS = +24m.26s.
Huancayo isS = +24m.39s., eSS = +30m.59s., esSS = +31m.12s.
Bombay i = +30m.55s. and +31m.16s.
San Juan eS = +27m.26s., ePS = +29m.36s., eSS = +36m.0s.
Ottawa eE = +36m.11s.
Sverdlovsk i = +19m.25s., e = +22m.50s.
Baku ePPS = +35m.0s., eSSS = +45m.47s.
Tiflis ePKPEN = +19m.34s., eE = +19m.51s.,e EZ = +20m.23s., ePKS = +23m.16s., PKSZ = +23m.39s.
Sotchi e = +19m.44s. and +20m.0s.
Ksara PP = +23m.32s., PPS = +36m.42s.
Copenhagen e = +19m.56s., i = +20m.14s. and +24m.10s.
Helwan iEZ = +20m.19s., eE = +30m.11s. and +32m.3s.
Collmberg Z i = +20m.4s., +20m.21s., and +20m.40s., e = +21m.57s.
Uccle i = +20m.49s.
Granada iPKP = +21m.49s., i = +21m.57s.
Long waves were also recorded at Pulkovo, Paris, De Bilt, Bidston, East Machias, Bozeman, Balboa Heights, Ukiah, Philadelphia, and Kew.

March 23d. Readings also at 0h. (Tucson), 5h. (near Fort de France), 7h. (Tucson, Osaka, near Mizusawa, Pasadena, Mount Wilson, and La Paz), 8h. (Christchurch and Sofia), 10h. (Medan and near Mizusawa), 11h. (Mizusawa), 15h. (Harvard and near Fordham), 19h. (Andijan, Tchimkent, and Perth), 21h. (near Branner and Fordham), 23h. (near Mizusawa).

March 24d. Readings at 1h. (Tacubaya and La Plata), 3h. (Kodaikanal), 4h. (near Mizusawa (2) and Vladivostok), 5h. (near Mizusawa, Stuttgart, Zurich, Sverlovsk, Baku, Basle, Chur, near Ebingen, Andijan, and Tchimkent), 6h. (Triest), 7h. (near Mizusawa), 8h. (near Sarajevo), 9h. (Tucson and Szeged), 10h. (Sitka), 11h. (Tucson). 12h. (Tucson and near Mizusawa), 13h. (Sverdlovsk, Baku, Tashkent, Grozny, Erevan, Ksara, and Tiflis), 19h. (Tucson), 21h. (Göttingen, Zurich, and Stuttgart), 22h. (Jena), 23h. (La Paz and near Fort de France).

March 25d. 0h. Local Japanese shock.

Tokyo Imperial University gives epicentre as 35°·52N. 139°·44E.

Kiyosumi P = 38m.41s., S = 38m.52s.
Koyama P = 38m.41s., S = 38m.49s.?
Yosiwara P = 38m.41s., S = 38m.55s.
Susaki P = 38m.41s.
Kamakura P = 38m.50s., S = 38m.54s.
Tukubasan P = 38m.50s., S = 39m.2s.
Mitaka P = 38m.50s., S = 38m.55s.
Komaba P = 38m.51s., S = 38m.57s.
Tokyo Imp. Univ. P = 38m.51s., S = 38m.57s.

March 25d. 1h. 42m. 20s. Epicentre 1°·0N. 123°·3E. (as on 1937 March 21d.).

$A = -·5489$, $B = +·8357$, $C = +·0173$; $\delta = -2$; $h = +7$;
$D = +·836$, $E = +·549$; $G = -·009$, $H = +·014$, $K = -1·000$.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Manila		13·7	351	e 3 16	− 2	6 3	+11	—
Batavia	Z.	17·9	246	e 4 18	+ 6	—	—	12·7
Hong Kong		23·0	338	5 3	− 4	9 10	− 4	—
Medan		24·7	276	5 21	− 3	9 39	− 5	—
Agra	E.	50·6	305	—	—	e 15 56	−21	—
Frunse		60·2	321	e 10 50	+38	—	—	—
Andijan		60·7	317	e 10 42	+27	—	—	—
Tashkent		63·0	317	i 10 8	−23	—	—	26·0
Sverdlovsk		74·5	329	e 11 44	+ 2	21 6	−11	29·7

Additional reading :—
Tashkent e = +10m.44s.
Long waves were recorded at Strasbourg and Stuttgart.

March 25d. 5h. 39m. 55s. Epicentre 1°·5N. 121°·0E.

$A = -·5149$, $B = +·8569$, $C = +·0260$; $\delta = +8$; $h = +7$;
$D = +·857$, $E = +·515$; $G = -·013$, $H = +·022$, $K = -1·000$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		13·0	0	i 3 9k	0	7 5	L	—	—	(7·1)
Batavia		16·1	242	e 3 57	+ 8	e 8 31	?	—	—	12·1
Hong Kong		21·7	344	4 55	0	8 59	+ 8	—	—	—
Medan		22·4	277	5 10	+ 8	i 9 30	SS	—	—	—
Phu-Lien		23·8	326	e 5 25	+10	e 9 46	SS	—	—	—
Zi-ka-wei	Z.	29·5	1	e 6 7	− 1	—	—	—	—	—
Calcutta	N.	38·0	307	e 7 41	+20	—	—	—	—	—
Colombo	E.	41·4	279	e 7 35	−15	—	—	—	—	—
Vladivostok		42·6	13	e 7 54	− 5	i 13 58	−25	—	—	e 19·9
Kodaikanal	E.	44·1	284	e 8 5?	− 7	—	—	—	—	—
Melbourne		45·0	153	e 13 44	?	e 15 32	PPS	—	—	26·9
Agra	E.	48·4	307	e 7 16	?	15 50	+ 4	19 54	SS	—
Bombay		50·3	294	e 10 31	PP	e 16 25	+12	—	—	—
Almata		57·1	324	e 9 56	+ 6	—	—	—	—	—
Andijan		58·7	318	e 10 9	+ 7	—	—	—	—	—
Tashkent		61·1	318	e 10 12	− 6	18 36	− 1	—	—	e 29·0
Tchimkent		61·3	319	e 10 49	+29	—	—	—	—	—
Samarkand		62·0	315	e 10 49	+25	—	—	—	—	—
Sverdlovsk		72·9	331	e 11 32	− 1	e 20 55	− 4	—	—	35·1
Tiflis	Z.	78·7	312	e 12 19	+13	—	—	—	—	e 46·1
Ksara		85·1	303	e 11 12	?	e 22 2	[−59]	—	—	—
Pulkovo		89·1	330	—	—	e 23 41	− 5	—	—	e 47·7
Strasbourg		104·0	321	—	—	e 37 5?	SSS	—	—	e 53·1
Moncalieri		105·2	317	e 16 32	?	—	—	—	—	—
Uccle		105·3	324	—	—	e 28 51	PPS	—	—	e 53·1
Paris		107·2	322	—	—	e 28 5?	PS	—	—	e 69·1

Additional readings :—
Batavia 1E = +10m.5s.
Medan iSN = +10m.52s.
Melbourne i = +21m.53s.
Tiflis eZ = +13m.33s.
Ksara e = +14m.11s.
Long waves were also recorded at Stuttgart, De Bilt, Kew, and Edinburgh.

March 25d. Readings also at 1h. (Sverdlovsk, Tashkent, and near Manila), 2h. (near Mizusawa and near Tiflis), 3h. (near Tucson (2) and near Balboa Heights), 4h. and 5h. (Fort de France), 8h. (Pulkovo, Sverdlovsk, Bucharest, Istanbul, Triest, Stuttgart, near Manila (2) and near Fort de France), 9h. (Andijan, Mount Wilson, and Riverside), 10h. (near Algiers), 12h. (Fort de France, Huancayo, Rio de Janeiro, La Paz, Tucson, Mount Wilson, Riverside, and Tinemaha), 13h. (La Paz and Tucson), 15h. (Oaxaca, Puebla, Tacubaya, Vera Cruz, Tucson (2), and Tiflis), 16h. (Tucson and near Malabar), 17h. (Fort de France, Almata, Andijan, Frunse, Samarkand, and Tchimkent), 18h. (Mount Wilson, Riverside, Tinemaha, and Tucson), 19h. (Manila), 20h. (Sotchi), 22h. (Fort de France).

March 26d. 0h. Local Japanese shock.

Tokyo Imperial University gives epicentre as 35°·31N. 140°·27E.

Kiyosumi P =51m.17s., S =51m.22s.
Okiziku P =51m.17s., S =51m.27s.
Titibu P =51m.17s., S =51m.38s.
Koyama P =51m.17s., S =51m.39s. ?
Yosiwara P =51m.17s., S =51m.42s. ?
Tokyo Imp. Univ. P =51m.35s., S =51m.45s.
Komaba P =51m.37s., S =51m.46s.
Tukubasan P =51m.39s., S =51m.51s.
Kamakura P =51m.39s., S =51m.49s.
Mitaka P =51m.39s., S =51m.52s.
Susaki P =51m.44s., S =52m.0s.
Mizusawa ePN =52m.28s., iS =53m.29s.
Osaka P =52m.35s., S =53m.29s.

March 26d. 3h. Undetermined shock.

Riverview iE =57m.19s., iN =58m.19s., iE =58m.49s., iN =59m.17s., eN =61m.9s., iE =61m.15s., eZ =61m.23s., iN =62m.0s., iE =62m.4s., iZ =62m.29s., LE =62·5m.
Melbourne e =58m.7s., i =58m.43s., 59m.42s., 59m.50s., and 60m.3s., L =60·1m.
Brisbane eN =59m.0s. and 63m.12s.
Adelaide iP =59m.3s., i =59m.15s., 59m.18s., 59m.26s., and 59m.46s., iS =59m.53s., iL =60·1m.
Batavia PZ =63m.32s., iSN =69m.28s.
Perth P =63m.53s., PP =64m.7s., PPP =64m.23s., i =64m.48s., 65m.15s., 65m.50s., S =65m.58s., SS =66m.8s., i =66m.22s., L =67·2m.
Medan PEN =65m.23s., eSE =72m.43s.
Bombay eE =67m.21s., eN =78m.21s.
Vladivostok iP =67m.49s., iS =77m.26s., eL =87m.54s.
Ksara e =74m.46s., ePP =76m.8s., ePS =85m.56s.
Riverside iPKPZ =74m.53s.
Mount Wilson iPKPZ =74m.54s.
Tucson P =75m.3s.a.
Fordham i =75m.59s. and 76m.10s.
Colombo eE =76m.0s.
Harvard iZ =76m.6s.
Kodaikanal eE =77m.0s.
Tashkent iS =80m.55s., eL =103·1m.
Baku e =86m.0s.
Sverdlovsk e =90m.19s., L =106·0m.
Long waves were also recorded at Pasadena and Tiflis.

March 26d. Readings also at 0h. (Tashkent, Vladivostok, Branner, Samarkand, Tchimkent, Frunse, and Andijan), 1h. (Pasadena, Mount Wilson, Riverside, Wellington, Tiflis, College, and Sverdlovsk), 5h. (Sitka, Samarkand, Tchimkent, Tiflis, Frunse, and Andijan), 7h. (Andijan, Tchimkent, Samarkand, and Triest), 11h. (Ksara, Rio de Janeiro, Piatigorsk, and Triest), 12h. (Baku, Stuttgart, Ottawa, Tiflis, Strasbourg, and Sverdlovsk), 13h. (Strasbourg and near Fort de France), 17h. (near Balboa Heights), 23h. (near Tananarive).

March 27d. Readings at 0h. (Santa Clara, Lick, San Francisco, near Berkeley, and Harvard), 1h. (Tiflis and Tucson), 2h. (Tucson), 4h. (San Juan), 5h. (near Istanbul, Bucharest, Strasbourg, Moscow, Wellington, Cheb, near Granada, Sofia, Triest, Stuttgart, Sverdlovsk, and Ksara), 6h. (Tucson, Samarkand, and Andijan), 7h. (Ksara and San Juan), 9h. (Medan), 10h. (San Juan), 11h. (Tucson), 12h. (Tucson), 14h. (Hukuoka, Tchimkent, Medan, Samarkand, Andijan, and Sverdlovsk), 15h. (near Mizusawa), 16h. (near Taihoku, Fordham, and Harvard), 17h. (Vladivostok and Sverdlovsk) ,18h. (Fort de France and Andijan), 19h. (College).

March 28d. Readings at 0h. (near Mizusawa), 1h. (Sotchi), 2h. (Ksara and Tiflis), 3h. (College, Tucson, Fordham, Mount Wilson, Riverside, Tinemaha, and Ottawa), 8h. (Sotchi), 10h. (Triest), 13h. (near Mizusawa), 17h. (Mizusawa, Andijan, Samarkand, and Tchimkent), 18h. (Ottawa), 20h. (near Ferndale and Berkeley).

March 29d. 0h. 17m. 56s. Epicentre 5°·5S. 126°·0E. (as on 1938, April 26d.).

$A = -\cdot5851$, $B = +\cdot8054$, $C = -\cdot0952$; $\delta = +7$; $h = +7$;
$D = +\cdot809$, $E = +\cdot588$; $G = +\cdot056$, $H = -\cdot077$, $K = -\cdot996$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		19·1	268	i 4 36	+ 9	i 8 0	+ 3	—	—	—
Manila		20·6	347	i 4 56a	PP	8 45	SS	—	—	—
Medan		28·7	289	6 3	+ 2	i 11 25	+35	—	—	—
Hong Kong		30·0	338	5 21	−51	11 20	+10	12 18	PP	—
Phu-Lien		32·3	325	e 6 42	+ 9	—	—	—	—	—
Brisbane		33·7	133	e 9 34	?	—	—	i 10 52	?	e 16·3
Melbourne		36·5	154	—	—	i 11 47	−64	—	—	—
Riverview		36·6	144	—	—	e 14 9	SS	—	—	—
Sydney		36·7	144	—	—	e 11 22	?	—	—	e 18·1
Mizusawa	E.	46·6	17	e 8 20	−12	e 14 48	−33	—	—	—
Colombo	E.	47·7	285	e 8 34	− 6	—	—	—	—	—
Vladivostok		48·7	5	i 8 44	− 4	e 15 44	− 6	—	—	e 22·9
Agra	E.	56·6	308	i 9 47a	0	17 38	0	12 2	PP	—
Bombay		57·7	297	e 9 49	− 6	e 17 56	+ 3	e 12 15	PP	—
Almata		65·7	324	e 10 53	+ 5	—	—	—	—	—
Andijan		67·3	319	11 2	+ 3	e 19 57	+ 3	—	—	—
Semipalatinsk		68·2	332	11 2	− 2	—	—	—	—	—
Tashkent		69·6	318	e 11 13	0	i 20 20	− 1	—	—	e 36·6
Tchimkent		69·8	320	11 14	0	e 20 23	0	—	—	—
Samarkand		70·4	315	e 11 23	+ 5	—	—	—	—	—
Sverdlovsk		81·5	330	i 12 12	− 9	i 22 14	−18	—	—	38·1
Tiflis		87·1	312	i 12 44	− 5	e 23 22	− 6	—	—	e 47·1
Ksara		93·1	303	e 14 38	?	e 25 50	PS	e 16 30	PP	—
Moscow		93·6	325	e 17 12	PP	e 24 29	+ 3	—	—	—
Pulkovo		97·6	329	—	—	e 22 46	?	—	—	—
Stuttgart		111·6	321	e 19 27	PP	—	—	—	—	—
Strasbourg	z.	112·6	321	e 19 24	PP	—	—	—	—	—
Tinemaha	z.	113·8	52	e 18 21	[−19]	—	—	—	—	—
Pasadena	z.	114·4	54	i 18 22	[−20]	—	—	—	—	—
Mount Wilson	z.	114·5	54	i 18 22	[−20]	—	—	—	—	—
Riverside	z.	115·1	54	i 18 23	[−20]	—	—	—	—	—
Tucson		120·8	55	i 18 35	[−19]	—	—	i 19 15	PP	e 49·9
Harvard	z.	140·0	18	i 19 8	[−22]	—	—	—	—	—
La Paz	z.	154·1	148	19 38	[−15]	—	—	i 20 34	PKP_2	—

Additional readings:—
Batavia iN = +7m.22s.
Medan iE = +11m.56s.
Melbourne i = +13m.32s. and +14m.47s.
Agra iE = +18m.42s., SSE = +21m.37s.
Bombay e = +18m.58s.
Semipalatinsk e = +11m.58s.
Tiflis eZ = +13m.24s., eE = +23m.0s., eZ = +24m.28s., eE = +24m.32s.
Moscow ePS = +25m.34s.
Pulkovo e = +25m.56s. and +27m.22s.
Stuttgart eEZ = +20m.21s.
Strasbourg e = +20m.26s.
Tucson i = +20m.15s. and +22m.47s.

March 29d. 2h. 28m. 50s. Epicentre 9°·5N. 126°·7E.

N.E. Mindanao. Centre in Philippines deep. Felt strongly at Cantilan; moderately at Hinatuan and Dapa; and slightly at Port Lamon, Butuan, Mainit, and Cabadbaran.

Epicentre 9°·0N. 126°·0E. (Strasbourg).

W. C. Repetti. Seismological Bulletin for 1939. Manila Central Observatory, Manila, 1940, p. 13.

$A = -\cdot5896$, $B = +\cdot7910$, $C = +\cdot1640$; $\delta = +21$; $h = +7$;
$D = +\cdot802$, $E = +\cdot598$; $G = -\cdot098$, $H = +\cdot131$, $K = -\cdot986$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		7·5	313	i 1 56a	+ 3	3 25	+ 5	—	—	—
Hong Kong		17·5	318	4 9	+ 2	7 24	+ 3	4 16	PP	8·9
Zi-ka-wei	Z.	22·1	349	e 5 10	+11	i 9 8	+10	—	—	i 9·5
Phu-Lien		22·4	304	e 5 0	− 2	9 1	− 3	—	—	—
Batavia		25·2	234	i 5 31	+ 2	9 51	− 1	—	—	—
Medan		28·4	262	6 1	+ 3	10 43	− 2	—	—	e 15·2
Vladivostok		33·8	9	e 6 52	+ 6	e 12 16	+ 6	—	—	i 19·7
Calcutta	N.	38·9	295	—	—	13 23	− 5	—	—	—
Agra	E.	49·1	299	8 45	− 6	—	—	10 45	PP	—
Frunse		56·2	317	e 10 3	+19	—	—	—	—	—
Andijan		57·1	313	e 9 58	+ 8	—	—	—	—	—
Tashkent		59·5	314	—	—	e 18 9	− 7	—	—	e 31·3
Tchimkent		59·5	315	e 10 13	+ 6	—	—	—	—	—
Samarkand		60·8	311	e 10 0	−16	e 18 11	−22	—	—	—
Sverdlovsk		69·1	329	i 11 6	− 4	20 5	−10	—	—	36·2
Baku		73·9	310	—	—	e 18 5	?	—	—	39·6
Tiflis		77·7	312	12 0	0	e 21 48	− 4	—	—	31·2
Moscow		81·7	326	e 12 22	0	e 22 38	+ 4	—	—	e 46·7
Pulkovo		85·1	330	—	—	e 22 52	[− 9]	—	—	43·7
Ksara		85·5	303	e 12 44	+ 3	e 23 18	+ 6	—	—	—
Tucson		111·2	50	19 22	PP	—	—	—	—	—

Additional readings:—
Batavia iSEN? = +10m.3s.
Agra SSE? = +19m.21s.
Tashkent eS = +18m.34s., e = +25m.17s.
Baku e = +24m.11s. and +30m.5s.
Tiflis ePN = +12m.4s.
Long waves were also recorded at De Bilt, Cheb, Strasbourg, Stuttgart, and Uccle.

March 29d. Readings also at 0h. (near Perth), 9h. (La Paz, Tucson, Mount Wilson, Pasadena, and Riverside), 11h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Merida, Oaxaca, Tacubaya, Vera Cruz, near Balboa Heights, and near Mizusawa), 14h. (near Mizusawa), 17h. (Kodaikanal), 21h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, San Francisco, Berkeley, Branner, Lick, Ferndale, Fresno, Calcutta, and near Bombay), 22h. (near Branner).

March 30d. Readings at 0h. (Hukuoka, near Apia, and near Berkeley), 1h. (near Bagnères), 3h. (Samarkand and Andijan), 6h. (near Medan), 7h. (Tiflis), 8h. (Berkeley, Fresno (2), Lick (2), and Branner (2)), 9h. (Hukuoka, Sverdlovsk, and Tashkent), 10h. (Balboa Heights, Fresno, Lick, Berkeley, and Branner), 11h. (near Wellington), 16h. (near Fordham), 19h. (Almata).

March 31d. 7h. 18m. 14s. Epicentre 42°·0N. 145°·2E.

Intensity III at Nemuro ; II at Kusiro, Miyako, and Abasin ; and I at Urakawa.

Epicentre 42°·0N. 145°·2E.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1939, Tokyo. 1949, p. 10.

$A = -\cdot6121$, $B = +\cdot4254$, $C = +\cdot6666$; $\delta = -1$; $h = -2$;
$D = +\cdot571$, $E = +\cdot821$; $G = -\cdot547$, $H = +\cdot380$, $K = -\cdot745$.

A depth of focus 0·015 has been assumed.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro	1·4	14	0 11k	−17	0 21	−27	—	—	—
Sapporo	3·1	291	0 46	− 3	1 19	− 7	—	—	—
Hatinohe	3·1	242	0 50	+ 1	1 29	+ 3	—	—	—
Miyako	3·4	225	0 55	+ 2	1 37	+ 4	—	—	—
Aomori	3·5	251	0 56	+ 2	1 40	+ 4	—	—	—
Mizusawa	4·2	228	1 7	+ 4	i 1 57	+ 5	—	—	—
Akita	4·5	240	1 14	+ 6	2 9	+10	—	—	—
Sendai	5·0	223	1 16	+ 2	2 14	+ 2	—	—	—
Hukusima	5·5	222	1 25	+ 4	2 27	+ 3	—	—	—
Mito	6·7	215	1 35	− 2	2 54	+ 1	—	—	—
Utunomiya	6·8	219	1 46	+ 7	3 0	+ 5	—	—	—
Kakioka	7·0	216	1 41	0	3 1	+ 1	—	—	—
Nagano	7·6	228	2 5k	PP	3 57	SS	—	—	—
Tokyo Cen. Met. Ob.	7·7	216	2 1	+10	3 14	− 3	—	—	—
Toyama	8·2	232	2 12	PP	3 36	+ 7	—	—	—
Nagoya	9·4	227	2 26	PP	3 58	0	—	—	—
Vladivostok	9·9	281	i 2 24	+ 4	e 4 14	+ 4	—	—	5·4
Osaka	10·5	228	2 43	PP	4 52	SS	—	—	—
Semipalatinsk	44·4	305	3 2	?	—	—	—	—	—
Almata	48·9	296	e 6 29	?	—	—	—	—	—
Andijan	53·1	295	9 1	− 5	—	—	—	—	—
Sverdlovsk	53·4	318	i 9 6	− 3	i 16 34	+ 5	—	—	24·8
Tashkent	54·9	297	i 9 20	0	e 16 54	+ 5	—	—	e 27·4
Moscow	65·0	324	i 10 27	− 1	—	—	i 10 47	pP	e 32·3
Pulkovo	65·4	330	e 10 31	0	e 19 8	+ 5	—	—	e 31·1
Tiflis	70·1	309	11 2	+ 2	20 8	+ 9	—	—	31·8
Tinemaha	70·6	57	i 11 3	0	—	—	—	—	—
Santa Barbara z.	71·3	60	e 11 7	0	—	—	e 11 26	pP	—
Haiwee N.	71·4	57	e 11 8	0	—	—	—	—	—
Mount Wilson z.	72·5	59	i 11 14a	0	—	—	i 11 32	pP	—
Pasadena	72·5	59	i 11 14a	0	—	—	i 11 31	pP	—
Riverside z.	73·1	59	i 11 17a	− 1	—	—	—	—	—
La Jolla z.	73·9	60	i 11 22	− 1	—	—	—	—	—
Collmberg	78·2	331	i 11 48	+ 1	e 21 52	sS	i 12 3	pP	—
Tucson	78·4	57	i 11 48a	0	—	—	i 11 57	pP	—
Ksara	80·6	307	e 12 2	+ 2	—	—	e 15 6	PP	—

Additional readings :—
Collmberg i = +12m.16s., e = +12m.35s. and +14m.14s., i = +14m.33s.
Tucson iP = +12m.7s.
Ksara PPP = +16m.52s.
Long waves were also recorded at Melbourne, Uccle, Paris, Stuttgart, De Bilt, and Strasbourg.

March 31d. Readings also at 0h. (Andijan), 1h. (Andijan and Frunse), 6h. (Bucharest, Helwan, Rome, Sofia, Istanbul, Tiflis, and Ksara), 7h. (Strasbourg, Stuttgart, and Uccle), 9h. (Lick and Branner), 12h. (Tchimkent, Almata, Frunse, Andijan (5), and Samarkand), 13h. (Tucson, Andijan (2), near Wellington, and New Plymouth), 17h. (New Plymouth), 21h. (College), 22h. (La Jolla, Riverside, Pasadena, Mount Wilson, Haiwee, Santa Barbara, Tinemaha, Sverdlovsk, Tashkent, Vladivostok, Manila, Tucson, Wellington, Ksara, and Samarkand).

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