The International Seismological Summary.

1937 October, November, December.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

This concluding number for 1937 contains altogether 122 determined epicentres, of which 43 are repetitions from other dates in the same year.

Abnormal focal depth is noted in the case of the following :—

Date.	Epicentre.	Depth.
	° °	
Oct. 12d. 20h.	25·7S. 68·8W.	0·015
17d. 9h..	39·0N. 15·2E.	0·040
29d. 7h.	37·0N. 70·5E.	0·020
31d. 22h.	37·0N. 70·5E.	0·020
Nov. 14d. 10h.	36·3N. 71·0E.	0·025
16d. 13h.	36·3N. 71·0E.	0·025
22d. 4h.	35·1N. 135·7E.	0·050

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January, 1949.

KEW OBSERVATORY,
RICHMOND,
SURREY.

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1937 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. 19h. 16m. 32s. Epicentre 23°·0S. 174°·5W.

A = −·9172, B = −·0883, C = −·3885; $\delta = -2$; $h = +4$;
D = −·096, E = +·995; G = +·387, H = +·037, K = −·921.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Arapuni		17·2	207	—	—	e 7 28	+14	—	9·0
Wellington		20·3	204	4 47	+ 7	8 31	+ 8	i 11·2	12·5
Christchurch		23·1	203	4 59	− 9	8 48	−28	10·6	—
Riverview		31·9	242	e 7 52	PPP	e 12 22	+42	14·7	16·7
Sydney		31·9	242	—	—	e 9 28?	?	16·6	18·5
Melbourne		37·6	237	i 7 21	+ 3	i 12 57	−11	—	22·8
Adelaide		42·4	243	e 9 20	PP	e 17 3	SS	—	23·9
Honolulu		46·9	22	e 8 41	+ 7	e 17 58	SS	e 18·7	—
Perth		61·5	245	e 11 8	+47	e 19 57	?	30·9	37·1
Manila		73·3	294	e 11 27	− 8	21 42	+38	—	—
Kobe	E.	74·7	319	—	—	21 20	+ 1	—	46·0
Batavia		77·2	269	18 56	?	—	—	—	—
Pasadena		78·1	45	e 12 2	0	i 22 6	+10	e 32·0	—
Mount Wilson	Z.	78·2	45	i 12 1	− 2	—	—	—	—
Riverside	Z.	78·5	45	i 12 4	0	—	—	—	—
Tinemaha		79·3	43	i 12 13	+ 4	—	—	—	—
Haiwee	E.	79·4	44	e 12 11	+ 2	—	—	—	—
Zi-ka-wei		81·7	309	e 12 36	+14	—	—	—	48·2
Tucson		81·9	50	12 23	0	e 22 49	+13	32·7	—
Vladivostok		82·2	324	e 12 22	− 2	e 22 42	+ 3	—	48·3
Hong Kong		82·7	298	—	—	22 40	− 4	—	46·0
Victoria		84·5	32	—	—	e 23 10	+ 8	44·6	—
Sitka		86·3	21	e 13 12	+27	23 28	+ 8	e 35·8	—
Phu-Lien		88·3	293	22 28?	?	—	—	—	—
College		90·0	349	—	—	e 23 33	[0]	e 39·3	—
Huancayo		93·6	105	e 17 25	PP	e 24 0	[+ 7]	e 37·5	—
La Paz	Z.	98·0	113	e 17 58a	PP	—	—	46·0	53·0
Irkutsk		102·7	322	13 28?	−32	24 22	[−17]	e 51·5	62·5
Calcutta	N.	104·7	289	—	—	e 24 57	[+ 8]	—	79·4
Philadelphia		111·3	55	e 29 16	?	34 13	SS	e 51·1	—
Ottawa		112·0	49	—	—	e 28 58	PS	56·5	—
San Juan		113·4	80	—	—	25 27	[+ 2]	e 55·2	—
Rio de Janeiro	E.	114·2	131	e 28 58	PS	—	—	e 59·5	—
Oak Ridge	Z.	114·5	53	i 21 16	PPP	—	—	e 58·5	—
Weston	Z.	114·6	53	e 21 18	PPP	—	—	59·5	—
Agra	E.	115·0	291	—	—	i 25 23	[− 9]	—	—
Seven Falls		115·6	48	—	—	e 30 4	?	60·5	—
Bombay		117·5	280	—	—	e 25 40	[− 1]	—	83·5
Cape Town		122·0	193	—	—	e 36 58	SS	e 66·2	—
Tashkent		124·2	306	e 19 55	[+54]	i 26 3	[0]	e 49·5	74·1
Sverdlovsk		127·9	326	e 29 20	PS	e 38 7	SS	58·5	72·4
Baku		138·9	306	e 22 30	PP	—	—	73·0	85·6
Grozny		141·2	311	e 19 34	[+ 2]	—	—	—	—
Tiflis		142·3	309	e 20 42	[+67]	e 41 1	SS	e 77·5	85·8
Copenhagen		147·0	354	19 41	[− 2]	—	—	79·5	—
Theodosia		147·2	320	e 19 46	[+ 3]	—	—	—	—
Simferopol		148·0	321	e 19 44	[0]	—	—	—	—
Yalta		148·3	319	19 40	[− 5]	—	—	—	—
Hamburg		149·3	356	i 19 46	[0]	—	—	79·5	—
Ksara		151·3	298	e 19 47	[− 2]	—	—	—	84·5
Uccle		152·2	4	—	—	e 29 58	{−32}	e 81·5	—
Paris		154·1	5	—	—	e 44 28?	SSP	82·5	—
Stuttgart		154·1	354	e 20 28?	[+35]	—	—	e 90·5	—
Helwan		155·9	292	e 20 18	[+22]	30 48	{− 2}	53·5	—

For Notes see next page.

NOTES TO OCT. 1d. 19h. 16m. 32s.

Additional readings :—
Arapuni i = +10m.16s.
Wellington i = +5m.52s., e = +6m.17s., iL_q = +9·8m.
Christchurch P_cPN = +9m.5s., L_qE = +9m.20s., P_cS = +12m.57s., S_cS = +17m.6s.
Riverview eN = +13m.22s.
Melbourne i = +8m.32s., +15m.37s., +16m.28s., +18m.38s., +19m.45s., and +20m.35s.
Honolulu ePP = +10m.15s.
Perth PP = +14m.28s., PPP = +15m.27s., PS = +20m.12s., SS = +24m.21s., i = +25m.11s., SSS = +27m.0s.
Tucson P = +12m.43s.
Sitka ePPP = +17m.41s., PS = +23m.46s., eSS = +28m.19s.
College S = +23m.56s. and +24m.0s., eS_cSP = +26m.14s., eSS = +29m.56s., eSSS = +33m.36s.
Huancayo ePPP = +19m.7s., eS = +24m.41s., eS_cS = +24m.47s., eSS = +30m.31s., PSPS = +31m.15s., eSSS = +34m.42s.
Irkutsk e = +16m.28s.? e = +19m.28s.? PS = +26m.52s., SS = +32m.46s., SSS = +37m.28s.?
Calcutta S = +9m.26s.
Philadelphia ePSPS = +35m.7s.
Ottawa eN = +35m.28s.?
San Juan eS = +27m.35s., SS = +35m.6s.
Tashkent e = +20m.34s., +22m.15s., and +25m.36s., i = +27m.35s. and +29m.21s., e = +31m.59s., +33m.28s., and +35m.21s., e = +37m.29s., +40m.5s., and +42m.15s., i = +44m.23s., e = +46m.36s.
Baku e = +23m.5s., +30m.38s., +35m.7s., +43m.49s., +50m.0s., and +64m.0s.
Tiflis eE = +23m.9s. and +32m.55s.
Copenhagen +20m.3s.
Ksara PP = +23m.27s., ePSKS = +33m.51s., ePPS = +36m.51s.
Uccle eE = +43m.8s., eN = +53m.40s., e = +60m.30s.
Stuttgart eN = +66m.18s.
Long waves were also recorded at Apia, La Plata, Averroes, Algiers, Hyderabad, Scoresby Sund, and at other Russian, European, and American stations.

Oct. 1d. Readings also at 1h. (near Algiers), 2h. (Tucson), 3h. (La Paz), 6h. (near Andijan), 7h. (Tashkent), 9h. (Almata, Samarkand, Semipalatinsk, Tchimkent, Andijan, Baku, Sverdlovsk, Sitka, and near Lick), 10h. (Alicante), 14h. (Adelaide, Melbourne, Christchurch (2), New Plymouth, and Wellington (2)), 15h. (Perth, Riverview, Sydney, Cape Town, Bombay, Baku, Tashkent, Tiflis, Ksara (2), Paris, near Hukuoka, and Hukuoka B), 16h. (Averroes, Granada, San Fernando, De Bilt, Uccle, Kew, Baku, and Tashkent), 18h. (near Andijan), 19h. (Wellington), 21h. (Mount Wilson, Pasadena, Tinemaha, Tucson, and New Plymouth), 22h. (near Lick).

Oct. 2d. 14h. 15m. 46s. Epicentre 41°·1N. 47°·7E.
(Epicentre suggested by U.S.S.R. Stations of the Caucasus).

A = +·5086, B = +·5590, C = +·6548 ; δ = −8 ; h = −2 ;
D = +·740, E = −·673 ; G = +·441, H = +·484, K = −·756.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	1·8	113	0 22	−10	0 50	− 6	—	1·7
Tiflis	2·3	286	e 0 41	+ 1	—	—	1·4	—
Erevan	2·6	249	e 0 48	+ 4	i 1 23	+ 6	—	—
Grozny	2·6	327	e 0 47	+ 3	e 1 17	0	—	1·8
Sotchi	6·4	296	e 1 50	+12	e 3 3	+10	—	—
Theodosia	9·8	298	—	—	e 5 29	S_g	—	—
Ksara	11·9	236	e 2 55	+ 1	e 5 32	+23	—	9·2
Moscow	16·1	339	e 3 42	− 7	e 6 30	−19	—	10·6
Tashkent	16·2	82	e 3 29	−21	e 6 28	−23	i 9·2	11·5
Andijan	18·6	84	e 4 15	− 6	—	—	e 10·8	—
Frunse	20·0	77	e 5 25	+48	—	—	e 9·2	—
Pulkovo	21·6	337	e 4 46	− 8	e 8 43	− 6	e 10·5	—
Almata	21·8	74	e 4 58	+ 2	—	—	—	—

Additional readings :—
Baku P_g = +25s., e = +32s. and +43s.
Tiflis e = +43s. and +46s.
Erevan iS_g = +1m.32s.
Grozny P_g = +53s., iS_g = +1m.30s.
Tashkent e = +4m.9s., i = +7m.30s. and +8m.31s.
Pulkovo e = +3m.44s. and +8m.30s.

Oct. 2d. Readings also at 0h. (near Tananarive), 1h. (Tashkent and Vladivostok), 2h. (Christchurch, Wellington, Sverdlovsk, and Ksara), 3h. (Huancayo, Baku, Sverdlovsk, Tashkent, and Oak Ridge), 4h. (Uccle), 5h. (Huancayo, San Juan, Oak Ridge, Philadelphia (2), Weston, Tinemaha, Pasadena, Mount Wilson, Tucson, and Scoresby Sund), 6h. (Wellington, Baku, Sverdlovsk, Tashkent, Sumoto, and near Wakayama), 8h. (Amboina (2)), 9h. (near Amboina and near Berkeley), 11h. (near Hukuoka and near Hukuoka B), 16h. (La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Huancayo, and La Paz), 17h. (Christchurch, near Wellington, and New Plymouth), 18h. (Grozny), 21h. (Huancayo), 23h. (near Nagoya, Mizusawa, and near Manila).

Oct. 3d. 2h. 15m. 23s. Epicentre 47°·4N. 8°·5E.

$A = +\cdot6719$, $B = +\cdot1004$, $C = +\cdot7338$; $\delta = -1$; $h = -4$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Zurich	0·0	—	i 0 7a	0	i 0 12	+ 1
Basle	0·6	282	i 0 17	+ 2	i 0 29	+ 3
Ebingen	0·8	22	e 0 19	+ 1	0 22	− 9
Ravensburg	0·8	63	e 0 19?	+ 1	—	—
Chur	0·9	128	i 0 18k	− 2	i 0 31	− 3
Neuchatel	1·1	249	i 0 27	+ 5	e 0 46	+ 7
Strasbourg	1·3	337	e 0 40	+15	e 0 48	+ 4
Stuttgart	1·5	19	e 0 23	− 5	e 0 38	−11

Additional reading:—
Chur i = +21s.

Oct. 3d. 8h. 24m. 26s. Epicentre 36°·7N. 121°·1W. (as on 1937 Feb. 17d.).

$A = -\cdot4151$, $B = -\cdot6881$, $C = +\cdot5951$; $\delta = -7$; $h = 0$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Lick		0·8	325	e 0 17	− 1	i 0 29	− 2
Fresno	N.	1·1	88	e 0 22	0	i 0 37	− 2
Branner		1·1	310	e 0 22	0	i 0 39	0
Berkeley		1·5	321	e 0 30	+ 2	—	—
San Francisco		1·5	315	e 0 28	0	e 0 52	+ 3

Lick gives also iN = +21s.

Oct. 3d. 20h. Epicentre South-West Japan.

Hukuoka B P = 37m.55s., S = 38m.22s.
Hukuoka P = 37m.57s., S = 38m.24s., M = 38m.35s.
Sumoto ePNZ = +38m.17s., ePE = 38m.20s., eSN = 39m.16s., eSEZ = 39m.18s., MN = 39m.39s.
Husan P = 38m.38s., S = 39m.29s.
Kobe eP = 38m.42s., eSZ = 39m.28s., eSE = 39m.30s., SN = 39m.33s., ME = 39m.43s.
Toyooka PEN = 38m.49s., PZ = 38m.51s., S = 39m.39s., MN = 39m.52s.
Nagoya P = 39m.7s., S = 40m.44s., M = 41m.19s.
Zinsen eZ = 40m.54s., eEN = 41m.3s.
Keizyo ePEN = 41m.1s.
Long waves were recorded at Vladivostok.

Oct. 3d. Readings also at 2h. (near Grozny), 3h. (Mount Wilson (2), La Jolla, Pasadena (2), Riverside, Tinemaha (2), Tucson (2), Huancayo, Ksara, Perth, Riveriew, Sydney, Christchurch, Wellington, near Apia, and near Tananarive), 4h. (Baku and Sverdlovsk), 8h. (Baku, Tashkent, Tiflis, Grozny, Helwan, and Ksara), 14h. (Andijan and near Apia), 15h. (Haiwee, Mount Wilson, Pasadena, La Jolla, Riverside, Tinemaha, Tucson, Vladivostok, Sverdlovsk, Simferopol, and Ksara), 16h. (Baku and Wellington), 18h. (near Algiers), 19h. (Berkeley, Ukiah, Seattle, Sitka, Oak Ridge, Philadelphia, Honolulu, and near Manila), 20h. (Andijan, Frunse, and Tiflis), 21h. (Baku and Tashkent), 23h. (Oak Ridge and Wellington).

Oct. 4d. 7h. Epicentre South-West Pacific.

Christchurch PE? = 40m.36s., iSZ = 46m.22s., L_r = 50m.52s.
Brisbane ePEN = 46m.0s., iPPEN = 48m.48s., eSN = 56m.0s., eSE = 56m.12s., eSSE = 61m.0s., eSSN = 61m.18s.
Riverview eN = 48m.0s., eL = 55m.0s., MN = 56m.54s.
Melbourne i = 48m.44s. and 58m.43s., L = 60m., M = 62m.48s.
Wellington e = 49m.23s., i = 51m.35s., M = 52m.
Sydney e = 51m.45s., L = 56m.27s., M = 58m.42s.
Mount Wilson iPZ = 52m.4s., iZ = 52m.33s.
Pasadena iPZ = 52m.4s., eSN? = 62m.7s., eLE = +73·9m.
Tinemaha iPZ = 52m.19s.
Vladivostok eP = 52m.19s., eS = 62m.43s.
Riverside ePZ = 52m.22s.
Tucson P = 52m.25s., eP_cP = 53m.6s., ePS = 62m.44s., eL = 72m.12s.
Adelaide e = 54m.30s., eL = 56m.20s., M = 63·6m.
Perth i = 57m.55s., 65m.15s., and 69m.18s., L = 72m.10s., M = 77m.7s.
Honolulu eS_cS = 59m.2s., L = 61m.2s.
Yalta eP = 59m.41s.
Ksara ePKP = 59m.50s., epPKP = 60m.32s., esPKP = 60m.50s., iPP = 63m.31s., pPP = 64m.6s., SKSP = 73m.16s.
Sverdlovsk e = 59m.57s. and 69m.22s., L = 93m.
Simferopol eP = 60m.3s.
Theodosia eP = 60m.21s.
Berkeley eEN = 62m.10s., eN = 75m.42s.
Baku e = 63m.4s., 71m.8s., 75m.12s., 83m.40s., and 104m.41s., L = 114m., M = 121m.48s.
Huancayo ePS = 64m.0s., i = 64m.39s., eL = 83m.50s.
La Paz eN = 64m.8s., LN = 89m.24s., MN = 95m.20s.
Long waves were also recorded at Tashkent, Tiflis, Kodaikanal, American, and European stations.

Oct. 4d. Readings also at 0h. (near Nagoya), 2h. (Riverview, near Almata, and near Wellington), 4h. (Hong Kong, Phu-Lien, Vladivostok, Medan, Batavia, Bombay, Calcutta, Kodaikanal, Andijan, Tashkent, and Ksara), 5h. (Andijan), 6h. (Kodaikanal), 7h. (Edinburgh), 8h. (San Juan), 9h. (near Tananarive), 10h. (near Kobe and Nagoya (4)), 11h. (Nagoya, Andijan, and near Algiers), 12h. (Oak Ridge, Weston, Williamstown, Pasadena, Riverside, Medan, and Batavia), 13h. (near Nagoya), 14h. (Copenhagen and Batavia), 17h. (Riverview, Sydney, and Wellington, and near Nagoya), 18h. (Huancayo), 19h. (near Manila), 20h. (near Kobe and Sumoto), 22h. (Mount Wilson and Pasadena).

Oct. 5d. 6h. 21m. 24s. Epicentre 23°·0N. 109°·0W.

$A = -·3000$, $B = -·8712$, $C = +·3885$; $\delta = -8$; $h = +4$;
$D = -·946$, $E = +·326$; $G = -·126$, $H = -·367$, $K = -·921$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson		9·4	350	e 2 10	− 8	4 11	+ 4	—	—
Tacubaya	N.	9·8	109	e 2 25	+ 1	—	—	—	—
La Jolla		12·2	325	e 2 54	− 4	—	—	e 5·5	—
Vera Cruz	E.	12·6	104	i 3 17	+14	—	—	—	—
Riverside		13·2	328	e 3 10	− 1	—	—	—	—
Mount Wilson		13·7	327	e 3 16	− 2	—	—	—	—
Pasadena		13·7	327	i 3 17k	− 1	—	—	i 5·8	—
Haiwee		15·2	331	e 3 38	0	—	—	—	—
Tinemaha	E.	16·2	332	e 3 49	− 1	—	—	—	—
Fresno	N.	16·6	328	e 3 58	+ 2	—	—	—	—
Denver		17·0	11	e 3 56	− 5	e 7 17	+ 7	e 8·8	9·2
Lick		18·0	325	e 4 13	0	e 7 42	+10	e 9·1	—
Branner		18·3	324	e 4 21	+ 4	—	—	—	—
Berkeley		18·7	325	e 4 20	− 2	i 7 52	+ 4	—	—
San Francisco		18·7	325	e 4 26	+ 4	e 7 57	+ 9	—	—
Ukiah		20·1	326	e 4 40	+ 2	e 8 21	+ 2	—	—
Ferndale	E.	21·8	327	e 4 51	− 5	e 8 48	− 4	—	—
Florissant		22·4	40	e 4 52	−10	e 8 56	− 8	e 10·5	12·0
St. Louis		22·4	40	e 4 52	−10	i 8 58	− 6	e 10·8	—
Bozeman		22·7	356	e 5 4	0	e 9 6	− 3	e 11·3	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Butte		23·1	354	5 9	+ 1	e 8 58	−18	e 12·3	—
Chicago		26·0	36	e 8 59	P_cP	e 10 0	− 6	12·1	—
Columbia		26·8	58	e 5 56	+12	e 10 17	− 2	15·1	—
Seattle		26·8	339	e 5 45	+ 1	e 10 7	−12	14·2	—
Victoria		27·8	339	e 5 36?	−17	—	—	10·6	—
Toronto		32·0	42	—	—	e 11 36?	− 6	14·6	—
Philadelphia		33·2	51	—	—	e 11 53	− 7	e 13·8	—
Fordham		34·4	50	i 6 58	+ 7	e 12 8	−11	—	20·1
Ottawa		35·0	41	e 7 1	+ 5	e 14 36?	SS	16·6	—
Williamstown		35·6	48	e 6 59	− 2	—	—	—	—
Vermont		36·3	44	—	—	e 12 40	− 8	e 15·2	—
Oak Ridge	z.	36·6	48	e 7 7	− 3	—	—	e 19·1	—
Weston		36·8	48	e 7 12	+ 1	i 12 48	− 8	—	20·1
Seven Falls		38·9	41	—	—	e 14 36	+68	18·6	—
Sitka		39·0	337	e 9 11	PP	e 13 32	+ 3	e 16·7	—
San Juan		40·3	88	e 7 55	+15	13 56	+ 7	e 16·9	—
Honolulu		45·1	278	8 21	+ 1	15 4	+ 5	19·8	—
Huancayo		48·0	133	e 9 17	+34	16 0	+19	e 21·5	—
College		48·9	339	e 9 8	+18	e 15 48	− 5	e 19·6	—
Stuttgart		89·8	36	—	—	e 23 52	− 1	42·6	53·3
Irkutsk		99·6	340	e 18 24	?	e 24 30	[+ 5]	56·6	—
Sverdlovsk		100·0	5	e 18 16	PP	e 26 46	?	44·6	57·1
Tiflis		111·2	21	e 8 24	?	—	—	e 44·6	63·4
Baku		114·0	17	—	—	e 40 13	SSS	57·1	63·3
Tashkent		116·0	2	e 18 28	[−17]	e 26 6	[+30]	e 56·3	71·7

Additional readings :—
Tucson i = +2m.14s., +2m.18s., +2m.21s., +2m.38s., and +2m.43s., iP_g = +2m.45s., e = +3m.10s. and +3m.19s., eS = +3m.46s., e = +3m.52s., i = +4m.4s., +4m.21s., and +4m.30s., iS_g = +4m.47s., i = +5m.8s.
Denver ePPE = +4m.11s., eE = +7m.55s., eN = +7m.24s., eSSN = +7m.54s., eE = +8m.1s.
Berkeley iPZ = +4m.25s., eSEN = +7m.56s., i = +8m.0s., eE = +9m.0s.
Ferndale ePN = +4m.54s.
Florissant eZ = +5m.0s., ePPZ = +5m.19s., eN = +5m.34s., eE = +8m.51s., eEN = +9m.3s., iE = +9m.8s., eZ = +9m.12s.
St. Louis iEN = +5m.6s., ePPPE = +5m.28s., iE = +6m.22s. and +6m.44s., eSSE = +9m.55s.
Bozeman eS = +9m.12s.
Seattle ePP = +6m.26s., eP_cP = +8m.14s.
Williamstown e = +18m.38s.
Sitka ePPP = +9m.26s., eP_cP = +9m.46s., eS_cS = +17m.54s.
San Juan ePP = +9m.35s.
Honolulu P_cP = +10m.1s., ePP = +10m.8s., eSS = +17m.44s.
Huancayo ePPP = +12m.7s., eSS = +19m.46s.
College eS_cS = +18m.44s.
Irkutsk e = +31m.18s., +42m.36s.? and +49m.36s.?
Sverdlovsk SS = +32m.6s.
Baku e = +47m.54s. and +52m.36s.
Tashkent e = +16m.37s., i = +29m.29s., e = +30m.36s., +35m.48s., and +40m.36s.
Long waves were also recorded at Kodaikanal, Bombay, Ksara, Ivigtut, Scoresby Sund, Perth, Rio de Janeiro, and at other European, American, and Russian stations.

Oct. 5d. Readings also at 2h. (near Malaga), 3h. and 4h. (near Manila), 5h. (La Paz), 7h. (La Plata and near Santiago), 9h. (Almeria), 13h. (near Andijan), 14h. (Batavia and Oak Ridge), 15h. (near Almeria, Granada, Malaga, and Toledo), 17h. (Yalta), 18h. (Kobe and Sumoto), 19h. (Tucson), 21h. (Cheb), 22h. (near Florissant, St. Louis, and near Tananarive), 23h. (near Batavia).

Oct. 6d. 1h. 18m. 48s. Epicentre 35°·9N. 140°·1E. (as on 1937 Feb. 17d.).

$A = -\cdot6229$, $B = +\cdot5208$ $C = +\cdot5838$; $\delta = +6$; $h = 0$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tukubasan	0·3	0	0 12	+ 1	0 17	− 1
Tokyo I.U.	0·4	231	0 14	+ 1	0 21	0
Komaba	0·4	234	0 15	+ 2	0 24	+ 3
Mitaka	0·5	242	0 15	+ 1	0 24	+ 1
Kamakura	0·8	217	0 17	− 1	0 32	+ 1
Kiyosumi	0·8	175	0 19	+ 1	0 31	0
Titibu	0·8	276	0 19	+ 1	0 27	− 4
Misaki	0·9	208	0 17	− 3	0 33	− 1
Koyama	1·1	239	0 19	− 3	0 32	− 7

Oct. 6d. 9h. 47m. 12s. Epicentre 18°·5N. 99°·0W.

Some damage at Chilpacingo, Tixtla, and Chilapa (in the State of Guerrero). Felt at Toluca, Anecameca, Tchuacan, Puebla, Cerdan, Atlixco, Acapluco, Tenancingo, Terrango del Valle, Ayutla, Cordoba, Jojutla, etc. Epicentre 17°47′N. 99°10′W., near Tacubaya.

P. Stahl. Macroseismes Signales. Annales de l'Institut de Physique du Globe de Strasbourg, 1937, Tome II, Le patie Sismologie, Mende, 1940, pp. 113-115.

$A = -\cdot1485$, $B = -\cdot9373$, $C = +\cdot3154$; $\delta = +6$; $h = +5$;
$D = -\cdot988$, $E = +\cdot156$; $G = -\cdot049$, $H = -\cdot312$, $K = -\cdot944$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Puebla	N.	0·9	54	0 28	+ 8	—	—	—	—
Tacubaya	N.	0·9	349	0 26	+ 6	—	—	—	—
Oaxaca	N.	2·6	125	0 41	− 3	—	—	—	—
Vera Cruz	N.	2·8	76	0 51	+ 4	—	—	—	—
Guadalajara	N.	4·6	296	1 15	+ 3	—	—	—	—
Manzanillo	N.	5·0	272	1 17	− 1	—	—	—	—
Mazatlan	N.	8·4	307	2 9	+ 3	—	—	—	—
Merida	N.	9·1	75	2 20?	+ 6	—	—	—	—
Tucson		17·3	323	i 4 9	+ 5	i 7 32	+16	9·0	—
St. Louis		21·5	19	e 4 54	+ 2	e 8 51	+ 4	e 10·6	—
Florissant		21·6	19	e 4 51	− 3	e 8 51	+ 2	e 12·2	—
Denver		21·7	348	e 4 54	− 1	e 8 55	+ 4	i 11·9	12·0
La Jolla		21·7	314	i 4 55k	0	i 8 58	+ 7	—	—
Columbia		22·3	41	e 5 0	− 1	e 9 1	− 1	e 10·6	—
Riverside		22·5	317	i 5 4	+ 2	e 9 13	+ 8	—	—
Pasadena		23·1	316	i 5 9k	+ 1	e 9 9	− 7	e 11·6	—
Mount Wilson		23·2	316	i 5 10k	+ 1	e 9 27	+ 9	—	—
Cincinnatti		24·1	29	i 5 19	+ 1	i 9 35	+ 1	—	—
Haiwee		24·3	321	i 5 22	+ 2	e 9 25	−12	—	—
Tinemaha	E.	25·1	321	i 5 26	− 2	—	—	—	—
Chicago		25·3	19	e 5 28	− 2	9 52	− 2	—	—
Chicago (Loyola)		25·3	19	e 5 30	0	i 10 5	+11	—	—
Fresno	N.	25·8	318	e 5 35	+ 1	—	—	—	—
Lick		27·3	319	e 5 50	+ 2	—	—	—	—
Branner		27·7	318	e 5 52	0	—	—	—	—
Georgetown		27·8	38	i 5 53	0	i 10 35	0	e 13·8	—
Berkeley		28·0	319	e 5 54k	− 1	e 10 45	+ 7	—	—
San Francisco		28·1	318	e 5 57	+ 2	—	—	—	—
Pennsylvania		28·7	34	e 5 58	− 3	i 10 44	− 6	e 13·6	—
Bozeman		28·9	343	e 6 1	− 2	—	—	16·0	—
Ukiah		29·4	320	e 6 7	0	e 11 2	+ 1	e 13·6	—
Butte		29·6	342	6 8	− 1	e 11 40	+36	15·1	—
Buffalo		29·7	31	e 6 8	− 2	e 11 1	− 5	—	—
Philadelphia		29·7	39	i 6 9	− 1	i 11 3	− 3	e 15·3	—
Toronto		30·0	29	6 12	0	11 6	− 4	15·8	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ferndale		30·9	321	6 24	+ 4	—	—	—	—
Fordham		31·0	39	i 6 19	− 2	i 11 23	− 3	—	—
San Juan		31·2	84	6 23	0	i 11 29	0	i 12·5	—
Williamstown		32·6	37	i 6 35	0	11 47	− 4	e 16·0	—
Ottawa		33·1	30	6 38	− 2	11 55	− 4	18·8	—
Oak Ridge		33·4	38	6 41k	− 1	i 12 1	− 2	—	—
Weston		33·4	38	i 6 41k	− 1	i 12 1	− 2	—	—
Vermont		33·7	34	e 7 3	+18	i 12 7	− 1	e 15·0	—
Saskatoon		34·1	352	6 40	− 8	12 4	−10	17·3	—
Seattle		34·8	332	e 7 10	+16	e 12 44	+19	e 15·3	—
Shawinigan Falls		35·3	31	6 58	− 1	12 30	− 3	16·8	—
Victoria		35·8	332	6 59	− 4	12 39	− 2	15·8	—
Seven Falls		36·7	33	7 2	− 8	12 44	−10	17·8	—
East Machias		37·2	39	e 7 24	+ 9	e 13 6	+ 4	e 15·5	—
Huancayo		38·3	140	e 7 18	− 6	e 12 55	−24	14·9	—
La Paz		46·2	136	8 30	+ 2	i 15 24	+ 9	20·6	25·5
Sitka		47·0	334	e 8 36	+ 1	e 15 25	− 1	23·9	—
Honolulu		55·1	284	e 9 43	+ 7	e 17 10	− 8	e 23·0	—
Ivigtut		55·5	27	13 16	PPP	17 21	− 3	24·8	—
College		56·5	338	9 43	− 3	e 18 2	+25	e 24·5	—
Rio de Janeiro	E.	68·3	125	e 11 18	+13	i 20 10	+ 4	—	—
Scoresby Sund		68·4	20	11 4a	− 2	20 3	− 4	33·8	—
Rathfarnham Castle		77·0	37	—	—	i 21 20	−25	38·8	—
Oxford		80·4	39	—	—	i 22 36	+15	e 38·8	50·1
Jersey		80·6	41	e 12 18	+ 2	i 22 18	− 5	e 44·8	—
Averroes		81·4	58	e 16 27	PP	e 22 54	+23	—	—
San Fernando		81·4	55	e 12 22	+ 2	i 22 32	+ 1	—	—
Toledo		82·6	51	i 12 21	− 5	i 22 35	− 8	—	51·8
Malaga		82·7	54	i 12 30	+ 3	e 22 48	+ 4	—	—
Granada		83·2	53	i 12 34	+ 5	i 22 52	+ 3	—	—
Paris		83·6	41	i 12 31k	− 1	i 22 50	− 3	40·8	51·8
De Bilt		84·0	37	i 12 33	− 1	i 22 56	− 1	41·8	44·6
Uccle		84·0	38	12 33k	− 1	22 52	− 5	42·8	—
Almeria		84·2	53	e 12 27	− 7	e 22 48	−11	—	—
Hamburg		86·0	34	i 12 42k	− 1	i 23 20	+ 3	e 43·8	—
Besançon		86·4	42	i 18 40	PPP	—	—	—	—
Copenhagen		86·4	32	i 12 44k	− 1	i 23 22	+ 1	36·8	—
Upsala		86·7	27	e 12 37	−10	i 23 24	0	e 43·8	—
Göttingen		86·9	36	e 12 48	0	—	—	—	—
Strasbourg		86·9	39	i 12 48k	0	i 23 16	[+ 2]	e 43·8	54·3
Neuchatel		87·1	41	e 12 48	− 1	e 23 26	− 2	—	—
Stuttgart		87·7	39	i 12 51k	− 1	i 23 34	+ 1	e 44·8	48·8
Zurich		87·9	41	e 12 37	−16	e 23 36	+ 1	—	—
Algiers		88·3	52	e 12 48	− 7	e 23 35	− 4	62·8	—
Cheb		89·0	37	—	—	e 22 48?	?	—	—
Pulkovo		91·8	23	e 13 26	+15	23 37	[− 6]	e 47·3	52·7
Triest		91·9	40	—	—	e 24 34	+23	—	47·8
Vienna	Z.	92·1	37	e 13 12	0	—	—	—	—
Moscow		97·5	23	e 13 35	− 2	23 56	[−18]	43·3	55·0
Bucharest		99·9	36	—	—	e 24 22	[− 5]	—	61·8
Sverdlovsk		103·0	11	18 34	PP	25 2	[+21]	48·8	58·4
Irkutsk		106·7	346	18 25	PKP	25 21	[+23]	e 52·8	69·7
Tiflis		111·4	29	e 19 16	PP	i 28 47	PS	e 45·8	—
Helwan		112·2	46	e 19 18	PP	e 26 23	{+ 2}	—	—
Ksara		112·5	41	e 14 54	P	35 2	SS	—	—
Baku		114·7	26	e 18 25	[−17]	—	—	51·8	62·1
Tashkent		119·5	10	20 8	PP	26 15	[+26]	57·8	69·3
Manila		128·7	308	19 12	[+ 3]	—	—	—	—
Agra	E.	134·5	3	e 19 45	[+25]	—	—	—	—
Calcutta	N.	138·6	349	e 18 13	?	i 22 56	PP	—	—
Bombay		142·0	13	—	—	e 49 35	?	—	—
Batavia	Z.	151·9	293	19 49	[− 1]	—	—	—	—
Medan	E.	152·0	320	e 20 0	[+10]	—	—	—	—

For Notes see next page.

NOTES TO OCT. 6d. 9h. 47m. 12s.

Additional readings :—

Tucson PP = +4m.22s.
St. Louis ipP = +5m.9s., iEN = +5m.14s., iPPN = +5m.24s., isPN = +5m.33s., iEN = +7m.0s., iSEN = +8m.54s., isSEN = +9m.18s., iE = +9m.49s., isSSE = +10m.11s.
Florissant iPZ = +4m.54s., ipPZ = +5m.8s., i = +5m.13s., iZ = +5m.52s., eN = +8m.26s., iZ = +9m.14s. and +10m.40s.
Denver epPE = +5m.16s., iN = +5m.18s., esPN = +5m.26s., eN = +6m.0s., eE = +6m.18s., eN = +6m.41s., eE = +6m.43s., eN = +7m.54s., esSN = +9m.22s., isSE = +9m.30s.
La Jolla ipPZ = +5m.18s.
Columbia ePP = +5m.23s., iS = +9m.7s. and +9m.9s., S = +9m.25s.
Riverside ipPNZ = +5m.26s.
Pasadena iEZ = +5m.25s., ipP = +5m.32s., iSE = +9m.27s.
Mount Wilson ipPNZ = +5m.32s.
Cincinnati i = +5m.47s., isP = +5m.56s. i = +10m.1s.
Chicago ePcP = +8m.34s., S = +10m.19s.
Chicago (Loyola) isP = +6m.9s.
Georgetown ipP = +6m.12s., i = +7m.27s., isS = +11m.10s.
Berkeley iE = +7m.13s., iN = +7m.17s., eN = +15m.40s., eE = +15m.43s.
Pennsylvania e = +6m.55s.
Ukiah ePP = +7m.10s., PPP = +7m.30s., ePcP = +8m.23s.
Bozeman ePP = +7m.1s., ePPP = +7m.12s.
Butte ePP = +6m.54s., ePPP = +7m.5s.
Buffalo e = +6m.51s., ePP = +7m.19s.
Philadelphia iP = +6m.27s., i = +6m.42s., iP = +6m.50s., i = +10m.19s. and +10m.51s., iS = +11m.23s.
Ferndale eE = +6m.29s., eEN = +17m.26s.
San Juan P = +6m.30s., iP = +6m.42s., PP = +6m.58s., ePcP = +9m.0s., iS = +11m.47s.
Williamstown i = +6m.57s. and +7m.47s.
Ottawa eE = +7m.52s., e = +14m.56s.
Weston i = +6m.46s., ipP = +7m.1s., iPP = +8m.1s., iScP = +12m.6s., isSE = +12m.38s.
Vermont eP = +7m.38s., ePP = +7m.59s., ePPP = +8m.18s., eS = +12m.9s.
Saskatoon PPP = +8m.0s.
Seattle eP = +7m.29s., eSS = +14m.44s.
Shawinigan Falls e = +8m.18s.
Victoria e = +8m.48s.
East Machias PP = +8m.55s., iPcP = +9m.5s., iPPP = +9m.18s., eS = +14m.35s.
Huancayo iP = +7m.38s., ePP = +8m.36s., ePcP = +8m.56s., iPPP = +9m.3s., S = +13m.14s., iS = +13m.29s., iScS = +17m.22s.
La Paz iPZ = +8m.38s.a, iPPN = +10m.32s., SSN = +18m.44s.
Sitka P = +8m.58s., ePP = +10m.50s.
Honolulu eP = +10m.11s., ePcP = +10m.41s., eScS = +19m.24s.
College eP = +10m.0s., ePcP = +11m.6s., ePP = +12m.18s., ePPP = +13m.18s., eScS = +19m.50s., eSS = +21m.54s.
Scoresby Sund +11m.26s. and +20m.57s.
Rathfarnham Castle e = +21m.56s., i = +32m.17s.
Oxford iSE = +22m.11s.
Jersey e = +15m.18s., +23m.18s., +24m.0s., and +27m.48s.
Averroes e = +23m.14s. and +23m.42s.
Toledo ipP = +12m.44s., e = +22m.29s., i = +23m.2s.
De Bilt iZ = +12m.56s.
Uccle pP = +12m.54s.
Copenhagen +13m.7s. and +23m.48s.
Strasbourg ipPZ = +13m.12s., ePPZ = +16m.14s., isS = +23m.52s., eSSN = +29m.3s.
Stuttgart epP = +13m.12s., epP = +16m.16s., epPP = +16m.33s., isS = +23m.59s., eSPE = +25m.12s., e = +37m.48s. ?
Algiers eS = +24m.0s., ePS = +24m.48s. ?
Pulkovo e = +15m.14s., +17m.38s., and +25m.34s.
Moscow eS = +24m.40s., PPS = +26m.50s.
Bucharest e = +24m.52s.
Sverdlovsk e = +24m.45s., PS = +27m.42s., PPS = +28m.42s.
Irkutsk PS = +28m.19s., PPS = +29m.26s.
Helwan e = +29m.1s.
Ksara ePP = +19m.22s., epPP = +19m.44s., PS = +28m.59s.
Baku e = +29m.23s. and +31m.8s.
Tashkent PS = +30m.16s., PPS = +31m.45s., SS = +37m.6s., SSS = +41m.18s.
Manila PP = +21m.6s.
Bombay eN = +53m.41s.
Calcutta eN = +19m.23s. and +23m.41s.
Medan iE = +21m.3s.
Long waves were also recorded at La Plata, Christchurch, Wellington, Cape Town, and Hong Kong.

Oct. 6d. 17h. 4m. 46s. Epicentre 6°·7S. 153°·8E. (as on 1937 September 26d.).

$A = -\cdot8912$, $B = +\cdot4385$, $C = -\cdot1159$; $\delta = -5$; $h = +7$;
$D = +\cdot442$, $E = +\cdot897$; $G = +\cdot104$, $H = -\cdot051$, $K = -\cdot993$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Brisbane		20·7	182	e 4 38	− 6	i 8 38	+ 7	—	—
Palau		23·8	305	5 17	+ 2	9 45	+17	—	—
Amboina		25·7	276	5 29	− 4	10 10	+ 9	—	—
Riverview		27·1	184	e 5 53	+ 7	i 10 44	+20	e 13·3	15·3
Sydney		27·1	184	e 5 52	+ 6	i 10 38	+14	15·9	16·6
Adelaide		31·4	204	e 5 21	−64	i 11 36	+ 4	15·5	19·7
Melbourne		32·0	193	e 6 49	+19	i 11 51	+ 9	15·4	18·2
Apia		34·6	104	e 6 50	− 3	e 12 3	−19	e 15·2	17·1
Titizima		35·4	343	6 51	− 9	—	—	—	—
Manila		38·8	303	i 7 28	0	10 18	?	—	—
Wellington		39·2	155	e 6 12	−79	i 13 40	+ 8	23·1	27·2
Christchurch		40·2	159	6 34	−66	13 40	− 8	21·0	—
Nake		42·0	328	5 34	?	—	—	—	—
Kosyun		43·2	313	8 9	+ 5	14 30	− 2	—	—
Taito		43·3	314	8 1	− 4	14 37	+ 4	—	—
Perth		43·4	230	i 8 36	+30	i 14 34	− 1	21·8	24·4
Karenko		43·8	315	8 6	− 3	—	—	—	—
Yokohama		44·0	343	7 55	−16	—	—	22·4	—
Arisan		44·1	315	8 13	+ 1	—	—	—	—
Tokyo, Cen. Met. Ob.		44·2	344	7 17	−55	—	—	—	—
Hunatu		44·3	343	8 11	− 2	—	—	—	—
Koti		44·4	336	8 13	− 1	14 43	− 6	—	—
Wakayama		44·4	339	8 11	− 3	—	—	—	—
Kakioka		44·6	345	8 11	− 5	14 34	−18	—	—
Mito		44·6	345	8 15	− 1	—	—	—	—
Nagoya		44·6	341	e 8 23	+ 7	—	—	—	—
Kumagaya		44·7	344	8 16	0	—	—	—	—
Gihu		44·8	341	8 15	− 2	14 50	− 5	—	—
Kobe	E.	44·8	339	e 8 21	+ 4	e 15 44	+49	e 19·1	27·0
Hikone		44·9	341	8 14	− 4	—	—	—	—
Kumamoto		45·0	332	8 19	0	14 55	− 3	—	—
Maebasi		45·0	344	8 20	+ 1	—	—	—	—
Oiwake		45·1	343	8 20	0	14 54	− 5	—	—
Unzendake		45·2	332	8 24	+ 4	15 0	− 1	—	—
Nagasaki		45·4	332	8 21	− 1	15 0	− 4	—	—
Nagano		45·5	344	8 22	− 1	15 21	+16	—	—
Hirosima		45·6	336	8 22	− 2	15 0	− 6	—	—
Hukuoka B		45·8	333	e 8 26	+ 1	e 15 6	− 3	—	—
Tomie		45·8	332	8 34	+ 9	15 4	− 5	—	—
Hukusima		45·9	345	8 25	− 1	—	—	—	—
Toyama		45·9	342	8 25	− 1	15 21	+10	—	—
Hamada		46·2	335	8 28	0	15 9	− 6	—	—
Sendai		46·3	347	8 27	− 2	15 12	− 4	21·8	—
Batavia		46·7	268	8 29	− 3	15 24	+ 2	e 22·2	—
Mizusawa	E.	47·1	348	e 8 35	0	e 15 20	− 8	—	—
	N.	47·1	348	e 8 30	− 5	e 15 18	−10	—	—
Husan		47·7	333	e 8 38	− 2	15 33	− 3	—	—
Hong Kong		48·3	308	8 44	− 1	15 49	+ 4	22·2	23·3
Taikyu		48·5	334	8 50	+ 4	—	—	—	—
Zi-ka-wei	E.	48·8	323	e 8 48	− 1	i 15 56	+ 4	—	—
Keizyo		50·7	333	e 9 3	0	e 16 17	− 1	—	16·4
Zinsen		50·7	332	i 9 3	0	i 16 18	0	—	16·5
Phu-Lien		53·8	302	e 9 27	+ 1	e 17 1	0	—	—
Honolulu		55·0	58	9 44	+ 9	17 19	+ 2	e 22·8	—
Medan		56·0	280	e 9 43	0	i 17 29	− 1	—	—
Calcutta	N.	70·3	297	11 14	− 3	i 20 18	−11	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Irkutsk		72·2	331	i 11 27	− 2	20 49	− 2	33·2	—
Colombo		75·0	279	11 44	− 1	21 23	0	30·7	43·0
Agra	E.	80·5	299	i 12 11	− 4	22 16	− 6	—	—
College		83·2	22	e 12 24	− 5	e 22 26	−23	32·2	—
Bombay		83·7	290	i 12 33	+ 1	i 22 53	− 1	—	—
Semipalatinsk		84·8	322	e 12 32	− 5	—	—	—	—
Almata		85·1	315	12 41	+ 2	23 3	[+ 2]	—	—
Sitka		85·4	32	—	—	e 23 8	− 3	e 34·3	—
Frunse		86·7	314	12 47	0	23 21	− 3	—	—
Andijan		87·9	311	e 12 54	+ 1	i 23 50	+15	—	—
Ukiah		88·8	51	e 13 1	+ 4	e 23 27	[+ 2]	e 36·8	—
Berkeley		89·3	53	e 12 59	0	i 23 31	[+ 3]	e 40·5	—
Tchimkent		90·2	313	e 13 4	0	—	—	—	—
Tashkent		90·3	312	13 2	− 2	i 23 51	− 6	e 41·2	54·4
Victoria		90·3	42	—	—	e 25 14?	PS	47·2	—
Seattle		90·8	43	e 17 14?	PP	e 23 26	[−11]	e 41·8	—
Pasadena		92·1	56	i 13 13k	+ 1	i 24 18	+ 5	e 41·1	—
Mount Wilson		92·2	56	i 13 14	+ 1	e 24 19	+ 5	—	—
Tinemaha	E.	92·4	54	e 13 20	+ 6	e 24 20	+ 4	—	—
Haiwee	Z.	92·5	54	e 13 22	+ 8	—	—	—	—
La Jolla		92·7	57	i 13 15	0	—	—	—	—
Riverside		92·7	56	i 13 16k	+ 1	—	—	—	—
Butte		97·3	44	—	—	e 24 14	[+ 1]	e 46·7	—
Sverdlovsk		97·3	327	i 13 34	− 2	—	—	45·2	60·5
Tucson		98·1	58	e 13 39	− 1	e 24 9	[− 9]	—	—
Bozeman		98·4	44	—	—	e 24 22	[+ 3]	e 45·6	—
Baku		104·9	315	e 14 30	+20	24 56	[+ 6]	51·7	58·3
Grozny		107·7	314	e 14 28	P	e 25 16	[+14]	—	—
Tiflis	N.	108·6	311	e 14 31	P	e 26 25	S	e 55·2	—
Moscow		110·1	327	e 14 35	P	26 52	?	52·7	64·5
Pulkovo		112·2	332	18 32	[− 6]	26 2	{−18}	e 53·7	71·1
Florissant		114·2	50	e 14 54	P	e 26 40	{+ 6}	e 55·6	e 65·1
Chicago		115·6	46	—	—	e 25 38	[+ 4]	e 47·3	—
Scoresby Sund		116·2	358	19 53	PP	26 53	{+ 5}	55·2	—
Ksara		116·8	303	e 15 6	P	e 36 40	SS	—	—
Upsala		117·5	336	—	—	e 36 14?	SS	e 56·2	—
Toronto		120·8	42	e 20 14?	PP	e 28 14	?	66·2	—
Bucharest		121·1	318	e 20 32	PP	e 25 28	[−25]	69·2	73·2
Helwan		121·4	301	e 20 34	PP	e 30 14	PS	—	—
Bergen		121·4	342	e 20 18	PP	e 26 18	[+24]	—	—
Cape Town		121·5	223	e 20 31	PP	i 30 49	PS	e 57·9	70·3
Copenhagen		122·3	335	20 29	PP	27 33	{+ 4}	55·2	—
Ottawa		122·5	39	e 18 58	[0]	e 26 4	[+ 6]	37·7	—
Columbia		122·7	53	e 20 44	PP	e 26 5	[+ 6]	e 52·6	—
Ivigtut		123·2	12	20 35	PP	30 32	PS	55·2	—
Stara Dala		124·3	325	e 16 44	?	—	—	—	—
Vermont		124·5	39	e 20 55	PP	e 26 20	[+16]	e 57·6	—
Seven Falls		124·6	35	e 20 14?	?	—	—	37·2	—
Hamburg		124·8	335	e 18 59	[− 3]	—	—	57·2	—
Philadelphia		125·1	45	e 21 5	PP	e 26 5	[− 1]	—	—
Prague		125·1	329	e 20 54	PP	e 30 38	PS	e 59·2	63·2
Vienna	Z.	125·1	326	e 19 2	[− 1]	—	—	—	—
Williamstown		125·3	40	e 19 4	[+ 1]	—	—	e 58·1	—
Cheb		126·1	330	e 21 14?	PP	—	—	e 60·2	—
Oak Ridge		126·5	41	i 19 6k	[+ 1]	i 26 20	[+10]	e 60·2	—
Weston		126·7	40	e 19 6	[0]	i 26 23	[+12]	—	—
Edinburgh		127·6	343	i 22 36	?	—	—	—	—
Huancayo		127·7	111	e 19 2	[− 6]	e 26 8	[− 6]	e 54·1	—
De Bilt		127·9	336	e 19 12	[+ 4]	—	—	e 58·2	62·4
East Machias		127·9	36	e 21 38	PP	e 38 12	SS	64·2	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Durham	N.	128·2	342	i 22 34	?	i 28 22	{+14}	—	—
Stuttgart		128·5	330	e 19 9	[0]	e 38 34	SS	e 65·2	84·2
Stonyhurst		129·2	341	e 21 24	PP	—	—	61·2	—
Uccle		129·2	335	19 13	[+ 3]	i 28 37	{+23}	e 58·2	—
Strasbourg		129·3	331	e 19 14	[+ 3]	i 38 50	SS	e 61·2	67·2
Bidston		129·8	342	e 21 29	PP	—	—	—	—
Zurich		129·8	330	e 19 7	[− 5]	e 29 39	?	—	—
Basle		130·1	330	e 19 12	[0]	—	—	—	—
Kew		130·5	338	e 21 34	PP	—	—	e 57·2	—
Oxford		130·6	339	e 21 33	PP	i 31 35	PS	e 51·2	72·8
Neuchatel		130·8	330	e 19 14	[+ 1]	—	—	—	—
Rathfarnham Castle		130·8	345	i 18 48	[−25]	—	—	51·2	—
Paris		131·5	334	e 19 19	[+ 4]	—	—	68·2	83·2
La Paz		132·5	120	i 19 21a	[+ 4]	i 26 20	[− 6]	73·2	83·1
Jersey		133·0	339	e 22 35	PP	—	—	e 38·4	—
San Juan		139·4	69	e 16 23	P	e 26 20	[−18]	e 64·0	—
Algiers		139·9	322	e 19 37	[+ 7]	e 22 32	PP	e 35·2	—
Toledo		141·4	332	e 19 28	[− 5]	—	—	—	—
Almeria		143·0	328	e 19 35	[− 1]	—	—	—	—
Granada		143·3	329	i 19 47	[+11]	—	—	—	—
Malaga		144·1	329	e 19 44	[+ 7]	—	—	—	—
San Fernando		145·2	331	i 19 42	[+ 3]	e 26 41	[− 6]	—	—
Rio de Janeiro	N.	146·2	151	e 19 40	[− 1]	—	—	—	—
Averroes		148·3	329	e 19 52	[+ 7]	e 26 41	[−11]	e 42·2	—

Additional readings :—
Brisbane iPPN = +4m.50s., iSSN = +9m.20s., iSSE = +9m.26s., eS_cSN = +15m.50s., eS_cSE = +16m.2s.
Riverview iN = +11m.12s.
Adelaide i = +7m.51s.
Apia iZ = +11m.40s.
Wellington iP_cP = +7m.34s., PP = +8m.3s., i = +8m.45s., iPPP = +9m.14s., i = +12m.14s., +16m.0s., and +16m.53s., iSS = +17m.19s., L_g = +20·1m.
Christchurch PP = +8m.16s., PPP = +9m.2s., SS = +16m.44s., L_gN = +17·3m.
Perth PP = +9m.16s., PPP = +9m.57s., PPPP = +10m.21s., i = +12m.14s., P_cS = +13m.14s., i = +13m.59s., PS = +14m.54s., i = +17m.34s., SS = +17m.54s., SSS = +19m.31s.
Kobe eE = +11m.26s. and +13m.46s.
Oiwake PP = +10m.8s., PPP = +10m.50s., e = +12m.24s., SS = +18m.11s.
Hamada SS = +18m.31s.
Honolulu P = +9m.48s., ePP = +11m.44s., ePPP = +13m.12s., eS_cS = +19m.26s.
Calcutta epPN = +12m.3s., iN = +13m.49s., +21m.57s., and +22m.34s.
Agra PPE = +15m.27s., SSE = +27m.51s.
College ePPP = +17m.40s., eS = +22m.38s., ePS = +23m.24s., ePPS = +23m.44s., eSS = +28m.6s., eSSS = +31m.23s.
Bombay i = +13m.18s., +16m.6s., and +23m.31s.
Sitka S_cS = +23m.36s.
Ukiah ePP = +16m.28s., e = +20m.46s., ePPS = +25m.1s.
Berkeley iN = +13m.11s., iE = +16m.34s. and +23m.33s., iN = +23m.45s., iE = +25m.9s.
Tashkent e = +17m.9s., PPP = +18m.50s., eSKS = +23m.26s., ePS = +24m.58s.
Seattle eS = +24m.13s.
Pasadena ePPZ = +16m.54s.
Tucson iPP = +17m.41s., e = +22m.58s., eS = +25m.19s., ePS = +26m.18s., eS_cSP = +26m.32s., eSS = +31m.17s., ePSPS = +32m.16s., eSSS = +35m.36s.
Baku PP = +18m.57s., PS = +27m.50s.
Grozny e = +18m.56s.
Tiflis ePPN = +19m.1s., ePSN = +28m.29s., SSEN = +33m.47s.
Moscow PP = +19m.9s., PS = +28m.32s., SS = +34m.17s.
Pulkovo PP = +19m.11s., PS = +28m.51s.
Florissant eZ = +18m.11s., eE = +18m.33s., eZ = +18m.44s., iZ = +19m.35s., eN = +19m.43s., eE = +25m.19s., ePSE = +29m.8s., eN = +29m.20s., ePPSE = +30m.12s.
Chicago eSKKS = +27m.2s., ePS = +29m.26s., ePSPS = +36m.20s.
Scoresby Sund PS = +29m.28s., eN = +31m.49s. and +33m.38s., SS = +36m.50s., SSS = +40m.20s., e = +42m.44s.
Ksara iPP = +19m.59s., ePKKP = +28m.28s., PS = +29m.59s., ePPS = +31m.11s.

Continued on next page.

Bucharest S?E = +37m.6s.
Helwan i = +37m.44s., +41m.14s., and +47m.6s.
Cape Town i = +37m.29s.
Copenhagen PS = +30m.32s., PPS = +31m.32s., SS = +37m.14s.
Ottawa e = +20m.32s. and +27m.34s.
Columbia ePKKP = +28m.37s., ePS = +30m.30s., ePPS = +31m.46s., eSSS = +41m.43s.
Vermont eSKKKS = +27m.52s., ePS = +30m.50s., eSS = +37m.53s., eSSS = +41m.55s.
Philadelphia eSKKS = +27m.47s., eSSS = +42m.45s.
Prague e = +36m.44s.
Vienna e = +20m.53s.
Williamstown e = +20m.48s.
Oak Ridge ePPZ = +20m.58s., eN = +31m.8s., eZ = +32m.50s., eN = +46m.14s.
Weston iPZ = +19m.10s., ePPZ = +21m.2s., ePS = +31m.2s., eSSE = +38m.28s.
Huancayo ePKP = +19m.12s., PKP = +19m.16s., PP = +21m.21s., iPKS = +22m.33s., iPPP = +23m.47s., SKKKS = +28m.13s., ePKP,PKP = +37m.42s., ePSPS = +38m.52s., SSS = +42m.21s.
De Bilt iPPZ = +21m.12s., e = +22m.34s.
East Machias ePKS = +22m.32s., ePSPS = +38m.41s., eSSS = +42m.44s.
Stuttgart PP = +21m.17s., eZ = +21m.52s., ePKS = +22m.32s., ePPPZ = +24m.5s., ePS = +31m.18s., ePPS = +32m.52s.
Stonyhurst i = +22m.34s.
Uccle PPZ = +21m.21s., SKP = +22m.37s., iPPSN = +32m.59s.
Strasbourg e = +21m.16s., iPPZ = +21m.24s., iSKP = +22m.39s., iPPSZ = +33m.5s.
Bidston i = +22m.34s., eL = +23m.12s.
Kew iPKS = +22m.36s.
Oxford i = +22m.35s.
Rathfarnham Castle i = +21m.19s. and +22m.10s.
Paris e = +22m.43s.
La Paz iSPKP = +21m.48s., iPPZ = +22m.54s.
San Juan ePKP = +19m.18s., ePKS = +23m.0s., iPKS = +23m.9s., PKS = +23m.59s., ePPP = +25m.23s., eSKSP = +32m.23s.
Algiers e = +18m.14s., iPS = +23m.12s.
Toledo ePP = +22m.39s.
Almeria iPP = +23m.9s.
Granada iPP = +22m.52s.
Malaga e = +22m.49s.
San Fernando eSSEN = +41m.50s.
Averroes i = +20m.9s. and +20m.52s., eS = +23m.19s., e = +24m.1s.

Oct. 6d. 21h. 48m. 4s. Epicentre 1°·1N. 29°·4W. (as on 1937 Mar. 23d.).

$A = +\cdot8710$, $B = -\cdot4908$, $C = +\cdot0190$; $\delta = -11$; $h = +7$;
$D = -\cdot491$, $E = -\cdot871$; $G = +\cdot017$, $H = -\cdot009$, $K = -1\cdot000$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro	27·4	208	e 6 15	+26	(e 10 31)	+ 3	e 10·5	—
Averroes	38·1	28	e 8 54	PP	—	—	e 18·9	21·9
San Juan	39·9	298	e 8 21	+44	—	—	20·2	—
La Paz	42·0	244	7 58	+ 4	i 14 22	+ 8	20·9	24·8
Malaga	42·3	29	e 8 8	+11	—	—	—	—
Granada	43·1	30	e 8 4	0	e 14 49	+19	—	—
Toledo	45·0	27	e 8 15	− 4	e 15 37	PS	e 23·3	—
Algiers	46·5	37	—	—	e 13 13	?	i 25·9	—
Huancayo	47·5	253	e 8 37	− 1	e 15 41	+ 7	e 20·2	—
Jersey	53·3	20	e 9 36	+13	—	—	e 27·9	—
Paris	54·9	26	e 9 28	− 7	—	—	37·9	—
Rathfarnham Castle	55·5	16	i 10 0	+21	i 17 16	− 8	22·9	27·4
Oxford	55·8	21	—	—	e 17 22	− 6	e 23·7	30·3
Oak Ridge	55·9	324	i 9 40a	− 2	—	—	e 25·9	—
Strasbourg	57·1	29	e 9 56?	+ 6	e 17 45	0	27·9	30·9
Uccle	57·2	24	—	—	17 43	− 3	e 26·9	—
Stuttgart	57·9	29	e 9 53	− 3	e 17 51	− 4	30·9	—
De Bilt	58·5	24	—	—	e 18 6	+ 3	e 27·9	30·4
Copenhagen	64·1	24	—	—	19 20	+ 6	29·9	—
Helwan	64·3	57	—	—	e 14 26	PPP	—	40·0

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Oct. 10d. Readings at 0h. (Baku and Sverdlovsk), 2h. (Tashkent and Sverdlovsk), 3h. (Medan), 4h. (Vladivostok, Irkutsk, Sverdlovsk, Kobe, Mizusawa, and Tashkent), 5h. (Paris, Strasbourg, Stuttgart, Baku, Ksara, and Copenhagen), 7h. (Mizusawa, Sverdlovsk, Tashkent, Sitka, Riverside, Mount Wilson, and Pasadena), 8h. (Mizusawa, Oak Ridge, Tashkent (2), and Vladivostok, and Kobe), 9h. (Baku, Sverdlovsk, Stuttgart, Paris, Uccle, Strasbourg, and Ksara), 10h. (Wellington), 16h. (Hukuoka, Hukuoka B, Sumoto, Toyooka, Kobe, and Nagoya), 19h. (Perth), 20h. (Manila, Nagoya, Sverdlovsk, Wellington, Ksara, and Tashkent), 21h. (Stuttgart), 23h. (Frunse, Brisbane, Tashkent, and Andijan (2)).

Oct. 11d. Readings at 1h. (Scoresby Sund and near Tiflis), 5h. (La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Stara Dala, Sverdlovsk, and Tashkent), 7h. (Andijan), 9h. (Medan), 11h. (Wellington), 12h. (Alicante, Huancayo, La Paz, and near Tananarive), 15h. (Ksara, Tacubaya, New Plymouth, near Christchurch, Wellington, and near Santiago), 17h. (Melbourne, Perth, Wellington, Irkutsk, Tiflis, Baku, Ksara, Sverdlovsk, Tashkent, De Bilt, Paris, Strasbourg, Uccle, Mount Wilson (2), Pasadena, Riverside (2), Kobe, near Nagoya (2), and Mizusawa), 20h. (Tiflis (2)), 21h. (La Paz, Wellington, La Plata, Columbia, Christchurch, La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Huancayo, Scoresby Sund, Helwan, Ksara, Granada, De Bilt, Paris, Strasbourg, Uccle, Tashkent, Sverdlovsk, Tiflis, San Juan, Rio de Janeiro, and Tucson), 22h. (Melbourne, Bombay, Calcutta, Baku, Tiflis (2), Copenhagen, Bidston, Stonyhurst, Edinburgh, Kew, Jersey, Stuttgart, San Fernando, Hyderabad, Berkeley, and Ukiah), 23h. (Andijan, Calcutta, Phu-Lien, Samarkand, Frunse, Tashkent, Irkutsk, De Bilt, and near Santiago).

Oct. 12d. 3h. 10m. 8s. Epicentre 53°·0S. 145°·0E.

$A = -\cdot4951$, $B = +\cdot3467$, $C = -\cdot7967$; $\delta = +6$; $h = -6$;
$D = +\cdot574$, $E = +\cdot819$; $G = +\cdot653$, $H = -\cdot457$, $K = -\cdot604$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Melbourne		15·2	0	—	—	6 24	− 4	8·0	8·8
Adelaide		18·6	344	i 4 21	0	i 7 57	+11	9·1	12·5
Riverview		19·7	15	e 4 39	+ 5	i 8 14	+ 4	e 9·6	11·4
Sydney		19·7	15	—	—	(8 2)	− 8	8·0	9·5
Christchurch		20·6	73	i 4 43	0	e 8 26	− 3	10·2	—
Wellington		23·2	71	i 5 9	0	i 9 19	+ 1	10·9	12·5
Brisbane	E.	26·2	17	i 9 10	?	i 12 16	?	—	14·3
Perth		29·7	304	7 29	PPP	i 11 2	− 4	13·1	13·8
Tashkent		114·3	305	e 19 46	PP	e 30 52	PPS	—	62·3
Ksara		127·3	277	e 21 22	PP	e 30 58	PS	—	66·5
Granada		153·1	246	e 20 6	[+14]	—	—	84·7	—
Malaga		153·2	245	e 20 22	[+30]	—	—	—	—

Additional readings:—
Melbourne i = +6m.52s.
Adelaide i = +4m.35s. and +8m.10s.
Christchurch iP_cP = +8m.38s., L_qE = +8m.48s.
Wellington iPP = +5m.36s., iSS = +9m.56s., iP_cS? = +13m.8s.
Perth S = +11m.25s.
Tashkent e = +35m.3s.
Long waves were also recorded at Chatham Is. and Baku.

Oct. 12d. 15h. 59m. 46s. Epicentre 14°·0N. 92°·0W.

$A = -\cdot0339$, $B = -\cdot9701$, $C = +\cdot2404$; $\delta = +4$; $h = +6$;
$D = -\cdot999$, $E = +\cdot035$; $G = -\cdot008$, $H = -\cdot240$, $K = -\cdot971$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	5·5	304	1 57	P_g	—	—	—	—
Merida	N.	7·3	18	2 42	P_g	—	—	—	—
Little Rock	E.	20·7	59	e 4 47	+ 3	i 8 47	+16	i 10·0	—
Florissant		24·8	4	e 5 22	− 3	e 10 21	SS	e 14·7	20·7
Tucson		25·0	320	i 5 31	+ 4	e 10 9	+20	e 13·4	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
San Juan		25·2	76	e 5 29	0	e 9 59	+ 7	10·8	—
La Jolla	Z.	29·7	314	i 6 13	+ 3	—	—	—	—
Philadelphia		29·8	28	—	—	e 11 11	+ 4	i 15·0	—
Riverside		30·4	316	i 6 18	+ 2	—	—	—	—
Huancayo		30·7	146	e 6 19	0	e 11 26	+ 5	i 12·2	—
Mount Wilson	Z.	31·0	316	i 6 24k	+ 3	—	—	—	—
Pasadena		31·0	316	i 6 25k	+ 4	e 11 26	0	e 14·7	—
Haiwee		32·0	319	e 6 32	+ 2	—	—	—	—
Williamstown		32·9	27	i 6 39	+ 1	—	—	—	—
Weston		33·5	28	e 6 41a	− 2	—	—	e 16·6	—
Fresno	N.	33·6	317	e 6 38	− 6	—	—	—	—
Ottawa		34·2	20	e 6 49	0	—	—	13·2	—
Bozeman		35·4	337	e 9 44	?	—	—	e 25·4	—
Branner		35·6	317	e 7 5	+ 4	—	—	—	—
Berkeley	N.	35·9	317	e 8 40	PPP	e 13 55	?	—	—
La Paz		38·4	140	e 7 20	− 5	i 14 20	+60	19·6	31·0
Victoria		43·0	330	8 14	+11	14 37	+ 8	23·2	—
Sitka		54·0	333	e 9 21	− 7	e 17 5	+ 2	e 24·1	—
Granada		80·4	54	e 12 27	+12	—	—	44·1	—
Uccle		83·2	40	—	—	e 22 50	+ 1	e 41·2	—
De Bilt		83·4	37	—	—	e 23 14?	+23	e 42·2	47·8
Strasbourg		86·0	41	—	—	e 23 16	[+ 8]	e 39·2	—
Ksara		111·3	46	19 14?	PP	e 28 46	?	—	69·2
Tashkent		122·3	17	—	—	e 25 58	[0]	e 57·2	71·2
Amboina	N.	139·1	281	—	—	e 29 17	{+ 1}	—	—

Additional readings :—
Little Rock iE = +7m.39s.
Florissant eZ = +8m.47s., eE = +9m.36s., eN = +9m.54s.
Tucson iP = +5m.38s., PP = +6m.14s., ePPP = +6m.19s., S = +10m.14s., iS = +10m.22s., eSS = +13m.19s.
San Juan ePPP = +6m.13s., eP_cP = +7m.54s.
Philadelphia eS = +11m.17s.
Riverside iZ = +9m.16s.
Huancayo P = +6m.27s., ePPP = +7m.32s., eP_cP = +8m.47s., S = +11m.11s., iS = +11m.37s.
Pasadena iZ = +9m.19s.
Weston ipPZ = +6m.53s.
Victoria SSS = +18m.14s.
Sitka eS = +17m.23s., eS_cS = +19m.28s.
Strasbourg ePS = +24m.40s.
Tashkent e = +27m.36s., +31m.2s., +32m.18s., and +40m.45s.
Long waves were also recorded at Oak Ridge, Seattle, Baku, Sverdlovsk, Pulkovo, and other European stations.

Oct. 12d. 20h. 50m. 57s. Epicentre 25°·7S. 68°·8W.

A = +·3263, B = −·8412, C = −·4313 ; δ = +11 ; h = +3 ;
D = −·932, E = −·362 ; G = −·156, H = +·402, K = −·902.

Felt at Autofagasta. Scale VII at Taltal, epicentre to the North. Bulletin del Servicio Seismologico de la Univ. de Chile, Santiago, 1939, p. 74.

A depth of focus 0·015 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		3·1	359	0 57	+ 8	1 33	+ 7	i 2·1	—
Santiago		7·8	189	2 4	+12	3 56	SSS	—	—
La Paz		9·2	5	2 4a	− 7	i 3 53	0	4·4	5·4
San Javier		10·2	194	2 32	+ 8	4 50	SSS	—	—
La Plata		13·1	137	3 5	+ 3	5 21	− 4	6·2	—
Huancayo		14·9	334	i 3 22	− 3	4 31	?	i 6·1	—
Rio de Janeiro	N.	23·5	88	i 5 31	PP	i 9 13	+13	i 11·0	—
Balboa Heights		36·0	343	e 6 3?	?	—	—	—	—
San Juan		43·9	4	e 7 49	− 6	i 14 3	−13	i 17·8	—
Little Rock	E.	64·1	338	e 10 20	− 3	i 18 51	+ 4	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Philadelphia		65·6	355	i 10 31	− 1	i 19 6	0	e 27·3	—
St. Louis	E.	67·1	342	e 10 32	−10	i 20 5	+41	—	—
Florissant		67·3	342	i 10 40	− 3	i 19 23	− 3	—	—
Weston		67·8	359	i 10 43a	− 3	i 19 34	+ 2	—	—
Oak Ridge	Z.	67·9	359	i 10 51	+ 4	—	—	*	—
Williamstown		68·2	358	i 10 47	− 2	—	—	—	—
Tucson		70·2	323	i 11 0	− 1	e 19 52	− 8	e 28·1	—
Ottawa		71·0	355	e 11 4	− 2	i 20 7	− 3	—	—
Seven Falls		72·5	359	—	—	e 20 27	0	28·1	—
Cape Town	E.	74·0	120	—	—	i 20 56	+12	e 36·6	41·8
La Jolla		74·3	320	i 11 27	+ 2	—	—	—	—
Riverside		75·2	320	i 11 29k	− 1	—	—	—	—
Mount Wilson		75·7	320	i 11 33k	0	—	—	—	—
Pasadena		75·7	320	i 11 34k	+ 1	e 21 1	− 1	e 32·1	—
Haiwee		77·0	322	i 11 41	+ 1	—	—	—	—
Tinemaha	E.	77·9	322	i 11 46	+ 1	e 21 8	−18	—	—
Fresno	N.	78·5	320	e 11 49	+ 1	—	—	—	—
Lick		80·0	320	e 11 57	0	—	—	—	—
Berkeley		80·7	320	e 13 9	+69	e 21 32	−24	—	—
Bozeman		80·8	332	e 12 9	+ 8	—	—	—	—
Ukiah		82·1	320	—	—	(e 22 10)	0	e 22·2	—
Averroes		82·7	47	e 12 17	+ 6	e 22 23	+ 7	e 38·1	42·1
San Fernando		85·4	46	e 12 29	+ 5	i 22 49	+ 6	—	—
Granada		87·6	47	i 12 40	+ 5	e 23 25	+21	—	—
Almeria		88·1	48	—	—	e 22 46	[− 5]	—	—
Ivigtut		88·2	10	12 37	− 1	22 59	[+ 7]	—	—
Victoria		88·4	328	i 12 53	+14	(23 3?)	− 8	23·0	—
Toledo		88·8	44	i 12 43	+ 3	i 23 6	− 9	e 40·4	—
Wellington		91·1	222	i 13 38	+47	i 25 18	?	—	—
Algiers		91·8	49	e 13 19	+25	e 23 23	−19	e 41·1	—
Jersey		95·2	36	i 13 38	+28	e 24 3	− 7	e 33·6	—
Rathfarnham Castle		95·5	32	e 13 35	+24	i 23 36	[+ 3]	36·1	—
Bidston		97·1	32	—	—	i 23 45	[+ 3]	e 39·1	—
Oxford		97·1	35	—	—	i 23 46	[+ 4]	—	—
Kew		97·4	35	e 13 23	+ 3	i 23 49	[+ 5]	e 39·1	—
Paris		97·6	39	e 13 22	+ 1	e 23 51	[+ 6]	45·1	—
Edinburgh		98·4	31	—	—	e 23 57	[+ 8]	e 51·1	—
Uccle		99·6	37	e 14 0	+30	i 24 2	[+ 7]	e 39·1	—
Zurich		100·5	41	e 17 43	PP	—	—	—	—
Strasbourg		100·6	40	i 13 37	+ 3	i 24 9	[+ 9]	e 39·0	—
De Bilt		100·7	36	e 13 36	+ 1	e 24 7	[+ 7]	e 50·1	52·1
Scoresby Sund		101·5	14	13 39	0	e 24 10	[+ 6]	45·1	—
Stuttgart		101·5	41	e 13 37	− 2	e 24 13	[+ 9]	e 54·1	—
Triest		103·0	45	e 17 57	PP	i 24 20	[+ 9]	e 41·2	46·6
Cheb		103·9	41	e 14 3?	+14	e 24 26	[+11]	e 49·1	—
Hamburg		104·0	36	e 14 20	+30	e 24 25	[+ 9]	e 45·1	—
Prague		105·1	41	—	—	e 24 29	[+ 8]	—	33·1
Copenhagen		106·2	35	e 14 33	+34	24 35	[+10]	—	—
College		108·5	333	e 21 21	PPP	(e 28 3)	PS	e 28·0	—
Helwan		110·6	65	e 19 24	PP	25 47	+14	—	67·9
Bucharest		110·9	49	i 19 18	PP	e 24 54	[+ 9]	—	—
Ksara		115·4	63	e 14 49	P	—	—	—	70·1
Pulkovo		116·4	33	e 19 24	PP	27 17	SKKS	e 54·6	72·2
Moscow		120·0	38	e 20 6	PP	e 25 25	[+ 5]	e 61·6	67·8
Tiflis		123·8	55	e 18 43	PKP	—	—	e 71·0	—
Baku		127·5	57	e 21 5	PP	e 27 46	?	48·6	—
Sverdlovsk		132·5	34	e 19 4	PKP	e 27 0	SKKS	56·1	—
Tashkent		142·1	54	i 19 11	[− 6]	i 29 4	PS	e 56·6	89·1
Bombay		144·0	92	e 19 22	[+ 2]	—	—	—	—
Andijan		144·5	55	e 19 26	[+ 5]	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kodaikanal		144·6	108	i 19 28	[+ 7]	—	—	—	—
Frunse		145·6	50	e 19 23	[0]	—	—	—	—
Amboina	E.	146·5	212	e 19 11	[−14]	—	—	—	—
Almata		147·1	48	e 18 9	?	—	—	—	—
Batavia●		148·0	172	19 32	[+ 5]	—	—	—	—
Mizusawa		151·6	305	e 19 33	[0]	—	—	—	—
Irkutsk		153·0	9	e 19 37	[+ 2]	—	—	e 71·1	—
Vladivostok		155·8	320	e 19 42	[+ 3]	i 24 29	?	—	—
Nagoya		155·9	299	e 19 56	[+17]	—	—	—	—
Calcutta	N.	158·9	92	e 21 20	?	—	—	—	91·6
Manila		165·6	221	19 52	[+ 2]	24 37	?	—	—
Phu-Lien		173·1	138	—	—	25 3?	?	—	—
Hong Kong		175·7	219	—	—	(32 58)	?	—	33·0

Additional readings :—
La Paz iN = +3m.13s.
Huancayo i = +3m.35s., +3m.49s., +4m.5s., and +6m.18s.
San Juan P = +8m.28s., ePP = +9m.36s., PPP = +10m.15s.
Little Rock eE = +11m.55s., +15m.22s., and +16m.43s., iE = +19m.32s.
Philadelphia ePP = +13m.33s.
St. Louis eE = +11m.15s. +16m.3s., and +21m.16s.
Florissant ipPZ = +11m.8s., iZ = +11m.20s., eE = +18m.56s., isS = +20m.3s., eN = +20m.12s., iE = +21m.13s.
Weston ipP = +11m.10s., isS = +20m.24s.
Williamstown i = +11m.24s.
Tucson iP = +11m.19s., PP = +13m.14s., S = +20m.4s., eS = +20m.30s., eSS = +24m.16s.
Ottawa e = +20m.56s.
Cape Town iN = +21m.1s.
Riverside ipPZ = +11m.59s., iSPZ = +12m.9s., eNZ = +14m.48s., ePKP,PKPZ = +38m.53s.
Mount Wilson ipPZ = +12m.3s., ePKP,PKPZ = +38m.59s.
Pasadena ipPZ = +12m.3s., esPZ = +12m.13s., iEN = +15m.3s., isSEN = +21m.54s., ePKP,PKPZ = +38m.50s.
Tinemaha isPE = +12m.30s.
Averroes ePP = +15m.27s., e = +23m.16s., eSS = +27m.45s.
Ivigtut +13m.8s., +23m.15s., eN = +24m.3s.
Toledo ipP = +13m.12s.
Algiers iS = +23m.50s., PS? = +24m.42s.
Jersey i = +23m.33s., eSKS = +24m.23s., e = +25m.28s. and +30m.3s.
Bidston i = +24m.28s.
Kew ipP = +13m.49s., iSN = +24m.39s.
Paris e = +17m.21s.
Uccle eN = +17m.56s., e = +24m.53s., eE = +27m.3s., iE = +31m.57s.
Strasbourg ipPZ = +14m.6s., eE = +17m.3s., ePPZ = +17m.39s., ipPPE = +18m.7s., iPSZ = +26m.41s., eE = +29m.57s., eSSE = +32m.12s.
De Bilt eZ = +14m.8s.
Scoresby Sund +26m.1s. and +30m.59s.
Stuttgart epP = +14m.9s., e = +18m.12s., eSKKS = +24m.49s., ePS = +26m.38s., eSS = +32m.3s.
Copenhagen PP = +18m.39s., SKKS = +25m.22s., PS = +27m.27s.
Helwan i = +24m.51s. and +28m.18s., PPS = +29m.18s., i = +30m.3s., SS = +34m.23s.
Bucharest e = +25m.49s., L?E = +29m.21s., eE = +31m.24s.
Ksara ePKP = +18m.37s., iPP = +19m.35s., ipPP = +19m.59s., PS = +29m.15s., PPS = +30m.17s.
Pulkovo e = +29m.2s., +29m.20s., and +35m.9s.
Moscow e = +20m.29s., +22m.1s., +26m.24s., +26m.55s., +29m.23s., and +29m.33s.
Tiflis eN = +20m.42s., +39m.32s., and +58m.24s.
Baku e = +22m.49s., +30m.47s., +33m.22s., and +37m.3s.
Sverdlovsk i = +19m.35s., e = +21m.24s. and +21m.52s., i = +22m.22s., +23m.0s., and +23m.15s., e = +28m.12s. and +31m.54s.
Tashkent e = +19m.40s., +20m.20s., and +20m.54s., i = +22m.14s. and +22m.59s., e = +32m.59s., i = +40m.53s., e = +41m.34s., i = +41m.39s.
Andijan e = +21m.4s. and +22m.10s.
Almata e = +21m.9s.
Batavia iPZ = +19m.36s., iZ = +20m.6s., iEN = +20m.28s.
Irkutsk e = +23m.8s., +30m.15s., +34m.3s.?, +38m.3s.?, and +44m.3s.?
Vladivostok i = +19m.44s. and +20m.15s.
Long waves were also recorded at Stonyhurst and Hyderabad.

Oct. 12d. Readings also at 2h. (Amboina, Christchurch, New Plymouth, and near Wellington), 4h. (Huancayo and near Hukuoka B), 5h. (San Juan, La Paz, Ukiah, Tucson, Mount Wilson, Pasadena, Riverside, Berkeley, and near Medan), 6h. (Ksara), 7h. (Mount Wilson, Pasadena, Riverside, and Santiago), 8h. (Christchurch, Hastings, near New Plymouth, and Wellington), 9h. (near Helwan and Ksara; shock felt at Jericho and Beersheba, very slightly at Jerusalem. P. Stahl. Macroseismios Signates. Annales de l'Institute de Physique de Globe de Strasbourg, 1937. Tome II, 2nd part Seismology, pp. 113-115), 12h. (near Kobe, Toyooka, and Nagoya), 13h. (Copenhagen and near Santiago), 15h. (Andijan and Samarkand), 16h. (College) 18h (Mizusawa), 19h. (Oaxaca and Tacubaya (2)), 20h. (Mount Wilson, Pasadena, and Riverside), 21h. (Amboina).

Oct. 13d. Readings at 1h. (Santiago), 3h. (near Santiago), 4h. (Samarkand), 6h. (Samarkand and near Tananarive), 7h. (Samarkand and Santiago), 8h. (Copenhagen), 13h. (Huancayo and La Paz), 15h. (Balboa Heights (2)), 19h. (Hong Kong, College, Mount Wilson, Pasadena, Riverside, Tinemaha, Vladivostok, Ksara, Irkutsk, Tashkent, Baku, Sverdlovsk, Pulkovo, Tiflis, Copenhagen (3), Stuttgart, Paris, Strasbourg, Uccle, and near Mizusawa), 20h. (De Bilt), 21h. (La Paz, Hastings, and near Wellington), 22h. (New Plymouth and near Wellington).

Oct. 14d. Readings at 0h. (Lick), 1h. (Lick (2)), 4h. (Samarkand and Andijan), 6h. (Helwan and Balboa Heights), 9h. (Frunse, Andijan, Tashkent, Samarkand, and Sverdlovsk), 10h. (Andijan and Tashkent), 13h. (Grozny), 16h. (Balboa Heights), 18h. (Tashkent, Sverdlovsk, and Balboa Heights, Hukuoka B, and Kobe), 19h. (Stuttgart), 20h. (Santiago), 21h. (Ksara, Baku, Tashkent, Grozny, and Helwan), 22h. (Frunse, Andijan, and Almata), 23h. (Samarkand).

Oct. 15d. Readings at 0h. (Tchimkent, Andijan, Nagoya, Almata, Frunse (2), and Kobe), 3h. (Pasadena, Huancayo, Balboa Heights, La Paz, Mount Wilson, and Riverside), 4h. (Tchimkent, Andijan, and Tashkent), 8h. (Nagoya), 9h. (Medan), 10h. (Alicante and Santiago), 11h. (Ksara), 14h. (La Plata, Nagoya, and Santiago), 16h. (Tashkent, Mount Wilson, Riverside, Pasadena, Tchimkent, Andijan, Almata, Frunse, Samarkand, Tucson, Wellington, and Sverdlovsk), 17h. (Irkutsk and Kodaikanal), 19h. (Christchurch), 21h. (Batavia).

Oct. 16d. Readings at 1h. (Batavia and Huancayo), 5h. (near Branner and Lick), 6h. (Andijan and Samarkand), 7h. (Mizusawa), 8h. (near Almata), 10h. (Vienna), 11h. (near Santiago and San Javier), 12h. (Alicante and near Batavia), 13h. (Erevan), 18h. (Batavia), 20h. (near Apia).

Oct. 17d. 4h. 47m. 1s. Epicentre 35°·5N. 141°·0E.

Strongly felt at Tyosi, Katuura, Kakioka, fairly strongly at Tukubasan, Mito, Tokyo, Yokohama, Misima, and Aidu. Radius greater than 300km.

Epicentre 35°·5N. 141°·0E. See Seismological Bulletin of the Cent. Met. Obs. Japan, for the year 1937. Tokyo 1939, pp. 55-57. Macroseismic Chart p. 55.

$A = -\cdot6342$, $B = +\cdot5135$, $C = +\cdot5781$; $\delta = +9$; $h = 0$;
$D = +\cdot629$, $E = +\cdot777$; $G = -\cdot449$, $H = +\cdot364$, $K = -\cdot816$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	0·2	335	0 10a	0	0 15	− 1	—	—
Katuura	0·7	242	0 18	+ 1	—	—	—	—
Kakioka	1·0	318	0 19k	− 2	0 32	S_g	—	—
Mito	1·0	334	0 21k	0	0 36	0	—	—
Tokyo Cen. Met. Ob.	1·0	281	0 25a	+ 4	0 40	+ 4	—	0·9
Tokyo Imp. Univ.	1·0	281	0 25	+ 4	0 39	+ 3	—	—
Tukubasan	1·0	315	0 21k	0	0 35	− 1	—	—
Komaba	1·1	278	0 25	+ 3	0 40	+ 1	—	—
Mera	1·1	239	0 24k	+ 2	0 39	0	—	—
Yokohama	1·1	267	0 27k	+ 5	0 41	+ 2	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kamakura		1·2	262	0 28	+ 4	0 47	+ 6	—	—
Misaki		1·2	253	0 28	+ 4	0 46	+ 5	—	—
Onahama		1·4	357	0 27k	0	0 46	0	—	—
Utunomiya		1·4	320	0 26k	− 1	0 43	− 3	—	—
Kumagaya		1·5	296	0 28k	0	0 48	− 1	—	—
Ito		1·6	251	0 32k	+ 2	0 54	S_g	—	—
Koyama		1·6	265	0 28	− 2	0 53	+ 2	—	—
Titibu		1·6	287	0 28	− 2	0 52	+ 1	—	—
Misima		1·7	257	0 31	0	0 55	+ 1	—	—
Maebasi		1·8	300	0 24k	− 8	0 48	− 8	—	—
Numadu		1·8	257	0 33k	+ 1	0 59	+ 3	—	—
Hunatu		1·9	270	0 34k	0	1 1	+ 2	—	—
Yosiwara		1·9	260	0 28	− 6	0 54	− 5	—	—
Kohu		2·0	274	0 37a	+ 2	1 11	S_g	—	—
Aidu		2·2	341	0 35a	− 3	1 0	− 6	—	—
Oiwake		2·2	293	0 42a	P*	1 14	S_g	—	—
Hukusima		2·3	349	0 41k	+ 1	1 8	− 1	—	—
Omaesaki		2·4	248	0 41a	0	1 13	+ 1	—	—
Hatidyozima		2·6	202	0 43	− 1	1 16	− 1	—	—
Iida		2·6	270	0 49a	P*	1 34	S_g	—	—
Nagano		2·6	297	0 47a	+ 3	1 17	0	—	—
Matumoto		2·6	287	0 44	0	1 23	+ 6	—	—
Takada		2·7	306	0 49	+ 4	1 34	S_g	—	—
Hamamatu		2·8	254	0 48a	+ 1	1 28	+ 6	—	—
Sendai		2·8	358	0 45k	− 2	1 18	− 4	—	—
Yamagata		2·8	349	0 49k	+ 2	1 32	+10	—	—
Niigata		2·9	327	0 53	+ 5	1 35	+11	—	—
Takayama		3·1	282	0 51a	0	1 59	?	—	—
Nagoya		3·3	264	0 58	+ 5	2 1	?	—	2·7
Toyama		3·3	291	0 57a	+ 4	1 45	S*	—	—
Gihu		3·5	269	0 59a	+ 2	1 48	S*	—	—
Husiki		3·5	294	0 59	+ 2	2 0	S_g	—	—
Sakata		3·5	344	1 5	P*	1 59	S_g	—	—
Kanazawa		3·6	286	1 8	P*	1 59	S_g	—	—
Mizusawa	E.	3·7	4	i 1 1	+ 1	1 33	−12	—	—
	N.	3·7	4	i 0 58	− 2	1 30	−15	—	—
Ibukisan		3·8	269	1 4a	+ 3	2 3	S_g	—	—
Kameyama		3·8	263	1 4a	+ 3	2 1	S*	—	—
Tu		3·8	259	1 6	P*	2 1	S*	—	—
Wazima		3·8	301	1 3a	+ 2	1 58	S*	—	—
Hikone		3·9	269	1 6a	P*	2 9	S_g	—	—
Hukui		3·9	281	1 5	P*	2 14	S_g	—	—
Akita		4·2	350	1 8k	+ 1	2 9	S*	—	—
Miyako		4·2	10	1 3	− 4	1 50	− 7	—	—
Morioka		4·2	2	1 5k	− 2	2 10	S*	—	—
Kyoto		4·3	265	1 10	+ 2	2 13	S*	—	—
Yagi		4·4	259	1 10a	0	2 13	S*	—	—
Osaka		4·6	261	1 15	+ 3	2 28	S_g	—	—
Osaka B		4·6	261	1 15	+ 3	2 28	S_g	—	—
Miyadu		4·7	271	1 16	+ 2	2 26	S*	—	—
Kobe		4·8	262	i 1 18a	+ 3	i 2 26	S*	—	3·0
Siomisaki		4·8	247	1 17a	+ 2	2 39	S_g	—	—
Hatinohe		5·0	4	1 16k	− 2	2 22	+ 4	—	—
Toyooka		5·0	273	i 1 21a	+ 3	2 33	S*	—	3·1
Wakayama		5·0	257	1 19a	+ 1	2 27	S*	—	—
Sumoto		5·2	258	i 1 22a	+ 1	2 29	+ 7	2·8	3·2
Aomori		5·3	358	1 23	+ 1	2 31	+ 6	—	—
Okayama		5·8	265	1 32	+ 3	3 8	S_g	—	—
Muroto		6·1	250	1 35a	+ 1	2 52	+ 7	—	—
Tadotu		6·1	260	1 40a	+ 6	2 59	S*	—	—
Hakodate		6·3	357	1 37	+ 1	2 57	+ 7	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sakai		6·4	275	1 44	+ 6	3 29	L	(3·5)	—
Koti		6·5	254	1 40	+ 1	2 58	+ 3	—	—
Muroran		6·8	359	1 37	− 7	3 10	+ 7	—	—
Urakawa		6·8	11	1 45	+ 1	3 15	+12	—	—
Matuyama		7·0	259	1 47a	+ 1	—	—	—	—
Hirosima		7·1	266	1 50	+ 2	3 16	+ 6	—	—
Simidu		7·2	250	1 49	0	3 6	− 7	—	—
Hamada		7·3	269	1 50	0	3 22	+ 7	—	—
Sapporo		7·5	2	1 50	− 3	3 14	− 6	—	—
Obihiro		7·6	12	2 7	+12	3 54	S*	—	—
Kusiro		7·9	19	1 38	−21	2 59	−31	—	—
Ooita		8·1	256	2 10k	+ 8	4 32	S_g	—	—
Asahigawa		8·3	6	2 6	+ 2	3 39	− 1	—	—
Simonoseki		8·4	263	2 8	+ 2	4 17	S*	—	—
Titizima		8·4	174	2 4	− 2	3 38	− 5	—	—
Nemuro		8·6	23	2 14	+ 5	3 45	− 3	—	—
Miyazaki		8·7	249	2 12a	+ 2	3 56	+ 6	—	—
Izuka		8·7	261	2 19	+ 9	4 41	S_g	—	—
Haboro		8·9	4	2 26	P*	4 7	+12	—	—
Hukuoka		8·9	261	2 4	− 8	4 4	+ 9	—	5·7
Hukuoka B		8·9	261	2 4	− 8	4 7	+12	—	5·1
Kumamoto		8·9	255	2 14	+ 2	4 59	S_g	—	—
Saga		9·1	259	2 20	+ 6	—	—	—	—
Unzendake		9·4	256	2 23	+ 5	5 12	S_g	—	—
Kagosima		9·5	249	2 24	+ 4	4 30	+20	—	—
Nagasaki		9·6	257	2 23a	+ 2	5 17	S_g	—	—
Husan		9·8	272	2 25	+ 1	5 26	S_g	—	5·8
Taikyu		10·1	276	i 2 32	+ 4	4 34	+ 9	5·9	6·3
Vladivostok		10·4	320	i 2 34	0	e 4 27	− 5	i 4·6	5·7
Tomie		10·6	257	2 46	+10	5 18	L	(5·3)	—
Ootomari		11·2	5	2 44	0	4 48	− 4	—	—
Keizyo		11·4	284	i 2 50	+ 3	e 5 47	L	(e 5·8)	—
Zinsen		11·8	281	i 2 53a	0	e 5 31	SS	e 6·0	—
Nake		12·1	237	2 26	−31	—	—	—	—
Heizyo		12·7	290	e 3 5	0	e 6 5	SS	—	—
Zi-ka-wei	N.	16·9	260	e 3 59	0	8 43	L	(8·7)	9·5
Hong Kong		26·8	248	—	—	11 9	SS	13·2	16·6
Irkutsk		30·9	315	e 6 18	− 2	—	—	14·0	16·5
Phu-Lien		33·5	253	—	—	11 59	− 6	—	22·1
Amboina		40·8	199	(7 43)	− 2	—	—	—	—
Semipalatinsk		45·6	309	i 8 20	− 4	15 0	− 6	—	—
Calcutta	N.	47·3	269	8 35	− 2	15 24	− 7	23·2	28·8
Medan	E.	50·4	241	e 9 9	+ 8	16 12	− 2	e 23·0	—
College		50·6	32	e 9 9	+ 7	i 16 13	− 4	e 24·6	—
Batavia		52·5	225	9 15	− 2	16 38	− 5	—	—
Andijan		53·0	298	9 21	0	16 49	− 1	—	—
Tchimkent		54·5	300	9 30	− 2	—	—	—	—
Honolulu		54·9	87	e 9 11	−24	e 17 4	−12	e 22·7	—
Tashkent		55·0	299	i 9 33	− 2	i 17 16	− 1	25·1	33·7
Sverdlovsk		56·1	320	i 9 42	− 1	i 17 26	− 6	32·2	33·9
Samarkand		57·2	298	9 49	− 2	17 32	−14	—	—
Hyderabad		57·9	269	10 21	+25	18 17	+22	27·8	37·8
Bombay		61·8	274	i 10 22	− 1	i 18 43	− 3	—	40·0
Colombo		62·6	258	18 50	S	(18 50)	− 6	31·5	—
Kodaikanal	E.	62·6	263	i 10 27	− 1	i 18 56	0	e 30·2	41·7
Brisbane	N.	63·7	168	i 19 5	S	(i 19 5)	− 5	29·5	33·6
Victoria		67·8	46	—	—	e 19 59†	− 1	28·0	—
Moscow		68·3	324	i 11 2	− 3	19 58	− 8	33·5	40.7
Baku		68·8	305	e 11 8	0	i 20 10	− 1	33·0	37·4
Pulkovo		69·3	330	e 11 9	− 2	20 11	− 6	—	43·8
Riverview		69·6	171	—	—	e 20 35	+14	e 37·5	40·8
Grozny		70·1	309	11 16	0	e 20 25	− 2	—	—
Perth		71·1	202	9 42	†	20 33	− 5	38·5	43·1
Piatigorsk		71·4	311	11 24	0	—	—	—	—
Tiflis		71·5	308	11 23	− 1	20 41	− 2	34·2	40·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Erevan		72·5	307	i 11 35	+ 5	—	—	—	—
Ukiah		72·6	54	—	—	e 21 16	+20	e 30·7	—
Melbourne		73·1	176	—	—	e 21 2	+ 1	32·2	43·3
Berkeley	N.	73·9	55	—	—	e 30 53	?	—	—
Upsala		74·2	335	e 10 59?	−41	e 21 5	− 9	e 43·0	44·7
Lick		74·6	55	e 11 46	+ 3	—	—	—	—
Simferopol		76·2	316	e 11 48	− 4	—	—	—	—
Bozeman		76·4	43	—	—	e 20 40	−58	—	—
Tinemaha	Z.	77·0	53	i 11 53	− 3	—	—	—	—
Mount Wilson		78·7	56	i 12 5a	− 1	—	—	—	—
Pasadena		78·7	56	i 12 5a	− 1	i 22 1	− 2	e 32·2	—
Copenhagen		79·1	333	12 6	− 2	22 2	− 5	37·0	—
Riverside		79·3	56	i 12 7a	− 2	—	—	—	—
La Jolla		80·1	56	i 12 12	− 1	—	—	—	—
Hamburg		81·7	334	e 12 16	− 6	i 22 30	− 4	e 41·0	52·0
Ksara		81·8	305	i 12 20a	− 2	i 22 34	− 1	—	—
Budapest		82·4	324	12 26	+ 1	e 22 41	0	e 45·5	57·0
Stara Dala		82·5	325	e 12 13	−13	e 22 32	−10	—	53·0
Wellington		82·5	155	i 12 23	− 3	e 22 40	− 2	e 39·5	42·0
Prague		82·6	329	e 12 26	0	e 22 39	− 4	e 38·0	52·5
Jena		83·1	330	i 12 28	− 1	—	—	e 41·0	53·0
Vienna		83·1	326	e 12 28	− 1	e 23 23	+35	e 46·5	—
Göttingen		83·3	332	e 12 29	− 1	—	—	e 45·0	—
Cheb		83·5	330	—	—	e 22 59?	+ 7	e 45·0	46·0
Belgrade		83·6	322	e 13 35a	+63	e 23 53	PS	e 47·3	—
Christchurch		83·8	157	i 12 29	− 3	e 21 2	?	39·0	—
Graz		84·4	326	i 12 32	− 4	e 23 1	0	e 43·0	54·2
Durham	N.	84·5	339	—	—	i 22 55	− 7	—	53·0
De Bilt		84·6	334	i 12 35a	− 1	22 57	− 6	e 40·0	47·5
Tucson		84·8	53	i 12 37	0	e 23 4	− 1	e 39·6	—
Zagreb		85·1	325	e 12 31	− 8	e 22 59?	[− 2]	e 41·4	—
Stonyhurst		85·6	339	—	—	i 23 14	+ 1	48·0	53·4
Stuttgart		85·8	330	i 12 41a	− 1	e 23 5	[− 1]	e 43·0	54·5
Uccle		86·0	335	i 12 41a	− 2	i 23 5	[− 3]	e 42·0	51·2
Bidston		86·1	340	i 12 39	− 5	e 23 4	[− 4]	e 42·0	54·0
Triest		86·2	326	—	—	i 23 6	[− 3]	e 33·7	46·7
Strasbourg		86·5	331	i 12 45a	− 1	e 22 59	[−12]	e 42·0	53·0
Kew		87·0	337	i 12 47	− 1	e 23 10	[− 4]	e 42·0	52·6
Oxford		87·0	338	—	—	23 13	[− 1]	e 34·0	55·2
Rathfarnham Castle		87·1	342	—	—	i 23 42	+14	42·0	—
Zurich		87·1	330	e 12 46a	− 3	e 23 13	[− 1]	—	—
Helwan		87·3	305	e 12 48	− 2	23 19	[+ 4]	—	—
Basle		87·4	330	e 12 48	− 2	—	—	—	—
Neuchatel		88·1	331	e 12 52	− 2	—	—	—	—
Paris		88·3	334	i 12 56	+ 1	e 23 18	[− 4]	48·0	49·0
Jersey		89·5	337	i 23 30	S	(i 23 30)	[0]	e 41·5	46·0
Ottawa		92·9	24	e 13 15	− 1	e 23 45	[− 5]	37·0	—
Seven Falls		92·9	20	—	—	e 24 5	−15	48·0	—
Toronto		93·0	28	—	—	i 23 51	[+ 1]	48·0	—
Vermont		94·6	23	—	→	e 24 32	− 3	e 44·1	—
Williamstown		96·1	23	e 13 29	− 2	—	—	—	e 58·0
Oak Ridge		96·9	23	—	—	e 24 5	[− 6]	e 44·0	—
Weston		97·0	23	e 13 32	− 3	e 24 1	[−11]	—	e 54·0
Philadelphia		97·8	26	—	—	e 24 14	[− 2]	e 45·7	—
Algiers		98·1	326	—	—	31 59?	SS	54·0	—
Toledo		98·4	333	e 13 40	− 1	e 23 14	?	—	53·7
Columbia		100·5	34	e 24 27	S	(e 24 27)	[− 2]	e 44·2	—
San Fernando		102·2	333	e 24 36	S	(e 24 36)	[− 2]	53·0	—
San Juan		120·6	29	—	—	e 26 6	[+14]	e 51·4	—
Huancayo		139·7	63	e 19 22	[± 8]	—	—	e 64·9	—
La Paz		147·9	60	i 19 42	[− 2]	—	—	71·5	75·4
Rio de Janeiro		166·9	18	—	—	33 59?	?	—	—

For Notes see next page.

NOTES TO OCT. 17d. 4h. 47m. 1s.

Additional readings :—
Kumagaya +52s.
Kobe i = +1m.34s., iE = +2m.15s.
Toyooka SZ = +2m.36s.
Hukuoka i = +4m.28s.
Vladivostok e = +6m.44s., +7m.38s., +10m.12s., +10m.46s., and +11m.22s.
Zi-ka-wei iE = +4m.11s., iN = +4m.43s.
Phu-Lien eN = +17m.49s., eE = +18m.53s.
Amboina iE = (+8m.57s.), iEN = (+13m.47s.); all readings have been increased by 2 minutes.
Calcutta i = +15m.39s., SSSN = +18m.54s.
Honolulu eP = +9m.25s., eP_cP = +10m.15s., ePP = +11m.27s., ePPP = +12m.29s., eS_cS = +19m.13s., eSS = +20m.54s.
Sverdlovsk L_q = +25·6m.
Kodaikanal iPSE = +19m.22s., SSSE = +25m.29s.
Brisbane iPPN = +19m.41s., eSN = +23m.17s.
Perth P = +10m.1s., SP = +21m.9s.
Platigorsk e = +17m.59s.?
Tiflis e = +11m.44s., ePP = +14m.40s., eE = +32m.7s.
Copenhagen +26m.59s.
Ksara PP = +15m.31s., ePS = +23m.27s.
Budapest iN = +12m.46s.
Wellington iPP = +15m.31s., eSS = +27m.59s.?
Vienna e = +14m.21s., PS = +23m.57s.
Christchurch ePPNZ = +13m.50s., i = +22m.35s., SS = +28m.6s., L_q = +35·3m.
Durham iN = +23m.15s.
Tucson iP = +12m.46s., eS_cS = +24m.1s., eSSS = +32m.39s.
Stuttgart eP_cP = +12m.49s., iS = +23m.12s., ePS = +24m.0s., eSS = +28m.41s.
Uccle e = +29m.44s. and +33m.27s.
Strasbourg iPSZ = +24m.38s., eSSN = +28m.53s., eSSSE = +32m.11s.
Helwan e = +13m.17s., PP = +16m.11s., e = +16m.59s., PS = +24m.11s.
Jersey PP = +26m.59s., SKS = +33m.12s., S = +34m.32s., PS = +35m.4s., SS = +37m.29s.
Ottawa eN = +30m.29s.
Vermont i = +24m.34s. and +25m.50s.
Oak Ridge eZ = +25m.59s.
Weston e = +26m.12s., eSS = +31m.34s.
San Fernando ePSN = +34m.20s.
Huancayo eP = +17m.30s., PKP = +19m.33s., ePKS = +23m.6s., SSS = +46m.42s.
La Paz iPKPZ = +19m.45s., ipPKP = +20m.52s., isPKP = +21m.33s.
Long waves were also recorded at Scoresby Sund, Bucharest, Edinburgh, Granada, Almeria, Tortosa, Cape Town, and Adelaide.

Oct. 17d. 9h. 59m. 8s. Epicentre 39°·0N. 15°·2E. (according to Strasbourg).

Felt Force III at Taranto.

P. Stahl.

Macroseismes Signales. Annales de l'Institut de Physique du Globe de Strasbourg, 1937, Tome II, Part 2 Seismology 1940, pp. 113-115.

$A = +\cdot7519$, $B = +\cdot2043$, $C = +\cdot6268$; $\delta = -3$; $h = -1$;
$D = +\cdot262$, $E = -\cdot965$; $G = +\cdot605$, $H = +\cdot164$, $K = -\cdot779$.

A depth of focus 0·040 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Capodimonte	N.	1·9	339	i 0 52	+ 7	i 1 3	−17	—	2·2
Prato		5·7	330	i 1 27	+ 1	—	—	—	—
Triest		6·7	352	i 1 39	+ 1	i 2 56	+ 1	—	—
Zagreb		6·8	4	i 1 37a	− 2	i 2 52?	− 5	—	—
Belgrade		7·0	32	i 2 48k	+66	i 3 3	+ 1	—	—
Sofia		7·2	55	e 2 25	+41	i 3 43	SSS	—	—
Graz		8·1	2	i 1 54	0	i 3 22	− 4	—	—
Chur		8·9	334	e 2 5	0	e 3 44	0	—	—
Budapest	N.	9·0	18	2 7	0	e 3 48	+ 2	6·4	—
Stara Dala		9·1	13	e 2 8	0	e 3 54	+ 6	—	5·9
Vienna		9·3	6	e 2 9	− 1	3 54	+ 1	—	—
Ravensburg		9·7	337	e 2 17	+ 2	e 3 57	− 5	—	—
Zurich		9·7	332	e 2 15a	0	e 4 1	− 1	—	—
Bucharest		9·8	53	i 2 20	+ 4	—	—	3·6	—
Algiers		9·9	259	e 2 19	+ 1	i 4 10	+ 4	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Neuchatel		10·0	326	e 2 18	− 1	e 4 3	− 6	—	—
Basle		10·2	330	e 2 20	− 2	e 4 10	− 3	—	—
Stuttgart		10·7	338	e 2 27	− 1	e 4 20	− 4	—	—
Strasbourg		11·0	333	i 2 33	+ 2	i 4 56	+25	—	—
Prague		11·1	357	e 2 36	+ 3	4 42	+ 9	—	6·6
Jena		12·2	349	e 2 46	0	—	—	—	5·1
Paris		13·4	321	2 52?	− 9	—	—	—	—
Almeria		14·1	266	—	—	e 5 56	+16	—	—
Uccle		14·1	331	e 3 7	− 2	e 6 11	+31	—	—
Granada		14·9	269	e 3 55	PPP	e 7 10	?	—	—
Toledo		14·9	280	e 3 20	+ 1	i 6 7	+10	e 6·8	—
Malaga		15·7	267	e 3 52	PP	e 7 4	SS	—	—
Copenhagen		16·8	354	i 3 36	− 4	—	—	—	—
Ksara		17·4	100	e 3 49	+ 3	e 7 5	+17	—	—
Moscow		22·4	34	e 4 32	− 4	—	—	—	—
Tiflis		22·7	73	4 48	+10	e 8 25	+ 2	—	—
Pulkovo		22·9	19	4 41	+ 1	8 24	− 2	—	—
Sverdlovsk		34·5	43	e 7 43	PP	i 11 28	− 2	15·9	—
Weston		62·9	304	i 9 55a	− 3	—	—	—	—
Oak Ridge		63·0	304	i 9 57k	− 1	—	—	—	—
Williamstown		63·9	304	i 10 4	0	—	—	—	—
Riverside	z.	95·1	323	i 12 51	− 1	—	—	—	—
Mount Wilson	z.	95·2	323	i 12 53	+ 1	—	—	—	—
Pasadena	z.	95·3	323	i 12 53	+ 1	—	—	—	—

Additional readings :—
Taranto (△ = 2°·2) gives P 9h.58m.40s.
Trenta gives (△ = 0°·9) iP 9h.58m.43s.
Triest PP = +2m.0s.
Zagreb i = +1m.44s., iZ = +1m.47s., i = +2m.0s., +2m.6s., and +2m.12s.
Belgrade i = +3m.57s., e = +4m.8s.
Budapest iN = +3m.4s., iE = +3m.56s., iEN = +4m.27s.
Vienna e = +2m.18s., S* = +3m.43s., S_g = +4m.4s.
Bucharest eN = +3m.15s. and +3m.32s.
Algiers eE = +4m.17s., eN = +4m.28s.
Stuttgart iNZ = +4m.29s., iS_g = +4m.40s.
Strasbourg i = +4m.28s.
Jena eE = +2m.52s.
Toledo i = +3m.34s.
Tiflis eE = +8m.10s.

Oct. 17d. 13h. 32m. 44s. Epicentre 35°·5N. 141°·0E. (as at 4h.).

A = −·6342, B = +·5135, C = +·5781; δ = +9; h = 0.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tokyo Cen. Met. Ob.	1·0	281	0 20a	− 1	0 36	0	0·7
Tokyo I.U.	1·0	281	0 21	0	0 36	0	—
Tukubasan	1·0	315	0 16	− 5	0 28	− 8	—
Komaba	1·1	278	0 21	− 1	0 36	− 3	—
Kamakura	1·2	262	0 22	− 2	0 40	− 1	—
Mitaka	1·2	278	0 22	− 2	0 39	− 2	—
Titibu	1·6	287	0 22	− 8	0 47?	S*	—
Koyama	1·6	265	0 22	− 8	0 48	S*	—
Nagoya	3·3	264	e 0 55	+ 2	1 57	S_g	2·2
Mizusawa	3·7	4	0 54	− 6	1 46	+ 1	—
Kobe	4·8	262	e 1 18	+ 3	2 29	S*	2·8
Toyooka	5·0	273	e 1 33	P*	e 2 35	S*	3·1
Sumoto	5·2	258	1 27	+ 6	e 2 37	S*	3·0
Hukuoka B	8·9	261	e 2 17	+ 5	e 4 47	S_g	—
Mount Wilson z.	78·7	56	e 12 10	+ 4	—	—	—

Additional readings :—
Toyooka SN = +2m.38s.
Sumoto PE = +1m.32s.
Long waves were also recorded at Vladivostok, Irkutsk, Tashkent, and Sverdlovsk.

Oct. 17d. 19h. 9m. 6s. Epicentre 35°·5N. 141°·0E. (as at 13h.).

Tokyo gives epicentre 35°·7N. 141°·1E.

$A = -\cdot6342$, $B = +\cdot5135$, $C = +\cdot5781$; $\delta = +9$; $h = 0$.

		△	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tokyo Cen. Met. Ob.		1·0	281	0 22k	+ 1	i 0 36	0	0·7
Tokyo I.U.		1·0	281	0 22	+ 1	0 37	+ 1	—
Tukubasan		1·0	315	0 20	− 1	0 32	− 4	—
Komaba		1·1	278	0 22	0	0 37	− 2	—
Kamakura		1·2	262	0 26	+ 2	0 44	+ 3	—
Mitaka		1·2	278	0 26	+ 2	0 43	+ 2	—
Koyama		1·6	265	0 26	− 4	0 50	− 1	—
Titibu		1·6	287	0 26	− 4	0 44?	− 7	—
Nagoya		3·3	264	e 0 59	P*	1 55	S_g	2·0
Mizusawa		3·7	4	i 1 0	0	1 42	− 3	—
Kobe		4·8	262	e 1 15	0	2 28	S*	3·1
Toyooka	E.	5·0	273	1 34	P	e 2 44	S_g	3·9
	Z.	5·0	273	e 1 39	P*	2 37	S*	—
Sumoto		5·2	258	e 1 44	P_g	2 54	S_g	2·1

Additional readings :—
Tokyo i = +33s.
Mizusawa eN = +1m.46s.
Toyooka SN = +2m.42s.
Sumoto ePE = +1m.47s.
Long waves were also recorded at Vladivostok, Irkutsk, and Sverdlovsk.

Oct. 17d. Readings also at 2h. (Sverdlovsk and Tashkent), 4h. (Theodosia), 5h. (Toyooka, near Mizusawa (2), and Nagoya (2)), 7h. (St. Louis), 8h. (Tiflis (2) and San Juan), 9h. (Andijan, Toledo, and near Samarkand), 10h. (Triest and near Andijan), 12h. (Tiflis and near Santiago), 13h. (Fresno, Malaga, near Almeria, and Granada), 14h. (Fresno, near Branner, Lick, near Mizusawa, and near Nagoya (2)), 15h. (Nagoya and near Granada), 16h. (Zurich and near Neuchatel), 17h. (Nagoya and near Samarkand).

Oct. 18d. Readings at 0h. and 1h. (near Tiflis), 2h. (Apia), 3h. (Apia and Santiago), 4h. (Fresno), 5h. (Mount Wilson, Pasadena, Riverside, and near Apia), 7h. (near Apia and near Santiago), 8h. (Christchurch, Wellington, Ksara, Tiflis, Haiwee, La Jolla, Mount Wilson, Pasadena, and Riverside), 13h. (Mount Wilson, Pasadena, and Riverside, and Apia), 14h. (Apia, Mount Wilson, Pasadena, and Riverside), 16h. (Apia, Wellington, Mount Wilson, and Tucson), 17h. (Apia, Andijan, Grozny, and Tiflis), 18h. (Apia), 21h. (Sverdlovsk, Irkutsk, Hong Kong, Phu-Lien, Apia, and near Taihoku), 22h. (Apia, Mount Wilson, Pasadena, Riverside, Tiflis, Frunse, near Andijan, and Samarkand), 23h. (near Berkeley, Branner, Lick, and San Francisco).

Oct. 19d. Readings at 0h. (Erevan, Tiflis, Ksara, Apia, Mount Wilson, Pasadena, and Riverside), 1h. (Apia), 2h. (Apia, Nagoya, and near Sumoto), 3h. (Apia and near Tucson), 4h. (Apia), 5h. (Pasadena, near Mount Wilson, Riverside, and near Tananarive), 6h. (near San Javier), 7h. (Apia and Samarkand), 8h. (Tacubaya), 9h. (Apia), 10h. (Samarkand), 12h. (Apia), 14h. (near Santiago), 15h. (Apia, Almeria, Mount Wilson, Pasadena, Riverside, La Plata, and near Santiago), 19h. (Apia, San Francisco (2), near Berkeley, and near Santiago), 20h. (La Paz).

Oct. 20d. 1h. 23m. 46s. Epicentre 31°·1N. 78°·1E.

$A = +\cdot1769$, $B = +\cdot8394$, $C = +\cdot5140$; $\delta = +8$; $h = +1$;
$D = +\cdot979$, $E = -\cdot207$; $G = +\cdot106$, $H = +\cdot503$, $K = -\cdot858$.

Felt Scale VIII at Dehra Dun, VI at Roorkee and Ambala, V at Lahore, Mussoorie, Simla, and Jullunder, IV at New Delhi. Epicentre 30°·0N. 78°·2E. India Weather Review, 1937. Annual Summary, Part D, Seismic Records, p. D 47.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Dehra Dun		0·8	183	0 4	−14	—	—	—	0·2
Agra		3·9	180	1 2	0	i 2 6	S_g	—	—
Andijan		10·7	336	e 2 42	+ 4	e 4 44	+ 5	—	—
Almata		12·2	356	e 3 1	+ 3	e 5 7	− 9	e 6·7	—
Samarkand		12·4	317	e 3 3	+ 2	e 5 15	− 6	—	—
Tashkent		12·4	328	i 2 58	− 3	i 5 13	− 8	6·6	7·7
Calcutta	N.	12·5	130	3 0	− 2	i 5 6	−17	—	7·0
Bombay		13·1	202	i 3 7	− 3	i 5 23	−15	—	8·0
Hyderabad		13·6	178	3 44	PPP	6 40	SSS	7·5	8·7
Semipalatinsk		19·3	5	e 4 21	− 8	—	—	—	—
Kodaikanal	E.	20·8	182	e 4 36	− 9	i 8 15	−18	i 10·6?	—
Colombo		24·1	176	9 35	S	(9 35)	+ 1	17·1	17·2
Baku		24·6	301	e 5 33	+10	e 9 53	+11	14·7	18·7
Grozny		28·3	305	e 6 10	+13	e 10 52	+ 9	—	—
Sverdlovsk		28·5	340	i 5 59	0	10 47	+ 1	15·1	16·9
Erevan		28·6	298	e 6 11	+11	e 11 37	+49	—	—
Irkutsk		28·6	34	e 6 0	0	11 18	+30	16·2	18·2
Tiflis		28·6	301	e 6 3	+ 3	e 11 4	+16	e 16·9	—
Piatigorsk		30·4	306	e 6 21	+ 5	—	—	—	—
Hong Kong		33·3	97	11 55	S	(11 55)	− 7	18·9	19·4
Theodosia		36·0	306	e 7 9	+ 4	e 17 32	?	e 25·2	—
Yalta		36·8	304	e 6 24	−47	e 17 25	?	—	—
Zi-ka-wei	Z.	36·9	77	e 8 6	PP	—	—	—	23·2
Sebastopol		37·2	305	e 7 17	+ 2	e 13 11	+ 9	e 17·6	—
Moscow		37·6	323	7 18	0	13 5	− 3	16·7	23·2
Helwan		40·1	281	e 7 35	− 4	e 13 49	+ 3	—	27·9
Bucharest		42·5	303	e 4 16	?	e 14 30	+ 8	27·2	—
Pulkovo		42·7	327	e 7 57	− 3	14 24	0	21·7	25·5
Vladivostok		43·9	59	e 8 8	− 2	—	—	e 24·3	28·6
Upsala		48·9	324	e 8 48	− 2	e 15 14?	−39	26·2	30·2
Copenhagen		51·4	320	—	—	16 32	+ 4	20·3	—
Jena	N.	52·1	313	e 9 14	0	—	—	—	—
Hamburg		52·9	317	e 9 20	0	—	—	e 25·2	31·2
Stuttgart		53·9	310	e 9 26	− 1	e 17 1	− 1	e 30·7	35·4
Chur		53·9	308	e 9 26	− 1	—	—	—	—
De Bilt		55·9	315	—	—	e 17 38	+ 9	e 30·2	37·6
Toledo		65·3	303	i 10 45	− 1	i 19 29	0	—	—
Granada		65·9	300	e 10 53	+ 3	—	—	45·8	—
Malaga		66·7	300	e 10 59	+ 4	—	—	—	—
La Paz	Z.	146·0	287	19 44	[+ 3]	—	—	—	—
Huancayo		149·0	302	e 19 54	[+ 8]	—	—	—	—

Additional readings :—
Agra P* = +1m.11s.
Samarkand e = +4m.40s.
Calcutta SS?N = +5m.26s., S*N = +5m.54s., S_gN = +6m.27s.
Bombay e = +2m.33s., iS* = +6m.22s., iN = +6m.37s., i = +7m.45s.
Colombo S = +12m.32s.
Baku e = +10m.33s. and +11m.37s.
Tiflis e = +7m.4s., eE = +10m.4s.
Hong Kong S? = +15m.52s.
Helwan PPP = +9m.24s.
Bucharest eE = +14m.41s., eEN = +16m.42s.
Stuttgart eEZ = +9m.33s.
Toledo eS? = +18m.13s.
Long waves were also recorded at Husan, Cape Town, Oak Ridge, Philadelphia, and other European stations.

Oct. 20d. 5h. 47m. 31s. Epicentre 13°·3N. 88°·7W.

$A = +\cdot0221$, $B = -\cdot9733$, $C = +\cdot2285$; $\delta = +1$; $h = +6$;
$D = -1\cdot000$, $E = -\cdot023$; $G = +\cdot005$, $H = -\cdot228$, $K = -\cdot974$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Merida	E.	7·7	353	i 2 19	P*	—	—	—
Tacubaya	N.	11·8	303	3 4	+11	—	—	—
Little Rock	E.	21·6	352	e 4 57	+ 3	i 8 47	− 2	e 10·6
Columbia		21·8	17	e 4 56	0	e 8 58	+ 6	e 10·0
San Juan		22·3	74	e 5 4	+ 3	e 9 19	+17	9·8
Tucson		27·7	318	e 5 52	0	e 9 51	−42	14·1
Huancayo		28·4	152	e 5 53	− 5	e 10 35	−10	—
Philadelphia		29·1	22	e 6 0	− 4	e 10 48	− 8	e 12·4
Williamstown		32·2	23	i 6 30	− 2	—	—	—
Oak Ridge	Z.	32·7	24	e 6 29?	− 7	—	—	e 15·5
Weston		32·7	24	e 6 30	− 6	i 11 48	− 4	e 15·8
Riverside	Z.	33·2	314	i 6 41	+ 1	—	—	—
Ottawa		33·8	17	e 6 42	− 4	e 12 5	− 5	16·5
Mount Wilson	Z.	33·8	314	i 6 46	0	—	—	—
Pasadena		33·8	314	e 6 47	+ 1	—	—	e 14·5
Sverdlovsk		105·6	16	—	—	e 27 56	PS	50·5

Additional readings :—
Little Rock ePPE = +5m.27s., eE = +5m.47s.
San Juan ePP = +5m.11s.
Tucson i = +5m.58s. and +6m.4s.
Huancayo eP = +6m.13s.
Williamstown i = +6m.47s.
Weston iZ = +6m.35s., iPPN = +7m.40s.
Riverside iP_cPZ = +9m.19s., iS_cPZ = +12m.59s.
Mount Wilson iP_cPZ = +9m.24s., iS_cPZ = +12m.58s.
Pasadena eZ = +7m.2s., iS_cPZ = +13m.1s.
Long waves were also recorded at Oaxaca, Baku, and Tashkent.

Oct. 20d. Readings also at 0h. (Apia, Ksara, San Juan, Granada, and near Malaga), 1h. (Tiflis and near Lick), 2h. (Erevan and Tiflis), 3h. (Andijan, near Samarkand, and Batavia), 4h. (Apia, Wellington, Göttingen, and Strasbourg), 6h. (Apia, Zurich, and near Manila), 7h. (Perth, Christchurch, and Wellington), 10h. (College and Wellington), 11h. (Batavia, Apia, Oaxaca, Tacubaya, Mount Wilson, Riverside, and Tucson), 12h. (Medan and near Taihoku), 15h. and 19h. (Apia), 20h. (Ksara, Christchurch, Wellington, Huancayo, Mount Wilson, Pasadena, Riverside, near Balboa Heights, near Mizusawa, and near Nagoya), 21h. (Brisbane, Baku, Sverdlovsk, Tashkent, Tchimkent, Frunse, near Almata, and Andijan), 22h. (Apia).

Oct. 21d. Readings at 4h. (near Tashkent, near Andijan, Samarkand, and Tchimkent), 5h. (Scoresby Sund, Kodaikanal, and Wellington), 9h. (Apia, Oaxaca, and Santiago), 10h. (Tucson), 12h. (Tacubaya (8) and Tucson), 15h. (Perth, Sverdlovsk, and Tashkent), 17h. and 18h. (near Santiago), 21h. (near Nagoya), 23h. (Tucson).

Oct. 22d. 16h. 14m. 15s. Epicentre 1°·0N. 98°·5E.

$A = -\cdot1478$, $B = +\cdot9888$, $C = +\cdot0173$; $\delta = -13$; $h = +7$;
$D = +\cdot989$, $E = +\cdot148$; $G = -\cdot003$, $H = +\cdot017$, $K = -1\cdot000$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Medan		2·6	4	0 53	P_g	1 31	S_g	—	—
Batavia	E.	11·0	131	e 3 29	+47	—	—	—	—
Colombo		19·5	289	4 29	− 2	8 8	+ 2	10·0	—
Phu-Lien		21·2	22	e 4 50	+ 1	e 8 56	+15	—	—
Kodaikanal	E.	22·8	296	e 5 14	+ 9	i 9 17	+ 6	i 11·6	13·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N.	23·6	337	5 11	− 2	9 32	+ 7	—	13·5
Manila		26·0	57	6 13	+37	—	—	—	18·8
Hong Kong		26·1	35	5 38	+ 1	10 37	+30	14·3	18·6
Bombay		30·8	307	e 6 21	+ 1	e 11 21	− 2	—	13·8
Agra	E.	32·6	326	e 6 32	− 3	i 11 49	− 2	—	—
Zi-ka-wei		37·1	34	e 7 31	+17	—	—	22·8	24·6
Andijan		46·1	332	8 31	+ 3	15 16	+ 2	—	—
Almata		46·3	339	8 32	+ 3	15 18	+ 2	—	—
Tashkent		48·0	331	i 8 38	− 5	i 15 33	− 8	e 23·0	30·2
Irkutsk		51·3	5	e 9 7	− 1	16 29	+ 3	27·8	33·1
Baku		58·9	319	—	—	e 18 10	+ 2	28·2	32·1
Tiflis		63·0	317	e 10 28	− 3	18 56	− 5	38·8	45·8
Sverdlovsk		63·4	338	i 10 31	− 3	i 19 3	− 3	29·8	—
Ksara		66·9	306	i 10 56	0	e 19 55	+ 6	32·2	—
Helwan		69·8	302	i 20 20	S	(i 20 20)	− 3	—	40·5
Prague		85·4	320	—	—	e 23 9	− 2	—	—
Copenhagen		86·9	326	12 45	− 3	23 24	− 2	51·8	—
De Bilt		91·3	322	—	—	e 24 5	− 1	e 54·8	—
Pasadena	Z.	130·9	41	e 19 13	[− 1]	—	—	—	—
Mount Wilson	Z.	131·0	41	e 19 12	[− 2]	e 22 35	SKP	—	—
Riverside	Z.	131·6	40	e 19 12	[− 3]	e 22 35	SKP	—	—

Additional readings :—
Kodaikanal iSSE = +10m.27s.
Calcutta ePPN = +5m.41s., SSN = +10m.31s.
Baku e = +14m.4s.
Tiflis eE = +26m.27s.
Ksara ePS = +20m.24s.
Helwan i = +21m.30s., PPP = +22m.35s.
Long waves were also recorded at Kobe, Hyderabad, Stuttgart, Strasbourg, Paris, Granada, Scoresby Sund, Wellington, Cape Town, and Huancayo.

Oct. 22d. Readings also at 0h. (Apia, Wellington, Brisbane, and near Santiago), 1h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Baku, Grozny, Tiflis, Ksara, Tashkent, Sverdlovsk, Irkutsk, Copenhagen, Jena, and Melbourne), 4h. (Little Rock, Grozny, and near Santiago), 5h. (Hong Kong, Medan, and near Batavia), 8h. (Andijan and Wellington), 11h. (San Francisco, near Branner, Fresno, and Lick), 12h. (Apia), 13h. (near La Paz), 15h. (Tiflis), 16h. (Batavia), 18h. (Apia), 22h. (Columbia).

Oct. 23d. 3h. 1m. 52s. } Epicentre 32°·5N. 140°·0E.
3h. 11m. 17s. }

A = −·6473, B = +·5432, C = −·5347 ; δ = −3 ; h = +1 ;
D = +·643, E = +·766 ; G = −·410, H = +·344, K = −·845.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Nagoya	3·7	317	1 0 56	− 4	1 24	−21	—	1·4
II		3·7	317	0 57	− 3	1 22	−23	—	1·9
I	Kobe	4·6	302	e 1 12	0	e 1 52	−15	—	2·4
II		4·6	302	e 0 58	−14	e 1 40	−27	—	—
I	Sumoto E.	4·6	295	e 1 8	− 4	2 1	− 6	—	2·4
I	N.	4·6	295	e 1 12	0	1 59	− 8	—	2·2
I	Z.	4·6	295	e 1 18	+ 6	2 11	+ 4	—	2·3
II		4·6	295	e 1 19	P*	e 2 5	− 2	—	2·4
I	Toyooka	5·2	306	1 21	0	e 2 39	S*	—	—
II	N.	5·2	306	e 1 21	0	—	—	—	—
I	Mizusawa	6·7	8	e 1 42	0	2 57	− 3	—	—
II	E.	6·7	8	e 1 43	+ 1	e 2 46	−14	—	—
I	Hukuoka B	8·1	280	e 2 26	P*	e 4 39	S_g	—	—
I	Tashkent	55·8	300	—	—	e 17 24	− 4	e 26·4	34·1
I	Sverdlovsk	57·8	320	—	—	e 17 53	− 1	30·6	—

Additional readings :—
Kobe I ePN = +1m.16s., SZ = +1m.56s.
Sumoto II ePE = +1m.22s.
Long waves were also recorded at Husan and Hong Kong.

Oct. 23d. 14h. 42m. 24s. Epicentre 2°·0S. 121°·0E.

A = −·5147, B = +·8567, C = −·0347; δ = +6; h = +7;
D = +·857, E = +·515; G = +·018, H = −·030, K = −·999.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		14·7	253	e 3 33	+ 2	—	—	—	—
Manila		16·5	358	3 44	−10	—	—	—	—
Hong Kong		25·1	344	5 26	− 2	9 57	+ 6	12·9	14·7
Zi-ka-wei	Z.	33·0	1	e 6 44	+ 5	—	—	—	18·1
Nagóya		39·9	21	e 7 20	−17	—	—	—	—
Calcutta	N.	40·1	309	e 9 58	PPP	—	—	—	26·8
Andijan		61·4	319	e 10 17	− 3	—	—	—	—
Tashkent		63·7	319	i 10 12	−24	e 18 54	−16	e 35·9	41·2
Sverdlovsk		76·0	331	i 11 53	+ 2	e 21 30	− 4	36·6	—
Baku		77·0	312	—	—	e 22 6	+21	42·6	—
Tiflis		81·1	312	e 12 32	+14	—	—	—	—
Ksara		87·0	304	i 13 1a	+13	e 28 32	SS	—	—

Additional readings:—
Batavia ePE = +3m.37s., iN = +11m.49s.
Manila S_g? = +4m.12s.
Andijan e = +11m.6s.
Tashkent e = +10m.22s. and +20m.22s.
Baku e = +31m.36s.
Ksara ePP = +16m.12s.

Oct. 23d. 16h. 53m. 18s. Epicentre 37°·9S. 177°·8E.

Felt scale V-VI max. at Raukaumera Peninsula.

C. R. Hayes.

Earthquakes in New Zealand (incl. Earthquakes Summaries for 1937). Extr. from New Zealand Off. Year Book, 1939.

Dominion Observatory, Wellington, New Zealand, Bulletin No. 138, p. 7.

A = −·7905, B = +·0304, C = −·6117; δ = −1; h = −1;
D = +·038, E = +·999; G = +·611, H = −·023, K = −·791.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Arapuni		1·7	264	0 32	+1	0 50	− 4	—	—
Hastings		1·9	202	0 42?	P_g	—	—	—	0·9
New Plymouth		3·1	248	0 53	+ 2	1 28	− 1	—	—
Wellington		4·1	214	1 7	+ 2	1 56	+ 1	—	2·0
Christchurch		6·9	214	1 45	0	3 4	− 1	—	—
Chatham Ils.		7·4	147	2 36	P_g	i 3 24	S*	—	6·7
Riverview		21·9	273	e 4 56	− 1	e 9 6	+12	e 10·9	12·9
Sydney		21·9	273	e 4 49	− 8	i 9 9	+15	10·8	12·2
Brisbane	E.	23·2	290	i 5 6	− 3	i 9 24	+ 6	—	—
Melbourne		25·9	260	5 35	0	10 26	+22	12·7	15·4
Adelaide		31·5	263	—	—	i 11 10	−24	—	18·4
Manila		74·6	303	11 42	− 1	(21 26)	+ 8	21·4	—
Zi-ka-wei	Z.	86·5	314	e 13 0	+14	—	—	—	48·4
La Jolla	Z.	92·8	49	e 13 15	− 1	—	—	—	—
Pasadena	Z.	93·1	48	e 13 18	+ 1	—	—	—	—
Mount Wilson	Z.	93·3	48	i 13 19	+ 1	—	—	—	—
Riverside	Z.	93·5	48	i 13 18	− 1	—	—	—	—
Huancayo		95·6	110	e 13 33	+ 5	(e 24 36)	− 7	e 24·6	—
Tucson		96·4	54	13 34	+ 2	—	—	e 43·1	—
Calcutta	N.	103·1	289	e 17 57	PP	—	—	—	77·1
Ottawa		126·3	57	e 19 5	[0]	—	—	64·7	—
Tashkent		126·3	298	e 20 40	PP	e 30 58	PS	e 56·0	71·0
Sverdlovsk		135·2	317	i 21 53	PP	e 39 47	SS	64·2	70·8
Baku		140·0	291	e 21 0	?	e 32 24	PS	e 64·7	79·6
Tiflis		144·1	291	e 19 30	[− 8]	—	—	72·7	86·5

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Scoresby Sund	146·7	11	e 19 32	[−10]	—	—	66·7	—
Moscow	148·0	317	i 19 40	[− 4]	—	—	—	—
Ksara	149·0	273	19 45	[− 1]	e 33. 4	SS	—	—
Pulkovo	149·9	327	e 19 57	[+10]	—	—	—	—
Helwan	151·1	264	—	—	e 33 47	SS	—	—
Theodosia	151·1	296	e 20 1	[+12]	—	—	—	—
De Bilt	164·9	343	—	—	e 34 0	SS	e 86·7	95·9
Uccle	166·3	342	—	—	e 38 12	PPS	e 86·7	—
Stuttgart	166·4	327	—	—	e 38 20	PPS	e 91·7	—
Paris	168·6	344	—	—	e 37 42?	?	90·7	—

Additional readings :—
Tuai (Δ =1°·0) gives 16h.53m.0s., M =16h.53m.16s.
Arapuni +43s., +59s., +1m.16s., and +1m.25s.
Hastings +46s. and +52s.
New Plymouth +1m.0s., +1m.2s., +1m.6s., +1m.13s., +1m.17s., S =+1m.35s.
Wellington +1m.11s., +1m.16s., +1m.21s., +1m.23s., +1m.32s., and +1m.35s.
Chatham Ils i =+4m.54s.
Christchurch +2m.1s., +2m.7s., +2m.15s., +2m.33s., +2m.55s., +3m.0s., +3m.15m., +3m.25s.
Melbourne i =+6m.12s.
Adelaide e =+9m.4s., i =+13m.55s.
Manila SE =+17m.10s.
Mount Wilson ePPZ =+16m.52s.
Riverside ePPZ =+16m.59s.
Tashkent e =+22m.18s., +23m.41s., +24m.33s., +29m.28s., and +31m.45s.
Baku e =+22m.58s., +37m.12s., and +46m.6s.
Tiflis eEN =+21m.54s., eN =+41m.53s.
Moscow e =+23m.11s.
Ksara iPKP =+19m.56s., ePPP =+26m.54s.
Pulkovo e =+23m.13s.
Helwan e =+36m.42s.
Long waves were also recorded at San Juan, Irkutsk, La Paz, Vladivostok, Apia, Strasbourg, Hong Kong, Rio de Janeiro, Bombay, San Fernando, Copenhagen, Oak Ridge, Kew, and Ivigtut.

Oct. 23d. 17h.

Scale III-IV at Almeria. Bulletin Mensuel Provisoire du Bureau International de Seismologie, Strasbourg.

Almeria iP_g =23m.21s., iS_g =23m.27s.
Granada iP_g =23m.53s., iS_g =24m.10s.
Alicante P =23m.57s.
Malaga iP =24m.5s., P_g =24m.7s., iPP =24m.15s., PS =24m.29s., iS =24m.34s., SS =24m.45s.
Toledo eP =24m.26s., i =24m.48s., iS_g =25m.11s.
San Fernando iPN =25m.41s.
Tortosa eN =25m.47s., S =25m.59s.

Oct. 23d. Readings also at 0h. (Wellington), 1h. (near Wellington, Christchurch, and New Plymouth), 2h. (Wellington), 3h. (Apia, Pasadena, Riverside, Oak Ridge, and near Algiers (2)), 4h. (near Nagoya and near Santiago), 5h. (near Santiago), 9h. (Apia and Tiflis), 10h. (Tiflis), 11h. and 13h. (La Paz), 14h. (near Nagoya and Apia), 15h. (Columbia, near New Plymouth, Wellington, and near Nagoya), 17h. (Almeria), 18h. (La Paz and Manila), 21h. (near Tananarive), 23h. (near Kobe, Sumoto, Nagoya, and Toyooka).

Oct. 24d. 11h. 35m. 57s. Epicentre 60°·0N. 150°·5W.

This determination is calculated accurately from epicentre of 1937 July 25d. (60°·2N. 148°·9W.), and is correct to 0°·1.

$A = -\cdot4374$, $B = -\cdot2474$, $C = +\cdot8646$; $\delta = +6$; $h = -9$;
$D = -\cdot492$, $E = +\cdot870$; $G = -\cdot753$, $H = -\cdot426$, $K = -\cdot503$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
College		5·0	11	1 17k	− 1	e 2 7	−11	e 2·5	—
Sitka		8·4	103	e 2 5	− 1	i 3 35	− 8	i 5·0	—
Victoria		19·5	114	i 4 37	+ 6	—	—	8·0	—
Seattle		20·5	114	e 4 57	PP	e 8 0	−27	e 8·9	—
Saskatoon		25·3	88	5 20	−10	9 44	−10	13·0	—
Butte		26·3	104	e 5 39	0	e 10 23	+12	e 12·2	—
Ukiah		27·0	127	e 5 39	− 6	e 10 31	+ 9	e 11·7	—
Bozeman		27·3	104	e 6 4	+16	e 10 20	− 7	e 12·2	—
San Francisco		28·5	127	e 6 1	+ 2	—	—	—	—
Berkeley		28·5	127	e 5 59	0	i 10 53	+ 7	—	—
Branner	E.	28·9	127	e 6 1	− 2	—	—	—.	—
Lick		29·2	127	e 6 5	0	—	—	—	—
Fresno	N.	30·5	126	e 6 25	+ 8	—	—	—	—
Tinemaha	Z.	30·8	123	i 6 20	0	—	—	—	—
Mount Wilson		33·3	125	i 6 42k	+ 1	—	—	—	—
Pasadena		33·4	125	i 6 41k	− 1	e 12 5	+ 2	e 14·3	—
Riverside		33·8	125	i 6 44k	− 2	e 12 10	0	—	—
La Jolla		34·9	125	i 6 56	+ 1	i 12 29	+ 2	—	—
Tucson		38·1	118	i 7 22	0	e 13 16	0	e 15·4	—
Florissant		42·7	92	e 7 59	− 1	e 14 16	− 8	e 28·1	—
St. Louis	E.	42·9	92	e 8 1	− 1	e 14 30	+ 3	e 20·8	—
Toronto		44·5	78	e 8 30	+15	e 14 45	− 6	20·0	—
Little Rock		44·8	98	e 8 18	+ 1	—	—	e 23·1	—
Scoresby Sund		44·8	22	i 8 36	+19	14 51	− 4	21·0	—
Ottawa		45·1	74	8 18	− 2	14 55	− 4	20·8	—
Ivigtut		45·2	42	8 28	+ 8	15 17	+16	21·0	—
Buffalo		45·3	78	i 8 23	+ 2	e 15 15	+13	—	—
Shawinigan Falls		45·6	70	e 8 23	− 1	—	—	23·0	—
Seven Falls		46·1	69	8 34	+ 6	15 23	+ 9	22·0	—
Vermont		46·9	73	e 10 41	PP	e 15 17	− 8	i 28·7	—
Pennsylvania		47·4	80	e 8 37	− 1	—	—	e 23·8	—
Vladivostok		48·1	286	e 8 41	− 2	e 15 33	− 9	e 24·2	28·1
Williamstown		48·3	74	i 8 43	− 2	—	—	—	—
Oak Ridge		49·2	73	i 8 50a	− 2	e 16 11	+13	e 22·0	—
Fordham		49·3	76	e 8 48	− 5	15 58	− 1	—	—
Georgetown		49·3	80	e 8 51	− 2	i 15 56	− 3	e 23·0	—
East Machias		49·5	69	e 9 47	+53	—	—	e 19·6	—
Philadelphia		50·0	78	e 9 4	+ 6	e 15 56	−13	e 19·4	—
Columbia		51·1	88	e 9 45	+39	e 15 1	?	e 23·4	—
Irkutsk		53·0	313	e 9 17	− 4	16 44	− 6	25·0	33·4
Upsala	E.	60·1	8	—	—	e 18 3?	−21	—	—
Pulkovo		60·6	359	e 10 13	− 2	e 18 26	− 4	29·5	32·4
Sverdlovsk		60·9	341	i 10 14	− 3	i 18 5	−29	28·0	42·8
Zi-ka-wei	Z.	62·6	285	e 10 22	− 6	18 53	− 3	—	39·3
Rathfarnham Castle		63·5	24	—	—	i 23 29	SS	36·3	—
Copenhagen		63·9	12	10 35	− 2	19 8	− 4	33·0	—
Moscow		64·4	355	10 39	− 1	19 13	− 5	34·5	45·0
Hamburg	Z.	65·7	13	e 11 0	+12	—	—	—	—
Paris		69·3	19	e 8 3?	?	—	—	36·0	43·0
Prague		69·6	10	e 11 16	+ 3	e 20 19	− 2	e 39·0	51·5
Stuttgart		70·3	14	e 11 28	+11	e 20 31	+ 2	e 39·0	47·0
Basle		71·3	16	e 11 22	− 1	—	—	—	—
San Juan		71·5	85	e 11 35	+11	e 20 37	− 6	e 28·3	—
Vienna	Z.	71·6	9	e 11 33	+ 8	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Zurich		71·6	16	e 11 24	− 1	—	—	—	—
Neuchatel		71·8	16	e 11 25	− 1	—	—	—	—
Stara Dala		72·1	8	—	—	e 20 21	−29	—	50·0
Tchimkent		72·9	330	11 32	− 1	—	—	—	—
Hong Kong		73·6	286	21 3	S	(21 3)	− 4	—	43·2
Tashkent		73·9	330	11 41	+ 2	i 21 3	− 7	e 33·4	48·7
Trieste		73·9	12	—	—	e 20 53	−17	—	—
Theodosia		75·2	356	e 11 52	+ 6	e 21 19	− 6	—	—
Sebastopol		75·7	358	e 12 7	+18	e 21 30	0	—	—
Yalta		75·8	357	e 11 9	−41	—	—	—	—
Samarkand		76·0	331	11 54	+ 3	21 30	− 4	—	—
Grozny		76·2	348	11 52	0	e 21 33	− 3	—	—
Manila		76·8	276	11 56	+ 1	21 33	− 9	—	—
Tiflis		77·9	349	e 12 0	− 1	i 21 49	− 5	e 40·0	51·1
Phu-Lien		78·4	292	—	—	21 3?	−57	—	—
Baku		78·6	344	e 12 8	+ 3	21 56	− 6	37·5	47·2
Almeria		80·0	26	e 12 30	+17	—	—	—	—
Agra		84·5	317	—	—	i 22 52	−10	—	—
Calcutta,	N.	84·9	307	e 12 47	+ 9	i 22 55	−11	—	53·4
Ksara		86·4	355	i 12 58	+13	e 23 38	+17	—	—
Helwan		90·5	359	—	—	i 23 53	− 6	—	—
Huancayo		93·1	108	—	—	e 23 42	[− 8]	e 39·9	—
Bombay		93·9	319	e 17 6	PP	e 23 47	[− 8]	—	—
La Paz	N.	100·4	105	e 18 0	PP	—	—	55·0	64·0

Additional readings :—
Sitka P = +2m.11s., i = +3m.15s., S = +3m.54s.
Ukiah eP = +5m.48s., ePcP = +8m.23s., eS = +10m.45s.
Branner eN = +6m.6s.
Pasadena iSE = +12m.22s.
Tucson P = +7m.36s., iP = +7m.51s., ePP = +8m.47s., iPPP = +9m.14s.
Florissant iNZ = +9m.51s., eN = +17m.37s. and +18m.7s.
St. Louis eE = +8m.56s. and +9m.52s., iPPPE = +9m.57s., eSSE = +17m.39s.
Little Rock ePPE = +9m.54s., iPPPN = +10m.23s., eEN = +13m.1s.
Scoresby Sund +10m.20s. and +18m.21s.
Ottawa PPP = +10m.21s., SSS = +18m.21s.
Ivigtut +18m.27s.
Buffalo i = +8m.35s., ? = +18m.23s.
Vermont eSS = +18m.38s.
Pennsylvania e = +8m.52s. and +19m.9s.
Vladivostok e = +11m.40s., +17m.33s., and +20m.0s.
Williamstown i = +8m.57s., e = +22m.39s., i = +25m.16s.
Oak Ridge iN = +9m.1s., eSSN = +20m.9s.
Fordham ScP = +26m.3s.
Georgetown e = +8m.53s., PPP = +11m.3s., iS = +15m.59s., eSS = +19m.31s., and +19m.49s., e = +22m.3s.?
Philadelphia ePP = +11m.1s., eSS = +18m.30s.
Rathfarnham Castle +31m.39s.
Copenhagen +20m.21s. and +26m.27s.
Stuttgart ePP = +14m.14s., e = +20m.48s., eSS = +25m.9s.
San Juan eP = +12m.15s., ePP = +13m.42s., ePPP = +16m.7s., eScS = +21m.27s., eSS = +24m.55s., eSSS = +27m.44s.
Hong Kong PP? = +21m.37s., S? = +28m.14s.
Yalta i = +11m.32s.
Tiflis ePPN = +15m.12s., eN = +18m.16s., ePSN = +22m.17s., eN = +31m.3s.
Calcutta ePPN = +15m.53s., eSSN = +28m.19s.
Ksara PP = +16m.20s., PS = +25m.34s.
Huancayo eS = +24m.9s. and +24m.12s., ePPS = +25m.44s., ScSP = +26m.23s.
Long waves were also recorded at San Fernando, Hyderabad, De Bilt, Kodaikanal, Strasbourg, Kew, Rio de Janeiro, Kelzyo, Cape Town, and Christchurch.

Oct. 24d. Readings also at 0h. (Santiago), 7h. (Tananarive and La Paz), 8h. (Manzanillo), 10h. (Talhoku, Mizusawa, and Nagoya), 11h. (Malaga, Granada, Mizusawa, and Nagoya), 12h. (Manzanillo), 14h. (La Paz, Grozny, Tiflis, Riverside, Pasadena, Mount Wilson, Montezuma, and Huancayo), 15h. (Apia), 22h. (near Zurich and Chur), 23h. (Mizusawa).

Oct. 25d. 10h. 33m. 24s. Epicentre 37°·9S. 177°·8E. (as on 1937 Oct. 23d.).

Felt Force VI at Opotiki.

R. C. Hayes.

Earthquakes in New Zealand (incl. Earthquakes Summaries for 1937). Extract from New Zealand Official Year Book, 1939. Dominion Observatory, Wellington, W.I., New Zealand. Bulletin No. 138, p. 7. Epicentre 37°·9S. 177°·8E.

$A = -·7905$, $B = +·0304$, $C = -·6117$; $\delta = -1$; $h = -1$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tuai		1·0	210	0 36	S	(0 36)	0	—	0·9
Arapuni		1·7	264	0 29	− 2	0 48	− 6	—	—
Hastings		1·9	202	0 36?	+ 2	0 57	− 2	—	1·3
New Plymouth		3·1	248	0 51	0	1 32	+ 3	—	—
Wellington		4·1	214	1 5	0	1 54	− 1	—	—
Christchurch		6·9	214	e 1 40	− 5	2 56	− 9	—	—
Chatham Ils.		7·4	147	—	—	e 3 12	− 6	—	7·3
Riverview		21·9	273	i 4 56a	− 1	e 9 6	+12	e 11·2	12·9
Sydney		21·9	273	e 5 0	+ 3	i 9 26	+32	13·2	13·8
Brisbane		23·2	290	i 5 6	− 3	i 9 24	+ 6	10·0	—
Melbourne		25·9	260	5 33	− 2	10 25	+21	12·7	16·9
Adelaide		31·5	263	e 7 13	PP	e 14 34	SSS	—	19·5
Perth		50·3	257	—	—	i 21 37	SSS	—	—
Manila		74·6	303	i 11 40	− 3	21 21	+ 3	36·3	—
Hong Kong		84·6	303	—	—	(24 11)	PS	—	24·2
Pasadena		93·1	48	e 13 18	+ 1	—	—	e 45·6	—
Mount Wilson	z.	93·3	48	i 13 17	− 1	—	—	—	—
Riverside	z.	93·5	48	i 13 19	0	—	—	—	—
Huancayo		95·6	110	—	—	e 24 4	[0]	e 43·7	—
Tucson		96·4	54	e 13 33	+ 1	—	—	—	—
La Paz		97·9	118	e 23 45	SKS	(e 23 45)	[−31]	47·6	53·3
Kodaikanal	E.	104·3	272	e 19 36?	?	—	—	—	—
Irkutsk		110·1	321	—	—	e 23 36?	?	49·6	76·4
San Juan		121·5	90	—	—	e 25 59	[+ 4]	e 62·5	—
Ottawa		126·3	57	e 19 1	[− 4]	—	—	65·6	—
Tashkent		126·3	298	e 21 57	PP	e 41 55	SSS	e 56·9	64·5
Williamstown		127·1	62	e 19 5	[− 1]	—	—	—	—
Seven Falls		130·9	56	e 22 41	PP	—	—	63·6	—
Sverdlovsk		135·2	317	e 19 19	[− 3]	e 39 51	SS	56·6	71·1
Baku		140·0	291	e 19 36	[+ 5]	e 30 17	{+56}	76·8	85·4
Tiflis		144·1	291	e 19 34	[− 4]	e 41 14	SS	e 67·6	89·0
Platigorsk		145·6	295	e 19 39	[− 1]	—	—	—	—
Ksara		149·0	273	i 19 45a	[− 1]	—	—	—	—
Helwan		151·1	264	—	—	i 27 16	[+21]	—	—

Additional readings :—
Tuai +47s.
Arapuni +37s., +59s., +1m.16s., and +1m.27s.
Hastings +46s., +53s., +1m.3s., and +1m.11s.
New Plymouth +57s., +59s., +1m.7s., +1m.10s., +1m.14s., and +1m.25s.
Wellington +1m.7s., +1m.15s., +1m.20s., +1m.26s., +1m.58s., +2m.2s., and +2m.44s.
Christchurch e = +1m.46s., +1m.54s., +2m.5s., +2m.15s., +2m.21s., +2m.25s., +2m.30s., +2m.38s., and +3m.30s.
Chatham Ils. e = +3m.36s., i = +4m.6s. and +5m.36s.
Melbourne i = +6m.11s.
Perth i = +27m.31s.
Mount Wilson ePPZ = +16m.58s.
Huancayo eS = +24m.10s.
Irkutsk e = +32m.56s., +33m.56s., and +38m.20s.
San Juan eS$_o$SP = +29m.35s., ePPS = +30m.49s.
Tashkent e = +23m.40s., +24m.33s., and +33m.55s.
Seven Falls e = +36m.36s.?
Sverdlovsk i = +21m.49s. and +24m.50s., e = +30m.33s., +33m.53s., and +45m.28s.
Baku e = +23m.6s., +33m.17s., and +46m.59s.
Tiflis eN = +22m.36s., eE = +31m.48s. and +35m.16s.
Ksara ePP = +23m.25s., ePSKS = +33m.39s., ePPS = +36m.41s.
Helwan i = +29m.56s. and +33m.46s.
Long waves were also recorded at Cape Town, Bombay, Apia, Strasbourg, Copenhagen, Scoresby Sund, De Bilt, Kew, Prague, San Fernando, and Stuttgart.

Oct. 25d. 23h. 20m. 35s. Epicentre 49°·5N. 155°·5E.

$A = -\cdot5933$, $B = +\cdot2704$, $C = +\cdot7582$; $\delta = -1$; $h = -5$;
$D = +\cdot417$, $E = +\cdot910$; $G = -\cdot690$, $H = +\cdot314$, $K = -\cdot652$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sikka		8·1	273	2 8	+ 6	4 6	S*	—	—
Asahigawa		10·7	242	2 47	+ 9	—	—	—	—
Haboro		10·8	246	2 43	+ 4	—	—	—	—
Urakawa		11·5	235	3 13	PPP	—	—	—	—
Sapporo		11·7	241	2 59	+ 8	—	—	—	—
Hakodate		12·9	236	3 15	+ 8	—	—	—	—
Morioka		14·1	231	3 22	− 1	—	—	—	—
Mizusawa	E.	14·6	230	e 3 53	PPP	6 7	− 6	—	—
Sakata		15·4	232	3 50	+10	—	—	—	—
Hukusima		16·0	228	3 52	+ 4	—	—	—	—
Niigata		16·5	231	4 40	PPP	—	—	—	—
Kakioka		17·3	225	4 0	− 4	7 12	− 4	—	—
Vladivostok		17·5	257	e 4 10	+ 3	i 7 32	+11	i 9·3	15·4
Maebasi		17·7	227	4 12	+ 2	7 29	+ 3	—	—
Kumagaya		17·8	227	4 16	+ 5	7 32	+ 4	—	—
Nagano		17·9	230	4 17	+ 5	7 42	+12	—	—
Tokyo Cen. Met. Ob.		17·9	227	4 19	+ 7	—	—	—	—
Oiwake		18·0	228	4 12	− 1	7 41	+ 9	8·0	—
Wazima		18·1	236	4 17	+ 3	7 43	+ 8	—	—
Hunatu		18·6	227	4 24	+ 3	—	—	—	—
Kohu		18·6	227	4 23	+ 2	—	—	—	—
Misima		18·8	227	4 23	0	—	—	—	—
Gihu		19·7	230	4 31	− 3	7 56	−14	—	—
Nagoya		19·7	230	4 34	0	8 16	+ 6	—	—
Hikone		20·0	230	4 37	0	—	—	—	—
Osaka		20·9	233	4 43	− 3	8 56	+21	—	—
Osaka B		20·9	233	4 47	+ 1	—	—	—	—
Kobe		21·0	233	e 4 34	−13	e 8 37	0	—	—
Sumoto	E.	21·4	233	e 4 39	−12	e 8 46	+ 1	—	—
	Z.	21·4	233	i 4 51	0	e 8 50	+ 5	—	—
Wakayama		21·4	233	4 51	0	8 46	+ 1	—	—
Siomisaki		21·7	229	4 54	− 1	—	—	—	—
Hamada		22·6	238	5 3	0	—	—	—	—
Zinsen		24·0	252	i 5 18	+ 1	e 9 32	0	—	—
Husan		24·1	245	e 5 19	+ 1	—	—	—	—
Hukuoka B		24·4	239	5 22	+ 1	9 39	0	—	—
Kumamoto		24·8	237	5 19	− 6	—	—	—	—
College		33·0	41	—	—	e 12 18	+21	e 14·8	—
Hong Kong		42·3	246	14 14	S	(14 14)	− 5	—	24·2
Manila		44·8	231	i 8 18	+ 1	14 54	− 1	—	—
Sverdlovsk		52·9	317	i 9 19	− 1	e 16 45	− 3	25·4	35·5
Tashkent		57·9	298	e 10 18	+22	18 14	+19	e 27·7	36·5
Agra	E.	62·0	280	—	—	i 18 48	0	—	—
Pulkovo		62·4	333	i 10 26	− 1	—	—	e 31·9	38·4
Mount Wilson	Z.	62·7	69	i 10 28	− 1	—	—	—	—
Pasadena	Z.	62·7	69	i 10 28	− 1	—	—	—	—
Moscow		63·1	327	e 10 28	− 4	—	—	34·9	39·9
Riverside	Z.	63·3	69	i 10 31	− 2	—	—	—	—
Grozny		69·1	313	e 11 12	+ 2	—	—	—	—
Baku		69·2	309	11 6	− 4	e 20 20	+ 4	36·4	44·5
Piatigorsk		69·8	315	e 11 4	−10	—	—	—	—
Tiflis		70·7	313	11 19	− 1	e 20 35	+ 1	e 37·4	48·0
Bombay		71·2	278	i 11 23	0	e 20 38	− 2	—	39·4
Theodosia		72·4	321	11 30	0	—	—	—	—
Vienna	Z.	76·4	334	e 11 45	− 8	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Stuttgart		77·9	338	e 12 1a	0	e 22 8	+14	e 42·4	—
Zurich		79·4	339	e 12 13	+ 4	—	—	—	—
Weston	Z.	79·7	34	i 12 10k	− 1	—	—	e 43·4	—
Ksara		81·3	313	i 12 20	0	—	—	—	—
San Juan		103·0	40	—	—	e 25 39	− 7	e 43·9	—
Huancayo		124·1	66	—	—	i 36 21	?	—	—
La Paz	N.	131·8	64	e 38 13	SS	41 2	?	42·4	43·0

Additional readings :—
Oiwake PP = +4m.26s.
Kobe ePZ = +4m.39s.
Sumoto ePN = +4m.42s., iPE = +4m.49s.
Pulkovo e = +12m.36s. and +20m.17s.
Moscow e = +11m.11s.
Baku SS = +25m.37s., SSS = +28m.31s.
Tiflis eSSN = +25m.29s., eSSSN = +28m.33s.
Weston iZ = +12m.23s.
Ksara ePP = +15m.28s., ePS = +23m.18s.
San Juan eSS = +33m.13s., eSSS = +42m.53s.
Huancayo i = +36m.32s.
Long waves were also recorded at Rio de Janeiro, Christchurch, Wellington, Oak Ridge, Williamstown, Scoresby Sund, and other European stations.

Oct. 25d. Readings also at 0h. (Apia), 3h. (Hukuoka B), 5h. (Apia), 6h. (Nagoyo (2)), 7h. (Phu-Lien, Christchurch, Perth, Manila, Ksara, Mount Wilson, Pasadena, Riverside, Bombay, Kodaikanal, Sverdlovsk, Tashkent, Cape Town, Baku, Brisbane, Riverview, and Sydney), 8h. (Nagoya, Paris, Hyderabad, San Fernando, Tiflis, Irkutsk, La Paz, Hong Kong, Huancayo, Samarkand, and Andijan), 9h. (Andijan, Samarkand, Tashkent (2), Jersey, Frunse, Tchimkent, and Melbourne), 10h. (Wellington (2), Tuai (2), and New Plymouth (2)), 11h. (Manila), 12h. (Apia), 15h. (Apia), 16h. (Apia), 17h. (Nagoya), 19h. (Nagoya), 20h. (Tashkent, Andijan, Samarkand, and Tchimkent), 22h. (Hukuoka B).

Oct. 26d. Readings also at 0h. (Mount Wilson, Pasadena, and Riverside), 1h. (Batavia), 2h., 3h., and 7h. (Apia), 9h. (Mount Wilson and Riverside), 10h. (Mount Wilson (2), Pasadena (2), Riverside (2), Grozny, Piatigorsk, Tiflis, Helwan, Ksara, and Stuttgart), 11h. (Grozny), 12h. (Tacubaya), 13h. (Baku, Sverdlovsk, Tiflis, Mount Wilson, Pasadena, Riverside, Apia, Ksara, Vladivostok, Manila, Hong Kong, Nagoya, Kobe, and near Sumoto), 16h. (Oaxaca), 17h. (near Branner), 19h. (Pasadena, Riverside, Vladivostok, Manila, Sverdlovsk, Tiflis, Baku, and Ksara), 22h. (Andijan and near Samarkand).

Oct. 27d. 0h. Chile.

Santiago P = 21m.50s., S = 22m.18s.
La Plata P = 23m.52s., S = 25m.42s., L = 26m.30s.
La Paz iPZ = 25m.38s., iSN = 29m.14s., iN = 29m.54s., LN = 30m.44s., M = 32m.12s.
Huancayo P = 26m.25s., PP = 26m.51s., eS = 30m.31s., iL = 31m.21s.
Rio de Janeiro eP = 27m.0s., eS = 31m.29s.
San Juan eP = 31m.3s., ePP = 32m.45s., eS = 37m.56s. and = 38m.13s.
Tucson iP = 33m.2s. and = 33m.30s.
Weston iPZ = 33m.4s.a, i = 33m.31s.
Oak Ridge iZ = 33m.5s.k.
Riverside iPZ = 33m.27s.k, ipPZ = 33m.54s.
Mount Wilson iPZ = 33m.30s.k, iZ = 33m.40s., ipPZ = 33m.58s., eZ = 36m.30s. and = 39m.30s.
Pasadena iPNZ = 33m.30s.k, ipPZ = 33m.57s.
Tinemaha ePE = 33m.40s., epPE = 34m.10s.
Samarkand eP = 40m.49s., e = 41m.9s.
Ksara ePP = 41m.59s., ePPP = 44m.33s., ePS = 51m.43s., ePPS = 52m.47s., L = 78m.
Andijan eP = 42m.0s., e = 45m.33s.
Tiflis eEN = 43m.34s., eE = 49m.20s. and 53m.8s., eLEN = 59m.

Oct. 27d. 18h. 51m. 54s. Epicentre 2°·2N. 126°·9E. (as on 1937 Sept. 21d.).

$A = -\cdot6000$, $B = +\cdot7991$, $C = +\cdot0382$; $\delta = +2$; $h = +7$;
$D = +\cdot800$, $E = +\cdot600$; $G = -\cdot023$, $H = +\cdot031$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		13·6	335	3 15	− 2	i 6 28	SSS	—	—
Batavia		21·7	248	i 4 53	− 2	i 8 51	0	—	—
Hong Kong		23·5	329	5 17	+ 5	9 6	−17	11·0	14·7
Phu-Lien		27·1	315	5 6?	−40	—	—	—	—
Nagoya		34·1	15	e 6 47	− 1	—	—	—	—
Vladivostok		41·0	6	e 7 58	+12	e 13 58	− 1	—	20·5
Frunse		61·6	318	e 10 59	+37	—	—	—	—
Andijan		62·3	316	e 10 16	−10	—	—	—	—
Tashkent		64·6	315	i 10 49	+ 8	i 19 4	−17	e 29·9	43·8
Samarkand		65·7	313	e 10 30	−18	—	—	—	—
Sverdlovsk		75·3	329	11 40	− 7	21 10	−16	33·1	—
Baku		78·7	311	e 12 33	+27	e 21 56	− 7	37·6	48·2
Tiflis	E.	82·6	311	e 12 8	−18	e 22 14	−29	e 44·1	—
Ksara		89·6	304	e 12 58	− 3	e 23 42	− 9	—	50·6

Additional readings :—
Batavia ePE = +4m.55s., S?E = +8m.57s.
Ksara ePS = +24m.38s.
Long waves were also recorded at Irkutsk, Wellington.

Oct. 27d. Readings also at 3h. (La Paz), 4h. (Riverside, Mount Wilson, Pasadena, Wellington, Ksara, Taihoku, Tiflis, and Sverdlovsk), 5h. (Erevan, Tiflis, and Baku), 6h. (Tiflis and Samarkand), 9h. (Pennsylvania), 10h. (Pasadena, Mount Wilson, and La Paz), 11h. (Pasadena, Mount Wilson, Samarkand, Riverside, Christchurch, Wellington, and Kobe), 15h. (Riverside, Mount Wilson, Pasadena, Tinemaha, Fresno (3), San Francisco (3), Bucharest, Sofia, Lick (3), Berkeley (3), and Branner (3)), 16h. (La Paz, Lick (4), Williamstown, Oak Ridge, La Plata, Riverside, Mount Wilson, Pasadena, San Francisco, and Branner (4)), 17h. (Lick and Branner), 18h. (Andijan), 20h. (Branner (4), Lick (4), San Francisco (3), Berkeley (3), and Fresno (2)), 22h. (Lick), 23h. (Lick and Branner).

Oct. 28d. 9h. Undetermined shock :—

Sydney e = 35m.40s., L = 43m.55s., M = 44m.45s.
Perth P = 36m.19s., PP = 36m.52s., P_cP = 38m.58s., S = 40m.56s., SSS = 42m.27s., SSS = 42m.48s., L = 44m.50s., M = 45m.35s.
Adelaide eP = 36m.58s., S = 38m.34s., iL = 39m.28s., M = 39m.54s.
Amboina PEN = 39m.54s., S?EN = 44m.12s.
Melbourne iP = 40m.14s., i = 40m.28s., S = 41m.55s., L = 42m.10s., M = 42m.30s.
Riverview eZ = 40m.36s., iN = 40m.43s., iE = 41m.11s. and 42m.9s., iN = 42m.17s., iSN = 42m.31s., iE = 42m.36s., iZ = 42m.47s. and 42m.54s., M = 46m.31s.
Brisbane ePN = 40m.42s., iE = 41m.12s., iSEN = 42m.30s.
Ksara e = 49m.6s., M = 103m.
Christchurch 51m.
Wellington e = 52m.0s.
Pasadena iPZ = 53m.26s.
Mount Wilson iPZ = 53m.27s.
Riverside iPZ = 53m.28s.
Weston ePZ = 54m.33s., iPZ = 54m.39s., i = 54m.47s.
Williamstown i = 54m.34s.
Oak Ridge iZ = 54m.37s.a.
Long waves were also recorded at Baku, Sverdlovsk, and Tortosa.

Oct. 28d. 15h. 30m. 12s. Epicentre 2°·5N. 122°·0E. (as on Sept. 28d.).

$A = -\cdot5294$, $B = +\cdot8473$, $C = +\cdot0433$; $\delta = +6$; $h = +7$;
$D = +\cdot848$, $E = +\cdot530$; $G = -\cdot023$, $H = +\cdot037$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		12·0	355	2 52	− 3	5 40	+29	—	8·6
Hong Kong		21·1	340	4 52	+ 4	8 44	+ 5	—	13·6
Phu-Lien		23·6	324	4 48?	−25	—	—	—	—
Zi-ka-wei	Z.	28·5	0	e 5 40	−19	10 36	−10	—	17·5
Irkutsk		51·7	347	e 8 59	−12	e 16 13	−19	25·8	—
Tashkent		61·0	317	i 10 18	0	18 43	+ 8	e 33·1	41·3
Sverdlovsk		72·6	330	—	—	e 20 51	− 5	33·8	—
Baku		74·8	312	e 10 48	−56	21 36	+16	39·8	46·8
Ksara		85·4	303	e 12 42	+ 2	e 24 22	PS	—	55·8

Additional readings :—
Baku e = +26m.51s. and +30m.54s.
Long waves were also recorded at De Bilt, Paris, Strasbourg, Uccle, Tiflis, Sydney, Wellington, and Christchurch.

Oct. 28d. Readings also at 1h. (Tiflis and near Manila), 3h. (Apia, Sydney, near Branner, and Lick), 4h. (Bucharest, Kodaikanal, and Batavia), 5h. (near San Javier), 6h. (Samarkand and near Andijan), 7h. (Helwan, Samarkand, Ksara, and Tiflis), 9h. (Lick), 11h. (Huancayo, near Grozny, and near Mizusawa), 12h. (Berkeley, Branner, Lick, and San Francisco), 13h. (near Hukuoka and Hukuoka B), 15h. (Amboina and Durham), 18h. (Mount Wilson, Pasadena, Riverside, Adelaide, and Riverview), 19h. (Andijan), 20h. (Lick and Wellington), 22h. (near Grozny), 23h. (near Branner).

Oct. 29d. 7h. 26m. 31s. Epicentre 37°·0N. 70°·5E.

Felt force VI at Cherat and Drosh ; force V at Lahore, Shillong, Peshawar, Srinigar, and Kaboul.

India Weather Review, 1937. Annual Summary, Part D., Seismic Records, pp. D47. Earthquake Reports.

$A = +\cdot2672$, $B = +\cdot7547$, $C = +\cdot5992$; $\delta = +1$; $h = +1$;
$D = +\cdot943$, $E = -\cdot334$; $G = +\cdot200$, $H = +\cdot565$, $K = -\cdot801$.

A depth of focus 0·020 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand		3·8	315	1 11	P*	i 1 54	S*	—	—
Andijan		4·0	20	1 17	+16	i 2 9	+20	—	—
Tashkent		4·4	351	i 1 18	+12	i 2 18	+20	i 2·9	—
Tchimkent		5·3	354	1 32	+14	2 39	+20	—	—
Frunse		6·7	27	i 1 48	+11	—	—	—	—
Almata		8·0	36	2 8	+14	3 43	+19	—	—
Dehra Dun		9·1	135	2 29	+20	3 59	+ 9	—	5·5
Agra		11·7	145	2 39	− 4	i 4 38	−13	—	—
Baku		16·4	288	e 3 46	+ 4	i 6 46	+ 8	—	—
Bombay	E.	18·2	174	i 4 0	− 3	i 7 9	− 9	—	—
Grozny		19·9	296	i 4 26	+ 5	i 7 58	+ 7	—	—
Tiflis		20·4	291	i 4 27	+ 1	i 8 4	+ 4	—	—
Erevan		20·5	286	e 2 29	?	6 22	?	—	—
Hyderabad		20·7	159	4 29	0	7 59	− 7	10·0	12·7
Sverdlovsk		20·9	345	i 4 36	+ 5	i 8 27	+18	—	—
Calcutta		21·1	128	e 4 34	+ 1	i 8 9	− 4	e 9·6	—
Platigorsk		21·9	298	i 4 44	+ 3	i 8 44	+17	—	—
Kodaikanal	E.	27·4	165	e 5 29	− 3	i 9 51	− 8	—	14·3
Theodosia		27·5	298	e 5 30	− 3	11 28	SS	—	—
Irkutsk		28·2	46	i 5 46	+ 6	10 20	+ 8	—	—
Ksara		28·3	273	i 5 39a	− 2	10 11	− 3	—	—
Yalta		28·4	296	e 6 37	PP	—	—	—	—
Sebastopol		28·8	297	i 5 43	− 2	—	—	—	—
Moscow		29·0	321	i 5 48	+ 1	10 18	− 7	11·0	15·6
Colombo		31·2	162	e 6 0	− 6	—	—	—	16·9

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		Δ °	Az. °	P. m. s.	O−C. s.	S. m. r.	O−C. s.	L. m.	M. m.
Bucharest		34·1	297	e 6 31	0	e 11 44	0	—	—
Pulkovo		34·3	325	i 6 33	0	11 43	− 4	12·0	16·8
Phu-Lien		35·2	107	e 7 29	+49	e 11 58	− 3	—	—
Sofia		36·3	294	e 6 51	+ 1	e 12 15	− 3	—	—
Stara Dala		39·4	303	e 7 17	+ 1	—	—	—	—
Hong Kong		40·3	99	13 18	S	(13 18)	0	—	17·7
Upsala		40·4	322	i 7 24	0	i 13 11	− 9	—	—
Vienna		40·6	304	e 7 25	0	e 15 31	?	—	—
Prague		41·7	307	e 7 34	0	e 16 59	SS	—	—
Triest		42·7	301	i 7 42	− 1	i 17 13	SS	—	—
Copenhagen		42·8	316	i 7 44a	+ 1	i 13 52	− 3	—	—
Jena		43·5	308	i 7 50	+ 1	—	—	—	—
Hamburg		44·3	313	i 7 55a	0	—	—	—	23·5
Stuttgart		45·3	305	i 8 3a	0	e 14 27	− 4	—	—
Strasbourg		46·2	305	i 8 8	− 2	e 14 28	−16	—	—
Vladivostok		46·5	63	—	—	e 16 24	?	—	—
De Bilt		47·3	311	i 8 18	− 1	e 14 57	− 2	e 19·5	—
Uccle		48·0	309	i 8 24a	0	i 15 6	− 3	e 18·5	—
Paris		49·6	306	e 8 35	− 1	—	—	—	—
Manila		50·0	103	9 7	+27	15 36	− 1	22·7	—
Kew		50·8	311	—	—	e 15 40	− 8	e 26·5	—
Edinburgh		51·6	317	—	—	e 21 12	SSS	—	—
Bidston		52·0	314	—	—	e 16 1	− 3	e 28·5	—
Nagoya		52·7	70	e 9 3	+ 3	—	—	—	—
Nagano		53·1	68	9 6	+ 3	—	—	—	—
Sapporo		53·1	59	9 5	+ 2	—	—	—	—
Oiwake		53·5	70	9 8	+ 2	—	—	—	—
Mizusawa	E.	54·3	65	(9 16)	+ 4	9 16	P	—	—
Hukusima		54·4	67	9 14	+ 2	—	—	—	—
Kakioka		54·7	69	9 15	0	—	—	—	—
Batavia		54·7	133	—	—	15 53	−47	—	—
Scoresby Sund		56·4	337	i 9 28k	+ 1	17 9	+ 6	—	—
Almeria		56·9	294	e 9 24	− 6	—	—	—	—
Toledo		56·9	297	i 9 6	−24	—	—	—	—
Ivigtut		70·2	334	10 55	− 2	19 53	− 1	—	—
Ottawa		92·5	337	e 12 53	− 1	e 23 5	[− 5]	33·5	—
Oak Ridge		93·6	333	i 5 58a	?	—	—	—	—
Weston	z.	93·7	333	i 12 50a	− 9	—	—	—	—
Williamstown		94·1	333	i 13 0	− 1	—	—	—	—
Haiwee	z.	107·0	7	e 17 4	?	—	—	—	—
Mount Wilson	z.	108·7	7	e 14 10	P	—	—	—	—
Pasadena	z.	108·8	7	e 14 11	P	—	—	—	—
Riverside	z.	109·0	7	e 17 19	?	—	—	—	—
La Jolla	z.	110·1	7	i 18 30	PKP	—	—	—	—

Additional readings :—
Andijan i = +1m.19s., +1m.24s., +1m.41s., and +1m.54s.
Samarkand i = +1m.20s., +1m.24s., +1m.36s., and +1m.51s.
Tchimkent i = +1m.36s., +1m.40s., +1m.45s., and +2m.4s.
Almata i = +2m.24s. and +3m.32s.
Agra sPEN = +3m.24s.
Bombay ipPE = +4m.50s., esPE = +5m.12s., iE = +8m.17s.
Tiflis pPE = +4m.49s., sPE = +5m.3s., sSN = +8m.45s.
Calcutta SS = +8m.49s.
Kodaikanal iE = +11m.8s.
Irkutsk sP = +6m.5s., PP = +6m.29s.
Ksara ipP = +6m.25s., isP = +6m.52s., isS = +11m.37s.
Yalta e = +7m.31s., +11m.32s., and +15m.38s.
Moscow pP = +6m.4s., iPP = +6m.32s.
Bucharest eE = +7m.47s., +10m.1s., +11m.23s., and +12m.54s., S?E = +14m.12s., eN = +14m.19s., eE = +15m.13s., eN = +15m.21s., and +16m.21s., eE = +16m.25s.
Pulkovo pP = +6m.49s., sP = +6m.55s., PP = +7m.19s.
Sofia eN = +16m.37s., eE = +18m.21s.
Stara Dala e = +9m.0s. and +9m.31s.
Hong Kong S? = +16m.19s.
Upsala iE = +16m.18s.
Vienna e = +9m.4s., S_cS = +17m.4s.

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Prague e = +10m.19s. and +14m.53s.
Triest ipP? = +8m.56s.
Copenhagen pP = +8m.32s., sP = +8m.53s. and +9m.17s., PP = +9m.26s., pPP = +10m.5s., sPP = +10m.31s., S = +13m.45s., sS = +15m.15s., SS = +17m.11s.
Jena eE = +9m.29s.
Hamburg eE = +17m.59s.
Stuttgart epP = +8m.51s., esP = +9m.9s., ePPEZ = +9m.53s., eZ = +11m.5s., esS = +15m.47s., e = +18m.43s.
Strasbourg iPPPZ = +10m.3s.
Vladivostok e = +17m.42s.
De Bilt iZ = +9m.33s., eN = +16m.23s.
Scoresby Sund sP = +10m.43s., PPP = +12m.59s., sS = +18m.31s., SS = +20m.41s., SSS = +22m.47s.
Toledo i = +9m.58s.
Weston iZ = +13m.10s., +14m.39s., and +16m.5s.
Williamstown e = +16m.5s., i = +16m.48s.
Haiwee eZ = +17m.56s., ePKKPZ = +29m.20s., eZ = +29m.38s.
Mount Wilson iZ = +17m.38s. and +18m.23s., iPKKPZ = +29m.17s., eZ = +30m.15s.
Pasadena eZ = +17m.13s. and +18m.22s., iZ = +18m.33s., eZ = +20m.5s. and +20m.57s., iPKKPZ = +29m.17s.
Riverside eZ = +18m.10s., iPKKPZ = +29m.16s., iZ = +30m.27s.

Oct. 29d. Readings also at 0h. (Apia), 2h. (Branner and Lick), 3h. (Branner, Lick, Tananarive, and Cape Town), 4h. (Kobe), 5h. (Branner, Lick, and Cape Town), 9h. (Amboina and Samarkand), 13h. (Sumoto), 15h. (Simferopol), 17h. (near Algiers), 18h. (Huancayo, Baku, Ksara, Grozny, Piatigorsk, Sverdlovsk, and Tiflis), 19h. (Wellington, Apia, Christchurch, Pasadena, Tashkent, Ksara, and Sverdlovsk), 20h. (Baku, Tiflis, Neuchatel, Zurich, Basle, Scoresby Sund, and Moscow), 21h. (Lick), 23h. (Apia).

Oct. 30d. Readings at 0h. (Branner and Lick), 1h. (Medan, Hong Kong, and Tiflis), 2h. (Branner, Lick, Berkeley, San Francisco, and Fresno), 3h. (Ferndale), 4h. (Wellington and La Paz), 5h. (Pasadena, Mount Wilson, Haiwee, Riverside, Huancayo, and Perth), 6h. (La Paz), 8h. (Tiflis, Baku, Agra, Kodaikanal, Calcutta, Samarkand, Tchimkent, Almata, Sverdlovsk, Andijan, and Tashkent), 9h. (Pulkovo), 10h. (Mizusawa), 12h. (Wellington), 15h. (Pasadena, Mount Wilson, Haiwee, and Riverside), 16h. (Manila and Hong Kong), 20h. (Pulkovo, Tiflis, Baku, Agra, Kodaikanal, Calcutta, Samarkand, Tchimkent, Almata, Sverdlovsk, Andijan (2), Tashkent, Copenhagen, Bombay, and Frunse), 22h. (Sumoto, Almata, Branner, and Lick).

Oct. 31d. 22h. 26m. 44s. Epicentre 37°·0N. 70°·5E. (as on 1937 Oct. 29d.).

A = +·2672, B = +·7547, C = +·5992; $\delta = +1$; $h = +1$.

Depth of focus 0·020 has been assumed as on Oct. 29d.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand		3·8	315	0 53	− 6	e 1 39	− 5	—	—
Andijan		4·0	20	1 9	+ 8	i 2 11	+22	—	2·4
Tashkent		4·4	351	i 1 10	+ 4	2 30	?	i 2·8	3·4
Frunse		6·7	27	e 1 45	+ 8	i 3 13	+21	—	3·5
Almata		8·0	36	e 2 8	+14	e 3 52	+28	—	—
Baku		16·4	288	—	—	e 6 46	+ 8	—	—
Grozny		19·9	296	e 4 8	−13	e 8 4	+13	—	—
Tiflis	E.	20·4	291	4 24	− 2	e 8 8	+ 8	—	—
Sverdlovsk		20·9	345	4 35	+ 4	i 8 42	+33	12·0	—
Calcutta		21·1	128	—	—	e 8 25	+12	—	—

Additional readings:—
Samarkand e = +1m.17s., S = +2m.5s.
Grozny e = +8m.9s.
Sverdlovsk L_q = +11m.4s.

Oct. 31d. Readings also at 0h. (Nagoya), 2h. (near Algiers, Wellington (2), and Christchurch (2)), 4h. (Tashkent, Baku, Tiflis, and Ksara), 5h. (Berkeley, Fresno, San Francisco, Branner, and Lick), 14h. (Mizusawa and Nagoya), 16h. (Mizusawa), 17h. (Tiflis), 18h. (San Javier, Berkeley, San Francisco, Branner, and Lick), 21h. (Berkeley, San Francisco, Branner, and Lick), 22h. (Vienna), 23h. (Berkeley, San Francisco, Branner (3), and Lick (2)).

Nov. 1d. 8h. 35m. 0s. Epicentre 24°·7S. 70°·2W. (as on 1937 March 14d.).
Felt force V at Taltal (25°·5S. 70°·5W.).
Boletin del Servicis Seismologico de la Universidad de Chile. Observations for 1937. Santiago-Chile, 1939, p. 76.
(Epicentre 24°·9S. 70°·3W. given by U.S.C.G.S.).

$A = +\cdot3081$, $B = -\cdot8558$, $C = -\cdot4155$; $\delta = -4$; $h = +3$;
$D = -\cdot941$, $E = -\cdot339$; $G = -\cdot141$, $H = +\cdot391$, $K = -\cdot910$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		2·4	31	0 49	P_g	i 1 1	−11	i 1·3	—
La Paz		8·4	14	i 2 1a	− 5	i 3 55	+12	4·4	5·2
Santiago		8·7	182	3 30	S	(3 30)	−20	—	—
San Javier		11·0	187	—	—	e 5 55	+68	—	—
Huancayo		13·5	338	e 3 32	+17	e 6 39	+52	i 8·0	—
La Plata		14·7	137	3 35	+ 4	6 30	+14	7·5	—
Oak Ridge		66·9	359	i 10 53	− 3	—	—	—	—
Riverside	z.	73·6	321	i 11 35a	− 2	—	—	—	—
Mount Wilson	z.	74·2	321	i 11 38a	− 2	—	—	—	—
Pasadena		74·2	321	i 11 39a	− 1	—	—	—	—
Tinemaha	E.	76·3	322	e 11 51	− 1	—	—	—	—
Bucharest		111·2	49	e 15 0	P	—	—	—	—
Ksara		116·1	64	e 19 57	PP	e 29 37	PS	—	69·0
Andijan		145·0	53	(19 34)	[− 5]	19 34	PKP	—	—

Additional readings :—
Montezuma e = +56s., iS = +1m.16s.
La Paz iN = +4m.21s.
Santiago S = +4m.56s.
Bucharest e = +16m.16s.
Long waves were also recorded at Tashkent and Sverdlovsk.

Nov. 1d. Readings also at 0h. (Branner (2) and Lick (2)), 2h. (San Javier), 4h. (Kobe), 7h. (Sofia, Toledo, and Malaga), 8h. (Perth), 12h. (Almata, Nagoya, Agra, Basle (2), Neuchatel, Zurich, and Mizusawa), 13h. (Zurich), 17h. (Tiflis, Helwan, and Ksara), 18h. (Cape Town), 19h. (Algiers), 21h. (Berkeley, San Franciso, Fresno, Kobe, Lick, and Branner (2)).

Nov. 2d. 11h. Undetermined shock in South Pacific :—
Brisbane iPN = 0m.0s., iSN = 4m.0s., iSE = 4m.6s., L = 6m.0s., M = 7m.42s., S_cSN = 11m.36s., S_cSE = 11m.42s.
Christchurch P = 1m.36s., iPP = 3m.37s., S = 9m.11s., SS = 12m.50s., L_qE = 13m.40s., L_r = 17m.40s.
Wellington e = 2m.0s.?, eL = 14m., M = 18m.
Manila P = 2m.19s., SEN = 8m.22s., SSN = 10m.55s.
Zi-ka-wei eZ = 3m.42s., M = 20m.4s.
Phu-Lien e = 4m.
Sydney e = 5m.5s. and 6m.32s., i = 7m.23s., L = 9m.52s., M = 12m.21s.
Kobe ePZ? = 5m.7s., ePN? = 5m.21s., eSE = 9m.17s., eSZ = 9m.23s., MZ = 17m.31s.
Perth P = 5m.15s., S = 12m.39s., SS = 16m.13s., L = 19m.38s.
Kodaikanal eE = 6m.
Riverview eE = 6m.6s. and 8m.42s., eL = 10m.0s., M = 11m.13s.
Irkutsk eP = 6m.17s., eS = 15m.39s., eL = 29m.
Melbourne e = 6m.56s. and 9m.27s., i = 12m.0s., M = 14m.48s.
Bombay e = 7m.22s.
Haiwee ePZ = 8m.23s.
Mount Wilson iPZ = 8m.23s.
Pasadena iPZ = 8m.23s., eLN = 34m.
Tinemaha ePZ = 8m.25s.
Riverside iPZ = 8m.26s.
La Jolla ePZ = 8m.27s.
Sverdlovsk e = 12m.35s., 19m.17s., 21m.18s., 26m.33s., and 30m.35s., L = 37m., M = 51m.42s.
Tucson ePP = 12m.42s., eL = 41m.30s.
Ksara e = 14m.55s. and 29m.13s., L = 57m., M = 66m.30s.
Calcutta eN = 15m.15s., MN = 36m.59s.
Agra eE = 17m.11s.
Tashkent e = 18m.32s., 24m.0s., 24m.16s., 28m.8s., and 32m.12s., eL = 36m.42s., M = 47m.12s.
Victoria e = 20m., L = 41m.
Baku e = 22m.47s., 28m.45s., and 32m.28s., L = 44m., M = 55m.48s.
De Bilt eEN = 34m.12s. and 38m.18s., eL = 60m., M = 66m.41s.
Long waves were also recorded at Hong Kong, Berkeley, Ukiah, Huancayo, La Paz, San Juan, Pulkovo, Copenhagen, Stuttgart, Paris, and Strasbourg.

Nov. 2d. Readings also at 0h. (near Sumoto), 1h. (Santiago), 3h. (near Hukuoka B), 6h. (Andijan, Frunse, and Samarkand), 7h. (Andijan and Samarkand), 13h. (Andijan, Frunse, Tchimkent, and near Samarkand), 14h. (Mount Wilson, Pasadena, Riverside, near Grozny, and Tiflis), 15h. (Baku, Andijan, Tashkent, Sverdlovsk, Irkutsk, Perth, Christchurch, Wellington, Brisbane, Santiago (2), Mount Wilson, Pasadena, and Riverside), 16h. (Agra, Bombay, Almata, Samarkand, Tchimkent, Tiflis, Grozny, Frunse, Tashkent, Andijan, and Paris), 17h. (Huancayo, near La Paz, and near Hukuoka B), 18h. (La Plata, Rio de Janeiro, San Juan, Oak Ridge, Williamstown, Tucson, La Jolla, Mount Wilson, Pasadena, Riverside, and Tinemaha), 22h. (Tiflis).

Nov. 3d. Readings at 3h. (Tashkent, Irkutsk, Tiflis, Almeria, Andijan, Frunse, Almata, Samarkand, and Tchimkent), 4h. (Kobe), 5h. (Manila, Hukuoka B, and Brisbane), 6h. (Huancayo, La Paz (2), and Medan), 7h. (Tashkent, La Paz, Sverdlovsk, and Batavia), 8h. (Manila and Malaga), 9h. (Fresno and Lick), 10h. (Branner and Berkeley), 11h. (Uccle), 15h. (Pennsylvania), 16h. (Tiflis), 18h. (Oak Ridge), 19h. (Apia), 20h. (Sitka), 21h. (Sverdlovsk and Tashkent), 22h. (Tinemaha, Riverside, Pasadena, and Mount Wilson), 23h. (Tashkent, Branner, Lick, Mizusawa, Helwan, and Ksara).

Nov. 4d. Readings at 2h. (Mizusawa and Wellington). 5h. (New Plymouth, Christchurch, and Wellington), 7h. (Apia), 8h. (Ksara, Tucson, Sydney, Brisbane, Riverside, Mount Wilson, and Pasadena), 10h. (Tacubaya), 15h. (Pasadena, Mount Wilson, Riverside, Tucson, Haiwee, Tinemaha, and Santa Barbara), 16h. (Nagoya and Huancayo), 20h. (Stuttgart and Ravensburg), 22h. (Brisbane, Riverview, and Wellington), 23h. (Pasadena, Mount Wilson, Riverside and Tucson).

Nov. 5d. 9h. 28m. 24s. Epicentre 4°·3S. 134°·3E.

Felt in Western New Guinea and in the Isle of Pandjang 3°S. 132°E. (Strasbourg).

J. de Boer.

Aardbevingen in den Oost Indischen Archipel. Waargenomen gedurende het jaar, 1937.

Natuurkundig Tijdschrift voor Nederlansch-Indie, Afl. 3, Deel XCIX, 1939, pp. 101-131.

$A = -\cdot6965$, $B = +\cdot7137$, $C = -\cdot0745$; $\delta = +3$; $h = +7$;
$D = +\cdot716$, $E = +\cdot698$; $G = +\cdot052$, $H = -\cdot053$, $K = -\cdot997$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina		6·1	276	1 10	−24	i 1 55	−50	—	—
Palau		11·6	2	2 46	− 4	5 4	+ 3	—	—
Manila		22·9	326	i 4 55	−11	8 57	−16	—	—
Batavia		27·4	266	5 48	− 1	i 10 4	−24	—	—
Brisbane		29·2	144	i 11 54	S	(i 11 54)	+56	17·2	—
Perth		32·5	209	6 31	− 3	11 46	− 3	16·6	20·6
Hong Kong		33·0	325	7 33	PP	11 29	−28	—	17·1
Riverview		33·3	154	e 8 24	PPP	—	—	e 24·5	—
Sydney		33·3	154	e 8 44	PPP	17 16	L	24·9	26·3
Melbourne		34·8	165	—	—	e 12 55	+30	—	—
Miyazaki		36·1	357	6 57	− 8	12 22	−23	—	—
Medan	E.	36·4	283	6 18	−50	—	—	—	—
Kumamoto		37·1	356	7 14	0	—	—	—	—
Osaka B		38·7	3	7 27	0	—	—	—	—
Kameyama		39·0	5	7 30	0	—	—	—	—
Hikone		39·4	4	7 27	− 6	—	—	—	—
Oiwake		40·6	5	7 44	+ 1	13 29	−25	—	—
Nagano		40·9	6	7 45	− 1	13 43	−15	—	—
Wazima		41·5	4	7 49	− 1	—	—	—	—
Mizusawa	E.	43·7	8	(8 11)	+ 3	8 11	P	—	—
Wellington		51·6	141	—	—	e 14 36?	?	e 27·6	—
Christchurch		51·7	145	15 23	?	22 55	SSS	31·5	—
Irkutsk		60·9	340	e 10 38	+21	18 28	− 6	e 30·6	—
Agra	E.	62·6	304	i 10 28	0	i 18 24	−32	—	—
Tashkent		74·4	315	e 12 20	+38	i 22 4	PPS	e 34·6	42·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand		75·6	313	e 11 48	0	—	—	—	—
Sverdlovsk		84·7	328	e 12 36	− 1	i 22 46	−18	36·6	—
Grozny		91·9	313	e 13 26	+15	—	—	—	—
Tiflis		92·5	311	e 13 23	+ 9	e 23 40	[− 7]	e 47·6	—
Ksara		99·4	303	e 13 27	−19	—	—	—	67·6
Haiwee	z.	106·8	53	e 14 40	P	—	—	—	—
Pasadena		106·9	56	e 14 34	P	—	—	e 52·6	—
Mount Wilson	z.	107·0	56	e 14 34	P	—	—	—	—
Riverside	z.	107·6	56	e 14 44	P	—	—	—	—
Tucson		113·3	57	e 18 52	[+12]	—	—	—	—
Huancayo		146·4	119	e 19 52	[+11]	—	—	—	—

Additional readings :—
Manila iEN = +6m.47s., iN = +9m.40s., iE = +10m.49s.
Brisbane ePPE = +12m.36s., ePPN = +12m.42s., eS = +16m.18s.
Perth PP = +7m.38s., SS = +14m.29s., SSS = +14m.48s.
Riverview eE = +15m.6s. and +19m.30s.
Melbourne i = +21m.26s.
Christchurch L_qE = +27·2m.
Tiflis eSKKSN = +24m.2s.
Ksara ePP = +17m.24s., ePS = +26m.15s.
Haiwee iPKPZ = +18m.38s.
Pasadena iZ = +14m.43s., iPKPZ = +18m.39s.
Mount Wilson iZ = +14m.43s., iPKPZ = +18m.39s.
Riverside iPKPZ = +18m.37s.
Tucson i = +20m.10s.
Huancayo i = +20m.1s., +20m.13s., and +20m.35s.
Long waves were also recorded at Uccle, Copenhagen, Stuttgart, Paris, Strasbourg, Berkeley, and De Bilt.

Nov. 5d. Readings also at 0h. (Tiflis and Branner), 2h. (Hong Kong, Nagoya, Santiago, Phu-Lien, Manila, and Irkutsk), 3h. (Tiflis (2), Sverdlovsk, De Bilt, and Algiers), 6h. (Irkutsk and Tashkent), 7h. (Perth, Triest, Zagreb, and Tucson (2)), 8h. (Pennsylvania), 9h. (Tchimkent, Andijan, and Samarkand), 10h. (Samarkand and Amboina), 12h. (Tiflis, Haiwee, Pasadena, Erevan, Grozny, Mount Wilson, and Riverside), 14h. (Santiago, Berkeley, and San Francisco), 16h. (San Juan), 18h. (Grozny, Erevan, and Tiflis), 19h. (Apia), 20h. (Zurich), 22h. (Tiflis, Riverside, Mount Wilson, Tucson, Branner, Huancayo, Lick, and La Paz), 23h. (Manila, Tchimkent, Andijan, Almata (2), Samarkand, Helwan, Ksara, Semipalatinsk, and Frunse (2)).

Nov. 6d. Readings at 3h. (Bucharest, Ksara, and Tiflis), 5h. (Amboina), 6h. (Pennsylvania, Tiflis, and San Juan), 7h. (Perth and Riverview), 14h. (Mizusawa, Oak Ridge, Shawinigan Falls, near Williamstown, Weston, and Ottawa), 18h. (near Reykjavik).

Nov. 7d. 9h. 8m. 36s. Epicentre 9°·3S. 72°·7W.

A = +·2935, B = −·9423, C = −·1605 ; δ = −17 ; h = +7 ;
D = −·955, E = −·297 ; G = −·048, H = +·153, K = −·987.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		3·8	223	i 1 1a	0	—	—	—	—
La Paz		8·4	149	2 4	− 2	i 4 7	S*	4·4	4·5
San Juan		28·3	13	—	—	e 10 41	− 2	e 12·1	—
Rio de Janeiro		31·3	119	—	—	e 11 24	− 7	e 15·6	—
Little Rock		47·6	338	e 8 42	+ 3	e 15 36	+ 1	—	—
St. Louis		50·4	342	i 9 2	+ 1	e 17 49	?	—	—
Tucson		55·1	320	e 9 30	− 6	—	—	e 27·5	—
Riverside	z.	60·4	317	i 10 14	+ 1	—	—	—	—
Pasadena		61·0	317	i 10 19	+ 1	—	—	—	—
Haiwee	z.	62·1	320	i 10 27	+ 2	—	—	—	—
Tinemaha	z.	62·9	320	i 10 33	+ 3	—	—	—	—
Ksara		110·5	58	e 15 1	P	e 29 10	PS	—	64·4

For Notes see next page.

NOTES TO Nov. 7d. 9h. 8m. 36s.

Additional readings :—
Huancayo $iP_g = +1$m.21s.
La Paz iSN = +4m.10s.
San Juan eS = +11m.24s.
Little Rock ipPN = +8m.49s., esSE = +15m.50s.
St. Louis ipPN = +9m.11s.
Tucson iP = +9m.38s., P = +9m.49s., ePP = +11m.53s., PPP = +13m.9s.
Ksara ePP = +19m.14s.
Long waves were also recorded at La Plata, Chatham Ils., Wellington, De Bilt, Stuttgart, Copenhagen, Sverdlovsk, and Tashkent.

Nov. 7d. 19h. 7m. 43s. Epicentre 34°·6N. 73°·2E.

Felt force VIII at Srinagar, force VI at Gurez and Drosh, IV at Peshawar.

India Weather Review, 1937, Annual Summary Part D, Seismic Records, pp. D 47 and 48. Epicentre 36°·8N. 73°·5E.

A = +·2384, B = +·7897, C = +·5652; $\delta = -9$; $h = 0$;
D = +·957, E = −·289; G = +·163, H = +·541, K = −·825.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Dehra Dun		5·9	135	3 7	S	(3 7)	S*	—	4·3
Andijan		6·2	352	i 1 32	− 3	2 37	−11	—	3·3
Samarkand		7·1	318	1 41	− 7	i 2 56	−14	—	—
Tashkent		7·4	337	i 1 50	− 2	3 16	− 2	i 3·5	4·1
Tchimkent		8·2	341	1 57	− 6	i 3 24	−14	—	—
Frunse		8·4	8	2 0	− 6.	i 3 42	− 1	—	—
Agra	E.	8·5	150	2 10	+ 3	3 40	− 5	—	—
Almata		9·2	18	2 19	+ 3	i 4 43	SSS	—	4·9
Bombay		15·7	183	e 3 44	0	e 7 0	SS	e 8·3	10·0
Hyderabad		17·7	163	e 3 47	−23	7 17	− 9	8·8	10·7
Calcutta	N.	17·9	127	e 4 13	+ 1	e 7 43	+13	—	—
Baku		19·4	295	e 4 30	0	e 8 56	SSS	e 12·3	14·0
Erevan		23·4	292	e 4 9	−62	—	—	—	—
Tiflis		23·4	297	5 8	− 3	9 27	+ 6	e 15·3	22·3
Sverdlovsk		23·8	343	5 16	+ 1	9 20	− 8	e 12·7	14·3
Kodaikanal	E.	24·6	170	—	—	9 45	+ 3	—	13·7
Colombo		28·3	166	11 26	S	(11 26)	+43	—	15·4
Irkutsk		28·4	42	—	—	10 17?	−28	15·3	—
Ksara		30·8	279	e 5 51?	−29	e 11 42	+19	—	19·6
Moscow		32·3	322	e 6 28	− 5	e 13 14	SS	e 16·8	20·9
Pulkovo		37·5	326	e 6 21	−56	—	—	e 17·8	19·8
Copenhagen		46·0	317	8 19	− 8	—	—	24·3	—

Additional Readings :—
Dehra Dun S = +3m.27s.
Andijan i = +1m.58s. and +3m.5s.
Samarkand i = +2m.11s.
Tchimkent i = +4m.14s.
Frunse i = +4m.30s.
Agra P_gE = +3m.0s., S_gE = +4m.40s.
Almata e = +3m.54s.
Bombay e = +6m.32s.
Calcutta SSN = +8m.23s.
Tiflis eE = +10m.53s.
Ksara i = +6m.24s.
Copenhagen +8m.29s.
Long waves were also recorded at Vladivostok, Stuttgart, De Bilt, Upsala, Hamburg, Scoresby Sund, Uccle, Hong Kong, Paris, and Strasbourg.

Nov. 7d. Readings also at 0h. (Mizusawa), 7h. (Branner), 9h. (Christchurch), 10h. (Christchurch, Tucson, Oaxaca, and Vera Cruz), 16h. (Christchurch), 17h. (Brisbane, Batavia, Hukuoka B, and Ksara), 21h. (Tchimkent and Andijan), 22h. (Nagoya), 23h. (Hukuoka B and Zagreb).

Nov. 8d. 13h. Caucasus :—

Erevan eP = 2m.55s., i = 4m.23s.
Tiflis ePN = 3m.4s., e = 3m.10s., SEN = 3m.54s., iLN = 4m.8s., M = 6m.36s.
Piatigorsk eP = 3m.22s., i = 3m.38s. and 4m.37s.
Grozny eP = 3m.51s., e = 5m.11s.
Theodosia eP = 3m.58s., e = 9m.48s.
Baku eP = 4m.27s., eS = 5m.50s., L = 6m.24s., M = 7m.42s.
Ksara eP = 4m.33s., eS = 5m.42s., eS_g = 6m.17s.
Yalta P = 5m.19s., e = 6m.49s.
Sebastopol P = 5m.32s.
Long waves were also recorded at Sverdlovsk.

Nov. 8d. Readings also at 5h. (Tucson, Christchurch, Wellington, and Brisbane), 6h. (Berkeley, Sverdlovsk, and Tashkent), 7h. (Brisbane, Wellington, Andijan, Samarkand, Tashkent, Tiflis, Grozny, and Sverdlovsk), 8h. (Andijan, Samarkand, Almata, Semipalatinsk, Irkutsk, Tashkent, and Sverdlovsk), 10h. (Copenhagen), 11h. (Wellington), 15h. (Christchurch, Wellington, and Brisbane), 17h. (near Branner), 19h. (Belgrade, Bucharest, Sofia Stuttgart, Ksara, Tiflis, Sebastopol, Theodosia, Yalta, and Rio de Janeiro), 23h. (Tiflis and near Lick).

Nov. 9d. 1h. Undetermined shock :—

Nagoya e = 18m.7s. and 20m.0s.
Hukuoka B P = 18m.10s., S = 18m.32s.
Keizyo ePEN = 18m.14s., eSEN = 22m.14s.
Hukuoka S = 18m.31s.
Sumoto P = 18m.40s., eEN = 19m.19s., SEN? = 19m.25s.
Kobe ePN = 18m.44s.
Vladivostok i = 18m.50s., 18m.58s., 19m.18s., and 19m.25s., eL = 19m.30s.
Heizyo ePEN = 20m.17s.
Zinsen eSE? = 21m.15s.
Semipalatinsk e = 23m.2s., eS = 25m.2s.
Sverdlovsk e = 23m.8s., L = 28m.0s.
Almata e = 27m.34s. and 28m.36s.
Tashkent e = 27m.48s. and 31m.6s., i = 31m.32s. and 32m.0s., eL = 32m.18s., M = 40m.30s.
Andijan e = 30m.37s.
Long waves were also recorded at Hong Kong, Tiflis, Ksara, Baku, Pulkovo, and some European stations.

Nov. 9d. Readings also at 1h. (Irkutsk and near Wellington), 6h. (Baku, Sverdlovsk, Pulkovo, Vladivostok, Ksara, Calcutta, Phu-Lien, Manila, near Hong Kong, and near Taihoku), 7h. (Ferndale, Copenhagen, De Bilt, Uccle, Ksara, Strasbourg, Stuttgart, Tiflis (2), near Andijan, and Samarkand), 9h. (Baku, Ksara, Huancayo, Mount Wilson, Pasadena, Riverside, Tinemaha, and Cape Town), 10h. (Huancayo, La Paz, Tacubaya, Tucson, Berkeley, Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Oak Ridge, Weston, Wellington, Stuttgart, De Bilt, Sverdlovsk (2), Moscow, Tiflis (2), Ksara, Copenhagen, Grozny, Piatigorsk, and near Andijan), 11h. (Be Bilt, Christchurch, La Paz, Tiflis (2), near Santiago, and near Lick), 13h. (Sumoto and Amboina), 14h. (Baku and Sverdlovsk), 15h. (near Lick), 17h. (Fresno and near Lick), 19h. (Tiflis, near Mizusawa), 20h. (Tiflis), 21h. (Brisbane), 22h. (Baku, Sverdlovsk, Tashkent, and near Lick).

Nov. 10d. 7h. 19m. 25s. Epicentre 43°·5N. 126°·5W.

$A = -\cdot4329$, $B = -\cdot5850$, $C = +\cdot6859$; $\delta = +9$; $h = -3$;
$D = -\cdot804$, $E = +\cdot595$; $G = -\cdot408$, $H = -\cdot551$, $K = -\cdot728$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Seattle		5·0	33	e 1 27	P*	i 2 38	S*	—	—
Berkeley	N.	6·5	149	e 1 32	− 7	—	—	—	—
Lick		7·1	147	e 1 47	− 1	—	—	—	—
Fresno		8·5	140	e 2 8	+ 1	—	—	—	—
Tinemaha		9·0	133	e 2 17	+ 4	—	—	—	—
Haiwee	E.	9·8	135	e 2 28	+ 4	—	—	—	—
Butte		10·2	71	e 3 15	?	—	—	—	—
Santa Barbara		10·5	147	e 2 25	−10	—	—	—	—
Bozeman		11·2	73	2 42	− 2	—	—	—	—
Mount Wilson		11·3	142	e 2 44	− 2	—	—	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Pasadena	11·4	142	i 2 47	0	—	—	e 4·8	—
Riverside	11·9	140	e 2 50	− 4	—	—	—	—
Sitka	14·7	342	e 1 54	?	i 6 20	+ 4	—	—
Tucson	16·7	127	e 3 59	+ 2	—	—	e 7·3	—
College	24·5	340	e 5 10	−12	—	—	—	—
Florissant	27·5	88	e 6 17	+27	—	—	e 12·7	15·7
Little Rock	27·7	97	e 6 22	+30	—	—	e 15·1	—
Toronto	33·8	73	—	—	e 12 35?	+25	17·6	—
Honolulu	34·2	241	e 10 51	?	i 12 5	−11	—	—
Ottawa	35·8	69	—	—	e 12 35?	− 6	17·6	—
Vermont	37·8	70	—	—	e 13 17	+ 6	—	—
Williamstown	38·4	72	e 7 35?	+10	—	—	19·1	—
Seven Falls	38·9	65	—	—	e 13 35	+ 7	18·6	—
Vladivostok	68·9	311	—	—	e 20 29	+16	e 36·6	38·0
Irkutsk	75·0	332	—	—	e 20 53	−30	35·6	—
Pulkovo	75·3	13	—	—	e 21 23	− 3	36·1	42 4
Uccle	76·8	31	—	—	i 21 49	+ 7	e 32·6	—
Sverdlovsk	79·9	357	e 12 12	0	22 15	− 1	32·6	46·3
Moscow	80·2	9	—	—	e 27 55	SS	e 41·1	45·3
Stuttgart	80·2	29	—	—	e 21 53	−26	e 33·6	46·6
Tashkent	94·7	349	e 20 58	?	e 24 26	−10	e 40·3	52·6
Ksara	101·4	15	e 18 0	PP	e 27 10	PS	41·6	52·6
Christchurch	102·3	221	e 30 18$_a$	?	e 39 29	?	e 51·9	—

Additional readings :—
Seattle i = +3m.26s.
Mount Wilson iP = +2m.47s.
Riverside eZ = +9m.22s.
Sitka i = +3m.22s., +5m.47s., +6m.51s., +7m.7s., +7m.40s., +8m.1s., and +9m.30s.
Tucson i = +4m.22s., +4m.38s., +4m.51s., and +5m.17s.
Little Rock iE = +6m.30s.
Honolulu i = +11m.27s., +12m.26s., +14m.13s., +14m.42s., and +19m.37s.
Irkutsk e = +26m.5s. and +29m.17s.
Tashkent e = +23m.17s., +25m.38s., +30m.4s., +33m.54s., and +37m.42s.
Christchurch L_qN = +46·9m.
Long waves were also recorded at Ivigtut, Oak Ridge, Perth, Edinburgh, De Bilt, Kew, Bidston, Wellington, Kodaikanal, Paris, Strasbourg, Hong Kong, Tiflis, Scoresby Sund, Copenhagen, East Machias, and Chicago.

Nov. 10d. 19h. 42m. 58s. Epicentre 42°·0N. 78°·0E. (as on 1937 March 21d.).

$A = +\cdot1550$, $B = +\cdot7291$, $C = +\cdot6666$; $\delta = -3$; $h = -2$;
$D = +\cdot978$, $E = -\cdot208$; $G = +\cdot139$, $H = +\cdot652$, $K = -\cdot745$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		1·5	329	i 0 28	0	i 1 1	S_g	—	1·0
Frunse		2·7	289	e 0 48	+ 3	i 1 19	0	—	—
Andijan		4·4	255	e 1 22	P*	i 2 2	0	—	4·0
Tchimkent		6·3	276	e 2 2	P_g	e 3 35	S_g	—	—
Tashkent		6·5	267	e 2 1	P*	i 2 53	− 2	i 3·9	4·3
Semipalatinsk		8·5	10	e 2 4	− 3	e 4 4	S*	—	—
Samarkand		8·7	258	e 1 54	−16	e 3 28	−22	—	—
Agra	E.	14·8	180	—	—	e 5 48	−30	—	—
Sverdlovsk		18·6	329	e 4 21	0	e 7 52	+ 6	i 11·3	11·4
Moscow		29·5	312	e 6 8	0	e 11 4	+ 2	—	18·0
Pulkovo		34·0	318	—	—	e 14 57	SSS	—	—

Additional readings :—
Frunse iP_g = +55s., S_g = +1m.37s.
Andijan eP_g = +1m.34s., i = +1m.44s., +1m.50s., and +2m.9s., S_g = +2m.30s.
Tashkent i = +2m.9s., +2m.28s., and +3m.13s.
Samarkand e = +4m.20s.
Sverdlovsk iL_q = +9·8m.
Moscow e = +14m.42s. and +15m.45s.
Pulkovo e = +17m.25s.
Long waves were also recorded at Irkutsk, Copenhagen, Tiflis, and Baku.

Nov. 10d. Readings also at 0h. (Berkeley), 2h. (Tiflis and Agra), 6h. (Philadelphia and Agra), 7h. (Fresno and Ukiah), 9h. (Hukuoka B), 12h. (Fresno, Berkeley, Lick, Branner, and San Francisco), 14h. (Berkeley, Lick, Branner, Fresno, and San Francisco), 21h. (Tashkent, Keizyo, Zi-ka-wei, Calcutta, Phu-Lien, Hong Kong, and Sverdlovsk), 22h. (Tiflis, Tinemaha, Santa Barbara), Mount Wilson (2), Pasadena (2), Riverside (2), Tucson, Erevan, La Paz, and Baku), 23h. (Stuttgart, Dehra Dun, and Samarkand).

Nov. 11d. 0h. 1m. 33s. Epicentre 20°·0N. 63°·5E.

$A = +\cdot4196$, $B = +\cdot8416$, $C = +\cdot3400$; $\delta = -5$; $h = +5$;
$D = +\cdot895$, $E = -\cdot446$; $G = +\cdot152$, $H = +\cdot304$, $K = -\cdot940$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Bombay		8·9	96	e 2 37	PPP	e 5 50	?	—	9·4
Hyderabad		14·4	98	e 2 51	−36	e 6 26	+17	9·2	11·1
Agra	E.	15·1	59	i 3 30	− 6	6 26	+ 1	7·4	—
Kodaikanal	E.	16·6	124	i 3 54?	− 2	7 14	+14	8·9	14·6
Samarkand		19·8	7	e 5 27	PPP	e 9 13	?	—	—
Andijan		22·0	18	e 4 56	− 2	e 8 21	−35	—	—
Calcutta	N.	23·3	80	e 5 0	−10	i 9 37	+17	i 12·3	17·3
Baku		23·4	334	e 5 7	− 4	i 9 9	−12	13·4	17·9
Frunse		24·7	20	e 5 12	−12	e 9 14	−30	—	—
Erevan		25·9	326	e 5 36	+ 1	—	—	—	—
Tiflis		26·8	329	e 5 43	− 1	e 10 5	−14	e 12·4	18·0
Grozny		27·6	332	e 5 58	+ 7	e 10 21	−11	—	—
Ksara		28·1	304	i 6 8	+13	e 11 6	+26	—	21·0
Piatigorsk		29·4	330	e 6 10	+ 3	e 10 50	−11	—	—
Helwan		30·7	295	e 5 57	−22	e 11 47	+26	—	23·1
Sverdlovsk		36·8	358	7 17	+ 6	i 12 31	−25	16·4	20·2
Bucharest		39·4	317	4 27?	?	—	—	—	—
Moscow		40·6	339	e 7 45	+ 2	e 13 33	−21	21·0	27·5
Irkutsk		45·1	35	e 10 3	PP	e 14 38	−21	22·4	27·0
Pulkovo		46·3	338	e 8 23	− 6	e 14 52	−24	24·0	30·2
Triest		48·0	314	—	—	e 15 23	−18	—	32·4
Copenhagen		52·0	327	—	—	16 29	− 7	28·4	—
Uccle		55·3	318	—	—	e 17 18	− 3	e 26·4	—

Additional readings :—
Agra SSE = +6m.51s.
Calcutta ePPPN = +5m.50s., iSSN = +10m.45s.
Tiflis iSEN = +10m.19s.
Ksara iSS = +12m.30s.
Helwan e = +6m.42s., PP = +7m.7s., PPP = +7m.30s., e = +7m.54s. and +10m.15s.
Irkutsk e = +17m.15s.
Long waves were also recorded at Hong Kong, Phu-Lien, and other European stations.

Nov. 11d. Readings also at 0h. (near Berkeley), 8h. (Tchimkent and near Andijan), 9h. (Huancayo), 10h. (Paris, Strasbourg, Uccle, Baku, Sverdlovsk, Ksara, and Tashkent), 11h. (Paris, Strasbourg, Uccle, Sverdlovsk, Ksara, and Huancayo), 12h. (Baku, Tashkent, Ksara, Theodosia, Erevan, Grozny, Sotchi, and Piatigorsk), 14h. (Mount Wilson, Pasadena, and Riverside), 15h. (Phu-Lien and near Calcutta), 16h. (Medan), 18h. (Baku, Sebastopol, Yalta, Theodosia, near Erevan, Grozny, Sotchi, and Piatigorsk), 19h. (Sverdlovsk and Tashkent), 22h. (Wellington, near Andijan, and Samarkand).

Nov. 12d. 14h. 39m. 24s. Epicentre 35°·4N. 78°·0E.

A = +·1699, B = +·7991, C = +·5767; δ = +1; h = 0;
D = +·978, E = −·208; G = +·120, H = +·564, K = −·817.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Dehra Dun		5·1	180	1 36	P*	2 16	− 4	—	2·6
Andijan		7·0	322	e 1 48	+ 2	e 3 42	S_g	—	—
Almata		7·9	355	2 1	+ 2	e 3 33	+ 3	—	—
Frunse		7·9	342	1 56	− 3	i 4 4	S*	—	—
Agra	E.	8·2	180	e 2 3	0	i 3 14	−24	—	—
Tashkent		9·1	313	e 2 10	− 4	e 3 40	−20	e 4·1	5·8
Tchimkent		9·5	319	e 2 20	0	—	—	—	—
Samarkand		9·7	299	2 36	+14	e 4 26	+11	—	—
Semipalatinsk		15·1	7	e 3 30	− 6	e 6 32	+ 7	—	—
Calcutta	N.	15·7	142	e 3 21	−23	e 6 38	− 1	8·3	—
Bombay		17·1	197	e 3 55	− 7	e 6 41	−31	—	—
Sverdlovsk		24·4	338	—	—	e 9 45	+ 6	11·6	13·4
Tiflis		26·6	295	e 6 46	PPP	—	—	e 10·3	—
Ksara		34·5	280	e 8 5	PP	e 13 17	+57	—	22·6

Additional readings:—
Almata i = +3m.50s., e = +4m.13s.
Agra S_gE? = +4m.9s.
Tashkent i = +2m.24s., +2m.42s., +3m.35s., and +3m.47s.
Semipalatinsk e = +7m.53s.
Long waves were also recorded at Vladivostok, Baku, and Irkutsk.

Nov. 12d. 14h. 43m. 36s. (I) } Epicentre 45°·9N. 74°·2W.
16h. 57m. 27s. (II) }

Felt at St. Jerome (P.Q.).

L. Don Leet.

Earthquakes in North Eastern America, July-Dec., 1937. Bulletin of the Seismological Society of America, Vol. 28, No. 3, July, 1938, pp. 169-176, Fig. 1, p. 172. Epicentre 45°·9N. 74°·2W.

A = +·1902, B = −·6720, C = +·7158; δ = +13; h = −4;
D = −·962, E = −·272; G = +·195, H = −·689, K = −·698.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
I	Ottawa	1·2	245	0 26	+ 2	0 40	− 1	—
II		1·2	245	0 24	0	0 38	− 3	—
I	Shawinigan Falls	1·2	57	e 0 30	+ 6	i 0 45	+ 4	—
II		1·2	57	e 0 27	+ 3	i 0 43	+ 2	—
I	Seven Falls	2·6	62	e 0 42	− 2	—	—	—
II		2·6	62	e 0 39	− 5	—	—	—
I	Williamstown	3·3	166	e 0 48	− 5	1 28	− 7	i 1·9
II		3·3	166	e 0 56	+ 3	i 1 36	+ 1	—
I	Oak Ridge	3·9	150	i 1 24	P_g	i 2 12	S_g	—
II		3·9	150	e 1 21	P_g	e 2 5	S_g	—
I	Weston	4·1	148	e 1 24	P_g	e 2 0	+ 5	—
II		4·1	148	i 1 22	P_g	i 1 57	+ 2	—
I	Ukiah	36·3	278	e 5 21	?	—	—	—

Additional readings:—
Ottawa I i = +35s., II i = +31s.
Williamstown I iP = +54s., iS = +1m.35s., II iP = +1m.2s., iS = +1m.43s.
Ukiah I i = +5m.24s.

Nov. 12d. Readings also at 3h. (Basle and Zurich), 4h. (Huancayo), 5h. (Wellington, and Christchurch), 9h. (Andijan and Samarkand), 10h. (Nagoya), 11h. (Tiflis, Baku, Tashkent, and Ksara), 12h. (Sverdlovsk, Helwan, Tiflis, Baku, Tashkent, and Ksara), 13h. (Tchimkent), 14h. (Tiflis), 15h. (Tchimkent (2), Andijan (2), Samarkand, Mizusawa, and Frunse), 17h. (Samarkand, Andijan, Frunse, Mizusawa, Sverdlovsk, Baku, Tiflis, Nagoya, Almata, Vladivostok, Kobe, Hong Kong, Tashkent, Bombay, Calcutta, and Agra), 18h. (Branner (3)), 22h. (Christchurch, Huancayo, La Paz, Pasadena, Mount Wilson, and Riverside), 23h. (Tashkent, Baku, Sverdlovsk, Ksara, and Wellington).

Nov. 13d. 9h. 50m. 23s. Epicentre 32°·5S. 177°·0W.

$A = -·8438$, $B = -·0442$, $C = -·5347$; $\delta = -14$; $h = +1$;
$D = -·052$, $E = +·999$; $G = +·534$, $H = +·028$, $K = -·845$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Arapuni		8·2	225	2 19	PPP	3 25	−13	4·0	—
New Plymouth		9·8	225	—	—	4 38	+21	—	—
Wellington		11·0	214	e 2 46	+ 4	4 50	+ 3	5·4	7·3
Christchurch		13·7	214	i 3 49	PPP	5 33	−19	—	—
Apia		19·2	18	i 4 24	− 4	e 8 26	SS	—	—
Brisbane	E.	26·4	275	i 5 31	− 9	i 10 31	+19	11·9	—
Riverview		26·6	258	(e 5 44)	+ 2	e 5 44	P	e 11·2	14·2
Sydney		26·6	258	e 5 44	+ 2	e 10 36	+20	13·5	16·1
Melbourne		31·4	250	i 6 19	− 6	i 11 44	+12	15·7	18·8
Adelaide		36·8	254	e 7 15	+ 4	e 12 9	−47	—	19·9
Perth		55·9	257	i 12 10	PP	i 17 14	−15	i 28·7	43·1
Batavia		75·0	272	—	—	24 37?	?	—	—
Manila		75·5	298	i 11 43k	− 5	21 47	+19	—	—
Kobe	E.	80·5	322	e 10 40	?	i 22 15	− 7	—	45·8
Hong Kong		85·4	300	12 37	− 3	23 6	[+ 3]	—	51·6
Santa Barbara	Z.	85·6	45	e 12 39	− 2	—	—	—	—
Zi-ka-wei	Z.	86·0	311	e 12 41	− 2	—	—	—	50·6
Pasadena		86·3	46	e 12 45	0	i 23 25	+ 5	e 36·0	—
Mount Wilson	Z.	86·5	46	i 12 47	+ 1	—	—	—	—
Berkeley		86·6	41	e 12 47	+ 1	i 23 35	+12	—	—
Lick		86·6	41	e 12 46	0	—	—	—	—
Riverside		86·7	46	i 12 47	0	—	—	—	—
Ukiah		87·0	39	—	—	e 23 16	[+ 2]	e 36·1	—
Medan		87·1	276	e 16 7	PP	—	—	e 48·6	—
Fresno	N.	87·2	43	e 12 57	+ 8	—	—	—	—
Haiwee		87·6	44	e 13 3	+12	—	—	—	—
Tinemaha	E.	88·3	44	e 12 57	+ 2	—	—	—	—
Tucson		89·7	51	e 13 3	+ 2	e 23 25	[− 6]	e 38·6	—
Phu-Lien		90·2	294	—	—	23 37?	[+ 3]	—	—
Huancayo		93·2	106	e 13 23	+ 6	e 24 38	+15	e 38·6	—
Victoria		93·7	32	—	—	e 24 13	−14	44·6	—
La Paz		96·4	114	e 17 55	PP	i 24 21	[+12]	51·1	60·9
Bozeman		98·1	40	—	—	24 49	−15	e 38·8	—
Calcutta	N.	105·5	286	e 18 26	PKP	i 24 14	[−39]	—	73·7
Kodaikanal	E.	108·5	270	19 37?	PP	—	—	—	—
Irkutsk		108·7	320	e 20 37?	PPP	e 24 37?	[−29]	61·6	—
Agra	E.	116·0	287	—	—	i 25 31	[− 5]	—	—
Bombay		116·6	275	e 19 50	PP	e 25 41	[+ 3]	—	—
San Juan		117·0	84	—	—	25 43	[+ 4]	e 54·6	—
Philadelphia		118·4	59	—	—	e 29 50	PS	e 54·2	—
Ottawa		119·7	52	—	—	e 30 1	PS	e 53·6	—
Weston		121·9	57	—	—	e 37 22	SS	—	e 65·6
Seven Falls		123·5	51	—	—	e 30 43	PS	61·6	—
Tashkent		127·4	299	e 17 59	?	e 26 23	[+10]	e 66·9	86·4
Sverdlovsk		134·1	320	i 19 19	[− 1]	i 29 11	{+25}	64·6	85·1
Scoresby Sund		139·6	12	22 37?	PP	—	—	75·6	—
Baku		141·8	296	e 18 51	[−42]	e 26 16	[−25]	e 69·1	88·9
Grozny		144·9	300	e 19 39	[0]	—	—	—	—
Tiflis		145·8	297	e 19 37	[− 3]	—	—	e 67·1	102·6

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Erevan	145·9	295	e 19 41	[+ 1]	—	—	—	—
Moscow	146·6	324	i 19 39	[− 3]	—	—	—	—
Piatigorsk	146·8	302	e 19 42	[0]	—	—	—	—
Pulkovo	147·3	334	e 19 43	[0]	—	—	e 85·1	—
Theodosia	152·0	307	e 19 53	[+ 3]	—	—	—	—
Ksara	152·5	280	i 19 54k	[+ 3]	—	—	77·6	86·6
Yalta	153·0	305	e 20 0	[+ 8]	—	—	—	—
Sebastopol	153·4	306	e 19 59	[+ 7]	—	—	—	—
Helwan	155·6	271	e 19 56	[+ 1]	e 27 27	[+27]	—	—
Copenhagen	155·9	348	e 20 7	[+12]	—	—	87·6	—
De Bilt	160·3	356	i 20 4	[+ 3]	i 24 10	PP	e 88·6	98·7
Stuttgart	163·1	346	e 20 6k	[+ 2]	e 30 37	{−51}	e 91·6	103·6
Strasbourg	163·4	348	e 20 7	[+ 3]	—	—	—	102·6
Paris	163·7	2	e 19 37?	[−27]	—	—	81·6	96·6
Zurich	164·5	345	e 20 53	[+48]	—	—	—	—
Averroes	171·2	82	—	—	e 48 37?	SSP	101·6	109·6
San Fernando	171·4	60	e 33 34	?	e 46 55	SS	93·6	—
Granada	172·9	48	i 20 15	[+ 4]	—	—	—	—
Almeria	173·8	44	e 20 24	[+13]	—	—	e 96·6	—

Additional readings :—
Arapuni +2m.38s.
New Plymouth S? = +3m.12s., +3m.36s., +3m.47s., and +3m.52s.
Wellington +2m.59s. and +3m.13s., S = +4m.27s., +4m.33s., +4m.36s., +4m.38s., and +4m.41s.
Christchurch iZ = +5m.7s., eE = +5m.12s., iZ = +6m.42s., iEN = +6m.59s., eE = +7m.7s., iEN = +7m.33s., i = +8m.10s., iNZ = +9m.59s. and +11m.27s., iZ = +14m.3s., iN = +15m.1s., i = +18m.33s.
Apia i = +4m.50s. and +9m.6s.
Brisbane ePPE = +6m.19s., eP_cPE = +8m.43s., eS_cSE = +16m.13s.
Riverview eN = +11s. and +1m.24s.
Melbourne PP = +7m.20s., i = +11m.40s.
Adelaide e = +8m.51s. and +16m.20s.
Perth i = +12m.47s., +15m.9s., +19m.37s., +24m.0s., +26m.3s., +26m.36s., and +28m.17s.
Manila iPPNZ = +15m.41s.
Kobe eE = +16m.29s., eE = +26m.58s.
Hong Kong SS? = +24m.9s.
Berkeley eN = +35m.35s., iE = +37m.7s.
Ukiah ePS = +23m.40s.
Tucson P = +13m.20s., iP = +13m.29s. and +13m.42s., eS = +23m.45s., eS_cS = +23m.56s., ePPS = +25m.13s.
Huancayo eP = +13m.45s. and +13m.52s., ePP = +17m.30s., eS = +24m.38s., ePS = +25m.44s., eSS = +30m.58s., eSS = +34m.59s.
La Paz iSKKS = +26m.33s., SSN = +37m.21s.
Bozeman ePPS = +26m.37s.
Irkutsk e = +28m.37s.?, +32m.37s.?, and +43m.37s.?
Agra iE = +29m.21s.
Bombay eE = +22m.20s.
San Juan PS = +30m.3s., ePSPS = +36m.44s., eSSS = +40m.51s.
Philadelphia ePSPS = +36m.37s. and +36m.44s.
Ottawa e = +36m.1s.
Tashkent e = +22m.23s. and +45m.19s.
Sverdlovsk i = +22m.48s., +23m.18s., and +32m.42s.
Baku e = +21m.25s., +35m.19s., +40m.45s., +47m.37s., and +60m.18s.
Tiflis eP = +12m.59s., eN = +14m.0s., eE = +23m.45s.
Moscow i = +23m.56s.
Pulkovo e = +20m.50s. and +23m.11s.
Ksara iPP = +22m.38s.
Helwan e = +24m.27s., +26m.30s., and +29m.37s.
Copenhagen +20m.19s.
Stuttgart ePKPZ = +20m.41s. and +20m.53s., ePKSZ = +24m.25s., eZ = +29m.38s., eSKKSZ = +32m.10s., eSKSP = +35m.54s.
Strasbourg eSKP = +22m.49s., e = +24m.25s., +24m.38s., and +28m.25s.
Granada iPP = +25m.33s.
Long waves were also recorded at Stonyhurst, Upsala, Portland, East Machias, Florissant, Honolulu, Sitka, Vladivostok, Jersey, Ivigtut, Rathfarnham Castle, Prague, Toledo, Oak Ridge, Kew, La Plata, Rio de Janeiro, Uccle, Bidston, Cape Town, and Graz.

Nov. 13d. 11h. 50m. 31s. Epicentre 38°·8N. 69°·7E. (as on 1937 May 15d.).

$A = +\cdot2711$, $B = +\cdot7328$, $C = +\cdot6240$; $\delta = -13$; $h = -1$;
$D = +\cdot938$, $E = -\cdot347$; $G = +\cdot217$, $H = +\cdot585$, $K = -\cdot781$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand		2·3	292	0 39	− 1	i 1 29	S_g	—	—
Tashkent		2·5	353	i 0 55	P_g	i 1 24	+10	i 2·0	3·0
Andijan		2·8	46	0 38	− 9	1 25	+ 3	—	2·1
Tchimkent		3·5	359	1 11	P_g	1 59	S_g	—	—
Frunse		5·5	41	e 1 45	P_g	i 2 57	S_g	—	4·0
Almata		7·0	49	e 1 55	P*	e 3 28	S*	—	4·7
Dehra Dun		10·9	139	4 29	S	(4 29)	−15	6·3	6·5
Agra	E.	13·5	146	e 3 15	0	i 5 20	−27	—	8·5
Semipalatinsk		13·8	29	e 3 35	+16	e 6 33	SSS	—	—
Baku		15·3	281	e 3 39	0	e 7 43	L	(e 7·7)	11·0
Grozny		18·6	291	e 4 18	− 3	e 8 21	SS	—	—
Sverdlovsk		19·0	346	i 4 31	+ 5	9 10	?	i 12·1	12·4
Tiflis		19·2	286	e 4 23	− 5	e 8 24	SS	e 11·5	14·1
Bombay		20·0	171	e 4 27	−10	e 8 4	−13	—	—
Piatigorsk		20·6	293	e 4 51	+ 8	—	—	—	—
Calcutta	N.	22·7	130	e 5 0	− 4	i 9 2	− 7	e 11·1	15·2
Sotchi		23·0	292	e 4 27	−40	—	—	—	—
Irkutsk		27·4	49	—	—	e 10 29?	+ 1	15·1	16·0
Ksara		27·6	269	e 5 46	− 5	e 11 3	+31	—	—
Pulkovo		32·5	323	e 9 15	?	—	—	13·0	18·0
Helwan		32·7	265	—	—	e 14 17	SSS	—	—
Colombo		33·1	161	12 20	S	(12 20)	+21	20·3	—
Hamburg		42·6	310	e 11 29?	?	—	—	—	—

Additional readings :—
Samarkand iP* = +44s., P_g = +47s., i = +1m.2s., +1m.7s., and +1m.13s.
Tashkent i = +1m.38s.
Andijan P_g = +49s., i = +1m.1s. and +1m.30s., S_g = +1m.38s.
Tchimkent S_g = +2m.28s.
Frunse e = +2m.16s., i = +3m.18s. and +3m.46s.
Almata e = +2m.43s.
Dehra Dun S = +5m.29s.
Agra SSE = +5m.46s.
Sverdlovsk iL_q = +10·8m.
Tiflis i = +9m.11s.
Calcutta PPPN = +5m.34s., eSSN = +9m.55s.
Helwan e = +19m.5s.
Colombo S = +17m.35s.
Long waves were also recorded at Moscow, Hong Kong, Vladivostok, De Bilt, and Copenhagen.

Nov. 13d. 17h. 53m. 47s. Epicentre 32°·5S. 177°·0W. (as at 9h.).

$A = -\cdot8438$, $B = -\cdot0442$, $C = -\cdot5347$; $\delta = -14$; $h = +1$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington		11·0	214	e 2 39	− 3	4 24	−23	—	—
Christchurch		13·7	214	—	—	e 5 31	−21	—	—
Brisbane	E.	26·4	275	i 5 31	− 9	—	—	11·0	—
Riverview		26·6	258	e 5 49	+ 7	—	—	e 12·6	14·3
Sydney		26·6	258	e 5 41	− 1	—	—	e 12·5	15·7
Melbourne		31·4	250	i 6 25	0	11 45	+13	15·7	18·0
Adelaide		36·8	254	—	—	e 15 33	SS	—	22·5
Perth		55·9	257	1 7 3	?	i 16 19	−70	28·3	—
Manila		75·5	298	11 37	−11	21 31	+ 3	—	—
Pasadena		86·3	46	e 12 46	+ 1	—	—	e 38·2	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mount Wilson	Z.	86·5	46	i 12 47	+ 1	—	—	—	—
Berkeley		86·6	41	—	—	e 23 16	[+ 5]	e 40·2	—
Riverside		86·7	46	e 12 48	+ 1	—	—	—	—
Haiwee	N.	87·6	44	e 12 59	+ 8	—	—	—	—
Tinemaha	E.	88·3	44	e 12 59	+ 4	—	—	—	—
Vladivostok		88·6	325	e 12 51	− 5	e 24 47	PS	e 42·2	49·6
Tucson		89·7	51	13 4	+ 3	—	—	e 41·3	—
Huancayo		93·2	106	—	—	e 23 43	[+ 8]	e 37·4	—
Victoria		93·7	32	—	—	e 24 1	[+ 7]	44·2	—
Calcutta	N.	105·5	286	e 20 33	?	—	—	—	66·5
Irkutsk		108·7	320	—	—	e 24 13?	[−53]	e 48·2	—
Sverdlovsk		134·1	320	e 22 46	?	—	—	64·2	—
Baku		141·8	296	e 19 58	[+25]	e 26 29	[−13]	e 72·2	86·6
Grozny		144·9	300	e 19 45	[+ 6]	—	—	—	—
Tiflis		145·8	297	e 19 42	[+ 2]	—	—	e 62·7	87·1
Piatigorsk		146·8	302	e 19 40	[− 2]	—	—	—	—
Pulkovo		147·3	334	e 19 56	[+13]	—	—	e 80·7	89·0
Ksara		152·5	280	i 19 52k	[+ 1]	e 42 54	SS	75·7	82·7
Paris		163·7	2	e 20 13?	[+ 9]	—	—	89·2	—
Granada		172·9	48	e 19 53	[−18]	—	—	97·2	—

Additional readings :—
Wellington +3m.4s. and +3m.18s., S = +4m.28s., +4m.32s., and +4m.35s.
Christchurch eEN = +5m.53s., iE = +6m.49s., iZN = +7m.35s., iEZ = +9m.7s. and +13m.5s.
Brisbane iPPE = +6m.37s., eSPE = +10m.19s.
Riverview e?N = +2m.49s.
Sydney e = 17h.48m.43s.
Melbourne i = +7m.43s., e = +14m.18s.
Perth i = +12m.8s., +22m.6s., and +26m.58s.
Berkeley eN = +23m.26s., eE = +36m.2s., eN = +36m.20s.
Tucson e = +20m.31s.
Huancayo SKS = +24m.1s., ePS = +25m.2s., ePPS = +25m.54s., eSS = +31m.1s., eSSS = +34m.31s.
Irkutsk e = +29m.13s.?
Baku e = +35m.59s., +41m.50s., +52m.8s., and +60m.20s.
Tiflis PPE = +22m.55s., eE = +33m.7s.
Ksara ePP = +23m.35s., ePPS = +36m.48s.
Long waves were also recorded at Arapuni, Hong Kong, Cape Town, Kodaikanal, Bombay, Ivigtut, De Bilt, Copenhagen, Uccle, San Fernando, Strasbourg, Stuttgart, Scoresby Sund, La Paz, Ukiah, Oak Ridge, and East Machias.

Nov. 13d. Readings also at 0h. (Baku, Sverdlovsk, Tashkent, Tiflis, Perth, Lick, and near Sumoto), 1h. (Huancayo and near Ferndale), 2h. (Huancayo, Erevan, and Tiflis), 4h. (La Paz), 5h. (near Erevan), 6h. (Christchurch, Wellington, Ksara, and near Lick), 7h. (Tiflis, San Francisco, and near Berkeley), 9h. (Apia and Samarkand (2)), 10h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Christchurch, and Wellington), 12h. (Mount Wilson, Pasadena, Riverside, Ksara, Sverdlovsk, Moscow, Perth, Sebastopol, Theodosia, and Yalta), 14h. (Tiflis, near Tashkent, and near Santiago), 16h. (Averroes), 17h. (Mount Wilson, Pasadena, and Riverside), 19h. and 21h. (near Hukuoka B), 22h. (Medan).

Nov. 14d. 10h. 58m. 10s. Epicentre 36°·3N. 71°·0E. (as on 1937 Sept. 9d.).

Damage to houses at Chitral and in Kashmir. Felt Force IX at Gurez, Drosh, Cherat, Srigagar, and Lahore, Force VIII at Skardu, Rawalpindi, Force VII at New Delhi, Miranshah, Dras, and Kaboul, strongly felt at Tashkent, Stanilabad, and Kokand (Turkestan).

Macroseismic area 900-1000 sq. kms. Epicentre 37°·3N. 72°·3E. India Weather Review, 1937. Annual Summary Part D, Seismic Records, p. D. 48, Earthquake Reports.

J. Lynch.

The Earthquake of Nov. 14, 1937. Bulletin of the Seismological Society of America, Vol. 28, p. 177-189, 1938. Epicentre 35°·6N. 70°·8E.

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

A depth of focus 0·025 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan		4·6	14	1 10	0	1 54	−10	—	—
Samarkand		4·6	319	1 10	0	—	—	—	—
Tashkent		5·2	347	i 1 14	− 4	—	—	—	—
Tchimkent		6·1	351	1 29	0	i 2 36	− 3	—	—
Frunse		7·1	22	1 42	0	i 2 58	− 4	—	—
Almata		8·3	32	i 2 0	+ 2	i 3 31	+ 1	—	—
Dehra Dun		8·4	133	2 10a	+11	3 10	−23	3·8	7·8
Agra		10·9	145	2 30	− 2	4 19	−12	—	—
Semipalatinsk		15·6	22	i 3 30	− 1	i 5 37	−41	—	—
Baku		17·0	290	i 3 46	− 2	i 6 53	+ 4	—	—
Bombay		17·4	174	i 3 55	+ 3	i 7 11	+13	—	—
Hyderabad		19·9	159	4 34	+16	8 13	+26	9·5	13·0
Calcutta	E.	20·4	127	i 4 32	+ 9	i 8 8	+12	—	—
Grozny		20·6	299	i 4 26	+ 1	i 8 1	+ 2	—	—
Tiflis	E.	21·0	295	i 4 26	− 3	i 8 7	0	—	—
Erevan		21·1	288	i 4 31	+ 1	i 8 17	+ 8	—	—
Sverdlovsk		21·7	345	i 4 34	− 2	i 8 16	− 3	11·3	—
Piatigorsk		22·6	300	i 4 45	0	i 8 33	− 2	—	—
Kodaikanal	E.	26·6	166	i 4 24	−58	i 8 59	−42	11·7?	13·8
Theodosia		28·2	299	5 33	− 4	10 59	+52	e 12·0	13·0
Irkutsk		28·4	44	5 41	+ 2	e 10 1	− 9	11·8	—
Ksara		28·8	275	i 5 42a	0	10 18	+ 2	—	—
Yalta		29·0	297	5 39	− 5	11 12	+52	—	—
Simferopol		29·1	299	5 40	− 5	e 10 29	+ 8	—	—
Sebastopol		29·5	299	5 47	− 1	—	—	—	—
Moscow		29·8	321	i 5 47	− 4	10 27	− 5	—	16·0
Colombo		30·4	163	5 58	+ 2	10 5	−37	12·1	17·5
Helwan		33·7	270	i 6 22	− 3	11 32	− 1	—	—
Phu-Lien		34·7	106	i 6 37	+ 4	i 11 49	+ 1	15·3	17·7
Bucharest		34·8	297	e 6 34a	0	i 11 50	0	15·5	18·2
Pulkovo		35·1	325	6 31	− 6	11 41	−13	12·3	15·5
Lemberg		36·3	306	i 7 2	+15	e 12 22	+ 9	—	19·7
Sofia		36·9	295	6 50?	− 2	i 12 15?	− 7	—	—
Belgrade	z.	38·8	298	i 7 4a	− 4	i 12 48	− 3	—	—
Kecskemet	z.	39·2	302	i 7 1	−10	e 12 30	−26	e 17·6	31·3
Budapest		39·6	303	i 7 12	− 2	12 55	− 7	—	16·3
Dairen		39·8	71	6 23	−53	—	—	—	—
Hong Kong		39·8	98	7 19k	+ 3	13 8	+ 3	21·3	—
Stara Dala		40·1	304	e 7 17	− 1	13 7	− 3	14·8	16·3
Upsala		41·2	322	i 7 25	− 2	i 13 20	− 6	—	16·7
Vienna		41·3	305	e 7 25	− 3	13 18	− 9	—	—
Medan		41·4	135	7 31	+ 2	i 13 26	− 3	—	—
Zagreb		41·8	301	i 7 23	− 9	13 31	− 4	—	17·1
Zi-ka-wei	z.	41·9	81	i 7 36k	+ 3	13 38	+ 2	27·8	28·6
Graz		42·1	303	i 7 30	− 5	i 13 30	− 9	i 15·8	17·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Prague		42·5	308	i 7 36a	− 2	i 13 38	− 7	e 15·3	17·3
Laibach		42·8	301	e 7 42	+ 2	i 13 51	+ 2	—	—
Heizyo		42·9	69	7 42	+ 1	15 15	SS	—	—
Triest		43·3	301	i 7 43a	− 1	i 13 51	− 6	e 17·8	20·0
Copenhagen		43·6	315	e 7 43	− 4	i 13 57	− 4	—	—
Cheb		43·8	308	e 7 46	− 2	e 13 58	− 6	e 17·4	17·8
Capodimonte	N.	43·9	294	i 7 50	+ 1	i 14 20	+15	—	—
Zinsen		44·0	71	i 7 51a	+ 1	i 14 12	+ 5	—	15·9
Jena		44·2	308	i 7 47	− 5	i 14 5	− 5	e 15·8	18·5
Keizyo		44·2	71	7 52	0	10 57	?	—	15·8
Taityu		44·2	92	7 56	+ 4	—	—	—	—
Tainan		44·3	94	7 56	+ 4	—	—	—	—
Taihoku		44·4	90	(7 57)	+ 4	(13 40)	−32	—	—
Arisan		44·6	92	8 0	+ 5	—	—	—	—
Takao		44·6	94	7 56	+ 1	—	—	—	—
Giran		44·8	90	7 58	+ 2	—	—	—	—
Hamburg		45·0	313	i 7 54a	− 4	i 14 20	− 1	—	18·3
Karenko		45·0	91	8 4a	+ 6	—	—	—	—
Göttingen		45·2	310	i 7 55	− 4	i 14 18	− 6	—	—
Taito		45·2	93	8 28	+29	i 13 12	?	—	—
Kosyun		45·3	94	8 4a	+ 4	—	—	—	—
Syuhurei		45·4	72	7 58	− 3	i 16 0	SS	—	—
Taikyu		45·9	72	8 7a	+ 2	11 16	?	14·7	16·2
Stuttgart		46·0	306	e 8 2	− 4	e 14 29	− 6	e 24·6	—
Chur		46·1	304	e 8 1	− 6	e 17 33	SS	—	—
Husan		46·5	73	8 12a	+ 2	(14 46)	+ 4	14·8	—
Karlsruhe		46·5	307	i 8 10	0	14 37	− 5	—	—
Zurich		46·6	304	e 8 7	− 3	e 14 30	−14	—	—
Isigakizima		46·9	89	8 14	+ 1	—	—	—	—
Strasbourg		47·0	306	i 8 10a	− 4	i 14 45	− 4	—	19·7
Tomie		47·2	77	8 19	+ 4	i 16 21	?	—	—
Basle		47·3	304	e 8 10	− 6	e 17 42	SS	—	—
Bergen		47·4	323	8 13	− 4	14 52	− 3	19·5	22·8
Neuchatel		47·8	304	e 8 15	− 5	e 20 55	?	—	—
Nagasaki		48·0	76	8 23	+ 2	16 33	?	—	—
De Bilt		48·1	312	i 8 20a	− 2	i 15 2	− 3	e 18·8	19·6
Hukuoka		48·1	75	e 8 23	+ 1	15 57	+52	—	—
Hukuoka B		48·1	75	i 8 24	+ 2	11 33	PPP	14·5	—
Saga		48·1	75	8 32	+10	—	—	—	—
Izuka		48·3	75	8 25	+ 1	i 16 45	SS	—	—
Unzendake		48·3	76	8 21	− 3	i 17 10	?	—	—
Besançon		48·4	304	i 8 25	+ 1	i 15 4	− 5	—	—
Kumamoto		48·6	76	8 31a	+ 5	i 16 51	SS	—	—
Uccle		48·8	310	i 8 25a	− 2	i 15 10	− 5	—	—
Naha		48·9	86	8 30	+ 21	i 11 45	PPP	—	—
Kagosima		49·0	78	8 31	+ 2	i 16 56	SS	—	—
Hirosima		49·4	74	8 33	+ 1	i 15 25	+ 2	—	—
Manila		49·4	103	i 8 37a	+ 5	17 17	?	29·1	—
Miyazaki		49·5	77	8 35	+ 2	i 15 28	+ 4	—	—
Sakai		49·6	72	8 36	+ 2	—	—	—	—
Marseilles		49·7	299	i 8 36	+ 2	i 15 28	+ 1	—	—
Matuyama		49·9	74	8 41	+ 5	i 17 3	?	—	—
Paris		50·4	307	i 8 38a	− 2	i 15 30	− 7	18·8	21·8
Simidu		50·4	75	8 41	+ 1	—	—	—	—
Koti		50·5	74	8 43	+ 3	i 15 43	+ 5	—	—
Okayama		50·5	72	8 39	− 1	i 17 8	?	—	—
Tadotu		50·5	73	8 44	+ 4	i 17 15	?	—	—
Toyooka		50·8	70	8 45	+ 2	17 11	?	—	—
Kobe		51·1	71	e 8 47	+ 2	17 16	?	—	32·8
Muroto		51·2	74	8 48a	+ 2	i 15 58	+10	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tokusima	51·2	72	8 46	0	—	—	—	—
Miyadu	51·3	70	8 44	− 2	i 17 13	?	—	—
Sumoto	51·3	72	8 48a	+ 2	e 17 18	?	—	17·5
Durham	51·6	315	i 8 47	− 2	i 15 48	− 5	—	—
Kew	51·6	312	i 8 46a	− 3	i 15 46	− 7	21·8	28·4
Osaka	51·6	71	8 54	+ 5	—	—	34·7	—
Osaka B	51·6	71	8 54a	+ 5	i 17 33	?	—	—
Wakayama	51·6	72	8 50a	+ 1	i 15 58	+ 5	—	—
Kyoto	51·7	70	8 52a	+ 3	i 17 34	?	—	—
Wazima	51·7	67	8 52	+ 3	i 17 32	?	—	—
Kanazawa	51·9	68	8 47	− 4	—	—	—	—
Yagi	51·9	71	8 44	− 7	—	—	—	—
Hikone	52·0	70	8 55	+ 3	i 16 8	+ 9	—	—
Husiki	52·1	68	8 57	+ 5	i 17 31	?	—	—
Ibukisan	52·1	70	8 56	+ 4	—	—	—	—
Oxford	52·1	312	i 8 45a	− 7	i 15 51	− 9	18·5	29·0
Toyama	52·2	68	8 54	+ 1	i 17 23	?	—	—
Edinburgh	52·3	317	i 8 51	− 3	i 15 56	− 7	—	22·0
Kameyama	52·3	71	8 56	+ 2	i 17 42	?	—	—
Siomisaki	52·3	73	8 56	+ 2	i 17 29	?	—	—
Stonyhurst	52·3	315	i 8 53	− 1	i 16 0	− 3	—	21·2
Gihu	52·4	70	8 54a	− 1	i 17 36	?	—	—
Tu	52·4	71	8 59	+ 4	i 17 47	?	—	—
Barcelona	52·6	299	8 52	− 4	15 59	− 8	20·1	22·7
Nagoya	52·6	70	i 9 0a	+ 4	—	—	17·7	—
Bidston	52·8	315	i 8 53	− 5	i 15 59	−10	21·8	28·7
Matumoto	52·9	69	8 40	−18	i 17 18	PPS	—	—
Nagano	53·0	68	9 1a	+ 2	i 17 39	?	—	—
Hakodate	53·1	60	9 3	+ 3	—	—	—	—
Muroran	53·1	60	8 59	− 1	—	—	—	—
Sapporo	53·1	59	9 0	0	i 17 48	—	—	—
Jersey	53·2	310	i 8 54	− 6	15 59	−16	—	—
Niigata	53·2	66	8 58	− 2	—	—	—	—
Akita	53·3	64	9 6a	+ 5	i 17 57	?	—	—
Hamamatu	53·3	70	9 3	+ 2	i 17 50	?	—	—
Aomori	53·4	63	9 2	0	i 10 54	?	—	—
Oiwake	53·4	68	9 3a	+ 1	i 16 24	+ 7	—	—
Algiers	53·5	292	e 8 20	−43	i 16 12	− 7	—	—
Asahigawa	53·6	58	9 9	+ 6	i 18 3	?	—	—
Kohu	53·6	60	9 12	+ 9	e 10 52	?	—	—
Maebasi	53·7	68	9 7	+ 3	i 17 39	?	—	—
Hunatu	53·8	68	9 6	+ 1	i 18 0	?	—	—
Omaesaki	53·8	70	8 54	−11	i 14 57	?	—	—
Batavia	54·0	134	9 7	+ 1	i 16 25	− 1	21·8	—
Tortosa	54·0	298	i 9 1	− 5	i 16 22	− 4	i 21·9	22·4
Yamagata	54·0	65	9 11	+ 5	—	—	—	—
Aidu	54·1	67	9 45	+38	e 17 3	+36	—	—
Hatinohe	54·1	62	9 7a	0	i 17 45	?	—	—
Kumagaya	54·1	68	9 9a	+ 2	i 18 0	?	—	—
Misima	54·1	70	8 54	−13	i 15 50	−37	—	—
Morioka	54·1	63	9 8a	+ 1	e 16 28	+ 1	—	—
Numadu	54·1	70	9 7	0	i 10 22	?	—	—
Hukusima	54·3	67	9 8	0	e 16 33	+ 4	—	—
Ito	54·3	70	9 11	+ 3	—	—	—	—
Mizusawa	54·3	64	i 9 10	+ 2	i 16 31	+ 2	—	—
Urakawa	54·4	59	9 21	+12	—	—	—	—
Yokohama	54·5	69	9 12a	+ 2	i 17 10	?	—	—
Tokyo Cen. Met. Ob.	54·5	68	9 11a	+ 1	e 16 37	+ 5	—	—
Kakioka	54·6	67	9 7	− 4	i 16 34	+ 1	—	—
Tukubasan	54·6	67	9 10	− 1	e 10 32	?	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rathfarnham Castle		54·7	315	i 9 11	0	i 16 34	− 1	26·8	—
Mito		54·8	67	9 12a	0	e 16 40	+ 4	—	—
Mera		54·9	70	9 14	+ 1	e 18 10	?	—	—
Tyosi		55·3	68	9 8	− 8	i 18 11	?	—	—
Hatidyozima		55·6	71	9 16	− 2	e 13 16	?	—	—
Nemuro		56·0	57	9 20	− 1	i 18 27	?	—	—
Scoresby Sund		57·2	337	i 9 29	0	i 17 10	+ 2	—	—
Toledo		57·5	298	i 9 30	− 1	i 17 10	− 2	e 26·6	—
Almeria		57·6	294	i 9 28	− 4	i 17 3	−10	e 25·4	33·6
Granada		58·3	295	i 9 36	− 1	i 17 24	+ 2	—	—
Malaga		59·0	295	i 9 41	− 1	i 17 42	+11	27·8	—
Reykjavik		59·2	330	e 9 43	0	i 17 40	+ 6	—	—
Titizima		60·0	76	9 49	+ 1	—	—	—	—
San Fernando		60·5	295	i 9 52	0	i 17 42	− 8	—	—
Averroes		62·7	293	i 10 2	− 5	i 18 10	− 8	e 31·8	—
Amboina	E.	66·5	113	10 29	− 2	i 19 2	− 3	—	—
Ivigtut		71·0	334	i 10 54	− 5	i 19 55	− 3	—	—
Sitka		84·4	13	i 12 11	− 1	22 34	+14	i 33·9	—
Cape Town		85·4	221	i 12 20	+ 3	i 22 24	− 6	e 38·8	49·7
Halifax		89·6	329	e 12 20	−17	i 23 8	− 1	34·8	—
Seven Falls		90·2	335	e 12 50?	+10	i 22 50?	[− 1]	36·8	—
East Machias		90·9	332	e 12 32	−11	i 22 54	[− 1]	i 36·7	—
Shawinigan Falls		91·3	336	e 12 44	− 1	e 23 24	0	36·8	—
Portland		93·0	333	e 12 57	+ 4	23 7	[0]	37·8	—
Ottawa		93·3	336	e 12 53	− 1	i 23 4	[− 5]	37·8	—
Vermont		93·3	334	i 12 53	− 1	i 23 43	+ 1	e 37·5	—
Oak Ridge		94·5	333	i 12 57a	− 3	i 23 10	[− 5]	e 37·8	—
Weston		94·5	333	i 12 58a	− 2	i 23 10	[− 5]	—	—
Victoria		94·7	9	i 13 1	+ 1	i 23 10	[− 6]	36·8	—
Adelaide		94·8	130	e 13 2	+ 1	i 23 14	[− 2]	30·4	36·3
Williamstown		94·9	334	i 12 58	− 3	i 25 10	?	—	—
Seattle		95·6	9	e 13 19	+14	24 46	+45	e 39·6	—
Toronto		96·0	338	e 13 5	− 1	i 23 17	[− 6]	37·8	—
Buffalo		96·5	337	i 13 8	− 1	i 23 22	[− 3]	—	45·8
Fordham		96·7	333	13 9	− 1	23 24	[− 2]	—	—
Butte		98·0	2	e 13 15	0	e 23 30	[− 3]	—	—
Philadelphia		98·0	334	i 13 14	− 1	i 24 13	− 9	e 42·0	—
Pennsylvania		98·1	336	e 16 36	?	e 23 30	[− 3]	—	26·9
Madison		99·0	345	e 13 20	0	i 23 32	[− 6]	—	—
Melbourne		100·6	129	i 14 30	+63	e 24 45	+ 2	—	—
Cincinnati		101·6	340	i 13 28	− 4	i 23 42	[− 8]	—	—
Ferndale		102·2	11	—	—	e 25 44	+47	—	—
Riverview		102·2	122	e 17 26	PP	i 23 54	[0]	e 42·0	46·0
Sydney		102·3	122	e 18 6	PP	i 24 0	[+ 6]	i 28·2	30·0
Florissant		103·3	345	i 13 39	0	i 23 51	[− 7]	—	—
St. Louis		103·4	345	e 13 40	0	e 23 52	[− 7]	—	—
Ukiah		103·8	11	e 13 47	+ 6	e 24 54	−16	e 44·0	—
Berkeley		105·2	11	e 13 47	P	e 24 5	[− 3]	—	—
San Francisco		105·3	11	e 18 10	PKP	e 24 9	[+ 1]	—	—
Branner		105·6	11	e 18 6	PKP	e 24 57	−28	—	—
Lick		105·8	10	e 18 8	PKP	e 25 57	+30	—	—
Honolulu		106·5	46	e 18 31	PP	24 52	[+39]	—	—
Tinemaha		106·5	7	e 13 57	P	e 24 17	[+ 4]	—	—
Fresno	N.	106·6	8	e 13 59	P	e 24 14	[+ 1]	—	—
Haiwee		107·5	7	e 14 2	P	e 24 17	[0]	—	—
Little Rock		107·6	345	e 14 41	P	i 24 1	[−17]	—	—
Santa Barbara	z.	108·9	8	e 13 47	P	—	—	—	—
Mount Wilson	z.	109·3	7	14 8	P	e 24 4	[−21]	—	—
Pasadena		109·4	7	e 14 5	P	—	—	—	—
Riverside	z.	109·6	7	e 14 6	P	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
La Jolla	z.	110·8	7	e 18 39	PKP	—	—	—	—
Tucson		111·8	1	14 18	P	25 1	[+26]	e 45·8	—
San Juan		112·2	315	14 18	P	i 25 38	[+62]	e 45·3	—
Apia		119·9	84	(e 21 50?)	PPP	—	—	e 21·8	—
Merida		120·2	339	i 19 52	PP	i 29 43	PS	—	—
Christchurch		121·5	123	i 18 32	PKP	27 40	?	36·8	—
Wellington		122·2	120	i 18 32	PKP	—	—	36·8	—
Rio de Janeiro		122·2	264	i 20 5	PP	(e 26 22)	?	e 26·4	—
La Paz		138·8	288	e 18 52	[−12]	i 26 15	[+22]	67·4	68·2
La Plata		138·9	256	19 2	[− 2]	—	—	55·6	—
Huancayo		141·3	300	i 19 7	[− 1]	e 26 27	[+30]	i 63·4	—
Santiago		148·5	263	19 32	[+12]	e 41 23	SS	—	—

Additional readings :—
Andijan i = +1m.20s.
Tchimkent i = +1m.38s.
Frunse i = +1m.45s., +1m.47s., +1m.53s., and +2m.10s.
Almata i = +2m.4s., +2m.8s., +2m.22s., +2m.58s., +3m.12s., and +3m.39s.
Agra iEN = +2m.33s., iN = +4m.1s.
Baku i = +3m.51s.
Bombay sP = +4m.56s.
Calcutta isPE = +5m.43s., sS?E = +9m.12s.
Tiflis eE = +8m.0s.
Sverdlovsk pP = +4m.57s., sP = +5m.20s.
Kodaikanal iE = +5m.4s. and +5m.31s.
Theodosia i = +6m.32s.
Irkutsk PP = +6m.39s.
Ksara pP = +6m.24s., sS = +11m.33s.
Yalta i = +8m.32s. and +10m.12s., e = +11m.32s.
Simferopol i = +6m.27s.
Moscow pP = +6m.20s., sP = +6m.38s., PP = +6m.49s.
Colombo SS = +10m.44s.
Helwan pP = +7m.10s., i = +8m.0s. and +10m.30s., sS = +12m.40s.
Phu-Lien iPPP = +6m.53s., SS = +13m.8s.
Bucharest iPP = +7m.26s. and +7m.50s., SSN = +13m.20s., SSE = +13m.22s.
Sofia eSS = +13m.32s.?
Belgrade iZ = +7m.55s., iPPPZ = +8m.42s., iZ = +12m.35s., iSSZ = +16m.10s., i = +20m.23s. and +23m.40s.
Kecskemet z. ipP = +7m.58s., ePP = +8m.38s., eP_cP = +9m.14s., eSPP = +9m.38s., e = +11m.22s., eP_cS = +12m.58s., esS = +13m.42s., esS_cP = +14m.14s., e = +15m.50s., eS_cS = +16m.57s.
Budapest iN = +7m.15s. and +7m.42s., ipPE = +8m.2s., PPE = +8m.50s., PPN = +8m.59s., P_cPN = +9m.23s., iE = +11m.8s., iN = +11m.13s., iE = +12m.3s., SN = +12m.59s., iN = +13m.17s., +13m.35s., and +14m.6s., isSE = +14m.10s., iNE = +14m.48s., SS = +15m.44s., iN = +15m.59s., iE = +17m.29s.
Dairen i = +13m.49s.
Hong Kong PP? = +8m.35s., ? = +10m.11s., S = +14m.30s., SS? = +16m.36s.
Pulkovo pP = +7m.6s., PP = +7m.46s., sPP = +8m.42s., sS = +12m.45s.
Upsala iPPE = +8m.39s., iE = +9m.12s., iSE = +13m.26s., iE = +14m.50s., iSSN = +15m.56s.
Vienna i = +7m.30s., SS = +16m.13s., S_cS = +17m.52s.
Zagreb i = +7m.43s., iZ = +8m.17s., i = +8m.26s., i = +9m.10s., +9m.26s., and +9m.39s., e = +10m.13s., +10m.43s., +11m.4s., and +12m.28s., i = +14m.54s., e = +15m.32s., i = +16m.42s.
Zi-ka-wei iE = +7m.42s., iN = +8m.30s., PPZ = +9m.0s., PPPZ = +9m.12s., PPPPZ = +9m.42s., iZ = +10m.45s., iN = +15m.16s., iZ = +15m.28s., SSZ = +16m.30s., SSSZ = +17m.22s., SSSSZ = +17m.40s., iZ = +21m.52s., +24m.16s., and +26m.33s.
Graz i = +10m.20s. and +15m.2s.
Prague ePP = +9m.8s., eSS = +14m.50s.
Laibach iNE = +9m.28s. and +15m.8s.
Triest i = +15m.35s., iSSS = +17m.11s.
Copenhagen iP = +7m.45s., pP = +8m.38s., sP = +9m.0s., PP = +9m.31s., pPPE = +10m.12s., isPP = +10m.41s., eE = +13m.23s., sS = +15m.16s., eSS = +16m.48s., iE = +17m.12s., iS_cS = +17m.27s., iE = +17m.32s.
Cheb ePP? = +8m.40s., ePPP = +9m.39s., e = +10m.39s. and +13m.23s.
Zinsen ipPZ = +8m.45s., iPPZ = +9m.35s., iPPPE = +11m.3s., iSN = +15m.38s., isSN? = +17m.23s., iSSE? = +17m.24s.
Jena iPN = +7m.54s., iZ = +8m.39s., e = +8m.43s., i = +9m.35s., e = +10m.37s. eN = +15m.2s., iE = +15m.19s.
Taihoku PP? = (+9m.15s.), i = (+11m.3s.); readings increased by 13m.

Continued on next page.

Hamburg iEZ = +7m.56s., iSS = +17m.44s., eZ = +18m.2s.
Karenko e = +8m.50s. and +9m.35s.
Göttingen iEZ = +8m.51s. and +9m.13s., iPPZ = +9m.55s., isS = +15m.40s., iSS = +17m.55s.
Kosyun i = +9m.26s.
Taikyu PP = +9m.3s., i = +9m.24s.
Stuttgart ipP = +8m.58s., iSP = +9m.11s., iPP = +9m.55s., iS = +14m.33s., esS = +15m.45s., eS$_c$S = +17m.25s., iSS = +18m.0s., eSSS = +18m.50s.
Husan eS = +11m.8s.
Zurich ePP = +10m.0s., iSS = +17m.37s.
Strasbourg ipPZ = +8m.54s., isPZ = +9m.25s., P$_c$PZ = +9m.53s., iPPZ = +10m.3s., ipPPZ = +10m.41s., sPPZ = +11m.10s., PPPZ = +11m.54s., sSN = +16m.8s., iS$_c$SN = +17m.41s., iSS = +18m.15s.
Bergen PP = +9m.30s., PPP = +10m.8s,. S = +16m.10s.
De Bilt iZ = +9m.7s. and +10m.15s.
Uccle iSP = +9m.43s., iPP = +10m.23s., ipPPE = +11m.7s., iPPPZ = +11m.25s., iSPP = +11m.32s., isS = +16m.27s., iN = +17m.54s. and +19m.8s.
Marseilles i = +8m.55s., ipPE = +9m.28s., iSPN = +9m.43s., ipPPE = +10m.3s., iPPE = +10m.33s., iN = +10m.37s., iE = +11m.35s., i = +12m.8s., iS?E = +15m.21s.?, sSN = +16m.53s., iS$_c$SN = +18m.2s., eE = +18m.53s., iSSSN = +20m.0s.
Paris isP = +9m.54s., PP = +10m.36s.
Simidu i = +10m.20s., +12m.7s., and +13m.35s.
Koti i = +9m.39s., e = +17m.13s.
Toyooka PEN = +8m.48s., eSN = +17m.22s.
Kobe iPEN = +8m.50s., SE = +17m.19s., eN = +20m.43s., eE = +20m.53s., eZ = +21m.7s.
Muroto i = +9m.44s. and +12m.22s., e = +16m.42s.
Sumoto e = +9m.45s., eSN = +17m.22s., SE = +17m.26s.
Durham iP$_c$PE = +10m.3s., iPPEN = +10m.47s., iN = +17m.5s., iE = +17m.11s., S$_c$SEN = +18m.15s., iSSEN = +17m.50s., iE = +20m.53s.
Kew iP$_c$P = +10m.2s., iPP = +10m.46s., iS$_c$SN = +18m.10s., eSSN = +19m.35s.
Osaka i = +9m.41s., +11m.35s., +12m.29s., +13m.30s., +17m.35s., +18m.7s., +19m.11s., +22m.14s., and +24m.32s.
Wakayama e = +9m.47s., i = +17m.26s.
Yagi i = +11m.44s. and +17m.28s.
Oxford PP = +10m.48s., SS = +17m.7s.
Toyama i = +10m.16s. and +10m.58s.
Edinburgh i = +10m.9s., +10m.54s., +17m.20s., +18m.20s., +19m.43s., and +20m.12s.
Kameyama i = +10m.51s.
Stonyhurst i = +10m.8s., iPP = +10m.56s., i = +17m.31s., iSS = +20m.11s.
Gihu i = +11m.25s.
Bidston iPP = +10m.55s., iS$_c$S = +18m.25s., eSS = +20m.5s.
Nagano i = +10m.18s., +12m.8s., +13m.25s., and +22m.18s.
Jersey sP = +10m.14s., PP = +11m.0s., PPP = +12m.11s., i = +13m.11s., iP$_c$S = +14m.2s., sS = +17m.47s., SSS = +21m.59s.
Hamamatu i = +18m.15s.
Oiwake i = +9m.10s., +10m.13s., +12m.28s., +13m.7s., +13m.48s., +17m.31s., +17m.58s., and +21m.49s.
Algiers ipP = +8m.57s., iPP = +10m.4s., ipPP = +10m.43s., esPP = +11m.16s., i = +12m.13s., iS = +14m.48s., i = +17m.17s., iSS = +18m.24s., i = +20m.0s.
Maebasi i = +11m.54s.
Batavia iE = +12m.45s., iN = +13m.4s.
Tortosa iSE = +16m.17s.
Aidu i = +18m.39s.
Morioka e = +10m.18s., i = +18m.1s.
Hukusima i = +18m.4s.
Tokyo Cen. Met. Ob. e = +10m.31s., +11m.52s., +13m.25s., +14m.47s., and +18m.2s.
Kakioka i = +10m.31s. and +18m.25s.
Rathfarnham Castle i = +11m.17s., iPP = +11m.35s., iPPP = +13m.12s., i = +21m.42s.
Mito i = +18m.16s.
Mera e = +10m.42s.
Scoresby Sund pPZ = +10m.21s., isP = +10m.46s., PP = +11m.38s., e = +12m.45s., S$_c$PE = +13m.40s., iP$_c$SN = +14m.5s., eE = +15m.44s. and +18m.14s., iS$_c$S or sS = +18m.30s., eE = +20m.26s., iSSN = +20m.43s., eE = +21m.2s., isSS = +22m.40s.
Reykjavik iP = +9m.46s., i = +11m.1s., PP = +11m.57s.
San Fernando iN = +11m.30s. and +12m.25s., iE = +17m.35s., iN = +18m.37s. and +19m.15s.
Averroes P$_c$P = +10m.36s., ipPE = +11m.1s., sP = +11m.36s., pPP = +11m.48s., sP$_c$P = +12m.6s., PPN = +12m.26s., PPP = +13m.59s., i = +18m.23s., S$_c$S = +19m.10s., SS = +19m.43s., sS$_c$SE = +21m.11s., SS = +22m.20s., sSSE = +23m.48s., SSS = +25m.12s.

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Ivigtut iP = +10m.56s., eEN = +11m.38s., ipP = +11m.53s., isP = +12m.17s., e = +13m.10s., PP = +13m.38s., PPP = +15m.14s., e = +16m.35s., SP = +20m.33s., sS = +21m.20s., eE = +22m.21s., SS = +24m.20s.
Sitka i = +12m.15s. and +12m.26s., iPP = +15m.34s., iPPP = +17m.33s., iS_cS = +23m.6s., ePS = +23m.32s., i = +23m.44s., iPPS = +23m.56s., SS = +28m.13s., iSSS = +31m.55s.
Cape Town ipPE = +13m.0s., ipPN = +13m.4s., isPE = +13m.17s., iPPN = +15m.39s., iPPE = +15m.42s., ipPPE = +16m.24s., ipPPN = +16m.29s., iPPPE = +17m.39s., iPPPN = +17m.44s., iSN = +22m.29s., iE = +23m.4s. isS?N = +23m.24s., isS?E = +23m.29s., iPSE = +23m.54s., iPSN = +24m.10s., iSS = +27m.58s., iSSSE = +31m.21s., iSSSN = +31m.24s.
Halifax i = +22m.38s., e = +24m.20s.
Seven Falls e = +16m.20s., +24m.50s.?, and +27m.50s.?
East Machias ePP = +16m.15s., ePPP = +18m.15s., ePPS = +24m.32s., iSS = +28m.44s. and +29m.24s.
Shawinigan Falls i = +13m.42s., e = +24m.39s.
Ottawa e = +16m.36s., +17m.52s., +24m.50s., and +29m.50s.
Vermont i = +16m.40s., +18m.44s., +22m.59s., +24m.49s., +26m.23s., e = +29m.53s., i = +33m.42s.
Oak Ridge epPZ = +13m.54s.
Weston ipP = +13m.50s., iPP = +16m.46s., iS = +23m.51s., iPS = +24m.55s., ePKP,PKPZ = +39m.31s.
Victoria e = +14m.24s., eN = +16m.56s., i = +25m.2s.
Adelaide e = +12m.8s., i = +17m.2s., i = +17m.50s., iS = +23m.48s., i = +24m.38s. and +26m.30s.
Williamstown ipP = +14m.8s., iP_cP? = +16m.48s., iPP = +18m.3s., ePPP? = +18m.27s., iPS? = +26m.20s., i = +26m.58s. +39m.34s., e = +41m.48s.
Seattle ePPP = +17m.18s., ePPP = +19m.17s., i = +23m.35s., iS_cS = +25m.39s., iPS = +25m.51s., i = +27m.17s., eSS = +31m.28s., eSSS = +35m.26s.
Toronto e = +16m.50s. and +31m.50s.?
Buffalo i = +17m.4s., +18m.20s., +19m.12s., +25m.10s., +25m.32s., +25m.52s., +26m.36s., and +27m.14s.
Philadelphia i = +16m.36s., +17m.13s., +18m.25s., +23m.23s., +23m.28s., and +25m.15s., iPS = +26m.9s., i = +26m.46s., iPSPS = +32m.16s., ePKP,PKP = +38m.16s.
Pennsylvania i = +17m.16s. and +18m.6s., e = +18m.33s., i = +20m.34s., e = +25m.15s.
Madison e = +14m.17s. and +24m.25s.
Melbourne i = +17m.42s., +18m.40s., +22m.29s., +23m.47s., and +26m.24s., e = +41m.38s. and +55m.20s.
Riverview iN = +26m.40s., iE = +28m.12s., iEN = +32m.21s., eL_qE = +34·4m.
Sydney PP = +19m.2s.
Florissant iZ = +13m.43s., ePPZ = +14m.35s., iPKPZ = +17m.42s., iPP = +17m.57s., epPKP = +18m.35s., ipPPZ = +18m.53s., iPPPN = +20m.1s., iSKKSN = +24m.32s., iSN = +24m.55s., isSKSN = +25m.38s., iZ = +25m.40s., iSPN = +26m.39s., isSN = +27m.3s., iPPSNZ = +27m.49s., eN = +36m.20s.
St. Louis eE = +16m.55s., iE = +17m.32s. and +24m.0s., eSEN = +25m.2s., iE = +25m.41s., +26m.48s., and +28m.16s., eE = +33m.0s.
Ukiah ePP = +18m.1s., eS = +25m.38s., ePS = +26m.52s., eSS = +32m.59s., iSSS = +36m.58s.
Berkeley ePZ = +13m.50s., eZ = +16m.58s., eEN = +17m.13s. and +18m.12s., iPKPN = +18m.17s., iN = +24m.14s., eE = +25m.52s., iN = +25m.55s., eE = +29m.50s.
San Francisco eEN = +25m.53s.
Branner eEN = +18m.33s. and +25m.55s.
Lick eEN = +18m.13s.
Honolulu PKS = +20m.11s., iS = +26m.2s., ePS = +27m.30s.
Tinemaha eE = +17m.55s., iNE = +26m.1s., eE = +30m.40s.
Fresno ePKPN = +18m.4s., eN = +18m.29s. and +26m.1s.
Haiwee eN = +17m.4s., +18m.10s., +21m.57s., and +30m.7s.
Little Rock eN = +15m.16s., iPKPE = +18m.9s., eE = +18m.18s., eN = +18m.26s., eEN = +18m.30s. and +18m.40s., epPPEN = +19m.7s., eN = +20m.6s., iE = +20m.39s., +24m.16s., and +25m.37s.
Santa Barbara iZ = +18m.34s., ePKKPZ = +29m.20s., eZ = +34m.21s.
Mount Wilson iZ = +17m.22s., iPKPZ = +17m.50s., iPPZ = +18m.32s., iZ = +18m.44s., isPPZ = +19m.56s., iZ = +20m.6s., iSKPZ = +21m.53s., iPKSZ = +22m.17s., eSPZ = +27m.46s., eZ = +28m.47s., iPKKPZ = +29m.15s., iZ = +30m.29s., iSKKPZ? = +32m.37s., iZ = +34m.14s. and +34m.22s., iPKP,PKPZ = +38m.0s., iZ = +38m.7s.
Pasadena eEZ = +17m.22s., ePPZ = +18m.33s. and +18m.42s., iZ = +18m.52s., and +19m.37s., isPPZ = +19m.58s., eSKPZ = +21m.50s., iPKSZ = +22m.19s., iZ = +27m.42s. and +29m.0s., iPKKPZ = +29m.14s., iPPSN = +29m.20s., iZ = +30m.28s. and +34m.22s., eZ = +37m.30s.
Riverside iPKPZ = +17m.51s., iZ = +18m.44s., esPPZ = +20m.0s., iPKSZ = +22m.11s., iPKKPZ = +29m.14s., iZ = +30m.27s. and +34m.19s., ePKP,PKPZ = +37m.59s.

Continued on next page.

La Jolla iZ = +18m.50s., ePKKPZ = +29m.11s., eZ = +34m.7s.
Tucson iPKP = +18m.19s., PP = +19m.10s., i = +19m.22s., iPP = +19m.34s., i = +19m.46s. and +20m.10s., iPKS = +20m.31s., eS = +26m.50s., i = +28m.6s., PS = +28m.31s., iPKKP = +29m.10s., i = +29m.19s., iPPS = +29m.44s., eSS = +34m.29s.
San Juan iPP = +19m.27s., i = +19m.36s., iPKS = +21m.23s., iPPP = +21m.36s., i = +27m.22s., iPS = +28m.36s., iS_eS = +28m.59s., iPPS = +29m.50s., iSS = +34m.55s., iPKP,PKP = +37m.48s.
Christchurch ipPZ = +20m.8s., PP = +21m.4s., iEZ = +23m.44s., i = +30m.57s., SS = +32m.12s.
Wellington ipP = +20m.15s., iPP = +21m.12s., iPPP = +22m.52s., i = +23m.52s.
La Paz iPKPZ = +19m.5s. and +19m.9s., iPPZ = +21m.58s., iSKP = +22m.44s., iSKKS = +28m.42s., iSS = +39m.44s., iN = +41m.14s.
Huancayo P = +19m.12s., i = +19m.5s. and +19m.48s., iPP = +22m.41s., i = +22m.49s., iPKS = +23m.1s., i = +23m.15s., +23m.23s., +23m.28s., and +23m.42s., ePPP = +25m.47s., iSKS = +26m.32s. and +27m.2s., iSKSP = +32m.49s., iPPPS = +36m.55s., iSSS = +41m.2s., i = +41m.6s., +41m.47s. +42m.8s., and +42m.16s.

Nov. 14d. 13h. 59m. 0s. Epicentre 22°·4S. 62°·5W.

A = +·4273, B = −·8208, C = −·3789; δ = −14; h = +4;
D = −·887, E = −·462; G = −·175, H = +·336, K = −·925.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		5·9	265	1 31	0	—	—	—	—
La Paz		7·9	316	i 1 58a	− 1	i 3 29	− 1	4·1	4·9
Santiago		13·2	212	—	—	5 29	−11	—	—
Huancayo		16·0	308	e 3 59	+11	6 17	−29	—	—
La Jolla	Z.	75·8	315	e 11 48	− 2	—	—	—	—
Riverside	Z.	76·6	316	i 11 53k	− 1	—	—	—	—
Mount Wilson	Z.	77·2	316	i 11 57k	0	—	—	—	—
Pasadena		77·2	316	i 11 57k	0	—	—	—	—
Tinemaha	E.	79·1	318	i 12 9	+ 1	—	—	—	—
Wellington		97·4	220	e 13 53	+16	—	—	—	—

Additional readings :—
Montezuma i = +1m.35s., e = +1m.37s., i = +1m.47s., +1m.49s., and +1m.51s.
Huancayo S = +7m.6s., i = +7m.28s. and +8m.26s.
Riverside iZ = +12m.22s.
Pasadena iZ = +12m.26s., eZ = +12m.39s.
Mount Wilson iZ = +12m.26s. and +12m.39s.
Wellington e = +13m.57s., S = +14m.0s. and +14m.5s.

Nov. 14d. 23h. 51m. 23s. Epicentre 19°·2N. 121°·2E. (as on 1937 Aug. 15d.).

A = −·4896, B = +·8084, C = +·3269; δ = +8; h = +5;
D = +·855, E = +·518; G = −·169, H = +·280, K = −·945.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		4·6	184	1 35	P_g	2 36	S_g	—	—
Taihoku		5·8	3	e 1 31	+ 2	2 26	−12	—	—
Zi-ka-wei	Z.	11·9	1	—	—	e 5 13	+ 4	—	9·3
Phu-Lien	E.	13·8	279	e 3 26	+ 7	e 4 37?	?	—	9·8
Sumoto		19·4	37	e 4 32	+ 2	4 47	?	—	—
Kobe		19·8	37	e 4 32	− 3	e 7 40	−33	—	—
Nagoya		21·2	38	e 4 36	−13	—	—	—	—
Irkutsk		35·6	343	—	—	e 15 37?	?	18·6	22·7
Agra	E.	40·3	290	e 7 45	+ 5	—	—	—	—
Tashkent		49·1	309	9 33	+42	17 41	?	e 25·6	31·3
Sverdlovsk		58·1	327	9 39	−19	17 56	− 2	27·1	33·7
Moscow		70·8	324	—	—	e 24 18	SS	—	42·2
Ksara		75·8	300	e 12 5	+15	e 24 21	?	45·1	50·6

Additional readings :—
Sumoto eZ = +4m.35s.
Kobe ePN = +4m.36s., eZ = +7m.54s.
Long waves were also recorded at Hong Kong, Vladivostok, Scoresby Sund, Kodaikanal, and other Russian and European stations.

Nov. 14d. Readings also at 0h. (Wellington), 1h. (Huancayo and La Paz), 2h. (Erevan, Fresno, near Berkeley, Branner, Lick, and San Francisco), 3h. (Huancayo and La Paz), 4h. (Frunse, Tchimkent, and near Andijan), 5h. (Christchurch, Wellington, Ksara, De Bilt, Copenhagen, Stuttgart, Zagreb, Belgrade, Bucharest, near Sofia, near Almata, and Andijan), 7h. (Wellington), 8h. (Santiago), 12h. (near Mizusawa), 13h. (Mount Wilson, Riverside, Tashkent, and near Samarkand), 15h. (near Manila), 16h. (near Santiago), 17h. (near Algiers, Almeria, and Granada), 18h. (Mizusawa, near Andijan, Tashkent, and near Manila), 19h. (Mount Wilson, Pasadena, Riverside, Merida, Tucson, and near Manila), 20h. (Mount Wilson, Pasadena, Riverside, Melbourne, Perth, Wellington, and Ksara), 21h. (Sverdlovsk, Kodaikanal, Tashkent, and Huancayo), 22h. (Baku, Strasbourg, Paris, Uccle, and San Fernando).

Nov. 15d. 1h. 47m. 35s. Epicentre 46°·3N. 7°·4E.

$A = +\cdot6875$, $B = +\cdot0893$, $C = +\cdot7206$; $\delta = -10$; $h = -4$;
$D = +\cdot129$, $E = +\cdot992$; $G = +\cdot715$, $H = +\cdot093$, $K = -\cdot693$.

Scale IV at Sion and Sierre.

Jahresbericht (1937) des Schweizerischen Erdbebendienstes Separatabdruck aus den Annalen der Schweizerischen Meteorologischen Zentralanstalt (Jahrgang, 1937), p. 3.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Sion	0·0	—	i 0 2	P*	i 0 4	S*	—
Neuchatel	0·7	336	i 0 4	−13	i 0 31	+ 3	—
Basle	1·3	6	i 0 25	0	e 0 42	− 2	—
Zurich	1·3	37	e 0 26	+ 1	i 0 45	+ 1	—
Besançon	1·3	314	i 0 51	S	(i 0 51)	+ 7	—
Chur	1·6	69	e 0 30	0	e 0 52	+ 1	—
Ravensburg	2·1	45	e 0 41	P_g	i 1 10	S_g	—
Strasbourg	2·3	6	e 0 49	P_g	i 1 25	+16	—
Stuttgart	2·7	26	e 0 44	− 1	e 1 22	+ 3	—
Uccle	4·9	337	—	—	e 2 1	−14	—
Jena	5·4	30	e 1 48	P_g	e 2 35	+ 7	3·1

Additional readings:—
Neuchatel i = +19s.
Strasbourg ePP = +56s., i = +1m.13s., PS = +1m.16s., iSSN = +1m.30s., iSSE = +1m.40s. and +1m.45s.
Stuttgart eP_g = +54s., e = +1m.29s., iS_g = +1m.32s., iE = +1m.39s. and +1m.43s.
Jena eE = +2m.39s.

Nov. 15d. 21h. 37m. 22s. Epicentre 35°·1N. 78°·1E.

Felt Force VII at Srinagar. Epicentre 34°·5N. 77°·5E.

India Weather Review, 1937. Annual Summary Part D. Seismic Records p.D. 48. Earthquake Reports.

$A = +\cdot1691$, $B = +\cdot8024$, $C = +\cdot5724$; $\delta = +8$; $h = 0$;
$D = +\cdot979$, $E = -\cdot206$; $G = +\cdot118$, $H = +\cdot560$, $K = -\cdot820$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Dehra Dun		4·7	180	1 8	− 6	1 58	−12	2·5	2·6
Andijan		7·2	322	1 54	+ 5	3 20	+ 7	—	4·4
Agra		7·9	180	i 2 5	+ 6	i 3 33	+ 3	—	5·2
Almata		8·2	355	i 2 7	+ 4	3 28	−10	—	5·2
Frunse		8·2	342	e 2 6	+ 3	3 44	+ 6	—	4·9
Tashkent		9·3	315	2 16	− 1	e 3 27	−28	—	6·6
Tchimkent		9·8	320	2 28	+ 4	e 4 15	− 2	—	—
Samarkand		9·9	300	2 28	+ 3	i 3 18	−62	—	—
Calcutta	N.	15·4	142	i 3 35	− 5	i 6 20	−12	i 7·2	9·5
Semipalatinsk		15·4	5	3 39	− 1	e 8 33	L	(e 8·5)	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Bombay		16·8	198	i 3 57	− 1	i 6 57	− 8	i 8·8	10·4
Hyderabad		17·5	179	3 59	− 8	e 7 8	−13	9·0	11·7
Baku		22·9	292	i 5 17	+11	i 9 24	+11	12·1	14·9
Kodaikanal	E.	24·8	182	e 6 27	+62	i 10 42	+56	13·3	14·4
Sverdlovsk		24·8	338	i 5 28	+ 3	9 39	− 7	12·2	13·6
Irkutsk		25·4	39	e 5 33	+ 2	e 10 7	+11	13·6	—
Grozny		26·4	298	i 5 45	+ 5	10 30	+18	—	—
Tiflis		26·8	295	e 5 46	+ 2	i 10 38	+19	—	—
Erevan		27·0	291	5 50	+ 5	10 33	+11	—	—
Colombo		28·1	176	5 59	+ 4	10 39	− 1	14·0	15·5
Piatigorsk		28·3	300	6 6	+ 9	—	—	—	—
Phu-Lien		28·8	112	e 6 0	− 2	e 10 49	− 2	e 16·9	19·2
Theodosia		33·8	301	e 8 2	PPP	e 12 26	+16	—	—
Hong Kong		33·9	102	10 53	?	14 27	SS	18·6	19·9
Moscow		34·4	320	6 53	+ 2	12 20	+ 1	—	21·5
Ksara		34·6	280	i 6 56	+ 3	e 12 0	−22	—	—
Yalta		34·7	299	e 6 57	+ 3	e 14 52	SSS	—	—
Sebastopol		35·2	300	7 6	+ 8	e 12 34	+ 3	—	—
Zi-ka-wei	Z.	36·3	83	e 7 8	+ 1	12 40	− 8	21·0	22·4
Medan		36·7	144	7 2	− 8	i 12 47	− 7	16·6	—
Zinsen		38·8	73	i 7 27	− 1	e 13 27	+ 1	e 21·1	22·6
Keizyo		39·1	72	e 7 49	+18	e 13 35	+ 4	—	—
Pulkovo		39·4	324	7 34	+ 1	13 34	− 1	19·4	23·9
Taito		39·4	97	7 22	−11	—	—	—	—
Helwan		39·5	276	i 7 36	+ 2	13 58	+21	—	26·5
Bucharest		40·5	300	e 7 40	− 2	13 50	− 2	19·8	—
Taikyu		40·7	74	e 11 4	?	e 13 0	−55	—	—
Husan		41·3	75	7 49	0	—	—	23·3	—
Tomie		41·8	79	7 54	+ 1	14 14	+ 3	—	—
Nagasaki		42·6	78	7 59	0	—	—	—	—
Sofia		42·6	297	8 0	+ 1	e 17 46	SS	—	—
Hukuoka B		42·8	77	e 8 3	+ 2	e 14 21	− 5	—	—
Manila		43·5	107	8 11	+ 4	14 55	+19	21·6	25·6
Miyazaki		44·1	79	8 11	− 1	14 37	− 8	—	—
Hirosima		44·2	76	8 10	− 2	—	—	—	—
Belgrade	N.W.	44·4	301	e 8 12	− 2	e 14 59	+10	e 22·4	—
Budapest		45·0	305	e 8 19	0	i 15 1	+ 3	—	30·1
Stara Dala		45·6	305	e 10 14	PP	e 14 56	−10	e 20·1	27·1
Upsala		45·7	323	e 8 25	+ 1	e 15 14	+ 6	e 22·6	27·6
Muroto		45·9	76	8 25k	+ 1	15 10	− 1	26·1	—
Kobe	E.	46·2	74	8 30	+ 2	e 15 12	− 3	—	30·6
	N.	46·2	74	8 29	+ 1	15 15	0	—	26·6
	Z.	46·2	74	8 28	0	15 14	− 1	—	29·9
Osaka		46·5	74	8 28	− 3	15 21	+ 2	—	—
Osaka B		46·5	74	8 43	+12	15 33	+14	26·2	—
Kyoto		46·6	73	8 30	− 2	—	—	—	—
Vienna		46·7	307	e 8 39	+ 7	e 15 24	+ 2	—	—
Hikone		46·9	73	8 38	+ 4	—	—	—	—
Gihu		47·3	72	8 36	− 1	15 25	− 6	—	—
Toyama		47·3	70	8 13	−24	—	—	—	—
Zagreb		47·4	303	e 8 39	+ 1	e 15 40	+ 8	e 28·2	—
Graz		47·5	304	i 8 40	+ 2	i 15 34	0	e 19·2	33·7
Nagoya		47·5	72	e 8 41	+ 3	—	—	—	—
Prague		47·8	309	e 8 31	−10	e 15 36	− 2	e 23·6	27·6
Nagano		48·0	70	8 43	0	—	—	—	—
Copenhagen		48·4	318	8 41	− 5	15 48	+ 2	21·6	—
Oiwake		48·4	71	8 46	0	i 14 18	?	—	—
Triest		48·9	304	i 8 53	+ 3	i 15 58	+ 5	e 24·6	28·7
Cheb		49·1	310	e 10 48	PP	e 19 54	SS	—	32·6
Misima		49·1	72	8 19	−32	—	—	—	—

Continued on page next.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia	N.	49·2	141	7 24	?	i 15 54	− 4	—	—
Hukusima		49·4	68	9 35	+42	—	—	—	—
Tokyo Cen. Met. Ob.		49·5	71	8 49	− 5	15 39	−23	—	—
Jena		49·5	310	i 8 50	− 4	e 16 2	0	e 24·6	33·1
Mizusawa	E.	49·5	66	8 57	+ 3	e 15 54	− 8	—	—
	N.	49·5	66	e 8 45	− 9	e 15 58	− 4	—	—
Hamburg		50·1	315	e 8 59a	0	e 16 32	+22	e 22·8	32·6
Göttingen	Z.	50·4	312	e 8 56	− 5	—	—	—	—
Stuttgart		51·4	308	e 9 9k	0	e 16 27	− 1	e 27·6	34·6
Chur		51·5	306	e 9 10	+ 1	e 16 28	− 1	—	—
Bergen		51·9	324	—	—	e 20 31	SS	—	29·7
Zurich		52·1	306	e 9 16	+ 2	e 16 38	0	—	—
Strasbourg		52·3	308	i 9 17a	+ 2	i 16 44	+ 4	—	35·1
De Bilt		53·2	313	9 25	+ 3	16 55	+ 3	27·6	31·0
Neuchatel		53·2	306	e 9 22	0	e 16 38?	−14	—	—
Besançon		53·8	306	e 9 31	+ 5	—	—	—	—
Uccle		54·0	311	e 9 30	+ 2	i 17 4	+ 1	e 26·6	—
Paris		55·6	309	e 9 41	+ 1	e 18 23	+58	29·6	36·6
Kew		56·7	313	—	—	e 17 38?	− 2	e 29·6	33·1
Durham		56·9	318	—	—	e 17 39	− 3	—	38·3
Edinburgh		57·1	319	—	—	e 17 46	+ 1	e 30·6	37·2
Oxford		57·1	314	9 15	−35	i 17 43	− 2	e 28·1	33·7
Stonyhurst		57·3	316	—	—	e 17 38?	− 9	33·6	38·1
Bidston		57·7	316	—	—	e 18 38	+45	e 30·6	37·6
Barcelona		58·2	302	e 10 3	+ 5	—	—	e 32·2	41·1
Algiers		59·3	296	i 10 6	0	—	—	e 37·6	—
Rathfarnham Castle		59·6	317	i 9 8	−60	i 18 22	+ 5	30·6	39·6
Scoresby Sund		60·6	338	14 26	PPP	18 36	+ 6	—	—
Almeria		63·3	298	e 10 28	− 5	e 19 6	+ 2	—	—
Granada		64·0	299	i 10 41	+ 3	e 19 25	+12	—	—
College		74·1	19	—	—	e 21 13	+ 1	e 31·0	—
Perth		75·5	147	10 38?	−10	—	—	—	—
Sitka		83·9	18	e 12 34	+ 1	—	—	e 35·9	—
Victoria		94·7	16	—	—	e 24 2	[+ 3]	55·6	—
Ottawa		96·4	341	—	—	e 24 8	[− 1]	42·6	—
Philadelphia		101·4	339	—	—	e 24 35	[+ 1]	e 41·2	—
Mount Wilson	E.	109·4	13	e 18 45	PP	—	—	—	—
Pasadena	Z.	109·5	13	e 19 1	PP	—	—	e 61·6	—
Riverside	Z.	109·8	13	e 19 8	PP	—	—	—	—
Tucson		112·5	8	e 19 18	PP	—	—	e 53·3	—
San Juan		116·9	321	e 20 8	PP	36 20	SS	e 55·0	—
La Paz		144·6	293	i 19 45k	[+ 7]	—	—	72·6	88·5
Huancayo		146·7	307	i 19 51	[+ 9]	—	—	—	—

Additional readings :—
Andijan i = +2m.9s., +2m.34s., +2m.46s., +3m.6s., +3m.46s., and +3m.55s.
Agra S_g = +4m.19s.
Almata i = +3m.59s.
Frunse i = +2m.35s., +2m.47s., +2m.55s., +3m.24s., and +3m.58s., S = +4m.14s., i = +4m.31s.
Tashkent i = +2m.25s., +2m.38s., +2m.47s., and +2m.56s.
Tchimkent i = +4m.19s.
Samarkand i = +3m.0s. and +5m.34s.
Calcutta iPPN = +3m.44s., iSSN = +6m.46s.
Kodaikanal SSE? = +12m.1s.
Tiflis iPE = +5m.48s., eN = +5m.51s., iN = +8m.0s., eEN = +10m.20s.
Phu-Lien e = +11m.20s.
Hong Kong S? = +15m.16s., SS? = +15m.58s.
Moscow pP = +7m.13s., PP = +8m.8s.
Ksara ePPP = +8m.4s., eSS = +13m.28s.
Zi-ka-wei iZ = +12m.52s., +15m.40s., and +20m.0s.
Medan ePE = +7m.42s., iE = +12m.54s. and +13m.32s., iN = +13m.52s.
Zinsen ePPE = +8m.54s.
Pulkovo pP = +7m.53s.
Helwan PP = +9m.15s., SS = +16m.44s., e = +18m.3s.
Bucharest iN = +7m.49s. and +8m.49s., eE = +9m.32s., iE = +14m.13s. and +16m.56s.

Continued on next page,

Sofia e = +9m.42s.
Belgrade iNW = +9m.53s., eNW = +18m.21s.
Budapest iE = +10m.12s., iN = +10m.23s.. eE = +18m.12s.
Upsala ePPE = +10m.20s., eSE = +15m.9s., eSSE = +18m.24s., iSSN = +18m.28s.
Osaka i = +10m.0s., PP = +10m.30s., PPP = +11m.1s., SS = +18m.40s.
Vienna PP = +10m.32s., PPP = +11m.16s., SSS = +19m.24s.
Gihu SS = +19m.37s.
Zagreb e = +8m.47s., i = +10m.36s., e = +19m.1s.
Prague ePP = +10m.39s., eSS = +19m.8s.
Copenhagen +10m.42s. and +19m.20s.
Triest iPP = +10m.48s., iSS = +19m.23s.
Jena iP = +8m.56s., iE = +10m.52s., iN = +10m.56s., eN = +19m.38s., eE = +19m.48s., i = +19m.56s., eN = +20m.2s., iN = +20m.8s.
Hamburg iPPZ = +11m.2s., iE = +17m.46s., iSS = +20m.13s.
Stuttgart eZE = +9m.31s., epPEZ = +9m.49s., ePP = +11m.14s., ePS = +16m.49s., e = +17m.44s., eSSS = +20m.8s.
Strasbourg ipPZ = +10m.7s., PPZ = +11m.19s., SSE = +18m.5s., iSSSE = +20m.53s., iPKP,PKP = +39m.33s.
De Bilt eSS = +20m.45s.
Uccle PPE = +11m.42s., SSE = +20m.55s.
Paris e = +23m.29s.
Durham eE = +17m.45s.
Oxford eP = +10m.17s., e = +21m.47s., i = +23m.54s.
Stonyhurst i = +23m.9s. and +23m.59s.
Algiers eS = +13m.42s.
Rathfarnham Castle i = +25m.1s.
Scoresby Sund +24m.26s.
College eSS = +26m.6s.
Sitka eSSS = +32m.6s.
Ottawa eN = +31m.38s.?
Philadelphia eSS = +32m.43s.
Tucson ePP = +19m.33s., ePKS = +21m.16s.
San Juan ePS = +30m.16s., ePPS = +31m.32s.
La Paz iPPN = +23m.32s.
Huancayo PKP = +19m.56s. and +20m.7s., ePP = +23m.22s.
Long waves were also recorded at Jersey, Butte, Bozeman, Ukiah, Oak Ridge, Karlsruhe, Brisbane, Wellington, Toyooka, Berkeley, Ivigtut, Tortosa, Williamstown, Cape Town, and Toledo.

Nov. 15d. 22h. 50m. 31s. Epicentre 35°·6N. 139°·7E. (as on 1937 Mar. 27d.).

Seismological Bureau of Tokyo Imperial University gives Epicentre 35°·57N. 139°·57E.

$A = -\cdot6216$, $B = +\cdot5271$, $C = +\cdot5795$; $\delta = +4$; $h = 0$;
$D = +\cdot647$, $E = +\cdot763$; $G = -\cdot442$, $H = +\cdot375$, $K = -\cdot815$.

		Δ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	M. m.
Komaba		0·1	345	0 8	0	0 12	− 1	—
Mitaka		0·1	299	0 8	0	0 13	0	—
Tokyo Cen. Met. Ob.		0·1	33	i 0 11a	+ 3	i 0 16	+ 3	0·3
Tokyo Imp. Univ.		0·1	33	0 10	+ 2	0 15	+ 2	—
Kamakura		0·3	203	0 11	0	0 16	− 2	—
Titibu		0·4	307	0 11	− 2	0 20	− 1	—
Misaki		0·5	189	0 11	− 3	0 19	− 4	—
Tukubasan		0·7	28	0 17	0	0 27	− 1	—
Nagoya		2·3	259	0 43	+ 3	1 10	+ 1	1·3
Mizusawa		3·7	19	—	—	e 1 55	S*	—
Toyooka	E.	4·0	271	e 1 38	+34	2 6	S*	2·2
	N.	4·0	271	e 1 35	+31	e 2 4	S*	2·2

Nov. 15d. Readings also at 0h. (Huancayo, La Paz, Mount Wilson, Pasadena, Riverside, Nagoya, and near Mizusawa), 1h. (San Juan, Rio de Janeiro, Mount Wilson, Pasadena, and Riverside), 2h. (Ksara, Hastings, near Arapuni, Christchurch, Tuai, Stratford, and Wellington), 6h. (Christchurch, Hastings, Riverview, Sydney, Melbourne, Perth, Wellington, Ksara, Mount Wilson, Pasadena, and Riverside), 9h. (Riverside, Wellington, near Basle, Neuchatel, and Zurich), 11h. (Apia, Sion, near Basle, Zurich, and Neuchatel), 12h. (Santiago (2)), 13h. (Santiago, Samarkand, near Andijan, and near Manila), 14h. (Bucharest, Sofia, and near Balboa Heights), 15h. (Riverside and Hastings), 16h. (Nagoya and Balboa Heights), 19h. (Samarkand), 20h. (Santiago (4), Frunse, near Andijan, Samarkand, and Tashkent),

Nov. 16d. 13h. 49m. 22s. Epicentre 36°·3N. 71°·0E. (as on Nov. 14d.).

$A = +·2630$, $B = +·7638$, $C = +·5894$; $\delta = -5$; $h = 0$.

A depth of focus 0·025 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan		4·6	14	1 9	− 1	i 2 2	− 2	—	2·3
Samarkand		4·6	319	1 8	− 2	e 1 52	−12	—	2·4
Tashkent		5·2	347	i 1 15	− 3	i 2 1	−17	i 2·1	3·2
Tchimkent		6·1	351	1 24	− 5	i 2 26	−13	—	2·6
Frunse		7·1	22	e 1 44	+ 2	i 3 3	+ 1	—	—
Almata		8·3	32	e 2 51	+53	—	—	—	—
Agra	E.	10·9	145	e 2 40	+ 8	i 4 38	+ 7	—	—
Semipalatinsk		15·6	22	e 3 31	0	—	—	—	—
Bombay		17·4	174	e 3 38?	−14	—	—	—	—
Calcutta	N.	20·4	127	—	—	i 8 14	+18	—	—
Grozny		20·6	299	4 26	+ 1	7 52	− 7	—	—
Tiflis	E.	21·0	295	e 4 24	− 5	e 8 4	− 3	—	—
Sverdlovsk		21·7	345	i 5 36	+60	e 8 18	− 1	10·6	—
Pulkovo		35·1	325	—	—	i 11 45	− 9	—	—

Additional readings :—
Samarkand $eS_g = +2m.0s.$
Calcutta $i = +8m.41s.$
Tiflis $eP = +1m.15s.$, $eE = +5m.26s.$

Nov. 16d. 22h. 28m. 5s. Epicentre 34°·5N. 99°·5E.

$A = -·1434$, $B = +·8134$, $C = +·5638$; $\delta = +5$; $h = 0$;
$D = +·986$, $E = +·165$; $G = -·093$, $H = +·556$, $K = -·826$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N.	15·7	222	e 3 43	− 1	i 6 57	+18	i 8·1	10·6
Irkutsk		18·0	9	4 12	− 1	7 6	−26	9·5	11·3
Zi-ka-wei	Z.	18·3	92	e 4 25	+ 8	7 57	SS	—	11·6
Agra	E.	20·2	254	4 36	− 3	i 8 18	− 3	—	13·4
Frunse		21·5	300	e 5 3	+11	—	—	—	—
Semipalatinsk		21·5	326	e 4 41	−11	—	—	—	—
Andijan		22·7	294	e 5 10	+ 6	—	—	e 11·6	—
Tashkent		25·1	296	i 5 22	− 6	9 45	− 6	i 13·9	17·2
Sverdlovsk		34·7	322	i 6 51	− 3	—	—	17·4	—
Moscow		47·1	317	8 31	− 4	—	—	25·4	28·7
Ksara		52·2	288	—	—	e 14 20	?	33·9	—

Ksara gives also $e = +22m.40s.$
Long waves were also recorded at Bombay, Hong Kong, Phu-Lien, Vladivostok, Baku, Pulkovo, Tiflis, Copenhagen, De Bilt, and Stuttgart.

Nov. 16d. Readings also at 0h. (Frunse, Tchimkent, Tiflis, near Samarkand, and near Tashkent), 1h. (Almeria, La Paz, Andijan, and Frunse), 5h. (Frunse (2), Bombay, Calcutta, Agra, Tashkent (2), Tchimkent (2), Almata, Sverdlovsk, near Andijan (2), and near Santiago), 6h. (near Wellington), 8h. (Tashkent, Baku, Andijan, and near Wellington), 9h. (near Wellington), 10h. (Tucson, near Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, and Tinemaha), 11h. (Fresno and Andijan), 12h. (near La Jolla, Mount Wilson, Pasadena, and Riverside), 14h. (Tiflis), 15h. (Christchurch and Wellington and near Santiago), 16h. (Brisbane, Perth, Baku, Tashkent, Mount Wilson, Pasadena, Riverside, Zurich, Mizusawa, near Nagoya, and near Chur), 17h. (Ksara, Sverdlovsk, and Tiflis), 19h. (near Wellington), 20h. (Tashkent), 21h. (Baku, Sverdlovsk, Tashkent, Tiflis, Ksara, and near Triest), 22h. (Rio de Janeiro).

Nov. 17d. Readings at 1h. (Batavia and Huancayo), 2h. (Wellington and Santiago), 4h. (Ksara), 7h. and 9h. (near Hukuoka B), 11h. (near Manila), 13h. (Batavia (2)), 14h. (Batavia, Copenhagen, Mount Wilson, Pasadena, and Riverside), 17h. (Calcutta, Graz, Hong Kong, Weston, Oak Ridge, Little Rock, near Florissant, and St. Louis), 19h. (near Nagoya), 20h. (Oak Ridge), 21h. (Phu-Lien), 23h. (Berkeley, Branner, Lick, Fresno, Ferndale, Ukiah, Tucson, Seattle, Sitka, Butte, Haiwee, Mount Wilson, Pasadena, and Riverside).

Nov. 18d. 2h. 48m. 2s. Epicentre 5°·9S. 146°·7E.

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

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview		28·1	172	e 6 31	PP	i 11 7	+27	e 15·8	15·9
Sydney		28·1	172	—,	—	e 11 21	+41	15·4	17·0
Adelaide		29·8	192	e 6 9	− 2	i 11 4	− 3	16·7	20·3
Melbourne		31·8	182	—	—	i 11 40	+ 2	17·5	18·6
Kosyun		37·6	318	7 20	+ 2	—	—	—	—
Nake		37·9	336	7 21	+ 1	—	—	—	—
Karenko		38·5	321	7 26	0	—	—	—	—
Tainan		38·7	319	7 28	+ 1	—	—	—	—
Perth		38·8	224	6 40	−48	13 23	− 3	19·9	21·2
Batavia		39·6	267	7 36	+ 1	—	—	e 25·0	—
Mera		41·1	352	7 49	+ 2	—	—	—	—
Wakayama		41·4	345	7 49	− 1	—	—	—	—
Ooita		41·5	341	7 50	0	—	—	—	—
Sumoto		41·6	346	e 7 52	+ 1	—	—	—	—
Osaka		41·7	346	7 49	− 3	14 5	− 5	—	—
Osaka B		41·7	346	7 55	+ 3	—	—	—	—
Kobe		41·8	346	e 7 46	− 7	e 14 3	− 8	—	—
Hunatu		41·9	351	7 54	0	—	—	—	—
Tokyo (Cen. Met. Ob.)		41·9	352	8 0	+ 6	—	—	—	—
Nagoya		41·9	349	e 7 55	+ 1	—	—	—	—
Gihu		42·1	349	7 31	−24	13 59	−17	—	—
Hukuoka B		42·2	339	e 8 0	+ 4	e 14 11	− 6	—	—
Hong Kong		42·4	312	7 58	0	14 20	0	—	21·6
Kumagaya		42·4	352	7 56	− 2	—	—	—	—
Mito		42·5	353	8 0	+ 1	—	—	—	—
Maebasi		42·7	352	7 56	− 4	—	—	—	—
Oiwake		42·7	351	8 3	+ 3	14 14	−10	—	—
Nagano		43·1	350	8 4	0	14 31	+ 1	—	—
Toyama		43·3	349	8 2	− 3	—	—	—	—
Hukusima		43·8	354	8 10	+ 1	—	—	—	—
Christchurch		43·9	153	8 11a	+ 1	14 38	− 4	21·4	—
Wazima		44·0	349	8 12	+ 1	—	—	—	—
Zi-ka-wei	Z.	44·1	328	e 8 10	− 2	—	—	—	26·4
Mizusawa		45·1	354	e 8 22	+ 2	14 59	0	—	—
Medan		48·9	280	e 8 51	+ 1	e 15 53	0	—	—
Calcutta	N.	63·7	298	e 12 21	PP	i 19 12	+ 2	—	—
Irkutsk		68·2	333	—	—	20 3	− 1	e 29·0	—
Kodaikanal	E.	70·5	283	e 11 19	+ 1	—	—	—	—
Bombay		76·8	290	e 12 13	+18	e 21 37	− 5	—	—
Tashkent		84·5	312	—	—	e 22 52	−10	e 49·9	58·7
Sitka		88·4	32	e 17 9	PPP	e 23 27	[+ 4]	e 40·6	—
Sverdlovsk		92·7	327	e 16 13	PP	24 41	+23	40·0	—
Victoria		94·4	42	—	—	e 23 58?	[0]	38·0	—
Pasadena		97·5	57	i 13 37k	0	—	—	e 45·0	—
Mount Wilson		97·6	57	i 13 38k	0	—	—	—	—
La Jolla	Z.	98·2	58	i 13 41	+ 1	—	—	—	—
Riverside	Z.	98·2	57	i 13 39k	− 1	—	—	—	—
Baku		99·0	310	e 22 32	?	e 31 44	SS	46·5	54·9
Tiflis	E.	102·8	312	—	—	e 24 41	[+ 1]	e 56·0	69·5
Tucson		103·7	59	e 14 7	+ 2	—	—	e 47·1	—
Ksara		110·5	303	e 19 13	PP	e 28 38	PS	62·0	72·5
Williamstown		129·2	36	i 19 10	[0]	—	—	e 71·0	—
Oak Ridge	Z.	130·3	36	i 19 12	[− 1]	—	—	e 69·0	—
Balboa Heights		134·1	83	e 18 32	[−48]	—	—	—	—
La Paz	N.	139·0	124	e 19 24	[− 5]	—	—	—	—
San Juan		145·7	66	e 19 42	[+ 2]	—	—	—	—

For Notes see next page.

NOTES TO Nov. 18d. 2h. 48m. 2s.

Additional readings :—
Adelaide i = +11m.21s. and +13m.5s.
Melbourne i = +13m.7s., +13m.49s., and +16m.47s.
Perth i = +9m.17s., P_cS = +12m.25s., PS = +13m.35s., SS = +16m.41s., SSS = +17m.51s., SSSS = +18m.11s.
Batavia PZ = +7m.38s., iE = +9m.14s.
Osaka PP = +7m.32s., i = +7m.55s. and +14m.20s., SS = +17m.7s., SSS = +17m.50s.
Kobe ePN = +7m.53s.
Gihu PP = +8m.45s., PPP = +9m.58s.
Oiwake PS = +14m.22s.
Mizusawa ePN = +8m.25s.
Christchurch P_cSNZ = +14m.8s., L_qE = +17·8m.
Medan iN = +16m.34s.
Calcutta iN = +19m.43s.
Tashkent e = +29m.36s. and +36m.22s.
Sitka e = +20m.27s., eS = +23m.41s.
Victoria e = +25m.58s.?
Pasadena ePPZ = +17m.35s.
Mount Wilson eZ = +14m.25s.
Riverside ePPZ = +17m.39s.
Tiflis eE = +31m.22s.
Tucson eP = +14m.20s., ePKKP = +30m.5s.
Williamstown e = +22m.27s.
Oak Ridge eZ = +22m.31s.
San Juan ePKP = +19m.47s. and +20m.57s.
Long waves were also recorded at Uccle, Moscow, Pulkovo, Cape Town, De Bilt, Kew, Rio de Janeiro, Copenhagen, and Wellington.

Nov. 18d. 4h. The stations of Central Asia of the U.S.S.R. give Epicentre 40°·9N. 78°·3E., but the observations are difficult to reconcile with any definite determination :—

Almata iP = 40m.40s., i = 40m.59s., 41m.5s., and 41m.10s., S = 41m.15s., S_g = 41m.22s., M = 41m.25s.
Frunse P = 41m.3s., i = 41m.11s., iPP = 41m.19s., i = 41m.32s. and 41m.42s., S = 41m.54s., S_g = 42m.3s., M = 42m.34s.
Andijan eP = 42m.6s., e = 43m.16s. and 43m.34s.
Tashkent eP = 42m.30s., iS = 44m.2s., iL = 44m.24s., M = 44m.48s.
Samarkand eP = 42m.37s., e = 43m.34s.
Tchimkent e = 42m.38s., iS = 44m.18s.
Grozny eP = 45m.24s., e = 51m.0s.
Moscow e = 46m.4s. and 55m.15s., M = 58m.0s.
Agra iE = 46m.25s., i = 48m.45s.
Irkutsk S = 47m.34s., L = 49m.0s.
Calcutta iN = 48m.43s., M = 55m.38s.
Kodaikanal e = 53m.
Pulkovo e = 55m.7s. and 56m.7s., M = 60m.24s.
Long waves were also recorded at Copenhagen.

Nov. 18d. Readings also at 0h. (Oak Ridge, Philadelphia, Sverdlovsk, and Tashkent), 3h. (La Paz and near Hukuoka B), 4h. (Baku and Capodimonte), 5h. (Grozny and Graz), 7h. (near Santiago), 8h. (near Sumoto), 11h. (Balboa Heights), 12h. (Sitka, near Kobe, Sumoto, Toyooka, Nagoya, and Hukuoka B), 14h. (La Plata, near Santiago (2), near Branner (2), Lick (2), San Francisco and Fresno (2), 15h. (Triest), 16h. (Tiflis, Ksara, Pasadena, Riverside, Apia, and near Sumoto), 17h. (Sverdlovsk, Tashkent, Samarkand, and Sitka), 18h. (Samarkand), 20h. (Branner, San Francisco, near Lick, and near Samarkand), 21h. (Pasadena, Riverside, Mount Wilson, Tucson, Huancayo, and La Paz), 22h. (Sverdlovsk, Tashkent, Samarkand, Philadelphia, Mount Wilson, Pasadena, and Riverside).

Nov. 19d. 0h. 50m. 33s. Epicentre 43°·2N. 113°·7W.

$A = -\cdot2939$, $B = -\cdot6696$, $C = +\cdot6821$; $\delta = 0$; $h = -3$;
$D = -\cdot916$, $E = +\cdot402$; $G = -\cdot274$, $H = -\cdot625$, $K = -\cdot731$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Butte		2·9	17	—	—	2 2	S_g	e 3·5
Haiwee		7·8	206	1 55	− 3	e 3 13	−15	—
Fresno	N.	8·0	218	e 1 58	− 2	e 3 23	−10	—
Ukiah		8·2	244	—	—	e 3 43	+ 5	—
Berkeley		8·4	233	e 2 9	+ 3	i 3 49	+ 6	—
Lick		8·4	228	e 2 7	+ 1	e 2 36	−67	—
San Francisco	N.	8·6	234	e 2 31	+22	e 3 55	+ 7	—
Branner	E.	8·7	228	e 2 23	+13	e 3 54	+ 4	—
Mount Wilson		9·6	202	—	—	i 4 7	− 5	—
Riverside	Z.	9·6	198	i 2 19	− 2	i 4 9	− 3	—
Pasadena		9·7	203	i 2 19	− 3	i 4 11	− 4	—
Santa Barbara		9·9	210	e 2 36	+ 1	i 4 19	− 1	—
Tucson		11·2	167	e 2 46	+ 2	5 3	+11	i 5·5

Additional readings :—
Butte e = +3m.10s.
Fresno iN = +2m.15s.
Ukiah e = +4m.7s.
Berkeley eE = +2m.15s., eZ = +3m.53s., iZ = +4m.36s.
Lick eN = +2m.34s.
San Francisco iE = +3m.59s.
Branner eE = +4m.34s.
Tucson i = +3m.26s., +3m.34s., +4m.23s., and +4m.34s., iS = +5m.10s., i = +5m.16s., +5m.21s., and +5m.25s.
Long waves were also recorded at Philadelphia.

Nov. 19d. 2h. 36m. 11s. Epicentre 32°·5N. 49°·0E.

$A = +\cdot5544$, $B = +\cdot6377$, $C = +\cdot5347$; $\delta = -8$; $h = +1$;
$D = +\cdot755$, $E = -\cdot656$; $G = +\cdot351$, $H = +\cdot404$, $K = -\cdot845$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		7·9	6	e 2 8	+ 9	e 3 45	+15	4·3	6·8
Erevan		8·5	336	e 2 10	+ 3	e 3 18	−17	—	—
Tiflis	E.	9·8	341	e 2 4	−20	e 4 15	− 2	e 7·2	—
Grozny		11·1	348	e 2 43	0	e 4 10	−39	—	—
Ksara		11·1	281	e 2 51	+ 8	e 4 35	−14	—	—
Helwan		15·4	264	e 3 37	− 3	—	—	e 8·4	—
Tashkent		18·4	56	i 4 18	0	e 7 49	+ 8	e 8·6	11·6
Sverdlovsk		25·6	14	e 5 30	− 2	9 54	− 5	13·8	—

Additional readings :—
Tiflis eE = +3m.17s., +3m.34s., and +4m.3s., iE = +4m.34s.
Ksara iS_g = +5m.29s.

Nov. 19d. Readings also at 0h. (near Fresno and near Wellington), 1h. (Guadalajara, Oaxaca, Puebla, Tacubaya, Mount Wilson, Pasadena, and Riverside), 3h. (Mount Wilson, Pasadena, Riverside, and Balboa Heights (2)), 4h. (Almata, Frunse, near Andijan, Samarkand, Tashkent, and Tchimkent), 6h. (Tacubaya), 8h. (Samarkand (2), Tashkent, Andijan (3), and Sverdlovsk), 9h. (Samarkand and Andijan), 11h. (near Amboina), 17h. (Yalta), 19h. (Batavia), 20h. (Irkutsk and Tashkent), 22h. (Agra, Bombay, Calcutta, Hyderabad, Kodaikanal, Baku, Sverdlovsk, Tashkent, Ksara, Cape Town, and Mount Wilson).

Nov. 20d. Readings at 1h. (Sumoto), 2h. (Sumoto and near Grozny), 3h. (near Piatigorsk and Tiflis), 4h. (Stuttgart, Toledo, and near Malaga), 9h. (Sverdlovsk, Tashkent, Tiflis, and Ksara), 10h. (Tiflis), 12h. (Alicante), 15h. (near Balboa Heights and near Mizusawa), 16h. (Santiago), 17h. (Balboa Heights, Bombay, Medan, and Santiago), 19h. (Bucharest and Sofia (2)), 20h. (Christchurch, Wellington, and Ksara), 21h. (Tiflis), 22h. (Sverdlovsk and Tashkent), 23h. (Balboa Heights, near Santiago, and near Reykjavik).

Nov. 21d. 20h. 29m. 27s. Epicentre 35°·9N. 24°·6W.

Some damage on the Isle of Santa Maria (Azores).

Epicentre 36°47′N. 26°15′W.

Annales de l'Institut de Physique du Globe de Strasbourg, Tome II, 2e Partie, Seismologie, 1937, p. 64, Mende 1940.

$A = +\cdot7382$, $B = -\cdot3380$, $C = +\cdot5838$; $\delta = +1$; $h = 0$;
$D = -\cdot416$, $E = -\cdot909$; $G = +\cdot531$, $H = -\cdot243$, $K = -\cdot812$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Averroes		14·4	95	e 3 49	PPP	5 55	−14	i 6·9	—
San Fernando		14·8	83	3 37	+ 5	—	—	—	—
Toledo		16·6	70	i 3 57	+ 1	e 7 14	+14	—	—
Almeria		17·8	80	i 4 13	+ 2	e 7 37	+ 9	e 9·9	—
Jersey		21·1	43	e 4 45	− 3	e 7 48	−51	e 11·4	13·6
Rathfarnham Castle		21·6	30	e 5 0	+ 6	i 8 55	+ 6	10·6	11·6
Algiers		22·3	80	e 5 0	− 1	9 9	+ 7	12·6	—
Oxford		23·0	39	—	—	i 9 11	− 3	—	—
Stonyhurst		23·6	34	—	—	i 9 26	+ 1	11·6	13·6
Paris		23·7	48	e 5 19	+ 5	e 9 27	0	11·6	21·6
Durham		24·7	33	—	—	i 9 45	+ 1	—	13·0
Edinburgh		24·8	30	—	—	i 9 47	+ 1	—	—
Uccle		25·5	44	e 5 31	− 1	i 10 2	+ 5	e 13·6	—
Neuchatel		25·9	54	e 5 35	0	—	—	—	—
De Bilt		26·6	43	i 5 47	+ 5	10 14	− 2	e 13·0	13·7
Strasbourg		26·9	51	e 5 47	+ 2	e 10 35	+15	e 14·0	15·2
Zurich		27·1	54	e 5 47	+ 1	—	—	—	—
Stuttgart		27·8	52	e 5 56	+ 3	e 10 33	− 2	e 14·6	—
Prague		31·4	50	—	—	e 11 3	−29	—	18·0
Copenhagen		32·0	39	—	—	11 35	− 7	14·6	—
Pulkovo		42·3	38	—	—	e 14 11	− 8	e 22·0	24·6
Moscow		45·9	44	e 8 25	− 1	e 15 3	− 8	24·0	27·0
Helwan		46·8	80	—	—	e 15 25	+ 1	—	—
Ksara		49·0	74	e 9 1	+11	e 16 15	+20	—	29·6
Tiflis	E.	53·0	61	e 9 32	+11	e 16 51	+ 1	e 27·6	39·5
Sverdlovsk		58·3	39	i 9 57	− 2	17 56	− 5	24·6	—
Tashkent		70·0	53	11 4	−11	e 20 21	− 5	e 39·0	43·0
Riverside	Z.	73·0	300	e 11 34	+ 1	—	—	—	—
Mount Wilson	Z.	73·4	300	e 11 35	− 1	—	—	—	—
Pasadena	Z.	73·5	300	e 11 37	+ 1	—	—	—	—

Additional readings :—
Averroes iSS = +6m.28s., e = +6m.35s.
Toledo PP = +4m.13s.
Jersey e = +5m.11s., eSS = +10m.47s.
Algiers ePP = +5m.33s.
Edinburgh i = +12m.37s.
Uccle eE = +9m.42s., eN = +9m.47s. and +11m.46s.
Strasbourg eSSZ = +11m.54s., eSSE = +11m.59s.
Stuttgart e = +13m.21s.
Pulkovo e = +17m.28s.
Tashkent i = +12m.27s., e = +15m.39s.
Long waves were also recorded at Bidston, Kew, Scoresby Sund, Hamburg, and Tortosa.

Nov. 21d. Readings also at 0h. (Andijan and Frunse), 1h. (Andijan, Frunse, Almata, Tiflis, Sverdlovsk, Tashkent, Grozny, and Semipalatinsk), 2h. (Batavia), 4h. (Oaxaca), 6h. (Balboa Heights), 7h. (Sumoto and Kobe), 8h. (Balboa Heights and Nagoya), 12h. (Santiago), 14h. (Andijan, Frunse, Tchimkent, and Samarkand), 17h. (Nagoya), 20h. (Balboa Heights).

Nov. 22d. 4h. 12m. 49s. Epicentre 34°·4N. 120°·9W.

Felt Force V in the region of Point Conception (California).

Macroseismic area 2000 sq. miles. Epicentre 34°33′N. 120°47′W.

F. Neuman.

United States Earthquakes, 1937, Coast and Geodetic Survey, Serial 619, Washington, 1940, p. 22-23, Chart p. 13.

$A = -·4246$, $B = -·7095$, $C = +·5624$; $\delta = -3$; $h = 0$;
$D = -·858$, $E = +·514$; $G = -·289$, $H = -·483$, $K = -·827$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Pasadena		2·3	96	i 0 38	− 2	i 1 6	− 3
Mount Wilson		2·4	94	i 0 40	− 1	i 1 8	− 4
Fresno	N.	2·5	21	e 0 43	0	i 1 22	S_g
Haiwee		3·0	54	e 0 50	0	i 1 24	− 3
Lick		3·0	348	e 0 49	− 1	e 1 15	−12
Riverside		3·0	98	i 0 47	− 3	i 1 21	− 6
Branner	E.	3·3	341	e 1 3	P_g	e 1 42	S*
La Jolla	Z.	3·4	115	i 0 55	0	—	—
Berkeley		3·6	343	i 0 59	+ 1	i 1 35	− 7
San Francisco		3·6	340	e 1 17	P_g	—	—
Ukiah		5·0	341	—	—	e 2 31	S*
Tucson		8·7	100	e 2 12	+ 2	4 37	S_g

Additional readings:—
Branner iN = +1m.52s.
Berkeley iZ = +1m.6s., eN = +1m.10s.
Tucson i = +5m.3s., +5m.14s., +5m.19s., +5m.24s., +5m.28s., +5m.53s., +6m.4s., +6m.19s., +6m.43s., and +7m.25s.
Long waves were also recorded at Christchurch and Wellington.

Nov. 22d. 4h. 53m. 6s. Epicentre 35°·1N. 135°·7E.

As given by the Imperial Marine Observatory, Kobe.

$A = -·5869$, $B = +·5727$, $C = +·5724$; $\delta = +8$; $h = 0$;
$D = +·698$, $E = +·716$; $G = -·410$, $H = +·400$, $K = -·820$.

A depth of focus 0·050 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Kobe		0·6	225	0 45	0	1 22	+ 2	—
Toyooka		0·8	301	i 0 45	0	i 1 21	0	1·7
Sumoto		1·0	222	i 0 46k	0	i 1 24	+ 2	1·4
Nagoya		1·1	86	i 0 46	0	1 24	+ 1	1·4
Hukuoka B		4·7	253	1 16	− 1	2 17	0	—
Mizusawa	E.	5·9	45	—	—	2 34	− 7	—
Mount Wilson	Z.	82·5	53	i 11 41k	− 4	—	—	—
Pasadena	Z.	82·5	53	i 11 40k	− 5	—	—	—
Riverside	Z.	83·1	53	i 11 43	− 5	—	—	—

Nov. 22d. 17h. 39m. 17s. Epicentre 35°·8N. 138°·2E.

Strongly felt at Kohu and fairly strongly at Iida and Hunatu. Epicentre 34°·77N. 138°·25E. Radius 200-300kms.

See Seismological Bulletin of the Cent. Met. Obs., Japan, for the year 1937. Tokyo, 1939, pp. 57-59. Macroseismic Chart, p. 59.

$A = -\cdot6060$, $B = +\cdot5418$, $C = +\cdot5823$; $\delta = -14$; $h = 0$;
$D = +\cdot667$, $E = +\cdot745$; $G = -\cdot434$, $H = +\cdot388$, $K = -\cdot813$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Iida	0·4	226	0 7a	− 6	0 12	− 9	—	—
Kohu	0·4	119	0 6k	− 7	0 11	−10	—	—
Matumoto	0·5	336	0 7	− 7	0 16	− 7	—	—
Hunatu	0·6	123	0 9k	− 6	—	—	—	—
Oiwake	0·6	28	0 16a	+ 1	0 26	0	—	—
Yosiwara	0·7	148	0 22	+ 5	0 31?	+ 3	—	—
Koyama	0·8	125	0 22	+ 4	0 32	+ 1	—	—
Titibu	0·8	76	0 22	+ 4	0 34	+ 3	—	—
Maebasi	0·9	49	0 21a	+ 1	0 34	0	—	—
Misima	0·9	138	0 25k	+ 5	0 35	+ 1	—	—
Nagano	0·9	0	0 19a	− 1	0 33	− 1	—	—
Numadu	0·9	143	0 15k	− 5	0 26	− 8	—	—
Takayama	0·9	294	0 17k	− 3	0 29	− 5	—	—
Kumagaya	1·0	70	0 20k	− 1	0 35	− 1	—	—
Hamamatu	1·1	200	0 22k	0	0 35	− 4	—	—
Ito	1·1	139	0 18k	− 4	0 33	− 6	—	—
Mitaka	1·1	97	0 21	− 1	0 36	− 3	—	—
Kamakura	1·2	117	0 22	− 2	0 39	− 2	—	—
Komaba	1·2	97	0 23	− 1	0 41	0	—	—
Nagoya	1·2	238	0 21k	− 3	0 41	0	—	0·9
Omaesaki	1·2	180	0 19	− 5	0 35	− 6	—	—
Toyama	1·2	318	0 26a	+ 2	0 45	+ 4	—	—
Yokohama	1·2	107	0 23k	− 1	0 42	+ 1	—	—
Gihu	1·3	251	0 23k	− 2	0 38	− 6	—	—
Husiki	1·3	317	0 26	+ 1	0 49	+ 5	—	—
Misaki	1·3	119	0 22	− 3	0 39	− 5	—	—
Sinagawa	1·3	98	0 28k	+ 3	0 46	+ 2	—	—
Takada	1·3	2	0 29	+ 4	0 47	+ 3	—	—
Tokyo Imp. Univ.	1·3	95	0 24k	− 1	0 41	− 3	—	1·1
Kanazawa	1·4	300	0 30	+ 3	0 51	+ 5	—	—
Ibukisan	1·5	254	0 26	− 2	0 45	− 4	—	—
Mera	1·6	124	0 28k	− 2	0 47	− 4	—	—
Tukubasan	1·6	75	0 29k	− 1	0 50	− 1	—	—
Utunomiya	1·6	61	0 29	− 1	0 50	− 1	—	—
Hikone	1·7	251	0 31k	0	0 55	+ 1	—	—
Kamayama	1·7	236	0 29	− 2	0 50	− 4	—	—
Kakioka	1·7	75	0 31k	0	0 54	0	—	—
Kiyosumi	1·7	112	0 22	− 9	0 47	− 7	—	—
Tu	1·7	232	0 27	− 4	0 47	− 7	—	—
Mito	1·9	72	0 35	+ 1	1 1	+ 2	—	—
Wazima	1·9	327	0 36	+ 2	1 7	+ 8	—	—
Kyoto	2·1	249	0 40a	+ 3	1 8	+ 4	—	—
Tyosi	2·1	92	0 37	0	1 4	0	—	—
Aidu	2·3	41	0 42	+ 2	1 5	− 4	—	—
Yagi	2·3	237	0 38k	− 2	1 8	− 1	—	—
Onahama	2·4	62	0 53a	+12	1 26	+14	—	—
Miyadu	2·5	264	0 42	− 1	1 13	− 1	—	—
Osaka B	2·5	242	0 43a	0	1 19	+ 5	—	—
Hukusima	2·6	43	0 46k	+ 2	1 25	+ 8	—	—
Kobe	2·7	246	i 0 45a	0	i 1 19	0	—	1·5
Toyooka	2·8	264	0 45a	− 2	1 21	− 1	—	1·5
Wakayama	2·9	238	0 52	P*	1 30	S*	—	—
Yamagata	3·0	35	1 2	P_g	1 42	S_g	—	—
Siomisaki	3·1	220	0 59	P_g	1 23	− 6	—	—
Sumoto	3·1	242	c 0 49a	− 2	1 36	S*	—	1·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tokusima		3·4	241	0 55	0	1 44	S*	—	—
Isinomaki		3·6	42	1 24	+26	—	—	—	—
Okayama		3·7	252	1 1	+ 1	1 42	− 3	—	—
Tadotu		3·9	249	1 8	P*	2 4	S*	—	—
Sakai		4·0	268	1 22	P_g	2 18	S_g	—	—
Mizusawa		4·1	34	e 1 8	+ 3	2 4	S*	—	—
Koti		4·5	240	1 21	P*	2 18	S*	—	—
Morioka		4·6	30	1 14a	+ 2	2 13	+ 6	—	—
Miyako		4·9	37	1 21	+ 4	2 17	+ 2	—	—
Hirosima		5·0	255	1 21	+ 3	2 34	S*	—	—
Simidu		5·2	237	1 28	P*	2 45	S_g	—	—
Izuka		6·6	253	1 52	P*	3 18	S*	—	—
Hukuoka		6·8	254	e 1 47	+ 3	3 27	S*	—	—
Hukuoka B		6·8	254	e 1 49	+ 5	e 3 28	S*	—	—
Kumamoto		6·9	246	1 50	+ 5	3 36	S*	—	—
Unzendake		7·2	247	3 50k	S_g	—	—	—	—
Husan		7·5	267	e 2 48	P_g	—	—	—	—
Nagasaki		7·5	248	3 49	S	(3 49)	S*	—	—
Kagosima		7·6	239	4 8	S	(4 8)	S_g	—	—
Tomie		8·4	250	4 22	S	(4 22)	S*	—	—
Mount Wilson	z.	80·4	54	i 12 13a	− 2	—	—	—	—
Pasadena	z.	80·4	54	i 12 12	− 3	—	—	—	—
Riverside	z.	81·0	54	i 12 16	− 2	—	—	—	—

Additional readings :—
Wakayama +1m.40s.
Sumoto ePN = +0m.53s., eZ = +56s.
Long waves were also recorded at Vladivostok, Tashkent, Sverdlovsk, Copenhagen, Hong Kong, and Tiflis.

Nov. 22d. Readings also at 1h. (Apia and Tucson (2)), 2h. (Tucson (2)), 3h. (Tucson), 4h. (Andijan), 6h. (Nagoya, Pasadena, Riverside, and Mount Wilson), 7h. (Andijan and Samarkand), 8h. (Tiflis), 12h. (Pasadena, Riverside, Mount Wilson, and Ksara), 13h. (Grozny and Tiflis), 14h. (Zurich), 16h. (Balboa Heights), 17h. (Triest), 18h. (Triest and Zurich), 19h. (Batavia, Triest, and Nagoya), 21h. (Erevan, Grozny, and Tiflis).

Nov. 23d. 13h. Probably more than one shock.
Brisbane ePN = 56m.30s., ePPN = 57m.12s., iSN = 61m.0s., iSE = 61m.6s., eLN = 62m.12s.
Adelaide e = 59m.36s. and 63m.49s., M = 71·8m.
Manila iPZ = 61m.12s., SN? = 65m.51s., LN? = 68m.25s.
La Paz iPZ = 61m.45s., iSN = 68m.39s., LN = 74m., M = 76m.42s.
Huancayo eP = 62m.9s., eP_cP = 63m.21s., eS = 68m.8s., iS = 68m.34s., eSS = 71m.13s., eS_cS = 71m.53s., eL = 71m.57s.
Christchurch PZ = 62m.49s., iS = 68m.23s., L_q = 70m.29s., L_r = 73m.17s.
Melbourne e = 64m.3s. and 66m.37s.
Bombay eE = 64m.31s., eEN = 74m.47s.
Tucson eP = 64m.43s., e = 64m.59s., eP_cP = 65m.45s., eL = 90m.26s.
Riverside ePZ = 64m.47s.
Andijan P = 64m.50s., S = 75m.24s.
Mount Wilson iPZ = 64m.53s.
Pasadena ePZ = 64m.53s., eLE = 88m.
Samarkand eP = 65m.3s.
Perth 66m.
Wellington i = 69m.50s., eL = 74m., M = 77m.
La Plata L = 70m.42s.
Rio de Janeiro e = 71m.
Calcutta eN = 71m.10s., M = 137m.41s.
Ksara ePKP = 71m.52s., ePP = 75m.2s., eSS = 93m.44s., M = 132m.
Pulkovo e = 72m.9s., 76m.42s., and 79m.3s., eL = 134m.30s., M = 152m.0s.
Stuttgart eZ = 72m.18s. and 73m.36s., eEZ = 75m.32s., eL = 125m.
Copenhagen 72m.21s., L = 120m.
Moscow e = 72m.40s., 77m.16s., and 79m.46s., eL = 132·5m., M = 151·6m.
Arapuni e = 73m.0s.
Kodaiaknal eE = 73m.
Sverdlovsk e = 76m.38s., L = 97m.
Tiflis eE = 76m.48s., 80m.24s., 83m.54s., and 97m.38s., eLE = 126m., M = 156·7m.
Tashkent e = 96m.42s. and 100m.51s., eL = 128m.36s., M = 149m.36s.
Long waves were also recorded at Hong Kong, Irkutsk, Berkeley, Riverview, Cape Town, Ukiah, Oak Ridge, De Bilt, Uccle, Paris, Strasbourg, and Jersey.

Nov. 23d. Readings also at 4h. (Kobe), 6h. (Kobe and near Triest), 7h. (Sverdlovsk, Mount Wilson, Pasadena, Riverside, Bucharest, near Berkeley, Branner, Lick, and San Francisco), 8h. (Riverview, Sverdlovsk, Tashkent, Moscow, Pulkovo, Ksara, Tiflis (2), Brisbane, Haiwee, La Jolla, Riverside, Mount Wilson, Pasadena, Christchurch, Wellington, New Plymouth, Triest, and Scoresby Sund), 11h. (Kobe and near Sumoto). 14h. (Riverview and Tiflis), 15h. (Apia and Tiflis), 16h. (near Calcutta and near Tiflis (3)), 18h. (Bucharest, Andijan, Frunse, and Santiago (2)), 19h. (Erevan, near Grozny, and Tiflis), 20h. (near Samarkand).

Nov. 24d. Readings at 1h. (Mount Wilson, Pasadena, Riverside, and Tucson), 2h. (Huancayo, La Paz (2), Berkeley, Oak Ridge, Christchurch, Wellington, Bombay, Sverdlovsk, Tashkent, Ksara, De Bilt, and near San Javier), 3h. (Balboa Heights, Mount Wilson, Pasadena, Riverside, Irkutsk, Pulkovo, Moscow, Copenhagen, Stuttgart, and near Samarkand), 4h. (East Machias, Little Rock, and Tucson), 5h. (Grozny and near Sumoto), 7h. (La Plata, La Paz, Mount Wilson, Pasadena, Riverside, and near Santiago), 8h. (near Keizyo), 11h. (Neuchatel), 12h. (Copenhagen), 15h. (Batavia), 18h. (Amboina), 19h. (Tucson), 22h. (near Tashkent).

Nov. 25d. 5h. 34m. 56s. Epicentre 24°·6N. 121°·1E. (as on 1937 March 30d.).

$A = -\cdot4702$, $B = +\cdot7794$, $C = +\cdot4140$; $\delta = -5$; $h = +3$;
$D = +\cdot856$, $E = +\cdot517$; $G = -\cdot214$, $H = +\cdot354$, $K = -\cdot910$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		0·6	31	e 0 15	0	0 31	+ 5	—	0·6
Zi-ka-wei	N.	6·5	2	e 1 49	+10	—	—	—	—
Manila		10·0	182	2 27	0	4 40	+18	—	7·1
Husan		12·5	31	e 3 4	+ 2	e 7 27	?	—	—
Phu-Lien		13·9	257	e 3 15	− 6	e 6 35	SSS	—	—
Vladivostok		20·5	23	—	—	e 8 40	+13	e 11·3	13·4
Calcutta		30·1	273	e 7 22	PPP	i 12 33	SS	e 16·3	20·5
Irkutsk		30·4	339	e 6 28	+12	e 11 46	+30	17·1	19·8
Tashkent		45·9	305	i 8 16	−10	e 10 13	?	25·4	31·2
Sverdlovsk		53·7	324	i 9 19	− 7	—	—	26·1	32·2
Moscow		66·4	323	—	—	e 17 29	?	e 35·1	42·4

Additional readings :—
Zi-ka-wei iN = +3m.58s. and +4m.11s.
Calcutta ePPPN = +8m.32s.
Tashkent e = +9m.10s.
Moscow e = +5m.16s.
Long waves were also recorded at Copenhagen, Kodaikanal, Triest, Uccle, Edinburgh, Durham, San Fernando, Zinsen, and Taikyu.

Nov. 25d. Readings also at 0h. (Tucson, Pasadena, Riverside, Manila, Perth, Kodaikanal, Medan, and near Batavia), 1h. (Ksara, Bombay, Calcutta, Sverdlovsk, Irkutsk, Tashkent, Oak Ridge, Weston, Melbourne, Riverview, and near Amboina), 2h. (Wellington and Christchurch), 4h. (Arapuni, Christchurch, Wellington, Adelaide, Melbourne, Riverview, Sydney, Brisbane, Apia, Manila, Tiflis, Tucson, Haiwee, Mount Wilson (2), Pasadena, and Riverside), 5h. (Pulkovo (2), Ivigtut, Scoresby Sund, Moscow, Sverdlovsk, Tiflis, Calcutta, Ksara, Bombay, Honolulu, La Paz, Huancayo, Rio de Janeiro, Oak Ridge, Ukiah, Stuttgart, Strasbourg, Paris, Jersey; De Bilt, Granada, Berkeley (2), Victoria, St. Louis, Philadelphia, Perth, Christchurch, and near Wellington), 9h. (De Bilt, Strasbourg, Stuttgart, Uccle, Cheb, Triest, Belgrade, Bucharest, Sofia, Copenhagen, Ksara, and Tiflis), 11h. (La Paz, Tucson, Mount Wilson, Pasadena, and Riverside), 13h. (Sofia), 18h. (Branner, near Berkeley, and San Francisco), 23h. (Tucson, Nagoya, Neuchatel, near Berkeley, Lick, and San Francisco).

Nov. 26d. 3h. 44m. 10s. Epicentre 42°·3N. 142°·4E.

Felt force II at Kusiro, Sapporo, Urakawa, and Obihiro; I at Muroran, Hakodate, and Hatinohe.

Epicentre given by the Central Met. Obs., Japan.

$A = -\cdot5878$, $B = +\cdot4527$, $C = +\cdot6706$; $\delta = +15$; $h = -3$;
$D = +\cdot610$, $E = +\cdot792$; $G = -\cdot531$, $H = +\cdot409$, $K = -\cdot742$.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Urakawa	0·3	118	0 24	+13	0 34	+16	—	—
Obihiro	0·9	44	0 6	−14	0 18	−16	—	—
Muroran	1·1	272	0 21a	− 1	0 37	− 2	—	—
Sapporo	1·1	315	0 21k	− 1	0 35	− 4	—	—
Hakodate	1·3	248	0 31	+ 6	0 53	+ 9	—	—
Asahigawa	1·5	359	0 19	− 9	0 36	−13	—	—
Kusiro	1·6	65	0 5k	−25	0 24	−27	—	—
Aomori	1·9	219	0 35	+ 1	1 1	+ 2	—	—
Hatinohe	1·9	200	0 34a	0	1 1	+ 2	—	—
Haboro	2·1	346	0 40	+ 3	—	—	—	—
Nemuro	2·6	66	0 37	− 7	1 3	−14	—	—
Miyako	2·7	187	0 43s	− 2	1 16	− 3	—	—
Morioka	2·8	200	0 45	− 2	1 17	− 5	—	—
Mizusawa	3·2	197	0 56	+ 4	1 35	+ 3	—	—
Sakata	3·9	210	1 10	P*	2 5	S_g	—	—
Sendai	4·2	198	1 5	− 2	1 55	− 2	—	—
Yamagata	4·3	202	1 2	− 6	2 0	+ 1	—	—
Hukusima	4·8	200	1 13k	− 2	2 25	S*	—	—
Aidu	5·0	201	1 22	+ 4	—	—	—	—
Mito	6·1	196	1 32	− 2	3 54	S_g	—	—
Utunomiya	6·1	200	1 32	− 2	2 42	− 3	—	—
Kakioka	6·3	198	1 35	− 1	—	—	—	—
Maebasi	6·4	205	1 43	+ 5	—	—	—	—
Tukubasan	6·4	198	2 45	S	(2 45)	− 8	—	—
Wazima	6·5	223	1 38	− 1	2 45	−10	—	—
Nagano	6·5	212	1 39	0	3 27	S_g	—	—
Kumagaya	6·6	202	1 51	+10	3 20	S*	—	—
Otwake	6·7	208	1 41	− 1	3 44	S_g	—	—
Tokyo	6·9	198	1 59	P*	3 10	+ 5	—	—
Toyama	6·9	217	1 46	+ 1	—	—	—	—
Tyosi	6·9	189	1 20	−25	2 50	−15	—	—
Yokohama	7·2	198	2 16	P_g	—	—	—	—
Hunatu	7·3	204	1 51	+ 1	—	—	—	—
Kohu	7·3	205	1 52	+ 2	3 10	− 5	—	—
Misima	7·7	202	1 59	+ 3	4 3	S_g	—	—
Numadu	7·7	202	2 20	P*	—	—	—	—
Gihu	8·2	215	2 2	− 1	—	—	—	—
Nagoya	8·3	210	e 1 56	− 8	4 47	S_g	—	5·1
Hamamatu	8·4	207	2 38	+32	—	—	—	—
Hikone	8·5	217	2 4	− 3	—	—	—	—
Kameyama	8·7	213	2 8	− 2	—	—	—	—
Husan	12·6	240	e 3 8	+ 5	e 3 57	?	—	—
Mount Wilson z.	74·1	58	e 11 49	+ 9	—	—	—	—

Nov. 26d. 10h. 45m. 6s. Epicentre 24°·1N. 123°·1E.

Felt fairly strongly at Giran and Isigakizima.

Macroseismic radius greater than 300kms.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937, Tokyo, 1939. Macroseismic Chart, p. 62.

A = −·4991, B = +·7656, C = +·4061; δ = +16; h = +4;
D = +·838, E = +·546; G = −·222, H = +·340, K = −·914.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Isigakizima		1·0	77	0 20	− 1	0 32	− 4	—	—
Giran		1·4	298	0 35k	+ 8	0 53	+ 7	—	—
Karenko		1·4	265	0 36	+ 9	0 55	+ 9	—	—
Taihoku		1·6	303	0 30	0	0 51	0	—	—
Miyakozima		2·1	71	0 34k	− 3	—	—	—	0·9
Taityu		2·2	271	0 45k	+ 7	1 5	− 1	—	—
Taito		2·3	233	0 42k	+ 2	1 11	+ 2	—	—
Takao		2·9	240	1 0	P_g	1 38	S_g	—	—
Tainan		2·9	246	0 56	+ 8	1 32	S*	—	—
Kosyun		3·0	226	0 54k	+ 4	1 33	S*	—	—
Hokoto		3·3	260	0 55	+ 2	1 46	S_g	—	—
Naha		4·6	62	1 29	P_g	2 15	S*	—	—
Nake		7·1	52	1 41k	− 7	3 0	−10	—	—
Zi-ka-wei		7·1	352	e 1 50	+ 2	3 13	+ 3	—	4·7
Manila		9·7	193	i 2 27k	+ 5	4 57	S*	—	—
Tomie		9·8	29	2 24a	0	4 27	+10	—	—
Kagosima		9·9	40	2 31	+ 6	—	—	—	—
Nagasaki		10·5	33	2 33	− 2	—	—	—	—
Unzendake		10·6	34	2 44	+ 8	5 29	+52	—	—
Miyazaki		10·7	42	2 42	+ 4	4 43	+ 4	—	—
Kumamoto		10·9	36	2 41	+ 1	—	—	—	—
Hukuoka		11·4	32	e 2 49	+ 2	e 5 8	+12	—	—
Hukuoka B		11·4	37	e 2 49	+ 2	e 4 55	− 1	—	—
Ooita		11·8	37	3 32	PPP	—	—	—	—
Husan		12·1	24	e 2 56	− 1	5 9	− 5	—	—
Taikyu		12·6	21	3 4	+ 1	5 25	− 1	—	—
Hirosima		13·1	36	3 16	+ 6	5 40	+ 2	—	—
Koti		13·1	42	3 16	+ 6	5 56	+18	—	—
Muroto		13·3	43	3 3	−10	4 30	?	—	—
Zinsen		13·7	12	i 3 16a	− 2	i 5 50	− 2	i 7·6	7·9
Keizyo		13·8	13	e 3 18	− 1	e 7 47	L	(e 7·8)	—
Siomisaki		14·5	47	3 31	+ 3	—	—	—	—
Sumoto		14·5	43	e 3 31	+ 3	6 40	+29	—	7·0
Wakayama		14·6	43	3 27	− 3	—	—	—	—
Kobe		14·9	42	e 3 40	+ 6	e 6 51	+31	—	7·9
Heizyo		15·0	7	e 3 35	0	e 6 32	+ 9	—	9·5
Osaka B		15·0	43	3 11	−24	—	—	—	—
Yagi		15·1	44	4 7	PPP	—	—	—	—
Phu-Lien	N.	15·6	260	e 3 47	+ 4	e 6 54	+17	8·1	10·0
Kameyama		15·8	44	3 48	+ 3	6 44	+ 2	—	—
Gihu		16·3	44	3 58	+ 6	7 54	+61	—	—
Nagoya		16·3	46	e 3 55	+ 3	6 48	− 5	—	—
Hamamatu		16·5	47	4 22	PP	7 0	+ 2	—	—
Omaesaki		16·8	48	4 7	+10	—	—	—	—
Hatidyozima		17·2	55	4 2k	− 1	7 11	− 3	—	—
Titizima		17·4	77	4 4	− 2	7 22	+ 3	—	—
Toyama		17·4	41	4 19	+13	7 36	+17	—	—
Numadu		17·5	48	4 8	+ 1	—	—	—	—
Misima		17·6	48	4 5	− 3	7 29	+ 6	—	—
Hunatu		17·7	47	4 10	0	7 26	0	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mera		18·1	49	4 28	+14	7 33	− 2	—	—
Oiwake		18·1	45	4 15	+ 1	7 38	+ 3	—	—
Nagano		18·1	42	4 9	− 5	7 32	− 3	—	—
Yokohama		18·2	48	4 28	PP	7 39	+ 2	—	—
Maebasi		18·4	45	4 15	− 3	—	—	—	—
Tokyo		18·4	47	4 19	+ 1	8 9	SS	—	—
Kumagaya		18·5	46	4 18	− 1	7 38	− 6	—	—
Kakioka		19·0	46	4 19	− 7	7 46	− 9	—	—
Tyosi		19·2	50	4 21	− 7	—	—	—	—
Mito		19·3	46	4 24	− 5	—	—	—	—
Palau		19·9	146	4 33	− 3	8 16	+ 1	—	—
Hukusima		20·1	45	4 35	− 3	—	—	—	—
Mizusawa		21·4	42	e 4 51	0	i 8 38	− 7	—	—
Medan		31·2	234	6 24	+ 1	—	—	—	—
Irkutsk		31·6	338	6 22	− 4	e 11 26	− 9	16·9	—
Calcutta	N.	31·9	275	e 6 39	+10	i 11 51	+11	e 15·5	21·1
Batavia	Z.	34·0	210	6 46	− 2	—	—	—	—
Agra	E.	40·6	285	i 7 47	+ 4	i 13 47	− 7	—	—
Hyderabad		42·1	270	8 7	+12	14 32	+16	18·4	25·9
Semipalatinsk		42·2	321	7 52	− 4	—	—	—	—
Almata		42·3	310	e 8 15	+18	—	—	—	—
Frunse		43·9	308	e 8 18	+ 8	—	—	—	—
Colombo		44·8	255	8 18	+ 1	14 54	− 1	18·3	27·4
Andijan		45·3	304	8 26	+ 5	15 7	+ 5	e 25·1	—
Kodaikanal	E.	45·5	262	i 8 22	− 1	15 6	+ 1	22·1	27·9
Bombay		46·9	274	e 8 37	+ 3	i 15 22	− 3	i 18·9	—
Tashkent		47·7	305	i 8 37	− 3	e 15 28	− 8	23·5	27·9
Sverdlovsk		55·1	325	i 9 32	− 4	i 17 8	−10	28·8	35·1
Brisbane		58·9	149	e 12 12	PP	i 17 54	−14	e 22·0	—
Riverview		63·5	154	—	—	e 19 6	− 1	e 34·4	46·9
Grozny		64·9	309	e 10 46	+ 3	e 19 23	− 1	—	—
Tiflis	E.	65·9	307	i 10 47	− 3	19 32	− 5	e 27·6	44·0
Erevan		66·5	306	e 10 53	− 1	—	—	—	—
Moscow		68·0	324	10 58	− 5	e 19 49	−13	32·4	41·6
Sotchi		69·2	311	e 11 7	− 3	—	—	—	—
Pulkovo		70·9	329	e 11 14	− 7	e 20 26	−10	32·4	40·1
Theodosia		71·8	312	11 23	− 3	20 38	− 8	—	—
Simferopol		72·7	313	i 11 27	− 5	e 20 47	−10	—	
Yalta		72·8	312	i 11 26	− 6	20 48	−10	—	—
Sebastopol		73·2	313	11 30	− 5	20 52	−10	—	—
Ksara		74·8	300	i 11 42	− 2	e 21 18	− 2	—	—
Upsala		76·9	331	—	—	e 20 36	−67	e 37·9	41·7
Christchurch		81·2	146	—	—	e 24 40	PPS	38·8	—
Copenhagen		81·2	328	12 16	− 3	22 24	− 5	38·9	—
Scoresby Sund		82·5	350	i 12 22k	− 4	—	—	—	—
Hamburg		83·6	328	i 12 28a	− 4	—	—	e 44·3	51·9
Cheb		84·1	324	—	—	e 21 54?	−64	e 38·9	45·9
Zagreb	Z.	84·1	318	i 12 31a	− 3	—	—	—	—
Göttingen	E.	84·7	326	e 12 34	− 3	—	—	—	—
Triest		85·6	319	i 11 14	?	i 22 41	[−24]	e 50·2	57·1
Stuttgart		86·6	323	i 12 43	− 3	e 23 14	[+ 3]	e 47·9	55·4
De Bilt		86·8	328	i 12 44a	− 3	e 23 10	[− 2]	e 40·9	48·1
Strasbourg		87·5	324	i 12 47a	− 4	e 23 24	− 7	e 39·5	48·3
Zurich		87·7	323	e 12 48a	− 4	—	—	—	—
Uccle		88·0	327	i 12 49a	− 4	e 22 45	[−35]	40·9	—
Basle		88·2	323	e 12 50	− 4	—	—	—	—
Neuchatel		88·8	323	e 12 53	− 4	—	—	—	—
Oxford		90·1	329	—	—	23 50	− 5	e 46·2	50·9
Paris		90·2	326	e 13 17	+13	—	—	46·9	54·9
Mount Wilson	Z.	97·9	47	i 13 34	− 5	—	—	—	—
Pasadena	Z.	97·9	47	e 13 34	− 5	—	—	—	—
Riverside	Z.	98·5	47	i 13 36	− 6	—	—	—	—
Tucson		103·9	45	e 14 2	− 4	—	—	48·7	—
Philadelphia		114·0	15	—	—	e 29 0	PS	—	—
Huancayo		158·8	59	e 20 3	[+ 4]	e 26 59	[− 4]	e 64·2	—
La Paz	Z.	167·0	56	i 20 9k	[+ 2]	—	—	82·3	110·3

For Notes see next page.

NOTES TO NOV. 26d. 10h. 45m. 6s.

Additional readings :—
Zi-ka-wei iZ = +2m.5s. and +2m.41s., iE = +3m.37s., iN = +4m.5s.
Sumoto ePEZ = +3m.34s., SN = +6m.42s.
Kobe ePN? = +3m.48s., ePE? = +3m.50s.
Calcutta ePPN = +7m.31s., ePPPN = +7m.53s., iN = +10m.19s., iSSN = +13m.25s.
Agra pPE = +8m.7s., PPPE = +9m.44s., sSE = +14m.28s., SSE = +16m.19s., SSSE = +17m.23s.
Almata e = +10m.27s. and +17m.17s.
Kodaikanal PPPE = +10m.31s., SSE = +18m.21s., SSSE = +19m.34s.
Bombay iE = eN = +8m.56s. and +10m.46s.
Sverdlovsk L_q = +26·0m.
Brisbane iN = +14m.6s., iSS?EN = +19m.48s.
Tiflis PPE = +13m.35s., eSSE = +24m.0s.
Ksara i = +12m.2s.
Christchurch eEN = +34m.48s.
Triest e = +45m.11s.
Strasbourg eE = +13m.10s.
Mount Wilson ePPZ = +16m.58s.
Pasadena iZ = +13m.51s., ePPZ = +16m.55s., eZ = +17m.41s.
Tucson eP = +14m.6s., ePP = +18m.12s., PP = +18m.16s., iPP = +18m.20s.
Huancayo ePKP = +20m.39s., ePKS = +25m.0s., eSKSP = +34m.11s., ePPS = +27m.11s., eSS = +43m.44s, and +44m.50s., eSSS = +50m.16s.
La Paz iZ = +21m.12s., iPPZ = +25m.0s., iZ = +29m.46s.
Long waves were also recorded at Stara Dala, Hong Kong, Bidston, Kew, Oak Ridge, San Fernando, Prague, Jersey, Granada, Bergen, Edinburgh, Durham, and Stonyhurst.

Nov. 26d. 15h. 36m. 35s. Epicentre 35°·5N. 141°·0E. (as on 1937 Oct. 17d.).

Near position 35°·7N. 141°·0E. given by Central Met. Obs., Japan.

A = −·6342, B = +·5135, C = +·5781 ; δ = +9 ; h = 0 ;
D = +·629, E = +·777 ; G = −·449, H = +·364, K = −·816.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	0·2	335	0 10	0	0 13	− 3	—	—
Katuura	0·7	242	0 13	P_g	0 29	+ 1	—	—
Kiyosumi	0·7	242	0 12	P_g	0 27	− 1	—	—
Kakioka	1·0	318	0 20k	− 1	0 34	− 2	—	—
Mito	1·0	334	0 20k	− 1	0 32	− 4	—	—
Sinagawa	1·0	277	0 24	+ 3	0 39	+ 3	—	—
Tokyo Cent. Met. Obs.	1·0	281	i 0 25k	+ 4	i 0 42	+ 6	—	0·9
Tokyo I.U.	1·0	281	0 23	+ 2	0 40	+ 4	—	—
Tukubasan	1·0	315	0 21	0	0 35	− 1	—	—
Komaba	1·1	278	0 24	+ 2	0 41	+ 2	—	—
Mera	1·1	239	0 25a	+ 3	0 41	+ 2	—	—
Yokohama	1·1	267	0 26a	+ 4	0 43	+ 4	—	—
Kamakura	1·2	262	0 27	+ 3	0 44	+ 3	—	—
Misaki	1·2	253	0 27	+ 3	0 46	+ 5	—	—
Mitaka	1·2	278	0 28	+ 4	0 46	+ 5	—	—
Onahama	1·4	357	0 44a	S	(0 44)	− 2	—	—
Utunomiya	1·4	320	0 27	0	0 43	− 3	—	—
Kumagaya	1·5	296	0 30k	P_g	0 57	S_g	—	—
Ito	1·6	251	0 34a	P_g	0 56	S_g	—	—
Koyama	1·6	265	0 12	−18	0 41	−10	—	—
Titibu	1·6	287	0 12	−18	0 39	−12	—	—
Misima	1·7	257	0 33a	+ 2	1 6	S_g	—	—
Maebasi	1·8	300	0 33k	+ 1	1 4	S_g	—	—
Numadu	1·8	257	0 34	+ 2	0 57	+ 1	—	—
Hunatu	1·9	270	0 35a	+ 1	1 4	S_g	—	—
Yosiwara	1·9	260	0 12	−22	0 46	−13	—	—
Kohu	2·0	274	0 37a	P*	1 9	S_g	—	—
Aidu	2·2	341	0 28	−10	1 11	S*	—	—
Oiwake	2·2	293	0 42a	P*	1 9	S*	—	—
Hukusima	2·3	349	0 37a	− 3	1 2	− 7	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Niigata		2·3	327	0 57	+17	1 32	+23	—	—
Omaesaki		2·4	248	0 42	+ 1	1 37	+25	—	—
Nagano		2·6	297	0 46	+ 2	1 16	− 1	—	—
Hatidyozima		2·6	202	0 47	+ 3	1 15	− 2	—	—
Matumoto		2·6	287	0 44	0	1 20	S*	—	—
Takada		2·7	306	0 47	+ 2	1 22	S*	—	—
Hamamatu		2·8	254	0 51	+ 4	1 22	0	—	—
Sendai		2·8	358	0 43a	− 4	1 32	S_g	—	—
Yamagata		2·8	349	0 55	+ 8	1 39	S_g	—	—
Takayama		3·1	282	0 53	+ 2	1 50	S_g	—	—
Nagoya		3·3	264	1 2	P_g	1 57	S_g	—	2·2
Toyama		3·3	291	0 58	P*	1 56	S_g	—	—
Gihu		3·5	269	1 10	P_g	2 4	S_g	—	—
Husiki		3·5	294	1 1	P*	1 42	+2	—	—
Sakata		3·5	344	1 6	P*	2 8	S_g	—	—
Kanazawa		3·6	286	1 23	P_g	2 7	S_g	—	—
Mizusawa	E.	3·7	4	0 58	− 2	1 37	− 8	—	—
	N.	3·7	4	0 55	− 5	1 40	− 5	—	—
Ibukisan		3·8	269	1 9	P*	2 1	S*	—	—
Kameyama		3·8	263	1 9	P*	1 57	S*	—	—
Wazima		3·8	301	1 2	+ 1	1 58	S*	—	—
Hikone		3·9	269	1 2	0	2 1	S*	—	—
Akita		4·2	350	1 9	+ 2	1 50	− 7	—	—
Miyako		4·2	10	1 2	− 5	1 44	−13	—	—
Morioka		4·2	2	1 1a	− 6	1 46	−11	—	—
Kyoto		4·3	265	1 12	+ 4	2 32	S_g	—	—
Yagi		4·4	259	1 17	P*	2 4	+ 2	—	—
Osaka B		4·6	261	1 22	P*	2 39	S_g	—	—
Miyadu		4·7	271	1 18	+ 4	2 15	+ 5	—	—
Kobe		4·8	262	e 1 18	+ 3	e 2 33	S_g	—	3·0
Siomisaki		4·8	247	1 20	+ 5	3 7	?	—	—
Hatinohe		5·0	4	1 13a	− 5	2 6	−12	—	—
Toyooka		5·0	273	1 29	P*	2 48	S_g	—	3·1
Wakayama		5·0	257	1 29	P*	2 50	S_g	—	—
Sumoto		5·2	258	1 27	+ 6	2 52	S_g	—	3·0
Aomori		5·3	358	1 19	− 3	2 53	S_g	—	—
Muroto		6·1	250	1 36	+ 2	3 49	?	—	—
Hakodate		6·3	357	1 48	P*	—	—	—	—
Sakai		6·4	275	2 17	P_g	—	—	—	—
Muroran		6·8	359	1 46	+ 2	—	—	—	—
Matuyama		7·0	259	1 50	+ 4	3 43	S_g	—	—
Hirosima		7·1	266	1 51	+ 3	3 54	S_g	—	—
Sapporo		7·5	2	1 59	+ 6	3 18	− 2	—	—
Kusiro		7·9	19	1 32	−27	2 59	−33	—	—
Titizima		8·4	174	2 3	− 3	3 33	−10	—	—
Nemuro		8·6	23	1 58	−11	3 25	−23	—	—
Miyazaki		8·7	249	2 12	+ 2	3 57	+ 7	—	—
Hukuoka B		8·9	261	e 2 24	+12	e 4 31	S*	—	—
Kumamoto		8·9	255	2 15	+ 3	4 59	S_g	—	—
Nagasaki		9·6	257	2 10	−11	—	—	—	—
Husan		9·8	272	—	—	e 5 14	S*	—	—
Vladivostok		10·4	320	e 2 31	− 3	e 4 53	SSS	e 5·5	6·1
Zi-ka-wei	Z.	16·9	260	e 4 8	+ 9	—	—	—	8·3
Andijan		53·0	298	e 9 27	+ 6	—	—	—	—
Mount Wilson		78·7	56	e 12 14	+ 8	—	—	—	—
Pasadena		78·7	56	e 12 13	+ 7	—	—	—	—

Additional readings :—
Onahama S = +0m.59s.
Kobe eN = +2m.13s., eE = +2m.16s., eZ = +2m.20s.
Toyooka ePN = +1m.34s., PE = +1m.37s., SZ = +2m.55s.
Sumoto SE = +2m.56s.
Long waves were also recorded at Tashkent and Tiflis.

Nov. 26d. 21h. 59m. 20s. Epicentre 43°·9N. 13°·1E.

Felt Force VI at Faro (Pesaro), Force V at Pesaro, Force IV at Ancone. Radius about 40-50kms. Macroseismic area 8000 sq. kms. Epicentre 43°52′N. 13°04′E.

P. Caloi.

Attivita sismica i Italia nel Decennio, 1930-1939. Commissione Italiana di Studio per i Problemi del Soccorso alle Popolazioni, Vol. IX. Felice le Monnier, Firenze, 1942.

$A = +·7041$, $B = +·1638$, $C = +·6909$; $\delta = -7$; $h = -3$;
$D = +·227$, $E = -·974$; $G = +·673$, $H = +·157$, $K = -·723$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Prato		1·4	270	e 0 29	+ 2	—	—
Triest		1·8	15	0 30	− 2	0 55	− 1
Zurich		4·7	318	1 20	P*	e 2 20	S*
Basle		5·3	316	e 1 20	− 2	—	—
Neuchatel		5·3	308	e 1 20	− 2	e 2 20	− 5
Stuttgart		5·6	332	e 2 10	P_g	e 3 11	S_g
Strasbourg	E.	6·0	324	—	—	e 2 45	+ 2

Additional readings :—
Zurich eS_g = +2m.34s.
Stuttgart e = +2m.18s.
Strasbourg iS_gE = +3m.25s., iE = +3m.33s., +3m.46s., and +3m.58s.

Nov. 26d. Readings also at 0h. (Tiflis), 1h. (Ksara), 3h. (Amboina), 6h. (Andijan and Ksara), 8h. (Perth), 10h. (Medan), 12h. (La Paz), 14h. (La Paz, Andijan, and Perth), 18h. (Santiago), 19h. (Tacubaya), 20h. (Santiago and Zagreb), 21h. (Basle), 23h. (Tacubaya).

Nov. 27d. 13h. 32m. 29s. Epicentre 56°·3S. 24°·2W. (as on 1937 Sept. 17d.).

$A = +·5085$, $B = -·2285$, $C = -·8302$; $\delta = +2$; $h = -8$;
$D = -·410$, $E = -·912$; $G = -·757$, $H = +·340$, $K = -·557$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro	N.	36·2	329	e 8 31?	PP	—	—	—	—
Cape Town		36·6	71	i 7 9	− 1	i 12 59	+ 6	e 17·3	19·6
La Paz		51·7	303	i 9 9_s	− 2	i 16 33	+ 1	28·4	40·1
Huancayo		59·0	298	e 10 6	+ 2	e 18 21	+11	e 24·0	—
Christchurch		79·6	193	12 22	+12	22 12	0	—	—
Wellington		81·5	195	—	—	e 22 11	−21	e 41·5	—
Helwan		97·9	47	—	—	26 37	PS	—	—
Ksara		103·2	49	e 20 16	PPP	—	—	52·0	58·5
Bombay		109·4	85	—	—	e 24 31?	−38	—	62·5
Tiflis	E.	113·6	50	—	—	e 26 40	{+10}	e 56·5	68·8
Baku		114·5	54	—	—	e 27 49	{+73}	57·5	70·0
Calcutta	N.	120·9	95	—	—	e 25 41	[−12]	—	79·0
Tashkent		124·9	66	—	—	e 40 46	?	e 69·6	72·8
Victoria		132·7	296	e 22 43	?	—	—	69·5	—
Zi-ka-wei	Z.	145·3	121	e 19 29	[−11]	—	—	—	80·8

Additional readings :—
Cape Town iPPP = +8m.42s., iSSE = +15m.7s., iSSSE? = +15m.39s.
Huancayo eP_cP = +11m.2s., ePP = +12m.35s., ePPP = +13m.47s., S_cS = +19m.57s., eSS = +22m.2s.
Christchurch eEN = +32m.31s., eNZ = +42m.11s.
Wellington e = +19m.31s.?, S? = +50m.18s. (Given as a separate shock).
Tiflis eE = +29m.53s. and +33m.10s.
Baku e = 29m.38s., +37m.58s., and +42m.41s.
Calcutta eN = +30m.12s.
Tashkent e = +47m.57s.
Long waves were also recorded at Algiers, Adelaide, Riverview, Hong Kong, Kodaikanal, Oak Ridge, Irkutsk, Sverdlovsk, Vladivostok, Jersey, and other European stations.

Nov. 27d. 20h. 10m. 32s. Epicentre 71°·0N. 10°·0E.

$A = +\cdot3225$, $B = +\cdot0569$, $C = +\cdot9448$; $\delta = -11$; $h = -12$;
$D = +\cdot174$, $E = -\cdot985$; $G = +\cdot930$, $H = +\cdot164$, $K = -\cdot328$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Scoresby Sund		10·5	283	1 28?	−67	—	—	—	—
Upsala		11·6	161	—	—	e 4 43	−18	—	—
Pulkovo		14·0	134	e 3 14	− 8	e 5 40	−19	e 9·0	10·1
Copenhagen		15·4	174	3 34	− 6	—	—	9·5	—
Moscow		19·4	127	e 4 27	− 3	e 7 57	− 7	e 9·0	13·5
Uccle		20·4	192	e 6 40	?	e 8 40	+15	—	—
Prague		21·1	172	e 4 44	− 4	e 8 35	− 4	—	14·5
Stuttgart		22·3	182	e 5 16	+15	e 9 7	+ 5	e 14·5	16·3
Strasbourg		22·5	184	—	—	e 9 3	− 2	—	16·5
Paris		22·6	194	5 28?	+25	—	—	—	—
Vienna		23·0	169	e 5 9	+ 2	e 14 5	?	—	—
Stara Dala		23·5	166	e 5 6	− 6	—	—	—	—
Zurich		23·7	183	e 5 21	+ 7	—	—	—	—
Sverdlovsk		25·4	97	e 5 31	0	10 1	+ 5	i 16·4	17·5
Theodosia		28·9	141	6 34	+31	15 44	L	(15·7)	—
Grozny		32·9	128	e 6 42	+ 4	—	—	e 18·3	—
Tiflis	E.	34·1	131	e 8 26	PPP	e 12 15	+ 1	e 20·8	24·5
Baku		36·7	125	e 15 28	?	—	—	e 21·5	—
Ksara		39·8	146	e 9 35	PPP	e 16 43	SS	—	—
Tashkent		41·6	103	i 7 51	0	e 14 9	+ 1	e 21·5	25·7
Oak Ridge	Z.	47·8	280	i 8 40a	− 1	—	—	—	—
Tinemaha		66·1	317	i 10 51	0	—	—	—	—
Haiwee		66·9	317	i 10 57	+ 1	—	—	—	—
Mount Wilson	Z.	68·8	316	i 11 7a	− 1	—	—	—	—
Pasadena		68·9	316	i 11 9a	0	—	—	—	—
Riverside	Z.	68·9	316	i 11 7a	− 2	—	—	—	—
La Paz	N.	101·7	253	24 4	?	i 24 32	[− 3]	—	—

Additional readings :—
Upsala eN = +7m.28s.?
Vienna e = +13m.7s.
Stara Dala e = +16m.28s. ?
Sverdlovsk iL_q = +13·1m.
Tiflis e = +14m.34s., +17m.22s., +18m.44s., and +19m.17s.
Long waves were also recorded at Triest, Belgrade, Hamburg, Ivigtut, De Bilt, Cheb, and Granada.

Nov. 27d. Readings also at 0h. (Tiflis and Tacubaya (2)), 1h. (Manila), 3h. (Batavia and Triest), 6h. (near Apia), 8h. (Melbourne, Riverview, Mount Wilson, Pasadena, Riverside, Ksara, Christchurch, Arapuni, Wellington, and Huancayo), 9h. (Kodaikanal, Baku, Sverdlovsk, Oak Ridge, La Paz, Apia, and near Mizusawa), 10h. (Balboa Heights, San Juan, Christchurch, and Wellington), 11h. (Riverview), 12h. (Tucson), 13h. (Zurich and Sverdlovsk), 14h. (Vladivostok and Batavia), 16h. (Balboa Heights), 17h. (Christchurch and Wellington), 18h. (Riverview), 20h. (Berkeley, San Francisco, near Fresno, and Lick), 23h. (Lick (2) and near Fresno (2)).

Nov. 28d. 5h. 24m. 0s. Epicentre 0°·7S. 98°·1E.

$A = -\cdot1409$, $B = +\cdot9899$, $C = -\cdot0122$; $\delta = -10$; $h = +7$;
$D = +\cdot990$, $E = +\cdot141$; $G = +\cdot002$, $H = -\cdot012$, $K = -1\cdot000$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Medan		4·3	8	i 1 12	+ 4	i 2 9	+ 9	—	—
Batavia		10·3	122	2 29	− 3	i 4 36	+ 6	—	—
Colombo		19·7	293	4 33	− 1	6 5	?	8·9	16·1
Phu-Lien	N.	23·0	21	5 10	+ 3	i 9 29	+15	11·5	16·8
Kodaikanal	E.	23·2	299	i 5 8	− 1	i 9 16	− 2	10·9	13·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N.	25·0	339	i 5 26	− 1	i 9 55	+ 6	i 12·4	25·7
Hyderabad		26·4	314	5 41	+ 1	10 34	+22	14·9	21·3
Manila		27·3	55	5 47	− 1	12 4	SSS	18·5	—
Bombay		31·6	310	i 6 22	− 4	e 11 32	− 3	15·4	20·0
Taito		32·2	42	6 15	−17	—	—	—	—
Agra	E.	33·8	327	6 44	− 2	e 12 7	− 3	—	—
Dehra Dun		36·3	330	7 20	+13	13 0	+12	21·5	23·0
Zi-ka-wei	Z.	38·7	33	e 7 31	+ 4	13 25	0	21·5	26·0
Miyazaki		45·2	41	8 20	0	—	—	—	—
Kumamato		45·4	39	8 22	0	—	—	—	—
Hukuoka B		45·7	39	8 28	+ 4	e 16 46	?	—	—
Husan		45·9	35	e 8 29	+ 3	e 15 31	+20	—	—
Taikyu		46·2	34	(e 8 23)	− 5	e 24 0	L	(e 24·0)	—
Zinsen	E.	46·3	31	(e 8 11)	−18	e 15 6	−10	e 21·6	—
Andijan		47·4	333	e 8 38	0	e 15 36	+ 4	e 31·0	—
Hirosima		47·5	39	8 37	− 1	—	—	23·4	—
Almata		47·7	340	e 8 45	+ 5	e 15 45	+ 9	—	—
Muroto		47·9	42	8 41	− 1	—	—	—	—
Frunse		48·3	337	e 8 44	− 1	—	—	—	—
Sumoto		49·0	41	8 54	+ 4	e 15 57	+ 2	—	33·7
Siomisaki		49·1	43	8 50	− 1	—	—	—	—
Wakayama		49·1	41	8 51	0	15 51	− 5	—	—
Samarkand		49·2	328	8 45	− 7	—	—	—	—
Tashkent		49·3	332	e 8 47	− 6	i 15 57	− 2	—	37·6
Kobe		49·4	41	8 53	0	e 16 4	+ 4	—	34·0
Osaka B		49·6	41	8 58	+ 3	—	—	—	—
Toyooka	N.	49·7	40	—	—	e 18 30	?	e 30·4	35·7
Adelaide		50·8	137	e 9 10	+ 6	e 16 16	− 4	20·6	25·9
Gihu		50·9	42	9 3	− 2	15 53	−28	—	—
Misima		52·2	43	9 13	− 2	16 9	−30	—	—
Nagano		52·6	40	11 25	PP	—	—	—	—
Oiwake		52·6	41	9 18	0	—	—	—	—
Yokohama		52·8	43	8 17	−62	—	—	—	—
Irkutsk		53·0	5	9 24	+ 3	16 54	+ 4	29·0	34·3
Vladivostok		53·1	31	e 9 24	+ 3	e 17 39	PS	e 27·1	37·8
Tokyo		53·1	42	11 30	PP	—	—	—	—
Semipalatinsk		53·2	346	e 9 19	− 3	—	—	—	—
Mito		53·9	41	11 20	PP	—	—	—	—
Melbourne		56·7	136	i 9 55	+ 7	i 17 42	+ 2	31·3	41·3
Brisbane	N.	58·9	121	i 10 12	+ 9	e 18 6	− 2	e 27·0	34·2
Riverview	N.	59·5	129	e 14 30	?	e 18 30	+14	—	32·8
Baku		60·0	319	e 10 14	+ 3	e 18 2	−21	—	41·2
Erevan		63·5	317	e 10 29	− 5	—	—	—	—
Tiflis	E.	63·9	318	e 10 33	− 4	e 19 23	+11	e 33·0	40·7
Grozny		64·1	320	e 10 40	+ 2	—	—	e 30·0	—
Piatigorsk		66·1	320	e 10 49	− 2	—	—	—	—
Ksara		67·6	307	e 11 3	+ 2	e 20 23	+26	—	44·0
Helwan		70·3	302	11 14	− 3	—	—	—	—
Theodosia		71·5	318	11 23	− 1	20 37	− 6	—	—
Yalta		72·2	317	11 33	+ 4	20 51	0	54·0	—
Moscow		74·4	329	11 42	0	21 8	− 8	—	50·7
Christchurch		78·3	134	i 12 8a	+ 5	i 22 5	+ 6	37·6	—
Wellington		79·5	132	—	—	e 22 0?	−11	—	—
Pulkovo		79·6	332	12 7	− 3	22 7	− 5	48·5	57·7
Cape Town		81·0	236	i 12 24	+ 6	i 22 35	+ 8	e 37·9	43·9
Belgrade		81·7	315	e 12 19a	− 3	e 22 52	+18	e 56·5	—
Stara Dala		83·7	318	e 10 24	?	e 23 18	+24	—	62·0
Vienna		85·0	318	e 12 35	− 3	e 23 20	+13	—	—
Upsala		85·8	330	—	—	e 23 12	− 3	e 53·0	68·4
Prague		86·5	320	e 12 48	+ 2	e 24 12	+50	—	58·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Triest		86·5	316	12 50	+ 4	23 10	[− 1]	47·3	53·8
Cheb		87·8	320	e 12 57	+ 5	e 23 22	[+ 4]	e 64·0	70·0
Copenhagen		88·1	326	12 53k	− 1	23 33	− 4	—	—
Jena		88·3	320	e 12 48	− 7	—	—	e 48·0	64·5
Hamburg		89·4	324	e 12 54	− 6	e 24 0?	+11	54·0	—
Stuttgart		89·8	319	i 13 1k	− 1	e 24 0	+ 7	e 60·0	—
Zurich		90·2	317	e 13 0	− 4	—	—	—	—
Strasbourg		90·7	319	e 13 3	− 3	—	—	—	—
De Bilt		92·4	322	i 13 15	+ 1	—	—	e 53·0	56·8
Uccle		92·9	321	e 13 21	+ 5	e 23 53	[+ 4]	e 51·0	—
Paris		94·2	319	e 13 0	−22	—	—	54·0	68·0
Algiers		94·5	306	e 14 0	+37	e 24 0	[+ 2]	53·0	—
Rathfarnham Castlte		99·1	324	15 50	?	—	—	66·0	—
Granada		99·7	307	13 55	+ 8	—	—	—	—
Malaga		100·4	347	e 18 0	PP	—	—	—	—
Scoresby Sund		100·4	343	18 18	PP	32 54	SS	54·0	—
College		100·7	22	18 11	PP	e 24 33	[+ 3]	e 49·3	—
San Fernando		101·9	306	e 18 18	PP	e 33 44	SS	52·0	—
Sitka		109·6	27	19 21	PP	e 34 21	SS	55·3	—
Ivigtut		114·4	342	19 48	PP	27 0	{+25}	66·0	—
Victoria		120·6	30	e 20 0?	PP	—	—	60·0	—
Tinemaha	z.	130·6	38	e 19 14	[+ 1]	—	—	—	—
Mount Wilson	z.	132·5	41	e 19 14	[− 3]	—	—	—	—
Pasadena	z.	132·5	41	e 19 18	[+ 1]	—	—	—	—
Seven Falls		132·8	349	—	—	e 40 0?	SS	68·0	—
Riverside	z.	133·1	41	e 19 14	[− 4]	—	—	—	—
East Machias		134·3	345	e 22 27	PP	—	—	—	—
Ottawa		135·2	353	e 22 0?	PP	—	—	71·0	—
Rio de Janeiro	E.	135·6	236	—	—	e 29 0?	{+ 5}	—	—
Toronto		137·2	356	—	—	e 36 0	?	68·0	—
Oak Ridge		137·4	347	e 19 21	[− 5]	—	—	e 75·0	—
Weston		137·4	347	e 19 40	[+14]	e 29 14	{+ 9}	—	—
Williamstown		137·5	348	e 19 9	[−17]	e 22 5	PP	e 76·0	—
La Plata		138·1	210	22 42	PP	—	—	63·8	—
Tucson		138·4	37	e 19 34	[+ 7]	—	—	—	—
Pennsylvania		139·9	354	e 22 15	PP	—	—	—	—
Philadelphia		140·4	350	e 19 29	[− 2]	—	—	e 69·2	—
Florissant		141·3	10	e 19 20	[−13]	—	—	—	—
Little Rock		144·7	15	e 19 35	[− 4]	—	—	—	—
San Juan		156·6	319	e 20 0	[+ 4]	e 30 54	{ 0}	e 67·2	—
La Paz		158·2	219	i 20 2k	[+ 3]	i 31 21	{+18}	76·0	80·5
Huancayo		165·7	207	e 20 3	[− 3]	e 27 16	[+ 7]	e 64·1	—

Additional readings :—
Batavia iE = +2m.35s., i = +6m.43s., iEN = +7m.14s.
Calcutta iPPN = +5m.59s., iPPPN = +6m.12s., iSSN = +11m.0s.
Bombay iPP = +7m.27s., SS = +13m.17s.
Agra iE = +14m.50s., +15m.25s., and +18m.53s.
Zi-ka-wei iZ = +7m.43s., +9m.17s., +16m.49s., and +19m.5s.
Taikyu P reading decreased by 11m. to conform with Husan.
Zinsen ePE? reading increased by 4m. to conform with Husan.
Almata e = +10m.51s.
Sumoto eN = +28m.7s., eE = +28m.11s., eZ = +33m.1s.
Kobe ePE = +18m.56s.
Adelaide e = +14m.33s.
Melbourne i = +13m.42s., +21m.30s., +26m.45s., and +29m.55s.
Brisbane iPP?N = +11m.54s., eSSN = +21m.54s.
Baku e = +10m.47s., +13m.42s., +15m.18s., +26m.0s., and +34m.0s.
Tiflis iPE = +10m.36s., ePPE = +12m.55s., ePPPE = +14m.5s., iPSE = +19m.39s.
Grozny e = +16m.57s.
Helwan e = +14m.8s.
Christchurch PPZ = +15m.7s., SS = +27m.19s.
Cape Town iSE = +22m.40s., iPSE = +23m.15s., iSSE = +27m.39s., iSSS = +31m.13s.
Belgrade eNW = +15m.42s.

Continued on next page.

Upsala eE = +23m.24s.
Copenhagen +24m.18s.
Jena eZ = +12m.32s.
Stuttgart iP_6PZ = +13m.11s., e = +28m.30s., eSSS = +30m.18s., e = +59m.12s.
Strasbourg PPZ = +16m.41s., ePPPZ = +18m.42s., eZ = +19m.41s. and +20m.29s., PS = +25m.26s., PPS = +26m.6s., SSS = +34m.32s.
Uccle eE = +17m.4s., iE = +25m.16s.
Algiers ePS? = +24m.42s.
Granada iPP = +17m.49s.
Rathfarnham Castle e = +7m.2s.
College ePKS = +20m.9s., ePPS = +28m.48s., eSS = +33m.36s., ePSPS = +34m.19s.
San Fernando ePPPE = +20m.44s.
Sitka ePPS = +29m.5s.
Mount Wilson ePPZ = +21m.40s.
Pasadena ePPZ = +21m.48s., iSKPNZ = +22m.48s.
Riverside ePPZ = +21m.53s.
East Machias PKS = +22m.55s., ePKS = +23m.2s., ePPS = +34m.18s.
Oak Ridge eNZ = +22m.9s., eZ = +25m.7s., eN = +34m.27s., eZ = +35m.3s.
Weston iPP = +22m.12s., eSKPZ = +23m.44s., eSSE = +40m.18s.
Williamstown +25m.9s.
Pennsylvania +23m.20s.
Philadelphia iPP = +23m.11s., ePPPS = +37m.21s.
Florissant iZ = +19m.38s., eZ = +22m.29s., eN = +22m.31s., iZ = +22m.35s., iN = +22m.39s.
Little Rock iEN = +19m.44s., iN = +19m.56s., eE = +22m.57s.
San Juan iPP = +24m.19s., ePPP = +28m.24s., SKKKS = +32m.7s., eSS = +45m.34s.
La Paz $iPKP_2$ = +20m.41s., $ipPKP_2$ = +21m.41s., iPPZ = +24m.13s., iZ = +29m.13s., iSSN = +45m.0s., iSSSN = +50m.27s.
Huancayo PKP = +20m.42s., ePPP = +27m.51s., i = +36m.10s., eSS = +44m.17s., eSSS = +50m.25s.
Long waves were also recorded at Stonyhurst, Kew, Edinburgh, Bidston, Butte, Bozeman, and Sydney.

Nov. 28d. Readings also at 0h. (La Paz, Vladivostok, Sverdlovsk, Baku, Ksara, Apia, Wellington, Christchurch, Manila, Pasadena, Riverside, Tinemaha, and Mount Wilson), 1h. (Uccle, Oak Ridge, Tiflis, Calcutta, and Hong Kong), 4h. (Manila (2) and Andijan), 5h. (Tacubaya, Oaxaca, and Guadalajara), 6h. (Manila and Andijan), 7h. (Batavia and Manila), 9h. (Sumoto), 10h. (Batavia and Kodaikanal), 11h. (Algiers), 12h. (Tashkent, Mount Wilson, Tinemaha, Riverside, and Pasadena), 13h. (Irkutsk), 14h. (Kobe and Sumoto), 15h. (Manila), 17h. (Manila), 18h. (Berkeley, Fresno, San Francisco, Lick, and Branner), 21h. (Almata, Samarkand, Batavia, and Andijan), 22h. (Hong Kong, Sumoto, Mizusawa, Berkeley, Kobe, Mount Wilson, Tinemaha, Riverside, Pasadena, and Tucson).

Nov. 29d. Readings at 0h. (Samarkand), 1h. (Tiflis (2), Ksara, Tashkent, Santiago, Baku, and Erevan), 2h. (Grozny), 3h. (Ksara, Wellington, and Christchurch), 4h. (Pennsylvania), 5h. (Hong Kong, Christchurch, and Manila), 7h. (Triest), 8h. (Mizusawa and Santiago), 11h. (Tashkent, Irkutsk, Almata, Semipalatinsk, Christchurch, Wellington, and Tacubaya), 12h. (Tinemaha, Riverside, Mount Wilson, Pasadena, and Tucson), 14h. (Andijan), 15h. (Andijan, Tashkent, Samarkand, Sverdlovsk, Dehra Dun, Agra, and Calcutta), 17h. (Branner, Tiflis, Tashkent, Sverdlovsk, Irkutsk, and Baku), 18h. (Manila), 21h. (Santiago, Wellington, and Christchurch), 22h. (Oaxaca, Baku, Tashkent, and Ksara), 23h. (Uccle, Sverdlovsk, and Tiflis).

Nov. 30d. 0h. 40m. 27s. Epicentre 5°·5N. 91°·0E.

$A = -\cdot0174$, $B = +\cdot9953$, $C = +\cdot0952$; $\delta = -1$; $h = +7$;
$D = +1\cdot000$, $E = +\cdot017$; $G = -\cdot002$, $H = +\cdot095$, $K = -\cdot996$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Medan		7·9	102	1 59	0	i 3 24	− 6	—	—
Colombo		11·2	278	2 38	− 6	4 39	−13	5·7	6·5
Kodaikanal	E.	14·2	290	3 33	+ 9	i 5 55	− 9	6·7	7·9
Calcutta	N.	17·1	352	i 4 2	0	i 7 23	+11	i 8·6	14·2
Hyderabad		17·1	315	3 27	−35	6 42	−30	8·6	10·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		19·6	126	i 4 30	− 2	i 8 6	− 2	e 11·6	—
Phu-Lien		21·5	43	e 4 51	− 1	i 8 51	+ 4	11·3	14·2
Bombay		22·2	318	i 4 57	− 3	i 9 0	0	11·0	14·6
Agra	E.	24·8	333	i 5 20	− 5	i 9 48	+ 2	12·3	—
Dehra Dun		27·6	336	5 53	+ 2	10 13	−19	14·6	16·6
Hong Kong		27·9	51	5 53k	− 1	10 35	− 2	14·0	18·3
Manila		30·8	70	i 6 18a	− 2	i 12. 13	+50	—	—
Tainan		33·1	55	6 42	+ 2	—	—	—	—
Taito		33·8	56	6 38	− 8	—	—	19·9	—
Karenko		34·7	54	6 59	+ 5	—	—	—	—
Taihoku		35·1	53	—	—	e 12 38	+ 8	—	—
Zi-ka-wei	Z.	38·3	44	i 7 23k	− 1	13 21	+ 2	22·0	24·2
Andijan		38·9	337	7 26	− 3	13 31	+ 3	22·0	—
Almata		39·6	345	e 7 39	+ 4	e 13 41	+ 3	—	—
Samarkand		40·3	330	7 36	− 4	—	—	—	—
Tashkent		40·6	335	i 7 38	− 5	e 14 1	+ 7	e 20·0	28·0
Nake		43·0	54	8 3	0	—	—	—	—
Perth		44·1	148	e 8 8	− 4	14 36	− 9	21·0	23·2
Tomie		44·3	48	8 13	0	14 51	+ 3	—	—
Nagasaki		45·2	48	8 22	+ 2	14 37	−24	—	—
Zinsen		45·5	40	i 8 20a	− 3	e 15 3	− 2	e 23·7	—
Semipalatinsk		45·7	351	e 8 20	− 4	—	—	—	—
Husan		45·8	44	e 8 27	+ 2	e 15 21	+12	e 25·1	—
Kumamoto		45·9	48	8 26	0	—	—	—	—
Taikyu		45·9	43	e 8 24	− 2	e 15 12	+ 1	e 22·5	—
Hukuoka B		46·0	48	e 8 28	+ 1	—	—	—	—
Miyazaki		46·0	50	8 27	0	15 55	+43	—	—
Irkutsk		47·9	11	8 42	0	15 40	+ 1	27·6	29·6
Koti		48·3	49	8 44	− 1	—	—	—	—
Muroto		48·7	50	8 46	− 2	—	—	—	—
Tananarive		49·2	240	e 8 46	− 6	—	—	—	—
Tokusima		49·3	48	8 37	−16	—	—	—	—
Wakayama		49·8	48	8 56	0	—	—	—	—
Kobe	E.	50·0	48	e 8 58	0	e 16 12	+ 3	—	31·5
	N.	50·0	48	e 8 56	− 2	e 16 9	0	—	36·3
	Z.	50·0	48	e 8 54	− 4	e 16 14	+ 5	—	31·9
Siomisaki		50·0	50	8 58	0	16 20	+11	—	—
Baku		50·6	320	e 9 16	+14	i 16 19	+ 2	25·6	30·2
Kameyama		51·1	49	9 4	− 2	—	—	—	—
Gihu		51·5	49	9 28	+19	16 42	+13	27·8	—
Nagoya		51·6	49	e 9 10	0	—	—	—	—
Misima		53·0	50	9 19	− 2	—	—	—	—
Nagano		53·1	47	9 22	+ 1	—	—	—	—
Oiwake		53·2	48	9 22	0	—	—	—	—
Maebasi		53·6	48	9 22	− 3	—	—	—	—
Tokyo		53·9	49	9 30	+ 3	16 35	−27	26·4	—
Erevan		54·1	317	9 37	+ 8	—	—	—	—
Kakioka		54·4	48	9 10	−21	—	—	—	—
Tiflis		54·6	318	e 10 29	+57	i 18 10	+59	26·6	37·4
Grozny		54·8	320	9 35	+ 1	e 17 2	−12	23·6	—
Hukusima		55·2	48	9 37	0	—	—	—	—
Mizusawa	E.	56·2	46	(9 43)	− 1	9 43	P	—	—
Sverdlovsk		56·5	341	i 9 42	− 4	i 17 32	− 5	32·6	35·4
Ksara		58·2	306	i 9 58	0	e 18 8	+ 9	28·6	35·6
Adelaide		60·2	135	—	—	i 18 17	− 8	—	29·1
Helwan		61·1	300	10 23	+ 5	18 33	− 4	—	35·5
Theodosia		62·2	318	10 23	− 3	18 39	−12	—	—
Yalta		62·9	317	10 30	0	18 50	−10	e 34·6	—
Moscow		65·5	330	10 43	− 4	e 19 23	− 9	33·0	40·9
Melbourne		66·1	135	—	—	i 19 31	− 8	30·1	37·1
Brisbane		68·2	123	i 19 57	S	(i 19 57)	− 7	e 26·3	40·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview		68·9	129	—	—	i 20 8	− 5	i 34·0	42·1
Sydney		68·9	129	—	—	i 20 13	0	e 40·5	44·1
Pulkovo		70·8	333	e 11 11	−9	e 20 25	−10	e 35·0	41·3
Belgrade		72·4	315	i 12 30a	+60	e 20 44	− 9	e 39·3	—
Stara Dala		74·4	318	e 11 42	0	e 21 8	− 8	—	45·6
Vienna		75·7	319	e 11 43	− 6	e 21 26	− 4	—	—
Graz		76·2	317	i 11 45	− 7	e 21 23	−13	e 30·6	46·1
Upsala		76·9	331	e 12 0	+ 4	e 21 35	− 8	e 38·6	48·4
Prague		77·2	321	e 11 56	− 1	e 21 41	− 6	e 35·6	49·6
Triest		77·2	316	11 53	− 4	21 37	−10	e 35·9	41·9
Cheb		78·5	320	e 12 12	+ 8	e 21 57	− 4	e 44·6	46·6
Cape Town	E.	78·7	234	—	—	i 21 57	− 6	e 35·8	44·2
	N.	78·7	234	—	—	i 21 53	−10	e 37·0	40·8
Copenhagen		79·0	326	i 12 4	− 3	22 1	− 5	37·6	—
Jena		79·1	320	e 12 6	− 2	e 21 58	− 9	—	—
Göttingen		80·1	322	—	—	22 21	+ 3	e 40·6	—
Hamburg		80·3	324	e 12 12k	− 2	i 22 13	− 7	e 37·6	44·6
Stuttgart		80·5	318	e 12 12	− 3	e 22 18	− 4	e 40·6	47·9
Zurich		80·9	317	e 12 13k	− 4	e 23 57	PPS	—	—
Strasbourg		81·4	319	e 12 20	0	i 22 28	− 3	e 38·8	47·1
Basle		81·5	317	e 12 17	− 4	e 22 26	− 6	—	—
Neuchatel		81·9	317	e 12 20	− 3	e 22 28	− 8	—	—
De Bilt		83·1	322	e 12 30	+ 1	22 46	− 2	e 39·6	47·3
Uccle		83·7	321	e 12 36	+ 4	22 49	− 5	34·6	—
Paris		84·9	319	e 12 46	+ 8	e 22 58	− 8	44·6	49·6
Algiers		85·1	306	e 12 43	+ 4	e 23 10	+ 2	—	43·6
Kew		86·6	322	—	—	i 23 16	− 7	40·6	60·7
Durham	N.	87·0	325	—	—	i 23 21	− 6	—	46·6
Oxford		87·1	322	i 16 23	PP	i 23 27	− 1	e 41·6	60·4
Stonyhurst		87·6	324	—	—	i 22 30	[−47]	e 46·6	54·2
Christchurch		87·7	134	13 0a	+ 8	i 23 25	− 8	41·3	—
Edinburgh		87·8	326	—	—	e 23 31	− 3	e 46·6	58·6
Jersey		87·9	320	—	—	e 23 51	+16	e 50·6	—
Bidston		88·1	324	—	—	e 23 38	+ 1	e 45·6	58·1
Wellington		88·9	131	—	—	e 23 33?	[+ 7]	e 40·6	—
Almeria		89·5	307	e 13 2	+ 2	—	—	—	—
Rathfarnham Castle		90·0	324	—	—	e 24 33	+39	45·6	53·6
Granada		90·4	307	e 12 59	− 5	i 23 52	− 6	—	—
Toledo		90·4	310	e 13 1	− 3	e 23 56	− 2	—	—
Malaga		91·1	307	—	—	e 24 23	+19	—	—
Scoresby Sund		92·3	343	13 21	+ 9	24 14	− 1	—	—
San Fernando		92·5	306	—	—	e 24 21	+ 4	e 49·6	—
Averroes		94·0	303	—	—	e 24 33?	+ 3	e 46·6	50·6
College		97·7	21	e 17 40	PP	e 24 9	[− 6]	e 44·4	—
Victoria		118·5	24	e 19 33?	PP	e 36 33	SS	49·6	—
Butte		124·6	17	e 20 44	PP	e 37 39	SS	e 66·8	—
Seven Falls		125·2	344	—	—	e 33 33	PPS	54·6	—
Berkeley	N.	126·9	31	—	—	e 54 27	?	—	—
Ottawa		128·0	347	—	—	e 33 3	PPS	54·6	—
Tinemaha		129·6	30	i 19 9	[− 2]	—	—	—	—
Haiwee	E.	130·5	30	e 19 13	[0]	—	—	—	—
Mount Wilson	Z.	131·9	32	e 19 9	[− 6]	—	—	—	—
Pasadena		131·9	32	e 19 8	[− 7]	—	—	e 56·6	—
Riverside	Z.	132·4	32	e 19 8	[− 8]	—	—	—	—
Rio de Janeiro	E.	132·6	244	e 21 33?	PP	—	—	—	—
Philadelphia		133·0	344	e 23 10	PKS	e 45 8	SSS	e 57·9	—
Tucson		137·1	27	e 19 12	[−13]	26 22	[−12]	e 56·1	—
San Juan		147·2	316	e 19 15	[−28]	e 30 39	{+36}	e 71·9	—
La Paz		156·8	239	i 20 21e	[+24]	i 31 8	{+12}	76·0	89·5
Huancayo		165·0	244	e 20 7	[+ 1]	e 31 12	{−26}	—	—

For Notes see next page.

NOTES TO Nov. 30d. 0h. 40m. 27s.

Additional readings :—
Medan iEN = +3m.13s.
Calcutta iPPPN = +4m.1s., iSSN = +7m.57s.
Batavia iSN = +8m.9s.
Bombay eN = +3m.59s., iPP = +5m.8s., iSS = +9m.18s.
Agra ipPE = +5m.30s., PPPE = +6m.10s., isSE = +10m.1s., SSE = +10m.53s.
Manila iE = +8m.29s., iZ = +9m.37s., S?EN = +15m.1s.
Taihoku e = +20m.11s.
Zi-ka-wei PPZ = +8m.57s., PPPZ = +9m.24s., iZ = +16m.49s., +19m.7s., and +21m.5s.
Almata e = +9m.15s.
Samarkand e = +8m.22s.
Perth PP = +9m.58s., PPP = +10m.23s., PPPP = +10m.53s., SP = +14m.46s., SS = +18m.1s., SSS = +18m.51s., SSSS = +19m.33s.
Wakayama i = +10m.55s.
Tiflis PE = +10m.38s., ePPE = +12m.34s., ePPPE = +13m.48s., SSE = +22m.9s., eSSSE = +24m.9s.
Sverdlovsk L_q = +27·2m.
Ksara ePP = +12m.14s.
Adelaide +25m.23s.
Melbourne i = +24m.55s.
Brisbane iPE = +20m.3s., iPPN = +20m.51s., iPPE = +20m.57s., eSE = +24m.27s.
Sydney e = +32m.11s. and +36m.35s.
Vienna PS = +22m.15s.
Upsala eSSE = +26m.29s.
Triest ePPP = +16m.28s., eSSSE = +30m.33s.?
Cape Town iN = +27m.15s., iE = +27m.19s.
Copenhagen e = +12m.13s., PP = +15m.14s., PPP = +16m.59s., eEN = +22m.15s., eE = +22m.45s. and +22m.58s., SS = +27m.15s., SSS = +30m.45s.
Hamburg iE = +23m.0s.
Stuttgart eZ = +12m.21s., ePP = +15m.3s., e = +18m.38s., eSS = +27m.33s., eSSS = +31m.27s.
Strasbourg PPZ = +15m.37s., SSE = +27m.39s.
De Bilt iZ = +12m.36s., ePPZ = +15m.48s., eSSE = +28m.25s.
Uccle ePPE = +15m.52s., ePPPE = +17m.47s., ePSE = +23m.40s., iSSE = +28m.35s., SSSE = +32m.5s.
Paris PP = +16m.2s., PS = +23m.56s.
Algiers PP = +15m.49s., e = +28m.33s.?
Christchurch SS = +29m.9s., L_qN = +35m.41s.
Jersey ePS = +24m.33s., e = +29m.53s.
Rathfarnham Castle e = +36m.53s.
Toledo e = +30m.8s.
Scoresby Sund PP = +17m.2s., PS = +25m.27s., SS = +30m.33s.
College ePKS = +18m.38s., eS = +24m.56s., ePS = +25m.49s., eSS = +30m.57s., and +31m.39s., eSSS = +31m.52s.
Ottawa e = +38m.33s.?
Tinemaha eZ = +21m.19s., ePPZ = +22m.28s.
Mount Wilson iPKPZ = +19m.15s., iPPZ = +22m.36s., iZ = +22m.54s.
Pasadena iPKPZ = +19m.14s., eZ = +21m.35s., iPPZ = +22m.36s., iZ = +22m.52s.
Riverside iPKPZ = +19m.15s., iZ = +21m.40s., ePPZ = +22m.37s., eSKPZ = +23m.21s.
Philadelphia ePPP = +24m.28s., ePSPS = +39m.40s.
Tucson iPKP = +19m.26s., i = +20m.2s., ePP = +21m.58s., iPKS = +22m.54s. and +23m.12s., PPP = +24m.41s.
San Juan ePKP = +19m.24s., PKP = +20m.14s., ePP = +23m.12s., ePKS = +24m.7s., ePPP = +26m.7s., ePSPS = +42m.42s.
La Paz PPZ = +24m.30s.
Huancayo ePKS = +25m.23s., ePPP = +28m.12s., eSKSP = +34m.35s., ePPS = +38m.42s., eSS = +45m.27s.
Long waves were also recorded at Budapest, La Plata, Oak Ridge, St. Louis, Ivigtut, Vermont, Sitka, and Bergen.

Nov. 30d. 12h. 57m. 48s. Epicentre 5°·0N. 36°·6E.

$A = +\cdot7998$, $B = +\cdot5940$, $C = +\cdot0866$; $\delta = +2$; $h = +7$;
$D = +\cdot596$, $E = -\cdot803$; $G = +\cdot070$, $H = +\cdot052$, $K = -\cdot996$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helwan		25·2	349	i 5 30	+ 1	e 9 51	− 1	—	—
Tananarive		26·1	156	e 5 38	+ 1	—	—	—	—
Ksara		28·7	359	i 5 59	− 2	e 11 2	+12	—	16·2
Erevan		35·8	12	e 7 52	+49	—	—	—	—
Baku		37·2	17	e 7 23	+ 8	13 11	+ 9	20·2	21·9
Tiflis	E.	37·3	11	e 7 13	− 3	13 4	0	e 16·7	21·3
Bombay		37·9	66	e 7 20	0	i 13 13	0	17·5	21·2
Grozny		39·0	12	7 35	+ 5	—	—	—	—
Piatigorsk		39·3	8	i 7 31	− 1	—	—	20·7	—
Yalta		39·4	358	7 33	0	e 16 55	SSS	e 19·2	—
Bucharest		40·3	349	e 7 43	+ 3	13 51	+ 2	18·7	27·9
Belgrade		42·1	343	e 7 54k	− 1	e 14 18	+ 2	e 24·3	—
Cape Town		42·4	203	i 7 59	+ 1	i 14 26	+ 6	i 22·2	25·8
Hyderabad		42·7	70	—	—	14 35	+11	18·2	23·7
Colombo		43·1	86	14 29	S	(14 29)	− 1	21·9	24·1
Algiers		44·1	320	8 13	+ 1	e 15 13	+28	e 23·6	26·4
Samarkand		44·1	34	8 7	− 5	—	—	—	—
Zagreb	Z.	44·4	340	e 8 16	+ 2	—	—	e 23·6	—
Budapest		44·9	344	8 18	0	15 2	+ 6	21·2	29·2
Triest		45·1	338	8 17	− 3	14 58	− 1	e 21·9	25·9
Agra	E.	45·2	57	i 8 16	− 4	i 15 3	+ 2	22·1	—
Stara Dala		45·5	344	e 7 56	−27	e 15 12	+ 7	—	27·2
Graz		45·7	340	i 8 23	− 1	e 15 7	− 1	—	29·1
Dehra Dun		46·4	53	15 2	S	(15 2)	−16	22·9	23·2
Vienna		46·4	342	e 8 28	− 2	—	—	e 24·7	27·7
Tashkent		46·5	34	i 8 31	0	i 15 18	− 1	—	—
Barcelona		47·6	326	e 10 4	PP	—	—	e 19·2	30·3
Almeria		47·8	317	e 8 49	+ 8	e 15 59	+21	e 25·4	28·3
Andijan		47·9	38	e 8 40	− 2	15 40	+ 1	26·2	—
Tortosa	N.	48·1	324	e 9 14	+31	15 49	+ 7	19·7	26·9
Prague		48·6	342	e 8 41	− 6	e 15 48	− 1	e 19·2	30·2
Zurich		48·6	335	e 8 46	− 1	—	—	—	—
Granada		48·7	317	e 8 43	− 5	—	—	25·2	—
Malaga		49·0	317	e 8 28	−22	—	—	24·2	—
Neuchatel		49·0	335	e 8 52	+ 2	—	—	—	—
Basle		49·2	335	e 8 48	− 4	—	—	—	—
Cheb		49·4	341	e 10 12?	PP	e 16 12?	+12	e 22·2	33·2
Stuttgart		49·4	337	e 8 49	− 4	e 15 55	− 5	e 22·7	23·7
Averroes		49·7	311	e 9 6	+10	16 58	+54	24·9	32·4
Bagnères		49·8	326	—	—	(e 15 12?)	−54	e 15·2	—
Strasbourg		49·9	336	e 8 53	− 4	e 16 6	− 1	—	31·0
Karlsruhe		50·0	337	e 9 0	+ 2	—	—	e 23·4	—
San Fernando		50·2	314	e 9 7	+ 7	e 16 14	+ 3	24·7	—
Jena		50·3	341	e 8 54	− 6	—	—	e 21·2	29·8
Toledo		50·4	319	i 8 58	− 3	e 16 19	+ 5	e 20·2	33·3
Moscow		50·6	1	8 58	− 4	16 15	− 2	26·7	32·5
Göttingen		51·4	340	e 9 7	− 2	e 16 12?	−16	e 30·2	32·2
Almata		52·1	37	e 9 19	+ 5	—	—	—	—
Paris		52·4	332	e 9 17	+ 1	—	—	20·2	31·2
Calcutta	N.	52·9	66	e 9 55	+35	i 16 47	− 1	24·0	27·5
Uccle		53·0	335	e 9 23	+ 2	i 16 52	+ 2	23·2	32·7
Hamburg		53·1	341	e 9 15k	− 6	i 16 51	0	i 25·3	33·2
De Bilt		53·7	338	9 25	− 1	17 1	+ 2	e 25·2	32·5
Copenhagen		54·1	344	9 33	+ 4	17 6	+ 1	23·2	—
Jersey		54·9	331	e 9 30	− 5	i 19 42	?	—	33·4
Pulkovo		54·9	356	e 9 39	+ 4	e 17 11	− 5	27·7	35·8
Sverdlovsk		55·1	16	i 9 33	− 3	i 17 17	− 1	31·1	34·0
Kew		55·5	334	e 9 43	+ 4	i 17 30	+ 6	25·2	34·9
Oxford		56·2	333	9 40	− 4	i 17 32	− 1	e 22·5	38·0
Upsala		56·6	349	i 9 50	+ 3	e 17 40	+ 2	25·2	34·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Bidston		58·1	334	—	—	i 18 2	+ 4	28·2	43·4
Semipalatinsk		58·1	32	e 9 54	− 4	—	—	—	—
Stonyhurst		58·1	335	e 9 57	− 1	i 18 7	+ 9	27·2	36·8
Durham		58·4	336	—	—	i 18 0	− 2	—	33·7
Rathfarnham Castle		59·5	332	i 9 29	−38	i 18 50	+34	25·6	37·2
Edinburgh		59·8	336	—	—	i 18 28	+ 8	e 30·2	34·8
Bergen		60·1	344	—	—	18 12?	−12	28·6	—
Medan		61·9	88	10 23	− 1	—	—	28·2	—
Phu-Lien		69·6	70	e 11 12	− 1	—	—	—	—
Batavia		71·0	98	10 21	−61	i 20 39	+ 2	34·2	—
Irkutsk		72·5	37	11 32	+ 2	20 57	+ 3	37·2	40·2
Scoresby Sund		75·1	343	—	—	21 31	+ 7	32·2	—
Hong Kong		76·6	69	21 42	S	(21 42)	+ 2	—	44·5
Rio de Janeiro	N.	82·6	246	—	—	e 29 12?	?	e 44·0	—
Zi-ka-wei	Z.	83·0	59	e 12 26	− 2	—	—	—	50·6
Ivigtut		83·1	331	—	—	22 54	+ 6	—	—
Manila		83·3	76	i 12 32a	+ 2	23 0	+10	—	—
Perth		83·5	123	12 47	+16	22 57	+ 5	40·5	66·8
Seven Falls		98·1	319	—	—	e 30 12?	?	49·2	—
Weston	E.	99·7	314	—	—	e 26 46	PS	e 45·9	—
San Juan		100·4	289	—	—	e 24 36	[+ 7]	47·0	—
Vermont		100·4	316	—	—	e 24 37	[+ 8]	e 45·6	—
Ottawa		101·8	318	—	—	e 24 42	[+ 6]	48·2	—
Philadelphia		103·2	312	—	—	e 25 7	[+25]	e 46·9	—
Melbourne		107·5	128	i 19 12	PP	i 25 10	[+ 9]	51·6	52·5
College		110·2	2	—	—	e 28 43	PS	e 45·8	—
Huancayo		112·5	259	21 48	PPP	e 25 44	[+22]	e 45·9	—
Bozeman		121·9	333	—	—	e 36 18	SS	—	—
Victoria		124·0	343	—	—	e 26 12?	[+ 9]	55·2	—
Christchurch		125·5	142	25 59	S	(25 59)	[− 8]	e 59·1	—
Tucson		131·7	322	19 18	[+ 3]	—	—	e 56·7	—
Tinemaha	Z.	132·0	332	e 19 17	[+ 1]	—	—	—	—
Mount Wilson	Z.	134·2	331	e 19 27	[+ 7]	—	—	—	—
Pasadena		134·4	331	e 19 27	[+ 7]	—	—	e 64·8	—

Additional readings :—
Helwan e = +5m.56s., +6m.54s., i = +7m.36s. and +12m.0s.
Tiflis PE = +7m.21s., PPE = +8m.54s., eSSE = +15m.59s.
Bombay PPEN = +8m.40s., SSEN = +15m.22s.
Yalta e = +13m.32s.
Belgrade ePPZ = +10m.57s., eSSNW = +17m.32s.
Cape Town iPP = +9m.44s., iSSE = +17m.46s., iSSN = +17m.51s., iN = +20m.16s., i?E = +20m.41s.
Colombo S = +17m.59s.
Algiers P_cP? = +9m.54s.
Zagreb eZ = +10m.6s.
Budapest PE = +8m.21s., iN = +8m.31s., P_cPE = +10m.7s., PPN = +10m.9s., P_cPN = +10m.16s., iE = +10m.31s., P_cSN = +14m.17s., SSN = +18m.4s., S_cSN = +18m.16s., S_cSE = +18m.20s.
Triest i = +18m.30s.
Agra PPE = +10m.1s., SSE = +18m.22s.
Graz iS = +18m.41s.
Dehra Dun S = +18m.32s.
Vienna PP = +12m.43s., PPP = +15m.24s., SKS = +19m.15s., SKKS = +19m.52s., PPS = +22m.45s.
Prague e = +14m.12s. and +18m.12s.
Zurich ePP = +10m.43s.
Stuttgart epPZ = +9m.3s., ePP = +10m.50s., ePPP = +11m.14s., e = +13m.17s., +14m.37s., eSS = +19m.31s.
Averroes eN = +18m.44s., eE = +19m.57s.
Strasbourg ipPZ = +9m.15s., iP_cPZ = +10m.19s., ePPZ = +10m.55s.; SSN = +19m.45s.
San Fernando ePPN = +10m.51s., eSSEN = +20m.9s.
Jena e = +11m.0s., eE = +15m.12s.
Calcutta eN = +12m.19s., i = +19m.18s., iSS = +19m.53s.
Uccle ePPN = +11m.20s., SS = +20m.34s.
Hamburg iZ = +9m.24s., ePPN = +10m.59s., eSSN = +21m.15s.
Copenhagen +19m.18s.

Continued on next page.

Jersey e = +20m.22s. and +23m.36s.
Sverdlovsk L_q = +26·2m.
Kew iE = +10m.10s.
Upsala SS = +21m.19s.
Stonyhurst i = +13m.52s.
Durham iE = +18m.9s.
Bergen e = +25m.12s.?
Scoresby Sund +26m.24s.
Perth P_cP = +13m.2s., SP = +23m.57s., i = +24m.27s., SS = +28m.39s., SSS = +33m.10s., SSSS = +35m.0s.
Weston eSSE = +32m.16s.
San Juan ePKKP = +30m.26s., eSS = +32m.12s., eSSS = +36m.3s.
Vermont e = +32m.50s. and +36m.35s.
Ottawa eN = +41m.12s.?
Philadelphia eSS = +34m.2s.
Melbourne e = +28m.12s., +34m.12s.?, i = +49m.12s.?
College eSS = +34m.56s.
Huancayo eSKKS = +26m.7s., ePS = +28m.47s., eSS = +34m.39s., ePSPS = +35m.19s.
Bozeman e = +43m.42s.
Victoria eE = +37m.12s.?
Christchurch SN = +37m.25s., PS = +38m.35s., eSS = +44m.6s., L_qN = +52·5m.
Tucson iP = +19m.28s., +19m.42s., ePP = +21m.44s., ePKS = +22m.19s., PKS = +22m.44s.
Tinemaha eZ = +19m.40s., ePPZ = +21m.49s.
Mount Wilson iPKPZ = +19m.47s., iPPZ = +21m.55s., eSKPZ = +22m.22s.
Pasadena iPKPZ = +19m.47s., ePKPZ = +21m.50s.
Long waves were also recorded at Sofia, La Paz, La Plata, Oak Ridge, Portland, St. Louis, Berkeley, Zinsen, Brisbane, Riverview, Ukiah, Wellington, East Machias, Vladivostok, Little Rock, Besançon, Theodoisa, and Sydney.

Nov. 30d. Readings also at 3h. (Reykjavik), 4h. (Medan), 5h. (Santiago), 6h. (Pasadena, Riverside, Mount Wilson, Manzanillo, Guadalaljara, Oaxaca, Tacubaya, Tucson, and Wellington), 7h. (La Paz and Pennsylvania), 8h. (Triest), 9h. (Keizyo and Andijan), 10h. (Fresno and Lick), 12h. (Manzanillo, Almeria, and Calcutta), 13h. (Kobe, Husan, and Taikyu), 15h. (Andijan, Santiago, Sumoto, Nagoya, Samarkand, and Stuttgart), 16h. (Santiago (2), La Paz, Mount Wilson, Riverside, Pasadena, Mizusawa, and La Plata), 17h. (Santiago), 18h. (La Paz, Tucson, Huancayo, and Oak Ridge), 19h. (Tashkent, Baku, and Irkutsk), 22h. (Tashkent, Baku, Tiflis, Helwan, Sverdlovsk, and Ksara), 23h. (Manila, Tiflis, and Tucson).

Dec. 1d. 2h. 48m. 36s. Epicentre 35°·4N. 140°·7E. (as on 1937 June 30d.).
Tokyo gives Epicentre 35°·6N. 140°·7E.

A = −·6322, B = +·5174, C = +·5767; δ = −4; h = 0;
D = +·633, E = +·774; G = −·446, H = +·365, K = −·817.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	M. m.
Kiyosumi		0·5	239	0 16	+ 2	0 25	+ 2	—
Tokyo Cen. Met. Ob.		0·8	293	i 0 20k	+ 2	0 33	+ 2	1·0
Tokyo I.U.		0·8	293	0 19	+ 1	0 32	+ 1	—
Kamakura		0·9	265	0 18	− 2	0 33	− 1	—
Komaba		0·9	287	0 20	0	0 33	− 1	—
Misaki		0·9	254	0 18	− 2	0 31	S*	—
Mitaka		1·0	286	0 20	− 1	0 36	0	—
Tukubasan		1·0	329	0 18	− 3	0 28	S_g	—
Koyama		1·4	268	0 16	−11	0 31	−15	—
Titibu		1·4	294	0 16	−11	0 34	−12	—
Yosiwara		1·7	262	0 16	−15	0 37	−17	—
Nagoya		3·1	266	0 54	P*	1 44	S_g	2·1
Mizusawa		3·7	5	e 1 3	+ 3	i 1 39	− 6	—
Kobe		4·6	262	e 1 32	P_g	2 20	S*	2·4
Toyooka	E.	4·8	274	1 26	P*	e 2 24	S*	3·0
	N.	4·8	274	1 33	P_g	2 32	S_g	2·8
	Z.	4·8	274	1 31	P_g	2 30	S*	2·5
Sumoto	E.	4·9	259	e 1 32	P*	e 2 29	S*	2·9
	N.	4·9	259	e 1 34	S_g	e 2 34	S*	2·8

Additional reading :—
Kobe ePN = +1m.36s.

Dec. 1d. 22h. 18m. 0s. Epicentre 46°·2N. 7°·2E.

Felt Force IV at Sion (Valais). Epicentre at 15kms. N.W. of the town, near 46°15′N. 7°15′E.

E. Wanner.

Jahresbericht, 1937, des Schweizerischen Erdbebendienstes. Separatabdruck aus der Annalen der Schweizerischen Zentralanstalt. Jahrgang, 1937.

$A = -\cdot6891$, $B = -\cdot0871$, $C = -\cdot7194$; $\delta = -2$; $h = -4$;
$D = +\cdot125$, $E = +\cdot992$; $G = +\cdot714$, $H = +\cdot090$, $K = -\cdot695$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Sion	0·1	—	e 0 5	− 3	e 0 7	− 6
Neuchatel	0·8	348	e 0 18	0	i 0 33	+ 2
Basle	1·4	11	e 0 28	+ 1	i 0 44	− 2
Besançon	1·4	322	—	—	e 1 0?	S_g
Zurich	1·5	39	e 0 28	0	e 0 47	− 2
Ravensburg	2·2	46	—	—	e 1 11	+ 5
Strasbourg	2·4	9	—	—	e 1 20	S_g
Stuttgart	2·9	28	e 0 55	P_g	e 1 20	− 4

Additional readings:—
Neuchatel i = +21s.
Strasbourg iSS = +1m.28s., e = +1m.35s. and +1m.52s.
Stuttgart eS_g = +1m.33s.

Dec. 1d. Readings also at 6h. (Reykjavik), 9h. (Perth, Oak Ridge, Weston, and near Williamstown), 10h. (Wellington), 11h. (Helwan), 13h. (Hong Kong, Irkutsk, Moscow, Sverdlovsk, Pulkovo, and Copenhagen), 15h. (Alicante, Berkeley, Fresno (2), near Branner, Lick, and San Francisco), 16h. (Balboa Heights and Jena), 18h. (near La Paz), 19h. (Tashkent, Mount Wilson, and near Manila), 20h. (Sverdlovsk), 23h. (Mount Wilson, Pasadena, Riverside, and Tucson).

Dec. 2d. Readings at 0h. (Berkeley), 3h. (Mizusawa and Balboa Heights), 6h. (Manila), 11h. (Balboa Heights and Copenhagen), 13h. (Samarkand), 14h. (Tiflis and Grozny), 15h. (Triest), 16h. (Perth, Melbourne, Chatham Ils., Riverview, Sydney, Adelaide, Brisbane, Christchurch, Wellington, Ksara, Tashkent, Tucson, Kodaikanal, Huancayo, Sverdlovsk, Pasadena, Mount Wilson, and Riverside), 17h. (Tucson, Tiflis, Oak Ridge, and Paris), 18h. Copenhagen and Stuttgart), 19h. (Andijan), 20h. (Huancayo and Andijan), 22h. (Andijan, Kodaikanal, and Vermont), 23h. (Helwan, Granada, Tacubaya, Pulkovo, Baku, Moscow, Haiwee, Tiflis, Riverside, Mount Wilson, Pasadena, Sverdlovsk, Ksara, and Tashkent).

Dec. 3d. 15h. 28m. 3s. Epicentre 34°·4N. 120°·9W. (as on 1937 Nov. 22d.).

Near position 34°·6N. 120°·8W. given by Pasadena.

$A = -\cdot4246$, $B = -\cdot7095$, $C = +\cdot5624$; $\delta = -3$; $h = 0$;
$D = -\cdot858$, $E = +\cdot514$; $G = -\cdot289$, $H = -\cdot483$, $K = -\cdot827$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Santa Barbara		0·9	88	i 0 27	+ 7	i 0 40	+ 6
Pasadena		2·3	96	i 0 37	− 3	i 1 12	+ 3
Mount Wilson		2·4	94	i 0 47	P_g	i 1 14	S*
Fresno	N.	2·5	21	e 0 50	P_g	e 1 28	S_g
Haiwee	E.	3·0	54	e 0 59	P_g	i 1 38	S_g
Lick	N.	3·0	348	i 0 57	P*	—	—
Riverside		3·0	98	i 0 54	P*	e 1 27	0
Branner		3·3	341	—	—	e 1 17	−18
San Francisco	E.	3·6	340	—	—	e 1 44	+ 2

Additional reading:—
Branner eE = +2m.3s.

Dec. 3d. Readings also at 1h. (Samarkand), 2h. (Samarkand), 3h. (Triest), 4h. (Tiflis, Erevan, Grozny, and Wellington), 5h. (Branner, Lick, Fresno, San Francisco, and Berkeley), 14h. (Huancayo), 15h. (Ksara), 19h. (Santiago), 21h. (Santiago), 23h. (Huancayo, Ksara (2), Tinemaha (2), Pasadena (2), Mount Wilson (2), Riverside (2), Rio de Janeiro, Tashkent, La Paz (2), La Plata, San Juan, and Tucson (2)).

Dec. 4d. Readings at 0h. (Tinemaha, Riverside, Mount Wilson, Pasadena, Baku, Sverdlovsk, and Tiflis), 1h. (San Francisco), 2h. (Kobe and Sumoto), 3h. (Tacubaya, Oaxaca, and La Paz), 4h. (Huancayo), 5h. (Mizusawa and Triest), 6h. (Mizusawa), 7h. (Triest), 10h. (Tiflis), 14h. (Andijan and Samarkand), 15h. (Mizusawa), 21h. (Andijan and Tashkent), 22h. (Almata, Tchimkent, and Samarkand), 23h. (Christchurch).

Dec. 5d. 5h. 41m. 56s. Epicentre 14°·0N. 89°·4W.

$A = +\cdot0102$, $B = -\cdot9706$, $C = +\cdot2404$; $\delta = -4$; $h = +6$;
$D = -1\cdot000$, $E = -\cdot010$; $G = +\cdot002$, $H = -\cdot240$, $K = -\cdot971$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Merida	N.	6·9	359	1 25?	−20	—	—	—
Tacubaya	N.	10·8	301	2 48?	+ 9	—	—	—
Balboa Heights		10·9	116	e 2 20	−20	—	—	—
Little Rock		20·9	353	i 5 0	+14	e 8 56	SS	—
St. Louis		24·5	359	e 5 23	+ 1	e 9 38	− 2	e 13·9
Tucson		26·7	317	e 5 44	+ 1	—	—	e 12·5
Huancayo		29·4	151	e 6 7	0	e 11 10	+ 9	e 12·2
La Jolla		31·6	312	e 6 25	− 1	—	—	—
Riverside		32·2	313	i 6 31	− 1	—	—	—
Weston		32·3	25	i 6 46k	+13	—	—	e 17·7
Mount Wilson	z.	32·8	313	i 6 36	− 1	—	—	—
Pasadena		32·9	313	i 6 38	0	—	—	—
Tinemaha	z.	34·5	317	i 6 56	+ 4	—	—	—
La Paz	z.	36·9	144	7 27	+15	—	—	—

Additional readings :—
Little Rock iN = +5m.16s. and +5m.35s., eSN = +9m.0s., iE = +9m.43s.
St. Louis iEN = +5m.39s., eEN = +6m.20s., eSE = +9m.42s.
Tucson ePP = +6m.35s., ePPP = +6m.42s.
Huancayo eS = +11m.38s.
Riverside ipPZ = +6m.56s., iP_cPZ = +9m.13s., ipP_cPZ = +9m.25s., iP_cSZ = +12m.54s., ipS_cSZ = +13m.26s.
Mount Wilson ipPZ = +6m.52s., iP_cSZ = +12m.57s.
Pasadena iP_cPZ = +9m.16s., ipP_cPZ = +9m.31s., eS_cPZ = +12m.55s., iP_cSZ = +12m.58s., ipP_cSZ = +13m.26s.
Tinemaha ipPZ = +7m.12s., iP_cPZ = +9m.19s., eS_cPZ = +13m.0s., iP_cSZ = +13m.3s., epP_cSZ = +13m.26s., iS_cSEZ = +17m.5s.
Long waves were also recorded at Sverdlovsk, Ksara, Baku, Scoresby Sund, and San Juan.

Dec. 5d. Undetermined shock 15h.
Wellington e = 20m.19s., PPP = 20m.53s., iS = 23m.17s., iSS = 23m.28s., i = 24m.21s., L_r = 25m.0s.
Arapuni e = 22m.54s., M = 23m.30s.
Christchurch P? = 22m.41s., eS? = 24m.22s., iNZ = 24m.35s., eE = 24m.51s., eL = 25m.35s.
Chatham Ils. eS? = 23m.30s., M = 24m.30s.
Brisbane eN = 24m.0s. and 24m.54s., eLN = 26m.24s., MN = 32m.48s.
Sydney e = 24m.7s. and 26m.52s., eL = 31m.41s., M = 34m.22s.
Riverview ePE = 24m.10s., eSN = 28m.33s., eE = 28m.53s., eL = 31m.24s., M = 33m.38s.
Melbourne e = 24m.50s., i = 26m.22s., 30m.22s., and 33m.2s., L = 34m.7s., M = 35·9m.
Adelaide e = 28m.37s., i = 34m.3s. and 35m.18s., M = 38·7m.
Huancayo e = 30m.5s., i = 42m.19s., 43m.1s., 44m.26s., and 49m.32s.
Pasadena iP = 30m.49s., eN = 42m.29s., eLN = 57m.0s.
Mount Wilson iPZ = 30m.58s.
Riverside ePZ = 31m.0s.

Continued on next page.

Tinemaha ePZ = 31m.8s.
Tucson e = 31m.8s., i = 31m.24s., 31m.33s., and 61m.0s.
Pulkovo e = 35m.53s., i = 38m.2s., e = 46m.50s., eL = 90·5m., M = 111·5m.
Sverdlovsk e = 37m.44s., i = 41m.8s., L = 82m., M = 100·4m.
Moscow e = 37m.58s. and 41m.14s., eL = 96m.30s., M = 106·8m.
Tiflis eE = 38m.0s., 42m.3s., and 48m.9s., eLE = 95m., M = 112·8m.
Ksara iPKP = 38m.14s.k, i = 38m.34s., ePP = 41m.59s., ePSKS = 52m.23s., L = 95m., M = 106m.
Bombay eE = 38m.16s., e = 43m.58s., 49m.13s., and 83m.0s.
Calcutta eN = 38m.52s., iN = 43m.20s. and 46m.14s., MN = 91m.7s.
Stuttgart eZ = 39m.10s., eN = 53m.24s., eL = 108m., M = 123m.
Perth i = 40m.5s., 42m.43s., and 45m.30s., iL = 48m.30s.
Berkeley iE = 41m.35s.
Baku e = 42m.46s., 48m.0s., 56m.0s., 69m.25s., 75m.36s., and 85m.0s., L = 94m., M = 111·1m.
Victoria e = 42m.48s., L = 62m.0s.
Irkutsk e = 43m.18s., 47m.0s., 55m.0s., and 67m., eL = 73m.
Agra iE = 43m.49s., i = 47m.42s.
La Paz eZ = +44m.20s., LN = 63m.0s., M = 71m.42s.
Tashkent e = 44m.52s. and 78m., M = 107·4m.
Ottawa eE = 48m.30s., L = 75m.
Helwan e = 48m.9s. and 55m.36s.
Long waves were also recorded at Apia, Vladivostok, East Machias, Butte, Bozeman, Triest, Uccle, Hong Kong, San Fernando, Scoresby Sund, Williamstown, Cape Town, Cheb, De Bilt, Paris, Strasbourg, Copenhagen, Batavia, Oak Ridge, and Philadelphia.

Dec. 5d. 20h. 51m. 33s. Epicentre 36°·2N. 140°·0E.

$A = -\cdot6196$, $B = +\cdot5199$, $C = +\cdot5880$; $\delta = -6$; $h = 0$;

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tukubasan	0·1	—	0 10	+ 2	0 16	+ 3	—
Tokyo Cen. Met. Ob.	0·5	200	0 14$_a$	0	0 25	+ 2	0·6
Tokyo I.U.	0·5	200	0 14	0	0 23	0	—
Komaba	0·6	205	0 17	+ 2	0 26	0	—
Mitaka	0·6	214	0 17	+ 2	0 28	+ 2	—
Titibu	0·8	254	0 19	+ 1	0 29	S*	—
Kamakura	1·0	202	0 19	P$_g$	0 34	S*	—
Kiyosumi	1·1	172	0 19	− 3	0 35	S$_g$	—
Misaki	1·1	196	0 19	− 3	0 35	S$_g$	—
Koyama	1·2	224	0 19	− 5	0 33	− 8	—
Nagoya	2·7	247	0 50	+ 5	1 23	+ 4	—
Mizusawa E.	3·1	17	—	—	1 27	− 2	—

Dec. 5d. Readings also at 0h. (La Paz and Berkeley), 1h. (Berkeley (2), Lick (2), Branner (2), Fresno (2), and Tucson), 2h. (Lick and Fresno), 3h. (Graz), 5h. (Florissant), 7h. (near Wellington), 8h. (Tinemaha, Pasadena, Mount Wilson, and Riverside), 10h. (Samarkand), 12h. (La Paz), 13h. (Sotchi), 17h. (Hastings, Wellington, and Mizusawa), 18h. (Mizusawa), 20h. (Ksara).

Dec. 6d. 4h. 34m. 16s. Epicentre 35°·8N. 142°·0E.

$A = -\cdot6406$, $B = +\cdot5005$, $C = +\cdot5823$; $\delta = -6$; $h = 0$;
$D = +\cdot616$, $E = +\cdot788$; $G = -\cdot459$, $H = +\cdot358$, $K = -\cdot813$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa		3·4	348	1 7	P$_g$	1 36	− 1	—	—
Nagoya		4·1	261	e 1 8	+ 3	2 47	?	—	3·0
Kobe		5·7	261	1 28	0	i 2 59	S*	—	4·4
Toyooka		5·8	270	e 1 44	P*	3 12	S$_g$	—	4·1
Sumoto	E.	6·0	258	1 29	− 3	e 2 43	0	e 3·6	4·5
	N.	6·0	258	e 1 20	−12	e 2 41	− 2	e 3·4	3·9
	Z.	6·0	258	1 27	− 5	e 2 42	− 1	—	4·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka		9·8	261	2 20	− 4	4 55	S*	—	—
Hukuoka B		9·8	261	e 1 40	−44	e 3 54	−23	—	—
Husan		10·6	270	2 34	− 2	4 52	+15	—	—
Vladivostok		10·7	316	e 2 36	− 2	4 42	+ 3	e 6·5	9·4
Taikyu		10·9	274	2 40	0	5 40	SSS	7·8	—
Zinsen		12·5	282	e 2 53	− 9	e 5 56	SSS	e 7·9	9·1
Zi-ka-wei	Z.	17·8	260	i 4 2	− 9	7 30	+ 2	10·5	12·3
Hong Kong		27·7	249	6 42	PP	10 35	+ 2	13·6	18·7
Manila		28·3	228	7 30	?	13 18	?	—	—
Irkutsk		31·3	314	6 22	− 2	e 11 24	− 7	16·7	17·3
Phu-Lien	E.	34·3	255	e 8 13	PP	e 11 29	−48	—	22·8
Semipalatinsk		46·1	309	e 8 26	− 2	—	—	—	—
Calcutta	N.	48·1	270	e 8 49	+ 6	e 15 42	0	e 22·9	30·5
College		49·9	31	—	—	e 16 12	+ 5	e 20·4	—
Medan	E.	51·2	242	e 8 54	−13	i 16 22	− 3	e 28·7	—
Batavia		53·2	226	9 16	− 6	i 16 50	− 2	—	—
Andijan		53·6	298	e 9 28	+ 3	e 17 8	+10	28·7	—
Agra	E.	54·4	280	i 9 27	− 4	i 17 7	− 2	26·5	—
Tashkent		55·6	299	i 9 38	− 2	i 17 25	0	e 27·2	34·8
Sverdlovsk		56·4	320	i 10 0	+15	17 57	+21	32·5	39·7
Bombay		62·5	274	e 10 28	0	e 18 57	+ 3	—	39·3
Colombo		63·5	259	10 33	− 1	19 3	− 4	—	42·2
Kodaikanal	E.	63·5	264	i 10 34	0	19 9	+ 2	—	—
Brisbane	N.	63·8	168	—	—	e 19 14	+ 3	e 31·7	—
Moscow		68·5	324	e 11 5	− 1	20 5	− 3	e 36·2	44·0
Baku		69·3	305	11 20	+ 9	20 23	+ 6	35·7	44·6
Pulkovo		69·5	330	11 11	− 1	20 16	− 4	36·2	42·8
Grozny		70·5	310	e 11 28	+10	e 21 53	PPS	—	—
Ukiah		71·8	54	—	—	e 20 46	0	e 29·8	—
Tiflis	E.	72·0	309	e 11 53	+25	e 20 46	− 3	e 36·7	47·8
Berkeley	E.	73·1	55	—	—	i 21 2	+ 1	—	—
Melbourne		73·3	178	—	—	i 20 58	− 6	—	—
Mount Wilson	Z.	77·9	58	i 12 1	0	—	—	—	—
Pasadena	Z.	77·9	58	e 12 1	0	—	—	—	—
Riverside	Z.	78·5	58	i 12 0	− 4	—	—	—	—
Copenhagen		79·2	334	—	—	22 6	− 2	41·7	—
Ksara		82·3	305	i 12 25	0	e 23 2	+22	—	—
Belgrade		83·9	322	—	—	e 22 57	+ 1	e 45·0	—
Tucson		83·9	54	e 12 34	+ 1	e 23 4	+ 8	e 40·7	—
Stuttgart		85·9	331	e 15 50	PP	e 44 7	L	e 46·2	49·2
Huancayo		138·9	64	—	—	e 45 54	SSS	—	—
La Paz		147·0	62	i 19 51a	[+ 8]	—	—	72·7	95·9

Additional readings :—
Kobe iSE = +3m.2s.
Toyooka PZ = +1m.48s., ePN = +1m.59s., SZ = +3m.22s.
Zi-ka-wei z. PP = +4m.18s., iZ = +5m.14s., SSZ = +8m.0s., iZ = +9m.26s. and +9m.54s.
Hong Kong SS = +11m.24s.
Calcutta iPPN = +10m.30s., ePPPN = +11m.13s., iSSN = +19m.59s.
College S = +16m.14s., eS_cS = +18m.52s., eSS = +19m.56s.
Agra iPPE = +11m.28s., PSE = +17m.39s., SSE = +20m.42s.
Sverdlovsk L_q = +28·0m.
Bombay SS = +22m.51s.
Kodaikanal PSE = +19m.26s.
Ukiah eS = +21m.3s.
Melbourne i = +21m.44s., e = +29m.30s.
Ksara PP = +15m.43s., eSS = +28m.52s.
Tucson eP = +12m.39s., ePS = +23m.54s., e = +32m.58s., and +38m.56s.

Long waves were also recorded at Scoresby Sund, Jersey, Cheb, Stara Dala, Upsala, Prague, Stonyhurst, East Machias, Zagreb, De Bilt, Oak Ridge, Hamburg, San Fernando, Toledo, Durham, Göttingen, Budapest, Paris, Yalta, Strasbourg, Granada, Bucharest, Bergen, Uccle, and Triest.

Dec. 6d. 21h. 7m. 25s. Epicentre 14°·0N. 82°·0W. (Rough).

$A = +\cdot1351$, $B = -\cdot9613$, $C = +\cdot2404$; $\delta = +14$; $h = +6$;
$D = -\cdot990$, $E = -\cdot139$; $G = +\cdot033$, $H = -\cdot238$, $K = -\cdot971$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		5·6	153	e 1 19	− 8	e 1 53	−40	i 2·3	2·5
San Juan		15·8	72	—	—	e 7 34	SSS	9·7	—
Columbia		19·9	3	—	—	e 9 5	SSS	e 11·8	—
St. Louis		25·6	345	e 5 35	+ 3	e 10 9	+10	—	—
Philadelphia		26·5	13	—	—	e 10 4	−10	e 13·6	—
Huancayo		26·7	165	e 6 5	+22	10 41	+24	i 16·0	—
Chicago		28·2	350	—	—	e 10 35	− 6	e 12·9	—
Ottawa		31·7	9	e 6 25	− 2	e 11 35	− 2	16·6	—
Tucson		32·0	310	e 6 27	− 3	e 11 44	+ 2	e 16·6	—
La Paz		33·2	155	7 7	+27	—	—	—	—
Riverside	Z.	37·7	309	e 7 21	+ 2	—	—	—	—
Mount Wilson	Z.	38·3	309	i 7 22	− 2	—	—	—	—
Pasadena	Z.	38·4	309	i 7 22	− 3	—	—	—	—
Tinemaha		39·6	312	i 7 43	+ 8	—	—	—	—
Rio de Janeiro	E.	52·8	133	e 13 35	?	—	—	—	—

Additional readings :—
San Juan S = +8m.40s.
Philadelphia eS = +10m.35s.
Huancayo eP_cP = +8m.32s., S = +11m.28s.
Tucson eP = +6m.34s., ePP = +7m.19s., ePPP = +7m.41s.
La Paz iPPN = +8m.51s., eN = +20m.45s.
Pasadena iZ = +7m.27s.
Long waves were also recorded at Victoria, Port au Prince, Oak Ridge, Merida, Scoresby Sund, Bozeman, Baku, Paris, and Irkutsk.

Dec. 6d. 21h. 43m. 9s. Epicentre 14°·0N. 82°·0W. (as on Dec. 6d. 21h.).

$A = +\cdot1351$, $B = -\cdot9613$, $C = +\cdot2404$; $\delta = +14$; $h = +6$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		5·6	153	e 1 18	− 9	e 1 46	−47	i 2·2	2·4
Merida		10·0	315	e 2 15?	−12	—	—	—	—
Port au Prince		10·3	63	—	—	i 5 4	SSS	—	—
San Juan		15·8	72	3 40	− 5	e 6 31	−11	e 7·7	—
Tacubaya		17·3	290	i 4 13	+ 9	—	—	—	—
Columbia		19·9	3	—	—	e 8 17	+ 2	e 9·6	—
Little Rock		22·7	337	e 5 7	+ 3	e 9 14	+ 5	—	e 15·0
St. Louis		25·6	345	i 5 35	+ 3	e 10 20	+21	e 14·0	—
Florissant		25·8	345	—	—	e 11 51	SSS	—	—
Philadelphia		26·5	13	—	—	e 10 21	+ 7	e 11·4	—
Huancayo		26·7	165	e 5 41	− 2	i 10 18	+ 1	e 11·6	—
Chicago		28·2	350	—	—	e 10 39	− 2	e 13·0	—
Williamstown		29·6	15	e 5 51?	−18	—	—	e 13·8	—
Oak Ridge	Z.	29·8	16	—	—	(e 11 51?)	+44	e 11·8	—
Ottawa		31·7	9	—	—	e 11 33	− 4	15·8	—
Tucson		32·0	310	e 6 28	− 2	—	—	e 13·1	—
La Paz		33·2	155	e 6 43	+ 3	—	—	17·4	25·6
Riverside	Z.	37·7	309	e 7 15	− 4	—	—	—	—
Mount Wilson	Z.	38·3	309	e 7 20	− 4	—	—	—	—
Pasadena	Z.	38·4	309	i 7 27	+ 2	—	—	—	—
Tinemaha	Z.	39·6	312	i 7 33	− 2	—	—	—	—
Berkeley	N.	42·8	312	—	—	e 14 33	+ 7	—	—
Ukiah		44·0	313	e 10 29	PPP	e 14 24	−19	e 18·2	—
Sverdlovsk		102·9	19	—	—	32 20	SS	46·8	55·8
Ksara		104·2	50	e 20 32	PPP	—	—	55·8	62·8
Tashkent		118·9	24	—	—	i 27 11	{+ 5}	e 58·0	71·7

For Notes see next page.

NOTES TO DEC. 6d. 21h. 43m. 9s.

Additional readings :—
Port au Prince eNW = +3m.34s., iNE = +5m.34s., iNW = +5m.58s., iNE = +6m.24s.
Columbia eS = +8m.29s.
Little Rock iPEN = +5m.10s., iN = +5m.20s., iE = +5m.36s., iN = +10m.29s.
St. Louis epPN = +5m.40s., ePPN = +6m.4s., epPPN = +6m.12s., eE = +11m.6s.
Florissant eN = +12m.27s. and +15m.51s., eZ = +17m.9s.
Huancayo eP = +6m.41s., ePcP = +8m.34s., eS = +10m.36s., i = +11m.28s.
Chicago eS = +11m.3s.
Ottawa eE = +13m.9s.
Tucson P = +7m.2s., PP = +7m.36s., iPPP = +8m.2s.
Mount Wilson iZ = +7m.27s. and +9m.1s.
Pasadena iZ = +9m.3s.
Tashkent e = +33m.39s., +45m.33s., +47m.3s., and +53m.27s.
Long waves were also recorded at Scoresby Sund, Tiflis, Copenhagen, Stuttgart, Strasbourg, Uccle, De Bilt, Victoria, and Cheb.

Dec. 6d. Readings also at 1h. (Wellington), 2h. (Huancayo and Santiago), 4h. (Fresno and Philadelphia), 8h. (Karlsruhe and Barcelona), 11h. (Tacubaya), 12h. (Balboa Heights), 13h. (Apia), 17h. (Oak Ridge and Ottawa), 19h. (Ottawa, Andijan, Sverdlovsk, Tashkent, Agra, Almata, and Samarkand), 20h. (Santiago (3), Andijan, and Samarkand), 23h. (Pasadena, Mount Wilson, Sumoto, La Jolla, Riverside, and Tinemaha).

Dec. 7d. 9h. 30m. 51s. Epicentre 39°·0N. 40°·0E.

$A = +\cdot5969$, $B = +\cdot5009$, $C = +\cdot6268$; $\delta = +7$; $h = -1$;
$D = +\cdot643$, $E = -\cdot766$; $G = +\cdot480$, $H = +\cdot403$, $K = -\cdot779$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sotchi	4·5	358	e 1 9	− 2	e 1 59	− 6	—	—
Tiflis	4·5	52	e 1 8	− 3	i 2 18	+13	i 2·4	—
Piatigorsk	5·5	23	1 24	− 1	2 54	S*	—	—
Grozny	6·0	43	e 1 54		3 40		—	—
Ksara	6·1	212	e 1 55	P_g	3 40	S_g	—	—
				P_g	i 3 0	S*	—	—
Yalta	7·0	321	e 3 19	S	(e 3 19)	+11	—	—
Baku	7·7	77	e 3 0	S	(e 3 0)	−25	5·4	—
Moscow	16·8	356	e 2 53	−65	e 7 15	+10	10·6	12·0
Samarkand	20·8	80	e 4 36	− 9	—	—	—	—
Pulkovo	21·7	347	e 4 46	− 9	e 8 57	+ 6	e 11·6	13·6
Sverdlovsk	22·4	31	i 5. 1	− 1	e 9 1	− 3	—	12·5
Tashkent	22·4	75	e 5 5	+ 3	i 9 11	+ 7	e 16·4	18·6
Andijan	24·8	76	e 5 29	+ 4	e 9 47	+ 1	—	—

Additional readings :—
Sotchi e = +2m.39s.
Tiflis iPE = +1m.18s., eE = +1m.39s.
Ksara iS_g = +3m.36s.
Baku iS = +4m.41s.
Moscow e = +4m.25s.
Pulkovo e = +4m.53s.
Sverdlovsk L_g = +11·2m.
Long waves were also recorded at Belgrade, Helwan, Triest, De Bilt, Bucharest, Stuttgart, and Copenhagen.

Dec. 7d. 18h. 0m. 36s. Epicentre 14°·0N. 82°·0W. (as on December 6d.).

$A = +\cdot1351$, $B = -\cdot9613$, $C = +\cdot2404$; $\delta = +14$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		5·6	153	e 1 23	− 4	e 1 50	−43	i 2·4	2·4
Merida	E.	10·0	315	e 2 23	− 4	—	—	—	—
Port au Prince		10·3	63	e 0 49	?	i 3 23	−67	i 4·1	4·2
San Juan		15·8	72	e 3 51	+ 6	6 38	− 4	7·4	—
Tacubaya		17·3	290	i 3 52	−12	—	—	—	—
Philadelphia		26·5	13	—	—	i 10 43	+29	e 11·6	—
Huancayo		26·7	165	e 5 48	+ 5	10 41	+24	11·9	—
Chicago		28·2	350	—	—	e 11 0	+19	e 12·1	—
Tucson		32·0	310	e 6 34	+ 4	—	—	e 13·6	—
La Paz	N.	33·2	155	e 6 44	+ 4	—	—	19·4	22·6
Riverside	Z.	37·7	309	e 7 22	+ 3	—	—	—	—
Mount Wilson	Z.	38·3	309	e 7 26	+ 2	—	—	—	—
Pasadena		38·4	309	i 7 29	+ 4	—	—	e 21·8	—
Rio de Janiero	E.	52·8	133	—	—	e 19 54	SS	—	—
Sverdlovsk		102·9	19	—	—	e 38 14	SSS	47·4	56·1
Ksara		104·2	50	e 21 43	PPP	—	—	—	61·4
Tashkent		118·9	24	—	—	e 29 52	PS	e 56·0	72·2

Additional readings:—
Port au Prince iNE = +3m.44s., i = +4m.49s.
Huancayo PP = +6m.13s., S = +11m.6s.
Tucson P = +6m.41s., ePP = +7m.32s., PPP = +7m.45s.
Mount Wilson iZ = +7m.35s.
Tashkent e = +37m.30s.
Long waves were also recorded at Baku, Stuttgart, De Bilt, Copenhagen, Uccle, Bozeman, Berkeley, Seattle, Sitka, Scoresby Sund, and Tiflis.

Dec. 7d. Readings also at 0h. (Berkeley (2)), 2h. (Kobe, Nagoya, and Sumoto), 3h. (La Paz, Tinemaha, Mount Wilson, Pasadena, and Riverside), 4h. (Triest), 9h. (Tinemaha, Mount Wilson, Pasadena, and Riverside), 10h. (Tinemaha, Mount Wilson, Pasadena, and Riverside), 14h. (Tucson, Sitka, Mount Wilson, Riverside, Tinemaha, Sverdlovsk, Göttingen, Jena, and Nagoya), 16h. (Sumoto), 17h. (Branner and Little Rock), 19h. (Mount Wilson, Pasadena, Riverside, and Christchurch), 22h. (Apia and Berkeley).

Dec. 8d. 2h. 25m. 18s. Epicentre 14°·0N. 82°·0W. (as on 1937 December 7d.).

$A = +\cdot1351$, $B = -\cdot9613$, $C = +\cdot2404$; $\delta = +14$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		5·6	153	e 1 19	− 8	e 1 54	−39	i 2·3	2·5
Merida	N.	10·0	315	e 2 34	+ 7	—	—	—	—
Port au Prince		10·3	63	e 0 56	?	i 2 56	?	i 3·6	4·3
San Juan		15·8	72	e 4 20	+35	e 7 36	SSS	i 9·0	—
Tacubaya	N.	17·3	290	e 4 10	+ 6	—	—	—	—
Columbia		19·9	3	e 4 34	− 2	e 8 15	0	e 10·6	—
Little Rock		22·7	337	e 5 4	0	e 9 23	+14	—	—
St. Louis		25·6	345	i 5 32	0	e 10 1	+ 2	e 11·0	—
Florissant		25·8	345	e 5 33	− 1	e 17 48	?	—	—
Philadelphia		26·5	13	e 6 35	PP	e 10 21	+ 7	e 12·1	—
Huancayo		26·7	165	e 5 33	−10	e 10 10	− 7	12·5	—
Chicago		28·2	350	—	—	e 10 54	+13	e 12·2	—
Vermont		31·3	13	—	—	e 12 1	+30	e 16·5	—
Ottawa		31·7	9	—	—	e 11 42?	+ 5	15·7	—
Tucson		32·0	310	6 32	+ 2	e 11 52	+10	e 13·5	—
La Paz	Z.	33·2	155	i 6 42	+ 2	—	—	19·7	22·8
La Jolla		37·2	307	e 7 13	− 2	—	—	—	—
Riverside	Z.	37·7	309	i 7 20	+ 1	—	—	—	—
Mount Wilson	Z.	38·3	309	i 7 26	+ 2	—	—	—	—
Pasadena		38·4	309	i 7 26	+ 1	—	—	e 20·1	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Santa Barbara		39·6	308	e 7 30	− 5	—	—	—	—
Tinemaha	E.	39·6	312	e 7 38	+ 3	—	—	—	—
Bozeman		40·0	329	—	—	e 12 48	−56	e 18·2	—
Lick		42·2	312	e 8 0	+ 4	—	—	—	—
Rio de Janeiro	E.	52·8	133	—	—	e 19 42	SS	e 26·7	—
Berkeley	N.	42·8	312	—	—	e 19 12	?	—	—
Copenhagen		81·1	35	—	—	22 29	+ 1	34·7	—
Pulkovo		88·8	29	—	—	e 23 35	− 9	45·2	54·9
Sverdlovsk		102·9	19	—	—	e 24 32	[− 9]	42·7	—
Ksara		104·2	50	e 18 35	PP	e 26 58	PS	57·7	63·7
Tiflis	E.	106·0	39	—	—	e 30 36	PPS	e 47·7	—
Tashkent		118·9	24	—	—	e 25 54	[+ 8]	e 55·8	71·9

Additional readings :—
Port au Prince iSS = +3m.18s., i = +4m.51s.
San Juan ePP = +4m.46s., iS = +7m.44s.
Columbia eS = +8m.24s.
Little Rock iN = +5m.23s., eSN = +9m.28s., eE = +10m.3s. and +10m.30s.
St. Louis iEN = +5m.40s. and +6m.11s.
Florissant iN = +5m.36s., eZ = +19m.12s.
Huancayo iPP = +6m.15s., S = +10m.20s., iS = +10m.47s.
Chicago eS = +11m.3s.
Tucson iP = +6m.38s., iPPP = +7m.39s.
Mount Wilson eZ = +8m.16s. and +9m.0s.
Pulkovo e = +26m.57s.
Tiflis eE = +33m.48s.
Tashkent e = +29m.48s., +41m.39s., and +53m.6s.
Long waves were also recorded at Vladivostok, San Fernando, Paris, Uccle, Strasbourg, De Bilt, Stuttgart, Cheb, Scoresby Sund, Sitka, Moscow, and Baku.

Dec. 8d. 8h. 32m. 8s. Epicentre 22°·9N. 121°·5E.

Some damage at Taito and Karenko; rather strong at Kosyun, Takao, Giran, Taihoku, Tainan, and Arisan. Macroseismic radius greater than 300kms.

Epicentre 22°·9N., 121°·5E.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937, Tokyo pp. 63-65.

Macroseismic chart p.65.

$A = -\cdot4818$, $B = +\cdot7862$, $C = +\cdot3869$; $\delta = -7$; $h = +4$;
$D = +\cdot853$, $E = +\cdot522$; $G = -\cdot202$, $H = +\cdot330$, $K = -\cdot922$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taito	0·3	245	0 5a	P_g	0 11	S_g	—	—
Arisan	0·9	314	0 17k	− 3	0 28	S_g	—	—
Karenko	1·1	5	0 18	− 4	0 33	S_g	—	—
Kosyun	1·1	218	0 19	− 3	0 36	− 3	—	—
Tainan	1·2	275	0 21k	− 3	0 40	− 1	—	—
Takao	1·2	256	0 21	− 3	0 36	− 5	—	—
Taityu	1·5	329	0 25k	− 3	0 45	− 4	—	—
Giran	1·9	7	0 40	P_g	1 3	+ 4	—	—
Hokoto	1·9	289	0 27	− 7	0 50	− 9	—	—
Taihoku	2·1	0	e 0 40	+ 3	1 8	+ 4	—	1·3
Isigakizima	2·8	60	0 44k	− 3	1 20	− 2	—	—
Miyakozima	3·9	61	1 2	0	1 49	− 1	—	—
Naha	6·5	59	1 51	P*	—	—	—	—
Hong Kong	6·9	265	1 42	− 3	3 2	− 3	3·3	3·5
Manila	8·3	183	1 2 6k	+ 2	4 27	S_g	—	—
Zi-ka-wei z.	8·3	356	e 2 1	− 3	3 28	−12	—	—
Nake	9·0	51	2 11	− 2	3 49	− 9	—	—
Yakusima	11·0	45	2 7	−35	4 48	+ 1	—	—
Tomie	11·6	32	2 48	− 2	5 20	+19	—	—
Kagosima	11·8	41	2 59	+ 6	6 30	L	(6·5)	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki		12·3	35	3 1	+ 2	5 35	+17	—	—
Unzendake		12·5	38	3 5	+ 3	5 48	SS	—	—
Miyazaki		12·6	43	3 5	+ 2	5 37	+11	—	—
Kumamoto		12·8	38	3 7	+ 1	6 32	L	(6·5)	—
Hukuoka		13·2	33	3 13	+ 2	5 44	+ 4	—	12·2
Hukuoka B		13·2	33	3 17	+ 6	5 47	+ 7	—	8·9
Izuka		13·4	35	3 14	0	—	—	—	—
Ooita		13·6	39	3 25	+ 8	5 30	−20	—	—
Husan		13·8	27	3 19	0	5 55	+ 1	7·4	—
Phu-Lien	E.	14·0	264	e 3 18	− 4	i 6 22	SSS	7·4	9·2
Simidu		14·1	43	3 39	PP	6 55	SSS	—	—
Taikyu		14·3	24	3 28	+ 2	6 16	+10	—	10·1
Syuhurei		14·4	22	3 35	+ 8	7 57	L	(8·0)	—
Matuyama		14·7	40	3 51	PPP	6 46	SSS	—	—
Hirosima		14·9	38	3 41	+ 7	6 26	+ 6	—	—
Keti		15·0	42	3 38	+ 3	6 42	SS	—	—
Hamada		15·1	36	3 45	+ 9	6 18	− 7	—	—
Muroto		15·2	45	3 50	+12	—	—	—	—
Zinsen		15·2	16	i 3 37	− 1	i 6 34	+ 6	i 8·2	10·4
Keizyo		15·4	17	3 40	0	6 46	SS	8·5	10·4
Tadotu		15·6	41	4 5	PPP	7 37	L	(7·6)	—
Okayama		16·0	40	3 39	− 9	7 21	SSS	—	—
Siomisaki		16·4	47	4 0	+ 7	7 13	SS	—	—
Sumoto		16·4	43	3 57	+ 4	7 19	SS	11·1	12·4
Heizyo		16·5	12	i 3 59	+ 5	i 7 6	+ 8	8·7	11·1
Wakayama		16·5	44	4 2k	+ 8	7 20	PP	—	—
Kobe	E.	16·8	43	e 4 6	+ 8	7 31	SS	e 10·9	14·5
	N.	16·8	43	e 4 5	+ 7	7 39	SSS	e 9·7	12·7
	Z.	16·8	43	e 4 4	+ 6	e 7 31	SS	e 9·6	14·6
Osaka		17·0	43	4 23	PPP	7 28	SS	—	—
Osaka B		17·0	43	4 9	+ 8	7 43	SSS	—	—
Toyooka	E.	17·1	40	e 4 29	PPP	7 50	SSS	9·7	12·4
	N.	17·1	40	e 4 26	PPP	7 49	SSS	9·1	13·1
	Z.	17·1	40	4 18	PP	—	—	9·6	—
Yagi		17·1	44	4 9k	+ 7	7 43	SSS	—	—
Kyoto		17·3	43	4 11	+ 7	7 46	SSS	—	—
Miyadu		17·3	40	4 3	− 1	—	—	—	—
Kameyama		17·7	44	4 13	+ 3	7 48	SS	—	—
Tu		17·7	45	4 8	− 2	7 52	SS	—	—
Hikone		17·8	43	4 24	PP	—	—	—	—
Gihu		18·2	45	4 18k	+ 2	7 58	SS	—	—
Nagoya		18·2	45	e 4 20	+ 4	7 58	SS	—	8·1
Hamamatu		18·4	47	4 24k	+ 6	7 57	SS	—	—
Omaesaki		18·7	47	4 25	+ 3	8 10	SS	—	—
Kanazawa		18·9	40	4 37	+13	8 6	+13	—	—
Iida		19·0	44	4 29	+ 3	—	—	—	—
Hatidyozima		19·1	52	4 32	+ 5	8 10	+13	—	—
Titisima		19·2	75	4 30	+ 2	—	—	—	—
Husiki		19·3	42	4 32	+ 3	8 7	+ 5	—	—
Toyama		19·3	42	4 34	+ 5	8 7	+ 5	—	—
Numadu		19·4	46	4 34	+ 4	8 19	+15	—	—
Ito		19·5	46	4 39a	+ 8	7 58	− 8	—	—
Kohu		e19·5	45	4 35	+ 4	8 29	SS	—	—
Matumoto		19·5	44	4 34	+ 3	8 21	+15	—	—
Misima		19·5	46	4 32k	+ 1	8 20	+14	—	—
Hunatu		19·6	46	4 33	+ 1	8 26	+18	—	—
Wazima		19·6	39	4 35k	+ 3	8 18	+10	—	—
Nagano		19·9	42	4 40	+ 4	8 27	+12	—	—
Oiwake		19·9	43	4 37	+ 1	8 25	+10	—	—
Palau		19·9	142	4 37	+ 1	8 21	+ 6	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mera		20·0	49	4 54	PP	8 24	+ 7	—	—
Yokohama		20·1	48	4 51	PP	8 35	+16	—	—
Maebasi		20·3	43	4 49	+ 9	8 47	SS	—	—
Kumagaya		20·4	44	4 40	− 1	8 43	+18	—	—
Tokyo C.M.Obs.		20·4	46	4 45	+ 4	8 38	+13	—	—
Tukubasan		20·9	45	4 45	− 1	8 37	+ 2	—	—
Kakioka		21·0	45	4 41	− 6	8 37	0	—	—
Tyosi		21·1	50	4 37	−11	8 40	+ 1	—	—
Mito		21·2	45	4 49	0	—	—	—	—
Hukusima		22·0	44	4 56	− 2	—	—	—	—
Akita		23·0	41	5 14	+ 7	—	—	—	—
Mizusawa		23·3	42	5 9	− 1	9 21	+ 1	13·7	—
Morioka		23·6	42	5 13	0	9 34	+ 9	—	—
Miyako		24·1	42	5 18	0	9 38	+ 4	—	—
Hatinohe		24·4	40	5 8	−13	9 38	− 1	—	—
Sapporo		26·0	34	5 39	+ 3	11 10	SS	—	—
Amboina		27·2	165	i 5 47	0	—	—	—	—
Medan		29·3	232	i 6 10					
Calcutta	N.	30·6	276	i 6 22	+ 4	i 11 2	+ 3	11·9	—
Irkutsk		32·2	340	6 29	− 3	11 37	− 8	16·9	20·9
Batavia		32·3	208	i 6 33	0	11 46	0	15·9	—
Agra	E.	39·5	285	7 31	− 3	i 13 30	− 7	18·8	25·8
Almata		41·9	311	7 58	+ 4	14 16	+ 3	—	—
Semipalatinsk		42·2	322	7 52	− 4	—	—	—	—
Colombo		43·1	254	7 52?	−12	12 52?	?	22·9	27·9
Kodaikanal	E.	43·9	261	i 8 11	+ 1	i 14 41	− 1	20·6	31·4
Andijan		44·8	305	8 17	0	14 56	+ 1	24·9	—
Bombay		45·5	274	e 8 22	− 1	i 15 3	− 2	22·1	31·3
Tashkent		47·2	306	i 8 32	− 4	i 15 18	−11	24·9	31·9
Perth		54·8	186	9 35	+ 1	17 5	− 9	25·3	—
Brisbane		58·6	147	i 10 4	+ 3	i 18 4	0	e 24·9	36·8
Baku		61·8	305	i 10 21	− 1	i 18 36	−10	30·9	38·1
Riverview		63·1	152	e 10 31	− 1	19 22	+20	e 25·8	32·9
Sydney		63·1	152	—	—	e 18 53	− 9	e 32·7	40·1
Melbourne		64·3	160	e 10 40	+ 1	e 19 25	+ 8	e 36·8	—
Grozny		64·5	308	10 41	0	19 21	+ 2	—	—
Tiflis	E.	65·5	307	e 10 41	− 6	19 24	− 8	e 28·9	42·6
Piatigorsk		66·3	310	10 52	0	19 40	− 2	—	—
Moscow		68·0	323	e 10 57	− 6	i 19 49	−13	38·0	43·6
Sotchi		68·8	310	e 10 58	−10	—	—	—	—
College		69·8	27	e 11 4	−10	e 20 12	−11	e 27·1	—
Pulkovo		71·1	328	e 11 21	− 1	20 30	− 8	28·4	44·8
Theodosia		71·5	312	11 24	0	20 39	− 4	39·9	—
Yalta		72·2	312	11 26	− 3	20 46	− 5	37·9	—
Sebastopol		72·9	312	11 25	− 8	e 20 42	−17	—	—
Honolulu		73·8	73	e 11 34	− 4	e 20 46	−23	e 30·3	—
Ksara		74·2	300	i 11 35	− 5	e 21 14	0	—	—
Upsala		77·2	330	e 11 54	− 3	e 21 36	−11	e 34·9	41·3
Sitka		77·9	33	12 15	+14	22 21	+27	e 32·8	—
Bucharest		78·0	313	i 12 4	+ 2	i 21 53	− 2	—	55·1
Helwan		79·1	297	i 12 10	+ 2	22 18	+11	—	54·1
Wellington		80·7	142	—	—	e 21 52?	−32	—	35·9
Christchurch		81·1	145	i 12 18a	0	22 22	− 6	41·2	—
Budapest		81·4	317	e 12 19	− 1	22 28	− 3	43·4	49·4
Copenhagen		81·5	327	12 17	− 4	22 25	− 7	38·9	—
Belgrade		81·6	314	i 12 21a	0	e 22 24	− 9	e 44·8	—
Stara Dala		81·8	318	e 12 20	− 2	e 22 31	− 4	e 40·9	54·4
Bergen		82·3	334	—	—	22 33	− 7	—	46·7
Vienna		82·7	319	e 12 25	− 2	23 6	+22	e 48·9	55·4
Prague		83·0	322	e 12 29	+ 1	e 22 42	− 5	e 38·9	46·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Scoresby Sund		83·4	349	i 12 30a	0	22 39	−12	39·9	—
Graz		83·8	319	e 12 26	− 6	e 22 46	− 9	e 43·9	53·9
Hamburg		83·8	327	e 12 30a	− 2	e 22 52	− 3	e 44·2	51·9
Zagreb		84·0	318	e 12 34	0	e 22 52	− 5	e 45·4	—
Cheb		84·2	323	e 12 35	+ 1	e 22 53	− 6	e 43·9	55·2
Jena		84·2	323	i 12 34	0	e 22 52	− 7	e 39·9	46·4
Göttingen		84·8	325	e 12 36	− 1	e 22 54	−11	e 42·9	54·9
Triest		85·5	318	12 41a	0	23 8	− 4	e 40·9	45·4
Stuttgart		86·6	322	i 12 48k	+ 2	e 23 22	− 1	e 43·9	56·8
De Bilt		87·0	327	—	—	i 23 26	− 1	e 46·9	48·8
Karlsruhe		87·0	323	e 11 52	−56	—	—	e 43·9	55·9
Aberdeen		87·3	333	i 20 10	?	i 23 43	+14	43·3	56·3
Strasbourg		87·6	323	i 12 52	+ 1	e 23 26	− 6	—	57·1
Zurich		87·7	322	e 12 50	− 2	e 23 37	+ 4	—	—
Basle		88·2	321	e 12 42	−12	e 23 48	+10	—	—
Uccle		88·2	326	12 53	− 1	i 23 16	[− 5]	—	64·0
Victoria		88·4	37	12 52	− 3	23 36	− 4	36·9	—
Durham	N.	88·6	331	—	—	i 23 36	− 6	—	50·9
Edinburgh		88·6	333	e 16 32	PP	i 23 35	− 7	40·9	51·0
Neuchatel		88·9	321	e 12 54	− 4	—	—	—	—
Stonyhurst		89·6	331	i 13 4	+ 3	i 23 41	−10	e 42·9	51·3
Kew		90·1	328	i 13 1	− 2	—	—	e 42·9	58·3
Bidston		90·2	331	i 13 15	+11	—	—	—	58·6
Paris		90·3	325	e 13 4	0	e 23 39	[+ 5]	36·9	48·9
Oxford		90·4	329	—	—	e 23 50	− 8	—	58·7
Rathfarnham Castle		91·7	332	e 12 53	−17	i 23 57	−13	43·4	58·9
Marseilles		91·8	319	—	—	e 24 15	+ 4	e 45·9	56·9
Jersey		92·5	327	e 10 52?	?	e 24 22	+ 5	e 47·3	51·6
Ukiah		93·6	45	e 13 21	+ 2	e 24 8	[+15]	—	—
Berkeley		94·9	46	e 13 28	+ 3	i 24 38	+ 1	—	—
Butte		95·7	34	—	—	e 23 58	[− 7]	e 49·7	—
Ivigtut		95·8	355	—	—	24 12	[+ 6]	45·9	—
Tortosa	N.	96·2	319	—	—	e 29 7	?	e 44·9	63·5
Bozeman		96·7	34	—	—	e 23 58	[−12]	e 41·2	—
Algiers		97·0	314	e 13 34	− 1	e 26 52?	PS	—	62·9
Pasadena		99·8	47	—	—	e 32 10	SS	e 40·5	—
Mount Wilson	Z.	99·8	47	e 16 48	?	e 17 51	PP	—	—
Riverside	Z.	100·4	47	e 13 50	0	e 16 51	?	—	—
Almeria		100·5	318	e 17 54	PP	—	—	e 55·7	73·8
Granada		101·0	318	e 13 45	− 8	—	—	54·9	—
Tucson		105·8	44	18 38	PP	e 33 52	SS	e 45·2	—
Averroes		105·9	317	e 18 38	PP	—	—	e 57·4	68·9
Seven Falls		109·4	8	—	—	e 26 46	S	e 46·9	—
Chicago		110·1	23	e 18 52	PP	e 25 52	{−14}	e 48·0	—
Ottawa		110·3	12	e 19 22	PP	e 28 28	PS	50·9	—
Toronto		111·0	16	—	—	e 28 52?	PS	47·9	—
Vermont		111·6	11	—	—	e 28 57	PS	e 48·7	—
Florissant		111·7	26	e 19 19	PP	—	—	e 69·0	77·0
St. Louis	N.	111·9	26	—	—	e 35 13	SS	e 40·4	—
Cape Town		112·8	242	—	—	i 29 11	PS	e 55·2	66·8
Weston		114·0	10	—	—	e 36 57	SS	e 49·5	—
Philadelphia		115·6	14	e 19 46	PP	e 35 36	SS	e 51·5	—
San Juan		138·3	11	e 21 59	PP	i 40 45	SS	e 55·5	—
Huancayo		160·7	59	e 19 58	[− 3]	e 31 37	{+21}	e 71·6	—
Rio de Janeiro	E.	165·9	266	e 20 10	[+ 4]	e 31 52	{+10}	—	—
La Paz		168·9	56	20 7	[− 1]	26 57	[−14]	82·5	101·4

Additional readings :—
Taihoku ePN = +43s.
Hong Kong ? = +2m.12s.
Zi-ka-wei iZ = +2m.20s., +2m.44s., and +2m.57s., iN = +3m.44s., +4m.30s., +5m.12s., +6m.42s., +7m.16s., +9m.28s., +11m.12s., +12m.20s., and +13m.48s.
Phu-Lien PPPE = +3m.34s., iE = +4m.5s.

Continued on next page.

Sumoto PEN = +4m.0s., SN = +7m.23s., eZ = +8m.47s.
Calcutta ePPPN = +7m.25s., iN = +10m.12s., iSSN = +22m.47s.
Batavia iN = +7m.32s.
Agra PPPE = +9m.15s., SSSE = +16m.34s.
Almata e = +9m.40s.
Kodaikanal PPE = +9m.32s., PPPE = +10m.8s., SSE = +17m.18s., SSSE = +18m.12s.
Andijan e = +9m.26s.
Bombay ePP = +10m.21s., SS = +18m.16s.
Perth PP = +11m.50s., i = +15m.39s., P_cS = +15m.50s., PS = +17m.20s., SS = +21m.25s.
Brisbane iPPN = +12m.22s., e?N = +13m.52s., eSSN = +21m.46s., eSSS?N = +23m.34s.
Sydney e = +19m.36s., i = +21m.24s.
Melbourne e = +26m.7s. and +30m.2s.
Tiflis iPE = +10m.47s., SKKSE = +20m.17s., eE = +23m.2s., eSSE = +24m.12s., eE = +27m.3s.
Moscow L_q = +35·4m.
College eP = +11m.12s., ePP = +13m.50s., eS = +20m.18s., eSS = +24m.35s.
Honolulu eP = +11m.51s., PP = +14m.29s., ePPP = +16m.2s., iS = +21m.27s., eS_cS = +21m.40s., eSS = +26m.3s., SSS = +28m.33s.
Ksara ePP = +14m.25s., ePS = +21m.53s.
Upsala eSE = +21m.39s., eN = +21m.53s., eE = +21m.57s.
Sitka P = +12m.18s., S_cS = +22m.35s., SS = +27m.37s.
Bucharest PP = +15m.8s., SS = +27m.2s.
Helwan PP = +15m.17s., PPP = +17m.7s., e = +22m.0s.
Christchurch PP = +15m.25s., iPSE = +23m.0s., SS = +27m.43s., L_qE = +35m.12s.
Budapest P_cPN = +12m.32s., iE = +15m.31s. and +15m.41s., SE = +22m.15s., S_cSE = +22m.41s., iE = +23m.9s.
Copenhagen +15m.22s., eN = +22m.40s. and +28m.10s.
Belgrade iZ = +15m.26s., eNW = +27m.56s. and +31m.26s.
Vienna PKP = +15m.38s., PS = +28m.22s., PPS = +30m.4s., PSS = +44m.15s.
Prague e = +28m.22s. and +31m.52s.?
Scoresby Sund PP = +15m.44s., S = +23m.3s., PS = +24m.4s., e = +35m.4s.
Hamburg ePPZ = +15m.32s., SSSZ = +34m.7s., eE = +37m.58s. and +43m.22s.
Zagreb eEZ = +15m.51s.
Jena e = +15m.40s.
Triest PP = +17m.53s., SS = +28m.35s., eSSS = +32m.12s.
Stuttgart P_cP = +12m.55s., e = +15m.4s., ePPEZ = +16m.6s., eEZ = +22m.23s., eS = +23m.35s., ePS = +24m.10s., eSS = +28m.58s., eSSS = +33m.22s.
Aberdeen e = +24m.31s., iS = +29m.31s., e = +33m.45s., i = +36m.12s.
Strasbourg iZ = +15m.2s., iSE = +23m.47s., PSE = +24m.37s., PPSE = +25m.15s.
Zurich ePP = +16m.15s.
Basle ePP = +16m.19s.
Uccle PPEZ = +16m.18s., PSN = +24m.37s., SSN = +29m.23s., i = +30m.0s.
Victoria SSE = +29m.7s.
Edinburgh i = +23m.55s.
Stonyhurst i = +16m.41s.
Kew iN = +13m.16s., iPPZ = +16m.38s.
Paris PP = +16m.39s.
Rathfarnham Castle i = +15m.37s. and +25m.32s.
Jersey eSKS = +22m.52s., eSS = +30m.37s., e = +42m.22s.
Ukiah eS_cS = +24m.28s.
Butte eS = +24m.32s. and +24m.58s., eSS = +31m.19s.
Bozeman eSKS = +24m.10s., eSS = +31m.4s.
Algiers e = +17m.21s.
Tucson ePS = +27m.45s., ePPS = +28m.19s., eSSS = +37m.35s.
Seven Falls e = +34m.16s.
San Juan ePP = +22m.31s., iSKSP = +32m.34s.
Huancayo ePKP = +20m.6s., PP = +25m.8s., ePPP = +28m.18s., SS = +44m.50s.
La Paz iPKPZ? = +20m.12s., iPPZ = +25m.10s., iPPPZ = +28m.57s., iZ = +29m.34s.
Long waves were also recorded at Besançon, Columbia, Toledo, Malaga, San Fernando, Williamstown, Barcelona, Seattle, and La Plata.

Dec. 8d. 16h. 45m. 31s. Epicentre 8°·5S. 156°·0E.

A = −·9037, B = +·4023, C = −·1468; δ = +7; h = +7;
D = +·407, E = +·914; G = +·134, H = −·060, K = −·989.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Brisbane	E.	19·1	188	e 4 35	+ 8	i 8 5	+ 8	—	11·8
	N.	19·1	188	i 4 29	+ 2	e 8 17	+20	—	12·6
Riverview	E.	25·6	189	e 5 35	+ 3	i 10 23	+24	e 14·0	15·6
	N.	25·6	189	e 5 39	+ 7	i 10 27	+28	e 14·0	15·8
Sydney		25·6	189	—	—	i 10 13	+14	—	14·8
Melbourne		30·9	197	—	—	i 11 33	+ 9	15·5	17·5
Christchurch		37·8	160	e 7 23	+ 3	i 13 14	+ 3	19·0	—
Manila		41·6	303	9 25	PP	14 15	+ 7	—	—
Perth		44·0	231	14 59	S	(14 59)	+16	23·6	—
Hong Kong		51·2	307	16 31	S	(16 31)	+ 6	—	27·0
Honolulu		54·1	56	e 11 18	PP	—	—	25·5	—
Calcutta	N.	73·0	297	e 17 9	?	e 21 9	+ 9	—	—
Irkutsk		74·9	330	—	—	e 21 29?	+ 7	e 36·5	—
Pasadena		91·3	56	i 13 8	− 1	—	—	—	—
Mount Wilson		91·4	56	i 13 9	0	—	—	—	—
Tinemaha		91·7	53	i 13 10	0	—	—	—	—
Haiwee		91·8	54	e 13 11	0	—	—	—	—
Riverside	Z.	91·9	56	i 13 11	0	—	—	—	—
Tashkent		93·1	311	e 13 18	+ 1	i 23 45	[+ 5]	e 47·1	54·2
Tucson		97·1	58	e 12 49	−46	—	—	—	—
Sverdlovsk		100·0	327	e 17 56	PP	e 24 28	[+ 1]	45·5	—
Tiflis	E.	111·4	312	—	—	e 25 35	[+17]	e 68·5	70·7
Ksara		119·4	304	e 20 22	PP	e 35 44	SS	—	80·0

Additional readings:—
Sydney e = +13m.58s.
Melbourne e = +13m.36s.
Christchurch P_cPNZ = +9m.0s., iP_cSZ = +13m.19s., SS = +15m.41s., e = +16m.57s., L_qE = +16·1m.
Perth PP = +15m.37s., PPP = +15m.48s., PPPP = +15m.58s., P_cP = +18m.5s., S = +20m.16s., SS = +21m.31s., SSS = +21m.59s., SSSS = +22m.18s.
Irkutsk e = +25m.29s.?
Mount Wilson eZ = +17m.59s.
Riverside eZ = +17m.58s.
Tashkent e = +17m.35s. and +23m.3s., ePS = +25m.0s.
Sverdlovsk e = +25m.22s.
Tiflis eE = +28m.50s.
Long waves were also recorded at Kobe, Edinburgh, Uccle, De Bilt, Copenhagen, Moscow, and Baku.

Dec. 8d. 20h. 38m. 43s. Epicentre 22°·9N. 121°·5E. (as at 8h.).

A = −·4818, B = +·7862, C = +·3869; δ = −7; h = +4.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		2·1	0	e 0 39	+ 2	1 10	+ 6	—	1·9
Hong Kong		6·9	265	1 46	+ 1	2 57	− 8	—	4·7
Manila		8·3	183	i 2 11a	+ 7	4 13	S*	—	—
Hukuoka B		13·2	33	e 3 21	+10	e 5 51	+11	—	—
Husan		13·8	27	e 3 22	+ 3	—	—	7·4	—
Phu-Lien		14·0	264	e 3 17	− 5	e 6 20	SS	7·5	9·1
Taikyu		14·3	24	—	—	e 6 11	+ 5	9·2	—
Zinsen		15·2	16	e 3 37	− 1	—	—	e 8·2	—
Kobe	E.	16·8	43	—	—	e 6 39	−26	—	14·8
Nagoya		18·2	45	e 4 5	−11	—	—	—	—
Mizusawa	E.	23·3	42	5 12	+ 2	—	—	—	—
Medan	E.	29·3	252	e 6 14	+ 3	e 10 27	−32	—	—
Calcutta	N.	30·6	276	e 6 21	+ 3	i 12 9	+49	i 16·9	23·1
Irkutsk		32·2	340	e 6 17?	−15	e 11 17?	−28	16·3	18·1
Agra	E.	39·5	285	7 30	− 4	13 41	+ 4	—	25·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Semipalatinsk		42·2	322	7 51	− 5	—	—	—	—
Frunse		43·5	308	8 14	+ 7	—	—	25·6	—
Andijan		44·8	305	8 18	+ 1	—	—	23·3	—
Bombay		45·5	274	e 8 21	− 2	e 15 7	+ 2	—	—
Tashkent		47·2	306	e 7 41	−55	i 15 12	−17	e 24·4	31·3
Samarkand		48·8	303	e 8 44	− 5	—	—	—	—
Sverdlovsk		55·2	324	e 9 30	− 7	17 17	− 3	34·6	—
Baku		61·8	305	e 10 22	− 1	e 18 51	+ 5	32·3	42·5
Grozny		64·5	308	10 43	+ 2	—	—	—	—
Tiflis	E.	65·5	307	e 10 43	− 4	e 19 41	+ 9	e 31·9	43·4
Moscow		68·0	323	e 10 59	− 4	e 19 52	−10	34·8	44·2
Pulkovo		71·1	328	11 19	− 3	20 32	− 6	e 34·8	42·8
Ksara		74·2	300	i 11 38	− 2	—	—	—	50·3
Bucharest		78·0	313	—	—	e 21 59	+ 4	44·3	—
Copenhagen		81·5	327	—	—	22 35	+ 3	40·3	—
Triest		85·5	318	—	—	e 21 23	?	e 42·3	47·9
Stuttgart		86·6	322	e 12 49	+ 3	e 29 17	SS	e 46·3	56·7
De Bilt		87·0	327	i 12 46	− 2	—	—	e 44·3	48·4
Uccle		88·2	326	—	—	e 23 39	+ 1	e 46·3	—
Oxford		90·4	329	13 5	+ 1	—	—	e 43·0	58·6

Additional readings :—
Phu-Lien SSN = +6m.36s.
Calcutta iN = +10m.29s., iSSN = +14m.16s., iN = +15m.39s.
Agra PPPE = +9m.14s., SSE = +16m.29s.
Tashkent i = +7m.52s. and +8m.16s.
Sverdlovsk L_g = +28·3m.
Tiflis eE = +23m.45s.
Ksara ePP = +14m.39s., ePS = +22m.33s.
Triest e = +27m.41s.
Stuttgart ePS = +24m.17s.
Uccle e = +29m.48s.
Long waves were also recorded at other European stations and Scoresby Sund.

Dec. 8d. Readings also at 0h. (Brisbane and Nagoya), 1h. (Christchurch), 6h. (San Javier), 8h. (Andijan and Malabar), 10h. (Taihoku, Sverdlovsk, Hong Kong, Irkutsk, and Phu-Lien), 13h. (Amboina), 16h. (Andijan), 18h. (Montezuma), 23h. (Vladivostok, Berkeley, Tashkent, Sverdlovsk, Calcutta, Manila, Hong Kong, Phu-Lien, and Irkutsk).

Dec. 9d. Readings at 0h. (Hong Kong, Baku, Pulkovo, Moscow, Tiflis, Ksara, Copenhagen, De Bilt, Stuttgart, Uccle, Frunse, Samarkand, and near Andijan), 1h. (near Samarkand), 2h. (Baku), 3h. (Irkutsk, Vladivostok, Hong Kong, Sverdlovsk (2), Andijan, Tashkent (2), and Copenhagen), 5h. (Andijan), 8h. (near Medan), 9h. (San Juan and Tacubaya), 10h. (near Samarkand), 11h. (Zurich), 12h. (near Santiago), 14h. (Merida, Oaxaca, Tacubaya, and near Nagoya), 16h. (Ksara and Tiflis), 18h. (Santiago (3), Frunse, and near Andijan), 19h. (Hamburg and Santiago (2)), 22h. (near Calcutta), 23h. (Hong Kong, Vladivostok, Irkutsk, Tashkent, and Sverdlovsk).

Dec. 10d. 13h. 28m. 51s. Epicentre 35°·8N. 142°·0E. (as on 1937 Dec. 6d.).

A = −·6406, B = +·5005, C = +·5823 ; $\delta = -6$; $h = 0$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	E.	3·4	348	e 0 59	+ 4	1 38	+ 1	—	—
	N.	3·4	348	0 57	+ 2	1 41	+ 4	—	—
Nagoya		4·1	261	e 1 11	+ 6	2 35	+40	—	2·6
Kobe	E.	5·7	261	e 1 28	0	2 45	+10	—	4·4
	N.	5·7	261	e 1 25	− 3	2 37	+ 2	—	5·4
	Z.	5·7	261	e 1 27	− 1	e 2 42	+ 7	—	4·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Toyooka	E.	5·8	270	1 48	P*	3 16	S_g	—	6·7
	N.	5·8	270	1 50	P_g	3 17	S_g	—	7·0
	Z.	5·8	270	1 46	P*	e 3 24	S_g	—	—
Sumoto		6·0	258	e 1 32	0	3 18	S_g	4·0	4·8
Hukuoka		9·8	261	—	—	4 39	S*	5·3	—
Hukuoka B		9·8	261	e 2 28	+ 4	e 4 27	+10	—	—
Husan		10·6	270	2 37	+ 1	5 30	L	(5·5)	—
Taikyu		10·9	274	2 42	+ 2	6 14	?	—	—
Keizyo		12·2	283	e 5 17	S	(e 5 17)	+ 1	(e 7·6)	10·1
Zinsen		12·5	282	e 3 6	+ 4	—	—	e 7·3	—
Zi-ka-wei	Z.	17·8	260	e 4 7	− 4	7 35	+ 7	10·7	12·3
Hong Kong		27·7	249	6 30	PP	10 31	− 2	13·1	19·4
Manila		28·3	228	6 48	PP	i 11. 24	+41	—	24·4
Phu-Lien		34·3	255	6 9?	−41	—	—	—	23·4
Semipalatinsk		46·1	309	e 8 26	− 2	—	—	—	—
Calcutta	N.	48·1	270	e 8 45	+ 2	i 15 45	+ 3	e 23·2	30·2
Medan		51·2	242	—	—	e 16 27	+ 2	e 30·1	—
Frunse		51·4	300	e 9 9	0	e 16 20	− 8	—	—
Batavia		53·2	226	—	—	i 16 52	0	—	—
Andijan		53·6	298	9 31	+ 6	e 17 3	+ 5	29·2	—
Agra	E.	54·4	280	9 20	−11	16 58	−11	—	—
Sverdlovsk		56·4	320	i 9 49	+ 4	i 17 41	+ 5	28·1	39·2
Samarkand		57·8	298	9 46	− 9	e 17 26	−28	—	—
Bombay		62·5	274	e 10 29	+ 1	18 58	+ 4	—	42·5
Colombo		63·5	259	19 13	S	(19 13)	+ 6	34·2	43·3
Brisbane	N.	63·8	168	e 13 21	PP	(e 19 9)	− 2	e 19·2	—
Moscow		68·5	324	e 11 6	0	e 20 8	0	35·6	45·0
Baku		69·3	305	e 11 16	+ 5	e 20 25	+ 8	35·2	49·8
Pulkovo		69·5	330	e 11 13	+ 1	e 20 17	− 3	36·6	46·9
Grozny		70·5	310	e 11 37	+19	—	—	—	—
Tiflis	E.	72·0	309	e 11 30	+ 2	e 20 50	+ 1	e 36·1	47·3
Scoresby Sund		73·4	355	—	—	21 15	+10	43·2	—
Copenhagen		79·2	334	—	—	22 12	+ 4	41·2	—
Bucharest		81·3	319	—	—	22 33	+ 3	45·2	46·2
Ksara		82·3	305	i 12 25a	0	i 22 49	+ 9	—	—
Wellington		82·4	156	—	—	e 22 9?	−32	42·2	—
Cheb		83·6	330	e 23 9?	S	(e 23 9?)	+16	e 46·2	52·2
Tucson		83·9	54	e 12 37	+ 4	e 28 25	SS	e 49·5	—
De Bilt	E.	84·7	335	—	—	e 23 10	+ 6	e 44·2	53·0
Stuttgart		85·9	331	e 12 42	− 1	e 23 9	[+ 2]	e 46·2	56·0
Uccle		86·1	335	—	—	e 23 9	[+ 1]	e 45·2	—
Triest		86·4	327	—	—	e 23 3	[− 7]	e 44·3	48·6
Strasbourg		86·6	332	—	—	e 23 9?	[− 2]	e 47·2	56·7
Oxford		87·1	338	—	—	i 23 30	+ 2	e 47·6	55·2
Helwan		87·7	306	e 12 51	− 1	e 23 17	[− 1]	—	—
La Paz	N.	147·0	62	20 1	[+18]	—	—	—	—

Additional readings :—
Zi-ka-wei iZ = +5m.47s. and +8m.1s.
Hong Kong SS? = +11m.40s.
Manila SEN = +13m.29s.
Calcutta ePPN = +10m.29s., eSSN = +18m.57s., eSSSN = +20m.12s.
Agra PPE = +11m.27s., SSE = +20m.38s.
Bombay ePPE = +12m.49s., eE = +19m.53s.
Ksara PS = +23m.39s., SS = +28m.35s.
Cheb eS? = +32m.9s.?
Tucson eP = +12m.57s.
Stuttgart ePS = +24m.22s.
Helwan e = +17m.51s.
Long waves were also recorded at Williamstown, Philadelphia, Hyderabad, Huancayo, and other European stations.

Dec. 10d. 18h. 3m. 46s. Epicentre 44°·3N. 10°·8E.

Felt force VII at Pavullo (Modena); Epicentre 44°20′N. 10°45′E.

Notable earthquakes, Bulletin of the Seismological Society of Italy, vol. XXXVI (1938-XVI), N. 1-2, p.62.

Macroseismic radius about 100kms., area 30,000 sq. kms.

P. Caloi.

"Attivita sismica i Italia nel decennio 1930-1939. Commissione Italiana di Studio per i problemi del soccorso alle popolazoni, vol. IX, Fclice le Monnier-Firenze, 1942." Isoseismic chart, fig. 67.

$A = +\cdot7053$, $B = +\cdot1345$, $C = +\cdot6960$; $\delta = -5$; $h = -3$;
$D = +\cdot187$, $E = -\cdot982$; $G = +\cdot684$, $H = +\cdot130$, $K = -\cdot718$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Prato	0·5	153	i 0 14	0	—	—	—	—
Livorno	0·8	205	0 18	0	—	—	—	—
Padova	1·3	35	e 0 28	+ 3	0 42	− 2	—	—
Triest	2·5	57	0 41	− 2	1 25	S_g	—	—
Chur	2·7	341	e 0 47	+ 2	e 1 30	S_g	—	—
Zurich	3·4	334	e 0 56	+ 1	e 1 37	0	—	—
Ravensburg	3·6	345	e 1 7	P*	e 1 37	− 5	—	—
Neuchatel	3·8	316	e 1 1	0	e 2 0	S*	—	—
Basle	4·0	327	i 1 2	− 2	e 2 1	S*	—	—
Zagreb	4·0	65	e 1 13	P*	i 1 45	− 7	—	2·7
Ebingen	4·1	342	e 1 5	0	e 1 42	−13	—	—
Marseilles	4·1	257	1 6	+ 1	i 2 13	S_g	—	—
Besançon	4·5	313	1 26	P_g	2 14	+ 9	—	—
Stuttgart	4·6	347	e 1 10	− 2	i 2 0	− 7	—	3·2
Strasbourg	4·8	335	e 1 11	− 4	e 2 6	− 6	—	—
Karlsruhe	5·0	342	i 1 32	P*	e 2 24	+ 6	e 2·8	—
Vienna	5·5	42	e 1 43	P_g	e 3 26	P_g	—	—
Cheb	5·9	10	e 1 52	P_g	e 2 28	−12	e 2·9	3·6
Prague	6·3	22	e 0 44	−52	e 3 2	+12	—	3·7
Stara Dala	6·3	53	—	—	e 2 27	−23	—	5·2
Budapest	6·6	58	e 2 8	P_g	i 3 19	S*	—	—
Jena	6·7	7	e 1 44	+ 2	e 2 54	− 6	—	3·5
Belgrade	6·9	84	—	—	e 3 20	S*	—	—
Göttingen	7·3	354	e 1 50	0	i 3 11	− 4	—	3·5
Paris	7·3	311	e 2 3	P*	e 3 21	+ 6	4·2	6·2
Uccle	7·8	329	e 2 25	P*	i 3 46	S*	—	—
De Bilt	8·7	336	—	—	i 4 19	S*	e 4·7	5·7
Hamburg	9·3	357	—	—	e 3 14	−51	e 4·4	6·2
Algiers	9·5	221	—	—	e 4 36	S*	e 5·2	—
Kew	10·4	318	—	—	i 4 20	−12	—	7·1
Oxford	11·0	317	—	—	e 4 40	− 7	—	7·9
Toledo	11·9	253	e 2 55	+ 1	—	—	5·8	7·1
Yalta	16·7	81	e 3 57	0	—	—	—	—
Pulkovo	19·5	32	e 4 27	− 4	e 7 48	−18	10·7	12·2
Moscow	20·5	49	e 4 46	+ 4	e 8 25	− 2	12·7	13·6
Ksara	22·1	113	e 5 1	+ 2	e 9 13	+15	—	—
Tiflis	24·9	85	e 5 28	+ 2	e 10 3	+16	e 15·2	—
Grozny	25·1	81	e 5 14	−14	—	—	—	—
Sverdlovsk	33·3	51	—	—	e 12 21	+19	16·7	21·3
Tashkent	42·2	74	—	—	e 17 41	SS	e 24·2	30·2
La Paz N.	93·7	251	35 22	SSS	—	—	—	—

Additional readings:—
Triest $P_g = +0m.50s.$
Chur i = +48s. and +51s.
Zurich $eP_g = +1m.6s.$, $eS_g = +1m.51s.$
Ravensburg $eP^* = +1m.10s.$, $eP_g = +1m.17s.$, $eS^* = +1m.56s.$, +2m.5s., and +2m.17s., $iS_g = +2m.25s.$
Neuchatel $eP = +1m.9s.$, $e = +2m.15s.$

Continued on next page.

Basle $eP_g = +1m.17s.$
Zagreb $i = +1m.24s.$, $iE = +1m.34s.$, $iS = +2m.14s.$?
Ebingen $eP^*Z = +1m.18s.$, $eP_gNZ = +1m.29s.$, $eS^* = +2m.23s.$
Marseilles $i = +1m.27s.$, $iN = +1m.44s.$, $i = +1m.52s.$ and $+2m.18s.$, $iE = +2m.32s.$, $i = +2m.51s.$
Stuttgart $eP^*NZ = +1m.22s.$, $iP_gNZ = +1m.40s.$, $iS^* = +2m.14s.$, $i = +2m.35s.$, $iS^* = +2m.44s.$, $iS_gE = +2m.55s.$
Strasbourg $iP_gZ = +1m.38s.$, $iP_g = +1m.41s.$, $iS_g = +2m.41s.$, $i = +3m.4s.$
Vienna $P = +1m.48s.$, $P^* = +1m.59s.$, $P_g = +2m.8s.$ and $+2m.43s.$, $SS = +3m.35s.$
Stara Dala $e = +3m.31s.$
Budapest $PN = +2m.40s.$, $i = +3m.41s.$, $iN = +4m.6s.$, $iE = +4m.48s.$, $iN = +5m.3s.$ and $+5m.33s.$, $iE = +5m.42s.$, $iN = +5m.53s.$ and $+7m.7s.$
Jena $eZ = +2m.14s.$, $eN = +2m.8s.$ and $+2m.39s.$, $e = +3m.14s.$
Belgrade $e = +3m.52s.$, $i = +4m.11s.$ and $+4m.49s.$, $c = +5m.58s.$
Uccle $iN = +4m.22s.$, $iE = +4m.30s.$, $i = +4m.48s.$
Kew $iE = +4m.58s.$, $i = +5m.20s.$ and $+7m.4s.$
Long waves were also recorded at Jersey, Rathfarnham Castle, Upsala, Edinburgh, Irkutsk, Baku, Scoresby Sund, Copenhagen, Granada, Malaga, San Fernando, Bergen, and Bidston.

Dec. 10d. Readings also at 0h. (Andijan, Christchurch, and Stuttgart), 2h. (Prague), 3h. (Andijan), 8h. (Laibach), 10h. (Stonyhurst), 13h. (Hukuoka B), 14h. (Medan), 19h. (Andijan, Bombay, Batavia, Frunse, Medan, Tiflis, and Ksara), 20h. (Reykjavik, Tashkent, and Sverdlovsk), 21h. (Bucharest), 22h. (Wellington).

Dec. 11d. 13h. 39m. 30s. Epicentre 40°·2N. 142°·3E.

$A = -\cdot6060$, $B = +\cdot4684$, $C = +\cdot6429$; $\delta = -5$; $h = -2$;
$D = +\cdot612$, $E = +\cdot791$; $G = -\cdot509$, $H = +\cdot393$, $K = -\cdot766$.

Felt rather strongly at Miyako and Morioka. Radius of 200-300 kms. Seismo. Bull. Cent. Met. Obs., Tokyo, for 1937, pp. 66-67. Macroseismic Chart, p. 66. Epicentre as adopted.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Miyako	0·6	203	0 15$_a$	0	0 25	− 1	—
Hatinohe	0·7	300	0 15$_k$	P*	0 24	S$_g$	—
Morioka	1·0	240	0 22$_k$	+ 1	0 35	− 1	—
Aomori	1·3	298	0 25$_k$	0	0 42	S*	—
Mizusawa	1·4	220	i 0 28$_a$	P$_g$	i 0 46	S$_g$	—
Akita	1·7	254	0 28	− 3	0 51	− 3	—
Isinomaki	1·9	203	0 33	− 1	1 0	+ 1	—
Hakodate	2·0	323	0 46	P$_g$	1 13	S$_g$	—
Sendai	2·2	209	0 41$_k$	P$_g$	1 9	S*	—
Sakata	2·3	237	0 51	P$_g$	1 21	S$_g$	—
Muroran	2·4	335	0 37	− 4	1 5	− 7	—
Yamagata	2·5	218	0 43	0	1 10	− 4	—
Hukusima	2·8	210	0 48	+ 1	1 22	0	—
Obihiro	2·8	14	0 34	−13	1 17	− 5	—
Sapporo	2·9	346	0 49	+ 1	1 27	+ 3	—
Kusiro	3·2	29	0 41	−11	1 16	−16	—
Onahama	3·5	199	1 0	+ 3	1 40	0	—
Asahigawa	3·6	1	1 7	P*	1 45	+ 3	—
Mito	4·0	201	1 7$_a$	+ 3	1 56	+ 4	—
Nemuro	4·0	37	1 0	− 4	1 40	−12	—
Tukubasan	4·3	204	1 8	0	—	—	—
Kakioka	4·3	204	0 58	−10	1 59	− 1	—
Takada	4·4	226	2 8	S	(2 8)	+ 6	—
Tyosi	4·6	194	0 48	−24	1 30	−37	—
Maebasi	4·6	215	1 13	+ 1	2 12	+ 5	—
Kumagaya	4·6	210	1 5	− 7	2 13	+ 6	—
Nagano	4·8	224	1 19	+ 4	2 35	S$_g$	—
Oiwake	4·9	219	1 22	+ 5	2 21	+ 6	—
Tokyo Cen. Met. Ob.	4·9	205	1 17	0	2 15	0	—
Wazima	5·1	237	1 19	− 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	m.
		°	°	m. s.	s.	m. s.	s.	m.
Yokohama		5·2	205	1 27	+ 6	2 44	S*	—
Husiki		5·3	232	1 36	P*	3 0	S_g	—
Toyama		5·3	230	1 24	+ 2	—	—	—
Hunatu		5·4	211	1 27	+ 3	2 33	+ 5	—
Kohu		5·4	214	1 27	+ 3	2 41	S*	—
Misima		5·7	208	1 23	− 5	2 41	+ 6	—
Numadu		5·8	210	1 42	P*	2 49	+11	—
Hamamatu		6·6	215	1 58	P*	3 21	S*	—
Nagoya		6·6	221	e 1 48	+ 7	3 12	S*	3·6
Hikone		6·9	226	1 40	− 5	—	—	—
Kameyama		7·1	223	2 5	P*	3 31	S*	—
Kyoto		7·3	227	2 24	P_g	—	—	—
Osaka		7·7	226	3 13	S	4 21	S_g	—
Tinemaha	z.	73·4	57	i 11 47	+11	—	—	—
Mount Wilson	z.	75·4	58	i 11 57	+10	—	—	—
Riverside	z.	75·9	58	i 12 0	+10	—	—	—

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

Dec. 11d. Readings also at 0h. (Malaga), 2h. (Neuchatel, Zurich, and near Chur), 4h. (Fresno, near Berkeley, Branner, and Lick), 5h. (Triest), 6h. (Baku, Sverdlovsk, Tiflis, Moscow, Pulkovo, Ksara, Bucharest, Copenhagen, Oaxaca (2), and near Andijan), 7h. (near Nagoya), 8h. (Balboa Heights), 9h. (Christchurch, near Wellington, and near Andijan), 10h. (Chur, Neuchatel, Zurich, Basle, and Stuttgart), 11h. (La Paz), 12h. (Balboa Heights), 13h. (Samarkand, near Andijan, and Frunse), 16h. (Pulkovo and near Tashkent), 18h. (Balboa Heights, Ksara, and near Sitka), 19h. (Little Rock), 20h. (Basle, Chur (3), Neuchatel, Zurich (2), and Stuttgart), 22h. (La Paz).

Dec. 12d. Readings at 1h. (Baku, Tiflis, and Ksara), 2h. (Sverdlovsk, Lick, and near Fresno), 4h. (Haiwee, Mount Wilson, Pasadena, Riverside, Santa Barbara, Tinemaha, and Tucson), 7h. (Wellington), 8h. (Arapuni, Christchurch, Melbourne, Riverview, Sydney, Mount Wilson, Perth, Pasadena, Riverside, Tinemaha, Ukiah, Tucson, Huancayo, La Paz, Ottawa, Irkutsk, Kodaikanal, Bombay, Andijan, Samarkand, Baku, Sverdlovsk, Piatigorsk, Simferopol, Theodosia, Yalta, Pulkovo, Moscow, Helwan, Ksara, Paris, and Stuttgart), 9h. (Pulkovo, Moscow, Copenhagen, De Bilt, Strasbourg, Ivigtut, Scoresby Sund, East Machias, Williamstown, San Juan, and near Manila), 10h. (Melbourne, Riverview, Christchurch, Ksara, Sverdlovsk, Pulkovo, and Moscow), 11h. (Huancayo, Kodaikanal, Perth, and Oak Ridge), 12h. (San Fernando and La Paz), 13h. (Tiflis, near Baku, near Santiago, and near Grozny), 14h. (Huancayo, La Paz, Montezuma, Santiago, La Plata, Oak Ridge, Williamstown, Mount Wilson, Pasadena, Riverside, and Tinemaha), 16h. (Almata, Baku, Tchimkent, Frunse, Sverdlovsk, near Andijan, and near Samarkand), 17h. (near Mizusawa), 18h. (New Plymouth, Wellington, and near Andijan), 21h. (Medan).

Dec. 13d. 18h. 53m. 57s. Epicentre 22°·7N. 121°·2E.

Strongly felt at Taito, rather strongly felt at Karenko, Tainan, Giran, and Arisan.

Radius 300kms. Epicentre 22°·7N. 121°·2E.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937. Tokyo, 1939, pp. 67-68. Macroseismic Chart, p. 69.

$A = -·4784$, $B = +·7899$, $C = +·3837$; $\delta = +3$; $h = +4$;
$D = +·855$, $E = +·518$; $G = -·199$, $H = +·328$, $K = -·923$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taito	0·1	—	0 2a	P_g	0 5	S_g	—	—
Kosyun	0·8	211	0 17a	− 1	0 31	0	—	—
Takao	0·8	264	0 28	+10	0 41	+10	—	—
Arisan	0·9	336	0 21k	+ 1	0 31	− 3	—	—
Tainan	1·0	288	0 24k	+ 3	0 39	+ 3	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Karenko		1·4	16	0 24a	− 3	0 43	− 3	—	—
Taityu		1·5	342	0 33k	Pg	0 53	Sg	—	—
Hokoto		1·7	299	0 29k	− 2	1 1	Sg	—	—
Giran		2·1	14	0 40a	P*	1 5	S*	—	—
Taihoku		2·3	7	e 0 41k	+ 1	1 12	S*	—	1·7
Isigakizima		3·2	59	0 49k	− 3	1 22	−10	—	—
Miyakozima		4·3	60	1 4k	− 4	1 48	−12	—	—
Hong Kong		6·5	267	1 47	+ 8	3 1	+ 6	3·4	4·1
Naha		6·8	58	1 45	+ 1	2 53	−10	—	—
Manila		8·1	182	i 1 59a	− 3	3 33	− 2	—	—
Zi-ka-wei	z.	8·5	1	e 1 59	− 8	3 41	− 4	—	25·0
Nake		9·4	52	2 12	− 6	3 52	−15	—	—
Yakuzima		11·3	45	2 22	−24	5 54	Sg	—	—
Tomie		11·9	32	2 54	0	—	—	—	—
Nagasaki		12·6	36	3 1	− 2	5 43	+17	—	—
Unzendake		12·8	37	3 7a	+ 1	—	—	—	—
Miyazaki		12·9	42	3 9a	+ 2	5 44	+11	—	—
Kumamoto		13·1	38	3 7	− 3	—	—	—	—
Hukuoka		13·5	34	3 11	− 4	6 0	SS	7·6	10·0
Hukuoka B		13·5	34	e 3 14	− 1'	e 5 51	+ 4	—	10·7
Izuka		13·7	35	3 17	− 1	—	—	—	—
Phu-Lien		13·7	265	e 3 15	− 3	e 6 12	SS	8·2	11·8
Ooita		13·9	39	3 26	+ 5	6 10	+13	6·2	—
Husan		14·1	27	3 25	+ 2	6 6	+ 4	7·6	—
Simidu		14·5	43	3 43	PP	7 9	+58	—	—
Taikyu		14·6	25	e 3 33	+ 3	6 24	+11	—	10·3
Hirosima		15·2	38	3 43	+ 5	6 37	+ 9	—	—
Koti		15·3	42	3 50	+11	7 2	SSS	—	—
Hamada		15·4	36	3 46	+ 6	—	—	—	—
Zinsen		15·4	16	i 3 40k	0	i 6 43	+11	e 8·6	10·4
Muroto		15·5	45	3 28	−14	6 53	+18	—	—
Keizyo		15·6	17	3 43	0	6 47	+10	9·2	—
Tokusima		16·3	43	4 6	PP	7 27	SSS	—	—
Heizyo		16·7	12	e 4 2	+ 5	i 7 11	+ 8	9·1	11·2
Siomisaki		16·7	47	3 55	− 2	7 18	+15	—	—
Sumoto		16·7	43	e 3 54	− 3	7 32	SSS	10·7	12·7
Wakayama		16·8	44	4 1	+ 3	7 21	+16	—	—
Kobe		17·1	43	4 5	+ 3	7 39	SS	e 10·0	12·5
Osaka		17·3	43	4 4	0	7 30	+14	—	—
Osaka B		17·3	43	4 8	+ 4	—	—	—	—
Toyooka	E.	17·4	40	4 22	PP	7 54	SSS	—	12·5
	N.	17·4	40	e 4 34	PPP	7 41	SS	—	14·5
	z.	17·4	40	e 4 18	+12	7 55	SSS	—	13·1
Yagi		17·6	44	4 8k	0	7 19	− 4	—	—
Kyoto		17·7	43	4 13	+ 3	7 43	SS	—	—
Kameyama		18·0	44	4 18	+ 5	7 57	SS	—	—
Tu		18·0	45	4 18	+ 5	—	—	—	—
Hikone		18·1	43	4 2	−12	7 32	− 3	—	—
Ibukisan		18·3	43	4 15	− 2	7 51	+12	—	—
Gihu		18·5	45	4 22k	+ 3	7 57	+13	—	—
Nagoya		18·5	45	4 21	+ 2	7 55	+11	—	8·1
Hamamatu		18·8	47	4 26k	+ 3	8 1	+11	—	—
Hatidyozima		19·4	52	4 30a	0	8 1	− 3	—	—
Toyama		19·6	42	4 37	+ 5	8 18	+10	—	—
Numadu		19·7	46	4 37	+ 3	8 19	+ 9	—	—
Ito		19·8	46	4 38k	+ 3	8 23	+10	—	—
Misima		19·8	46	4 33	− 2	8 19	+ 6	—	—
Hunatu		19·9	46	4 33	− 3	8 20	+ 5	—	—
Kohu		19·9	45	4 35	− 1	8 23	+ 8	—	—
Palau		19·9	142	4 33	− 3	8 18	+ 3	—	—
Wazima		19·9	39	4 39	+ 3	8 21	+ 6	—	—
Nagano		20·2	42	4 40	+ 1	8 31	+10	—	—
Oiwake		20·3	43	4 45k	+ 5	8 32	+ 9	—	—
Yokohama		20·5	48	4 29	−13	8 36	+ 9	—	—
Maebasi		20·6	43	4 45	+ 2	9 0	SS	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kumagaya		20·7	44	4 40	− 4	8 33	+ 2	—	—
Tokyo Cen. Met.Ob.		20·7	46	4 43	− 1	8 54	SS	—	—
Tukubasan		21·2	45	4 45	− 4	8 37	− 4	—	—
Kakioka		21·3	45	4 46	− 4	8 37	− 6	—	—
Mito		21·5	45	4 51	− 1	—	—	—	—
Tyosi		21·5	50	4 48	− 4	8 36	−11	—	—
Vladivostok		22·2	22	i 4 57	− 3	i 9 1	+ 1	e 11·3	15·0
Hukusima		22·3	44	4 58a	− 3	9 1	− 1	—	—
Mizusawa		23·6	42	i 5 14	+ 1	i 9 26	+ 1	13·4	—
Morioka		24·0	42	5 15	− 2	9 36	+ 4	—	—
Miyako		24·4	42	5 18k	− 3	9 39	0	—	—
Hatinohe		24·7	40	5 23	− 1	9 29	−15	—	—
Amboina		27·1	165	5 39	− 7	—	—	—	—
Medan		28·9	232	e 6 5	+ 2	i 10 54	+ 1	—	—
Calcutta	N.	30·3	276	e 6 20	+ 5	i 11 17	+ 2	i 14·5	20·0
Batavia		32·0	208	i 6 27k	− 3	—	—	e 14·0	—
Irkutsk		32·3	340	6 35	+ 2	11 41	− 5	15·0	—
Dehra Dun		39·2	290	3 43?	?	14 3	+31	21·7	26·0
Agra		39·3	285	7 30	− 2	13 29	− 5	18·7	25·1
Hyderabad		40·4	270	7 36	− 5	13 36	−14	18·0	24·6
Almata		41·8	311	7 55	+ 2	e 14 11	0	—	—
Semipalatinsk		42·2	322	7 55	− 1	—	—	—	—
Frunse		43·4	309	8 6	0	14 33	− 2	—	—
Kodaikanal	E.	43·6	261	i 8 11	+ 3	e 14 39	+ 1	25·5	31·2
Andijan		44·7	305	8 20	+ 4	14 55	+ 1	23·0	—
Bombay		45·2	274	e 8 22	+ 2	i 15 0	− 1	21·0	32·0
Tchimkent		46·9	308	8 45	+11	—	—	—	—
Tashkent		47·0	306	i 8 19	−16	15 20	− 6	23·2	30·3
Samarkand		48·6	303	8 44	− 3	e 15 39	−10	—	—
Perth		54·6	186	i 9 28	− 4	17 5	− 6	26·9	—
Sverdlovsk		55·2	325	i 9 33	− 4	i 17 15	− 5	34·6	—
Brisbane	N.	58·6	147	i 9 57	− 4	e 17 33	−31	e 26·6	34·5
Baku		61·7	305	e 10 22	0	i 18 50	+ 6	31·6	42·2
Riverview		63·0	152	e 13 51	PPP	e 18 51	−10	e 27·9	34·7
Sydney		63·1	152	e 10 39	+ 7	—	—	e 32·4	40·3
Melbourne		64·2	160	i 10 39	0	i 19 19	+ 3	36·5	41·7
Grozny		64·4	308	10 42	+ 2	19 19	+ 1	—	—
Tiflis		65·4	307	10 46	− 1	19 31	+ 1	e 35·0	43·5
Erevan		65·8	305	e 10 39	−10	—	—	—	—
Piatigorsk		66·3	310	e 10 58	+ 6	e 19 41	− 1	—	—
Moscow		68·0	323	e 10 59	− 4	19 56	− 6	35·6	42·0
College		70·1	27	—	—	20 25	− 2	e 31·5	—
Pulkovo		71·1	328	11 19	− 3	20 31	− 7	33·6	43·2
Theodosia		71·4	312	11 25	+ 1	20 37	− 5	32·0	—
Simferopol		72·3	312	11 28	− 1	20 50	− 2	39·5	—
Yalta		72·4	312	11 24	− 6	20 36	−17	34·0	—
Ksara		74·0	300	11 41	+ 2	21 14	+ 3	—	—
Upsala	E.	77·2	330	e 11 55	− 2	i 21 41	− 6	e 38·0	48·6
	N.	77·2	330	e 12 0	+ 3	i 21 33	−14	e 36·0	41·2
Bucharest		78·0	313	12 3k	+ 1	i 21 51	− 4	35·2	52·1
Helwan		78·9	297	e 12 5	− 2	22 3	− 2	—	51·9
Wellington		80·7	142	12 13	− 3	22 28	+ 4	40·0	—
Christchurch		81·0	145	i 12 14a	− 4	i 22 34	+ 7	40·6	—
Budapest	E.	81·4	317	12 21	+ 1	22 28	− 3	e 42·0	53·6
	N.	81·4	317	12 26	+ 6	22 30	− 1	41·0	52·0
Belgrade		81·5	314	i 12 22	+ 1	e 22 29	− 3	e 44·1	—
Copenhagen		81·5	327	12 19	− 2	22 27	− 5	36·1	—
Stara Dala		81·7	318	e 12 25	+ 3	e 22 36	+ 2	e 41·0	56·6
Bergen		82·4	334	—	—	22 38	− 3	—	46·8
Vienna		82·7	319	e 12 25	− 2	22 44	0	e 44·0	56·6
Prague		83·0	322	e 12 27	− 1	e 22 43	− 4	—	46·1
Scoresby Sund		83·5	349	12 26	− 5	22 41	−11	36·0	—
Graz		83·8	319	i 12 29	− 3	e 22 44	−11	45·0	50·0
Hamburg		83·8	327	i 12 33k	+ 1	e 22 53	− 2	e 43·0	45·1
Zagreb		84·0	318	e 12 36	+ 2	e 22 58	+ 1	e 46·1	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Cheb	84·2	323	e 12 33	− 1	e 22 53	− 6	e 44·1	55·1
Jena	84·2	323	i 12 33	− 1	i 22 50	− 9	e 42·0	47·6
Göttingen	84·8	325	e 12 37	0	e 22 51	−14	e 43·1	47·1
Triest	85·5	318	12 41	0	i 22 57	[− 7]	e 40·7	46·7
Stuttgart	86·6	322	e 12 44a	− 2	e 23 5	[− 6]	e 44·1	57·0
De Bilt	87·0	323	i 12 49	+ 1	e 23 9	[− 5]	e 40·1	48·7
Aberdeen	87·4	333	i 23 27	S	(i 23 27)	− 3	43·4	48·5
Chur	87·4	321	e 12 47	− 3	e 23 8	[− 8]	—	—
Strasbourg	87·5	323	i 12 53k	+ 2	e 23 9	[− 8]	e 42·6	57·3
Zurich	87·7	322	e 12 50	− 2	—	—	—	—
Basle	88·2	321	e 12 52	− 2	—	—	—	—
Uccle	88·2	326	12 54k	0	i 23 16	[− 5]	e 42·1	48·5
Edinburgh	88·7	333	—	—	i 23 19	[− 5]	e 42·1	51·1
Durham	88·7	331	—	—	e 23 18	[− 7]	—	50·6
Neuchatel	88·8	321	e 12 53	− 4	—	—	—	—
Victoria	88·8	37	—	—	e 23 27	[+ 2]	44·1	—
Stonyhurst	89·7	331	—	—	e 23 23	[− 8]	e 43·1	51·4
Kew	90·1	328	—	—	i 23 24	[− 9]	e 50·0	54·6
Bidston	90·2	331	—	—	i 23 49	− 7	—	58.8
Paris	90·3	325	e 13 3?	− 1	e 23 1	?	46·1	48·1
Oxford	90·4	329	—	—	23 30	[− 5]	e 40·8	57·7
Rathfarnham Castle	91·7	332	i 13 2	− 8	i 23 21	[−22]	43·1	53·5
Jersey	92·5	327	e 19 38	PPP	e 30 33	SS	e 46·9	52·2
Barcelona	94·9	319	—	—	e 24 51	+14	e 46·6	54·3
Algiers	97·0	314	13 32	− 3	e 25 2	+ 7	e 53·1	63·1
Bozeman	97·1	34	—	—	e 26 9	PS	e 43·7	—
San Fernando	103·0	319	e 24 39	S	(e 24 39)	[− 2]	53·1	—
Averroes	105·8	317	e 12 14	?	28 4	PS	e 57·1	69·1
Tucson	106·1	44	e 18 33	PP	e 26 3	− 8	e 51·1	—
Seven Falls	109·7	8	—	—	e 34 33	SS	47·1	—
Chicago	110·4	23	—	—	e 34 33	SS	e 45·2	—
Ottawa	110·5	12	—	—	e 28 33	PS	53·1	—
Vermont	111·9	11	—	—	e 25 22	[+ 2]	e 53·8	—
Williamstown	113·6	10	—	—	(e 30 39)	PPS	e 30·6	36·5
Weston	114·2	10	—	—	e 30 14	PPS	e 53·6	—
Philadelphia	115·8	14	e 19 57	PP	e 25 31	[− 4]	e 51·9	—
San Juan	138·5	11	e 35 2	PPS	—	—	e 56·4	—
Huancayo	161·0	59	e 20 2	[0]	e 31 22	{+ 4}	e 80·4	—
Rio de Janeiro E.	165·7	266	e 24 58	PP	—	—	e 51·6	—
La Paz	169·3	57	i 20 9a	[0]	i 26 55	[−16]	82·1	91·2

Additional readings :—
Hong Kong ? = +2m.57s.
Zi-ka-wei iZ = +2m.25s., iN = +4m.49s., iZ = +5m.19s., iN = +5m.25s., +5m.43s., iZ = +6m.13s., +6m.57s., +7m.37s., and +15m.39s.
Phu-Lien PP = +3m.26s., SSE = +7m.26s.
Sumoto ePZ = +3m.57s., SZ = +7m.36s.
Kobe iPN = +4m.8s.
Vladivostok e = +5m.45s., i = +9m.17s.
Mizusawa iPE = +5m.16s., LN = +13m.25s.
Medan LN = +6m.15s., iE = +21m.38s.
Calcutta ePPN = +7m.2s., eSSN = +12m.40s.
Batavia iN = +7m.48s., iZ = +8m.3s.
Agra PPPE = +9m.11s., SSE = +15m.49s., SSS?E = +16m.34s.
Almata e = +9m.8s.
Kodaikanal PPE = +10m.5s., PPPE = +11m.10s., PSE = +16m.20s., SSE = +20m.3s., SSSE = +21m.49s.
Bombay ePN = +8m.26s., ePP = +10m.14s., eSS = +18m.7s.
Perth PP = +11m.45s., PPP = +12m.36s., PPPP = +13m.15s., SP = +17m.33s., SS = +21m.31s., i = +25m.1s.
Sverdlovsk L_g = +25·6m.
Brisbane ePPN ? = +11m.39s., eSSN ? = +20m.33s.
Riverview eE = +19m.6s.
Christchurch iPPEZ = +15m.22s., iSSEN = +28m.3s., eZ = +28m.26s., eNZ = +31m.7s., SSSE = +31m.33s., L_g = +35·0m., iEZ = +44m.48s.
Tiflis PE = +10m.48s., ePPE = +13m.16s., eE = +19m.17s., eSSE = +24m.19s.
College eSS = +24m.54s.
Bucharest PPE = +14m.31s., PPPN = +16m.27s., SS = +27m.3s., ? = +31m.3s.

Continued on next page.

Helwan PP = +15m.15s., e = +22m.18s., PS = +22m.43s.
Wellington PP = +15m.14s., PPP = +17m.10s., S_cS = +23m.3s., L_q = +33·4m.
Budapest P_cPE = +12m.30s., P_cPN = +12m.33s., iN = +12m.39s., +13m.15s., +13m.39s., and +13m.59s., PPE = +15m.28s.
Copenhagen +15m.31s. and +23m.23s.
Vienna SKKS = +23m.23s., PS = +24m.46s.
Prague e = +32m.33s.
Scoresby Sund +15m.46s., +23m.1s., SS = +28m.3s.
Hamburg eSSE = +27m.49s.
Jena iSN = +22m.45s. and +22m.48s.
Triest SS = +28m.29s. and +29m.21s.
Stuttgart iPZ = ePEN = +12m.47s.k, iP_cPZ = +12m.57s., ePP = +16m.9s., iS = +23m.34s., ePS = +24m.11s., eSS = +29m.3s.
De Bilt iE = +23m.38s.
Aberdeen eS = +31m.20s.
Strasbourg iZ = +13m.3s., eS = +23m.43s., ePS = +24m.39s., eSSN = +29m.29s.
Zurich ePP = +16m.26s.
Uccle PPZ = +16m.28s., PSZ = +24m.44s.
Edinburgh i = +23m.33s., +23m.52s., and +24m.54s.
Durham iEN = +23m.34s.
Victoria e = +29m.27s., eE? = +36m.9s.
Kew iS = +24m.0s., ePS = +25m.8s., e = +36m.38s., eL_q = +41·0m.
Bidston e = +25m.2s. and +36m.9s.
Rathfarnham Castle iPP = +16m.42s., iPPP = +18m.40s., iS = +23m.57s.
Algiers ePP? = +17m.41s.
San Fernando eSN = +32m.34s.
Averroes e?E = +13m.34s., ePPN = +18m.23s.
Tucson PP = +18m.41s.
Ottawa e = +44m.15s., eE = +49m.3s.?
Vermont ePPS = +30m.8s.
Philadelphia eSS = +35m.35s.
San Juan ePPPS = +36m.57s.
Huancayo PKP = +20m.10s., ePP = +24m.48s., SS = +44m.41s., SSS = +50m.21s.
La Paz iPPZ = +25m.11s., iZ = +29m.41s., SKSP = +35m.39s., iSS = +46m.9s.
Long waves were also recorded at Padova, Columbia, East Machias, Malaga, Tortosa, Toledo, Oak Ridge, Ivigtut, Granada, Cape Town, La Plata, and Karlsruhe.

Dec. 13d. 22h. 58m. 48s. Epicentre 26°·7N. 44°·5W.

A = +·6380, B = −·6270, C = +·4469; δ = −11; h = +3;
D = −·701, E = −·713; G = +·319, H = −·313, K = −·895.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Fort de France	19·6	234	e 4 28	− 4	—	—	—	—
San Juan	21·6	252	e 3 58	?	e 6 56	?	e 7·3	—
Philadelphia	28·7	306	e 6 10	+ 9	—	—	e 10·7	—
Vermont	29·1	316	e 6 37	+33	—	—	e 11·0	—
Ottawa	31·1	316	e 7 12	PP	e 11 32	+ 4	13·2	—
Columbia	32·2	293	—	—	e 11 48	+ 3	e 14·8	—
Averroes	32·7	70	—	—	e 11 52?	0	e 14·9	18·2
Granada	36·0	63	4 30	?	—	—	—	—
Chicago	38·3	305	8 42	PP	e 13 21	+ 2	18·2	—
Oxford	41·0	41	—	—	14 1	+ 2	—	—
Stonyhurst	41·1	38	—	—	e 15 12?	+71	19·2	—
De Bilt	44·9	42	—	—	e 15 1	+ 5	e 20·2	23·0
Scoresby Sund	45·7	10	—	—	15 17	+ 9	21·2	—
Strasbourg	45·8	47	e 8 26	+ 1	e 15 24	+15	e 22·8	—
Stuttgart	46·7	48	e 8 42	+10	e 15 25	+ 3	e 22·2	—
Hamburg	48·0	41	e 8 12	−31	—	—	25·2	27·2
La Paz	48·7	210	8 48	0	i 15 52	+ 2	25·2	26·5
Huancayo	48·8	222	e 8 34	−15	—	—	e 19·0	—
Triest	49·6	52	i 9 5	+10	i 16 8	+ 5	—	30·5
Copenhagen	49·9	39	8 54	− 3	16 10	+ 3	21·2	—
Prague	50·3	46	—	—	e 16 18	+ 5	—	32·7
Upsala	53·4	35	e 11 12?	PP	—	—	—	—
Tucson	57·2	293	9 51	0	—	—	e 28·2	—
Pulkovo	59·7	35	e 9 58	−11	e 18 30	+11	29·7	35·5
Moscow	64·0	39	e 10 35	− 3	e 19 16	+ 3	31·7	34·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Yalta		64·0	52	e 10 32	− 6	—	—	—	—
Helwan		65·7	68	e 10 51	+ 3	—	—	—	—
Ksara		68·3	63	e 11 0	− 5	—	—	—	—
Tiflis	E.	72·3	52	e 11 31	+ 2	e 21 4	+12	e 39·2	—
Sverdlovsk		75·8	33	11 45	− 5	21 31	0	31·2	42·1
Baku		76·3	52	e 12 0	+ 8	e 21 45	+ 8	e 36·2	43·1
Tashkent		88·7	44	i 12 39	−18	23 9	[−15]	e 40·1	50·8
Kodaikanal	E.	112·8	65	—	—	e 25 12	[−12]	—	—

Additional readings :—
La Paz iPKPZ? = +8m.56s., iPPZ? = +10m.56s., iSSN = +19m.36s.
Huancayo eP = +8m.52s., PPP = +11m.6s.
Triest ipP = +8m.27s.
Tucson ePP = +11m.30s.
Pulkovo e = +12m.6s.
Chicago eS_eS = +17m.20s.
Helwan e = +11m.4s. and +14m.26s.
Ksara e = +5m.46s.
Tiflis eE = +17m.52s.
Long waves were also recorded at Cape Town, Ivigtut, Oak Ridge, Toledo, Tortosa, Rio de Janeiro, San Fernando, Paris, Jersey, Durham, Rathfarnham Castle, Kew, Bidston, Edinburgh, Aberdeen, Irkutsk, and Williamstown.

Dec. 13d. Readings also at 2h. (La Paz), 4h. (Wellington), 5h. (Andijan and Christchurch), 6h. (Andijan, Irkutsk, Tashkent, Almata, Frunse, and Semipalatinsk), 8h. (Zurich), 9h. (Kobe and Sumoto), 10h. (Fresno, Berkeley, San Francisco, Branner, and Lick), 11h. (Copenhagen), 13h. (Wellington and Christchurch), 16h. (Branner and Lick), 17h. (La Paz).

Dec. 14d. Readings at 0h. (Bombay), 2h. (Malabar), 4h. (Mizusawa and near Nagoya), 6h. (Samarkand and near Andijan), 7h. (Nagoya, Kobe, Sumoto, Keizyo, Vladivostok, Sverdlovsk, near Hukuoka, Hukuoka B (2), Husan, and near Mizusawa), 8h. (near Hukuoka B and near Manila), 9h. (Christchurch and near Wellington), 10h. (Pasadena, Riverside, Tinemaha, and Scoresby Sund), 13h. (Scoresby Sund), 16h. (Tucson), 17h. (Sverdlovsk, Pulkovo, Tiflis, Tashkent, Ksara, Copenhagen, De Bilt, Uccle, Strasbourg, Paris, Stuttgart, and Scoresby Sund), 18h. (Scoresby Sund), 22h. (near Berkeley).

Dec. 15d. 11h. 32m. 34s. Epicentre 41°·6N. 142°·0E.

Felt rather strongly at Hatinohe and Hakodate. Radius 200-300kms. Epicentre 41°·6N. 142°·0E. Macroseismic chart, p. 69.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937, Tokyo, 1939, pp. 68-70.

A = −·5910, B = +·4617, C = +·6614 ; $\delta = -10$; $h = -2$;
D = +·616, E = +·788 ; G = −·521, H = +·407, K = −·750.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Urakawa	0·8	47	0 20	+ 2	0 32	+ 1	—	—
Hakodate	1·0	281	0 30k	+ 9	0 47	+11	—	—
Hatinohe	1·1	198	0 19a	− 3	0 34	S_g	—	—
Muroran	1·1	314	0 19k	− 3	0 33	S_g	—	—
Aomori	1·2	229	0 21	P*	0 38	S_g	—	—
Obihiro	1·6	34	0 37	P_g	0 57	S_g	—	—
Sapporo	1·6	342	0 26k	− 4	0 46	− 5	—	—
Miyako	1·8	180	0 31a	− 1	0 53	− 3	—	—
Morioka	2·0	198	0 32a	− 3	0 58	− 4	—	—
Asahigawa	2·2	7	0 41	P*	1 10	S*	—	—
Kusiro	2·3	52	0 34	− 6	1 3	− 6	—	—
Akita	2·4	229	0 42	+ 1	1 8	− 4	—	—
Mizusawa	2·6	195	0 42	− 2	1 10	− 7	—	—
Haboro	2·8	356	0 51	+ 4	1 17	− 5	—	—
Isinomaki	3·2	189	1 3	P_g	—	—	—	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Nemuro		3·2	57	0 45	− 7	1 21	−11	—	—
Sendai		3·4	194	0 42	−13	1 19	−18	—	—
Yamagata		3·6	201	1 3	P*	—	—	—	—
Hukusima		4·0	198	1 13	+ 9	1 52	0	—	—
Aidu		4·3	201	1 9	+ 1	2 ,8	S*	—	—
Mito		5·4	195	1 24	0	2 25	− 3	—	—
Utunomiya		5·4	200	1 20	− 4	2 22	− 6	—	—
Kakioka		5·5	194	1 17	− 8	2 24	− 6	—	—
Tukubasan		5·6	196	1 22	− 5	2 22	−11	—	—
Maebasi		5·7	205	1 26	− 2	—	—	—	—
Kumagaya		5·8	201	1 37	P*	2 43	+ 5	—	—
Nagano		5·8	213	1 33	+ 4	2 55	S*	—	—
Wazima		5·8	225	1 25	− 4	—	—	—	—
Oiwake		5·9	208	1 34	+ 3	2 42	+ 2	—	—
Tokyo Cen. Met. Ob.		6·2	198	1 38	+ 3	2 38	−10	—	—
Toyama		6·2	218	1 32	− 3	2 37	−11	—	—
Yokohama		6·5	198	1 44	+ 5	2 56	+ 1	—	—
Hunatu		6·6	203	1 40	− 1	3 4	+ 6	—	—
Kohu		6·6	204	1 36	− 5	2 53	− 5	—	—
Misima		6·9	201	1 51	+ 6	3 15	+10	—	—
Gihu		7·4	215	1 50	− 2	3 22	+ 4	—	—
Nagoya		7·5	213	e 1 51	− 2	3 3	−17	—	—
Sverdlovsk		52·1	316	8 51	−23	e 16 6	−32	24·4	—
Samarkand		55·2	295	—	—	17 56	PS	—	—
Tinemaha	z.	72·8	56	i 11 42	+10	—	—	—	—
Pasadena	z.	74·7	58	i 11 52	+ 9	—	—	—	—
Riverside	z.	75·3	58	i 11 56	+ 9	—	—	—	—
Ksara		78·9	305	9 47	?	e 21 11	−54	—	49·4

Long waves were also recorded at Vladivostok.

Dec. 15d. 21h. 25m. 45s. Epicentre 41°·7N. 15°·4E. (as on 1937, July 17d.).

Felt force VII at San Paolo in the state of Foggia; force V-VI at Torre-Maggiore; IV at San Severo.

Notable earthquake, see Bulletin of the Seismological Society of Italy, vol. XXXVI, p. 62-63. Macroseismic radius 40-50kms. Area: 8000 sq. kms.

P. Caloi.

"Attivita Sismica in Italia nel Decennio, 1930-1939. Commissione Italiana di Studio per i problemi del Soccorso alle popolazioni, vol. IX, Edit. Felice Le Monnier Firenze, 1942. Isoseismic chart, fig. 68. Epicentre 41°45′N. 15°15′E.

$A = +·7219$, $B = +·1989$, $C = +·6627$; $\delta = -13$; $h = -2$;
$D = +·266$, $E = -·964$; $G = +·639$, $H = +·176$, $K = -·749$.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Bari	1·2	117	e 0 25	+ 1	—	—	—	—
Prato	3·9	307	e 1 5	+ 3	—	—	—	—
Triest	4·1	346	e 1 47	P_g	2 11	S_g	—	—
Zagreb	4·2	6	e 1 8	+ 1	i 2 5	S*	—	—
Laibach	4·4	354	e 1 58k	S	(e 1 58)	− 4	—	2·6
Belgrade	4·8	48	—	—	e 2 25	S*	—	—
Stara Dala	6·4	16	—	—	e 3 26	S_g	—	4·2
Chur	6·6	327	e 1 40	− 1	e 2 49	− 9	—	—
Vienna	6·6	5	e 3 31	S	(e 3 31)	S_g	—	—
Zurich	7·5	321	e 1 50	− 3	e 3 12	− 8	—	—
Basle	8·0	319	e 1 57	− 3	e 3 23	−10	—	—
Neuchatel	8·1	314	e 1 57	− 5	e 3 19	−16	—	—
Stuttgart	8·3	330	e 2 35	+31	e 4 0	S*	—	—
Cheb	8·6	348	—	—	e 4 15	S*	—	5·2
Strasbourg	8·7	325	—	—	e 3 55	+ 5	—	—
Jena	9·6	345	e 3 45	?	e 4 27	+15	e 5·0	5·8

For Notes see next page.

NOTES TO DEC. 15d. 21h. 25m. 45s.

Additional readings :—
Zagreb eEZ = +1m.26s., i = +2m.13s.
Laibach iNW = +2m.13s., iS_gNW = +2m.31s.
Belgrade e = +2m.42s., iZ = +2m.49s. and +2m.58s.
Vienna P = +3m.35s., P* = +3m.51s., eS = +4m.38s. and +5m.20s.
Stuttgart e = +4m.37s. and +5m.4s.
Strasbourg e = +4m.15s.
Jena eE = +4m.31s.
Long waves were also recorded at Copenhagen.

Dec. 15d. Readings also at 3h. (Santiago), 5h. (La Paz, Lick, Huancayo, and Rio de Janeiro), 6h. (Santiago), 8h. (Upsala), 9h. (Mount Wilson, Riverside, Pasadena, Tinemaha, Tucson, La Jolla, and Haiwee), 10h. (Syuhurei, Balboa Heights, and Fresno), 13h. (Syuhurei, Lick, Kobe, Sumoto, San Francisco, Branner, Berkeley, Toyooka, and Nagoya), 14h. (Hukuoka and Hukuoka B), 16h. (Balboa Heights), 18h. (Tiflis), 20h. (near Hukuoka B), 21h. (Medan), 22h. (La Paz), 23h. (Mount Wilson and Riverside).

Dec. 16d. 8h. 28m. 20s. Epicentre 0°·5N. 121°·0E.

A = −·5150, B = +·8571, C = +·0087 ; δ = −8 ; h = +7 ;
D = +·857, E = +·515 ; G = −·004, H = +·007, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina		8·3	120	i 2 0	− 4	i 3 26	−14	—	—
Manila		14·0	0	i 3 14k	− 8	5 23	−36	—	—
Batavia		15·6	245	i 3 49	+ 6	i 7 0	SS	—	—
Medan		22·5	279	i 5 6	+ 4	i 9 12	+ 7	—	—
Hong Kong		22·7	344	5 10	+ 6	9 15	+ 6	11·9	—
Phu-Lien		24·6	327	e 5 16	− 7	9 40	− 2	—	—
Perth		32·6	188	4 25	?	—	—	14·2	15·2
Calcutta	N.	38·6	307	e 9 0	PP	i 13 19	− 4	e 15·7	22·5
Colombo		41·5	280	2 9	?	14 0	− 7	—	26·1
Vladivostok		43·5	12	—	—	e 14 14	−22	—	—
Riverview		44·4	144	e 8 52	+38	—	—	—	18·2
Bombay	E.	50·7	294	e 8 57	− 6	e 15 53	−25	—	—
Irkutsk		53·5	348	e 9 27	+ 3	e 16 39	−18	26·7	—
Andijan		59·5	319	e 9 56	−11	—	—	—	—
Tashkent		61·8	318	e 9 38	−45	i 17 33	−73	e 31·7	39·9
Samarkand		62·7	315	e 10 43	+14	—	—	—	—
Sverdlovsk		73·8	331	e 11 26	−12	20 49	−20	28·7	38·9
Baku		75·3	312	—	—	e 20 51	−35	e 35·2	—
Grozny		78·9	314	e 12 56	+49	e 22 26	+21	—	—
Tiflis		79·4	312	e 12 2	− 7	—	—	—	—
Ksara		85·9	304	i 12 58	+15	e 23 9	[+ 2]	—	—
Moscow		85·9	326	e 12 33	−10	(e 23 10)	− 6	e 23·2	—
Pulkovo		89·1	330	—	—	e 23 14	[−13]	e 44·2	53·3
Helwan		89·5	330	—	—	e 23 10	[−20]	—	—
Pasadena	Z.	114·8	51	i 18 35	[− 7]	—	—	—	—
Mount Wilson	Z.	114·9	51	i 18 34	[− 8]	—	—	—	—
Huancayo		160·1	126	e 19 56	[− 5]	e 27 6	[+ 1]	e 62·5	—
La Paz		161·7	151	i 19 59	[− 3]	i 31 8	{−14}	—	—

Additional readings :—
Hong Kong P_cP? = +9m.2s., SS = +10m.0s.
Calcutta ePPN = +9m.30s., ePPPN = +9m.42s., eSSN = +14m.18s.
Vladivostok i = +14m.54s.
Riverview eN = +8m.58s.
Bombay eE = +56s.
Andijan e = +14m.52s.
Samarkand e = +11m.46s.
Ksara ePP = +16m.2s., ePS = +23m.54s.
Pulkovo e = +23m.36s. and +24m.9s.
Helwan i = +23m.40s.
Pasadena iZ = +19m.0s.
Huancayo ePSPS = +44m.35s.
Long waves were also recorded at Hyderabad.

Dec. 16d. 9h. 35m. 55s. Epicentre 34°·3N. 140°·1E.

Felt rather strongly at Yokosuka, Katuura, Tokyo, Ito, Misima, and Hatidyozima. Radius 200-300kms.

Epicentre 34°·3N. 140°·1E.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937, Tokyo, 1939, pp. 70-71. Macroseismic Chart p. 72.

$A = -\cdot6351$, $B = +\cdot5310$, $C = +\cdot5609$; $\delta = -8$; $h = 0$;
$D = +\cdot641$, $E = +\cdot767$; $G = -\cdot430$, $H = +\cdot360$, $K = -\cdot828$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mera	0·7	340	0 19a	+ 2	0 30	+ 2	—	—
Kiyosumi	0·9	5	0 4	−16	0 14	−20	—	—
Misaki	0·9	335	0 25	+ 5	0 38	+ 4	—	—
Ito	1·1	309	0 25a	+ 3	0 39	0	—	—
Kamakura	1·1	336	0 25	+ 3	0 39	0	—	—
Hatidyozima	1·2	190	0 26a	+ 2	0 43	+ 2	—	—
Yokohama	1·2	342	0 26a	+ 2	0 40	− 1	—	—
Misima	1·3	311	0 27a	+ 2	0 43	− 1	—	—
Numadu	1·3	308	0 27a	+ 2	0 43	− 1	—	—
Komaba	1·4	346	0 28	+ 1	0 47	+ 1	—	—
Koyama	1·4	319	0 4	−23	0 22	−24	—	—
Tokyo Cen. Met. Ob.	1·4	349	i 0 29a	+ 2	i 0 47	+ 1	—	0·9
Tokyo Imp. Univ.	1·4	349	0 30	+ 3	0 48	+ 2	—	—
Yosiwara	1·5	307	−0 4	?	0 22	−27	—	—
Hunatu	1·6	318	0 32a	+ 2	0 52	+ 1	—	—
Omaesaki	1·6	281	0 28	− 2	0 50	− 1	—	—
Tyosi	1·6	24	0 31	+ 1	0 51	0	—	—
Kohu	1·8	317	0 34a	+ 2	1 5	S_g	—	—
Kakioka	1·9	2	0 35a	+ 1	0 59	0	—	—
Kumagaya	1·9	342	0 36a	+ 2	1 2	+ 3	—	—
Titibu	1·9	334	0 4	−30	0 27	−32	—	—
Tukubasan	1·9	0	0 35a	+ 1	0 58	− 1	—	—
Hamamatu	2·0	282	0 37k	+ 2	1 0	− 2	—	—
Mito	2·1	8	0 38a	+ 1	1 5	+ 1	—	—
Iida	2·2	303	0 42	P*	1 9	S*	—	—
Utunomiya	2·2	355	0 39	+ 1	1 6	0	—	—
Maebasi	2·3	338	0 40a	0	1 10	+ 1	—	—
Oiwake	2·4	328	0 44a	P*	1 13	+ 1	—	—
Nagoya	2·7	289	i 0 47k	+ 2	1 17	− 2	—	1·7
Onahama	2·7	14	0 39	− 6	1 10	− 9	—	—
Nagano	2·9	327	0 49a	+ 1	1 22	− 2	—	—
Gihu	3·0	292	0 50k	0	1 25	− 2	—	—
Kameyama	3·0	280	0 51k	+ 1	1 28	+ 1	—	—
Takayama	3·0	308	0 50	0	—	—	—	—
Tu	3·0	278	0 51	+ 1	1 24	− 3	—	—
Aidu	3·2	0	0 36	−16	1 17	−15	—	—
Takada	3·2	332	0 46	− 6	1 15	−17	—	—
Hikone	3·3	287	0 57k	P*	1 36	+ 1	—	—
Ibukisan	3·3	290	0 54	+ 1	1 31	− 4	—	—
Toyama	3·4	316	0 59	P*	1 38	+ 1	—	—
Hukusima	3·5	4	0 56	− 1	1 50	S*	—	—
Husiki	3·5	316	1 0	P*	1 39	− 1	—	—
Hukui	3·6	302	0 50	− 8	—	—	—	—
Kanazawa	3·6	310	1 8	P*	1 53	S*	—	—
Yagi	3·6	275	0 59k	+ 1	1 37	− 5	—	—
Kyoto	3·7	282	1 0k	0	1 41	− 4	—	—
Niigata	3·7	347	0 56	− 4	1 45	0	—	—
Simisaki	3·7	259	1 0k	0	1 40	− 5	—	—
Osaka	3·9	276	1 2	0	1 47	− 3	—	—
Osaka B	3·9	276	1 2k	0	2 9	S_g	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sendai		4·0	9	1 2	− 2	1 50	− 2	—	—
Yamagata		4·0	2	0 55	− 9	—	—	—	—
Kobe		4·1	276	i 1 6k	+ 1	i 1 49	− 6	—	2·1
Wakayama		4·1	271	1 6k	+ 1	1 51	− 4	—	—
Wazima		4·1	321	1 5	0	1 50	− 5	—	—
Isinomaki		4·2	13	1 7	0	1 54	− 3	—	—
Miyadu		4·2	289	1 7	0	2 1	+ 4	—	—
Sumoto		4·3	273	i 1 8k	0	1 53	− 7	—	2·2
Toyooka		4·5	288	1 11	0	2 14	S*	—	2·6
Sakata		4·6	357	1 17	+ 5	2 16	S*	—	—
Tokusima		4·6	269	1 15	+ 3	2 10	+ 3	—	—
Mizusawa		4·9	10	i 1 15	− 2	i 2 7	− 8	—	—
Muroto		5·0	260	1 18k	0	2 13	− 5	—	—
Okayama		5·1	276	1 34	P*	—	—	—	—
Tadotu		5·2	272	1 22k	+ 1	2 19	− 3	—	—
Akita		5·4	359	1 28	+ 4	2 39	S*	—	—
Morioka		5·4	8	1 21a	− 3	2 20	− 8	—	—
Miyako		5·5	15	1 24	− 1	2 21	− 9	—	—
Sakai		5·8	285	1 18	−11	2 13	−25	—	—
Matuyama		6·1	267	1 37k	+ 3	2 53	+ 8	—	—
Simidu		6·1	258	1 34	0	2 51	+ 6	—	—
Hatinohe		6·3	10	1 34	− 2	2 41	− 9	—	—
Aomori		6·5	4	1 41	+ 2	3 39	S_g	—	—
Hamada		6·6	278	1 42k	+ 1	2 55	− 3	—	—
Titizima		7·4	167	1 48	− 4	—	—	—	—
Hakodate		7·5	3	2 3	+10	3 57	S*	—	—
Miyazaki		7·6	254	1 56k	+ 1	3 21	− 2	—	—
Izuka		7·8	268	1 32	−26	3 31	+ 3	—	—
Kumamoto		8·0	262	1 57k	− 3	3 34	+ 1	—	—
Hukuoka		8·1	268	1 55	− 7	3 57	S*	—	—
Hukuoka B		8·1	268	2 1	− 1	4 5	S*	—	—
Urakawa		8·1	14	2 18	+16	3 30	− 5	—	—
Nagasaki		8·7	262	2 8	− 2	4 42	S_g	—	—
Sapporo		8·8	5	2 15	+ 4	4 25	S*	—	—
Kusiro		9·3	20	3 39	S	(3 39)	−26	—	—
Asahigawa		9·6	10	2 59	+38	—	—	—	—
Nemuro		10·0	24	2 28	+ 1	4 4	−18	—	—
Nake		10·8	240	2 42	+ 3	—	—	—	—
Vladivostok		10·9	326	e 2 39	− 1	i 4 44	0	e 5·5	9·9
Manila		26·2	227	5 29	− 9	11 31	SSS	—	—
Irkutsk		31·2	317	e 6 5?	−18	e 11 5?	−24	13·1	—
Andijan		52·9	299	e 9 8	−12	—	—	—	—
Sverdlovsk		56·5	320	i 9 37	− 9	e 17 21	−16	25·1	—
Moscow		68·8	324	e 11 0	− 8	—	—	e 39·6	44·4
Grozny		70·3	310	e 11 12	− 5	—	—	—	—
Tiflis		71·7	309	e 11 17	− 9	—	—	—	—
Tinemaha	z.	78·3	54	e 11 58	− 5	—	—	—	—
Mount Wilson	z.	80·0	56	i 12 7	− 6	—	—	—	—
Pasadena	z.	80·0	56	i 12 5	− 8	—	—	—	—
Riverside	z.	80·6	56	i 12 10	− 6	—	—	—	—
Tucson		86·1	54	e 14 2	?	—	—	—	—
La Paz	z.	149·1	62	e 19 51	[+ 5]	—	—	—	—

Additional readings :—
Tokyo Cen. Met. Ob. S_0S = +14m.3s.
Sumoto SZ = +1m.57s.
Toyooka SZ = +2m.17s.
Andijan e = +11m.41s.
Grozny e = +15m.9s.
Tinemaha iZ = +12m.21s.
Mount Wilson iZ = +12m.29s. and +12m.39s.
Pasadena iZ = +12m.29s.
Riverside iZ = +12m.32s.
Tucson i = +15m.19s.
Long waves were also recorded at Baku.

Dec. 16d. 17h. 35m. 27s. Epicentre 35°·7N. 23°·2E.

Felt Force IV at Anaugea (Crete), Cythera, and Neapolis (Vatika).

Epicentre 36°·4N. 21°·0E. (Athens).
36°·2N. 24°·0E. (U.S.C.G.S.).
35°·7N. 23°·2E. (Strasbourg).

Provisional Bulletin of the International Bureau of Seismology, 1937, p. 168. Strasbourg, 1938.

$A = +·7481$, $B = +·3207$, $C = +·5810$; $\delta = +6$; $h = 0$;
$D = +·394$, $E = -·919$; $G = +·534$, $H = +·229$, $K = -·814$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Athens		2·1	10	i 0 38	+ 1	i 1 11	+ 7	—	—
Sofia	E.	7·0	1	e 2 3	P*	e 3 15	+ 7	—	—
Bari		7·3	319	1 33	−17	—	—	—	—
Capodimonte	N.	8·7	309	e 2 14	+ 4	e 4 9	+19	—	5·6
Bucharest		9·0	14	2 13k	0	3 55	− 3	—	5·5
Helwan		9·0	128	2 13	0	3 45	−13	—	—
Belgrade		9·4	348	i 2 27k	+ 9	e 3 59	− 8	—	10·6
Ksara		10·6	96	i 2 30a	− 6	e 4 49	+12	—	—
Zagreb		11·5	332	e 2 54	+ 6	i 4 55	− 4	—	7·2
Sebastopol		11·9	39	2 48	− 6	6 56	L	(6·9)	—
Budapest	E.	12·2	347	e 3 11	PP	i 5 49	SSS	—	8·0
	N.	12·2	347	e 3 14	PPP	i 5 9	− 7	—	8·0
Laibach		12·2	330	e 3 48	+50	i 5 26	+10	—	7·8
Triest		12·2	327	i 2 56	− 2	i 5 5	−11	—	6·9
Yalta		12·3	41	2 50	− 9	—	—	—	—
Simferopol		12·4	38	e 2 59	− 2	—	—	—	—
Graz		12·7	336	e 3 0	− 5	e 5 22	− 6	e 5·6	8·0
Stara Dala		12·7	344	e 3 5	0	e 6 41	L	(e 6·7)	8·6
Padova		12·9	322	e 5 18	S	(e 5 18)	−15	—	—
Theodosia		13·1	41	3 12	+ 2	—	—	8·6	—
Vienna		13·5	340	e 3 15	0	e 5 58	+11	e 7·6	8·0
Sotchi		14·9	53	e 4 27	+53	—	—	—	—
Chur		15·1	322	e 3 40	+ 4	e 6 2	−23	—	—
Prague		15·7	337	e 3 48	+ 4	e 6 46	+ 7	—	9·6
Zurich		16·0	321	e 3 49a	+ 1	e 6 42	− 4	—	—
Cheb		16·4	333	e 3 51	− 2	e 6 46	−10	e 9·0	9·8
Basle		16·6	318	e 3 58	+ 2	e 7 11	+11	—	—
Neuchatel		16·6	318	e 3 57	+ 1	e 6 47	−13	—	—
Stuttgart		16·6	326	e 3 56	0	e 7 2	+ 2	e 9·7	11·5
Karlsruhe		17·1	326	e 4 8	+ 6	e 7 37	SS	—	—
Strasbourg		17·2	323	e 4 5	+ 2	7 11	− 3	—	—
Besançon		17·3	317	e 4 3	− 1	7 3	−13	—	—
Piatigorsk		17·3	55	i 4 4	0	—	—	—	—
Erevan		17·4	68	i 4 4	− 2	—	—	—	—
Jena		17·4	335	e 4 6	0	e 7 33	+14	e 8·6	10·0
Tiflis		17·9	64	e 4 7	− 5	7 29	− 1	e 9·0	—
Göttingen		18·4	335	e 4 18	0	—	—	—	—
Grozny		18·9	60	e 4 23	− 1	e 8 5	+12	—	—
Hamburg		20·1	338	e 4 35	− 3	e 8 26	+ 7	—	11·6
Paris		20·1	318	i 4 40	+ 2	e 8 23	+ 4	11·6	13·6
Uccle		20·1	324	4 41	+ 3	i 8 31	+12	11·1	—
Almeria		20·7	282	e 4 57	+13	e 9 2	PP	—	—
De Bilt		20·8	330	i 4 47	+ 2	8 40	+ 7	e 10·6	12·1
Copenhagen		21·3	345	i 4 48	− 2	8 37	− 6	11·6	—
Baku		21·5	69	i 4 51	− 1	i 8 50	+ 3	11·6	14·0
Granada		21·6	284	i 5 18?	PP	e 9 16?	SS	—	—
Toledo		21·9	290	i 5 2a	+ 5	e 8 58	+ 4	e 10·8	—
Malaga		22·3	282	e 5 38	PPP	9 52	SSS	—	—
Moscow		22·3	23	e 4 56	− 5	e 8 54	− 8	e 11·0	14·0
Jersey		22·9	316	e 5 5	− 1	e 9 4	− 9	e 13·4	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kew		23·1	322	i 5 8	0	i 9 15	− 1	13·6	15·7
Oxford		23·7	322	5 17a	+ 3	i 9 26	− 1	—	15·4
San Fernando		23·7	281	e 5 23	+ 9	i 9 37	+10	—	—
Upsala	N.	24·4	354	e 5 28	+ 7	e 9 38	− 1	e 13·6	16·6
Pulkovo		24·5	10	5 19	− 3	e 9 28	−12	12·0	16·3
Stonyhurst		25·5	325	e 7 27	PP	9 50	− 7	15·6	18·9
Bidston		25·6	323	—	—	i 9 43	−16	13·6	—
Rathfarnham Castle		27·1	321	i 5 6	−40	i 9 23	−61	11·0	13·0
Sverdlovsk		32·8	38	i 6 30	− 7	e 11 36	−18	—	—
Samarkand		34·6	70	6 48	− 5	12 26	+ 4	—	—
Tashkent		36·2	67	i 7 1	− 5	i 12 32	−15	—	26·4
Andijan		38·5	68	7 26	0	13 12	−10	—	—
Frunse		39·9	64	7 38	+ 1	—	—	—	—
Scoresby Sund		42·3	340	—	—	14 33?	+14	—	—
Bombay	E.	46·7	97	e 11 33?	PPP	e 15 14	− 8	—	—
Irkutsk		57·6	46	e 9 48	− 6	e 17 33?	−18	e 32·6	—
Weston		70·0	309	i 11 17a	+ 2	—	—	—	—
Oak Ridge	Z.	70·1	309	i 11 17	+ 1	—	—	—	—
Williamstown		71·0	309	i 11 23	+ 1	—	—	—	—
Tucson		99·8	322	e 13 49	+ 2	—	—	—	—

Additional readings :—
Bucharest P*E = +2m.53s., i = +3m.36s., S*N = +4m.17s., S_gE = +4m.45s.
Helwan e = +3m.8s., S_g = +4m.37s.
Belgrade eZ = +2m.34s., iZ = +2m.46s., +2m.50s., and +3m.53s., eNW = +4m.13s.
Ksara eSS = +5m.11s., iS_g = +6m.13s.
Budapest iE = +3m.46s., iN = +4m.1s., iE = +6m.9s., iN = +6m.49s., iE = +6m.51s., iN = +7m.6s.
Laibach iNE = +4m.48s., +5m.9s., and +5m.41s.
Padova S = +9m.3s.
Vienna PPP = +3m.31s.
Stuttgart ePP = +4m.10s., e = +7m.48s. and +8m.55s.
Strasbourg PPZ = +4m.16s., SZ = +7m.13s., SSZ = +7m.34s.
Tiflis iPE = +4m.9s.
Jena iPZ = +4m.9s., eSZ = +7m.39s., eE = +7m.53s.
De Bilt iZ = +5m.11s.
Copenhagen +5m.7s. and +8m.52s., eZ = +9m.4s.
Baku e = +5m.33s. and +6m.1s.
Toledo SS = +9m.45s.
Malaga iPP = +5m.54s., i = +6m.12s.
Jersey eSS = +10m.31s.
Oxford iSE = +9m.31s.
Stonyhurst i = +8m.42s.
Rathfarnham Castle iPPP? = +6m.55s., i = +10m.42s.
Bombay eE = +18m.30s.
Irkutsk e = +12m.33s.?
Weston iZ = +11m.32s.
Long waves were also recorded at Vladivostok, Durham, Edinburgh, Huancayo, Bergen, and Cape Town.

Dec. 16d. 18h. 25m. 10s. Epicentre 14°·0N. 125°·0E.

A = −·5568, B = +·7952, C = +·2404; δ = +16°; h = +6°;
D = +·819, E = +·574; G = −·138, H = +·197, K = −·971.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manila		4·0	279	i 1 6k	+ 2	1 57	+ 5	—	—
Taito		9·4	339	2 28	+10	4 4	− 3	4·9	—
Isigakizima		10·3	357	4 9	S	(4 9)	−21	—	—
Karenko		10·4	343	2 42	+ 8	—	—	—	—
Miyakozima		10·7	1	4 26	S	(4 26)	−13	—	—
Taityu		10·9	339	4 19	S	(4 19)	−25	—	—
Palau		11·4	125	4 41	S	(4 41)	−15	—	—
Hong Kong		13·2	310	3 7	− 4	4 39	−61	7·0	9·1
Nake		14·9	15	3 33	− 1	—	—	—	—
Zi-ka-wei	Z.	17·4	350	e 4 4	− 2	7 20	+ 1	—	10·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina		17·8	170	i 8 44	SSS	—	—	—	—
Phu-Lien		18·8	293	e 4 24	+ 1	8 2	+12	—	—
Kumamoto		19·4	15	4 28	− 2	—	—	—	—
Hukuoka B		20·7	15	e 4 6	−38	e 7 45	−46	—	—
Muroto		20·9	22	4 43	− 3	8 26	− 9	—	—
Husan		21·3	8	e 4 50	0	e 8 47	+ 4	—	—
Hirosima		21·4	17	4 42	− 9	—	—	—	—
Sumoto		22·1	23	4 57	− 2	e 9 2	+ 4	—	—
Wakayama		22·1	23	4 58	− 1	8 50	− 8	—	—
Kobe	E.	22·6	23	e 4 57	− 6	e 9 10	+ 3	—	—
	N.	22·6	23	e 4 59	− 4	e 9 3	− 4	—	—
	Z.	22·6	23	e 5 1	− 2	e 9 1	− 6	—	—
Osaka B		22·6	23	5 5	+ 2	—	—	—	—
Kameyama		23·2	25	5 8	− 1	—	—	—	—
Zinsen	N.	23·4	2	e 5 10	− 1	e 9 23	+ 2	—	—
Nagoya		23·7	25	5 11	− 3	—	—	—	—
Gihu		23·8	25	5 12	− 3	9 16	−12	—	—
Hunatu		24·7	27	5 26	+ 2	—	—	—	—
Oiwake		25·4	26	5 35	+ 4	—	—	—	—
Nagano		25·5	24	5 33	+ 1	—	—	—	—
Maebasi		25·6	26	5 51	+19	—	—	—	—
Batavia		27·0	223	—	—	11 14	SS	—	—
Medan		27·9	251	—	—	e 10 44	+ 7	—	—
Vladivostok		29·6	10	e 6 7	− 2	e 10 59	− 5	—	21·7
Calcutta	N.	35·8	289	—	—	i 12 44	+ 3	—	24·2
Irkutsk		41·6	341	e 7 48	− 3	e 14 3	− 5	21·8	—
Brisbane	E.	49·4	146	—	—	e 15 56	− 4	—	—
Bombay		50·1	283	e 8 56	− 3	e 16 26	+16	—	—
Frunse		51·9	314	e 9 17	+ 5	—	—	—	—
Andijan		52·8	311	e 9 22	+ 3	e 19 8	?	—	—
Riverview		53·7	153	—	—	e 16 56	− 3	e 22·5	26·9
Tashkent		55·2	311	9 35	− 2	17 30	+10	e 28·4	33·7
Samarkand		56·7	308	9 48	0	e 19 25	?	—	—
Sverdlovsk		64·4	327	i 10 36	− 4	e 19 12	− 6	29·8	41·1
Baku		69·8	308	e 11 21	+ 7	e 21 52	?	e 38·3	—
Grozny		72·7	311	e 11 34	+ 2	—	—	—	—
Tiflis		73·6	310	11 36	− 1	e 20 50	− 7	e 41·5	48·0
Moscow		77·4	325	e 11 55	− 3	—	—	e 42·3	58·5
Ksara		81·6	303	i 12 22	+ 1	e 22 18	−15	—	—

Additional readings :—
Manila S_gN = +2m.10s.
Taityu S = +5m.49s.
Amboina iSEN = +9m.28s.
Muroto PP = +5m.10s., i = +6m.12s.
Vladivostok i = +12m.22s.
Calcutta iN = +15m.21s. and +17m.24s.
Brisbane eE = +18m.50s., iE = +23m.44s.
Tiflis ePSE = +21m.8s.
Ksara epP = +12m.47s., iPP = +15m.35s., epPP = +15m.58s., esS = +23m.0s., eSS = +27m.36s.
Long waves were also recorded at De Bilt, Uccle, Stuttgart, Pulkovo, and Copenhagen.

Dec. 16d. Readings also at 1h. (Andijan), 2h. (Andijan), 3h. (Santiago), 5h. (Mount Wilson, Tinemaha, Pasadena, and Riverside), 8h. (Copenhagen), 11h. (Manila), 12h. (Malaga), 15h. (Andijan, Tinemaha, Tucson, Pasadena, Riverside, La Paz, and La Plata), 19h. (Tiflis and Tucson), 23h. (Balboa Heights).

Dec. 17d. 4h. 26m. 22s. Epicentre 9°·2S. 106°·7E.

$A = -\cdot2837$, $B = +\cdot9457$, $C = -\cdot1589$; $\delta = +8$; $h = +7$;
$D = +\cdot958$, $E = +\cdot287$; $G = +\cdot046$, $H = -\cdot152$, $K = -\cdot987$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Malabar		2·2	25	0 40	+ 2	i 1 7	+ 1	—	—
Batavia		3·0	3	i 0 47k	− 3	i 1 33	+ 6	—	—
Medan		15·0	328	e 2 38?	−57	—	—	i 9·1	—
Perth		24·2	160	6 45	PPP	10 56	SSS	13·4	16·5
Manila		27·5	30	6 10	+20	12 0	SSS	17·3	—
Colombo		31·2	300	11 26	S	(11 26)	− 3	—	—
Calcutta	N.	36·3	331	—	—	i 12 44	− 4	—	31·6
Bombay		43·5	310	e 8 8	+ 1	e 14 38	+ 2	—	26·1
Agra	E.	45·6	323	e 8 20	− 4	i 14 53	−13	—	—
Brisbane	N.	47·3	118	—	—	e 20 2	SSS	e 24·4	—
Riverview		47·6	128	—	—	e 18 44	SS	e 25·4	31·3
Vladivostok		56·9	22	—	—	e 17 36	− 6	e 31·2	38·6
Frunse		59·6	333	e 9 49	−19	e 17 55	−22	—	—
Andijan		59·7	330	e 10 0	− 9	e 18 3	−16	—	—
Tashkent		60·9	328	i 10 10	− 7	18 20	−14	e 31·1	42·9
Irkutsk		61·3	358	e 10 15	− 5	e 18 33	− 6	31·6	—
Baku		71·9	317	e 11 28	+ 1	i 20 48	0	e 37·1	—
Sverdlovsk		75·9	336	i 11 47	− 3	e 21 27	− 5	36·6	—
Tiflis	E.	75·9	317	e 11 50	0	e 21 28	− 4	—	—
Grozny		76·0	318	e 11 50	− 1	—	—	—	—
Ksara		79·5	306	i 12 12k	+ 2	e 23 8	− 3	—	—
Moscow		86·1	328	e 12 45	+ 1	e 23 12	[+ 4]	e 49·1	56·9

Additional readings :—
Batavia iPEN = +49s., iN = +1m.36s., iSEN = +1m.57s.
Medan iN = +9m.4s., iE = +9m.12s., iN = +12m.1s.
Perth PP = +7m.10s., P_cP = +10m.8s., SS = +11m.30s., SSS = +12m.7s.
Vladivostok e = +19m.38s.
Ksara ePP = +15m.48s.
Long waves were also recorded at Hong Kong, Phu-Lien, Pulkovo, Copenhagen, and De Bilt.

Dec. 17d. 7h. 19m. 3s. Epicentre 32°·5S. 71°·3W.

Felt Force V within a radius of 100kms. of the Epicentre 32°30′S. 71°20′W.

Felt Force IV at San Javier, Valparaiso, and in Argentine. See Boletin de Servicio Sismologico de la Univ. de Chile, Observaciones de 1937, Santiago de Chile, 1939, p. 76.

$A = +\cdot2709$, $B = -\cdot8004$, $C = -\cdot5347$; $\delta = -7$; $h = +1$;
$D = -\cdot947$, $E = -\cdot321$; $G = -\cdot171$, $H = +\cdot506$, $K = -\cdot845$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Santiago		1·1	150	(0 28)	+ 6	(0 44)	+ 5	—	—
San Javier		3·2	186	(1 1)	+ 9	(1 45)	+13	—	—
La Plata		11·4	106	2 48	+ 1	4 51	− 5	5·3	—
La Paz		16·2	12	i 3 49k	− 1	i 6 49	− 2	—	9·2
Huancayo		20·7	350	e 4 43	− 1	8 32	+ 1	i 8·9	—
Rio de Janeiro	E.	26·6	76	e 5 57	+15	e 10 15	− 1	—	—
Tucson		74·4	326	e 11 40	− 2	—	—	—	—
Riverside		79·1	323	i 12 7a	− 1	—	—	—	—
Mount Wilson		79·6	323	i 12 11a	+ 1	—	—	—	—
Pasadena		79·6	323	i 12 10a	0	—	—	—	—
Santa Barbara		80·6	322	i 12 15	− 1	—	—	—	—
Haiwee		81·1	324	12 18	0	—	—	—	—
Tinemaha	E.	81·9	325	e 12 23	0	—	—	—	—
Ksara		120·3	67	e 20 5	PP	e 29 35	PS	—	66·4
Baku		132·8	62	e 22 53	?	—	—	—	—
Sverdlovsk		139·2	38	e 19 29	[0]	—	—	61·0	—
Tashkent		147·5	62	e 19 52	[+ 9]	—	—	—	—
Andijan		149·9	64	i 18 57	[−50]	—	—	—	—

For Notes see next page.

NOTES TO DEC. 17d. 7h. 19m. 3s.

Additional readings and note :—
Santiago and San Javier readings have been increased by 1m.
La Paz iZ = +4m.8s., iN = +8m.13s.
Huancayo PP = +4m.48s.
Tucson iP = +11m.56s., PP = +14m.24s.
Sverdlovsk i = +22m.19s.
Tashkent i = +20m.37s., e = +20m.59s., and +21m.32s.
Long waves were also recorded at Paris, Strasbourg, Uccle, and Bombay.

Dec. 17d. 9h. 32m. 12s. Epicentre 22°·7N. 121°·2E. (as on Dec. 13d.).

Strongly felt at Taito, rather strongly at Karenko and Arisan. Radius 300kms. Epicentre 22°·9N. 121°·4E.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937, Tokyo, 1939, pp. 72-73. Macroseismic Chart p. 72.

$A = -\cdot4784$, $B = +\cdot7899$, $C = +\cdot3837$; $\delta = +3$; $h = +4$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taito	0·1	—	0 13a	+ 5	0 16	+ 3	—	—
Kosyun	0·8	211	0 24a	+ 6	0 44	+13	—	—
Takao	0·8	264	0 30k	+12	0 45	+14	—	—
Arisan	0·9	336	0 17k	− 3	0 27	S_g	—	—
Tainan	1·0	288	0 25k	+ 4	0 41	+ 5	—	—
Karenko	1·4	16	0 17	−10	0 34	−12	—	—
Taityu	1·5	342	0 29k	+ 1	0 49	0	—	—
Giran	2·1	14	0 35a	− 2	1 0	− 4	—	—
Taihoku	2·3	7	e 0 37k	− 3	1 9	0	—	1·7
Isigakizima	3·2	59	0 48k	− 4	1 20	−12	—	—
Miyakozima	4·3	60	1 5	− 3	1 48	−12	—	—
Hong Kong	6·5	267	1 42	+ 3	3 38	S_g	4·0	4·4
Manila	8·1	182	2 7a	+ 5	3 44	+ 9	—	—
Zi-ka-wei	8·5	1	e 2 4	− 3	3 50	+ 5	—	—
Nake	9·4	52	2 12	− 6	3 55	−12	—	—
Yakuzima	11·3	45	2 58	+12	7 1	?	—	—
Tomie	11·9	32	2 51a	− 3	6 3	L	(6·0)	—
Nagasaki	12·6	36	3 0	− 3	5 43	SS	—	—
Unzendake	12·8	37	3 8k	+ 2	—	—	—	—
Miyazaki	12·9	42	3 16	+ 9	5 17	−16	—	—
Kumamoto	13·1	38	3 3	− 7	—	—	—	—
Saga	13·2	35	2 29	−42	—	—	—	—
Hukuoka	13·5	34	3 14	− 1	5 38	− 9	7·3	9·2
Hukuoka B	13·5	34	3 16	+ 1	e 5 39	− 8	—	9·1
Izuka	13·7	35	3 16	− 2	—	—	—	—
Phu-Lien	13·7	265	e 3 22	+ 4	e 6 21	SSS	8·3	9·3
Husan	14·1	27	3 24	+ 1	e 6 14	SS	e 7·5	—
Taikyu	14·6	25	3 30	0	6 13	0	8·0	10·6
Matuyama	15·1	40	3 42	+ 6	6 26	+ 1	—	—
Hirosima	15·2	38	3 40	+ 2	6 25	− 3	—	—
Koti	15·3	42	3 53	+14	—	—	—	—
Hamada	15·4	36	3 42	+ 2	6 30	− 2	—	—
Zinsen	15·4	16	3 41	+ 1	6 41	+ 9	e 7·9	8·9
Muroto	15·5	45	3 33	− 9	6 41	+ 6	—	—
Keizyo	15·6	17	3 43	0	6 45	+ 8	8·5	10·5
Okayama	16·3	40	4 9	PP	7 22	SSS	—	—
Heizyo	16·7	12	e 4 1	+ 4	e 7 9	+ 6	8·8	9·6
Siomisaki	16·7	47	4 5	+ 8	8 19	L	(8·3)	—
Sumoto	16·7	43	e 4 0a	+ 3	7 16	+13	11·0	13·8
Wakayama	16·8	44	4 1	+ 3	7 36	+31	—	—
Kobe	17·1	43	e 4 7	+ 5	e 7 20	+ 8	e 8·7	11·6
Osaka B	17·3	43	4 21	+17	7 43	SS	—	—
Toyooka	17·4	40	4 22	+16	7 51	SSS	9·7	12·2
Yagi	17·6	44	4 8k	0	7 40	SS	—	—
Kyoto	17·7	43	4 14	+ 4	7 45	SS	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kameyama		18·0	44	4 22	+ 9	7 46	+14	—	—
Hikone		18·1	43	4 19	+ 5	—	—	—	—
Ibukisan		18·3	43	4 21	+ 4	—	—	—	—
Gihu		18·5	45	4 10	− 9	7 34	−10	—	—
Nagoya		18·5	45	4 21	+ 2	7 56	+12	—	8·1
Hamamatu		18·8	47	4 18	− 5	8 26	SSS	—	—
Iida		19·3	43	4 23	− 6	—	—	—	—
Hatidyozima		19·4	52	4 31	+ 1	8 11	+ 7	—	—
Titizima		19·5	72	4 30	− 1	—	—	—	—
Toyama		19·6	42	4 34	+ 2	8 16	+ 8	—	—
Numadu		19·7	46	4 35	+ 1	8 19	+ 9	—	—
Hunatu		19·9	46	4 35	− 1	8 23	+ 8	—	—
Palau		19·9	142	4 38	+ 2	8 33	+18	—	—
Wazima		19·9	39	4 35	− 1	8 11	− 4	—	—
Nagano		20·2	42	4 39	0	8 25	+ 4	—	—
Mera		20·3	49	5 2	PP	—	—	—	—
Oiwake		20·3	43	4 38	− 2	8 26	+ 3	—	—
Yokohama		20·5	48	4 51	+ 9	8 36	+ 9	—	—
Maebasi		20·6	43	4 48	+ 5	8 47	SS	—	—
Kumagaya		20·7	44	4 41	− 3	8 43	+12	—	—
Tokyo Cen. Met. Ob.		20·7	46	4 48	+ 4	8 39	+ 8	—	—
Tukubasan		21·2	45	4 44	− 5	8 37	− 4	—	—
Kakioka		21·3	45	4 43	− 7	8 35	− 8	—	—
Mito		21·5	45	4 49k	− 3	—	—	—	—
Tyosi		21·5	50	4 47	− 5	8 35	−12	—	—
Niigata		21·6	40	4 53	− 1	—	—	—	—
Hukusima		22·3	44	4 57a	− 4	9 3	+ 1	—	—
Sakata		22·7	41	5 7	+ 3	—	—	—	—
Mizusāwa		23·6	42	5 13	0	9 21	− 4	14·0	—
Morioka		24·0	42	5 15	− 2	9 35	+ 3	—	—
Miyako		24·4	42	5 16	− 5	—	—	—	—
Hatinohe		24·7	40	5 14	−10	—	—	—	—
Medan		28·9	232	i 6 10	+ 7	i 11 0	− 9	—	—
Calcutta	N.	30·3	276	e 7 5	PP	i 12 47	SS	i 17·4	22·1
Batavia		32·0	208	i 6 34	+ 4	i 12 20	+38	e 21·8	—
Irkutsk		32·3	340	6 29	− 4	e 11 36	− 9	16·8	—
Dehra Dun		39·2	290	11 48	?	16 8?	SS	22·6	23·8
Agra	E.	39·3	285	7 30	− 2	13 32	− 2	—	25·8
Hyderabad		40·4	270	7 45	+ 4	13 45	− 5	18·2	26·4
Almata		41·8	311	7 54	+ 1	—	—	—	—
Semipalatinsk		42·2	322	e 7 51	− 5	—	—	—	—
Colombo		42·8	255	8 6	+ 5	—	—	—	27·8
Kodaikanal	E.	43·6	261	i 8 13	+ 5	14 57	+19	22·6	30·9
Bombay		45·2	274	i 8 21	+ 1	i 15 2	+ 1	e 22·1	31·2
Tashkent		47·0	306	i 8 35	0	i 15 27	+ 1	24·4	29·0
Perth		54·6	186	i 9 30	− 2	e 17 31	+20	26·3	—
Sverdlovsk		55·2	325	i 9 35	− 2	i 17 17	− 3	33·2	—
Brisbane		58·6	147	i 10 0	− 1	—	—	e 26·7	—
Baku		61·7	305	10 25	+ 3	i 18 50	+ 6	31·3	41·7
Riverview		63·0	152	e 10 48	+17	e 19 12	+11	e 29·9	32·6
Sydney		63·1	152	—	—	e 19 16	+14	e 36·1	40·0
Grozny		64·4	308	10 43	+ 3	19 18	0	—	—
Tiflis		65·4	307	e 10 46	− 1	e 18 59	−31	e 36·3	43·6
Piatigorsk		66·3	310	e 10 51	− 1	19 39	− 3	31·8	—
Moscow		68·0	323	11 1	− 2	19 55	− 7	40·3	43·8
College		70·1	27	—	—	e 20 15	−12	e 31·5	—
Pulkovo		71·1	328	11 19	− 3	20 31	− 7	36·3	42·7
Theodosia		71·4	312	11 23	− 1	20 38	− 4	39·8	—
Simferopol		72·3	312	11 28	− 1	—	—	42·8	—
Yalta		72·4	312	11 29	− 1	—	—	40·3	—
Ksara		74·0	300	i 11 40a	+ 1	e 21 22	+11	—	—
Upsala	N.	77·2	330	—	—	e 21 36	−11	e 34·8	41·4
Bucharest		78·0	313	e 12 4k	+ 2	21 53	− 2	35·8	55·1
Helwan		78·9	297	i 12 3	− 4	22 13	+ 8	—	54·1
Wellington		80·7	142	—	—	e 22 48?	+24	—	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Christchurch		81·0	145	12 21	+ 3	e 23 18	PS	e 43·8	—
Budapest	E.	81·4	317	12 18	− 2	e 22 21	−10	e 42·3	50·3
	N.	81·4	317	e 9 40	?	22 14	−17	e 40·5	50·3
Belgrade		81·5	314	e 12 20a	− 1	e 22 38	+ 6	e 46·5	—
Copenhagen		81·5	327	12 18a	− 3	22 27	− 5	37·8	—
Stara Dala		81·7	318	e 12 25	+ 3	e 22 40	+ 6	e 41·8	55·3
Bergen		82·4	334	—	—	e 24 27	?	—	46·8
Vienna		82·7	319	12 24	− 3	e 22 43	− 1	e 42·8	50·3
Prague		83·0	322	e 12 25	− 3	e 22 42	− 5	—	46·3
Scoresby Sund		83·5	349	12 34	+ 3	23 6	+14	—	—
Graz		83·8	319	e 12 33	+ 1	e 22 37	−18	e 39·8	53·8
Hamburg		83·8	327	e 12 32	0	e 23 6	+11	e 43·5	45·8
Zagreb		84·0	318	e 12 35	+ 1	e 22 48?	− 9	e 45·8	—
Cheb		84·2	323	e 12 33	− 1	e 22 58	− 1	e 43·8	54·3
Jena		84·2	323	e 12 36	+ 2	e 22 48	−11	e 40·8	46·3
Göttingen		84·8	325	e 12 33	− 4	e 22 48?	−17	e 42·8	52·8
Triest		85·5	318	e 12 41	0	e 22 59	[− 5]	e 42·8	48·3
Stuttgart		86·6	322	e 12 46a	0	e 23 20	− 3	e 44·8	56·8
De Bilt		87·0	323	12 49	+ 1	e 23 23	− 4	e 39·8	48·7
Aberdeen		87·4	333	e 23 11	'S	(e 23 11)	[− 6]	43·0	56·5
Chur		87·4	321	e 12 49	− 1	—	—	—	—
Strasbourg		87·5	323	e 12 49	− 2	23 9	[− 8]	e 41·8	49·8
Zurich		87·7	322	e 12 49	− 3	—	—	—	—
Basle		88·2	321	e 12 53	− 1	—	—	—	—
Uccle		88·2	326	e 12 52	− 2	i 23 48	+10	e 44·8	48·6
Edinburgh		88·7	333	—	—	i 23 51	+ 8	e 42·8	56·8
Durham		88·7	331	—	—	i 23 36	− 7	—	50·8
Neuchatel		88·8	321	e 16 17	PP	—	—	—	—
Victoria		88·8	37	—	—	e 23 48?	+ 4	47·8	—
Stonyhurst		89·7	331	—	—	e 23 38	[+ 7]	44·8	52·1
Kew		90·1	328	17 48?	PP	—	—	—	—
Bidston		90·2	331	—	—	e 23 58	+ 2	43·8	58·5
Paris		90·3	325	e 12 57	− 7	e 25 10	?	43·8	48·8
Oxford		90·4	329	—	—	23 39	[+ 4]	e 38·8	58·7
Rathfarnham Castle		91·7	332	e 12 50	−20	i 24 6	− 4	43·8	50·8
Jersey		92·5	327	e 14 21?	+67	e 24 33	+16	e 45·3	51·8
Pasadena		100·1	47	i 17 46	PP	—	—	e 47·2	—
Mount Wilson	Z.	100·2	47	e 17 34	PP	—	—	—	—
Riverside	Z.	100·8	47	e 17 50	PP	—	—	—	—
Tucson		106·1	44	e 18 34	PP	—	—	—	—
Seven Falls		109·7	8	—	—	e 37 48?	?	48·8	—
Ottawa		110·5	12	—	—	e 28 24	PS	49·8	—
Vermont		111·9	11	—	—	e 24 45	PS	e 53·9	—
Huancayo		161·0	59	e 19 34	[−28]	—	—	70·9	—
Rio de Janeiro	E.	165·7	266	e 24 48	PP	—	—	—	—
La Paz		169·3	57	e 20 12a	[+ 3]	—	—	82·8	99·3

Additional readings :—

Hong Kong ? = +1m.50s., +3m.11s., and +3m.28s.
Zi-ka-wei iN = +4m.20s. and +4m.30s., iE = +4m.46s. and +5m.0s., iN = +5m.38s., +6m.4s., +7m.0s., +8m.6s., and +9m.30s.
Phu-Lién PP = +3m.32s.
Sumoto SE = +7m.19s.
Calcutta ePPPN = +8m.35s., eSSN = +14m.50s., iN = +16m.2s.
Irkutsk e = +7m.50s. and +14m.30s.
Agra PPPE = +9m.19s., SSSE = +16m.30s.
Kodaikanal PPE = +10m.0s., PPPE = +10m.47s., SSE = +18m.17s., SSSE = +19m.33s.
Bombay ePP = +9m.48s., eP_cP = +10m.13s., eSS = +18m.16s., eS_cS = +18m.26s., iGE = +18m.46s., eN = +25m.46s.
Perth iP = +9m.43s., eSP = +17m.41s., SS = +21m.41s., SSS = +23m.38s.
Sverdlovsk L_q = +26·9m.
Sydney e = +33m.1s.
Tiflis eN = +11m.2s., SE = +19m.33s., eE = +28m.24s. and +33m.0s.
College S = +20m.38s.
Ksara PP = +14m.31s., ePS = +22m.0s.
Upsala eE = +22m.36s.
Bucharest PSE = +22m.27s., ? = +22m.53s.

Continued on next page.

Helwan e = +12m.26s. and +13m.28s., PP = +15m.18s.
Christchurch L_q = +35·3m.
Budapest iN = +10m.57s.
Belgrade eNW = +12m.58s. and +17m.24s.
Copenhagen +22m.40s. and +28m.6s.
Vienna PP = +15m.46s., PS = +23m.17s.
Prague e = +34m.18s.
Scoresby Sund +28m.6s.
Hamburg eE = +34m.54s.
Triest i = +24m.13s., eN = +35m.18s.?
Stuttgart eP = +12m.54s.a, eZ = +14m.56s., eS = +23m.33s., ePS = +24m.21s., eSS = +29m.0s., eZ = +30m.17s., e = +33m.18s.
De Bilt PPZ = +16m.16s.
Aberdeen i = +23m.36s., e = +29m.22s., eS = +32m.31s., e = +33m.34s. and +36m.6s.
Strasbourg PPZ = +16m.18s., PPPZ = +17m.23s., eSZ = +23m.46s., PSZ = +24m.40s., SSE = +29m.28s., SSSNZ = +33m.38s.
Zurich ePP = +16m.17s., e = +31m.45s.
Uccle PPZ = +16m.27s., PSN = +24m.40s., SSE = +29m.37s., i = +30m.8s.
Durham iN = +23m.12s.
Rathfarnham Castle i = +23m.45s.
Jersey ePS = +25m.32s., eSS = +30m.35s., eSSS = +35m.29s.
Ottawa eE = +39m.48s.
Huancayo ePKP = +20m.48s., PP = +24m.47s., ePPP = +28m.24s., iPPS = +38m.26s., SS = +44m.49s., SSS = +51m.24s.
La Paz PPZ = +25m.30s., SSN = +46m.8s., SSSN = +52m.48s.
Long waves were also recorded at Bozeman, Philadelphia, East Machias, Barcelona, Cape Town, Malaga, Karlsruhe, San Fernando, Toledo, Ivigtut, Williamstown, Algiers, Granada, and Almeria.

Dec. 17d. 15h. Eastern Europe :—

Prato eP = 29m.46s.
Zurich eP = 30m.8s., eP_g = 30m.22s., eS_g? = 31m.5s.
Triest eP_g = 30m.12s., iS_g = 30m.53s.
Chur eP_g = 30m.16s., eS_g = 30m.46s.
Stuttgart ePZ = 30m.25s., eP_gZ = 30m.53s., eS = 31m.18s., eS_g = 32m.13s.
Neuchatel iP = +30m.31s.
Basle eP_g = +30m.32s., eS_g = 31m.38s.
Ravensburg eS = +31m.6s., eS* = +31m.27s., eS_g = 31m.39s.
Strasbourg e = 31m.38s., eS_g = 32m.12s., eSS = 32m.17s.
Zagreb eEZ = 31m.41s., e = 32m.0s.
Jena eN = 32m.0s.

Dec. 17d. 19h. 3m. 8s. Epicentre 54°·6N. 169°·9E.

A = −·5730, B = +·1012, C = +·8133; δ = +3; h = −7;
D = +·174, E = +·985; G = −·801, H = +·141, K = −·582.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
College		23·1	47	—	—	e 9 58	SS	—	—
Mizusawa		24·8	244	(5 15)	−10	5 15	P	—	—
Irkutsk		37·9	295	e 7 18	− 2	e 13 6	− 7	18·9	—
Tinemaha	z.	50·7	79	i 9 5	+ 2	—	—	—	—
Mount Wilson	z.	52·8	81	i 9 20	+ 1	—	—	—	—
Pasadena		52·8	81	i 9 20	+ 1	—	—	—	—
Riverside	z.	53·4	81	i 9 23	+ 1	—	—	—	—
Sverdlovsk		55·0	321	i 9 36	+ 1	e 17 19	+ 2	25·9	36·2
Tucson		58·4	77	e 10 0	0	—	—	—	—
Pulkovo		61·4	338	—	—	e 18 45	+ 5	35·4	42·2
Tashkent		63·0	305	i 10 28	− 3	e 18 57	− 4	e 31·4	40·6
Moscow		63·3	332	e 10 35	+ 2	e 19 11	+ 7	37·4	42·1
Ottawa		65·9	45	—	—	e 20 13	+36	—	—
Baku		72·4	317	e 11 30	0	e 20 55	+ 2	e 36·4	45·7
Tiflis		73·2	321	e 11 34	− 1	e 21 3	+ 1	e 38·4	49·7
Ksara		83·5	323	e 12 30	− 1	—	—	44·9	52·9

Additional readings :—
Tucson +10m.25s. and +10m.34s.
Ksara ePS = +24m.34s.
Long waves were also recorded at Vladivostok, Copenhagen, De Bilt, Stuttgart, Strasbourg, Uccle, Bombay, and Paris.

Dec. 17d. Readings also at 2h. (near Almeria, Granada, Malaga, Toledo, and near Sumoto), 3h. (Besançon, Strasbourg, near Basle, Chur, Neuchatel, Zurich, Stuttgart, and near Capodimonte), 5h. (near Capodimonte), 10h. (near Sumoto), 11h. (Perth), 12h. (Tucson and near Taihoku), 14h. (Andijan (4) and Mizusawa), 15h. (Oaxaca, St. Javier, near Santiago, Samarkand, and near Andijan (2)), 17h. (near Ottawa (2)), 20h. (Oaxaca), 21h. (near Wellington), 22h. (near Santiago (2)), 23h. (Tucson (2), La Paz, Frunse, Samarkand, and near Andijan).

Dec. 18d. 13h. 17m. 52s. Epicentre 41°·4N. 71°·6E.

$A = +\cdot2375$, $B = +\cdot7139$, $C = +\cdot6588$; $\delta = +8$; $h = -2$;
$D = +\cdot949$, $E = -\cdot316$; $G = +\cdot208$, $H = +\cdot625$, $K = -\cdot752$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan		0·9	138	i 0 41	+21	1 6	+34	—	—
Tashkent		1·7	268	i 0 33	+ 2	—	—	—	—
Frunse		2·7	56	0 52	P_g	i 1 32	S_g	—	—
Samarkand		3·9	245	i 1 11	P*	—	—	—	—
Almata		4·4	64	1 20	P*	2 33	S_g	—	—
Semipalatinsk		10·9	31	2 34	− 6	4 32	−12	—	—
Dehra Dun		12·2	153	3 18	PPP	5 38	SSS	8·0	8·1
Agra		15·2	156	3 48	PP	6 40	SS	7·6	10·7
Baku		16·4	273	i 3 52	− 1	i 6 56	0	8·7	—
Sverdlovsk		17·0	339	i 3 55	− 6	i 6 52	−18	8·5	—
Grozny		19·2	285	i 4 27	− 1	i 8 20	SS	—	—
Tiflis		20·0	280	4 35	− 2	i 8 17	0	—	—
Erevan		20·5	276	i 4 43	+ 1	i 8 31	+ 4	—	—
Piatigorsk		21·1	287	i 4 47	− 1	e 8 30	− 9	—	—
Bombay		22·4	177	i 5 19	+17	i 9 25	+21	11·4	15·4
Calcutta	N.	23·5	138	e 5 31	+19	i 9 50	+27	e 12·3	16·0
Sotchi		23·5	286	e 5 6	− 6	e 9 26	+ 3	—	—
Hyderabad		24·6	164	5 39	+16	10 4	+22	11·9	15·9
Irkutsk		24·7	53	i 5 29	+ 5	9 57	+13	13·1	—
Moscow		26·4	316	i 5 37	− 3	10 14	+ 2	13·6	15·3
Theodosia		26·5	291	5 39	− 2	e 10 26	+12	17·6	—
Ksara		29·1	266	i 6 8a	+ 4	11 14	+18	—	—
Pulkovo		31·3	321	6 20	− 4	11 37	+ 6	13·6	18·2
Kodaikanal	E.	31·5	169	e 6 41	+15	e 11 49	+15	15·8	18·3
Bucharest		33·1	291	6 42a	+ 2	i 12 12	+13	19·6	24·6
Lemberg		33·8	301	e 6 54	+ 8	—	—	e 18·4	22·8
Helwan		34·4	264	i 6 54	+ 3	—	—	—	—
Colombo		35·1	166	14 38?	S	(14 38)	SS	19·8	22·2
Phu-Lien		36·0	114	—	—	e 12 58	+14	—	—
Belgrade		37·0	293	i 7 11k	− 2	e 15 31	SS	e 21·4	24·6
Budapest	E.	37·3	298	7 16	0	—	—	—	23·6
	N.	37·3	298	e 7 23	+ 7	—	—	—	23·6
Upsala	E.	37·6	319	e 7 16	− 2	e 13 2	− 6	—	22·8
Stara Dala		37·9	299	e 7 19	− 1	e 12 58	−15	—	22·1
Vienna		39·0	300	e 7 29	− 1	e 13 22	− 7	e 17·1	26·6
Graz		39·4	298	i 7 32	− 1	e 13 40	+ 5	e 17·1	25·3
Zagreb		39·8	296	e 7 37	+ 1	—	—	—	—
Prague		39·9	304	e 7 34	− 3	e 13 29	−14	e 20·1	22·6
Copenhagen		40·4	312	7 39a	− 2	13 49	− 1	—	—
Laibach	N.W.	40·8	297	e 7 45a	0	i 14 0	+ 4	e 25·3	—
Zi-ka-wei		40·9	87	—	—	e 17 38	SSS	—	28·6
Cheb		41·3	304	e 7 47	− 2	e 14 0	− 4	e 20·1	26·1
Triest		41·3	297	i 7 44	− 5	i 14 9	+ 5	—	25·1
Jena		41·6	304	i 7 49	− 2	e 14 8	0	e 20·1	26·6
Hamburg		42·1	309	e 7 53a	− 2	17 8	SS	e 18·6	24·1
Göttingen		42·5	307	e 7 55	− 4	—	—	e 22·1	26·1
Stuttgart		43·6	302	i 8 6a	− 2	e 14 40	+ 2	e 22·6	24·5
Bergen		43·8	320	8 10	+ 1	14 35	− 5	—	26·3
Chur		43·9	300	e 7 57	−13	—	—	—	—
Karlsruhe		44·0	303	e 8 12	+ 1	e 14 46	+ 3	23·3	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Zurich		44·3	300	e 8 11a	− 2	—	—	—	—
Strasbourg		44·5	302	i 8 13a	− 2	i 15 4	+13	e 20·1	28·2
Medan		44·8	140	e 8 29	+12	—	—	e 28·1	—
Basle		44·9	300	e 8 17	− 1	—	—	—	—
De Bilt		45·2	308	8 19	− 1	15 6	+ 5	e 22·1	25·7
Neuchatel		45·5	300	e 8 20	− 3	—	—	—	—
Besançon		46·1	301	e 10 8?	PP	—	—	—	—
Uccle		46·1	306	8 26a	− 2	15 19	+ 5	e 22·1	—
Paris		47·8	304	e 8 39	− 2	e 15 45	+ 7	25·1	29·1
Aberdeen		48·1	316	e 8 38	− 5	e 15 42	0	—	29·6
Durham	N.	48·5	313	—	—	i 15 28	−20	—	32·1
Kew		48·7	308	i 8 46a	− 2	i 15 48	− 2	28·1	31·0
Edinburgh		49·0	315	i 10 47	PP	—	—	27·1	34·7
Oxford		49·2	309	i 8 59	+ 7	15 54	− 4	—	31·6
Stonyhurst		49·2	312	e 8 52	0	i 16 2	+ 4	28·1	32·6
Bidston		49·7	311	e 10 43	PP	e 19 34	SS	26·1	32·2
Gihu		50·3	74	9 2	+ 2	—	—	—	—
Manila		50·3	107	e 9 10	+10	16 26	+13	—	—
Jersey		50·5	307	i 9 8	+ 6	e 16 8	− 8	e 24·6	32·8
Nagoya		50·6	74	e 9 10	+ 8	—	—	—	—
Nagano		50·8	73	9 19	+15	—	—	—	—
Oiwake		51·2	74	9 20	+13	—	—	—	—
Maebasi		51·6	74	9 9	− 1	—	—	—	—
Rathfarnham Castle		51·6	313	e 8 18	−52	i 20 12	SS	27·1	33·1
Hunatu		51·7	75	9 12	0	—	—	—	—
Mizusawa	E.	51·8	69	(9 19)	+ 7	9 19	P	—	
Hukusima		51·9	71	9 18	+ 6	—	—	—	—
Misima		52·1	75	9 22	+ 8	—	—	—	—
Scoresby Sund		52·8	336	9 27	+ 8	—	—	18·1	—
Toledo		55·6	296	e 9 46	+ 6	—	—	e 31·7	—
Almeria		56·0	292	e 9 20	−23	e 17 29	− 1	—	—
Granada		56·6	293	e 9 38	− 9	e 17 28	−10	—	—
Batavia		57·3	137	—	—	e 16 47	−60	e 34·1	—
San Fernando		58·8	294	e 11 24	PP	e 18 16	+ 9	32·1	—
College		69·7	17	—	—	e 20 24	+ 2	e 28·3	—
Perth		83·6	144	e 12 36	+ 4	23 4	+11	i 43·1	—
Seven Falls		85·7	336	—	—	i 23 24	+10	46·1	—
Ottawa		88·8	338	i 12 57	0	e 23 32	[+ 7]	38·1	—
Victoria		89·6	10	—	—	e 23 56	+ 5	42·1	—
Oak Ridge		90·1	334	i 13 3	0	—	—	e 51·1	—
Weston		90·1	334	i 13 5	+ 2	e 23 40	[+ 7]	—	50·3
Williamstown		90·5	334	i 13 5	0	—	—	e 48·0	51·4
Bozeman		93·3	2	—	—	e 34 26	SSS	e 49·6	—
Philadelphia		93·6	335	—	—	e 24 0	[+ 7]	e 43·6	—
Mount Wilson	z.	104·2	8	e 14 10	+ 3	—	—	—	—
Pasadena		104·3	8	e 14 10	+ 2	—	—	e 62·1	—
Riverside	z.	104·5	8	e 14 9	+ 1	—	—	—	—
Tucson		106·7	2	e 14 23	P	—	—	e 87·1	—
La Paz		137·4	294	i 19 32k	[+ 6]	—	—	74·1	77·8
Huancayo		138·9	306	e 19 35	[+ 7]	e 27 15	[+38]	e 56·9	—

Additional readings :—
Frunse iP_g = +57s.
Agra ?E = +4m.38s., SSE = +7m.0s.
Sverdlovsk i = +3m.56s., +4m.53s., +6m.5s., and +6m.46s.
Grozny i = +5m.11s.
Piatigorsk i = +7m.5s.
Bombay PP = +5m.44s., eSSEN = +9m.59s.
Calcutta iPN = +5m.38s., iPPN = +6m.3s., iSN = +9m.56s.
Ksara PP = +6m.56s.
Kodaikanal SSE = +13m.23s.
Bucharest iE = +?m.56s. and +13m.54s., iN = +14m.15s., iE = +18m.46s.
Helwan i = +7m.44s., +8m.8s., +9m.15s., +10m.44s., +15m.42s., +16m.28s., and +17m.8s.
Colombo S = +17m.58s.

Continued on next page.

Belgrade eZ = +8m.29s., iNE = +9m.41s.
Budapest iE = +7m.25s., iN = +7m.29s. and +8m.16s., iE = +8m.36s. and +9m.10s., iN = +9m.23s., +15m.31s., and +15m.44s., iE = +17m.42s. and +18m.10s.
Upsala ePPN = +8m.34s., eSS = +15m.30s.
Vienna PP = +9m.3s., PPP = +9m.24s., SS = +16m.6s.
Graz ePP = +9m.1s.
Zagreb e = +9m.15s., eNE = +21m.38s., eZ = +23m.14s.
Prague ePP = +9m.8s.?
Copenhagen eEZ = +7m.47s., PP = +9m.10s., eE = +13m.55s.
Laibach eNW = +23m.41s.
Cheb ePP = +9m.17s.
Triest iE = +9m.29s., iSS = +16m.59s.
Jena iPP = +9m.20s., iPPZ = +9m.23s., iPPN = +9m.27s., eE = +16m.48s., eN = +17m.8s.
Hamburg iPPEZ = +9m.29s.
Göttingen e = +9m.30s.
Stuttgart pP = +8m.14s., PP = +9m.55s., eSS = +17m.40s.
Bergen PP = +9m.56s.
Zurich ePP = +9m.52s.
Strasbourg iPZ = +8m.21s., iPPZ = +9m.54s., iSSZ = +18m.5s.
Basle ePP = +10m.0s.
De Bilt PPZ = +10m.2s., SS = +18m.7s.
Uccle iPPZ = +10m.10s., SSE = +18m.31s.
Paris PP = +10m.28s.
Aberdeen iP = +8m.50s., i = +10m.28s., e = +18m.52s., i = +19m.22s. and +21m.47s., e = +24m.29s., i = +25m.30s.
Durham iN = +19m.27s.
Kew iZ = +9m.37s., iPPE = +10m.42s., iSS = +19m.35s., L_q = +26·1m.
Edinburgh i = +10m.57s. and +19m.43s.
Oxford ePE = +8m.44s., SS = +19m.26s.
Stonyhurst i = +10m.50s. and +19m.47s.
Manila iE = +16m.31s.
Jersey ePP = +10m.50s., eSS = +19m.38s., eSSS = +21m.8s., eSSSS = +23m.8s.
College eS_cS = +21m.40s., eSS = +24m.47s., eSSS = +28m.11s.
Perth PP = +16m.11s., i = +30m.43s.
Seven Falls e = +31m.32s.
Ottawa e = +33m.8s.
Oak Ridge iN = +45m.8s.?
Weston eSS = +30m.15s.
Philadelphia ePS = +25m.38s.
Mount Wilson iZ = +18m.16s., iPPZ = +18m.27s., ePKKPZ = +30m.2s.
Pasadena eZ = +18m.22s., iPPZ = +18m.29s., ePKKPZ = +30m.1s.
Riverside eZ = +18m.14s.
Tucson PP = +18m.44s.
La Paz SKP = +22m.12s., iSKP = +23m.18s.
Huancayo eP = +17m.54s., ePP = +22m.37s., ePPS = +34m.39s., eSS = +41m.18s.
Long waves were also recorded at Kobe, Malaga, St. Louis, Ivigtut, Berkeley, San Juan, Ukiah, East Machias, Columbia, Algiers, and Cape Town.

Dec. 18d. 20h. 49m. 5s. Epicentre 8°·0N. 81°·0W.

A = +·1549, B = −·9782, C = +·1383; δ = 0; h = +7;
D = −·988, E = −·156; G = +·022, H = −·137, K = −·990.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		1·7	56	i 0 36	P_g	i 0 46	− 8	1·0	·1·3
San Juan		17·8	53	e 4 10	− 1	e 7 34	+ 6	i 8·4	—
Huancayo		20·7	165	e 4 38	− 6	e 8 38	+ 7	i 9·7	—
Columbia		25·9	0	—	—	e 10 25	+21	e 12·3	—
La Paz		27·5	152	i 5 53k	+ 3	i 10 51	+21	14·2	16·6
St. Louis	N.	31·6	346	i 6 25	− 1	e 11 36	+ 1	e 14·3	—
Florissant	Z.	31·8	346	e 6 33	+ 5	e 13 49	SSS	e 14·3	—
Tucson		36·7	316	7 12	+ 2	—	—	e 17·5	—
Ottawa		37·5	7	e 8 55?	PP	—	—	13·9	—
Mount Wilson	z.	42·9	313	i 8 2	0	—	—	—	—
Pasadena		43·0	313	i 8 3	0	—	—	—	—
Santa Barbara	z.	44·2	312	e 8 12	0	—	—	—	—
Tinemaha		44·6	316	i 8 16	0	—	—	—	—
Rio de Janeiro		48·1	131	—	—	e 15 41	− 1	e 25·4	—

For Notes see next page.

NOTES TO DEC. 18d. 20h. 49m. 5s.

Additional readings and notes :—
San Juan iPP = +4m.16s., i = +4m.29s.
Huancayo iPP = +4m.50s., i = +8m.42s. and +9m.2s.
La Paz iSSN = +12m.23s., iSSSN = +13m.1s.
St. Louis eN = +7m.24s.
Florissant eN = +9m.25s.
Tucson ePP = +8m.39s.
Rio de Janeiro eN = +15m.49s.
Long waves were also recorded at East Machias, Scoresby Sund, Copenhagen, De Bilt, Stuttgart, Uccle, Ksara, Sverdlovsk, Baku, Tashkent, and Tiflis.

Dec. 18d. Readings also at 2h. (Ksara, Riverview, Sydney, Perth, Christchurch, and Wellington), 3h. (Tucson and Capodimonte), 5h. (Balboa Heights, Mizusawa, Wellington, and near Christchurch), 6h. (La Paz), 7h. (Tiflis), 8h. (Triest, Tchimkent, Samarkand, Frunse, and near Andijan), 10h. (Tucson, Ksara, Tiflis, Grozny, Nagoya, and near Mizusawa), 11h. (near Santiago), 13h. (Mizusawa), 14h. and 15h. (Christchurch), 17h. (Sverdlovsk, Tashkent, Zurich, and Tucson), 18h. (Christchurch), 19h. (New Plymouth, Yalta, and near Balboa Heights), 20h. (Philadelphia, Sverdlovsk, Ksara, Tashkent, Grozny, Tiflis, Samarkand, Andijan, Frunse, near Baku, and near Balboa Heights), 21h. (2) 22h. (4) and 23h. (near Balboa Heights).

Dec. 19d. Readings at 1h. (near Santiago), 2h. (Balboa Heights), 4h. (Balboa Heights, near Mizusawa, and near Nagoya), 5h. (Hamburg, Upsala, near Averroes, and near Samarkand), 10h. (Samarkand), 12h. (Tiflis, Ksara, and Samarkand), 14h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Samarkand, and Mizusawa), 16h. (Bucharest, Chur, Phu-Lien, and near Mizusawa), 18h. (Branner, near Berkeley, and Lick), 20h. (Balboa Heights), 23h. (near Berkeley).

Dec. 20d. 3h. 35m. 39s. Epicentre 8°·5S. 156°·0E. (as on Dec. 8d.).

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Brisbane		19·1	188	i 4 27	0	i 8 21	SS	10·0	11·8
Riverview		25·6	189	e 5 37	+ 5	e 10 13	+14	e 13·2	15·9
Sydney		25·6	189	e 5 41	+ 9	i 10 37	+38	e 14·1	14·8
Melbourne		30·9	197	—	—	i 13 11	SSS	15·4	17·4
Wellington		36·6	156	—	—	e 15 21?	SS	—	23·4
Christchurch		37·8	160	i 7 56	+36	14 0	+49	e 19·5	—
Manila		41·6	303	7 50	− 1	14 9	+ 1	—	—
Perth		44·0	231	i 8 43	+32	i 15 1	+18	i 22·7	25·8
Batavia		48·8	269	e 8 45	− 4	—	—	—	—
Pasadena		91·3	56	i 13 6a	− 3	—	—	—	—
Mount Wilson	z.	91·4	56	i 13 6a	− 3	—	—	—	—
Tinemaha	z.	91·7	53	e 13 6	− 4	—	—	—	—
Riverside		91·9	56	i 13 8a	− 3	—	—	—	—
Sverdlovsk		100·0	327	e 17 41	PP	e 24 23	[− 4]	45·4	60·2
Tiflis		111·4	312	—	—	e 28 52	PS	e 61·4	67·6
Moscow		112·8	327	e 19 22	PP	—	—	59·8	67·4
Ksara		119·4	304	e 20 21	PP	e 23 1	PPP	—	73·4
Balboa Heights		125·1	85	—	—	e 38 45	SS	—	—

Additional readings :—
Brisbane ePE = +4m.33s.
Riverview iE = +10m.26s., iN = +10m.32s.
Christchurch L_gE = +16·9m.
Manila iN = +16m.3s., iE = +17m.19s.
Perth i = +10m.21s., +18m.21s., and +21m.51s.
Batavia iE = +10m.35s.
Long waves were also recorded at Hong Kong, Vladivostok, Tashkent, Baku, Copenhagen, De Bilt, Stuttgart, and Scoresby Sund.

Dec. 20d. 4h. 59m. 39s. Epicentre 29°·3N. 81°·0E. (as on 1937 May 31d.).

$A = +\cdot1366$, $B = +\cdot8627$, $C = +\cdot4869$; $\delta = -2$; $h = +2$;
$D = +\cdot988$, $E = -\cdot156$; $G = +\cdot076$, $H = +\cdot481$, $K = -\cdot873$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Dehra Dun		2·8	292	0 1?	?	0 31	−51	—	0·8
Agra		3·4	231	0 58	+ 3	i 1 50	S_g	—	—
Calcutta	N.	9·4	134	—	—	e 4 4	− 3	—	—
Bombay		12·7	218	e 3 1	− 4	e 5 20	− 8	—	6·9
Andijan		13·4	330	e 3 18	+ 4	e 5 36	− 9	e 7·8	—
Frunse		14·5	339	—	—	e 5 56	−15	e 8·6	—
Tashkent		15·3	325	e 3 35	− 4	i 6 14	−16	e 8·0	9·2
Samarkand		15·5	315	e 3 39	− 3	e 6 23	−12	—	—
Kodaikanal	E.	19·3	192	—	—	8 10	+ 8	—	—
Sverdlovsk		31·0	339	6 20	− 1	e 12 5	+39	19·4	—
Tiflis		31·7	302	e 6 28	+ 1	—	—	e 20·4	—
Moscow		40·5	323	e 7 41	− 1	—	—	e 20·8	25·2
Polkovo		45·6	326	e 10 41	PPP	e 18 20	SS	—	27·2

Additional readings :—
Agra eN = +1m.2s., iE = +1m.8s. and +1m.40s.
Calcutta i = +4m.16s. and +4m.29s., iS_g = +5m.7s., iN = +5m.26s. and +5m.39s.
Bombay S_g = +6m.35s.
Tashkent e = +4m.16s. and +7m.4s.
Sverdlovsk L_q = +16·6m.
Moscow e = +9m.20s.
Pulkovo e = +11m.13s.
Long waves were also recorded at Almata, Hyderabad, Copenhagen, De Bilt, and Stuttgart.

Dec. 20d. 22h. 35m. 1s. Epicentre 25°·8S. 137°·0E.

$A = -\cdot6593$, $B = +\cdot6148$, $C = -\cdot4329$; $\delta = +6$; $h = +3$;
$D = +\cdot682$, $E = +\cdot731$; $G = +\cdot317$, $H = -\cdot295$, $K = -\cdot901$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Adelaide		9·2	172	i 2 13	− 3	i 3 51	−12	i 4·8	5·2
Melbourne		13·8	153	i 3 57	PPP	5 31	−23	—	—
Riverview		14·7	127	e 3 33	+ 2	i 6 59	SSS	9·0	11·8
Perth		19·5	247	i 8 1	S	(i 8 1)	− 5	10·0	11·0
Amboina		23·6	340	i 5 16	+ 3	i 10 47	SSS	—	—
Batavia		34·8	300	i 6 53	− 1	i 12 29	+ 4	—	—
Wellington		34·8	126	—	—	e 13 59?	?	—	19·0
Manila		43·1	338	8 4	0	14 33	+ 3	—	—
Andijan		89·3	317	e 13 1	+ 2	—	—	—	—
Sverdlovsk		104·2	327	e 18 23	PP	—	—	50·0	—
Ksara		112·6	297	—	—	e 36 25	SS	60·5	68·0
Huancayo		130·9	136	i 22 8	PP	—	—	—	—
Toledo		144·7	303	i 19 39a	[+ 1]	—	—	—	—
Williamstown		150·1	46	i 19 48	[+ 1]	—	—	—	—
Oak Ridge	z.	151·3	47	e 19 50	[+ 1]	—	—	—	—
Weston	z.	151·5	48	i 20 40k	[+51]	—	—	—	—

Additional readings :—
Adelaide i = +2m.34s. and +3m.59s.
Perth S = +9m.5s.
Melbourne S = +7m.29s.?
Riverview iN = +7m.4s. and +7m.35s., iZ = +7m.51s.
Huancayo i = +22m.26s.
Oak Ridge iZ = +19m.55s. and +19m.58s.
Weston iZ = +24m.43s.
Long waves were also recorded at Christchurch and Sydney.

Dec. 20d. Readings also at 1h. (La Paz), 4h. (Andijan and Tacubaya (2)), 6h. (Balboa Heights), 7h. (Perth), 8h. (Santiago), 12h. (Tucson, Riverside, Tinemaha, and Pasadena), 14h. (Santiago (4)), 18h. (La Paz and Huancayo), 22h. (Branner and Berkeley).

Dec. 21d. Readings at 3h. (Balboa Heights and near Andijan (2)), 4h. (Zagreb), 5h. (near Perth and near La Paz), 6h. (Tucson and near Piatigorsk, Sotchi, and Tiflis), 9h. (Balboa Heights), 10h. (Tucson, San Juan, Huancayo, and La Paz), 12h. (Medan and Tacubaya), 13h. (Copenhagen, Huancayo, and La Paz), 14h. (Mizusawa and Nagoya), 15h. (Batavia, Mizusawa, and Scoresby Sund), 16h. (near Sumoto), 17h. (Jersey and La Paz), 23h. (Tucson).

Dec. 22d. 3h. 37m. 23s. Epicentre 18°·7N. 105°·2W. (as on 1937 Sept. 20d.).

$A = -\cdot2485$, $B = -\cdot9147$, $C = +\cdot3187$; $\delta = 0$; $h = +5$;
$D = -\cdot965$, $E = +\cdot262$; $G = -\cdot084$, $H = -\cdot308$, $K = -\cdot948$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manzanillo	N.	0·9	67	0 38	+18	(0 38)	+ 4	—	—
Guadalajara	N.	2·6	41	1 3	P_g	—	—	—	—
Mazatlan	N.	4·7	347	1 33	P_g	—	—	—	—
Tacubaya	N.	5·8	80	1 35	+ 6	—	—	—	—
Oaxaca	N.	8·2	101	2 3	0	—	—	—	—
Vera Cruz	N.	8·6	86	2 11	+ 2	—	—	—	—
Tucson		14·4	341	i 3 28	+ 1	e 6 25	SS	i 7·2	—
Merida	N.	14·8	79	e 3 52	PPP	—	—	—	—
Riverside		18·7	326	e 4 16	− 6	—	—	—	—
Mount Wilson		19·3	326	i 4 24	− 5	—	—	—	—
Pasadena		19·3	326	i 4 24k	− 5	i 8 19	+17	e 9·6	—
Little Rock		19·7	34	e 4 35	+ 1	e 8 34	SS	i 11·1	—
Haiwee		20·7	330	e 4 41	− 3	—	—	—	—
Denver		20·9	1	e 4 53	+ 7	i 8 59	+24	e 11·3	12·6
Tinemaha		21·6	330	i 4 49	− 5	e 9 6	+17	—	—
Fresno	N.	22·1	328	e 4 56	− 3	—	—	—	—
Lick		23·5	326	e 5 9	− 3	e 9 35	+12	—	—
Branner		23·8	326	e 5 13	− 2	e 9 37	+ 9	—	—
St. Louis		23·8	30	e 5 17	+ 2	e 9 44	+16	e 12·1	13·1
Florissant		23·9	30	i 5 20	+ 4	i 9 50	+20	e 13·1	—
Berkeley		24·2	326	i 5 16	− 3	e 9 47	+12	e 12·8	—
San Francisco		24·3	326	e 5 16	− 4	e 9 52	+15	—	—
Ukiah		25·7	327	e 5 33	0	e 9 52	− 9	i 11·0	—
Columbia		26·4	49	i 5 50	+10	e 10 25	+13	e 11·3	—
Cincinnati		27·1	37	i 5 52	+ 6	i 10 48	+24	—	—
Bozeman		27·3	352	e 5 46	− 2	10 38	+11	e 11·4	—
Ferndale	E.	27·3	328	e 7 57	?	—	—	—	—
Chicago		27·5	28	e 5 55	+ 5	e 10 31	+ 1	e 11·9	—
Chicago Loyola		27·5	28	e 5 59	+ 9	e 10 55	+25	—	—
Madison		27·7	24	e 5 56	+ 4	e 10 47	+14	e 14·6	—
Butte		27·9	350	5 54	0	e 10 27	−10	e 14·3	—
Georgetown		31·6	45	i 6 29	+13	i 11 57	+22	15·8	—
Seattle		32·1	338	e 7 48	PPP	e 11 6	−37	e 12·7	—
Toronto		33·0	35	6 46	+ 7	12 16	+19	16·6	—
Victoria		33·1	338	e 6 52	+12	12 5	+ 6	17·3	—
Philadelphia		33·4	45	e 6 42	0	i 12 14	+11	i 18·9	—
Saskatoon		33·4	358	—	—	e 12 7	+ 4	16·6	—
Fordham		34·7	44	i 6 57	+ 3	—	—	—	—
Williamstown		36·1	42	i 7 0	− 5	i 12 51	+ 6	e 17·7	20·8
Ottawa		36·2	36	e 7 9	+ 3	i 13 5	+18	18·6	—
San Juan		37·0	83	e 7 15	+ 2	e 12 46	−13	e 14·7	—
Oak Ridge		37·1	42	i 7 18	+ 4	i 13 17	+16	e 20·6	—
Vermont		37·1	39	i 7 17	+ 3	i 13 15	+14	e 16·3	—
Weston		37·2	42	e 7 20k	+ 5	e 13 16	+14	e 19·1	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Shawinigan Falls		39·3	36	7 26	− 6	13 38	+ 4	20·1	—
Seven Falls		39·9	36	7 37	0	13 55	+12	19·6	—
East Machias		40·8	41	e 7 55	+10	14 9	+13	e 18·8	—
Huancayo		42·4	134	e 7 50	− 8	e 14 3	−17	i 19·1	—
Sitka		44·4	337	—	—	i 14 59	+10	e 18·2	—
Honolulu		49·3	282	—	—	e 19 10	SS	e 19·7	—
La Paz		50·5	131	8 58	− 4	i 16 21	+ 5	i 22·7	27·6
College		54·1	339	e 9 25	− 4	e 16 54	−11	e 22·2	—
Ivigtut		58·1	28	10 18	+20	18 9	+11	29·6	—
Scoresby Sund		70·3	20	11 43	+26	20 40	+11	32·6	—
Rio de Janeiro	E.	73·3	121	e 21 3	S	(e 21 3)	− 1	e 40·0	—
Edinburgh		81·3	34	—	—	i 22 44	+14	e 39·6	49·7
Aberdeen		81·4	33	—	—	e 22 43	+12	e 39·1	46·4
Bidston		82·2	36	e 13 29	+65	i 22 59	+20	36·6	—
Stonyhurst		82·4	35	e 13 7	+42	i 22 52	+11	e 39·6	47·4
Durham	N.	82·5	35	—	—	e 22 57	+15	—	42·1
Bergen		83·6	27	—	—	e 23 37?	PS	—	—
Oxford		83·8	37	e 13 1	+29	i 23 1	+ 6	e 35·1	49·7
Jersey		84·3	39	e 12 47	+12	e 23 15	+15	e 41·6	48·8
Kew		84·5	37	e 12 53	+17	i 23 18	+16	39·6	48·9
San Fernando		86·1	53	e 12 8	−36	23 32	+14	45·1	—
Averroes	N.	86·2	56	—	—	e 23 24	+ 5	—	—
Toledo		86·4	49	e 12 55	+10	e 23 36	+15	—	—
Paris		87·2	39	e 13 26	+37	e 23 37?	+ 9	43·6	53·6
De Bilt		87·3	35	i 13 28	+38	e 23 38	+ 9	e 39·6	44·9
Uccle		87·4	37	e 13 9	+19	23 26	− 4	e 39·6	—
Granada		87·7	51	i 12 49	− 3	e 32 42	SSS	—	—
Hamburg		89·1	33	e 11 37?	−81	e 23 37?	[+10]	e 44·6	53·2
Upsala		89·1	25	e 12 37?	−21	e 23 37	[+10]	e 41·6	52·2
Copenhagen		89·2	30	16 55	PP	23 40	− 7	e 36·6	—
Göttingen		90·2	34	—	—	e 23 25	[− 8]	e 43·6	—
Strasbourg		90·4	37	e 13 12	+ 8	23 46	[+11]	e 41·6	45·6
Stuttgart		91·2	37	e 13 19	+11	e 23 39	[0]	e 41·6	57·1
Cheb		92·2	35	e 15 37?	?	e 23 55	[+10]	e 46·6	57·6
Prague		93·3	34	e 14 1	+43	e 24 7	−17	e 41·1	49·6
Pulkovo		93·9	21	e 17 6	PP	24 29	0	43·1	47·3
Wellington		94·1	228	—	—	e 37 37?	?	e 42·6	—
Triest		95·4	38	e 17 4	PP	24 5	[+ 2]	46·7	—
Graz		95·6	37	e 22 8	?	e 32 56	?	e 44·6	57·2
Christchurch		97·7	227	26 13	S	(26 3)	+62	43·9	—
Vladivostok		99·2	321	e 17 42	PP	25 21	+ 7	—	65·3
Moscow		99·4	19	e 14 31	+45	e 26 3	+48	48·1	59·0
Sverdlovsk		103·8	6	e 18 25	PP	i 33 19	SS	42·6	59·7
Irkutsk		104·8	341	—	—	e 27 43	PS	53·6	—
Brisbane	N.	108·5	247	—	—	e 27 13	PS	e 33·9	51·6
Riverview		111·3	241	—	—	e 33 19	SS	e 50·9	59·0
Tiflis		113·8	24	e 15 11	P	e 29 19	PS	e 47·6	69·3
Ksara		115·9	35	e 19 50	PP	e 29 36	PS	55·6	63·6
Melbourne		116·7	237	—	—	e 29 27	PS	53·1	55·6
Baku		116·8	21	e 20 18	PP	29 53	PS	52·6	66·7
Tashkent		120·1	4	e 19 36	[+43]	e 36 31	SS	e 55·1	72·2
Manila		123·8	303	21 3	PP	—	—	—	—
Cape Town		127·9	119	e 19 18	[+10]	—	—	e 63·6	—
Agra	E.	134·3	356	e 23 8	?	—	—	—	—
Helwan		116·1	42	e 24 4	?	e 29 41	PS	—	—
Calcutta	N.	136·9	342	23 10	?	27 20	[+46]	e 61·9	90·2
Perth		140·9	243	—	—	29 37?	{+11}	—	—
Bombay		142·6	3	e 19 52	[+17]	e 41 35	SS	—	87·6
Batavia		146·4	288	i 19 38	[− 3]	—	—	—	—
Kodaikanal	E.	151·1	355	e 20 24	[+35]	—	—	—	—

For Notes see next page.

NOTES TO DEC. 22d. 3h. 37m. 23s..

Additional readings :—
Tucson iPP = +3m.58s., i = +5m.5s., S = +6m.44s.
Little Rock iP = +4m.38s., iN = +5m.29s., iE = +6m.59s., iSE = +8m.39s.
Denver ePPN = +5m.17s., iSE = +9m.2s., eN = +9m.47s., eSSN = +9m.56s., eE = +9m.59s.
Branner eN = +24m.41s.
St. Louis iPEN = +5m.21s., iPP = +5m.52s., iPPP = +6m.6s., iE = +6m.27s., iSEN = +9m.54s., eSSE = +10m.35s.
Florissant iNZ = +5m.24s., ePPPZ = +6m.9s., eZ = +9m.41s., eN = +9m.44s., eEN = +9m.54s., iZ = +13m.58s.
Berkeley iP$_c$PE = +8m.56s., iN = +9m.6s., eSN = +9m.53s., eZ = +10m.4s.
Ukiah ePP = +6m.18s., eS = +10m.9s.
Columbia ePPP = +6m.44s., eS = +10m.33s.
Cincinnati iPP = +6m.32s., SS = +11m.55s.
Bozeman ePP = +6m.21s.
Chicago S = +10m.47s., iS = +11m.3s.
Chicago Loyola ePPP = +6m.47s.
Madison e = +7m.37s.?
Butte eS = +10m.47s.
Georgetown i = +11m.46s., iS = +12m.4s.
Seattle e = +8m.38s.
Toronto PP = +7m.49s., SS = +14m.25s.
Victoria SS = +14m.25s.
Philadelphia iP = +6m.48s., i = +7m.42s., iS = +12m.18s., e = +14m.38s.
Saskatoon e = +14m.37s.?
Fordham i = +18m.57s., +23m.27s., and +31m.16s.
Williamstown iPP = +8m.13s., iSS = +15m.1s.
Ottawa PP = +8m.37s., e = +12m.55s., SSN = +15m.41s., SSS = +16m.7s.
San Juan eP = +7m.33s., ePPP = +9m.5s., iS = +13m.13s.
Oak Ridge PPZ = +8m.45s., eSSZ = +16m.5s.
Vermont eP = +7m.23s., iPP = +8m.43s., iS = +13m.24s.
Weston iPEZ = +7m.23s., iPP = +18m.46s., iS = +13m.18s., iGN = +17m.56s.
Seven Falls e = +9m.7s., SSS = +16m.48s.
East Machias eP = +8m.34s., iP$_c$P = +9m.29s., iPPP = +10m.6s., i = +21m.37s.
Huancayo iP = +8m.0s., ePP = +9m.15s., ePPP = +10m.11s., iS = +14m.14s.
Sitka eSS = +17m.52s.
La Paz iPZ = +9m.1s., iPPN = +10m.59s., iPPPN = +11m.47s., iSN = +16m.32s., iPS?N = +16m.56s., iSSN = +19m.52s.
College eP = +9m.46s., ePP = +11m.44s., ePPP = +12m.45s.
Ivigtut +13m.38s., SS = +22m.13s. and +24m.43s.
Scoresby Sund +25m.13s.
Rio de Janeiro ePN = +21m.7s., eSE = +29m.27s., eSN = +29m.37s.
Aberdeen i = +24m.48s. and +29m.44s., e = +35m.8s. and +41m.10s.
Jersey ePP = +15m.54s., ePS = +24m.17s., ePPS = +24m.55s., eSS = +29m.4s., e = +32m.15s.
San Fernando ePPN = +15m.50s.
Averroes iSN = +23m.36s., eN = +24m.1s. and +25m.3s.
Uccle ePPE = +16m.21s., iSE = +23m.43s., SSN = +29m.33s., iE = +30m.1s., SSSE = +33m.17s., i = +33m.37s.
Copenhagen PS = +24m.59s., SS = +29m.55s.
Strasbourg ePPZ = +16m.48s., PPPZ = +18m.46s., SN = +24m.43s., iPS = +25m.23s., iSSEZ = +30m.19s.
Stuttgart eP$_c$PEZ = +13m.45s., ePP = +16m.49s., eS = +24m.47s.; ePS = +25m.24s., eSS = +30m.17s., eSSS = +34m.37s.
Pulkovo e = +20m.20s., +22m.39s., +26m.10s., +28m.36s., and +29m.4s.
Christchurch eSN = +34m.25s., SS = +38m.34s.
Vladivostok eSS = +32m.25s.
Moscow ePP = +18m.8s., eSS = +32m.49s.
Sverdlovsk eSSS = +37m.13s.
Tiflis ePPN = +19m.42s., eE = +21m.11s.
Ksara ePPP = +22m.20s.
Baku PPS = +31m.12s., SS = +36m.31s.
Tashkent PS = +29m.57s., PPS = +31m.34s., eSSS = +41m.7s.
Calcutta iN = +32m.2s., eN = +41m.27s.
Bombay iN = +22m.57s., eEN = +59m.35s.
Batavia iN = +20m.39s.
Long waves were also recorded at Sydney, La Plata, Karlsruhe, Rathfarnham Castle, Tortosa, Almeria, Belgrade, Apia, Bucharest, Barcelona, Grozny, Hong Kong, and Hyderabad.

Dec. 22d. 7h. 35m. 13s. Epicentre 18°·7N. 105°·2W. (as at 3h.).

$A = -\cdot2485$, $B = -\cdot9147$, $C = +\cdot3187$; $\delta = 0$; $h = +5$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manzanillo	N.	0·9	67	0 28	+ 8	—	—	—	—
Guadalajara	N.	2·6	41	0 52	P_g	—	—	—	—
Mazatlan	N.	4·7	347	1 26	P*	—	—	—	—
Tacubaya	N.	5·8	80	1 25	− 4	—	—	—	—
Tucson		14·4	341	3 51	PPP	e 6 34	SSS	9·7	—
Riverside	Z.	18·7	326	e 4 20	− 2	—	—	—	—
Mount Wilson		19·3	326	e 4 28	− 1	—	—	—	—
Pasadena		19·3	326	i 4 27	− 2	i 8 27	SS	e 9·5	—
Little Rock		19·7	34	e 4 37	+ 3	e 8 28	SS	i 10·4	e 12·3
Haiwee	Z.	20·7	330	e 4 44	0	—	—	—	—
Tinemaha		21·6	330	e 4 51	− 3	—	—	—	—
Fresno	N.	22·1	328	e 4 59	0	—	—	—	—
St. Louis		23·8	30	i 5 17	+ 2	e 9 47	+19	e 13·1	—
Florissant		23·9	30	i 5 17	+ 1	e 9 44	+14	—	i 13·1
Berkeley		24·2	326	e 5 18	− 1	—	—	—	—
Columbia		26·4	49	—	—	e 10 25	+13	e 12·7	—
Bozeman		27·3	352	—	—	e 10 29	+ 2	—	—
Chicago		27·5	28	—	—	e 10 41	+11	e 14·3	—
Madison		27·7	24	—	—	e 10 47?	+14	—	—
Butte		27·9	350	e 5 54	0	e 10 39	+ 2	e 13·4	—
Toronto		33·0	35	—	—	e 12 5	+ 8	17·8	—
Victoria		33·1	338	—	—	e 12 11	+12	15·8	—
Philadelphia		33·4	45	e 6 43	+ 1	e 12 9	+ 6	e 14·3	—
Williamstown		36·1	42	i 7 7	+ 2	—	—	—	—
Ottawa		36·2	36	7 8	+ 2	12 55	+ 8	19·8	—
San Juan		37·0	83	e 8 55	PPP	—	—	e 17·8	—
Oak Ridge		37·1	42	e 7 14	0	e 13 14	+13	e 21·6	—
Vermont		37·1	39	e 8 46	PP	e 13 12	+11	e 17·1	—
Weston		37·2	42	i 7 15	0	e 13 2	0	—	21·3
Seven Falls		39·9	36	—	—	e 13 47?	+ 4	20·8	—
East Machias		40·8	41	—	—	e 14 11	+15	e 17·4	—
Huancayo		42·4	134	e 7 49	− 9	e 14 4	−16	e 17·6	—
La Paz		50·5	131	8 53	− 9	16 25	+ 9	22·8	27·2
De Bilt		87·3	35	—	—	e 23 45	+16	e 43·8	50·8
Uccle		87·4	37	—	—	e 23 23	− 7	e 39·8	—
Sverdlovsk		103·8	6	—	—	e 25 57	+ 5	47·8	56·2
Ksara		115·9	35	e 20 4	PP	e 30 58	PPS	57·8	—

Additional readings :—
Tucson S = +7m.2s., i = +10m.2s.
Little Rock iEN = +4m.47s., iSE = +8m.40s.
St. Louis ePPE = +5m.52s.
Florissant ePPN = +5m.47s., eZ = +9m.48s.
Philadelphia eP = +7m.22s.
San Juan ePPP = +9m.17s.
Huancayo ePP = +9m.32s., eS = +14m.14s.
Sverdlovsk e = +33m.14s.
Long waves were also recorded at Oaxaca, Vera Cruz, Ukiah, Sitka, Ivigtut, Scoresby Sund, Jersey, Paris, Copenhagen, Strasbourg, Stuttgart, Pulkovo, Moscow, Tiflis, Baku, and Tashkent.

Dec. 22d. Readings also at 2h. (Piatigorsk and Tiflis), 3h. (Guadalajara and Manzanillo), 4h. (Yalta, Theodosia, Mount Wilson, Berkeley, Tinemaha, Riverside, and Pasadena), 5h. (Manzanillo, Tinemaha, Riverside, Pasadena, Sebastopol, Simferopol, Hyderabad, Tucson, and St. Louis), 6h. (Berkeley), 11h. (La Paz), 12h. (Batavia and Calcutta), 14h. (Santiago and San Javier), 15h. (Toronto), 17h. (Sumoto), 19h. (Lick and Fresno), 20h. (Wellington, New Plymouth, and Manila), 22h. (Balboa Heights), 23h. (Manila).

Dec. 23d. 13h. 17m. 54s. Epicentre 16°·3N. 98°·6W.

Destructive, Scale VIII-IX at Ometepec (Gro) and Cacahuatepec (Oax). Felt Force VI at Puebla and generally in that district. Force VII at Tacubaya. Strongly felt in the states of Guerrero and Oaxaca.

Epicentre 16°18′N. 98°33′W. (Tacubaya).
15°·5N. 97°·5W. (Strasbourg).

Catalogo de tremblores. Serie sismologica Tremblores registrados, 1 de enero de 1935 al 31 de diciembre de 1939. Instituto de Geologia, Mexico, 1942, p. 36.

$A = -\cdot1436$, $B = -\cdot9496$, $C = +\cdot2789$; $\delta = +15$; $h = +5$;
$D = -\cdot989$, $E = +\cdot150$; $G = -\cdot042$, $H = -\cdot276$, $K = -\cdot960$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	1·9	68	0 26	− 8	—	—	—	—
Puebla	N.	2·8	8	0 40	− 7	—	—	—	—
Tacubaya	N.	3·1	350	0 43	− 8	—	—	—	—
Vera Cruz	Z.	3·7	39	0 51	− 9	—	—	—	—
Manzanillo	N.	6·0	298	1 26	− 6	—	—	—	—
Guadalajara	N.	6·3	315	1 30	− 6	—	—	—	—
Merida	E.	9·7	61	i 2 15	− 7	—	—	—	—
Mazatlan	N.	10·0	314	i 2 22	− 5	—	—	—	—
Chihuahua		14·1	332	e 3 17?	− 6	—	—	—	—
Little Rock		19·2	16	e 4 18	−10	—	—	—	—
Tucson		19·4	328	i 4 32	+ 2	i 8 12	+ 8	10·0	—
Balboa Heights		19·9	108	e 4 36	0	e 8 28	+13	11·3	13·5
St. Louis		23·4	16	e 5 5	− 6	i 9 26	+ 5	i 11·6	—
Columbia		23·7	37	e 5 9	− 5	i 9 12	−15	i 10·3	—
Denver		23·9	308	e 5 16	0	e 9 35	+ 5	e 12·0	13·1
Riverside		24·4	321	e 5 16	− 5	i 9 57	+18	—	—
Mount Wilson		25·0	321	e 5 24	− 3	e 10 8	+19	—	—
Pasadena		25·0	321	i 5 29	+ 2	i 10 2	+13	i 12·5	—
Port au Prince		25·1	80	(i 5 44)	+16	(10 4)	+13	(e 12·6)	(15·9)
Cincinnati		25·9	25	i 5 28	− 7	e 9 59	− 5	e 12·4	15·1
Haiwee		26·2	324	e 5 37	− 1	e 10 19	+10	—	—
Tinemaha		27·1	324	i 5 43	− 3	e 10 37	+13	—	—
Chicago Loyola		27·2	17	i 5 49	+ 2	i 10 35	+10	i 11·7	—
Fresno	N.	27·7	322	e 5 56	+ 4	e 11 4	+31	—	—
Madison		27·8	14	i 5 49	− 4	e 10 57	+22	e 14·8	—
Lick		29·2	321	e 6 3	− 2	e 11 7	+ 9	e 13·8	—
Georgetown		29·4	36	e 6 9	+ 2	i 10 31	−30	—	—
McComb Test		29·4	35	i 6 7	0	i 11 1	0	—	16·4
Branner		29·6	320	e 6 15	+ 6	e 11 16	+12	e 13·2	—
Berkeley		29·9	321	e 6 12k	0	e 11 18	+ 9	e 13·6	—
San Francisco		30·0	320	e 6 16	+ 4	e 11 8	− 2	—	—
Pennsylvania		30·3	32	i 6 13	− 2	e 11 21	+ 6	e 16·5	20·6
San Juan		31·0	80	i 6 20	− 1	i 11 18	− 8	—	—
Bozeman		31·1	344	e 6 16	− 6	i 11 42	+14	i 15·5	—
Philadelphia		31·2	36	e 6 16	− 7	i 11 25	− 4	i 14·4	—
Ukiah		31·3	323	e 6 22	− 2	11 29	− 2	e 13·9	—
Butte		31·8	344	i 6 33	+ 5	i 12 6	+28	i 16·6	—
Toronto		31·8	27	6 36	+ 8	11 49	+11	17·1	—
Fordham		32·5	36	e 6 32	− 2	i 11 59	+10	i 15·5	18·2
Ferndale		32·8	324	e 6 47	+10	e 12 19	+25	e 15·8	—
Williamstown		34·1	35	e 6 42	− 6	12 9	− 5	i 15·8	19·6
Ottawa		34·8	28	e 6 47	− 7	i 12 33	+ 8	17·3	—
Oak Ridge		34·9	36	e 6 52	− 3	i 12 22	− 5	e 19·1	—
Weston		34·9	36	e 6 52a	− 3	i 12 21	− 6	e 16·4	20·9
Vermont		35·3	32	e 6 55	− 4	i 12 46	+13	i 16·1	—
Fort de France		36·2	87	7 0	− 6	—	—	—	—
Saskatoon		36·3	352	7 6	− 1	12 43	− 5	17·5	—
Huancayo		36·4	139	7 15	+ 7	i 12 53	+ 3	i 18·7	—
Seattle		36·9	334	e 8 2	+50	—	—	15·0	—
Shawinigan Falls		37·0	30	7 11	− 2	13 8	+ 9	19·6	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria		37·9	334	7 22	+ 2	13 22	+ 9	18·1	—
Seven Falls		38·4	31	7 18	− 7	13 18	− 2	19·1	—
East Machias		38·7	37	i 7 28	+ 1	i 13 2	−23	16·2	—
La Paz		44·3	135	i 8 19a	+ 6	i 14 49	+ 1	21·0	24·2
Sitka		49·3	335	e 8 49	− 4	e 15 49	−10	i 20·3	—
Honolulu		56·0	286	e 9 36	− 7	i 17 42	+12	i 24·0	—
Santiago		56·2	152	9 48	+ 4	17 38	+ 5	—	—
Ivigtut		57·3	27	9 52	0	17 56	+ 9	—	—
College		58·7	338	i 10 4	+ 2	18 10	+ 4	i 24·1	—
La Plata		63·9	143	10 45	+ 8	19 17	+ 5	32·0	—
Rio de Janeiro		66·7	124	i 10 46	− 9	—	—	i 32·3	34·6
Scoresby Sund		70·3	20	11 16	− 1	20 24	− 5	—	—
Apia		78·2	251	i 12 18	+15	i 22 10	+13	32·4	43·6
Rathfarnham Castle		78·5	38	i 12 10	+ 6	i 22 10	+ 9	37·1	45·4
Edinburgh		79·7	35	i 12 13	+ 2	i 22 8	− 5	36·1	46·7
Aberdeen		79·9	34	i 12 14	+ 2	i 22 13	− 3	37·4	42·4
Bidston		80·3	37	i 12 1	−13	i 22 22	+ 2	31·1	50·4
Stonyhurst		80·6	37	i 12 25	+ 9	i 22 36	+13	38·1	45·2
Durham	N.	80·8	36	i 12 18	+ 1	i 22 35	+10	—	46·1
Oxford		81·8	39	i 12 22a	0	i 22 39	+ 4	e 34·1	47·5
Jersey		82·0	41	i 12 21	− 2	i 22 37	0	e 38·1	45·4
Averroes		82·2	58	e 12 25	+ 1	i 22 40	+ 1	39·1	41·1
San Fernando		82·4	55	e 12 29	+ 4	i 22 51	+10	39·1	—
Kew		82·5	39	i 12 26a	0	i 22 48	+ 6	31·1	47·6
Bergen		82·7	29	12 27	0	22 55	+11	—	47·2
Toledo		83·1	51	e 12 29	0	e 22 57	+ 9	—	42·1
Malaga		83·7	54	i 12 31	− 1	i 22 55	+ 1	41·1	—
Granada		84·2	53	i 12 44	+10	—	—	—	—
Paris		85·0	42	i 12 39	+ 1	i 23 16	+ 9	39·1	48·1
Almeria		85·2	53	i 12 40	+ 1	i 23 11	+ 2	e 38·0	47·3
De Bilt		85·5	37	i 12 42	+ 1	i 23 20	+ 8	e 37·1	48·1
Uccle		85·5	39	e 12 40k	− 1	i 23 19	+ 7	36·1	49·8
Barcelona		87·2	48	12 53	+ 4	23 46	+18	37·6	50·8
Hamburg		87·6	35	e 12 50k	− 1	i 23 32	0	e 43·1	50·1
Besançon		87·7	42	e 13 6?	+14	e 23 36	+ 3	—	50·1
Copenhagen		88·0	32	12 53	0	e 23 6	[−14]	37·1	—
Strasbourg		88·3	40	12 57a	+ 2	e 23 41	+ 2	e 30·6	50·6
Göttingen		88·5	37	i 12 55	− 1	i 23 39	[+15]	e 43·1	59·1
Neuchatel		88·5	42	e 12 56	0	e 23 34	[+10]	—	—
Upsala		88·5	27	e 12 55	− 1	e 23 28	[+ 4]	e 40·1	49·7
Basle		88·6	42	e 12 56	0	e 23 38	− 4	—	—
Karlsruhe		88·6	39	i 12 57	+ 1	23 38	− 4	44·1	51·3
Marseilles		88·8	45	e 12 31?	−26	e 23 1	[−24]	e 37·6	50·1
Stuttgart		89·1	39	e 12 53	− 5	i 24 20	+34	e 37·1	51·6
Zurich		89·3	41	e 12 58a	− 1	e 23 40	− 8	—	—
Algiers		89·4	52	i 13 5	+ 5	e 23 43	− 6	i 40·0	46·1
Jena		89·6	37	i 13 4	+ 3	e 23 36	[+ 6]	e 41·1	49·1
Chur		90·1	41	e 13 1	− 2	e 23 39	[+ 6]	—	—
Cheb		90·5	37	e 13 6	+ 1	e 23 54	− 5	e 43·1	57·1
Prague		91·7	37	13 11	+ 1	e 23 46	[+ 3]	e 42·1	53·6
Padova		92·2	42	e 13 14	+ 1	23 50	[+ 5]	e 53·1	62·1
Chatham Ils.		92·7	225	—	—	23 6	[−42]	38·6	53·1
Triest		93·3	41	i 13 21a	+ 3	i 23 55	[+ 4]	—	50·2
Laibach	N.E.	93·6	40	e 13 22	+ 3	i 23 57	[+ 4]	e 45·4	—
Vienna		93·6	38	e 13 19	0	24 13	−13	e 46·6	55·6
Graz		93·7	40	e 13 22	+ 2	i 23 58	[+ 4]	e 43·1	52·3
Pulkovo		93·7	24	i 13 21	+ 1	23 49	[− 5]	47·6	55·8
Zagreb		94·6	40	e 13 30	+ 6	i 24 18	[+19]	e 43·5	—
Stara Dala		94·9	37	e 13 30	+ 5	e 24 20	[+19]	e 41·1	56·6
Budapest	E.	95·6	38	13 34	+ 6	i 24 7	[+ 3]	43·1	57·1
	N.	95·6	38	13 34	+ 6	24 17	[+13]	42·1	55·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Capodimonte	N.	95·8	45	e 13 23	− 6	e 24 16	[+11]	36·1	69·1
Arapuni		96·6	233	—	—	24 18	[+ 8]	45·0	46·1
Lemberg		97·1	34	e 13 40	+ 5	e 18 40	?	e 37·9	56·9
Belgrade		97·8	39	e 13 49k	+11	i 24 23	[+ 7]	e 46·3	54·7
Wellington		98·1	230	13 49	+ 9	i 24 29	[+12]	45·6	49·1
Moscow		99·3	24	e 13 47	+ 2	24 17	[− 6]	42·6	53·4
Sapporo		99·4	321	13 52	+ 6	—	—	—	—
Christchurch		99·9	228	e 14 30a	+42	i 25 4	−16	47·1	—
Morioka		101·3	317	16 57	?	—	—	—	—
Bucharest		101·4	37	e 18 6	PP	24 39	[+ 5]	51·1	57·6
Mizusawa	N.	101·6	317	18 9	PP	26 32	+58	33·8	—
Akita		102·0	318	24 55	SKS	(24 55)	[+18]	—	—
Tyosi		103·6	313	17 6	?	—	—	—	—
Tukubasan		103·9	315	16 14	?	—	—	—	—
Kumagaya		104·5	315	15 19	?	—	—	—	—
Maebasi		104·5	315	19 8	PP	—	—	—	—
Yokohama		104·6	314	17 40	?	—	—	—	—
Oiwake		104·8	316	18 35	PP	i 27 53	PS	—	—
Nagano		104·9	316	18 14	PP	—	—	—	—
Vladivostok		104·9	324	i 14 12	+ 2	i 25 11	[+21]	—	66·0
Sverdlovsk		105·1	12	i 14 14	+ 3	24 53	[+ 2]	47·1	56·8
Misima		105·2	315	18 35	PP	—	—	—	—
Wazima		105·4	317	18 36	PP	i 27 56	PS	—	—
Toyama		105·6	316	18 40	PP	—	—	—	—
Kanazawa		106·0	316	23 15	?	—	—	—	—
Omaesaki		106·0	314	18 53	PP	—	—	—	—
Hamamatu		106·3	314	17 55	PKP	—	—	—	—
Gihu		106·6	315	17 44	PKP	—	—	—	—
Nagoya		106·6	315	e 19 9	PP	—	—	—	—
Hikone		107·0	315	18 56	PP	—	—	—	—
Osaka B		107·9	315	18 16	PKP	—	—	—	—
Kobe		108·0	315	e 14 20	P	e 26 0	{+ 9}	—	60·6
Wakayama		108·3	315	18 31	PKP	—	—	—	—
Sumoto		108·4	315	e 18 35	PKP	e 26 18	{+25}	—	73·4
Siomisaki		108·5	314	—	—	e 25 46	{− 8}	—	—
Hamada		110·0	317	19 5	PP	i 28 45	PS	—	—
Hirosima		110·1	317	18 19	[−14]	28 48	PS	—	—
Matuyama		110·2	316	18 45	[+12]	i 28 34	PS	—	—
Piatigorsk		110·5	29	e 19 9	PP	e 28 42	PS	—	—
Izuka		111·6	317	18 38	[+ 2]	—	—	—	—
Taikyu		111·6	320	e 26 10	S	(e 26 10)	{− 5}	i 56·1	—
Husan		111·8	319	19 26	PP	29 2	PS	e 54·2	—
Hukuoka		111·9	317	—	—	e 34 41	SS	—	—
Hukuoka B		111·9	317	e 19 25	PP	e 25 39	[+19]	—	—
Kumamoto		112·2	317	19 37	PP	i 28 58	PS	—	—
Miyazaki		112·2	315	19 18	PP	—	—	—	—
Grozny		112·3	27	e 19 13	PP	e 29 1	PS	—	—
Nagasaki		112·7	317	19 32	PP	—	—	—	—
Tiflis		113·1	30	e 19 31	PP	e 29 14	PS	e 38·1	—
Helwan		113·3	47	e 14 53	P	25 24	[− 1]	—	67·0
Brisbane		113·4	247	i 19 48	PP	i 25 36	[+10]	e 52·6	64·6
Tomie		113·5	317	18 40	[0]	—	—	—	—
Ksara		113·9	42	i 14 54	P	29 18	PS	—	—
Erevan		114·2	31	e 19 42	PP	e 29 32	PS	—	—
Riverview		115·5	240	e 20 2	PP	i 25 47	[+13]	e 53·2	68·5
Sydney		115·5	240	i 20 2	PP	i 25 49	[+15]	e 54·5	60·2
Baku		116·5	27	e 15 10	P	i 29 50	PS	—	—
Zi-ka-wei		119·1	321	e 15 18	P	20 6	PP	—	82·3
Melbourne		120·6	236	e 16 34	?	25 58	[+ 6]	48·4	63·5
Cape Town		121·2	121	e 15 29	P	i 27 34	{+13}	e 58·4	68·1

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Tashkent		121·6	11	e 15 17	P	—	—	—	—
Andijan		122·6	8	19 3	[+ 5]	e 30 37	PS	47·1	—
Samarkand		122·7	14	e 19 20	[+22]	e 30 24	PS	—	—
Taityu		124·4	316	20 54	PP	—	—	—	—
Tainan		125·5	315	20 49	PP	—	—	—	—
Adelaide		125·9	238	i 22 41	PPP	i 38 15	SS	59·2	65·2
Manila		130·3	306	i 19 21k	[+ 9]	—	—	64·1	—
Dehra Dun		133·5	4	21 56	PP	33 56	PPS	—	80·1
Phu-Lien		135·6	325	e 19 43	[+21]	32 35	PS	—	87·3
Agra		136·7	4	19 39	[+15]	26 19	[−14]	—	82·9
Calcutta	N.	140·8	349	i 19 26	[− 5]	e 26 25	[−15]	e 68·8	86·5
Bombay		144·0	14	i 19 38	[+ 1]	27 2	[+17]	e 71·1	91·1
Perth		145·1	238	19 56	[+17]	42 13	SS	76·1	77·9
Hyderabad		146·4	5	20 48	[+66]	—	—	68·7	83·6
Batavia		153·2	289	i 20 0k	[+ 8]	—	—	e 52·1	—
Medan		153·9	318	e 20 6	[+13]	—	—	e 74·1	—
Colombo		156·9	5	20 8	[+11]	—	—	69·9	99·7

Additional readings :—
Little Rock iPEN = +4m.22s.
Tucson iPP = +4m.53s., i = +5m.2s. and +7m.13s.
Columbia iPP = +6m.11s., iS = +9m.32s., i = +10m.15s., +10m.53s., and +13m.2s.
St. Louis iPPEN = +5m.34s., iPPPEN = +5m.45s., iE = +7m.48s., +9m.40s., +9m.50s., and +10m.9s.
Denver iPP = +5m.53s., iP$_c$PN = +8m.59s., eE = +9m.16s., i = +9m.39s., iE = +9m.49s., iN = +9m.53s.
Mount Wilson iZ = +5m.36s.
Port au Prince PP = (+6m.18s.), PPP = (+6m.34s.), SNW = (+10m.12s.), SS = (+11m.11s.); all readings increased by 10m.
Cincinnati i = +5m.32s. and +5m.47s., iPP = +6m.22s., i = +8m.31s., iS = +10m.5s., i = +10m.26s. and +10m.31s.
Chicago Loyola i = +5m.53s., iPPP = +6m.41s.
Lick eSN = +11m.11s.
McComb Test. i = +10m.28s., iS$_c$S = +17m.6s.
Berkeley ePN = +6m.15s., iS = +11m.21s.
Pennsylvania i = +7m.19s.
San Juan iS = +11m.36s.
Bozeman iP = +6m.27s., iPPP = +17m.30s., iP$_c$P = +18m.48s.
Philadelphia i = +6m.21s., iPP = +7m.12s., iP$_c$P = +9m.6s., i = +10m.27s., +11m.36s., and +16m.27s.
Ukiah iP = +6m.28s., iPPP = +7m.39s., P$_c$P = +8m.56s., iS = +11m.44s.
Toronto PP = +7m.29s.
Fordham iP = +6m.34s., +6m.40s., and +12m.6s.
Williamstown iP = +6m.47s., PP? = +7m.43s., PPP = +8m.2s., SS? = +14m.0s.
Oak Ridge iE = +12m.29s., iS$_c$S = +17m.18s.
Ottawa iP = +6m.53s., PPP = +8m.20s., SSE = +14m.33s.
Weston iP = +6m.55s., i = +7m.5s., iPP = +8m.21s., eP$_c$P = +9m.19s., iG = +14m.16s.
Vermont i = +7m.0s., iPP = +8m.5s.
Saskatoon SSS = +15m.30s.
Huancayo iP = +7m.23s., i = +7m.48s., +7m.52s., and +8m.0s., iPP = +8m.30s., i = +11m.56s., and +12m.32s.
Seattle eP$_c$P = +9m.18s.
Victoria PPP = +8m.58s., SSSE = +15m.56s.
Seven Falls PPP = +9m.0s., SS = +16m.14s.
East Machias iP = +8m.10s., i = +8m.26s., iPP = +9m.3s., iPPP = +9m.46s., i = +11m.42s. and +12m.18s.
La Paz iZ = +8m.30s., iPPN = +9m.56s., iPPP = +10m.51s., iSE = +14m.56s., iZ = +15m.18s. and +16m.28s., iSSN = +18m.15s., iSSSN = +19m.41s.
Sitka iP = +8m.56s., P$_c$P = +9m.59s., iPP = +10m.48s., iPPP = +11m.22s., iS = +16m.9s., iS$_c$S = +18m.49s., iSS = +19m.0s.
Honolulu iP = +9m.53s., P$_c$P = +10m.36s., ePP = +11m.54s., ePPP = +12m.55s.
Ivigtut PP = +12m.6s., PPP = +13m.7s., e = +13m.32s., S$_c$S = +19m.55s.
College ePP = +12m.15s., PPP = +13m.49s., iS$_c$S = +19m.50s., iSS = +22m.8s.
Scoresby Sund iPEZ = +11m.19s., eN = +11m.34s., eZ = +12m.28s., eE = +13m.6s., PP = +13m.50s., iPPP = +15m.42s., eN = +16m.42s., eZ = +17m.19s. and +18m.30s., eE = +18m.48s., eN = +19m.7s., PS = +20m.57s., SS = +25m.6s.
Apia iPP = +15m.15s., PS = +22m.48s., iSS = +27m.20s.

Continued on next page.

Rathfarnham Castle i = +13m.40s., iPP = +15m.5s., iPPP = +16m.54s., iPS = +22m.49s., iSS? = +26m.56s., iSSS = +29m.21s.
Edinburgh i = +12m.25s., +15m.25s., +17m.12s., +22m.24s., +22m.42s., +23m.23s., and +27m.52s.
Aberdeen iPP = +15m.16s., i = +16m.27s., iPPP = +17m.3s., e = +18m.53s., iPPPP = +20m.31s., i = +21m.26s., iSS = +27m.33s., iSSS = +30m.49s., i = +33m.17s. and +35m.14s.
Bidston i = +12m.36s., iPP = +15m.31s., i = +22m.56s., +27m.21s., and +35m.26s.
Stonyhurst i = +12m.37s., iPP = +15m.16s., SS = +27m.26s.
Durham P_gPN = +12m.31s., iN = +15m.22s.
Oxford iE = +15m.34s., iSE = +22m.46s.
Jersey ePP = +15m.36s., ePPP = +17m.25s., e = +20m.36s., ePS = +23m.28s., ePPS = +24m.5s., e = +27m.15s., eSS = +31m.55s.
Averroes iPE = +12m.27s., PP = +15m.34s., PPPE = +17m.24s., PSE = +23m.27s., iSS = +28m.14s., SSS = +31m.30s.
San Fernando iPEN = +12m.33s., PPE = +16m.1s., iN = +18m.58s., SSSN = +30m.41s.
Kew i = +12m.39s., iPP = +15m.36s., iZ = +22m.59s., i = +23m.11s., iPSE = +23m.21s., iPPSZ = +23m.43s., iN = +27m.20s., iSSE = +28m.0s.
Toledo i = +12m.35s.
Malaga iPP = +15m.46s.
Granada iPP = +16m.2s.
Paris PP = +15m.59s., PS = +23m.59s.
Almeria iPP = +15m.54s.
Uccle i = +12m.43s.a, iPP = +15m.50s., iZ = +16m.13s., iPPPZ = +17m.44s., iSKKS = +23m.45s., iPS = +24m.6s., iN = +27m.4s., iSSE = +28m.52s.
Hamburg iPE = ePN = +12m.55s., iPP = +16m.18s., iSNZ = +23m.48s., eSSE = +29m.25s., eSSSZ = +33m.42s.
Copenhagen i = +12m.58s., PP = +16m.17s., e = +23m.33s. and +23m.56s., PSEZ = +24m.46s., SS = +29m.6s., SSSE = +33m.18s.
Göttingen iPP = +16m.21s., iSS = +29m.41s.
Neuchatel ePP = +16m.23s.
Upsala iP = +13m.0s., iPP = +16m.22s., iPSE = +24m.40s., eSSE = +29m.35s., eSSSE = +33m.35s., iE = +36m.32s.
Basle ePP = +16m.24s.
Marseilles ePPE = +15m.57s.?, eE? = +21m.43s., iS = +23m.21s.?, iPSN = +24m.19s., iE = +25m.27s., iN = +25m.32s., eSSE = +29m.16s.
Strasbourg iPP = +16m.24s. and +16m.28s., iPSN = +24m.43s., iSSE = +29m.44s.
Stuttgart iP = +13m.0s.a, e = +13m.36s., iPP = +16m.16s., ePPP = +18m.26s., iSKS = +23m.39s., iPS = +24m.56s., iSS = +29m.48s.
Zurich ePP = +16m.29s.
Algiers eE = +16m.15s., ePP = +16m.40s., iS = +23m.56s., PS = +25m.0s.
Jena iPPN = +16m.31s., iPP = +16m.34s., e = +22m.36s., i = +24m.6s., eNZ = +25m.0s., eE = +25m.6s., eN = +29m.34s.
Chur ePP = +16m.31s.
Cheb ePP = +16m.38s.
Prague iPP = +16m.50s., ePS = +25m.32s., eSS = +30m.24s., eSSS = +34m.18s.
Chatham Ils. i = +24m.36s., SP = +26m.42s., e = +27m.48s., and +29m.24s., SS = +31m.6s.?, e = +34m.6s., SSS = +34m.36s.?
Triest iPP = +17m.3s., PS = +24m.59s.
Laibach i = +17m.7s.
Vienna PP = +17m.4s., PPP = +19m.13s., PPS = +25m.55s.
Graz iPP = +17m.11s., iPS = +24m.59s., iPPS = +25m.53s., i = +27m.5s.
Pulkovo PP = +17m.5s., PS = +30m.56s., SS = +31m.30s., SSS = +35m.54s.
Zagreb eNE = +16m.49s., eNW = +17m.16s. and +31m.49s.
Stara Dala ePP = +17m.10s., ePS = +26m.0s.
Budapest E. PP = +17m.21s., i = +17m.34s. and +20m.0s., SKKS = +24m.18s., PS = +26m.17s., i = +29m.12s. and +29m.42s., PKKP = +30m.14s., i = +30m.40s.
Budapest N. i = +14m.7s., PP = +17m.23s., i = +18m.44s., +19m.27s., +20m.8s., and +21m.57s., S = +24m.55s., PS = +26m.16s., i = +27m.44s. and +29m.16s., PKKP = +30m.16s., SS = +31m.17s.
Arapuni e = +26m.24s., SS = +32m.0s.
Belgrade eZ = +17m.3s., iPP = +17m.41s., eNW = +26m.28s., iPSNW = +26m.38s.
Wellington i = +13m.56s., PP = +17m.54s., PPP = +20m.7s., iSKKS = +25m.27s., SP = +26m.46s., eSS? = +32m.44s., iSSS? = +37m.3s.
Moscow PKP = +17m.19s., PP = +17m.47s., PPP = +20m.2s., PS = +26m.42s., SS = +32m.24s., eSSS = +36m.24s.
Christchurch iPP = +18m.37s., SKKS = +26m.4s., iZ = +27m.28s., iPS = +28m.5s.
Bucharest PPN = +21m.54s., PPE = +22m.16s., ?N = +27m.0s., SKSN = +28m.0s., SKSE = +28m.15s.
Mizusawa PE = +18m.19s.

Continued on next page.

Oiwake i = +21m.28s., +28m.38s., and +33m.2s.
Vladivostok PP = +18m.33s.
Sverdlovsk iPP = +18m.33s., ePS = +27m.39s.
Kobe ePZ = +14m.27s., eZ = +18m.52s., eE = +26m.11s.
Sumoto eZ = +18m.58s., eN = +19m.2s. and +34m.35s.
Taikyu S = +29m.1s.
Helwan PP = +19m.26s., PPP = +21m.56s., SKKS = +26m.30s., S = +27m.16s., PS = +28m.54s.
Brisbane eN = +20m.36s. and +21m.42s., iSKKSE = +26m.42s., iN = +27m.42s., iPSE = +29m.12s., iPSN = +29m.18s., iPPSE = +31m.12s., iN = +31m.42s., iSSEN = +35m.42s.
Ksara ePKP = +18m.26s., PP = +19m.34s.
Riverview iSKKSE = +26m.59s., iPSE = +29m.44s., SSE = +36m.35s., SSSE = +41m.12s., eL_qN = +47·8m.
Sydney iL? = +29m.41s., e = +36m.2s. and +49m.27s.
Baku iPP = +20m.2s.
Zi-ka-wei iZ = +31m.42s., +41m.52s., +47m.12s., +53m.2s., +55m.44s., and +63m.18s.
Melbourne e = +20m.28s., iPP = +20m.38s., i = +22m.4s., SKKS = +27m.26s., PS = +30m.33s., PPS = +31m.49s., SS = +37m.28s., SSS = +41m.21s.
Cape Town iPPE = +20m.30s., iPPN = +20m.41s., iSN = +28m.30s., iSE = +28m.34s., iPSE = +30m.32s., iPSN = +30m.36s., iPPSE = +31m.50s., iSS = +37m.0s., iSSSN = +40m.33s., iSSSE = +40m.42s., iG = +50·8m.
Tashkent iPP = +20m.5s., e = +20m.32s.
Adelaide i = +23m.53s., e = +31m.11s. and +32m.54s., i = +35m.17s., +40m.56s., +46m.31s., e = +52m.27s.
Manila PP = +21m.31s., SKP = +22m.8s.
Phu-Lien SS = +22m.7s., SKP = +23m.5s., e = +34m.24s., SS = +42m.21s.
Agra PP = +22m.27s., PPP = +25m.23s., SKKS = +28m.55s., iN = +29m.19s. and +32m.16s., PSKS = +32m.30s., PPSE = +34m.7s., iN = +34m.31s., SSE = +40m.12s., SSSE = +44m.53s.
Calcutta iPPN = +22m.39s., iSKPN = +22m.58s., iPPPN = +25m.54s., eSKKSN = +29m.23s., iPSKSN = +32m.48s., iPPSN = +35m.28s., iSSN = +41m.30s., iSSSN = +46m.58s.
Bombay e = +21m.2s., iPP = +22m.39s., iPPP = +26m.2s., iSKKS = +29m.2s., SKSP = +32m.47s., PPS = +35m.19s., SS = +42m.2s., S_cSS_cS = +43m.38s.
Perth i = +20m.12s., PP = +23m.43s., PPP = +27m.34s., i = +34m.18s., PPS = +36m.58s., i = +39m.26s., +40m.46s., and +43m.11s.
Hyderabad SKSP = +34m.26s.
Long waves were also recorded at Frunse and Toyooka.

Dec. 23d. 23h. 21m. 15s. Epicentre 16°·3N. 98°·6W. (as at 13h.).

A = −·1436, B = −·9496, C = +·2989; δ = +15; h = +5.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	1·9	68	e 0 42	+ 8	—	—	—	—
Puebla	N.	2·8	8	0 50	P*	—	—	—	—
Tacubaya	N.	3·1	350	0 55	P*	—	—	—	—
Vera Cruz	N.	3·7	39	1 5	P*	—	—	—	—
Manzanillo	N.	6·0	298	1 36	+ 4	—	—	—	—
Guadalajara	N.	6·3	315	1 39	+ 3	—	—	—	—
Merida	N.	9·7	61	2 29?	+ 7	—	—	—	—
Mazatlan	N.	10·0	314	e 2 33	+ 6	—	—	—	—
Little Rock	N.	19·2	16	e 4 22	− 6	e 8 13	+14	i 9·9	—
Tucson		19·4	328	i 4 26	− 4	e 8 7	+ 3	e 9·1	—
Balboa Heights		19·9	108	—	—	e 8 45	SS	—	—
St. Louis		23·4	16	e 5 9	− 2	e 9 27	+ 6	—	—
Columbia		23·7	37	e 5 5	− 9	e 9 31	+ 4	e 10·5	—
Denver		23·9	308	e 5 35	+19	e 9 32	+ 2	i 11·2	13·8
Riverside		24·4	321	i 5 18	− 3	—	—	—	—
Mount Wilson		25·0	321	e 5 23	− 4	—	—	—	—
Pasadena		25·0	321	i 5 29	+ 2	i 9 58	+ 9	e 12·0	—
Cincinnati		25·9	25	i 5 34	− 1	i 10 13	+ 9	—	—
Halwee		26·2	324	e 5 40	+ 2	—	—	—	—
Tinemaha		27·1	324	i 5 42	− 4	—	—	—	—
Chicago		27·2	17	e 5 45	− 2	e 10 27	+ 2	e 11·8	—
Fresno	N.	27·7	322	e 5 54	+ 2	—	—	e 15·1	—
Madison		27·8	14	e 5 53	0	e 10 40	+ 5	e 15·8	—
Lick		29·2	321	e 6 6	+ 1	—	—	—	—
Berkeley		29·9	321	i 6 23	+11	i 11 19	+10	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
San Juan		31·0	80	e 6 18	− 3	e 11 40	+14	e 13·0	—
Bozeman		31·1	344	e 6 3	−19	e 11 27	− 1	e 16·4	—
Philade phia		31·2	36	e 6 22	− 1	e 11 29	0	e 13·2	—
Ukiah		31·3	323	—	—	e 11 11	−20	e 12·3	—
Butte		31·8	344	i 6 25	− 3	i 11 43	+ 5	i 14·2	—
Toronto		31·8	27	6 28	0	11 45	+ 7	16·8	—
Fordham		32·5	36	i 6 34	0	i 11 56	+ 7	—	—
Williamstown		34·1	35	e 6 43	− 5	—	—	—	e 25·0
Ottawa		34·8	28	6 54	0	12 19	− 6	17·8	—
Oak Ridge		34·9	36	—	—	e 12 29	+ 2	e 21·8	—
Weston		34·9	36	e 6 56	+ 1	e 12 32	+ 5	e 20·1	—
Vermont		35·3	32	—	—	e 12 34	+ 1	e 15·2	—
Saskatoon		36·3	352	—	—	e 16 45?	SSS	19·8	—
Huancayo		36·4	139	e 7 3	− 5	12 54	+ 4	e 15·1	—
Victoria,		37·9	334	7 21	+ 1	13 15	+ 2	18·8	—
Seven Falls		38·4	31	7 23	− 2	13 23	+ 3	18·8	—
La Paz		44·3	135	i 8 12	− 1	14 49	+ 1	20·8	25·0
Sitka		49·3	335	e 11 52	PPP	e 15 54	− 5	e 19·8	—
College		58·7	338	e 10 0	− 2	e 17 57	− 9	e 23·4	—
Rio de Janeiro	N.	66·7	124	e 19 45	S	(e 19 45)	− 1	e 32·4	—
De Bilt		85·5	37	—	—	e 23 21	+ 9	e 40·7	—
Uccle		85·5	39	—	—	e 23 21	+ 9	e 42·8	—
Copenhagen		88·0	32	—	—	23 42	+ 6	44·8	—
Stuttgart		89·1	39	e 12 57	− 1	e 23 50	+ 4	e 49·8	—
Pulkovo		93·7	24	—	—.	e 23 50	[− 4]	e 49·2	54·1
Moscow		99·3	24	—	—	e 36 9	SSS	e 54·2	71·1
Sverdlovsk		105·1	12	e 18 27	PP	e 24 49	[− 2]	49·8	62·2
Ksara		113·9	42	e 19 34	PP	e 30 18	PS	—	72·7
Baku		116·5	27	—	—	e 29 41	PS	e 59·4	—
Tashkent		121·6	11	e 19 16	[+20]	i 26 3	[+ 8]	59·2	—

Additional readings :—
Little Rock iSE = +8m.27s.
Tucson iPP = +4m.32s., eS = +8m.20s.
St. Louis iPPEN = +5m.33s., iN = +7m.45s., iSE = +9m.29s., iN = +10m.41s.
Columbia iS = +9m.40s.
Denver iPPE = +5m.51s., iPPPN = +5m.54s., eSSN = +10m.10s.
Cincinnati iPPP = +6m.31s., e = +11m.55s.
Madison eSS = +12m.6s.
San Juan ePP = +7m.31s., S = +12m.12s.
Ukiah eS = +11m.41s.
Weston iPPZ = +7m.51s.
Vermont e = +12m.44s. and +20m.49s.
Huancayo eP = +7m.8s., ePP = +8m.29s., ePPP = +8m.59s.
Victoria PPP = +9m.0s.
Seven Falls i = +8m.53s.
La Paz iSZ = +14m.52s., iN = +18m.13s.
Sitka eSS = +18m.52s.
College eS_0S = +19m.50s.
Uccle i = +28m.53s.
Copenhagen +29m.39s.
Sverdlovsk e = +33m.30s.
Baku e = +36m.15s. and +43m.22s.
Tashkent e = +27m.22s., +30m.16s., and +42m.15s.
Long waves were also recorded at Pennsylvania, Seattle, East Machias, Scoresby Sund, Vladivostok, Strasbourg, Paris, Kew, and Jersey.

Dec. 23d. Readings also at 0h. (Triest and Mizusawa), 3h. (Brisbane, Tinemaha, Wellington, Riverside, Mount Wilson, Pasadena, and Balboa Heights), 6h. (Samarkand and Andijan), 13h. (Frunse, Andijan, and Grozny), 14h. (Oaxaca (7), Puebla (3), Vera Cruz (2), Tinemaha, Mount Wilson, and Riverside), 15h. (Guadalajara, Oaxaca (7), and Puebla), 16h. (Tinemaha, Guadalajara, Vera Cruz, Tacubaya (2), Pasadena, Tucson, Oaxaca (3), Puebla, and Hong Kong), 17h. (Erevan, Tiflis, Piatigorsk, Guadalajara, Andijan (2), Grozny, Balboa Heights, Vera Cruz, Tacubaya, Tucson, Oaxaca (9), and Puebla), 18h. (Guadalajara, Puebla (5), Oaxaca (8), Tucson, Tacubaya (5), Vera Cruz (5), Tinemaha, and Riverside), 19h. (Tucson and Oaxaca), 20h. (Riverside, Tinemaha, Oaxaca (2), Zagreb, Guadalajara (2), Balboa Heights, Pasadena, Mount Wilson, Triest, and Tucson), 21h. (Oaxaca (5), Vera Cruz (2), and Puebla), 22h. (Puebla, Vera Cruz, Oaxaca (2), Tacubaya, and Tucson), 23h. (Puebla, Oaxaca (2), Vera Cruz, Mount Wilson, Tinemaha, Riverside, and near Santiago),

Dec. 24d. 1h. 29m. 48s. Epicentre 16°·3N. 98°·6W. (as on 1937 Dec. 23d.).

$A = -\cdot1436$, $B = -\cdot9496$, $C = +\cdot2789$; $\delta = +15$; $h = +5$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.
Oaxaca	N.	1·9	68	0 25	− 9	—	—	—
Tacubaya	N.	3·1	350	1 0	P_g	—	—	—
Vera Cruz	Z.	3·7	39	0 50?	−10	—	—	—
Guadalajara	N.	6·3	315	—	—	e 3 19	S*	—
Merida	N.	9·7	61	—	—	i 4 48	S*	—
Little Rock	N.	19·2	16	e 4 29	+ 1	—	—	—
Tucson		19·4	328	4 30	0	—	—	10·2
Riverside	Z.	24·4	321	i 5 23	+ 2	—	—	—
Mount Wilson	Z.	25·0	321	i 5 28	+ 1	—	—	—
Tinemaha	Z.	27·1	324	i 5 46	0	—	—	—

Additional readings :—
Tucson i = +4m.53s.
Long waves were also recorded at Puebla.

Dec. 24d. 2h. 31m. 24s. Epicentre 16°·3N. 98°·6W. (as on 1937 Dec. 23d.).

$A = -\cdot1436$, $B = -\cdot9496$, $C = +\cdot2789$; $\delta = +15$; $h = +5$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.
Oaxaca	N.	1·9	68	1 12	S_g	—	—	—
Puebla	N.	2·8	8	0 49	+ 2	—	—	—
Tacubaya	N.	3·1	350	0 54	P*	—	—	—
Vera Cruz	Z.	3·7	39	0 46?	−14	—	—	—
Guadalajara	N.	6·3	315	1 41?	+ 5	—	—	—
Merida	N.	9·7	61	—	—	i 4 43	S*	—
Tucson		19·4	328	e 4 26	− 4	—	—	10·2
Riverside	Z.	24·4	321	e 5 19	− 2	—	—	—
Mount Wilson	Z.	25·0	321	i 5 25	− 2	—	—	—
Pasadena	Z.	25·0	321	i 5 31	+ 4	—	—	—
Tinemaha	Z.	27·1	324	e 5 46	0	—	—	—

Tucson gives i = +4m.33s., +6m.29s., +6m.58s., and +9m.44s.
Long waves were also recorded at Manzanillo.

Dec. 24d. 3h. 23m. 35s. Epicentre 36°·7S. 72°·3W.

Felt Force V within a radius of 80kms. about the area of Confluencia (36°40′S. 72°20′W.).
Bulletin of the Seismological Service of the University of Chile. Observations of 1937. Santiago, Chile, 1939, p. 76.

$A = +\cdot2443$, $B = -\cdot7656$, $C = -\cdot5951$; $\delta = -3$; $h = -1$;
$D = -\cdot953$, $E = -\cdot304$; $G = -\cdot181$, $H = +\cdot567$, $K = -\cdot804$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.
San Javier		1·2	24	0 28	+ 4	0 45	+ 4	—
Santiago		3·5	23	0 59	+ 2	1 43	+ 3	—
La Plata		11·8	85	2 53	0	5 7	+ 1	6·5
La Paz		20·5	13	e 4 43	+ 1	8 35	+ 8	11·2
Huancayo		24·7	354	e 5 24	0	e 9 40	− 4	e 10·7
Rio de Janeiro		28·6	70	—	—	10 25?	−23	—
Tucson		77·5	328	11 56	− 3	—	—	—
Riverside	Z.	82·0	324	i 12 20	− 3	—	—	—
Pasadena	Z.	82·4	324	i 12 24	− 1	—	—	—
Mount Wilson	Z.	82·5	324	i 12 24	− 2	—	—	—
Tinemaha	Z.	84·9	325	i 12 34	− 4	—	—	—

Additional readings :—
Huancayo PP = +5m.39s.
Tucson iP = +12m.13s.
Riverside iZ = +12m.36s.
Pasadena iZ = +12m.40s.
Mount Wilson iZ = +12m.40s.
Tinemaha iZ = +12m.51s.
Long waves were also recorded at Guadalajara and Oaxaca.

Dec. 24d. 4h. 35m. 21s. Epicentre 16°·3N. 98°·6W. (as on 1937 Dec. 23d.).

$A = -\cdot1436$, $B = -\cdot9496$, $C = +\cdot2789$; $\delta = +15$; $h = +5$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	1·9	68	0 44	P_g	—	—	—	—
Puebla	N.	2·8	8	0 49	+ 2	—	—	—	—
Tacubaya	Z.	3·1	350	0 53	+ 2	—	—	—	—
Vera Cruz	Z.	3·7	39	0 49?	−11	—	—	—	—
Manzanillo	Z.	6·0	298	1 34	+ 2	—	—	—	—
Guadalajara	N.	6·3	315	1 36?	0	—	—	—	—
Merida	E.	9·7	61	2 29	+ 7	—	—	—	—
Little Rock		19·2	16	e 4 27	− 1	—	—	—	—
Tucson		19·4	328	4 29	− 1	8 12	+ 8	e 9·0	—
Riverside		24·4	321	e 5 21	0	—	—	—	—
Pasadena		25·0	321	i 5 27	0	e 9 58	+ 9	e 13·9	—
Mount Wilson	Z.	25·0	321	i 5 29	+ 2	—	—	—	—
Tinemaha	Z.	27·1	324	e 5 42	− 4	—	—	—	—
San Juan		31·0	80	—	—	e 11 39	+13	e 14·2	—
Bozeman		31·1	344	—	—	e 11 33	+ 5	e 13·3	—
Huancayo		36·4	139	e 7 5	− 3	e 12 48	− 2	e 15·7	—
Victoria		37·9	334	—	—	e 16 15	SSS	21·3	—
La Paz		44·3	135	8 14	+ 1	14 51	+ 3	20·6	24·3

Additional readings:—
Little Rock iEN = +4m.32s., eE = +13m.0s.
Tucson iP = +4m.36s.
San Juan eS = +11m.49s.
Huacayo ePP = +8m.31s., eS = +12m.52s.
Victoria eN = +17m.27s.
Long waves were also recorded at Rio de Janeiro, Fresno, Sitka, Philadelphia, College, Sverdlovsk, Tashkent, and Seattle.

Dec. 24d. 6h. 20m. 40s. Epicentre 10°·3S. 75°·4W.

Damage at Oxapampa and Huancabamba (Peru), at Perene, Peruvian Corp Colony.

Epicentre 10°·3S. 75°·4W. (U.S.C.G.S.).
10°·6S. 74°·4W. (Strasbourg).

Annales de l'Institut de Physique du Globe de Strasbourg. Tome VI 2 partie, Seismologie, 1937, p. 74, Mende, 1940.

$A = +\cdot2481$, $B = -\cdot9523$, $C = -\cdot1776$; $\delta = -3$; $h = +6$;
$D = -\cdot968$, $E = -\cdot252$; $G = -\cdot045$, $H = +\cdot172$, $K = -\cdot984$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		1·8	178	i 0 28a	− 4	—	—	—	—
La Paz		9·4	132	i 2 20k	+ 2	i 4 40	SSS	i 5·2	6·8
Balboa Heights		19·6	349	e 4 35	+ 3	—	—	—	—
Santiago		23·5	171	5 11	− 1	9 38	+15	—	—
La Plata		29·2	148	6 5	0	10 56	− 2	14·9	—
San Juan		29·9	17	i 6 13	+ 1	e 11 4	− 5	e 12·3	—
Rio de Janeiro		33·2	115	i 6 38	− 2	i 11 48	−12	i 15·2	20·3
Merida	N.	34·1	337	i 6 51	+ 3	—	—	—	—
Tacubaya	N.	37·7	321	i 7 20	+ 1	—	—	—	—
Columbia		44·4	354	e 8 14	0	e 14 42	− 7	e 18·2	—
Little Rock		47·6	341	e 8 39	0	e 12 44	?	—	—
Philadelphia		50·0	2	i 8 59	+ 1	e 16 11	+ 2	e 20·1	—
Weston		52·6	5	e 9 16	− 2	i 16 50	+ 6	e 25·6	—
Oak Ridge		52·7	5	e 9 18	0	e 16 54	+ 8	e 26·3	—
Williamstown		52·8	4	i 9 19	0	e 16 50	+ 3	e 25·6	—
Chicago		53·1	348	—	—	e 16 38	−13	e 20·9	—
Toronto		53·8	357	9 32	+ 6	17 18	+17	27·3	—
Tucson		54·2	323	i 9 29	0	17 10	+ 4	e 23·3	—
Vermont		54·5	2	e 9 30	− 2	e 17 10	0	e 21·1	—
Madison		54·6	348	e 9 30	− 2	e 17 10	− 1	e 26·3	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
East Machias		55·3	8	—	—	i 17 26	+ 5	23·0	—
Ottawa		55·4	0	9 39	+ 1	17 30	+ 8	25·3	—
Seven Falls		57·3	4	—	—	17 50	+ 3	23·3	—
Riverside		59·4	320	i 10 7a	+ 1	e 18 22	+ 7	—	—
Mount Wilson		60·0	320	i 10 12a	+ 1	—	—	—	—
Pasadena		60·0	320	i 10 11a	0	i 18 30	+ 7	e 29·3	—
Haiwee		61·2	322	e 10 18	− 1	—	—	—	—
Tinemaha		62·0	322	i 10 20a	− 4	—	—	—	—
Fresno	N.	62·7	321	e 10 30	+ 1	—	—	—	—
Lick		64·2	321	e 10 40	+ 1	—	—	—	—
Bozeman		64·3	333	—	—	e 19 14	− 3	—	—
Branner		64·6	321	e 10 44	+ 3	—	—	—	—
Berkeley		64·9	321	i 10 42a	− 1	i 19 36	+12	—	—
San Francisco		65·0	321	e 10 47	+ 3	—	—	—	—
Butte		65·2	333	—	—	e 19 33	+ 5	e 34·0	—
Ukiah		66·3	321	—	—	e 19 48	+ 6	e 27·7	—
Victoria		72·1	329	11 29	+ 1	20 58	+ 8	29·3	—
San Fernando		79·8	50	e 12 23	+11	i 22 27	+13	38·3	—
Malaga		81·3	50	i 12 23	+ 3	i 22 36	+ 6	39·3	—
Granada		82·0	50	i 12 24	+ 1	i 22 44	+ 7	—	—
Toledo		82·6	47	e 12 25	− 1	e 22 53	+10	—	42·3
Almeria		82·8	51	e 12 25	− 2	e 22 53	+ 8	e 41·8	—
Sitka		83·1	332	e 12 43	+14	i 22 54	+ 6	e 38·6	—
Rathfarnham Castle		86·1	34	e 13 0?	+16	i 23 21	+ 3	42·3	47·3
Tortosa	N.	86·2	48	e 12 51	+ 7	23 25	+ 6	e 42·3	50·7
Honolulu		86·7	292	e 16 22	PP	e 22 58	[−14]	e 40·4	—
Jersey		87·0	38	—	—	e 23 18	[+ 4]	e 36·3	48·4
Cape Town		87·5	123	—	—	e 23 20	[+ 3]	e 39·6	51·9
Bidston		87·9	35	—	—	i 23 38	+ 3	e 37·3	—
Scoresby Sund		88·3	15	—	—	23 44	+ 5	39·3	—
Oxford		88·4	37	e 12 43	−12	i 23 30	−10	e 37·9	48·9
Stonyhurst		88·4	35	—	—	i 23 31	[+ 9]	42·3	49·3
Kew		88·9	37	e 15 31	?	e 23 22	[− 4]	e 37·3	49·2
Durham	N.	89·6	34	—	—	i 23 53	+ 2	—	47·7
Aberdeen		89·7	31	i 23 38	S	(i 23 38)	[+ 7]	48·0	50·5
Paris		89·8	40	i 13 8	+ 6	e 24 1	+ 8	43·3	45·3
Uccle		91·5	38	e 13 16	+ 6	i 23 49	[+ 7]	e 38·3	—
College		91·9	336	—	—	e 23 46	[+ 2]	e 37·6	—
De Bilt		92·3	37	i 13 28	+15	e 23 56	[+10]	e 39·3	45·5
Strasbourg		93·2	41	e 13 22	+ 5	23 50	[− 1]	—	50·3
Zurich		93·4	43	e 13 18	0	e 23 56	[+ 4]	—	—
Chur		94·0	43	e 13 22	+ 1	—	—	e 51·3	—
Stuttgart		94·1	41	e 13 23	+ 1	e 24 2	[+ 6]	e 44·3	51·3
Hamburg		95·5	36	i 13 31	+ 3	—	—	e 42·3	48·3
Cheb		96·4	39	e 13 37	+ 5	e 24 16	[+ 7]	e 46·3	53·3
Triest		96·7	45	e 13 48	+15	i 24 17	[+ 7]	e 43·3	48·3
Copenhagen		97·2	35	—	—	24 25	[+12]	45·3	—
Prague		97·7	40	—	—	e 24 20?	[+ 5]	—	49·3
Wellington		97·8	226	e 26 50	PS	e 35 15	SSS	46·1	—
Graz		98·0	44	e 13 42	+ 3	e 25 9	+ 5	e 51·3	55·6
Zagreb		98·3	45	e 13 52	+11	—	—	e 48·8	—
Stara Dala		100·0	43	e 21 20?	?	e 23 20?	[−67]	—	—
Upsala		100·3	31	e 14 2	+12	e 24 20?	[− 8]	e 44·3	56·3
Bucharest	E.	105·3	47	—	—	i 27 56	PS	53·3	—
Pulkovo		106·7	31	18 49	PP	25 4	[+ 6]	49·8	56·7
Moscow		111·3	34	18 50	[+14]	34 32	SS	49·8	57·8
Ksara		113·3	58	e 19 36	PP	e 29 19	PS	—	59·3
Tiflis		119·2	48	e 20 16	PP	—	—	e 50·3	80·7
Sverdlovsk		122·5	27	20 35	PP	27 40	{+10}	51·8	64·9
Baku		123·3	48	20 41	PP	30 58	PS	55·3	68·0

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Semipalatinsk		135·3	22	e 21 11	PP	—	—	—	—
Samarkand		135·6	43	e 19 24	[+ 2]	e 22 54	PP	—	—
Tashkent		136·2	39	19 26	[+ 3]	26 19	[−14]	56·5	80·1
Perth		136·6	195	—	—	i 40 40	SSP	i 66·4	—
Andijan		138·4	38	i 19 21	[− 6]	e 23 8	PP	—	—
Almata		139·3	39	e 20 20	[+51]	—	—	—	—
Vladivostok		139·6	329	19 31	[+ 1]	—	—	68·1	80·4
Bombay		148·1	71	e 19 51	[+ 7]	e 42 26	SS	e 71·8	86·5
Agra	E.	149·9	53	e 19 57	[+10]	—	—	—	—
Kodaikanal	E.	153·3	87	e 20 0	[+ 8]	—	—	71·2	82·0
Colombo		155·3	97	e 19 57	[+ 2]	—	—	—	88·3
Calcutta	N.	160·3	50	e 20 34	[+33]	e 28 0	[+55]	e 70·4	92·4
Batavia	Z.	163·5	187	i 20 7	[+ 3]	—	—	—	—
Manila		163·5	286	e 20 18	[+14]	e 27 26	[+19]	—	—

Additional readings :—
La Paz iN = +3m.10s.
San Juan iP = +6m.24s., iPP = +7m.9s., ePPP = +7m.36s., **iP$_c$P = +8m.50s.**, iS = +11m.10s. and +11m.16s.
Rio de Janeiro iSSS = +14m.20s.
Columbia eS = +14m.50s.
Little Rock iEN = +8m.46s., eEN = +11m.12s.
Philadelphia iS = +16m.16s.
Weston iZ = +9m.27s., iP$_c$PZ = +10m.31s., iPP = **+11m.22s.**, iZ = **+11m.32s.**, eSSN = +20m.41s.
Williamstown i = +10m.23s.
Tucson SS = +20m.32s.
Vermont eP = +9m.33s., ePP = +11m.44s., iS = +17m.18s.
East Machias eSS = +20m.56s.
Riverside iPPZ = +12m.17s.
Mount Wilson iPPZ = +12m.22s.
Pasadena iPPZ = +12m.20s., eS$_c$SE = +19m.56s., **iN = +20m.40s.**, **eSSN = +22m.56s.**, ePKP,PKPZ = +39m.42s.
Tinemaha iPPZ = +12m.34s., ePKP,PKPZ = +39m.38s.
Ukiah eS = +19m.53s., eSS = +24m.29s.
Malaga i = +14m.33s.
Toledo i = +12m.38s.
Sitka eP = +12m.56s., ePPP = +17m.43s., iPS = +23m.35s.
Rathfarnham Castle iSKS = +23m.10s., iSS = +28m.42s.
Jersey e = +23m.33s., ePS = +24m.32s., eSS = +29m.20s., **e = +31m.27s.**
Cape Town i = +23m.30s., eE = +29m.15s.
Scoresby Sund +29m.38s.
Stonyhurst iS = +23m.43s.
Kew iS = +23m.48s.
Aberdeen iP$_c$P = +23m.58s., e = +42m.50s.
Uccle iS = +24m.18s., iPSE = +25m.23s., iSSE = +30m.29s., **eSSS = +33m.50s.**
College eS = +24m.9s., ePPS = +25m.38s., eSS = +29m.52s., **eSSS = +33m.48s.**
De Bilt eN = +24m.20s.
Strasbourg PPZ = +15m.56s., ePSZ = +25m.37s., SSE = **+30m.20s.**
Zurich ePP = +17m.13s.
Stuttgart ePPZ = +17m.6s., eS = +24m.43s., ePS = +25m.48s.
Triest i = +25m.2s.
Copenhagen S = +25m.8s., i = +25m.13s.
Pulkovo S = +26m.22s., ePS = +27m.58s., eSS = +33m.50s.
Moscow PP = +19m.4s., PS = +28m.46s.
Ksara ePPS = +30m.26s.
Sverdlovsk PS = +30m.36s., SS = +37m.8s.
Baku SS = +37m.14s.
Tashkent eP = +16m.22s., SKKS = +28m.43s., **PPS = +34m.16s.**, SS = +39m.23s.
Perth i = +41m.27s., +50m.52s., and +57m.48s.
Vladivostok PP = +22m.25s., PPP = +25m.24s., e = **+41m.21s.**
Bombay e = +23m.23s.
Calcutta ePPN = +24m.14s., eSKPN = +24m.33s., PPN = +27m.29s., eSKKSN = +30m.59s., iPSKSN = +34m.23s., eSSN = +44m.4s., eSSSN = +48m.33s.
Manila iE = +23m.36s., iZ = +24m.42s.
Long waves were also recorded at Puebla, Padova, Barcelona, Bergen, Budapest, Helwan, Göttingen, Karlsruhe, Hyderabad, Jena, Phu-Lien, Belgrade, and Seattle.

Dec. 24d. Readings also at 0h. (Oaxaca (6), Tucson, and Puebla (2)), 1h. (Oaxaca (2) and Puebla), 2h. (Oaxaca (2), Puebla (2), Guadalajara, Tucson, Balboa Heights, and Sitka), 3h. (Tucson, Mount Wilson, Riverside, Tacubaya, Vera Cruz, Little Rock, Oaxaca, and Puebla), 4h. (Oaxaca (2), Puebla, St. Louis, Tacubaya, Vera Cruz, and Tucson), 6h. (Tucson, Oaxaca, Puebla, Tacubaya, Vera Cruz, Mount Wilson, Riverside, Tinemaha, Pasadena, and Vienna), 7h. (Andijan, Oaxaca, Tacubaya, and Melbourne), 8h. (Oaxaca, Puebla, Tacubaya, La Paz, Huancayo (3), and Hong Kong), 9h. (La Paz, Oaxaca (2), and Huancayo (2)), 10h. (Andijan, Tashkent, Frunse, Samarkand, and Tchimkent), 11h. (Andijan, Frunse, Samarkand, Mount Wilson, Riverside, Tinemaha, Pasadena, Fresno, San Francisco, Branner, and Lick), 12h. (Hukuoka B and Hukuoka), 13h. (Balboa Heights), 15h. (Puebla (2), Oaxaca (2), and Tacubaya (3)), 16h. (La Paz, Semipalatinsk, Manila, Tashkent, Andijan, Frunse, Samarkand, and Huancayo), 17h. (Honolulu, Tacubaya (2), Oaxaca (2), and Huancayo), 18h. (La Paz, Oaxaca, Tacubaya, Puebla, Vera Cruz, and Andijan), 20h. (Tacubaya, Oaxaca, Vera Cruz, and Puebla), 21h. (Puebla, Vera Cruz, Oaxaca (3), and Tiflis).

Dec. 25d. 1h. 9m. 52s. Epicentre 8°·5S. 126°·0E.

$A = -\cdot5814$, $B = +\cdot8003$, $C = -\cdot1468$; $\delta = +6$; $h = +7$;
$D = +\cdot809$, $E = +\cdot588$; $G = +\cdot086$, $H = -\cdot119$, $K = -\cdot989$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Batavia		19·1	276	4 38	+11	i 8 40	SSS	e 12·1	—
Manila		23·5	347	i 5 11	− 1	9 28	+ 5	—	—
Perth		25·2	200	5 41	+12	i 10 38	SS	—	—
Adelaide		28·7	159	e 6 3	+ 2	i 10 55	+ 5	13·7	18·6
Medan		29·8	293	e 6 20	+ 9	—	—	—	—
Hong Kong		32·7	339	(6 36)	0	6 36	P	—	12·1
Melbourne		33·9	152	i 6 46	− 1	i 12 15	+ 4	17·0	20·0
Riverview		34·2	141	—	—	e 12 14	− 2	e 19·1	—
Sydney		34·2	141	—	—	e 12 19	+ 3	—	20·2
Phu-Lien		34·8	327	e 6 56	+ 2	e 12 32	+ 7	—	—
Keizyo		45·8	1	e 8 18	− 7	—	—	—	—
Calcutta	N.	48·1	311	e 8 45	+ 2	i 15 52	+10	i 18·8	22·3
Kodaikanal	E.	51·8	290	e 9 18	+ 6	17 13?	+40	27·0	—
Christchurch		53·5	139	e 9 2a	−22	i 17 12	+15	27·9	—
Wellington		54·0	135	i 9 19	− 9	—	—	31·1	—
Bombay		59·1	297	i 10 8	+ 4	e 18 21	+10	—	—
Irkutsk		63·3	345	10 45	+12	19 19	+15	—	—
Frunse		69·3	322	e 11 9	− 2	—	—	—	—
Andijan		69·5	319	e 11 16	+ 4	20 16	− 4	—	—
Tashkent		71·8	319	i 11 25	− 1	i 20 34	−12	e 35·1	46·1
Sverdlovsk		84·0	330	i 12 30	− 4	e 22 55	− 2	41·1	50·5
Baku		85·0	312	e 12 44	+ 6	e 23 24	+17	45·1	52·8
Grozny		88·7	314	e 13 38	+41	—	—	—	—
Tiflis	N.	89·1	312	e 14 20	?	e 24 2	+16	—	25·7
Ksara		94·8	303	e 13 38	+13	26 32	PPS	—	—
Copenhagen		110·2	327	—	—	28 8?	PS	62·1	—
Stuttgart		113·9	320	e 19 40	PP	e 30 28	PPS	—	—
Huancayo		150·6	135	e 19 30	[−18]	—	—	e 70·8	—
La Paz		151·5	152	i 19 53	[+ 4]	—	—	78·6	82·5

Additional readings :—
Batavia iN = +5m.15s., iE = +8m.56s., iN = +9m.3s.
Perth i = +8m.45s., +12m.35s., +13m.55s., +16m.8s., +17m.27s., +18m.15s., and +20m.38s.
Adelaide e = +8m.33s. and +9m.16s.
Hong Kong P? = +2m.50s., SS? = +7m.46s.
Melbourne i = +15m.17s.
Riverview e?N = +11m.38s., eNE = +17m.2s.
Sydney i = +18m.22s.
Calcutta S?N = +14m.23s., iSSN = +16m.21s.
Christchurch L_QE = 23m.53s.
Bombay eE = +10m.20s., e = +12m.32s. and +31m.9s.
Baku e = +33m.14s.
Ksara ePP = +17m.36s.
La Paz ipPKP = +21m.26s., SKPZ = +23m.30s., PPZ = +25m.12s.

Dec. 25d. 9h. 55m. 48s. Epicentre 55°·9N. 111°·2E.

$A = -\cdot2037$, $B = +\cdot5251$, $C = +\cdot8263$; $\delta = 0$; $h = -8$;
$D = +\cdot932$, $E = +\cdot362$; $G = -\cdot299$, $H = +\cdot770$, $K = -\cdot563$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Irkutsk		5·5	232	i 1 36	P*	e 2 51	S*	—	—
Semipalatinsk		19·2	267	4 27	− 1	8 1	+ 2	—	—
Almata		25·3	255	5 30	0	10 8	+14	—	—
Zi-ka-wei	Z.	25·8	160	e 5 25	− 9	—	—	—	17·5
Frunse		26·7	258	e 5 41	− 2	—	—	e 14·0	—
Sverdlovsk		27·5	293	i 5 51	+ 1	10 33	+ 3	18·1	18·5
Andijan		29·5	256	e 6 15	+ 7	11 16	+14	—	—
Tchimkent		29·9	261	e 7 0	PP	—	—	—	—
Tashkent		30·8	260	e 6 35	+15	11 51	+28	16·6	17·1
Samarkand		33·2	260	6 36	− 4	—	—	—	—
Hong Kong		33·6	175	11 17	S	(11 17)	−49	18·0	21·1
Phu-Lien		35·2	187	e 5 21	?	—	—	—	21·8
Agra	E.	37·4	233	7 11	− 5	e 13 2	− 3	—	—
Moscow		39·5	302	e 7 33	− 1	13 34	− 3	19·7	25·7
Pulkovo		40·7	310	7 42	− 2	13 49	− 6	e 23·7	27·4
Baku		42·3	276	e 7 58	+ 1	e 14 26	+ 7	e 22·7	27·6
Grozny		42·6	282	e 7 31	−28	—	—	—	—
Piatigorsk		43·7	285	e 7 59	− 9	—	—	—	—
Tiflis		44·2	281	e 8 12	0	—	—	e 27·7	—
Theodosia		47·1	291	—	—	e 15 32	+ 4	30·2	—
Upsala	N.	45·9	316	—	—	e 17 12?	?	—	30·2
Bombay		49·9	234	e 8 29	−28	e 15 25	−42	e 25·3	—
Copenhagen		50·8	315	9 6	+ 2	16 42	+22	24·2	—
Bucharest		52·4	296	—	—	e 21 26	SSS	e 34·5	—
Kodaikanal	E.	52·6	224	e 16 45	S	(e 16 45)	+ 1	25·8	28·6
Hamburg		53·3	314	e 14 12	?	—	—	—	28·2
Vienna		54·4	305	e 9 33	+ 2	—	—	e 25·2	—
Jena		54·5	310	e 9 32	0	—	—	e 24·2	36·5
Cheb		54·8	310	—	—	e 22 12?	SSS	—	35·2
Ksara		54·8	279	i 9 34k	0	e 17 33	+19	—	—
Belgrade	N.W.	54·9	300	—	—	e 18 18	+62	e 35·0	—
Graz		55·6	305	e 9 57	+17	—	—	e 28·2	36·5
De Bilt		56·3	315	—	—	e 21 12?	SS	e 31·2	35·9
Zagreb		56·3	304	e 9 45	0	—	—	e 26·2	—
Stuttgart		57·2	310	e 9 52	+ 1	e 22 42	SS	e 32·2	38·6
Triest		57·5	305	e 26 2	?	e 30 54	?	—	38·2
Uccle		57·7	315	e 9 56	+ 1	—	—	—	—
Strasbourg		57·9	311	e 10 7	+11	—	—	e 32·2	—
Zurich		58·5	310	e 10 0	0	—	—	—	—
Basle		58·8	310	e 10 3	+ 1	—	—	—	—
Helwan		60·3	280	e 13 54	PP	e 18 39	+13	—	—
Toledo		69·9	312	e 11 17	+ 2	—	—	—	42·1
Mount Wilson	Z.	80·9	40	i 12 20	+ 3	—	—	—	—
Pasadena	Z.	80·9	40	e 12 20	+ 3	—	—	—	—
Riverside		81·4	40	e 12 22	+ 2	—	—	—	—

Additional readings :—
Sverdlovsk $L_g = +15\cdot6$m.
Hong Kong S? = +14m.38s.
Grozny e = +9m.33s.
Tiflis e = +20m.18s. and +23m.40s.
Theodosia e = +22m.6s.
Bucharest i = +23m.8s., iE = +23m.14s., iN = +24m.18s. and +27m.42s., iE = +29m.50s., eN = +29m.54s., iE = +32m.33s., iE = +33m.2s. and +33m.52s.
Hamburg eE = +24m.12s.?
Ksara ePPP = +12m.47s., SS = +21m.38s.
Belgrade eNW = +21m.42s.
Zagreb e = +9m.52s., eE = +25m.37s.
Stuttgart e = +26m.36s.
Long waves were also recorded at Göttingen, Stara Dala, Medan, Budapest, Yalta, Paris, Scoresby Sund, San Fernando, Hyderabad, Kew, Bidston, and Granada.

The following readings are attributed to Epicentre 39°·0N. 113°·0E. by the Central Met. Obs., Japan. They may belong to the above shock, but in this case the phases have been wrongly identified :—

Manila P =10h.3m.8s., S =9m.58s., M =19m.
Zinsen ePNE? =10h.4m.29s., eSNE =6m.38s., M =6m.48s.
Husan eP =10h.5m.32s., eS =8m.12s.
Heizyo ePNE =10h.5m.34s.
Kobe eSE? =10h.6m.27s., eN =11m.28s. and 12m.2s., eE =12m.15s., MZ = 13m.37s.
Taikyu eP =10h.7m.0s., iS =8m.18s.
Matuyama P =10h.7m.12s., S =10m.21s.
Hukuoka eP =10h.7m.16s., eS? =9m.23s.
Unzendake P =10h.9m.15s.
Izuka P =10h.9m.17s.
Nagasaki P =10h.9m.20s.
Tomie P =10h.9m.25s.
Hukuoka S? =10h.9m.27s.
Kumamoto P =10h.9m.39s.
Ooita P =10h.9m.41s.
Hamada P =10h.10m.10s.
Miyazaki P =10h.10m.14s.
Hirosima eP =10h.10m.23s.
Arisan P =10h.11m.59s.
Karenko P =10h.12m.4s.
Taityu P =10h.12m.7s.
Kosyun P =10h.12m.23s.
Muroto S =10h.13m.5s.

Dec. 25d. 13h. 52m. 9s. Epicentre 32°·9N. 132°·2E.

Felt rather strongly at Ooita, Kumamoto, and Simidu. Radius 200-300kms. Epicentre 32°·9N. 132°·2E.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1937. Tokyo, 1939, pp. 74-75. Macroseismic Chart p. 74.

$A = -\cdot5651$, $B = +\cdot6232$, $C = +\cdot5406$; $\delta = -4$; $h = +1$;
$D = +\cdot741$, $E = +\cdot672$; $G = -\cdot363$, $H = +\cdot400$, $K = -\cdot841$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Uwazima		0·5	41	0 19k	+ 5	0 27	+ 4	—	—
Simidu		0·7	100	0 18a	+ 1	0 27	− 1	—	—
Asosan		0·9	270	0 26a	+ 6	0 38	+ 4	—	—
Matuyama		1·1	26	0 33a	+11	0 47	+ 8	—	—
Miyazaki		1·2	213	0 25a	+ 1	0 37	− 4	—	—
Koti		1·3	59	0 28a	+ 3	0 54	+10	—	—
Kumamoto		1·3	266	0 28a	+ 3	0 45	+ 1	—	—
Hirosima		1·5	8	0 32a	Pg	0 57	+ 8	—	—
Izuka		1·5	301	0 31a	+ 3	—	—	—	—
Simonosiki		1·5	313	0 35a	Pg	0 56	+ 7	—	—
Unzendake		1·6	264	0 29a	− 1	0 53	Sg	—	—
Hukuoka B		1·7	294	i 0 34a	Pg	0 57	Sg	—	1·0
Hukuoka		1·7	294	i 0 30a	− 1	i 0 52	− 2	—	0·9
Muroto		1·7	78	0 31	0	1 2	Sg	—	—
Kagosima		1·9	226	0 40	Pg	1 13	Sg	—	—
Tadotu		1·9	43	0 44a	Pg	1 13	Sg	—	—
Hamada		2·0	357	0 42	Pg	1 7	Sg	—	—
Nagasaki		2·0	264	0 37a	P*	1 11	Sg	—	—
Tokusima		2·1	60	0 49	Pg	1 29	Sg	—	—
Ituhara		2·7	298	0 48k	P*	1 31	Sg	—	—
Sumoto	E.	2·7	57	e 0 39	− 6	1 30	Sg	—	1·7
	N.	2·7	57	e 0 38	− 7	1 29	Sg	—	1·7
	Z.	2·7	57	e 0 45	0	1 34	Sg	—	1·7
Sakai		2·8	18	1 1	Pg	1 40	Sg	—	—
Yakuzima		2·8	211	1 9	Pg	—	—	—	—
Wakayama		2·8	62	0 32	−15	1 10	−12	—	—
Tomie		2·9	264	0 56	Pg	1 39	Sg	—	—
Kobe		3·0	54	e 1 6	Pg	i 1 38	Sg	—	2·0
Siomisaki		3·0	80	0 52	+ 2	1 34	S*	—	—
Osaka		3·3	58	1 4	Pg	1 56	Sg	—	—
Osaka B		3·3	58	1 10	Pg	1 56	Sg	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Husan		3·4	297	1 0	P*	1 32	− 5	—	2·1
Toyooka	E.	3·4	39	1 12	P_g	1 58	S_g	—	2·2
	Z.	3·4	39	1 9	P_g	2 1	S_g	—	2·1
Kyoto		3·6	53	1 11	P_g	2 6	S_g	—	—
Miyadu		3·6	40	1 4	P*	2 7	SSS	—	—
Kameyama		4·0	61	1 8	+ 4	2 14	S_g	—	—
Hikone		4·1	54	1 10	P*	2 21	S_g	—	—
Tu		4·1	62	1 19	P_g	2 29	S_g	—	—
Ibukisan		4·2	55	1 13	P*	2 21	S_g	—	—
Taikyu		4·2	316	1 2	− 5	2 28	S_g	—	—
Gihu		4·5	55	1 13	+ 2	2 18	S*	—	—
Nagoya		4·6	59	e 1 14	+ 2	2 32	S_g	—	4·1
Hamamatu		4·9	68	1 13	− 4	2 16	+ 1	—	—
Kanazawa		5·1	44	2 18	S	(2 18)	− 2	—	—
Nake		5·1	208	1 36	P_g	2 38	S*	—	—
Omaesaki		5·3	70	1 42	P_g	2 48	S*	—	—
Iida		5·4	59	1 36	P*	2 50	S*	—	—
Toyama		5·6	46	2 1	P_g	2 54	S*	—	—
Kohu		5·9	62	1 44	P*	2 29	−11	—	—
Wazima		5·9	40	2 0	P_g	—	—	—	—
Hunatu		6·0	63	1 38	+ 6	3 22	S_g	—	—
Misima		6·0	67	1 29	− 3	2 51	+ 8	—	—
Numadu		6·0	66	1 46	P*	2 29	−14	—	—
Ito		6·1	69	1 29	− 5	—	—	—	—
Nagano		6·2	51	1 46	P*	3 1	S*	—	—
Oiwake		6·2	55	1 51	P*	3 14	S*	—	—
Keizyo		6·3	319	e 2 51	S	(e 2 51)	+ 1	—	—
Zinsen		6·4	318	e 2 40	S	(e 2 40)	−13	—	—
Maebasi		6·6	57	1 57	P*	3 24	S*	—	—
Kumagaya		6·7	60	2 1	P*	3 43	S_g	—	—
Kakioka		7·4	60	1 57	+ 5	4 2	S_g	—	—
Heizyo		8·1	325	e 4 1	S	(e 4 1)	S*	—	—
Zi-ka-wei		9·3	263	e 2 21	+ 4	i 5 21	S_g	—	—
Irkutsk		27·9	322	—	—	e 10 51?	+14	14·8	—
Andijan		47·7	298	e 8 46	+ 6	—	—	—	—
Sverdlovsk		53·3	319	—	—	e 21 40	SS	28·8	—
Mount Wilson	Z.	86·1	51	i 12 44	0	—	—	—	—
Pasadena	Z.	86·1	51	i 12 43	− 1	—	—	—	—
Riverside	Z.	86·7	51	e 12 46	− 1	—	—	—	—

Additional readings :—
Sumoto eN = +55s.
Kobe ePEN = +1m.8s., iS = +1m.51s.
Kanazawa S = +2m.58s.
Keizyo S = +3m.33s.
Zinsen eSN = +3m.31s.
Zi-ka-wei iN = +5m.45s.
Irkutsk e = +12m.51s.?

Dec. 25d. Readings also at 0h. (Mizusawa, Andijan, Frunse, Nagoya, Helwan, Oaxaca, Vera Cruz, Tacubaya, and Puebla), 1h. (Nagoya), 3h. (Branner, Fresno, and Lick), 4h. (Guadalajara, Tucson, Huancayo, Puebla, Tacubaya, Vera Cruz, Oaxaca, Mount Wilson, Pasadena, Riverside, and Merida), 5h. (Merida), 6h. (Upsala and Sumoto), 7h. (Oaxaca, Vera Cruz, Tacubaya, and Puebla), 8h. (Andijan, Puebla, Tacubaya, Vera Cruz, Oaxaca, and Samarkand), 9h. (Prague), 12h. (Santiago, Oaxaca, Vera Cruz, and San Javier), 13h. (Fresno and Lick), 14h. (Baku, Sverdlovsk, and Tashkent), 15h. (Riverside, Pasadena, Pulkovo, and Moscow), 16h. (Oaxaca), 17h. (Oaxaca, Riverside, Vera Cruz, Tacubaya, Puebla, and Mount Wilson), 18h. (Mount Wilson, Riverside, and Pasadena), 19h. (Puebla (2), Tacubaya (3), Vera Cruz (2), and Oaxaca (4), 20h. (San Javier, Huancayo, and La Paz), 21h. (La Paz (2), Huancayo, Rio de Janeiro, Pasadena, Riverside, Mount Wilson, Helwan, Manila, Tiflis, La Plata, San Juan, Sitka, Cape Town, Almata, Uccle, De Bilt, Toledo, Rio de Janeiro, Victoria, Ksara, Bombay, Calcutta, Riverview, Melbourne, Adelaide, Perth, Wellington, and Christchurch), 22h. (Copenhagen, Stuttgart, Paris, Strasbourg, and Oaxaca), 23h. (Grozny, Tiflis, and Manila).

Dec. 26d. 23h. 43m. 42s. Epicentre 15°·3N. 89°·4W.

Shock felt over the whole of the Republic of Salvador. Damage at Ahuachapan, Atiquizaya, Ataco, and Apaneca. Epicentre 15°·0N. 89°·2W. (Strasbourg).

P. Stahl.

Macroseismes Signales, Annales de l'Institut de Physique du Globe de Strasbourg, 1937, Tome II, 2e Partie, Seismologie, Mende, 1940, pp. 113-115.

$A = +\cdot0101$, $B = -\cdot9650$, $C = +\cdot2622$; $\delta = +8$; $h = +6$;
$D = -1\cdot000$, $E = -\cdot010$; $G = +\cdot003$, $H = -\cdot262$, $K = -\cdot965$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Merida	N.	5·6	358	i 1 39	P*	—	—	—	—
Oaxaca	N.	7·2	285	i 1 41	− 8	—	—	—	—
Vera Cruz	N.	7·5	302	e 1 52?	− 1	—	—	—	—
Tacubaya	Z.	10·2	295	e 2 30	− 1	—	—	—	—
Guadalajara	N.	14·3	294	e 3 29	+ 3	—	—	—	—
Little Rock		19·6	353	e 4 39	+ 7	e 8 29	SS	—	—
Columbia		20·1	20	—	—	e 8 46	SS	e 9·7	—
San Juan		22·5	78	e 5 1	− 1	e 9 11	+ 6	e 10·3	—
St. Louis		23·3	358	e 5 11	+ 1	e 9 42	+22	e 11·8	—
Tucson		25·8	316	e 5 31	− 3	e 10 16	+14	e 14·4	—
Chicago		26·6	3	—	—	e 10 27	+11	e 13·0	—
Huancayo		30·5	152	e 6 2	−15	e 10 31	+13	e 11·8	—
Williamstown		30·6	24	e 6 18	0	—	—	—	—
La Paz		37·9	145	e 7 23	+ 3	—	—	18·3	22·1
Ukiah		38·0	316	—	—	e 13 21	+ 7	e 15·6	—
Sverdlovsk		103·9	15	—	—	e 33 37	SS	46·3	56·4
Ksara		108·2	45	e 18 20	PKP	e 29 7	PS	—	64·8

Additional readings :—
Little Rock iE = +4m.48s., iPPE = +5m.4s., eE = +5m.42s., eN = +9m.21s. and +10m.15s.
San Juan ePP = +5m.26s., iS = +9m.35s.
St. Louis eE = +6m.43s., iSN = +9m.45s.
Tucson eP = +6m.33s., eS = +10m.21s.
Huancayo ePP = +7m.3s., ePPP = +7m.10s., eP_cP = +8m.47s.
Long waves were also recorded at Cape Town, Rio de Janeiro, Scoresby Sund, Bombay, and other American, European, and Russian stations.

Dec. 26d. Readings also at 0h. (Oaxaca (2) and Vera Cruz), 2h. (Oaxaca, Vera Cruz, Tacubaya, Puebla, and Tucson), 3h. (Oaxaca, Vera Cruz, Andijan, and Frunse), 4h. (Santiago, Manila, and Berkeley), 5h. (Berkeley, La Paz, Tashkent, Samarkand, Tchimkent, Andijan, Frunse, and Erevan), 6h. (Pasadena, Riverside, Tinemaha, Haiwee, Sitka, Huancayo, Tacubaya, Guadalajara, Merida, Publea, Tucson, Oaxaca, Vera Cruz, and Williamstown), 8h. (Tucson), 9h. (Fresno, Berkeley, Huancayo, Tacubaya, Puebla, Oaxaca, Vera Cruz, Branner, San Francisco, and Lick), 10h. (La Paz, Vera Cruz, and Oaxaca), 11h. (Medan), 12h. (Riverside and Balboa Heights), 16h. (Frunse, Andijan, Tchimkent, Samarkand, and Tashkent), 17h. (Vera Cruz, Oaxaca, Puebla, Tacubaya, Guadalajara, Merida, and Hukuoka B), 18h. (Oaxaca, Sverdlovsk, Tashkent, Pasadena, Riverside, La Paz, Huancayo, Berkeley, Fresno, Tucson, and Sitka), 21h. (Granada and Medan), 22h. (Manila, Kew, and near Hukuoka B).

Dec. 27d. 15h. 14m. 57s. Epicentre 16°·3N. 98°·6W. (as on 1937 Dec. 23d.).

Strongly felt at Chilpacingo and Ometepec; equally strongly felt at Bravos (Gro), Maltrata (Ver), Toluca (Mex), Coatepex (Ver), etc.

Intensity IV at Tacubaya. Epicentre 16°24′N. 98°39′W. (Tacubaya).

P. Stahl.

Macroseismic Signales, Annales de l'Institut de Physique du Globe de Strasbourg, 1937, Tome II, 2e Partie, Seismologie, Mende, 1940, pp. 113-115.

$A = -\cdot1436$, $B = -\cdot9496$, $C = +\cdot2789$; $\delta = +15$; $h = +5$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	1·9	68	0 38	P_g	—	—	—	—
Puebla	N.	2·8	8	0 48	+ 1	—	—	—	—
Tacubaya	N.	3·1	350	0 53	+ 2	—	—	—	—
Vera Cruz	N.	3·7	39	1 1	+ 1	—	—	—	—
Guadalajara	N.	6·3	315	1 36	0	—	—	—	—
Tucson		19·4	328	e 4 25	− 5	—	—	—	—
Riverside	Z.	24·4	321	i 5 16	− 5	—	—	—	—
Mount Wilson	Z.	25·0	321	i 5 22	− 5	—	—	—	—
Pasadena		25·0	321	i 5 25	− 2	—	—	—	—
Haiwee	Z.	26·2	324	e 5 36	− 2	—	—	—	—
Tinemaha	N.	27·1	324	e 5 41	− 5	—	—	—	—
San Juan		31·0	80	—	—	e 12 52	SS	—	—
Williamstown		34·1	35	i 6 41	− 7	—	—	—	—
Huancayo		36·4	139	e 7 17	+ 9	—	—	—	—
La Paz		44·3	135	e 9 3	+50	—	—	20·0	24·4
College		58·7	338	—	—	e 24 4	SSS	—	—
Ksara		113·9	42	e 19 45	PP	e 29 37	PS	65·0	74·0

Additional readings :—
Tucson i = +4m.28s., +4m.42s., +10m.25s., +10m.32s., +10m.49s., +11m.53s., and +12m.11s.
Long waves were also recorded at Sitka, Berkeley, San Fernando, Tashkent, Stuttgart, Uccle, De Bilt, Copenhagen, Jersey, Paris, Sverdlovsk, and Strasbourg.

Dec. 27d. Readings also at 0h. (Sumoto), 1h. (Batavia, Tacubaya, Vera Cruz, and Oaxaca), 2h. (Andijan), 3h. (Tucson, Tacubaya, Vera Cruz, and Oaxaca), 4h. (New Plymouth and Wellington), 5h. (La Paz and Huancayo), 6h. (La Paz), 8h. (Tacubaya, Vera Cruz, and Oaxaca), 10h. (Huancayo), 13h. (La Paz and Huancayo), 15h. (Tchimkent), 16h. (Andijan and Oaxaca), 17h. (Tacubaya, Oaxaca, and Mizusawa), 19h. (Balboa Heights), 20h. (Tacubaya and Oaxaca), 22h. (Tiflis and Grozny).

Dec. 28d. 3h. 9m. 18s. Epicentre 8°·5S. 126°·0E. (as on 1937 Dec. 25d.).

$A = -\cdot5814$, $B = +\cdot8003$, $C = -\cdot1468$; $\delta = +6$; $h = +7$;
$D = +\cdot809$, $E = +\cdot588$; $G = +\cdot086$, $H = -\cdot119$, $K = -\cdot989$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	5·2	25	i 1 18	− 3	i 2 16	− 6	—	—
Palau	17·9	29	4 12	0	7 31	+ 1	—	—
Batavia	19·1	276	4 29	+ 2	i 8 0	+ 3	—	—
Manila	23·5	347	i 5 13k	+ 1	9 28	+ 5	—	—
Adelaide	28·7	159	i 6 4	+ 3	i 10 50	0	i 13·7	19·6
Hong Kong	32·7	339	6 36	0	11 48	− 4	—	—
Melbourne	33·9	152	6 47	0	12 14	+ 3	15·6	19·9
Riverview	34·2	141	e 7 18	+29	i 12 16	0	—	21·4
Sydney	34·2	141	—	—	i 12 12	− 4	e 19·0	38·4
Phu-Lien	34·8	327	e 6 56	+ 2	e 12 21	− 4	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Miyazaki		40·5	7	7 41k	− 1	13 35	−17	—	—
Kumamoto		41·3	5	7 49	0	—	—	—	—
Gihu		44·8	13	8 17	0	—	—	—	—
Hunatu		45·4	15	8 16	− 6	—	—	—	—
Oiwake		46·1	14	8 30	+ 2	—	—	—	—
Nagano		46·4	13	8 32	+ 2	—	—	—	—
Mito		46·7	16	8 41	+ 9	—	—	—	—
Hukusima		47·9	15	8 45	+ 3	—	—	—	—
Calcutta	N.	48·1	311	e 8 52	+ 9	i 15 35	− 7	i 22·1	31·5
Mizusawa	E.	49·4	15	9 7	+14	—	—	—	—
Vladivostok		51·7	5	e 9 10	− 1	i 16 23	− 9	—	22·5
Kodaikanal	E.	51·8	290	—	—	i 16 24	− 9	24·4	30·2
Christchurch		53·5	139	e 9 4a	−20	16 54	− 3	26·5	—
Wellington		54·0	135	i 9 25	− 3	16 59	− 4	21·5	—
Agra	E.	58·4	309	i 9 57	− 3	i 17 49	−13	—	—
Bombay	E.	59·1	297	e 10 19	+15	i 18 12	+ 1	—	—
Irkutsk		63·3	345	10 31	− 2	18 57	− 7	30·7	—
Frunse		69·3	322	e 11 10	− 1	—	—	—	—
Andijan		69·5	319	11 15	+ 3	e 20 15	− 5	—	—
Semipalatinsk		70·8	332	11 17	− 3	—	—	—	—
Tashkent		71·8	319	i 11 24	− 2	i 20 39	− 7	—	45·3
Samarkand		72·6	316	e 11 21	−10	e 20 36	−20	—	—
Sverdlovsk		84·0	330	i 12 32	− 2	i 22 41	−16	38·7	—
Baku		85·0	312	i 12 41	+ 3	i 23 1	[0]	40·7	54·5
Grozny		88·7	314	e 12 59	+ 2	e 23 38	− 5	—	—
Tiflis		89·1	312	i 12 58	0	i 23 41	− 5	e 44·7	—
Ksara		94·8	303	e 13 26	+ 1	—	—	—	53·2
Helwan		98·2	—	—	—	e 24 9	[− 9]	—	56·7
Stuttgart		113·9	320	e 19 42	PP	e 29 30	PS	e 62·7	—
Strasbourg		114·9	320	e 19 42	PP	e 30 18	PPS	e 89·2	—
De Bilt		115·3	325	—	—	e 29 15	PS	e 59·7	68·4
Pasadena	Z.	116·1	56	e 18 46	[+ 1]	—	—	—	—
Mount Wilson	Z.	116·2	56	e 18 47	[+ 2]	—	—	—	—
Uccle		116·3	324	—	—	e 36 6	SS	e 59·7	—
Riverside	Z.	116·7	56	i 18 48	[+ 2]	—	—	—	—
Paris		118·1	321	e 20 9	PP	—	—	69·7	—
Huancayo		150·6	135	e 19 47	[− 1]	—	—	e 70·7	—
La Paz		151·5	152	e 19 57k	[+ 8]	i 44 32	SS	75·7	88·0
Balboa Heights		154·7	88	—	—	e 26 19	[−40]	—	—

Additional readings :—
Amboina iN = +3m.17s.
Batavia eEN = +8m.35s.
Manila iN = +15m.28s.
Adelaide i = +6m.27s., +7m.4s., +11m.55s., and +15m.55s.
Hong Kong SS = +13m.45s.
Melbourne i = +17m.1s.
Riverview iN = +14m.54s.
Gihu i = +9m.12s.
Oiwake i = +11m.2s.
Calcutta iPPN = +10m.28s., iPPPN = +11m.9s., iSSN = +18m.33s., iSSSN = +19m.37s.
Christchurch iEZ = +9m.26s., L_qN = +22·4m.
Wellington i = +10m.9s., P_cP? = +10m.28s.
Tiflis ePPSE = +25m.7s.
Ksara ePP = +17m.12s., ePS = +25m.51s.
Riverside eZ = +19m.51s.
Huancayo iPKP = +19m.57s., e = +20m.24s., PP = +22m.50s.
La Paz iPKPZ = +20m.2s., $iPKP_2Z$ = +20m.24s. and +20m.32s., ipPKPZ = +21m.16s., ipPKPN = +21m.22s., iSPN = +21m.51s., iSKPZ = +23m.36s., iPPN = +23m.58s.
Long waves were also recorded at Copenhagen, Kew, Cape Town, and Rio de Janeiro.

Dec. 28d. 6h. 19m. 25s. Epicentre 0°·7N. 29°·4W.

$A = +\cdot8711$, $B = -\cdot4909$, $C = +\cdot0122$; $\delta = -5$; $h = +7$;
$D = -\cdot491$, $E = -\cdot871$; $G = +\cdot011$, $H = -\cdot006$, $K = -1\cdot000$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro	E.	27·0	209	i 5 45	0	i 10 27	+ 5	i 13·6	17·1
	N.	27·0	209	i 5 47	+ 2	i 10 31	+ 9	i 13·6	16·6
Averroes		38·4	31	i 7 27	+ 2	e 13 41	+21	19·6	22·6
San Juan		40·1	296	7 42	+ 3	i 13 47	+ 1	e 16·5	—
San Fernando		41·6	29	7 50	− 1	i 14 16	+ 8	20·1	—
La Paz		41·9	246	i 7 55a	+ 1	i 14 17	+ 4	i 21·2	25·1
Malaga		42·7	30	i 8 2	+ 2	e 14 25	+ 1	21·6	—
Granada		43·4	30	i 8 5	− 1	—	—	—	—
Almeria		43·8	32	i 8 9	0	e 14 46	+ 6	e 23·5	—
La Plata		44·4	214	8 13	− 1	14 53	+ 4	21·9	—
Toledo		45·3	28	e 8 19	− 2	e 15 7	+ 5	18·2	25·8
Algiers		46·8	37	i 8 34	+ 1	e 16 24	+60	i 24·4	29·6
Huancayo		47·3	253	i 8 39	+ 2	i 15 29	− 2	i 19·1	—
Barcelona		49·5	30	8 33	−21	e 16 6	+ 4	—	29·8
Balboa Heights		50·6	281	e 8 35	−27	—	—	—	—
Santiago		51·5	224	e 9 8	− 1	e 16 30	+ 1	—	31·1
Jersey		53·7	22	e 9 25	− 1	e 17 4	+ 5	e 22·6	25·6
Paris		55·2	25	e 9 36	− 1	e 17 22	+ 2	24·6	33·6
Rathfarnham Castle		55·8	17	i 9 36	− 5	i 17 23	− 5	24·6	27·6
Neuchatel		55·9	29	e 9 42	0	e 17 34	+ 5	—	—
Weston		56·0	324	i 9 42	− 1	i 17 35	+ 5	e 27·6	—
Oxford	N.	56·1	21	e 9 40	− 3	i 15 30	?	e 23·6	29·8
Kew		56·2	22	i 9 43k	− 1	i 17 33	0	25·6	27·2
Oak Ridge		56·2	324	i 9 40a	− 4	—	—	e 26·6	—
Basle		56·6	29	e 9 43	− 4	e 17 40	+ 2	—	—
Cape Town		56·6	132	i 9 48	+ 1	i 17 41	+ 3	e 26·5	32·3
Bidston		56·9	18	i 9 55	+ 6	i 17 45	+ 3	25·6	28·9
Zurich		57·0	30	e 9 44	− 6	e 17 45	+ 2	—	—
Chur		57·1	30	e 9 47	− 3	e 17 42	− 3	—	—
Philadelphia		57·1	319	—	—	e 17 50	+ 5	e 26·6	—
Williamstown		57·3	324	i 9 49	− 3	—	—	e 26·1	—
Strasbourg		57·4	28	i 9 52a	− 1	i 17 54	+ 5	e 29·1	31·1
Stonyhurst		57·5	19	—	—	17 54	+ 4	25·6	29·0
Uccle		57·5	25	9 51k	− 2	i 17 51	+ 1	23·6	—
Karlsruhe		58·0	29	i 9 57	0	18 4	+ 7	31·6	—
Stuttgart		58·3	29	e 9 53	− 6	e 17 59	− 2	e 28·6	34·1
Columbia		58·5	311	—	—	e 17 48	−15	e 22·0	—
Durham		58·5	18	e 10 4	+ 4	i 18 6	+ 3	—	29·6
Triest		58·6	34	10 4	+ 3	i 18 4	0	e 28·6	33·1
De Bilt		58·8	25	i 10 2k	0	i 18 12	+ 5	e 27·6	30·3
Edinburgh		59·0	17	—	—	i 18 13	+ 3	—	29·5
Zagreb		60·0	35	i 10 12k	+ 1	e 18 31	+ 8	e 22·0	—
Ottawa		60·3	324	e 10 13	0	e 18 35?	+ 9	24·6	—
Aberdeen		60·4	17	e 12 41	PP	e 18 23	− 5	e 25·2	30·2
Graz		60·4	34	i 10 10	− 3	e 18 45	+17	e 30·6	43·6
Göttingen		60·5	27	e 10 11	− 3	e 18 33	+ 4	e 29·6	33·6
Jena	N.	60·9	29	e 10 15	− 2	e 18 35	+ 1	—	—
Vienna		61·6	33	e 10 18	− 4	18 29	−14	e 33·1	—
Toronto		61·7	320	—	—	e 18 35?	− 9	25·6	—
Prague		61·7	31	e 10 35?	+13	—	—	—	34·1
Hamburg		61·9	25	e 10 20a	− 4	i 18 54	+ 7	e 27·6	32·6
Belgrade		62·1	39	i 10 22a	− 3	i 18 56	+ 7	e 33·9	—
Stara Dala		62·4	35	e 10 29	+ 2	e 18 57	+ 4	—	36·1
Budapest		62·7	36	10 28	− 1	18 51	− 6	e 32·6	—
Copenhagen		64·4	25	10 38k	− 2	19 23	+ 5	26·6	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Bergen		65·2	18	10 44	− 1	—	—	—	—
Ksara		69·2	55	i 11 11k	+ 1	e 20 27	+11	33·6	39·6
Upsala		69·2	23	i 11 9	− 1	e 20 20	+ 4	—	36·1
Scoresby Sund		69·8	2	11 19	+ 5	20 32	+ 9	28·6	—
Yalta		70·9	43	i 11 18	− 3	i 20 36	0	—	—
Simferopol		71·0	42	e 11 10	−12	—	—	—	—
Theodosia		71·9	42	11 13	−14	20 49	+ 1	38·6	—
Pulkovo		74·6	27	i 11 40	− 3	21 30	+12	33·1	40·0
Moscow		76·6	33	11 52	− 2	21 44	+ 4	42·1	45·2
Tiflis		77·8	48	12 2	+ 1	21 53	0	e 37·6	47·8
Grozny		78·7	47	e 12 7	+ 1	—	—	—	—
Baku		81·4	50	i 12 24	+ 4	i 22 36	+ 5	40·1	49·8
Tucson		82·4	303	e 12 25	0	—	—	e 40·6	—
Riverside	z.	87·9	304	e 12 50	− 3	—	—	—	—
Mount Wilson	z.	88·5	304	e 12 54	− 2	—	—	—	—
Pasadena		88·6	304	e 12 56	0	—	—	e 44·6	—
Sverdlovsk		89·4	33	i 13 2	+ 2	23 32	[+ 3]	i 42·9	52·3
Victoria		92·1	318	—	—	i 24 17	+ 4	39·6	—
Ukiah		92·5	309	—	—	e 24 24	+ 7	e 42·3	—
Samarkand		94·5	51	17 4	PKP	—	—	—	—
Tashkent		96·1	49	i 13 25	− 6	e 26 5	PS	e 47·5	47·9
Andijan		98·5	50	17 23	PP	e 26 35	PS	—	—
Bombay		101·3	71	e 13 59	+ 5	i 24 35	[+ 2]	50·6	64·6
Agra	E.	105·1	62	e 18 32	PP	i 25 42	−21	—	—
Kodaikanal	E.	106·5	79	18 43	PKP	—	—	—	—
Irkutsk		114·5	30	e 19 41	PP	25 32	[+ 2]	54·6	—
Calcutta	N.	115·2	65	e 19 46	PP	—	—	—	71·2
Christchurch		133·0	202	e 21 34a	PP	—	—	66·7	—
Vladivostok		133·3	19	i 12 49	PP	e 26 28	[+ 1]	—	—
Batavia	E.	136·0	98	i 23 12	?	—	—	—	—
Manila		147·0	61	i 19 37k	[− 6]	24 37	?	—	—

Additional readings :—
Averroes iPP = +8m.50s., PPP = +9m.21s., SSS = +16m.43s.
San Juan ePP = +9m.15s., ePPP = +9m.53s.
La Paz iPPZ = +9m.31s., iP_cPN = +9m.39s., iPPP = +10m.13s., iSSN = +17m.19s., iS_cSN = +18m.7s.
Granada iPPP = +10m.6s.
Toledo iP = +8m.22s.
Algiers iPP = +10m.19s.
Huancayo iPP = +10m.29s., iPPP = +11m.13s., i = +15m.41s., +16m.27s., and +17m.14s.
Jersey ePP = +11m.10s., ePPP = +12m.48s., e = +13m.45s., ePS = +17m.40s., e = +19m.18s. and +20m.47s.
Paris e = +19m.32s.
Rathfarnham Castle i = +19m.25s., iSS = +21m.26s.
Kew ePPZ = +11m.41s., iEZ = +17m.43s., iS_cSE = +19m.42s., e = +23m.57s.
Cape Town iPPN = +11m.14s., iPPPE = +13m.1s., iPSE = +18m.4s., iPSN = +18m.23s., i?E = +10m.48s., iN? = +19m.39s., iSSSE = +24m.0s., iSSSN = +24m.7s.
Bidston e = +24m.2s.
Zurich ePP = +11m.37s.
Chur e = +9m.50s.
Williamstown i = +10m.59s.
Strasbourg iPPNZ = +12m.1s.
Stonyhurst i = +19m.52s.
Uccle iPPP = +13m.18s.
Stuttgart P = +10m.30s.k, ePP = +11m.57s., ePPP = +13m.15s., eS_cS = +19m.49s., e = +16m.29s.
Durham iE = +17m.6s.
Triest PPP = +13m.30s.
De Bilt iPPZ = +12m.9s.
Edinburgh i = +17m.48s. and +20m.3s.
Aberdeen e = +19m.58s.
Vienna P_cP = +11m.30s., PP = +12m.40s., PPS = +18m.42s.
Belgrade iZ = +10m.40s. and +12m.40s., eNE = +17m.38s. and +22m.45s.
Budapest iE = +10m.45s. and +19m.3s.
Copenhagen +19m.45s. and +20m.49s., eE = +22m.37s.
Ksara iPP = +13m.47s., eSS = +25m.9s.
Scoresby Sund +21m.24s.
Yalta e = +13m.30s.

Continued on next page.

Mount Wilson ePPZ = +16m.14s.
Pasadena ePPZ = +16m.22s.
Sverdlovsk iPS = +23m.53s., PS = +24m.52s., SS = +29m.35s.
Ukiah ePS = +25m.20s.
Tashkent iPP = +17m.18s.
Andijan e = +26m.35s.
Bombay iPP = +18m.1s., iS = +25m.17s., PS = +27m.5s., PPSE = +27m.59s., SSE = +32m.42s.
Irkutsk PS = +29m.16s., eSS = +35m.35s.
Christchurch iZ = +22m.52s., eZ = +30m.30s., eEN = +56m.15s.
Vladivostok e = +22m.53s. and +24m.43s.
Long waves were also recorded at Helwan, Tortosa, Bucharest, Oaxaca, Vera Cruz, Hyderabad, Perth, College, Sitka, Besançon, Hong Kong, Wellington, and Riverview.

Dec. 28d. Readings also at 1h. (Vera Cruz, Oaxaca, Grozny, Tiflis, and Huancayo), 2h. (Tacubaya, Oaxaca, and Vera Cruz), 3h. (Frunse, Tchimkent, Samarkand, and Andijan), 4h. (Lick, Mount Wilson, Riverside, Pasadena, Haiwee, Misima, Maebasi, Nagano, Hunatu, Hukusima, and Oiwake), 5h. (Samarkand, Sverdlovsk, Tashkent, La Paz, and Grozny), 6h. (Berkeley, Santiago, and La Paz), 7h. (La Paz, Samarkand, Tuai, New Plymouth, Hastings, Wellington, and Christchurch), 8h. (Andijan, Ksara, and Helwan), 9h. (Tiflis, La Paz, and Grozny), 11h. (Malabar and Batavia), 13h. (Amboina and Vera Cruz), 15h. (Puebla, Vera Cruz, Tacubaya, and Oaxaca), 16h. (Tokyo and Tiflis), 18h. (Santiago (2)), 19h. (Santiago (2) and Capodimonte), 20h. (Mizusawa, Nagoya, and Malabar), 21h. (Vera Cruz, Oaxaca, and Christchurch), 22h. (Balboa Heights and Hukuoka B), 23h. (Tiflis, Erevan, and Wellington).

Dec. 29d. Readings at 0h. (Christchurch, Huancayo, and near Manila), 1h. (Oaxaca, Vera Cruz, and near Irkutsk), 2h. (Balboa Heights, Neuchatel, and Zurich), 3h. (near Andijan and Samarkand), 4h. (Ksara, Tiflis, Christchurch, and Wellington), 5h. (Mount Wilson, Pasadena, and Riverside), 9h. (Mount Wilson, Pasadena, Riverside, Tashkent, Irkutsk, Sverdlovsk, and near Santiago), 11h. (Oaxaca (2), Vera Cruz, and near Tiflis), 12h. (Apia, Christchurch, Oaxaca, Tacubaya, and Vera Cruz), 13h. (Oaxaca, Tacubaya, Puebla, Vera Cruz, Tucson (2), Hastings, near New Plymouth, and Wellington), 14h. (Oaxaca, Vera Cruz, Hastings, New Plymouth, and near Wellington), 15h. (Sverdlovsk, Frunse, Semipalatinsk, near Andijan, Samarkand, Tashkent and Tchimkent, Mount Wilson, Pasadena, Riverside, near Berkeley, Branner, Lick, San Francisco, and near Santiago), 18h. (Batavia and Medan), 19h. (Sverdlovsk, Tashkent, Irkutsk, near Berkeley, and Branner), 20h. (near Medan and near Mizusawa), 22h. (Sverdlovsk, Vladivostok, near Mizusawa, and Nagoya), 23h. (Tashkent).

Dec. 30d. 2h. 6m. 43s. Epicentre 38°·9N. 1°·0W.

$A = +\cdot7802$, $B = -\cdot0136$, $C = +\cdot6254$; $\delta = +2$; $h = -1$;
$D = -\cdot017$, $E = -1\cdot000$; $G = +\cdot625$, $H = -\cdot011$, $K = -\cdot780$.

Felt intensity III-IV at Alicante and throughout the province.

Bulletin mensual provisoire du Bureau International de Sismologie, 1937, p. 175, Strasbourg, 1938. Epicentre 38°55′N. 1°3′W.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.
Alicante	0·7	144	0 9	P_g	—	—	—
Tortosa	2·2	31	0 40	P*	1 15	S_g	—
Almeria	2·3	209	i 0 45	P_g	i 1 15	S_g	—
Toledo	2·6	293	e 0 46	P*	i 1 28	S_g	—
Granada	2·7	230	i 0 50	P*	i 1 27	S_g	—
Malaga	3·5	232	i 0 55	− 2	e 1 39	− 1	—
Barcelona	3·5	43	e 0 55	− 2	e 1 57	S_g	e 2·1
Algiers	3·8	121	i 1 34	P_g	2 50	+63	—
San Fernando	4·8	241	e 1 37	P_g	2 37	S_g	—

Additional readings :—
Tortosa PE = +46s.
Toledo iP_g = +54s.
Malaga iP_g = +1m.9s., iSS = +1m.58s.
Algiers iP_g = +1m.45s., PP = +1m.54s.
San Fernando eP_gN = +2m.4s., iS_g = +2m.57s.
Long waves were recorded at Pulkovo, Sverdlovsk, and other European stations.

Dec. 30d. 11h. 41m. 1s. Epicentre 16°·3N. 98°·6W. (as on 1937 Dec. 27d.).

A = −·1436, B = −·9496, C = +·2789; δ = +15 : h = +5.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	1·9	68	0 32	− 2	—	—	—	—
Puebla	N.	2·8	8	0 45	− 2	—	—	—	—
Tacubaya	N.	3·1	350	0 50	− 1	—	—	—	—
Vera Cruz	N.	3·7	39	0 59	− 1	—	—	—	—
Manzanillo	N.	6·0	298	1 31?	− 1	—	—	—	—
Guadalajara	N.	6·3	315	i 1 34	− 2	—	—	—	—
Merida	E.	9·7	61	e 2 21	− 1	—	—	—	—
Little Rock		19·2	16	i 4 26	− 2	e 7 47	−12	e 12·9	—
Tucson		19·4	328	i 4 31	+ 1	i 8 17	+13	e 9·6	—
St. Louis		23·4	16	e 5 7	− 4	e 9 15	− 6	e 13·0	—
Riverside	Z.	24·4	321	i 5 26a	+ 5	—	—	—	—
Mount Wilson	Z.	25·0	321	i 5 29a	+ 2	e 10 7	+18	—	—
Pasadena		25·0	321	i 5 29a	+ 2	i 10 8	+19	e 11·5	—
Haiwee		26·2	324	e 5 40	+ 2	—	—	—	—
Tinemaha		27·1	324	i 5 47a	+ 1	—	—	—	—
Chicago		27·2	17	e 5 23	−24	e 10 15	−10	e 12·4	—
Fresno	N.	27·7	322	e 5 58	+ 6	—	—	—	—
Lick	N.	29·2	321	e 6 6	+ 1	—	—	—	—
Berkeley		29·9	321	e 6 12	0	e 11 23	+14	—	—
San Juan		31·0	80	e 6 23	+ 2	—	—	e 14·2	—
Bozeman		31·1	344	e 6 23	+ 1	—	—	e 16·2	—
Ukiah		31·3	323	—	—	e 11 29	− 2	e 12·7	—
Williamstown		34·1	35	i 6 19	−29	—	—	—	—
Ottawa		34·8	28	e 6 49	− 5	e 12 29	+ 4	17·0	—
Oak Ridge	Z.	34·9	36	i 6 49a	− 6	—	—	e 24·0	—
Weston		34·9	36	i 6 50	− 5	—	—	e 22·8	—
Huancayo		36·4	139	e 7 13	+ 5	e 12 23	−27	e 14·5	—
Seven Falls		38·4	31	e 5 59?	?	—	—	19·0	—
La Paz		44·3	135	i 8 19a	+ 6	14 47	− 1	21·0	24·6
Rio de Janeiro		66·7	124	—	—	23 59?	SS	—	—
Scoresby Sund		70·3	20	—	—	23 53	?	37·0	—
De Bilt		85·5	37	i 12 40	− 1	—	—	i 45·0	53·9
Stuttgart		89·1	39	e 9 5	?	—	—	e 49·0	—
Sverdlovsk		105·1	12	—	—	e 25 0	[+ 9]	49·0	—
Tiflis		113·1	30	e 19 27	PP	e 29 12	PS	e 59·0	64·6
Ksara		113·9	42	e 19 28	PS	e 29 12	PS	—	65·0

Additional readings :—
Little Rock iEN = +4m.34s., iPPEN = +4m.48s., iEN = +5m.13s., eSEN = +8m.5s., eN = +11m.42s.
Tucson iP = +4m.35s., iPP = +4m.46s., i = +5m.4s., +5m.18s., +5m.30s., and +6m.4s.
St. Louis iPN = +5m.10s., iN = +5m.17s., and +5m.37s., iE = +9m.35s. and +10m.19s.
Berkeley eE = +19m.36s.
Williamstown i = +7m.50s.
Oak Ridge i = +6m.57s.
Huancayo eP_cP = +8m.25s.
Stuttgart e = +10m.17s.
Sverdlovsk e = +28m.47s.
Long waves were also recorded at Philadelphia, Irkutsk, Moscow, Pulkovo, Wellington, Christchurch, Butte, Sitka, Seattle, Uccle, Victoria, and Copenhagen.

Dec. 30d. 13h. Readings attributed by Seismological Bulletin of Cent. Met. Obs., Tokyo, to an epicentre near Marianne Islands. The observations do not fit in with this, but as all the stations are in similar azimuths a satisfactory determination is not possible :—

Titizima P =7m.5s.
Tokyo Cen. Met. Obs. P =8m.22s., S =11m.23s.
Misima P =8m.26s., S =11m.17s.
Kumagaya P =8m.27s., S =11m.33s.
Hunatu P =8m.31s., S =11m.24s.
Kakioka P =8m.32s., S =10m.58s.
Kohu P =8m.34s., S =11m.27s.
Gihu P =8m.36s., S =11m.35s.
Yokohama P =8m.37s.
Maebasi P =8m.42s.
Nagano P =8m.43s., S =11m.47s.
Oiwake P =8m.45s., S =11m.41s.
Hukusima P =8m.47s., S =12m.9s.
Mera S =10m.11s.
Mito S =11m.23s.
Andijan e =14m.37s. and 22m.38s.

Dec. 30d. Readings also at 0h. (Vera Cruz and Oaxaca), 1h. (Grozny (3)), 2h. (Andijan (2), Oak Ridge, Tortosa, Grozny (4), Alicante, Samarkand, Malaga, Granada, Almeria, and Toledo), 3h. (Balboa Heights and Grozny (2)), 4h. (Grozny, Huancayo, and Oaxaca), 5h. (Oacaca, Amboina, and Merida), 7h. (Baku, Amboina, Sverdlovsk, Tiflis, Erevan, Piatigorsk, Tashkent, Grozny, Ksara, and Sotchi), 8h. (Grozny), 9h. (Grozny, Tiflis, and Erevan), 10h. (Toledo, Almeria, Granada, Malaga, Apia, Tucson, Manzanillo, Guadalajara, and Rathfarnham Castle), 11h. (Sverdlovsk, Baku, Huancayo, Santiago, Philadelphia, Tinemaha, Riverside, Mount Wilson, Pasadena, Oak Ridge, St. Louis, Chicago, Scoresby Sund, Copenhagen, and Ivigtut), 12h. (Apia), 13h. (Tchimkent (2), La Paz, Pasadena, Mount Wilson, Riverside, and Tinemaha), 16h. (Oak Ridge, Balboa Heights, and Oaxaca (2)), 18h. (Williamstown, Oak Ridge, Mizusawa, and San Juan), 22h. (Tacubaya, Piatigorsk, Grozny, Tiflis, and Erevan), 23h. (Tacubaya, Oaxaca, Santiago, Pasadena, Mount Wilson, Tinemaha, San Javier, and La Plata).

Dec. 31d. 17h. 41m. 22s. Epicentre 16°·3N. 98°·6W. (as on 1937 Dec. 30d.).

$A = -\cdot1436$, $B = -\cdot9496$, $C = +\cdot2789$; $\delta = +15$; $h = +5$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Oaxaca	N.	1·9	68	0 5	−29	—	—	—	—
Tacubaya	E.	3·1	350	0 51	0	—	—	—	—
Vera Cruz	N.	3·7	39	0 53	− 7	—	—	—	—
Manzanillo	N.	6·0	298	1 33	+ 1	—	—	—	—
Guadalajara	N.	6·3	315	1 36	0	—	—	—	—
Merida	E.	9·7	61	2 11	−11	—	—	—	—
Mazatlan	N.	10·0	314	i 2 29	+. 2	—	—	—	—
Little Rock		19·2	16	i 4 28	0	e 7 53	− 6	e 11·0	—
Tucson		19·4	328	i 4 32	+ 2	i 8 18	+14	i 8·9	—
Balboa Heights		19·9	108	e 4 28	− 8	—	—	—	—
St. Louis		23·4	16	i 5 10	− 1	i 9 26	+ 5	—	—
Columbia		23·7	37	e 5 2	−12	e 9 32	+ 5	i 10·4	—
Mount Wilson		25·0	321	i 5 29a	+ 2	—	—	—	—
Pasadena		25·0	321	i 5 28a	+ 1	i 10 2	+13	e 12·1	—
Cincinnati		25·9	25	i 5 34	− 1	e 10 8	+ 4	—	—
Haiwee		26·2	324	e 5 40	+ 2	—	—	—	—
Tinemaha		27·1	324	i 5 46a	0	—	—	—	—
Chicago (Loyola)		27·2	17	i 5 48	+ 1	i 10 37	+12	—	—
Fresno	N.	27·7	322	e 5 53	+ 1	—	—	e 15·3	—
Madison		27·8	14	e 5 56	+ 3	e 10 45	+10	e 16·6	—
Lick		29·2	321	e 6 7	+ 2	—	—	—	—
Georgetown		29·4	36	i 6 4	− 3	i 11 7	+ 6	—	—
Branner	N.	29·6	320	e 6 11	+ 2	—	—	—	—
Berkeley		29·9	321	e 6 14	+ 2	i 11 18	+ 9	e 15·0	—
Pennsylvania		30·3	32	i 6 15	0	e 11 17	+ 2	—	26·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
San Juan		31·0	80	i 6 18	− 3	e 10 45	−41	i 12·6	—
Bozeman		31·1	344	e 6 15	− 7	e 11 26	− 2	e 12·1	—
Philadelphia		31·2	36	i 6 22	− 1	i 11 30	+ 1	—	—
Ukiah		31·3	323	e 7 52	PPP	e 11 49	+18	e 13·2	—
Butte		31·8	344	6 30	+ 2	11 46	+ 8	17·1	—
Toronto		31·8	27	6 26	− 2	11 45	+ 7	15·6	—
Fordham		32·5	36	i 6 30	− 4	i 11 55	+ 6	—	—
Williamstown		34·1	35	i 6 47	− 1	e 12 11	− 3	e 16·8	—
Ottawa		34·8	28	6 52	− 2	12 31	+ 6	17·6	—
Oak Ridge		34·9	36	i 6 53	− 2	i 12 32	+ 5	e 20·6	—
Weston		34·9	36	i 6 53k	− 2	i 12 33	+ 6	i 20·6	—
Vermont		35·3	32	i 6 58	− 1	i 12 42	+ 9	e 15·2	—
Saskatoon		36·3	352	—	—	e 12 50	+ 2	19·6	—
Huancayo		36·4	139	e 7 6	− 2	i 12 50	0	i 13·5	—
Shawinigan Falls		37·0	30	7 12	− 1	13 4	+ 5	17·6	—
Seven Falls		38·4	31	7 23	− 2	13 25	+ 5	19·6	—
East Machias		38·7	37	7 34	+ 7	e 13 28	+ 3	e 15·7	—
La Paz		44·3	135	i 8 9k	− 4	i 14 44	− 4	23·8	28·8
Sitka		49·3	335	i 8 56	+ 3	i 16 5	+ 6	20·0	—
Honolulu		56·0	286	—	—	i 17 54	+24	e 23·5	—
College		58·7	338	e 10 18	+16	e 18 13	+ 7	e 23·9	—
La Plata		63·9	143	10 32	− 5	19 2	−10	32·6	—
Rio de Janeiro		66·7	124	e 10 56	+ 1	i 19 45	− 1	e 32·3	—
Scoresby Sund		70·3	20	11 14k	− 3	20 32	+ 3	36·6	—
Rathfarnham Castle		78·5	38	e 12 10	+ 6	i 22 25	+24	38·6	—
Edinburgh		79·7	35	i 15 10	PP	i 22 19	+ 6	e 46·6	—
Aberdeen		79·9	34	i 12 0	−12	e 22 7	− 9	e 38·6	46·6
Bidston		80·3	37	—	—	i 22 30	+10	e 38·6	—
Durham		80·8	36	e 12 18	+ 1	i 22 33	+ 8	—	—
Oxford	N.	81·8	39	—	—	i 22 43	+ 8	e 38·2	59·2
Jersey		82·0	41	e 12 20	− 3	e 22 38	+ 1	e 41·6	57·4
San Fernando		82·4	55	e 12 32	+ 7	i 22 47	+ 6	39·6	—
Kew		82·5	39	i 12 23a	− 3	i 22 47	+ 5	e 38·6	—
Bergen		82·7	29	—	—	22 38?	− 6	—	—
Granada		84·2	53	i 12 40	+ 6	e 23 3	+ 4	—	—
De Bilt		85·5	37	12 39	− 2	i 23 21	+ 9	e 41·6	45·1
Uccle		85·5	39	12 38a	− 3	e 23 9	− 3	e 40·6	—
Hamburg		87·6	35	e 12 51k	0	e 23 20	[+ 3]	e 45·6	—
Copenhagen		88·0	32	12 54	+ 1	23 22	[+ 2]	41·6	—
Göttingen		88·5	37	—	—	e 23 26	[+ 3]	—	—
Upsala		88·5	27	e 13 38?	+42	e 23 53	+12	e 46·6	—
Stuttgart		89·1	39	e 12 56	− 2	e 23 27	[0]	e 46·6	—
Jena		89·6	37	—	—	e 23 38	[+ 8]	—	—
Prague		91·7	37	e 15 7	+117	e 24 43	+33	—	57·6
Triest		93·3	41	e 17 3	PP	i 23 56	[+ 5]	—	56·6
Pulkovo		93·7	24	e 13 21	+ 1	23 53	[− 1]	44·1	51·3
Arapuni		96·6	233	—	—	e 27 38?	?	45·6	—
Belgrade	N.W.	97·8	39	—	—	e 24 19	[+ 3]	e 58·5	—
Wellington		98·1	230	e 16 38?	?	24 23	[+ 6]	45·7	—
Moscow		99·3	24	e 13 46	+ 1	e 24 23	[0]	49·1	53·4
Christchurch		99·9	228	e 18 1	PP	i 24 34	[+ 8]	46·7	—
Bucharest		101·4	37	—	—	24 36	[+ 2]	57·6	—
Vladivostok		104·9	324	18 31	PP	24 56	[+ 6]	—	64·3
Sverdlovsk		105·1	12	i 18 31	PP	24 25	[− 6]	49·1	56·3
Irkutsk		108·9	346	18 46	PP	25 38?	{−19}	55·6	—
Tiflis		113·1	30	e 14 51	+12	e 25 24	[0]	54·6	78·6
Helwan		113·3	47	e 19 25	PP	e 25 22	[− 3]	—	66·6
Ksara		113·9	42	e 19 21	PP	e 35 23	SS	—	—
Riverview		115·5	240	—	—	e 35 32	SS	e 58·3	66·4
Baku		116·5	27	20 1	PP	36 8	SS	56·6	68·3
Melbourne		120·6	236	—	—	e 25 56	[+ 4]	56·4	—
Tashkent		121·6	11	20 21	PP	25 57	[+ 2]	e 55·3	76·5
Manila		130·3	306	e 21 32	PP	—	—	—	—
Agra	E.	136·7	4	e 22 6	PP	—	—	—	—
Calcutta	N.	140·8	349	i 22 44	PP	—	—	—	83·6
Bombay		144·0	14	e 19 43	[+ 6]	—	—	—	86·6

For Notes see next page.

NOTES TO DEC. 31d. 17h. 41m. 22s.

Additional readings.—
Little Rock iEN = +5m.40s., +5m.55s., and +8m.32s.
Tucson iP = +4m.46s., iPP = +5m.1s., i = +5m.10s., +5m.28s., +5m.45s., +5m.57s., +6m.52s., +7m.18s., +8m.4s., and +8m.29s.
St. Louis iPPEN = +5m.38s., ePPPN = +5m.51s., iN = +6m.41s. and +7m.5s., iSSSN = +10m.9s.
Chicago (Loyola) e = +11m.56s.
Branner eE = +6m.18s.
Berkeley eN = +11m.2s., iN = +11m.5s., iZ = +11m.38s., eN = +17m.53s.
Pennsylvania e = +13m.13s. and +19m.33s.
San Juan ePPP = +7m.18s.
Bozeman eP = +6m.20s.
Ukiah ePPP = +8m.7s., PcP = +8m.41s.
Williamstown i = +7m.17s.
Ottawa SSS = +14m.59s.
Weston eSSN = +14m.25s., iG = +15m.58s.
Vermont ePP = +8m.18s.
Huancayo P = +7m.14s., PP = +8m.14s., iPPP = +8m.37s., i = +13m.9s.
Seven Falls PP = +8m.41s.
East Machias PPP = +9m.25s.
Sitka PP = +10m.49s., i = +16m.9s.
Honolulu eSS = +21m.41s.
College ePPP = +13m.48s.
Scoresby Sund PP = +13m.32s., PPP = +15m.38s., PSN = +20m.56s., eE = +21m.38s., SS = +25m.2s., SSS = +28m.14s.
Rathfarnham Castle i = +23m.20s.
Aberdeen PP = +15m.10s., PPP = +16m.55s., PS = +22m.52s., SS = +27m.35s., SSS = +30m.55s.
Durham eE = +12m.3s., iE = +22m.28s.
Jersey e = +14m.57s., eSS = +28m.5s., eSSS = +31m.6s.
Kew iPPZ = +15m.34s.
Uccle ePPE = +16m.1s., PSE = +24m.5s., eSSE = +28m.49s.
Hamburg ePPZ = +16m.8s., iSE = +23m.41s.
Copenhagen PP = +16m.19s., SKKS = +23m.43s., PSN = +24m.53s., SS = +29m.38s., SSS = +33m.20s.
Stuttgart eEZ = +15m.57s., ePP = +16m.22s., eS = +24m.17s., ePS = +24m.53s., eSS = +29m.43s.
Arapuni e = +34m.38s.?
Prague ePP = +17m.48s.
Triest i = +30m.54s.
Pulkovo PP = +17m.2s., PPP = +19m.1s., PS = +25m.17s., SS = +30m.38s., SSS = +34m.50s.
Belgrade eNW = +26m.34s.
Wellington i = +25m.20s.
Moscow ePP = +17m.34s., ePPP = +19m.44s., PS = +26m.34s.
Christchurch iSE = +25m.39s., PSEZ = +26m.51s., PPSE = +27m.44s., SS = +32m.29s.
Bucharest eE = +25m.28s.
Vladivostok PS = +27m.52s.
Sverdlovsk iPPP = +20m.38s., PS = +27m.41s., SS = +33m.32s., SSS = +37m.2s.
Irkutsk e = +27m.38s.?, +31m.38s.?, and +33m.38s.?
Tiflis ePN = +14m.55s., PPNZ = +19m.31s., ePPPZ = +21m.56s., PSNZ = +29m.9s., PPSZ = +39m.19s.
Helwan e = +29m.8s.
Ksara ePS = +29m.1s.
Baku PS = +29m.45s., PPS = +31m.4s.
Melbourne e = +30m.40s.
Tashkent SKKS = +27m.25s., PS = +30m.5s., iS = +30m.21s., PPS = +31m.47s., eSS = +36m.20s.
Manila iP? = +22m.42s., iE = +29m.35s.
Long waves were also recorded at Ferndale, Perth, Zagreb, Hyderabad, Ivigtut, Seattle, and Hong Kong.

Dec. 31d. Readings also at 1h. (Mizusawa), 3h. (Balboa Heights), 6h. (Pasadena, Mount Wilson, Tacubaya, and Oaxaca), 7h. (Balboa Heights and Manila), 9h. (Frunse, Andijan, and Samarkand), 10h. (Ksara, Tiflis, Baku, and Erevan), 11h. (Ksara, Tiflis, and Sverdlovsk), 12h. (Wellington and New Plymouth), 16h. (Balboa Heights, Mount Wilson, Pasadena, and Tinemaha), 17h. (Oaxaca, Grozny, La Paz, Vera Cruz, and Rio de Janeiro), 18h. (Oaxaca (2), Wellington, Tacubaya (2), Andijan, Samarkand, Tashkent, and Tchimkent), 19h. (Tacubaya (2)), 20h. (Tacubaya (3), Oaxaca (2), Balboa Heights, and Grozny), 21h. (Tinemaha, Pasadena, Mount Wilson, and Apia), 22h. (Tucson, Huancayo, Tacubaya, Oaxaca, and La Paz).

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