The International Seismological Summary.

1933 October, November, December.

FORMERLY THE BULLETIN OF THE
BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

The present quarter of the Summary deals with 123 epicentres. Of these, 47 are new and 76 are repetitions of old epicentres.

The classification of the determinations on the ground of the quality of the material is as follows :—

N.1.=10	R.1.=4	X.=40
N.2.=12	R.2.=17	
N.3.=25	R.3.=15	

The earthquakes with abnormal focus are as follows :—

	Date 1933. d. h. m. s.	Epicentre. ° °	Focal Depth. (Below Normal).
Oct.	25 23 28 16	23·5S. 66·5W.	+0·030
Nov.	14 14 5 10	33·8S. 70·0W.	+0·020
Nov.	19 1 33 40	32·6N. 139·0E.	+0·035
Dec.	1 10 27 8	20·5S. 170·0E.	+0·090
Dec.	4 19 33 56	47·2N. 144·0E.	+0·040

At the end of this quarter some readings from Helsingfors and Serra do Pilar which were received too late to insert in the text, will be found.

UNIVERSITY OBSERVATORY,
1939, May 13th. OXFORD.

1933 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. 2h. 21m. 40s. Epicentre 35°·2N. 136°·3E. (as on 1933 Aug. 24d.). R.3.

Osaka gives epicentre 35°50′N. 136°25′E.
Koti gives epicentre 35°30′N. 136°15′E.

A = −·591, B = +·565, C = +·576; D = +·691, E = +·723;
G = −·417, H = +·398, K = −·817.

		△	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Nagoya		0·5	93	i 0 8a	+ 1	0 17	+ 4	0·3
Osaka		0·8	232	0 13	+ 2	0 28	+ 7	0·8
Kobe		1·1	240	i 0 15a	− 1	e 0 28	0	0·6
Toyooka		1·2	291	0 15a	− 2	0 32	+ 1	0·5
Sumoto		1·4	234	i 0 21a	+ 1	e 0 51	+15	0·9
Muroto		2·6	222	e 0 53	P_g	1 31	S_g	—
Koti		2·8	234	e 0 47	P*	e 1 11	− 1	1·4
Simidu		3·6	229	0 53	+ 2	—	—	—
Tyosi		3·8	81	e 1 5	P*	1 53	S*	—
Mizusawa	E.	5·5	43	—	—	e 1 44	P_g	—
Nagasaki		5·9	246	e 2 55	S*	e 4 15	?	—

Additional readings:—
Kobe iNZ = +26s., iSZ = +32s. =S*.
Muroto P_g = +1m.11s. =S +4s.
Long waves were also recorded at Bombay and Paris.

Oct. 1d. 2h. 40m. 39s. Epicentre 6°·4S. 75°·2W. N.2.

A = +·254, B = −·961, C = −·111; D = −·967, E = −·255;
G = −·028, H = +·108, K = −·994.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		5·7	181	i 1 19	− 2	i 1 47	P_g	—	—
La Paz		12·2	146	i 3 1	+10	i 5 28	+20	6·3	6·6
Sucre		15·9	143	i 3 40	0	i 6 40	+ 4	8·1	—
San Juan		26·3	20	e 5 38	+ 6	e 10 9	+ 6	—	—
La Plata		32·7	153	6 25	− 4	12 15	SS	18·2	—
Georgetown		45·3	358	i 8 17	+ 2	e 14 55	0	e 23·4	—
Pittsburgh		47·0	355	e 8 51	+22	—	—	—	—
Fordham		47·3	1	e 8 31	0	e 15 21	− 2	—	—
Oak Ridge		49·0	4	i 8 47	+ 3	i 15 47	0	e 16·8	—
Ottawa		51·7	359	e 9 5	+ 1	e 16 21	− 3	e 21·4	—
La Jolla		56·0	317	i 10 3	+27	—	—	—	—
Riverside		56·7	318	i 9 38	− 3	—	—	—	—
Mount Wilson		57·3	318	i 9 41	− 4	—	—	—	—
Pasadena		57·3	318	i 9 42	− 3	—	—	—	—
Haiwee	Z.	58·4	320	i 9 50	− 3	—	—	—	—
Santa Barbara		58·6	317	i 10 23	+28	—	—	—	—
Tinemaha		59·2	320	i 9 55	− 4	—	—	—	—
Granada		79·5	50	i 12 13	+ 8	e 22 52	PS	—	—
Oxford		85·2	36	e 12 32	− 2	23 57	PS	—	—
De Bilt		89·1	37	12 54	+ 1	—	—	e 39·4	—
Neuchatel		89·4	42	e 12 54	− 1	—	—	—	—

Additional readings:—
Huancayo i = +2m.5s. and +2m.43s. =S* +5s.
San Juan e = +6m.35s.
La Plata E = +6m.45s., N = +6m.53s., eE = +11m.15s.
Pittsburgh eSS = +19m.3s.
Fordham eEN = +19m.7s.
Oak Ridge eEN = +8m.58s., iZ = +9m.7s. and +9m.13s.
Ottawa e = +17m.17s.
Riverside i = +10m.9s.
Mount Wilson iEZ = +10m.13s.
Pasadena i = +10m.14s.
Haiwee iZ = +10m.16s.
Tinemaha iEN = +10m.27s.
De Bilt e = +24m.38s. =PS −3s., eE = +33m.21s.?

Oct. 1d. 14h. 34m. 54s. Epicentre 37°·0N. 145°·5E. N.3.

A = −·658, B = +·452, C = +·602; D = +·566, E = +·824;
G = −·496, H = +·341, K = −·799.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		3·9	253	i 0 31k	−25	0 42	−58	—	0·8
Mizusawa	E.	4·0	303	e 1 10	P_g	i 1 40	− 2	—	—
	N.	4·0	303	e 1 5	P*	i 1 38	− 4	—	—
Susaki		5·8	249	0 57a	−25	1 37	P*	—	—
Nagoya		7·1	258	e 1 21	−20	2 18	P_g	—	2·7
Osaka		8·4	255	1 39	−20	2 56	−38	—	3·7
Kobe		8·7	258	e 2 3	0	e 3 2	−39	—	3·4
Toyooka		8·7	264	2 2	− 1	3 22	−19	—	3·6
Sumoto		9·0	256	2 11k	+ 4	3 18	−31	—	3·7
Vladivostok		12·0	305	2 50	+ 2	e 5 6	+ 3	5·7	6·4
Chiufeng		23·1	286	e 4 43	−19	e 8 56	−11	—	13·8
Ekaterinburg		57·1	320	e 9 54	+10	—	—	33·1	—
Tashkent		57·3	300	—	—	e 26 42	?	e 32·1	34·7

Additional readings:—
Osaka i = +1m.54s. and +2m.28s.
Sumoto iZ = +2m.21s., eSEZ = +3m.22s.
Long waves were also recorded at Tiflis and some European stations.

Oct. 1d. 19h. 24m. 10s. Epicentre 32°·9N. 131°·4E. N.2.

A = −·555, B = +·630, C = +·543; D = +·750, E = +·661;
G = −·359, H = +·407, K = −·840.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Hukuoka	1·1	310	i 0 16k	0	i 0 33	+ 5	—
Nagasaki	1·3	263	i 0 18k	0	i 0 36	+ 3	—
Simidu	1·3	95	i 0 20a	+ 2	i 0 39	+ 6	0·7
Koti	1·9	70	i 0 28	0	i 0 52	+ 3	0·9
Muroto	2·4	81	i 0 32	− 2	i 1 1	− 1	1·1
Sumoto	3·3	62	(0 48)	+ 1	0 48	P	0·8
Kobe	3·6	58	i 0 52	+ 1	1 33	+ 1	1·6
Osaka	3·9	60	0 44	−12	1 40	0	1·7
Toyooka	3·9	46	0 55	− 1	1 39	− 1	1·7
Nagoya	5·1	61	1 14	+ 1	2 10	0	—

Osaka gives also i = +55s. = P − 1s.

Oct. 1d. Readings also at 0h. (Tiflis), 2h. (Mizusawa), 3h. (near Tiflis (3) and near Mizusawa), 4h. and 5h. (near Tiflis), 7h. (La Paz), 9h. (Nanking and near Chiufeng), 12h. (Tiflis), 13h. (Huancayo and La Paz), 14h. (San Juan), 17h. (Vladivostok, Huancayo, near La Paz, and near Chiufeng), 18h. (near Huancayo), 19h. (near Sumoto), 21h. and 22h. (3) (near Tyosi), 23h. (near Barcelona).

Oct. 2d. 3h. 33m. 31s. Epicentre 36°·5N. 141°·3E. (as on 1931 Aug. 18d.). R.3.

A = −·627, B = +·503, C = +·595.

		△	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tyosi		0·8	205	i 0 11a	0	0 20	− 1	0·5
Mizusawa	E.	2·6	357	e 0 38	+ 1	e 1 12	+ 5	—
Nagoya		3·7	249	e 0 52	− 1	1 32	− 3	—
Osaka		5·0	251	1 10	− 1	2 17	+ 9	2·6
Kobe		5·3	252	—	—	e 2 22	+ 7	2·7
Sumoto		5·6	249	e 1 44	P_g	2 40	S*	2·8

Mizusawa gives also eSN = +1m.15s. = S* − 1s.

Oct. 2d. 9h. 10m. 20s. Epicentre 33°·6N. 118°·0W. (as on 1933 March 14d.). R.2.

A = −·391, B = −·735, C = +·553; D = −·883, E = +·469;
G = −·260, H = −·489, K = −·833.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Pasadena		0·6	346	i 0 4	− 5	—	—	—
Mount Wilson		0·6	356	i 0 7	− 2	—	—	—
Riverside		0·7	53	i 0 11	+ 1	—	—	—
La Jolla		1·0	139	i 0 18	+ 4	—	—	—
Santa Barbara		1·7	301	i 0 24	0	—	—	—
Haiwee		2·6	0	i 0 37	0	—	—	—
Tinemaha		3·5	358	i 0 50	0	—	—	—
Lick	N.	4·8	323	e 1 10	+ 2	i 2 0	− 3	—
Branner		5·1	320	e 1 11	− 2	i 2 10	0	—
Berkeley		5·5	322	e 1 16	− 2	i 2 17	− 3	—
San Francisco		5·5	320	e 1 20	+ 2	i 2 17	− 3	—
Tucson		6·2	100	e 2 3	P_g	i 3 10	S*	3·7
Ukiah		7·0	324	e 2 27	P_g	e 3 14	+15	—
Bozeman		13·2	22	—	—	e 5 48	+16	—
Florissant		22·8	69	e 5 13	+14	i 9 27	SS	i 14·0
Cincinnati	z.	27·4	69	—	—	i 11 4	SS	—
Fordham		35·5	65	—	—	e 12 43	+14	e 17·7
Oak Ridge		37·1	62	—	—	e 17 3	(−21)	e 19·2

Additional readings:—
Lick iN = +1m.19s. = P* +0s., iE = +1m.51s., iN = +2m.26s. = S* +5s., iEN = +2m.29s., iE = +2m.35s. = S_g +3s.
Branner iN = +1m.58s., iE = +2m.3s., and +2m.25s. = S* −5s., iN = +2m.37s. = S_g −5s.
Berkeley e = +1m.26s. = S* −5s.
San Francisco eE = +1m.23s., i = +2m.23s.
Tucson eP = +2m.18s., e = +2m.26s., and +2m.53s., S_g = +3m.25s.
Ukiah e = +3m.52s. = S_g +7s.
Bozeman e = +6m.50s., i = +7m.25s.
Cincinnati i = +13m.29s. and +14m.10s.
Long waves were also recorded at De Bilt, Feldberg, and other American stations.

Oct. 2d. 13h. 59m. 12s. Epicentre 10°·1S. 166°·3E. N.2.

A = −·957, B = +·233, C = −·175; D = +·237, E = +·972;
G = +·170, H = −·041, K = −·985.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Suva		14·2	126	4 12	+54	7 6	+70	8·2	—
Riverview		27·5	208	—	—	(e 10 24)	0	e 10·4	13·8
Melbourne		33·7	211	—	—	i 12 0	− 1	16·2?	22·2
Christchurch		34·0	172	(6 38)	− 2	6 38	P	18·8	—
Adelaide		35·5	222	—	—	e 11 21?	−68	e 15·8	20·9
Manila		51·3	298	e 8 57	− 4	14 54	−85	20·5	25·1
Hong Kong		60·5	303	18 23	S	(18 23)	0	—	33·8
Vladivostok		61·7	332	e 10 20	+ 4	e 18 46	+ 8	e 29·8	—
Chiufeng		68·3	321	e 10 59	− 1	e 19 59	− 2	—	36·6
Santa Barbara	z.	82·8	54	i 12 22	0	—	—	—	—
Pasadena		84·0	55	e 12 28	0	—	—	—	—
Mount Wilson		84·1	55	i 12 29a	0	—	—	—	—
La Jolla	z.	84·4	56	i 12 32	+ 2	—	—	—	—
Riverside	z.	84·6	55	i 12 28	− 3	—	—	—	—
Haiwee		84·7	53	i 12 33	+ 1	—	—	—	—
Tinemaha		84·7	52	i 12 32a	0	—	—	—	—
Bombay		96·5	288	e 21 48	?	e 23 48	[−20]	—	—
Tashkent		101·9	310	—	—	e 32 18	SS	e 55·8	59·6
Ekaterinburg		107·0	326	—	—	e 28 4	PS	50·8	67·5
Ottawa		116·6	44	—	—	e 30 18	PS	e 58·8	—
Bergen		127·7	349	—	—	e 44 54	?	—	—

For Notes see next page.

NOTES TO OCT. 2d. 13h. 59m. 12s.

Additional readings :—
Melbourne e = +14m.43s.
Christchurch L_q = +13·6m.
Ekaterinburg e = +29m.9s.
Ottawa eE = +39m.30s.
Long waves were also recorded at Wellington, Perth, Ivigtut, Oak Ridge, Pulkovo, and other European stations.

Oct. 2d. 15h. 29m. 27s. Epicentre 2°·1S. 81°·2W. N.1.

Probable error of the epicentre ±0°·18.

A = +·153, B = −·988, C = −·037 ; D = −·988, E = −·153 ; G = −·006, H = +·036, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	E.	11·2	8	i 2 45	+ 8	i 4 35	− 8	5·7	5·8
	N.	11·2	8	i 2 38	+ 1	e 4 28	−15	5·5	7·2
Huancayo		11·5	150	i 2 43	+ 1	i 4 57	+ 7	—	—
La Paz		19·3	139	i 4 24	+ 2	i 8 4	+12	9·8	10·9
Port au Prince		22·4	22	i 4 58	+ 3	i 8 38	−15	i 10·4	11·1
Sucre		22·9	138	i 4 58	− 2	i 9 10	+ 7	11·8	—
Montezuma		23·7	151	e 5 5	− 2	9 32	+14	e 15·0	—
San Juan		25·2	35	i 5 24	+ 2	i 9 48	+ 4	—	—
Fort de France		26·0	49	6 0	+31	10 28	+30	—	—
Santiago		32·7	163	6 31	+ 2	12 2	+16	16·4	—
Columbia		36·1	0	i 7 1	+ 2	i 12 33	− 5	e 17·4	—
La Plata	E.	39·2	149	7 24	− 1	13 25	+ 1	23·4	27·7
	N.	39·2	149	7 27	+ 2	13 10	−14	22·8	29·2
	Z.	39·2	149	7 28	+ 3	13 33?	+ 9	25·0	28·7
Charlottesville		40·2	3	i 7 35	+ 1	13 37	− 2	e 19·1	—
Georgetown		41·2	5	i 7 40	− 2	i 13 51	− 3	—	—
Cincinnati		41·3	356	i 7 46k	+ 3	i 12 42	−74	—	—
Woodstock		41·6	5	i 7 43	− 2	14 28	+28	—	—
St. Louis	N.	41·6	349	e 7 45	0	i 13 58	− 2	—	—
Florissant		41·8	349	i 7 46	− 1	i 13 59	− 4	—	—
Pittsburgh		42·6	2	i 7 51	− 2	i 14 8	− 7	i 19·0	—
Fordham		43·5	8	i 7 59	− 2	i 14 26	− 2	i 20·6	—
Tucson		44·4	323	i 8 9	+ 1	i 14 48	+ 7	i 20·5	—
Ann Arbor		44·5	357	i 8 9	0	14 45	+ 2	i 20·6	21·4
Buffalo		45·1	3	i 8 11	− 3	14 55	+ 3	—	—
Oak Ridge		45·5	11	i 8 16	− 1	e 14 41	−16	e 19·0	—
Madison		45·8	352	i 8 15	− 4	—	—	—	—
Toronto		45·8	2	i 8 20	+ 1	—	—	—	—
Ottawa		47·7	6	i 8 31	− 3	i 15 23	− 6	e 22·0	—
La Jolla		48·8	319	i 8 44	+ 2	e 15 51	+ 7	—	—
Riverside		49·6	320	i 8 49	+ 1	e 16 2	+ 7	—	—
Mount Wilson		50·1	320	i 8 54	+ 2	i 16 9	+ 7	—	—
Pasadena		50·2	320	i 8 55k	+ 2	i 16 8	+ 4	i 25·3	—
Haiwee		51·3	323	i 9 4	+ 3	e 16 26	+ 7	—	—
Santa Barbara	Z.	51·4	319	i 9 13	+11	—	—	—	—
Tinemaha		52·1	323	i 9 9	+ 2	e 16 29	− 1	—	—
Bozeman		54·6	335	e 9 30	+ 4	i 17 6	+ 2	e 28·1	—
Branner		54·8	320	e 9 29	+ 2	—	—	—	—
Berkeley		55·0	321	e 9 30k	+ 1	i 17 14	+ 5	—	29·8
Ukiah		56·4	322	e 9 42	+ 3	i 17 36	+ 8	30·8	—
Saskatoon		58·4	342	e 9 44	− 9	17 42	−13	29·6	—
Seattle		61·3	331	e 10 10	− 4	e 17 41	−52	e 30·4	—
Victoria		62·3	331	i 10 22	+ 2	i 18 43	− 3	e 36·4	38·6
Dakar		65·3	73	—	—	e 20 15?	?	—	—
Ivigtut		68·2	16	i 10 57	− 2	e 19 48	−11	24·6	—
Honolulu T.H.		78·3	292	e 11 58	− 1	21 57	0	i 36·7	—
San Fernando		79·3	53	12 4	0	22 11	+ 3	33·6	64·6
Malaga		80·7	53	e 12 10	− 2	i 22 21	− 2	35·6	47·6
Granada		81·4	52	i 12 16	+ 1	i 22 25	− 6	39·2	56·2
Toledo		81·6	49	e 12 14	− 2	i 22 25	− 8	e 39·1	50·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almeria		82·3	53	i 12 19	− 1	i 22 33	− 7	e 34·4	—
Alicante		84·0	51	e 12 31	+ 3	e 22 51	− 7	e 35·4	—
Bidston		84·7	36	12 35	+ 3	23 0	− 5	—	—
Tortosa	E.	85·1	49	12 35	+ 1	21 55	?	e 34·6	46·4
	N.	85·1	49	12 32	− 2	21 57	?	35·3	52·9
Stonyhurst		85·1	35	i 12 33	− 1	i 22 51	[− 9]	41·6	46·6
Edinburgh		85·1	33	i 12 35	+ 1	i 22 59	[− 1]	e 40·6	49·7
Bagnères		85·1	46	e 12 41	+ 7	e 23 2	[+ 2]	30·6	—
Oxford		85·4	38	i 12 35a	0	i 23 2	[0]	33·4	48·4
Durham		85·8	35	12 42	+ 5	23 6	[+ 1]	—	—
Kew		86·0	38	i 12 37a	− 1	i 23 10	− 8	34·6	45·7
Barcelona		86·4	48	12 43	+ 3	23 8	[− 1]	e 37·7	46·5
Algiers		86·6	53	i 12 43	+ 2	i 23 9	[− 2]	40·2	55·1
Puy de Dôme		87·4	44	12 46	+ 1	i 23 39	+ 8	e 44·6	—
Paris		87·5	41	i 12 45a	0	i 23 26	− 6	35·6	49·6
Uccle		88·8	39	i 12 51a	− 1	i 23 38	− 7	e 36·6	48·9
Marseilles		88·9	47	13 14	+22	e 25 43	?,	e 36·6	—
De Bilt		89·4	38	i 12 55a	0	e 23 34	[+ 5]	e 39·6	40·8
Bergen		90·1	29	16 3	PP	22 50	[−43]	48·6	—
Neuchatel		90·3	43	e 12 57	− 2	e 23 49	−10	—	—
Strasbourg		90·9	41	i 13 2a	0	i 24 0	− 4	e 43·6	51·6
Karlsruhe		91·3	41	13 7	+ 4	23 45	[+ 5]	e 50·6	—
Feldberg	N.	91·4	40	i 13 10	+ 6	e 23 2	−67	—	—
Zurich		91·4	43	e 13 4	0	e 24 4	− 5	—	—
Stuttgart		91·8	41	13 6a	0	e 24 7	− 6	e 44·6	56·8
Chur		92·0	43	e 13 6	− 1	e 23 37	[− 7]	—	—
Piacenza		92·1	45	13 0	− 7	23 43	[− 2]	37·6	53·2
Tunis		92·3	53	i 13 21	+13	—	—	—	—
Hamburg		92·4	36	i 13 8	− 1	e 23 44	[− 3]	e 41·2	53·6
Göttingen		92·4	38	e 13 8	− 1	e 24 15	− 3	47·6	49·7
Prato		93·1	47	e 13 11	− 1	i 24 21	− 4	e 36·9	48·6
Florence		93·2	47	13 16	+ 4	24 25	− 1	27·6	47·6
Jena		93·4	40	13 14	+ 1	i 24 33	+ 5	e 40·6	53·0
Padova		93·6	45	i 13 16	+ 2	24 16	−13	52·6	—
Copenhagen		93·8	34	13 14	− 1	24 27	− 4	—	—
Cheb		93·9	40	e 13 18	+ 3	e 23 56	[+ 1]	e 46·6	54·6
Treviso		93·9	44	i 13 15	0	24 1	{− 5}	e 50·6	66·6
Leipzig		93·9	39	e 13 17	+ 2	e 23 51	[− 4]	e 40·6	53·6
Venice		94·0	44	e 13 22	+ 6	e 24 4	{− 3}	—	—
Potsdam		94·3	37	e 13 15	− 2	i 24 29	− 7	e 42·6	51·6
Triest		95·0	44	13 20a	0	i 24 39	− 3	e 40·6	53·6
Prague		95·2	40	e 13 43	+22	e 24 39	− 5	e 40·6	50·6
Benevento		95·5	49	e 13 13	−10	23 33	[−30]	—	30·7
Graz		96·1	43	e 13 22	− 4	i 24 2	[− 4]	46·6	61·2
Upsala		96·3	30	—	—	24 7	[− 1]	e 44·6	54·0
Catania		96·3	53	13 28	+ 2	24 14	[+ 6]	50·6	59·4
Zagreb		96·5	44	e 13 28	+ 1	e 24 6	[− 2]	—	—
Vienna		96·6	42	i 13 31k	+ 3	24 49	− 7	—	57·6
Cape Town		96·8	125	13 35	+ 6	24 3	[− 7]	46·6	54·0
Trenta		97·1	51	e 13 33	+ 3	24 13	[+ 1]	53·6	—
Taranto		97·8	50	13 33	0	24 33	{− 3}	—	—
Budapest		98·5	43	e 14 33?	+56	24 24	[+ 6]	33·6	63·6
Wellington		99·1	228	—	—	i 24 23	[+ 2]	45·6	—
Belgrade		99·8	45	e 17 52	PP	e 24 22	[− 3]	e 56·9	—
Christchurch		100·2	225	17 58	PP	i 25 33	+ 5	e 47·9	—
Pulkovo		102·5	29	e 14 4	+ 9	e 25 32	−16	47·6	57·0
Kucino		107·7	31	e 14 56	P	26 14	{+24}	e 46·6	63·8
Sebastopol		108·9	43	e 19 4	PP	—	—	—	—
Simferopol		109·2	43	e 18 19	[+ 3]	e 25 13	[+ 3]	34·6	—
Yalta		109·4	43	e 18 39	PP	—	—	34·6	—
Helwan		110·5	60	e 17 51	[−28]	i 30 18	?	—	70·0
Ksara		113·5	55	20 27	?	30 15	?	—	—
Ekaterinburg		117·5	22	19 46	PP	i 25 40	[− 2]	50·6	76·4
Riverview		119·1	229	—	—	e 28 15	?	e 36·9	94·6
Melbourne		121·6	222	20 50	PP	25 55	[0]	59·8	61·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tananarive	E.	125·4	115	e 20 52	PP	26 7	[+ 1]	56·8	68·6
Adelaide		127·5	221	—	—	i 28 22	{+16}	61·6	71·8
Vladivostok		129·5	329	i 19 12	[+ 6]	26 24	[+ 6]	e 35·6	41·4
Nagano		130·0	318	19 23	[+16]	—	—	—	—
Nagoya		131·6	317	e 19 6	[− 4]	e 22 35	PKS	—	—
Tashkent		132·7	30	i 20 16	[+65]	—	—	60·6	78·2
Osaka		132·8	318	18 46	[−26]	32 0	PS	69·2	88·6
Kobe		133·1	318	e 18 56	[−16]	—	—	—	125·9
Sumoto		133·5	318	i 17 38	?	—	—	—	—
Andijan		134·6	28	e 18 23	[−51]	—	—	66·6	—
Almata		134·7	22	e 19 33	[+19]	—	—	—	—
Koti		134·8	318	e 19 18	[+ 3]	—	—	—	—
Keizyo		136·1	327	e 20 53	?	—	—	—	—
Taikyu		136·4	324	(e 22 57)	PKS	—	—	e 22·9	—
Zinsen		136·4	328	e 20 51	?	—	—	—	—
Miyazaki		137·2	317	19 19	[+ 1]	—	—	—	—
Chiufeng		138·9	340	19 18a	[− 2]	29 10	{− 7}	e 64·9	85·9
Perth		142·4	204	e 18 33	[−52]	—	—	—	93·6
Palau		144·2	279	19 36	[+ 4]	—	—	—	—
Nanking		144·7	330	19 39k	[+ 6]	29 57	{+ 5}	e 72·6	81·9
Dehra Dun		145·6	32	19 43	[+ 8]	34 3	?	—	101·6
Agra		148·1	36	e 19 39	[0]	—	—	—	93·4
Bombay		149·6	55	19 48	[+ 7]	—	—	—	94·0
Amboina		150·2	259	e 19 45	[+ 3]	—	—	e 80·6	—
Manila		154·9	301	i 19 54	[+ 6]	33 31	SKSP	—	—
Hyderabad		154·9	51	20 10	{−11}	34 25	SKSP	78·7	92·0
Hong Kong		154·9	325	20 23	{+ 2}	—	—	—	98·2
Calcutta		157·2	26	21 52	?	35 44	?	e 75·9	87·4
Kodaikanal		157·4	68	i 20 1	[+11]	34 28	SKSP	72·0	94·4
Colombo		160·5	75	e 20 2	[+ 7]	—	—	79·3	105·4
Batavia		168·4	224	i 20 10	[+ 8]	i 31 51	{−12}	92·7	105·2
Medan		178·5	4	i 20 56	?	i 32 39	{−16}	e 81·6	—

Additional readings :—
Huancayo i = +5m.21s.
Port au Prince PP = +5m.18s., PPP = +5m.23s., SS = +9m.28s.
Montezuma P = +5m.11s., eSS = +10m.31s.
San Juan i = +10m.2s.
Columbia e = +11m.54s., eSS = +14m.27s., e = +16m.4s.
La Plata PPPN = +8m.58s. = PP + 6s., PPPE = +9m.3s., N = +17m.37s. = S_cS + 0s., +20m.15s.
Charlottesville e = +9m.17s. = PPP − 5s., eSS = +15m.59s., e = +17m.33s. = S_cS − 10s.
Georgetown iSS = +17m.1s. ; T_0 = 15h.29m.5s.
St. Louis iPN = +7m.49s., ipPN = +8m.35s., iPPN = +9m.7s., iN = +13m.12s., isSN = +14m.38s., eSSN = +17m.14s. ; T_0 = 15h.29m.50s.
Florissant ipPZ = +8m.34s., iPPZ = +9m.26s., iPPPZ = +10m.1s., isSEN = +15m.15s., eSSEN = +17m.23s. ; T_0 = 15h.29m.50s.
Pittsburgh iPP = +9m.29s., e = +17m.11s. = SS + 6s., eSSS = +17m.26s.
Tucson i = +9m.58s., +14m.54s., +18m.1s. = S_cS − 7s. and +18m.12s.
Ann Arbor iPP = +10m.3s., iSS = +18m.15s. = S_cS + 6s. ; T_0 = 15h.29m.0s.
Oak Ridge iZ = +9m.6s., ePPPNW = +10m.28s., ePPPN = +10m.33s., iSE = +14m.50s., iZ = +17m.28s., eSSNW = +18m.2s. = SS + 2s., eN = +18m.11s. = S_cS − 4s. ; T_0 = 15h.29m.51s.
Toronto iPP = +10m.4s., iPPP = +10m.55s. ; T_0 = 15h.29m.17s.
Ottawa PP = +10m.25s., PS = +15m.41s., SS = +19m.3s., SSSN = +20m.21s.
Pasadena iZ = +9m.1s., iPPZ = +10m.42s., iS_cSZ = +18m.49s., iSSN = +19m.56s.
Bozeman eSS = +21m.3s.
Branner i = +9m.35s.
Berkeley eE = +9m.37s., iSZ = +17m.23s., iE = +19m.23s.
Saskatoon PPP = +13m.24s., SSS = +24m.30s. ; T_0 = 5h.29m.18s.
Seattle ePS = +19m.1s.
Victoria iSN = +18m.51s. ; T_0 = 15h.29m.45s.
Ivigtut PP = +13m.28s., eSE = +19m.53s., S_cS = +20m.55s.
Honolulu T.H. e = +16m.3s., SS = +27m.27s.
San Fernando PE = +12m.20s.
Malaga i = +12m.13s., e = +12m.59s. and +14m.0s., ePP? = +15m.24s., e = +16m.39s. = PPP − 14s., i = +22m.41s. = PS − 18s., e = +27m.42s. = SS + 17s.

Continued on next page.

Granada $P_cP = +12m.48s.$
Toledo iP = +12m.17s.
Almeria PP = +15m.27s.
Alicante PP = +16m.1s., PPP = +18m.23s.
Edinburgh i = +23m.7s. =S − 2s.
Kew iNZ = +13m.29s. and +14m.24s., iPPZ = +15m.57s., iSKSE = +23m.2s., eZ = +24m.18s. =PS + 14s., iE = +24m.27s.
Algiers PP = +16m.5s., SS = +29m.19s.
Puy de Dôme eSKS = +23m.17s.
Paris PS = +23m.45s.
Uccle iZ = +13m.21s., +13m.58s., and +14m.44s., iPPE = +16m.10s., iPPZ = +16m.13s., iZ = +23m.49s., iPSE = +24m.48s., iSSN = +29m.25s.
Marseilles PP = +16m.3s.
De Bilt eN = +23m.43s. =S − 7s.
Bergen SS = +29m.9s.
Neuchatel eSKS = +23m.25s.
Strasbourg i = +13m.31s., +14m.8s. and +14m.49s., ePP = +16m.53s., SKKS = +23m.47s., iPS = +24m.59s., PPS = +25m.38s., i = +27m.30s., SS = +29m.53s.
Feldberg iN = +16m.46s. =PP + 9s.
Zurich eSKS = +23m.38s.
Stuttgart iZ = +13m.25s., ePP = +17m.11s., ePPP = +19m.48s.
Hamburg iSKKSN = +24m.14s., iPSN = +25m.39s., iPPSN = +26m.9s., eSSE = +31m.9s.
Göttingen eSKSE = +23m.45s.
Jena iPZ = +13m.12s., eE = +15m.3s. and +23m.52s., iE = +24m.1s. =SKKS − 1s., iN = +24m.18s., eE = +24m.23s. and +28m.11s.
Copenhagen PP = +17m.15s., PPP = +20m.14s., SKS = +23m.50s., e = +24m.0s., PSE = +25m.39s.
Cheb e = +16m.3s. and +20m.51s.
Leipzig eE = +24m.1s. =SKKS − 5s., i = +24m.25s. =S − 7s., eN = +25m.53s. = PS + 16s., eE = +33m.15s.
Venice eP = +13m.26s., eS = +24m.11s.
Potsdam iPE = +13m.19s., eE = +16m.57s., iPPE = +16m.59s., iE = +17m.34s., eE = +17m.57s., iN = +20m.22s., iE = +22m.49s., iSKSEN = +23m.54s., iPSEN = +25m.2s., iPPSN = +25m.32s., eSSN = +29m.57s., iSSN = +30m.1s.
Triest PP = +17m.7s., eSKS = +23m.49s., iSKS = +23m.58s., i = +24m.5s. and +24m.34s., iSS = +30m.53s., SSS = +34m.51s., iSSSS = +37m.1s.
Graz i = +24m.12s., iPS = +25m.0s.
Upsala SKKSN = +24m.38s., PSE = +26m.8s., iN = +31m.12s. =SS + 2s.
Zagreb e = +17m.5s. =PP − 11s., eNW = +18m.17s., eZ = +18m.54s., e = +24m.17s., +24m.52s. =S − 4s., +31m.25s. =SS + 12s., +37m.15s., eNE = +38m.33s.?, e = +42m.3s., +50m.33s.?, eZ = +54m.33s.?
Vienna iN = +14m.47s., PP? = +16m.6s., PPP = +19m.2s., SKKS = +24m.16s., PPS = +26m.1s., iE = +45m.3s. and +46m.4s.
Cape Town PP = +17m.15s., PPP = +19m.19s., PS = +26m.3s., SS = +31m.8s., SSS = +34m.52s.
Wellington i = +26m.54s. =PS + 18s.
Belgrade e = +25m.23s. =S − 2s.
Christchurch PPPZ = +20m.15s., SKS = +24m.24s., PSE = +26m.50s., iEN = +27m.12s., iEZ = +29m.55s., SS = +32m.40s., L_qN = +42·5m.
Pulkovo ePP = +18m.0s.
Kucino ePP = +18m.48s., eSKS = +25m.0s.
Helwan PP = +19m.28s., PPP = +25m.14s., SKS = +28m.43s.
Ekaterinburg SS = +35m.57s.
Melbourne PPP = +23m.33s., PS = +30m.30s., SS = +37m.15s.
Tananarive E = +22m.18s. and +27m.53s., PSE = +30m.55s., EN = +32m.22s., SSSE = +42m.37s.
Adelaide i = +29m.23s., i = +38m.23s., e = +54m.3s.
Vladivostok iPP = +21m.28s., PPP = +24m.2s.
Tashkent iPP = +21m.39s., iPKS = +22m.47s.
Kobe eZ = +19m.15s. and +21m.40s. =PP + 2s., eZ = +22m.30s., eE = +22m.42s. =PKS − 5s., eN = +22m.45s.
Sumoto iN = +18m.7s., i = +22m.46s.
Koti eNZ = +22m.54s. =PKS + 1s.
Chiufeng iZ = +22m.12s. =PP − 3s., iPP = +23m.3s., SKKS = +30m.50s.
Nanking iZ = +21m.6s., iPP = +22m.56s., iZ = +33m.9s. =SKSP = +7s., iPSZ = +35m.5s., SS = +41m.46s., eZ = +57m.57s.
Agra PE = +19m.45s.
Bombay PP = +23m.21s., SS = +43m.33s.
Hong Kong ? = +23m.55s. =PP + 7s., +38m.36s., and +43m.43s. =SS − 7s.
Colombo iP = +24m.24s. =PP + 6s.
Batavia iN = +20m.43s.
Medan i = +21m.39s. and +27m.23s., L = +55m.9s.
Long waves were also recorded at Johannesburg and Tiflis.

Oct. 2d. 19h. 24m. 33s. (I)
21h. 55m. 27s. (II)
23h. 33m. 44s. (III)
Epicentre 2°·1S. 81°·2W. (as at 15h.). X. R.2. R.2.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Huancayo	11·5	150	e 2 38	− 4	e 4 50	0	6·7	—
II		11·5	150	e 2 41	− 1	e 4 39	−11	5·9	—
III		11·5	150	e 2 29	−13	e 4 59	+ 9	i 6·3	—
I	La Paz	19·3	139	4 31	PP	8 9	SS	9·8	13·4
II		19·3	139	4 23	+ 1	8 10	SS	10·8	14·4
III		19·3	139	i 4 24	+ 2	e 8 3	+11	10·6	12·0
I	Sucre	22·9	138	5 9	+ 9	—	—	—	—
II		22·9	138	e 5 3	+ 3	9 20	+17	13·1	—
III		22·9	138	5 13	+13	9 34	SS	13·3	—
I	San Juan	25·2	35	e 5 24	+ 2	e 9 46	+ 2	—	—
II		25·2	35	e 5 24	+ 2	e 9 50	+ 6	e 13·2	—
III		25·2	35	e 5 23	+ 1	e 9 38	− 6	e 12·7	—
II	La Jolla z.	48·8	319	i 8 41	− 1	—	—	—	—
III		48·8	319	i 8 40	− 2	—	—	—	—
I	Riverside	49·6	320	i 8 42	− 6	—	—	—	—
II	z.	49·6	320	i 8 47	− 1	—	—	—	—
III		49·6	320	i 8 47k	− 1	—	—	—	—
I	Mount Wilson z.	50·1	320	e 8 47	− 5	—	—	—	—
II		50·1	320	i 8 52a	0	—	—	—	—
III		50·1	320	i 8 52	0	—	—	—	—
II	Pasadena	50·2	320	i 8 53	0	—	—	—	—
III		50·2	320	i 8 52k	− 1	—	—	—	—
II	Haiwee	51·3	323	i 9 2	+ 1	—	—	—	—
III		51·3	323	i 9 1	0	—	—	—	—
I	Tinemaha	52·1	323	i 9 2a	− 5	—	—	—	—
II		52·1	323	i 9 7	0	—	—	—	—
III		52·1	323	i 9 6k	− 1	—	—	—	—

Additional readings :—
Huancayo I e = +4m.37s. and +5m.44s. =S* +4s., II e = +5m.16s., III i = +2m.42s. and +5m.36s. =S* −4s.
San Juan II e = +9m.39s.

Oct. 2d. Readings also at 2h. (Mizusawa), 3h. (La Paz and near Huancayo), 4h. (Tucson), 5h. (Trenta (2)), 6h. (Adelaide, Melbourne, Riverview, Sydney, Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Huancayo), 7h. (Sucre, near La Paz, Simidu, near Koti, and Sumoto), 10h. (Huancayo and La Paz), 11h. (near Tyosi, Mizusawa, and near Huancayo), 12h. (near Hukuoka), 15h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Tinemaha, and Riverside), 17h. (La Paz (2), Sucre, and Huancayo), 18h. (La Paz, Cincinnati, Mount Wilson, Pasadena, Riverside, Tinemaha, and Huancayo), 20h. (Vienna), 21h. (Nanking), 22h. (near Tyosi), 23h. (Chicago, La Jolla, Pasadena, Riverside, Tinemaha, near New Plymouth, and Wellington).

Oct. 3d. 7h. 54m. 22s. Epicentre 47°·5N. 2°·5E. N.3.

A = +·675, B = +·029, C = +·737 ; D = +·044, E = −·999 ; G = +·737, H = +·032, K = −·676.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Paris		1·3	0	0 10	− 8	0 24	− 9	0·6	—
Puy de Dôme		1·8	170	0 31	+ 5	i 0 53	+ 7	—	—
Neuchatel		3·1	99	e 0 46	+ 2	e 1 29	S*	—	—
Uccle		3·5	20	e 0 53	+ 3	i 1 33	+ 3	—	—
Strasbourg		3·7	70	e 0 58	+ 5	e 1 46	S*	—	—
Zurich		4·1	89	e 0 50	− 8	e 1 56	S*	—	—
Karlsruhe		4·2	66	2 5	S*	—	—	—	—
Stuttgart		4·6	71	e 1 17	P*	e 2 16	S*	—	2·5
Ravensburg		4·8	83	e 1 26	P_g	e 2 26	S*	—	—
De Bilt		4·9	19	—	—	e 2 26	S*	—	—
Göttingen		6·3	47	e 1 49	P*	e 2 51	+10	—	3·5
Jena	E.	6·8	56	e 2 0	P*	—	—	e 3·5	3·7
Vienna	z.	9·4	80	e 4 55	S_g	—	—	—	—

For Notes see next page.

NOTES TO OCT. 3d. 7h. 54m. 22s.

Additional readings :—
Neuchatel $P_g = +55s.$
Uccle eN = +1m.35s., eE = +1m.39s. =S* −3s.
Strasbourg eP = +1m.3s. =P* +3s., S_g = +2m.1s.
Göttingen eE = +2m.7s. =P_g +7s., eN = +3m.3s. =S* −3s.

Oct. 3d. 10h. 21m. 25s. Epicentre 2°·1S. 81°·2W. (as on 2d.). R.2.

A = +·153, B = −·988, C = −·037 ; D = −·988, E = −·153 ;
G = −·006, H = +·036, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		11·5	150	i 2 43	+ 1	i 4 55	+ 5	i 6·3	—
La Paz	E.	19·3	139	i 4 27k	+ 5	i 8 12	SS	10·4	14·9
Sucre		22·9	138	i 5 2	+ 2	i 9 23	SS	13·1	—
San Juan		25·2	35	i 5 19	− 3	i 9 42	− 2	—	—
Columbia		36·1	0	e 6 56	− 3	e 12 35	− 3	e 17·8	—
La Plata	N.	39·2	149	7 27	+ 2	13 28	+ 4	22·8	27·7
Cincinnati		41·3	356	i 7 41a	− 2	i 13 59	+ 3	17·6	—
Florissant		41·8	349	i 7 51	+ 4	i 13 59	− 4	—	—
Fordham		43·5	8	e 8 0	− 1	e 14 22	− 6	e 20·6	—
Tucson		44·4	323	e 8 11	+ 3	e 14 42	+ 1	e 20·6	—
Oak Ridge	N.E.	45·5	11	e 8 16	− 1	e 14 24	−33	e 21·6	—
	N.W.	45·5	11	e 8 20	+ 3	e 14 38	−19	e 24·6	—
Toronto		45·8	2	e 8 17	− 2	15 0	− 2	21·9	—
Ottawa		47·7	6	e 8 31	− 3	15 19	−10	e 23·6	27·6
La Jolla		48·8	319	i 8 42	0	—	—	—	—
Riverside	Z.	49·6	320	i 8 48	0	—	—	—	—
Mount Wilson	E.	50·1	320	i 8 54	+ 2	—	—	—	—
Pasadena		50·2	320	i 8 53k	0	e 16 11	+ 7	e 28·0	—
Haiwee		51·3	323	e 9 12	+11	—	—	—	—
Santa Barbara		51·4	319	i 9 1	− 1	—	—	—	—
Tinemaha		52·1	323	e 9 8k	+ 1	—	—	—	—
Lick		54·4	321	e 9 27	+ 3	—	—	—	—
Bozeman		54·6	335	—	—	e 17 5	+ 1	e 32·2	—
Victoria		62·3	331	e 18 47	S	(e 18 47)	+ 1	e 31·1	38·7
Sitka		73·3	334	—	—	e 20 53	− 7	e 40·7	—
Granada		81·4	52	i 12 5	−10	i 22 15	−16	38·7	—
Toledo		81·6	49	e 12 14	− 2	e 22 23	−10	—	—
Almeria		82·3	53	e 12 25	+ 5	—	—	e 37·2	—
Alicante		84·0	51	e 11 49	−39	e 21 53	−65	e 38·0	—
Oxford		85·4	38	—	—	i 22 56	[− 6]	—	—
Paris		87·5	41	e 12 35?	−10	—	—	45·6	47·6
Uccle		88·8	39	e 12 51	− 1	23 36	− 9	e 36·6	—
De Bilt		89·4	38	—	—	e 23 43	− 7	e 39·6	40·9
Strasbourg		90·9	41	e 13 7	+ 5	e 24 9	+ 5	e 34·6	—
Feldberg	N.	91·4	40	—	—	e 24 0	− 9	—	49·8
Ravensburg		92·1	42	e 13 5	− 2	e 24 5	−11	e 46·6	—
Piacenza		92·1	45	e 15 35	?	—	—	—	58·1
Florence		93·2	47	e 14 35	?	—	—	32·6	43·6
Copenhagen		93·8	34	—	—	24 28	− 3	44·6	—
Cheb		93·9	40	—	—	e 23 35?	[−20]	—	—
Potsdam		94·3	37	—	—	e 25 23	PS	44·6	—
Triest		95·0	44	e 13 14	− 6	e 24 29	−13	e 52·6	—
Christchurch		100·2	225	i 14 6	+22	25 31	+ 3	47·4	—
Kucino		107·7	31	—	—	e 36 3	?	e 56·1	63·9
Ksara		113·5	55	e 19 18	PP	e 29 35?	PS	—	—
Ekaterinburg		117·5	22	—	—	e 25 40	[− 2]	49·6	64·9
Vladivostok		129·5	329	e 21 25	PP	—	—	e 39·1	—
Tashkent		132·7	30	e 22 38	PKS	—	—	—	50·5
Chiufeng	Z.	138·9	340	e 22 37	PP	—	—	—	85·6
Manila		154·9	301	e 19 41	[− 7]	23 38	PP	—	—

For Notes see next page.

NOTES TO OCT. 3d. 10h. 21m. 25s.

Additional readings :—
Huancayo i = +3m.8s., e = +4m.15s., i = +5m.27s.
San Juan i = +6m.12s.
Columbia e = +15m.9s. =SSS −1s.
La Plata PPN = +8m.49s.
Cincinnati i = +7m.56s., +8m.22s., and +13m.18s.
Florissant iPPN = +9m.32s. ; T_0 =10h.21m.39s.
Oak Ridge iPZ = +8m.12s., eNE = +10m.4s. =P_gP +4s., eSE = +14m.50s., eNW = +17m.52s. =SS −8s., eE = +18m.7s., eNE = +18m.46s. =SSS −11s.
Toronto ePP = +10m.12s. =P_gP +11s., SS = +18m.9s. ; T_0 =10h.21m.29s.
Ottawa PPN = +10m.25s., SS = +18m.59s., SSSN = +21m.1s. ; T_0 =10h.21m.18s.
Bozeman e = +27m.59s.
Sitka e = +34m.41s.
Feldberg eN = +27m.57s.
Potsdam eN = +29m.53s.
Triest eSKS = +23m.41s., eSS = +30m.51s.
Christchurch SSNZ = +33m.9s., L_qN = +42m.31s.
Ekaterinburg e = +27m.38s., +29m.39s. =PS +0s., and +36m.3s. =SS +4s.
Tashkent e = +22m.48s., i = +32m.36s., e = +39m.20s. =SS +7s. and +47m.35s.
Chiufeng eZ = +22m.58s. =PKS −8s.
Long waves were also recorded at Cape Town, Berkeley, Ukiah, Ann Arbor, San Fernando, Pulkovo, and Bombay.

Oct. 3d. 14h. 21m. 54s. Epicentre 2°·1S. 81°·2W. (as at 10h.). R.2.

A = +·153, B = −·988, C = −·037 ; D = −·988, E = −·153 ;
G = −·006, H = +·036, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		11·5	150	2 45	+ 3	i 4 57	+ 7	i 6·8	—
La Paz		19·3	139	4 26	+ 4	i 8 7	SS	10·1	15·4
Sucre		22·9	138	5 5	+ 5	i 9 25	SS	13·6	—
Columbia		36·1	0	e 15 18	SSS	e 15 36	SSSS	—	—
Cincinnati	Z.	41·3	356	i 7 38a	− 5	—	—	—	—
Florissant	N.	41·8	349	i 7 48	+ 1	i 14 3	0	—	—
Oak Ridge	N.E.	45·5	11	e 8 11	− 6	e 14 51	− 6	e 24·1	—
La Jolla		48·8	319	i 8 36	− 6	—	—	—	—
Riverside		49·6	320	i 8 48	0	—	—	—	—
Mount Wilson	E.	50·1	320	i 8 53	+ 1	—	—	—	—
Pasadena		50·2	320	i 8 53k	0	—	—	—	—
Haiweee		51·3	323	i 9 2	+ 1	—	—	—	—
Tinemaha		52·1	323	i 9 7	0	—	—	—	—
Bozeman		54·6	335	—	—	e 17 0	− 4	e 32·1	—
Granada		81·4	52	e 12 6	− 9	i 22 16	−15	—	—
Oxford		85·4	38	—	—	i 22 54	[− 8]	—	—
Uccle	N.	88·8	39	—	—	e 23 35	[+10]	—	—
De Bilt		89·4	38	—	—	e 23 44	[+15]	e 40·1	—
Copenhagen		93·8	34	—	—	24 6?	[+12]	—	—

Additional readings :—
Huancayo iP* = +3m.19s., i = +5m.10s. and +6m.0s. =S_g −14s.
Florissant iPPPN = +9m.28s. =PP +10s. ; T_0 =14h.22m.6s.
Oak Ridge eNW = +10m.3s. =P_gP +3s., +15m.43s., and +18m.13s. =SS +13s.
Long waves were also recorded at Tucson, Cape Town, Suva, and at other European stations.

Oct. 3d. 18h. 38m. 58s. Epicentre 37°·2N. 138°·8E. N.1.

Probable error of epicentre ±0°·17.

A = −·599, B = +·525, C = +·605; D = +·659, E = +·752; G = −·455, H = +·398, K = −·797.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Takada	0·4	257	0 6k	0	0 14	+ 4	—	—
Nagano	0·7	222	0 10k	0	0 22	+ 4	—	—
Niigata	0·8	15	0 7k	− 4	0 20	− 1	—	—
Maebasi	0·8	165	0 9k	− 2	0 22	+ 1	—	—
Oiwake	0·9	193	0 13k	0	0 25	+ 2	—	—
Aidu	1·1	71	0 17	+ 1	0 34	+ 6	—	—
Utunomiya	1·1	126	0 13k	− 3	0 30	+ 2	—	—
Kumagaya	1·2	156	0 16k	− 1	0 32	+ 1	—	—
Matumoto	1·2	215	0 17k	0	0 31	0	—	—
Toyama	1·4	248	0 20k	0	0 40	+ 4	—	—
Hukusima	1·5	67	0 19a	− 2	0 38	− 1	—	—
Husiki	1·5	253	0 21k	0	0 41	+ 2	—	—
Kakioka	1·5	131	0 20a	− 1	0 41	+ 2	—	—
Tukubasan	1·5	133	0 20a	− 1	0 40	+ 1	—	—
Wazima	1·5	277	0 20k	− 1	0 40	+ 1	—	—
Kohu	1·6	187	0 23a	0	0 45	+ 4	—	—
Mito	1·6	122	0 21a	− 2	0 44	+ 3	—	—
Takayama	1·6	230	0 26a	+ 3	0 52	+11	—	—
Yamagata	1·6	50	0 19a	− 4	0 39	− 2	—	—
Hunatu	1·7	181	0 25a	+ 1	0 49	+ 5	—	—
Tokyo	1·7	153	0 24a	0	0 47	+ 3	—	1·4
Iida	1·8	205	0 27k	+ 1	0 55	+ 9	—	—
Yokohama	1·9	159	0 28	0	0 57	+ 8	—	—
Sendai	2·0	57	0 26a	− 3	0 52	+ 1	—	—
Misima	2·1	176	0 30a	0	0 57	+ 3	—	—
Numadu	2·1	179	0 31a	+ 1	1 2	+ 8	—	—
Tyosi	2·2	131	0 29a	− 2	1 2	+ 5	—	1·2
Gihu	2·4	222	0 36a	+ 2	1 17	S_g	—	—
Mera	2·5	160	0 34	− 2	1 1	− 3	—	—
Nagoya	2·5	216	0 38	+ 2	e 1 14	S*	—	1·8
Hamamatu	2·6	200	0 42a	+ 5	1 26	S_g	—	—
Susaki	2·6	177	0 38a	+ 1	1 14	+ 7	—	—
Akita	2·7	22	0 37	− 2	1 8	− 1	—	—
Mizusawa	2·7	42	i 0 37	− 2	1 13	+ 4	—	—
Omaesaki	2·7	190	0 43	P*	1 21	S_g	—	—
Hikone	2·8	227	0 44	P*	1 26	S_g	—	—
Kameyama	3·0	219	0 49k	P*	1 29	S*	—	—
Morioka	3·1	37	0 43a	− 1	1 30	S*	—	—
Kyoto	3·3	229	0 55	P*	1 44	S_g	—	—
Toyooka	3·6	243	0 52	+ 1	1 48	S*	—	2·1
Osaka	3·6	227	0 57	P*	1 51	S_g	—	3·0
Osaka B.	3·6	227	1 1	P*	2 7	?	—	—
Kobe	3·9	230	e 0 56	0	1 52	S*	—	2·2
Wakayama	4·2	228	1 4	+ 4	2 12	S_g	—	—
Hatidyozima	4·2	168	0 59	− 1	1 41	− 7	—	—
Sumoto	4·3	229	1 5	+ 4	2 15	S*	—	2·3
Siomisaki	4·5	214	1 3	− 1	2 16	S*	—	—
Muroto	5·5	225	e 1 15	− 3	2 34	S*	—	3·2
Koti	5·6	232	e 1 33	P*	e 2 36	+13	3·0	3·0
Hamada	5·9	249	1 30	+ 6	2 33	+ 2	—	—
Matuyama	5·9	238	1 26k	+ 2	3 10	S_g	—	—
Sapporo	6·2	18	1 30k	+ 2	2 41	+ 3	—	—
Simidu	6·5	229	1 35	+ 3	3 27	S_g	—	3·9
Hukuoka	7·7	245	1 50	+ 1	e 3 45	S*	—	—
Hukuoka B.	7·7	245	1 47	− 2	3 40	S*	—	—
Vladivostok	7·8	321	1 55	+ 4	e 3 31	+12	i 4·0	4·7
Kumamoto	7·9	239	1 54	+ 2	4 10	S_g	—	—
Miyazaki	8·0	231	1 54k	+ 1	3 55	S*	—	—
Nemuro	8·0	38	1 36	−17	—	—	—	—
Taikyu	8·3	264	1 58	0	3 56	S*	5·1	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki		8·6	242	e 2 1	− 1	e 3 53	+14	—	5·6
Keizyo		9·4	276	i 2 15	+ 2	—	—	e 4·8	6·2
Tomie		9·4	244	2 9	− 4	4 55	S_g	—	—
Zinsen	E.	9·6	276	e 2 19	+ 3	—	—	e 5·6	6·3
Heizyo	E.	10·4	284	2 27	+ 1	e 4 23	0	5·8	6·6
Zi-ka-wei		15·5	253	e 3 36	+ 1	6 51	+24	—	10·7
Nanking		17·2	259	3 57	0	i 7 26	+20	—	11·5
Chiufeng		17·9	287	i 4 5	0	7 34	+12	e 9·9	11·8
Taihoku		19·1	235	e 8 14	S	(e 8 14)	+26	—	—
Hong Kong		25·8	242	5 34	+ 7	10 14	+19	13·1	17·3
Manila		27·6	220	5 44	0	10 20	− 5	13·3	—
Andijan		50·5	296	e 8 54	− 1	—	—	—	—
Tashkent		52·5	297	9 9	− 1	16 33	− 2	e 29·0	32·8
Bombay		59·8	271	e 9 57	− 6	18 12	− 1	e 31·0	37·7
Kucino		65·4	322	—	—	e 19 20	− 5	e 32·5	41·5
Pulkovo		66·7	329	e 11 3	+13	e 19 37	− 4	35·0	40·3
Tiflis		68·9	307	e 11 4	0	e 20 1	− 7	e 37·0	46·5
Simferopol		73·4	315	e 11 36	+ 5	—	—	—	—
Yalta		73·7	314	e 11 30	− 3	—	—	—	—
Copenhagen		76·5	333	11 45	− 4	21 38	+ 1	40·0	—
Tinemaha		77·2	53	i 11 48a	− 5	—	—	—	—
Santa Barbara		77·8	56	i 11 51	− 6	—	—	—	—
Haiwee		77·9	54	i 11 54	− 3	—	—	—	—
Potsdam		78·7	330	—	—	e 21 50	−12	43·0	52·0
Ksara	E.	79·0	305	e 12 7	+ 4	e 22 3	− 2	—	—
Pasadena		79·0	55	i 11 57a	− 6	—	—	—	—
Mount Wilson	E.	79·1	55	i 11 59	− 4	—	—	—	—
Riverside	Z.	79·6	55	e 12 1	− 5	—	—	—	—
Vienna		80·4	325	e 12 6	− 4	—	—	47·0	53·0
De Bilt		82·0	333	e 12 24	+ 6	e 22 28	− 9	e 42·0	51·8
Feldberg	N.	82·3	330	—	—	e 22 33	− 7	—	51·1
Uccle		83·3	333	e 12 21	− 4	e 22 51	+ 1	43·0	—
Triest		83·5	325	e 12 20	− 6	i 22 42	−10	—	51·8
Ravensburg		83·7	328	e 12 19	− 8	—	—	e 44·0	—
Strasbourg		83·9	330	e 12 31	+ 3	e 22 55	− 1	e 41·0	—
Oxford		84·4	337	—	—	e 22 44	[−11]	—	56·6
Piacenza		85·8	327	e 12 50	+13	23 9	− 7	—	52·5
Florence		86·1	325	11 41	−58	22 56	−22	38·0	45·0
Alicante		95·6	329	—	—	e 20 28	?	e 64·1	—
La Paz		148·5	55	19 42	[+ 2]	—	—	—	—

Additional readings:—
Niigata +18s.
Toyooka iN = +1m.59s. = S_g +6s.
Osaka i = +1m.11s. = P_g +5s. and +2m.0s. = S_g +7s.
Kobe iE = +1m.5s. = P^g +1s.
Zi-ka-wei iE = +3m.51s.
Nanking iE = +4m.4s. = PP +1s.
Manila PPEN = +6m.28s.
Kucino e = +23m.22s. = SS −10s., eSSS = +26m.36s.
Triest iPS = +23m.34s.
Long waves were also recorded at Phu-Lien, Oak Ridge, and other European stations.

Oct. 3d. Readings also at 0h. (Branner), 1h. (Huancayo), 2h. (Andijan and near Nanking), 3h. (Huancayo), 5h. (Wellington, Pittsburgh, and near Huancayo), 7h. (Pasadena, Tinemaha, and Huancayo (2)), 8h. (Mizusawa and near Apia), 9h. (Ekaterinburg, Pittsburgh, Tucson, near Santiago, near Tiflis (2), and near Tyosi), 10h. (Bombay, Tashkent, and near Chiufeng), 11h. (Huancayo, Seattle, near La Paz), 12h. (Huancayo and Wellington), 13h. (Tiflis and near Tyosi), 14h. (near Tyosi), 15h. (Tucson), 16h. (near Manila), 18h. (Melbourne, Riverview, Christchurch, and Wellington), 19h. (Pasadena, Tinemaha, Huancayo, and near Apia) 20h. (near Graz and Vienna), 21h. (Huancayo, La Plata, La Paz, Pasadena, Haiwee, Tinemaha, Tucson, Simferopol, and Yalta), 22h. (De Bilt, Feldberg, Paris, Kew, Stuttgart, Kucino, and Tashkent, 23h. (Christchurch and Wellington).

Oct. 4d. 10h. 59m. 58s. Epicentre 31°·3N. 131°·5E. (as on 1933 May 23d.). X.

A = −·566, B = +·640, C = +·520; D = +·749, E = +·663;
G = −·344, H = +·389, K = −·854.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Simidu	1·9	40	e 0 11	−17	—	—	—
Nagasaki	2·0	316	0 26	− 3	0 54	+ 3	—
Hukuoka	2·4	338	0 34	0	0 59	− 3	1·1
Kôti	2·8	37	e 0 42	+ 2	e 1 10	− 2	—
Sumoto	4·2	42	e 1 18	P_g	1 54	+ 6	2·2
Nagoya	6·0	48	e 1 25	0	e 2 32	− 1	—

Sumoto gives also iZ = +1m.29s., SEZ = +1m.57s. =S* −6s.

Oct. 4d. 17h. A shock from an epicentre North of Australia which does not afford definite determination. Fourteen stations give records of this shock.
Batavia eP =17h.27m.49s.
Manila P =17h.28m.32s., iSEN =32m.42s.
Nagoya e =17h.31m.9s.
Perth e =17h.32m.0s., i =34m.50s.
Hong Kong P =17h.35m.5s., M =39m.30s.
Tiflis e =17h.36m.21s. and 47m.0s.
Ekaterinburg e =17h.36m.38s., 46m.11s., and 51m.53s., L =18h.4m.
Adelaide e =17h.36m.44s.?, i =38m.52s., L =40m.0s., M =43m.24s.
Medan e =17h.39m.12s.
Sydney e =17h.40m.30s., L =43m.12s., M =45m.30s.
Melbourne i =17h.40m.33s., 41m.7s., and 41m.46s., L =43m.30s., M =46m.54s.
Riverview i =17h.40m.34s., e =42m.42s., M =45m.18s.
Christchurch ePEN =17h.42m.5s., S =47m.42s., L_q =49m.50s., L_r =52m.18s.
Baku e =17h.46m.27s. and 55m.56s., L =18h.8m., M =19m.18s.

Oct. 4d. Readings also at 6h. (Huancayo), 7h. (Balboa Heights and near Apia), 10h. (Yalta), 12h. (Tucson), 14h. (near Apia and near Manila), 15h. (Alicante), 16h. (Bombay), 19h. (near Mizusawa), 21h. (Tucson), 22h. (Lick and near Medan).

Oct. 5d. 5h. 49m. 47s. (I) } Epicentre 68°·5N. 19°·5W. R.3.
6h. 21m. 40s. (II) } (as on 1923 June 17d.). R.2.

A = +·345, B = −·122, C = +·930; D = −·334, E = −·943;
G = +·877, H = −·311, K = −·367.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Reykjavik	4·5	194	e 1 3	− 1	e 1 44	−11	—	—
II		4·5	194	e 1 1	− 3	e 1 42	−13	—	—
I	Oxford	18·9	143	—	—	e 7 44	0	e 10·5	—
I	Kew	19·4	142	—	—	e 8 13?	+19	—	—
II		19·4	142	e 4 22a	− 1	e 7 50	− 4	e 9·3	—
I	De Bilt	20·2	132	4 33	+ 1	8 16	+ 6	e 10·2	12·8
II		20·2	132	4 32	0	8 15	+ 5	e 9·3	12·7
II	Uccle	21·1	135	e 4 41	0	e 8 28	0	9·8	—
II	Paris	22·5	140	e 4 57	+ 1	e 9 0	+ 5	11·3	14·3
II	Feldberg N.	22·8	129	—	—	i 9 17	+16	—	15·0
II	Strasbourg	24·0	132	5 22	+12	e 9 22	− 1	e 10·3	—
I	Stuttgart	24·3	130	—	—	e 9 13?	−15	e 13·2	—
II		24·3	130	e 5 19	+ 6	e 9 38	+10	e 12·3	16·7
II	Kucino	28·3	87	(e 6 56)	PP	—	—	e 6·9	16·2
I	Florence	29·4	131	—	—	e 4 13	?	15·2	18·2
II		29·4	131	e 5 20	−40	(10 20)	−35	10·3	16·8

Long waves to both shocks were recorded at Ivigtut and many European stations, also for I at Kucino, and II at Ekaterinburg and Oak Ridge.

Oct. 5d. 9h. 32m. 46s. Epicentre 34°·8N. 132°·9E. (as on 1933 May 16d.). X.

A = −·559, B = +·602, C = +·571.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Sumoto	1·7	105	e 0 24	0	e 0 41	− 3	0·7
Muroto	1·9	140	0 25	− 3	0 39	P_g	—
Kobe	1·9	94	e 0 38	P_g	0 53	S*	0·9
Nagoya	3·3	83	1 2	P_g	1 24	− 1	—

Oct. 5d. 13h. 29m. 53s. Epicentre 35°·1N. 57°·8E. N.1.

Probable error of epicentre ±0°·20.

A = +·436, B = +·692, C = +·575; D = +·846, E = −·533;
G = +·306, H = +·487, K = −·818.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tashkent		10·9	52	i 2 33	0	i 5 10	S*	6·2	10·1
Tiflis		12·1	307	2 46	− 4	e 5 13	+ 8	6·2	9·7
Andijan		12·8	60	e 2 56	− 3	5 46	+24	7·6	8·6
Almata		16·9	56	e 3 59	+ 6	7 31	+32	9·0	10·5
Dehra Dun		17·6	100	4 7	+ 5	7 7	− 8	11·6	12·1
Ksara		18·1	272	i 6 2	?	i 7 33	+ 6	—	—
Agra		19·0	109	4 19	0	7 56	+10	e 9·8	11·3
Yalta		20·3	305	4 34	+ 1	8 17	+ 5	—	—
Sebastopol		20·9	304	4 37	− 2	8 31	+ 7	—	—
Bombay		21·0	137	4 36	− 4	8 31	+ 5	10·5	12·7
Ekaterinburg		21·8	4	i 4 49	0	i 8 57	+15	—	—
Helwan		22·9	264	i 4 49	−11	i 9 3	0	—	15·9
Hyderabad		25·5	129	5 33	+ 8	9 53	+ 3	13·4	17·1
Calcutta		29·5	107	6 49	PP	12 9	SS	16·7	—
Belgrade		29·9	300	e 7 4	+60	e 12 18	+75	e 17·2	—
Pulkovo		30·4	333	i 6 11	+ 2	11 15	+ 5	15·7	20·8
Kodaikanal		30·6	140	6 10	0	i 11 7	− 7	i 16·5	19·4
Budapest		31·2	306	6 17	+ 1	12 7?	+44	e 18·1	25·6
Vienna		33·1	307	i 6 32a	− 1	13 53	SS	19·2	26·1
Zagreb		33·1	302	e 6 33	0	e 14 37	?	e 18·9	20·1
Trenta		33·1	290	e 6 47	+14	—	—	—	—
Graz		33·7	303	i 6 36	− 2	e 13 51	SS	e 21·1	28·2
Catania		34·2	286	e 7 59	PP	12 38	+29	16·6	18·1
Benevento		34·4	294	e 6 47	+ 3	12 7	− 5	19·1	—
Naples	E.	34·5	294	e 6 19	−26	e 11 17	−57	—	21·1
Triest		34·7	302	6 43	− 3	12 39	+22	e 19·9	21·6
Colombo		34·8	139	6 42	− 5	12 8	−10	18·3	24·1
Venice		35·7	301	e 6 37	−18	i 11 35	−57	—	23·7
Treviso		35·8	301	i 6 57	+ 1	—	—	—	—
Upsala		35·8	326	6 54	− 2	e 12 39	+ 6	e 21·1	25·0
Cheb		35·9	309	e 7 0	+ 3	e 12 38	+ 3	e 21·1	24·1
Potsdam		35·9	313	i 7 1	+ 4	i 12 42	+ 7	e 20·1	25·1
Leipzig		36·1	310	e 7 1	+ 2	e 12 43	+ 5	e 21·1	22·4
Florence		36·5	298	6 1	−61	i 11 34	−70	14·1	19·1
Prato		36·6	298	e 7 3	0	i 12 47	+ 2	e 19·1	29·7
Jena		36·6	309	e 7 2	− 1	—	—	e 21·1	24·6
Copenhagen		37·0	319	7 10	+ 4	12 54	+ 3	—	—
Piacenza		37·5	301	7 7	− 4	13 7	+ 8	19·1	26·4
Göttingen		37·6	311	e 7 10	− 2	e 13 3	+ 3	e 23·1	25·4
Chur		37·7	304	e 7 7	− 5	—	—	—	—
Hamburg		37·9	314	e 8 54	PP	e 24 31	L	(e 24·5)	28·1
Stuttgart		37·9	307	e 7 12	− 2	e 13 7	+ 2	e 21·1	26·6
Zurich		38·3	304	e 7 15	− 3	—	—	—	—
Karlsruhe		38·4	307	7 20	+ 2	—	—	e 26·1	—
Feldberg	N.	38·5	309	i 7 18	− 1	i 13 13	− 1	—	28·3

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Strasbourg	38·8	306	e 7 17	− 5	e 13 7?	−11	e 22·1	—
Neuchatel	39·4	304	e 7 22	− 5	e 13 28	+ 1	—	—
De Bilt	40·7	312	7 37	− 1	13 49	+ 2	e 21·1	29·2
Uccle	41·1	309	7 39	− 2	13 55	+ 2	21·1	—
Bergen	41·7	324	7 28	−18	17 46	(− 6)	—	27·6
Puy de Dôme	42·2	302	7 49	− 1	—	—	e 27·1	—
Paris	42·3	306	i 7 50	− 1	e 16 58	SS	24·1	24·1
Algiers	43·8	288	9 52?	PP	e 17 34	SS	31·1	—
Kew	44·0	310	i 8 3	− 2	e 14 36	0	e 21·1	28·9
Oxford	44·6	311	—	—	14 38	− 6	e 23·1	33·9
Tortosa	44·7	295	8 7	− 3	14 42	− 4	21·6	—
Durham	44·7	315	14 44	S	(14 44)	− 2	—	33·1
Phu-Lien	45·0	95	—	—	(14 7?)	−43	14·1	—
Stonyhurst	45·2	314	8 16	+ 2	18 16	(+ 3)	—	30·3
Bidston	45·7	313	i 7 47	−31	i 14 32	−28	e 22·1	35·1
Chiufeng	45·7	65	e 8 19	+ 1	15 8	+ 8	e 25·4	29·4
Edinburgh	45·7	317	—	—	e 15 7?	+ 7	—	34·5
Alicante	46·1	292	e 8 14	− 7	e 15 7	+ 1	e 22·0	—
Almeria	47·9	290	e 8 36	+ 1	e 15 32	+ 1	e 29·4	—
Toledo	48·3	295	e 8 35	− 3	e 15 32	− 5	e 23·1	—
Granada	48·8	291	i 8 42	0	i 15 45	+ 1	23·5	27·0
Medan	49·2	120	e 9 19	+34	—	—	—	—
Malaga	49·5	291	e 8 41	− 6	e 15 39	−15	25·4	—
Nanking	50·1	75	e 8 55	+ 3	—	—	e 27·1	34·0
Hong Kong	50·4	88	16 10	S	(16 10)	+ 4	—	33·2
San Fernando	50·9	291	14 0	?	(16 7)	− 6	24·1	35·6
Vladivostok	56·2	58	e 9 43	+ 6	—	—	22·5	34·4
Manila	59·9	93	e 10 7	+ 3	e 18 21	+ 6	29·2	33·1
Koti	60·9	68	e 10 10	− 1	—	—	e 33·1	34·8
Toyooka	61·1	64	e 20 54	?	—	—	e 34·3	34·3
Sumoto	61·6	65	—	—	e 18 39	+ 2	e 34·6	42·0
Kobe	61·7	65	—	—	e 18 40	+ 2	34·0	38·9
Batavia	61·9	122	—	—	19 7?	+26	—	—
Nagoya	62·8	64	(e 10 25)	+ 1	e 10 25	P	—	—
Oiwake	63·5	62	10 37	+ 8	—	—	—	—
Mizusawa E.	64·1	59	e 10 42	+ 9	18 59	−10	—	—
N.	64·1	59	e 10 46	+13	18 3	−66	—	—
Ivigtut	66·7	330	i 10 48	− 2	19 43	+ 2	30·1	—
Cape Town	78·2	213	21 42	S	(21 42)	−14	36·1	42·6
Ottawa	89·2	329	—	—	e 23 7?	[−21]	29·1	—
Sucre	127·5	271	19 10	[+ 8]	—	—	60·1	—
La Paz	128·6	276	19 52	[+48]	—	—	67·9	72·5

Additional readings and notes :—
Tiflis iN = +2m.55s., eE = +5m.55s. = S* − 3s.
Ksara SS = +8m.12s.
Agra PN = +4m.24s.
Bombay SS = +9m.28s.
Belgrade e = +13m.57s.
Vienna P_cP = +8m.14s., PPP = +9m.18s. = P_cP − 2s., iE = +13m.15s. and +14m.31s., S_cS = +16m.28s., SS? = +17m.2s. = S_cS + 1s., SSS = +18m.29s.
Zagreb eNE = +8m.1s.
Triest iPP = +8m.2s., i = +12m.16s.
Upsala PPE = +8m.7s.?, SS = +15m.5s. ?
Cheb ePP = +8m.22s.
Potsdam eE = +8m.13s., iPPE = +8m.14s., iPPN = +8m.19s., iPPPEN = +8m.40s., iN = +12m.35s., eEN = +14m.55s., iSSN = +15m.12s., iSSSE = +15m.44s., iSSSN = +15m.47s.
Stuttgart ePPP = +8m.40s. = PP + 4s., iEZ = +8m.47s. = PPP − 3s., e = +14m.49s., eSS = +15m.47s. = SSS − 7s., e = +18m.1s.
Feldberg eN = +16m.0s.
Strasbourg iPP = +8m.52s., eSS = +16m.23s.
De Bilt ePPZ = +9m.5s., eSS = +16m.46s.
Uccle ePPE = +9m.17s., SSN = +17m.0s.
Bergen true P is given without phase, S_cS is given as P.
Kew eE = +17m.59s. = S_cS − 7s.
Oxford e = +17m.59s. = S_cS − 11s.

Continued on next page.

Durham S = +18m.15s. = S_cS +5s.
Bidston i = +18m.17s. = S_cS +0s.
Chiufeng PPZ = +10m.10s. = P_cP +9s., SSN = +18m.13s.
Edinburgh i = +18m.31s. and +18m.43s.
Granada PP = +10m.38s., PPP = +11m.18s., P_cS = +14m.9s., SS = +19m.15s.
Malaga PP = +10m.39s., PPP = +11m.33s., P_cS? = +13m.55s., PS = +15m.52s., SSS = +20m.57s.
Hong Kong S = +20m.7s.
San Fernando PPN = +16m.13s., S = +20m.11s. and +20m.24s.; the S entered is given as another reading of PPN.
Sumoto eN = +18m.46s. = PS +2s.
Nagoya eP = +7m.29s.
Cape Town PP = +23m.13s., PPP = +23m.48s., S? = +28m.2s.
La Paz ePZ? = +17m.58s.
Long waves were also recorded at Barcelona, Ann Arbor, Oak Ridge, Chicago, Bozeman, Keizyo, Taikyu, Nagasaki, Melbourne, Sydney, and Johannesburg.

Oct. 5d. 15h. 6m. 26s. Epicentre 2°·1S. 81°·2W. (as on 3d.). R.2.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		11·5	150	e 2 43	+ 1	i 4 44	− 6	i 5·5	—
La Paz	N.	19·3	139	i 4 22a	0	i 8 2	+10	10·5	12·2
Sucre		22·9	138	4 59	− 1	i 9 22	+19	13·1	—
San Juan		25·2	35	e 5 19	− 3	i 9 42	− 2	—	—
La Jolla		48·8	319	i 8 41	− 1	—	—	—	—
Riverside		49·6	320	i 8 48	0	—	—	—	—
Mount Wilson		50·1	320	i 8 53	+ 1	—	—	—	—
Pasadena		50·2	320	i 8 52a	− 1	—	—	—	—
Haiwee		51·3	323	i 9 1	0	—	—	—	—
Tinemaha		52·1	323	i 9 7	0	—	—	—	—

Additional readings:—
Huancayo e = +3m.10s., i = +4m.34s.
San Juan i = +10m.3s.
Pasadena iZ = +8m.58s. and +9m.8s.

Oct. 5d. Readings also at 1h. (Tucson, Camerino, Florence, and near Prato), 2h. (Tucson (2)), 3h. (De Bilt, Uccle, Florence, and Triest), 4h. (Tucson), 6h. (Mizusawa and Tiflis (2)), 7h. (near Batavia), 8h. (Sydney, near Tiflis (2), and near Malabar), 11h. (La Paz, near Huancayo, and near Tiflis), 12h. (Bombay and near Glenmuick), 13h. (Christchurch and Wellington), 15h. (Andijan, Tashkent, Ekaterinburg, Tiflis, and near Simidu), 16h. (Andijan, Tashkent, Ekaterinburg, Tiflis (2), Baku, Ksara, Bombay, and Feldberg), 17h. (near Tiflis), 19h. (Nanking and near Tiflis), 21h. (La Paz, near Hukuoka, and Nagasaki), 22h. (Tiflis (2) and Tucson).

Oct. 6d. 5h. 59m. 53s. Epicentre 41°·6N. 77°·2E. (as given by the stations). N.3.

A = +·166, B = +·729, C = +·664; D = +·975, E = −·222;
G = +·147, H = +·647, K = −·748.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata	1·7	354	e 0 21	− 3	0 45	+ 1	—	0·8
Andijan	3·7	259	e 0 56	+ 3	1 41	+ 6	—	2·0
Tashkent	5·9	270	i 1 45	P*	—	—	e 3·2	3·4

Additional readings:—
Almata P_g = +23s. = P* −3s.
Andijan eP* = +1m.2s., P_g = +1m.8s.
Long waves were also recorded at Baku and Ekaterinburg.

Oct. 6d. Readings also at 1h. (Tiflis (2) and near Prato), 2h. (Huancayo, Tiflis, and near Victoria), 4h. (Huancayo), 5h. (Huancayo and La Paz), 6h. (Messina, Mineo, and near Catania), 10h. (San Francisco), 11h. (near Tashkent and near Ksara), 13h. (Tiflis), 14h (Huancayo), 15h. (San Francisco), 17h. (Ekaterinburg, Tashkent, Vladivostok, Tyosi, and near Mizusawa), 20h. (Huancayo, La Paz, La Plata, Sucre, and near Santiago), 22h. (La Paz), 23h. (Balboa Heights).

Oct. 7d. 2h. 9m. 42s. Epicentre 58°·5S. 145°·5E. (as on 1926 Oct. 27d.). X.

A = −·431, B = +·296, C = −·853; D = +·566, E = +·824; G = +·703, H = −·483, K = −·522.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Melbourne	20·7	359	—	—	8 5	−15	9·1	10·8
Christchurch	22·4	60	—	—	i 8 50	− 3	10·8	—
Adelaide	24·0	346	e 5 12	+ 2	i 9 30	+ 7	i 11·1	12·4
Riverview	25·0	11	e 5 19	− 1	i 9 44	+ 3	e 11·6	16·2
Wellington	25·2	60	5 20	− 2	9 53	+ 9	i 13·7	—
Ekaterinburg	133·5	311	—	—	e 39 39	SS	61·3	—
De Bilt	156·9	271	—	—	e 50 36	?	e 83·3	—

Riverview gives also i = +5m.23s.
Long waves were also recorded at Bombay, Tashkent, and other European stations.

Oct. 7d. 7h. Readings which do not afford an approximate epicentre.
Tiflis iPN = 7h.57m.10s., eS = 59m.33s., eLN = 59m.45s.
Ksara eP = 7h.57m.32s., S = 59m.51s., L = 8h.0m.8s.
Helwan eP = 7h.58m.20s., PP = 8h.0m.50s., S = 2m.17s., L = 4m.42s., M = 6m.45s.
Ekaterinburg eP = 8h.0m.30s., iS = 5m.16s., L = 10m.24s.
Vienna ePZ = 8h.0m.44s.
Triest eP = 8h.1m.16s., M = 14m.0s.
Tashkent eS = 8h.3m.0s., L = 5m.42s.
Long waves were also recorded at Kucino, De Bilt, Feldberg, Strasbourg, and Stuttgart.

Oct. 7d. Readings also at 1h. (near Tananarive), 6h. (De Bilt, Feldberg, Paris, Stuttgart, Strasbourg, Uccle, Ekaterinburg, Camerino, Florence, near Prato, and Triest), 7h. (Tashkent, near Mizusawa, Nagoya, and Tyosi), 8h. (near Mizusawa), 10h. (Andijan, Frunse, Tashkent, Ekaterinburg, and near Sumoto), 11h. (La Paz, Melbourne and near Sumoto), 12h. (Ekaterinburg, Tashkent, Uccle, and near Tiflis (2)), 13h. (Perth), 15h. (La Paz and near Apia), 16h. (Ekaterinburg, Tashkent, Huancayo, and La Paz).

Oct. 8d. Readings at 1h. (Tiflis), 2h. (Zurich and near Neuchatel), 3h. (Tiflis), 5h. (Tyosi (2)), 7h. (near Huancayo), 8h. (Ekaterinburg, Tashkent, Huancayo, and La Paz), 12h. (near Mizusawa, Nagoya, and Tyosi), 13h. (near Apia), 15h. (Triest), 16h. (near Apia and near Medan), 17h. (near Wellington), 18h. (near Nagasaki), 19h. (Cheb), 20h. (Huancayo), 23h. (Tiflis (2)).

Oct. 9d. 12h. 6m. 36s. Epicentre 35°·5N. 139°·1E. (as on 1929 Aug. 8d.). R.3.

A = −·615, B = +·533, C = +·581; D = +·655, E = +·756; G = −·439, H = +·380, K = −·814.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tokyo		0·6	71	0 3k	− 6	0 13	− 2	0·2
Susaki		0·9	187	0 11a	− 2	0 20	− 3	—
Tyosi		1·5	81	e 0 22	+ 1	0 40	+ 1	0·9
Nagoya		1·8	259	e 0 26	0	0 50	+ 4	1·0
Osaka		3·0	255	0 44	+ 1	1 28	S*	1·9
Kobe		3·3	257	0 48	+ 1	1 27	+ 2	1·7
Toyooka		3·4	272	0 58	P*	1 45	S_g	1·8
Sumoto		3·6	252	e 0 51	0	1 34	+ 2	1·9
Mizusawa	E.	3·9	24	e 0 59	+ 3	i 2 1	S*	—
	N.	3·9	24	e 1 6	P*	e 1 59	S*	—
Muroto		4·6	242	e 1 36	P_g	e 2 24	S_g	—
Koti		5·0	249	e 1 37	P_g	e 2 31	S*	—
Taikyu		8·5	276	e 3 7	S	(e 3 7)	−29	—

Additional readings:—
Osaka i = +55s. = P_g +1s.
Kobe iEZ = +55s. = P* +2s., iS = +1m.39s. = S* +2s.
Toyooka iZ = +1m.6s. = P_g +4s.
Koti eE = +2m.5s. = S −3s., eEZ = +2m.8s.

Oct. 9d. Readings also at 0h. (Tiflis (4) and near Huancayo), 1h. (De Bilt, Feldberg, Uccle, Strasbourg, Stuttgart, Florence, Triest, Ksara, and near Tyosi), 2h. (Trenta), 7h. (La Paz), 9h. (Bombay), 11h. (near Nagoya and Tyosi), 16h. (Tiflis, near Huancayo, and near Tyosi), 19h. (Wellington), 20h. (near Chiufeng), 21h. (Andijan, Tashkent, and Baku), 22h. (near Glenmuick), 23h. (Paris).

Oct. 10d. 3h. 34m. 7s. Epicentre 22°·5S. 70°·2W. (as on 1932 Feb. 27d.). X.

A = +·313, B = −·869, C = −·383; D = −·941, E = −·339; G = −·130, H = +·360, K = −·924.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		1·2	95	i 0 21	+ 4	i 0 32	+ 1	—	—
Sucre	N.	5·8	53	i 1 17	− 5	i 2 9	−19	—	—
La Paz	N.	6·3	18	i 1 28a	− 2	i 2 36	− 5	2·9	3·2
Santiago		10·9	182	4 13	S	(4 13)	−23	6·2	—
Huancayo		11·5	334	e 2 53	+11	e 5 17	+27	—	—
San Juan		41·1	6	e 13 28	?	14 8	+15	—	—
La Jolla		71·3	319	i 11 18	− 1	—	—	—	—
Riverside		72·1	320	i 11 25	+ 2	—	—	—	—
Mount Wilson		72·7	320	i 11 28k	+ 1	—	—	—	—
Pasadena		72·7	320	i 11 29k	+ 2	—	—	—	—
Santa Barbara	Z.	73·9	319	e 11 35	+ 1	—	—	—	—
Haiwee		74·0	323	i 11 35	0	—	—	—	—
Tinemaha		74·8	322	i 11 40k	+ 1	—	—	—	—

Additional readings:—
Santiago S = +6m.13s.
Huancayo i = +5m.26s.
San Juan eSS = +16m.50s.
Riverside iZ = +11m.52s.
Pasadena iZ = +11m.55s.
Tinemaha iZ = +12m.7s.

Oct. 10d. 13h. 34m. 50s. Epicentre 19°·0N. 101°·7W. (as on 1933 Jan. 24d.). X.

A = −·192, B = −·926, C = +·326; D = −·979, E = +·203; G = −·066, H = −·319, K = −·946.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson		15·6	330	e 3 43	+ 7	e 6 13	−16	i8·4	—
La Jolla		19·6	318	i 4 21	− 4	—	—	—	—
Mount Wilson		21·0	319	i 4 40	0	—	—	—	—
Pasadena		21·0	319	i 4 39a	− 1	i 12 16	L	(i 12·3)	—
Florissant		22·1	24	i 4 56	+ 4	i 8 57	+ 9	—	—
Haiwee		22·3	324	i 4 55	+ 1	—	—	e 12·2	—
Tinemaha		23·1	325	i 5 2	0	e 9 18	+11	—	—
La Paz	Z.	48·5	135	8 39	− 1	—	—	—	—

Florissant gives also ipPZ = +5m.15s., isSEN = +9m.45s.; T_0 = 13h.34m.51s.

Oct. 10d. 20h. 55m. 15s. (I) } Epicentre 48°·3N. 9°·0E. R.2.
21h. 0m. 32s. (II) } (as on 1933 March 6d.). R.2.

Close to Ebingen.

A = +·657, B = +·104, C = +·747.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Ebingen	0·1	190	i −0 3a	− 4	i −0 2	− 5	—	—
II		0·1	190	i −0 2a	− 3	i −0 1	− 4	—	—
I	Stuttgart	0·4	16	e 0 7	+ 1	i 0 14	+ 4	—	—
II		0·4	16	e 0 7	+ 1	i 0 15	+ 5	—	—
I	Hohenheim	0·5	19	e 0 5	− 2	i 0 12	− 1	—	—
II		0·5	19	e 0 6	− 1	i 0 13	0	—	—
I	Ravensburg	0·6	141	e 0 10	+ 1	i 0 17	+ 2	—	—
II		0·6	141	e 0 9	0	i 0 17	+ 2	—	—
I	Strasbourg	0·9	289	0 9	− 4	0 21	− 2	—	—
II		0·9	289	0 15	+ 2	0 27	+ 4	—	—
I	Zurich	1·0	197	e 0 14	0	e 0 26	0	—	—
II		1·0	197	e 0 15	+ 1	e 0 26	0	—	—
I	Chur	1·5	166	e 0 24	+ 3	e 0 43	+ 4	—	—
II		1·5	166	e 0 24	+ 3	e 0 43	+ 4	—	—
I	Neuchatel	1·9	227	e 0 30	+ 2	e 1 0	S_g	—	—
II		1·9	227	e 0 29	+ 1	e 1 1	S_g	—	—
I	Jena E.	3·0	32	e 0 45	P^*	—	—	e 1·5	1·7
II	E.	3·0	32	e 0 58	P_g	(e 1 15)	− 2	e 1·3	1·8
I	Göttingen	3·3	12	e 1 3	P_g	e 1 45	S_g	—	—
II		3·3	12	e 1 5	P_g	e 1 46	S_g	—	—

Additional readings :—
Ebingen I i = +0s., II i = +0s.
Stuttgart I eN = +9s., i_Q = +16s., i = +18s., II iE = +18s.
Hohenheim I i = +14s., II e = +10s.
Ravensburg I i = +19s., II i = +19s.
Strasbourg I SS = +1m.4s., II SS = +58s.
Neuchatel I eP_g = +34s., II eP_g = +34s.

Oct. 10d. Readings also at 0h. (Baku, Tiflis, and Tucson), 1h. (Andijan), 2h. (Port au Prince, and near Huancayo), 4h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Tucson), 6h. (La Plata), 8h. (Huancayo and La Paz), 9h. (La Paz), 10h. (Christchurch and near Wellington), 12h. (Bombay), 14h. and 16h. (La Paz), 20h. (near Manila and near Santiago), 21h. (Wellington).

Oct. 11d. 13h. 57m. 46s. Epicentre 38°·3N. 141°·9E. N.2.
(as given by the Japanese stations).

A = −·618, B = +·484, C = +·620 ; D = +·617, E = +·787 ;
G = −·488, H = +·382, K = −·785.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sendai	0·9	268	0 11k	− 2	0 23	0	—	—
Mizusawa	1·0	324	i 0 14k	0	i 0 28	+ 2	—	—
Yamagata	1·2	268	0 16k	− 1	0 28	− 3	—	—
Hukusima	1·3	244	0 17k	− 1	0 34	+ 1	—	—
Morioka	1·5	338	0 22	+ 1	0 44	+ 5	—	—
Onahama	1·6	210	0 24	+ 1	0 42	+ 1	—	—
Aidu	1·6	242	0 24a	+ 1	0 47	S^*	—	—
Mito	2·2	211	0 28	− 3	0 53	− 4	—	—
Kakioka	2·5	214	0 31	− 5	0 59	− 5	—	—
Tukubasan	2·6	215	0 31	− 6	1 1	− 6	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	2·7	198	e 0 38	− 1	1 11	+ 2	—	1·4
Kumagaya	3·0	223	0 43	0	1 14	− 3	—	—
Maebasi	3·0	230	0 41	− 2	1 17	0	—	—
Tokyo	3·2	213	0 43	− 3	1 22	0	—	—
Oiwake	3·3	234	0 47	0	1 28	+ 3	—	—
Nagano	3·4	242	0 50	+ 1	1 24	− 3	—	—
Yokohama	3·4	213	0 49	0	1 25	− 2	—	—
Hakodate	3·6	345	1 3k	P_g	1 59	S_g	—	—
Hunatu	3·8	223	0 53	− 1	1 45	+ 8	—	—
Kohu	3·8	227	0 55k	+ 1	1 48	S*	—	—
Misima	4·0	217	0 59	+ 2	1 46	+ 4	—	—
Numadu	4·0	218	0 59	+ 2	1 40	− 2	—	—
Wazima	4·1	258	1 0	+ 2	2 25	S_g	—	—
Susaki	4·3	214	0 59a	− 2	1 47	− 3	—	—
Omaesaki	4·8	219	1 10	+ 2	2 11	+ 8	—	—
Sapporo	4·8	355	1 26	P_g	2 24	S_g	—	—
Hamamatu	4·9	225	1 11	+ 1	2 12	+ 7	—	—
Kusiro	5·0	22	0 57	−14	1 50	−18	—	—
Gihu	5·0	237	1 12	+ 1	2 9	+ 1	—	—
Nagoya	5·1	233	e 1 13	0	2 19	+ 9	—	2·8
Hatidyozima	5·5	200	1 17	− 1	2 16	− 4	—	—
Hikone	5·5	238	1 21	+ 3	2 26	+ 6	—	—
Kameyama	5·6	233	1 26	+ 6	2 42	S*	—	—
Kyoto	6·0	239	1 26	+ 1	—	—	—	—
Osaka	6·3	237	1 27	− 3	2 55	S*	—	3·8
Toyooka	6·3	246	e 1 31	+ 1	2 37	− 4	—	2·9
Kobe	6·5	239	e 2 19	P_g	e 3 20	S*	—	3·7
Wakayama	6·9	237	1 37k	− 1	3 16	S*	—	—
Sumoto	6·9	237	e 1 37	− 1	e 3 22	S*	—	3·4
Vladivostok	8·9	306	e 2 10	+ 4	e 3 58	− 8	4·5	5·2

Additional readings :—
Osaka i = +2m.43s. =S+2s.
Kobe eEN = +2m.57s. =S+11s.
Sumoto ePN = +1m.44s., iZ = +2m.59s. =S+3s.
Long waves were also recorded at Ekaterinburg and Tashkent.

Oct. 11d. Readings also at 1h. (Bombay, Huancayo, and La Paz), 2h. (La Paz and Wellington), 3h. (Tiflis, Huancayo, and near La Paz), 4h. (Huancayo (3) and near La Paz (6)), 5h. (near La Paz), 6h. (Huancayo, near La Paz (2), Sucre, near Andijan, and Frunse), 7h. (La Paz), 8h. (Wellington, Huancayo, Sucre, and near La Paz), 10h. (near Taihoku), 12h. (Huancayo), 13h. (near Kobe and Sumoto), 15h. (Oak Ridge, Tucson, San Juan, Stuttgart, and near Ebingen), 16h. (Ekaterinburg, Tashkent, and Strasbourg), 18h. (Wellington), 19h. (San Juan, Huancayo, La Paz, Sucre, and near Branner), 20h. (La Paz), 21h. (La Paz and near Huancayo), 22h. (Medan, La Paz, and near Tiflis), 23h. (Huancayo, La Paz, Sucre, Mount Wilson, Pasadena, and Tinemaha).

Oct. 12d. 7h. 12m. 16s. Epicentre 26°·5S. 65°·2W. (as on 1931 April 3d.). X.

A = +·375, B = −·812, C = −·446 ; D = −·908, E = −·419 ;
G = −·187, H = +·405, K = −·895.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		5·1	319	i 0 56	−17	—	—	—	—
Sucre		7·5	0	i 1 48	+ 2	i 2 52	−19	—	—
La Paz		10·4	344	i 2 1	−25	i 3 17	−66	3·6	4·6
La Plata	E.	10·5	145	4 10	S	(4 10)	−16	9·0	9·9
	N.	10·5	145	4 12	S	(4 12)	−14	8·8	9·3

Continued on next page,

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		17·3	325	e 3 25	−33	(i 7 30)	+21	i 7·5	—
San Juan		44·9	359	e 8 31	+19	e 14 3	−46	—	—
Fordham		67·8	354	i 11 22	(− 2)	e 19 18	−36	—	—
Pittsburgh		68·3	350	i 11 22	(− 4)	i 19 22	−39	—	—
Oak Ridge		69·3	357	i 11 6	0	e 20 17	+ 4	—	—
Ottawa		72·5	354	—	—	e 20 14	−37	—	—
La Jolla		77·3	318	i 11 50	− 4	—	—	—	—
Riverside	z.	78·1	318	i 11 57	− 1	—	—	—	—
Pasadena		78·6	320	i 12 0k	0	i 22 9	+ 9	—	—
Mount Wilson		78·7	319	i 12 0k	− 1	—	—	—	—
Santa Barbara	z.	79·9	318	i 12 6	− 1	—	—	—	—
Haiwee		80·0	321	i 12 9	+ 1	e 22 23	+ 7	—	—
Tinemaha		80·8	321	i 12 12k	0	i 22 33	+ 9	—	—

Additional readings :—
Montezuma i = +1m.2s. and +1m.8s.
La Plata N = +4m.48s., SE = +7m.36s., SN = +7m.41s.
Huancayo iP = +3m.30s., e = +4m.18s., iS = +5m.30s., eS* = +6m.18s., iS_e = +6m.44s.
San Juan eSS = +17m.7s.
Pittsburgh iPS = +20m.6s.
Oak Ridge iZ = +11m.17s. and +11m.21s., e = +11m.32s. = P_cP +2s.
Ottawa eE = +20m.56s.
Riverside iZ = +12m.25s.
Pasadena iZ = +12m.27s. and +12m.38s.

NOTE TO THE ABOVE EARTHQUAKE.

The following suggestions where made as to the epicentre of the 12d.7h. shock :—
La Paz 20°S. 74°W.
U.S. Coast and Geodetic Survey report 23°S. 70°W.
Pasadena. The Pasadena and La Plata reports suggest an epicentre off the coast of Chili in latitude 43°S., *i.e.*, 43°S. 75° − 80°W.

In discussing the phase readings for this earthquake the Californian and other North American records are found irreconcilable with those of S. America ; so that the divergence of opinion as to the epicentre must be due either to some anomaly in the earthquake or to systematic error in reading phases.

Oct. 12d. Readings also at 0h., 1h., and 2h. (La Paz), 3h. (Huancayo (3), La Paz (4), and near Tyosi), 4h. (La Paz), 5h. (La Paz, Nanking, Hong Kong, and near Wellington), 7h. (Nanking, near Wellington, near Apia, and near Taihoku), 8h. (La Paz), 9h. (Camerino and La Paz), 10h. (Wellington and near Tyosi), 12h. and 14h. (Huancayo), 15h. (Huancayo and La Paz), 16h. (near Algiers), 17h. (Huancayo and near Apia), 18h. (La Paz and near Algiers), 21h. (La Paz, Mizusawa (2), and near Tyosi), 22h. (near Mizusawa and near Tyosi), 23h. (Ksara and near La Paz (2)).

Oct. 13d. Readings at 1h. (Tiflis), 2h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Ksara), 3h. (Baku, Ksara, Tiflis, Tucson, near La Paz (2), and near Amboina), 4h. (Tashkent), 6h. (near Apia), 11h. (Bombay and Messina), 12h. (Nagoya and near Tyosi), 13h. (Huancayo and La Paz), 14h. (near Huancayo (2)), 17h. (Kobe, near Nagoya, Osaka, and Sumoto), 18h. (near Lick (2) and near Mizusawa), 20h. (Huancayo, Frunse, near Andijan, and Tashkent).

Oct. 14d. 22h. 19m. 7s. Epicentre 53°·9N. 163°·7W. N.1.

Probable error of the epicentre ±0°·23.

A = −·566, B = −·165, C = +·808; D = −·281, E = +·960;
G = −·776, H = −·227, K = −·589.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		16·3	67	i 3 49	+ 4	i 6 53	+ 8	e 8·7	—
Victoria	E.	25·5	86	e 5 51	PP	(i 9 56)	+ 6	i 9·9	17·5
Seattle		26·5	87	—	—	e 10 53	SS	—	—
Ukiah		31·0	102	—	—	e 11 21	+ 1	—	—
Berkeley	E.	32·4	103	—	—	(i 11 45)	+ 4	i 11·7	—
Honolulu T.H.		32·9	169	—	—	e 13 5	SS	e 15·2	—
Bozeman		34·2	81	e 6 11	−31	e 12 8	− 1	e 16·9	—
Tinemaha		35·2	100	i 6 50	− 1	i 12 30	+ 6	—	—
Haiwee		36·1	100	i 6 56	− 3	i 12 58	+20	—	—
Santa Barbara	Z.	36·2	104	e 7 5	+ 5	e 12 49	+10	—	—
Pasadena		37·3	103	i 7 6k	− 3	i 12 56	0	e 18·4	—
Riverside		37·9	103	e 7 11	− 3	e 13 3	− 2	—	—
La Jolla		38·7	104	i 7 20	− 1	e 13 17	0	—	—
Vladivostok		42·4	282	e 9 56	(+ 7)	—	—	e 20·0	33·2
Tucson		42·9	98	e 7 57	+ 1	e 14 19	0	e 20·0	—
Osaka		45·8	271	8 19	0	13 50	?	17·0	—
Chicago		49·8	72	—	—	e 16 0	+ 2	e 24·5	—
Florissant		50·4	76	i 8 54	0	i 16 6	0	23·9	—
St. Louis		50·6	76	i 8 51	− 5	i 16 5	− 4	23·9	—
Toronto		53·2	64	9 20	+ 5	16 20	−25	24·2	—
Chiufeng		53·3	291	9 14a	− 2	17 2	+16	e 24·5	31·9
Ottawa		53·9	61	e 9 23	+ 2	16 53	− 1	e 25·4	28·9
Nanking		57·5	282	e 9 45	− 2	—	—	—	—
Oak Ridge		58·0	60	i 9 49	− 1	—	—	e 31·9	—
Fordham		58·0	63	e 9 47	− 3	e 17 50	+ 1	e 28·9	—
Ekaterinburg		63·5	335	i 10 24	− 5	19 12	PS	i 36·1	43·1
Pulkovo		65·8	353	e 10 39	− 5	e 19 47	PS	34·9	41·8
Hong Kong		67·5	278	20 1	S	(20 1)	+10	—	50·5
Copenhagen		70·4	3	—	—	20 53?	PS	40·9	—
Frunse		71·1	319	e 11 16	− 1	—	—	—	—
Oxford		73·3	11	—	—	21 17	PS	e 43·4	50·6
De Bilt		73·6	8	i 11 31	− 1	e 21 14	+10	e 34·9	46·5
Andijan		73·8	320	e 11 39	+ 6	21 13	+ 7	42·9	—
Kew		73·8	10	e 11 32	− 1	e 21 17	+11	e 36·9	—
Tashkent		74·5	322	i 11 53	+16	i 21 39	PS	e 37·9	47·9
Uccle		74·8	9	11 38a	− 1	e 21 22	+ 4	e 34·9	—
Feldberg	N.	75·7	6	—	—	e 21 41	PS	e 38·9	54·9
Stuttgart		77·2	5	11 52a	− 1	e 21 43	− 2	e 42·9	—
Strasbourg		77·3	6	i 11 52	− 2	e 22 30	PS	e 40·9	—
Zurich		78·5	7	e 12 0	0	—	—	—	—
Neuchatel		78·8	7	e 11 59	− 2	—	—	—	—
San Juan		79·6	73	e 12 19	+13	e 22 2	− 9	e 39·0	—
Simferopol		80·0	349	e 12 8	0	—	—	—	—
Yalta		80·4	348	12 9	− 1	—	—	—	—
Triest		80·4	3	12 8a	− 2	22 43	PS	—	52·9
Tiflis		81·3	339	12 13	− 2	e 22 44	+14	e 38·4	55·1
Baku		81·4	335	12 19	+ 4	22 48	+17	40·9	56·4
Prato		82·1	5	e 12 18	− 1	i 22 49	+11	—	—
Florence		82·2	5	12 17	− 2	22 53	+14	36·9	44·9
Agra	E.	83·1	307	e 12 21	− 3	e 22 42	− 6	e 42·9	—
Toledo		84·6	16	12 32	+ 1	e 22 52	−12	e 39·9	—
Alicante		86·7	14	e 12 42	0	e 23 22	− 2	e 50·3	—
Granada		87·3	17	i 13 2	+17	e 24 2	PS	47·4	55·1
San Fernando		87·6	19	14 29	?	22 58	[−19]	43·9	56·4
Almeria		87·8	16	e 12 33	−14	e 23 13	[− 6]	e 55·1	—
Ksara		90·6	344	e 12 55	− 5	e 23 53	− 9	—	—
Bombay		92·6	308	e 13 12	+ 3	—	—	—	59·7

For Notes see next page.

NOTES TO OCT. 14d. 22h. 19m. 7s.

Additional readings :—
Sitka e = +7m.5s.
Seattle e = +11m.41s.
Florissant ipPZ = +9m.17s., esSEN = +16m.47s. ; T_0 = 22h.19m.13s.
Ottawa SSE = +20m.53s. ; T_0 = 22h.19m.6s.
Oak Ridge iZ = +9m.59s., eNW = +12m.50s., +21m.48s. = SS +12s. and +24m.8s. = SSSS − 4s
Fordham eSSE = +21m.54s.
Strasbourg e = +14m.53s.? = PP +10s. and +15m.53s.?
San Juan ePP = +15m.39s., iSS = +27m.3s.
Tiflis e = +22m.23s., eSKKSZ = +23m.4s. = PS − 3s.
Baku SS = +28m.47s., SSS = +32m.29s.
Granada PP = +16m.35s.
San Fernando SN = +23m.45s. and +23m.53s., PSN = +24m.40s.
Long waves were also recorded at Ann Arbor, Columbia, Pittsburgh, Ivigtut, Phu-Lien, Wellington, Hyderabad, Kucino, Budapest, Potsdam, Paris, and Edinburgh.

Oct. 14d. Readings also at 0h. (Ann Arbor), 6h. (near La Paz), 7h. (Nanking and near Heizyo), 9h. (Ksara), 10h. (Huancayo, La Paz, Ksara, near Tyosi, and near Mizusawa), 12h. (Mizusawa, near Nagoya, and Tyosi), 18h. and 19h. (Tananarive), 20h. (La Paz), 22h. (near Tiflis), 23h. (Tucson).

Oct. 15d. Readings at 1h. (Christchurch, Wellington, and Kobe), 3h. (Ksara and Nagoya), 5h. (Nanking), 6h. (La Paz), 7h. (near Amboina), 8h. (near Mizusawa (2), Nagoya, and Tyosi), 9h. (near La Paz), 11h. (Mizusawa), 13h. (near La Paz), 14h. (Tucson and near Mizusawa), 16h. (near St. Louis, near Nagoya, Tokyo, and Tyosi), 21h. (near Huancayo).

Oct. 16d. 2h. 45m. 24s. Epicentre 52°·6N. 168°·7W. (as on 1933 July 28d.). X.

A = −·596, B = −·119, C = +·794 ; D = −·196, E = +·981 ;
G = −·779, H = −·156, K = −·607.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		19·5	64	i 4 26	+ 2	i 7 59	+ 3	e 11·6	—
Honolulu T.H.		32·4	161	—	—	e 13 51	SSSS	e 16·6	—
Berkeley	E.	35·1	96	—	—	e 13 17	+54	—	—
Tinemaha		38·1	95	i 7 15	− 1	—	—	—	—
Haiwee		38·8	95	i 7 20	− 2	—	—	—	—
Santa Barbara		38·9	98	i 7 23	0	—	—	—	—
Mount Wilson		40·1	97	i 7 32	− 1	—	—	—	—
Pasadena		40·1	97	i 7 33	0	—	—	—	—
Riverside		40·6	97	i 7 36	− 1	—	—	—	—
La Jolla		41·5	98	i 7 42	− 2	—	—	—	—
Ekaterinburg		63·4	334	i 10 31	+ 3	—	—	63·6	—
Neuchatel		80·3	4	e 12 14	+ 5	—	—	—	—
Baku		81·3	332	—	—	e 33 0	SSSS	41·6	47·6

Long waves were also recorded at Ukiah, Chiufeng, Bombay, Tiflis, Pulkovo, and San Fernando.

Oct. 16d. 4h. 34m. 52s. Epicentre 32°·7N. 67°·3E. N.3.

A = +·325, B = +·776, C = +·540 ; D = +·923, E = −·386 ;
G = +·208, H = +·498, K = −·842.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tashkent		8·7	10	1 55	− 8	i 3 39	− 2	—	4·7
Andijan		9·0	25	e 2 12	+ 5	4 14	P*	4·5	—
Agra	N.	10·8	118	2 35	+ 3	—	—	—	—
Frunse		11·7	27	e 2 42	− 2	4 50	− 5	—	—
Almata		13·0	33	e 3 7	+ 5	5 28	+ 1	7·1	—
Bombay		14·7	159	3 26	+ 1	8 27	L	11·4	12·3
Baku		15·9	304	e 3 40	0	i 6 43	+ 7	9·4	16·5
Hyderabad		18·3	144	4 5	− 5	7 39	+ 8	9·0	11·9
Calcutta		21·2	113	5 30	+48	9 44	+74	12·2	—
Kodaikanal		24·3	155	9 43	S	(9 43)	+15	12·9	14·4
Ekaterinburg		24·5	351	i 5 7	− 8	i 9 35	+ 3	i 14·9	15·6
Ksara		26·2	281	e 5 35	+ 4	10 24	+22	—	16·1
Pulkovo		36·4	329	e 6 46	−15	—	—	20·1	23·0
Chiufeng		39·5	65	e 7 28	0	e 13 50	+21	—	—
Vienna	Z.	40·8	308	i 7 41k	+ 2	—	—	—	—
Zurich		46·1	306	e 9 22	+61	—	—	—	—
Neuchatel		47·2	306	e 8 27	− 3	—	—	—	—

Additional readings :—
Kodaikanal S = +11m.3s.
Ekaterinburg iL_q = +12·8m.
Long waves were also recorded at Hong Kong and other European stations.

Oct. 16d. 4h. 41m. 12s. Epicentre 42°·6N. 144°·2E. (as on 1931 March 29d.). X.

Nagoya gives epicentre 42°·4N. 144°·0E.

A = −·597, B = +·431, C = +·677.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Ootomari	4·2	346	1 1	+ 1	2 42	?	—
Mizusawa	4·2	215	1 1	+ 1	i 1 46	− 2	—
Tyosi	7·3	202	e 1 43	− 1	3 4	− 2	3·1
Nagoya	9·3	220	e 2 36	P*	—	—	—

Oct. 16d. Readings also at 1h. (near Andijan and near Tashkent), 2h. (Tashkent), 3h. (Tyosi), 4h. and 6h. (Huancayo), 7h. (La Paz and Prato), 11h. (Bombay, Chiufeng, Hong Kong, Phu-Lien, and Medan), 12h. (Tyosi), 13h. (Pittsburgh, Toledo, Granada, Malaga, and near Almeria), 14h. (Huancayo, near Tyosi, and near Nagasaki (2)), 18h. (Baku, Ekaterinburg, Tiflis, Tashkent, Nanking, Chiufeng, Hong Kong, and Manila), 22h. (Mizusawa, Nagoya, and near Tyosi), 23h. (Hong Kong).

Oct. 17d. 12h. 23m. 47s. Epicentre 4°·2S. 130°·8E. (as on 1932 July 2d.). R.3.

A = −·652, B = +·755, C = −·073 ; D = +·757, E = +·653 ;
G = +·048, H = −·055, K = −·997.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	2·7	281	i 0 56	P_g	i 1 36	S_g	—	—
Batavia	24·0	264	5 10	0	i 9 41	+18	—	—
Hong Kong	31·1	329	6 18	+ 3	(12 18)	+57	12·3	14·8
Perth	31·1	205	e 6 13	− 2	i 10 23	−58	—	18·0
Adelaide	31·6	169	e 6 18	− 1	i 10 33	−56	—	15·0
Medan	33·0	284	e 6 27	− 5	—	—	—	—
Riverview	35·2	151	e 6 52	+ 1	e 11 44	−40	—	16·9
Sydney	35·2	151	—	—	e 11 1	?	18·0	19·5
Melbourne	36·0	161	—	—	i 11 55	−41	—	18·4
Nanking	38·0	343	7 30a	+15	e 13 25	+19	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya		39·8	9	e 4 50?	?	—	—	—	—
Chiufeng		46·3	345	i 8 35a	+12	15 25	+16	—	—
Vladivostok		47·3	1	e 8 23	− 8	i 15 9	−14	—	—
Bombay		61·6	294	e 12 13	PP	—	—	—	—
Frunse		69·1	319	e 11 6	+ 1	—	—	—	—
Andijan		69·7	316	e 10 46	−23	—	—	—	—
Tashkent		72·0	316	—	—	e 30 49	?	e 36·1	44·0
Ekaterinburg		82·8	329	i 12 20	− 2	i 22 29	−16	39·2	—
Baku		85·9	311	e 12 40	+ 2	22 53	[−13]	43·7	—
Tiflis		89·8	312	12 55	− 1	e 23 13	[−18]	—	—
Ksara		96·4	303	e 13 22	− 5	e 24 49	− 6	—	—
Tinemaha	z.	109·1	52	e 18 28	PP	—	—	—	—
Pasadena	z.	109·7	55	i 18 28	PP	—	—	—	—
Graz		110·2	318	(e 10 13?)	?	—	—	e 10·2	—
Huancayo		149·4	122	e 19 39	[− 2]	—	—	—	—
La Paz	z.	152·1	138	19 42	[− 2]	—	—	—	—

Additional readings :—
Batavia iE = +8m.56s. = P_cP +4s.
Adelaide i = +11m.23s., e = +11m.33s.
Riverview eN = +6m.55s., iN = +14m.3s.
Melbourne iL = +13m.10s.
Nanking eEZ = +7m.56s.
Chiufeng eS = +15m.37s., iN = +16m.14s.
Tiflis ePSE = +23m.47s. = S − 7s., ePPSN = +24m.3s.
Ksara eSKS = +23m.53s.
Long waves were also recorded at Wellington and De Bilt.

Oct. 17d. 13h. 33m. 41s. Epicentre 11°·0N. 97°·0W. N.3.

A = −·120, B = −·974, C = +·191 ; D = −·993, E = +·122 ;
G = −·023, H = −·189, K = −·982.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson		24·8	331	i 5 15	− 3	i 9 40	+ 3	12·9	—
Columbia		27·2	30	e 4 56	−44	e 9 2	P_cP	e 12·7	—
Florissant		28·4	11	i 5 42	− 9	i 10 16	−22	—	—
La Jolla		28·7	323	i 5 57	+ 4	—	—	—	—
Riverside	z.	29·5	324	i 6 3	+ 2	—	—	—	—
Mount Wilson		30·1	324	i 6 9a	+ 3	—	—	—	—
Pasadena		30·1	324	i 6 8a	+ 2	—	—	e 19·6	—
Cincinnati		30·2	20	i 6 9a	+ 2	i 10 38	−29	—	—
San Juan		30·7	73	e 5 30	−41	i 10 41	−35	e 14·3	—
Haiwee		31·5	327	i 6 18	0	—	—	—	—
Tinemaha		32·3	327	i 6 25	0	—	—	—	—
Berkeley	E.	35·2	325	—	—	e 15 47	?	—	—
Oak Ridge		38·5	32	e 7 19	0	e 12 19?	−55	e 20·8	—
Ottawa		38·9	25	—	—	e 12 19?	−61	e 16·3	21·3
Stuttgart		92·1	39	e 12 37	−30	—	—	e 44·3	—
Tashkent		126·2	13	e 20 55	PP	—	—	e 62·0	73·9

Additional readings :—
San Juan ePP = +6m.25s., e = +11m.42s.
Oak Ridge eLNW = +14m.19s.
Long waves were also recorded at Wellington, Baku, Ekaterinburg, and other American and European stations.

Oct. 17d. Readings also at 0h. (Huancayo, La Paz, and near Sucre), 1h. (Huancayo and near La Paz), 5h. (La Paz), 10h. (Adelaide, Melbourne, and Riverview), 12h. (Nagoya and Tucson), 13h. (Toronto), 15h. (Riverview, Sydney, Apia, and Wellington), 18h. (near Tiflis), 19h. (near Wellington), 22h. (Amboina, near Ebingen, near Batavia, and Malabar).

Oct. 18d. Readings at 1h. (Apia, Suva, Huancayo, and Tashkent), 2h. (Baku, Ekaterinburg, Tiflis, and Kucino), 4h. and 6h. (Huancayo), 8h. (Huancayo, San Juan, and near Tiflis), 9h. (near Taihoku), 10h. (Vladivostok, near Tiflis (2), near Mizusawa, and near Wellington), 11h. (Ekaterinburg and near Tiflis), 12h. (near Malabar), 13h. (Tuai, Hastings, near New Plymouth, Wellington, and La Paz (3)), 14h. (near Balboa Heights), 15h. (Huancayo and near Malabar), 16h. (Balboa Heights and Messina), 17h. (near Huancayo (2) and near La Paz), 18h. (New Plymouth and near Wellington), 22h. (near Taihoku).

Oct. 19d. 5h. 55m. 13s. Epicentre 37°·0N. 79°·9E. N.3.

A = +·140, B = +·786, C = +·602 ; D = +·985, E = −·175 ;
G = +·106, H = +·592, K = −·799.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Almata	6·6	341	e 1 34	0	3 12	S*	—
Andijan	7·0	305	e 1 36	− 3	3 24	S*	—
Frunse	7·2	328	e 1 41	− 1	3 31	S*	—
Ekaterinburg	23·6	333	e 5 12	+ 6	e 9 21	+ 5	12·2

Almata P* = +1m.47s.
Long waves were also recorded at Bombay.

Oct. 19d. 17h. 23m. 23s. (I) } Epicentre 34°·5N. 139°·2E. N.3.
17h. 31m. 18s. (II) } (as given by Susaki). X.

A = −·624, B = +·539, C = +·566.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
I Susaki	0·2	313	−0 2k	− 5	0 4	− 1	—
II	0·2	313	0 0k	− 3	0 5	0	—
I Tyosi	1·9	50	e 0 31	+ 3	0 50	+ 1	—
II	1·9	50	e 0 28	0	0 51	+ 2	—
I Nagoya	2·0	290	e 0 32	+ 3	e 1 7	S_g	—
II	2·0	290	e 0 29	0	0 54	+ 3	—
II Osaka	3·0	273	0 45	+ 2	1 30	S_g	2·1

Oct. 19d. Readings also at 0h. (near Tyosi), 3h. (near Tiflis), 4h. (near Huancayo), 5h. (Chiufeng, Phu-Lien, Medan, Bombay, Tashkent, Baku, Tiflis, and Ekaterinburg), 6h. (De Bilt, Copenhagen and near Sumoto), 7h. (La Plata, near La Paz, and near Santiago), 8h. (Tucson and near Malabar), 10h. (Huancayo), 13h. (Florence, Sienna, Apia, and near Prato), 15h. (near Huancayo), 16h. (near Batavia, Malabar, and near Mizusawa), 17h. (Riverview, Suva, Wellington, and Susaki (2)), 18h. (Ekaterinburg and Melbourne), 19h. (Baku), 23h. (near Mizusawa).

Oct. 20d. Readings at 1h. (Ekaterinburg and Tashkent), 2h. (Wellington), 3h. (Hamburg and near La Paz), 4h. (Apia), 5h. (Tyosi), 6h. (Apia), 7h. (Chiufeng (2), Ekaterinburg, Tashkent, and near Amboina), 8h. (Ekaterinburg, Tashkent, Chiufeng, near Wellington, and near Apia), 9h. (Fort de France), 13h. (near Almata), 14h. (Huancayo and Tiflis), 15h. (Alicante), 16h. (Tucson), 17h. (Huancayo (2)), 18h. (Tucson), 21h. (Tyosi).

Oct. 21d. 2h. 44m. 27s. Epicentre 34°·0N. 141°·5E. (as on 1933 April 21d.). R.2.

A = −·649, B = +·516, C = +·559 ; D = +·623, E = +·783 ;
G = −·438, H = +·348, K = −·829.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		1·8	343	i 0 20$_a$	− 6	0 41	− 5	—	0·8
Nagoya		4·0	288	e 0 58	+ 1	e 2 5	S_g	—	2·9
Mizusawa	E.	5·1	357	e 2 13	S	i 2 46	S_g	—	—
	N.	5·1	357	e 1 44	?	e 2 42	S_g	—	—
Osaka		5·1	279	1 18	+ 5	2 15	+ 5	—	4·7
Kobe		5·3	279	i 1 21	+ 6	2 23	+ 8	e 3·2	3·7
Sumoto		5·5	275	e 1 22	+ 4	—	—	—	5·5
Toyooka	N.	5·7	288	e 1 42	P_g	3 9	S_g	—	5·5
Koti		6·6	268	e 1 39	+ 5	—	—	e 3·5	—
Hukuoka		9·2	270	—	—	e 4 54	S_g	—	—
Nagasaki		9·8	266	—	—	e 5 31	?	—	—
Taikyu		10·7	284	2 36	+ 5	4 44	+13	7·3	—
Vladivostok		11·8	323	2 38	− 8	e 4 28	−30	5·0	8·2
Keizyo		12·3	291	e 2 54	+ 2	—	—	e 7·3	10·4
Zinsen		12·5	291	e 2 56	+ 1	—	—	e 8·1	—
Nanking		19·1	271	e 4 22	+ 2	—	—	e 11·6	14·6
Chiufeng		21·1	294	4 36$_a$	− 5	8 36	+ 8	e 12·0	15·1
Agra	E.	54·3	281	e 9 27	+ 4	e 17 1	+ 2	29·9	—
Tashkent		56·0	300	i 9 32	− 4	i 17 24	+ 1	e 27·0	34·2
Ekaterinburg		57·3	321	e 9 37	− 8	17 31	− 9	33·6	37·2
Bombay		62·2	276	10 25	+ 5	18 48	+ 3	—	39·8
Pulkovo		70·6	330	i 11 12	− 2	e 20 18	−10	36·6	43·6
Tiflis		72·6	310	e 11 25	− 1	e 21 23	PS	40·6	47·6
Copenhagen		81·2	334	—	—	22 11	−17	39·6	—
Potsdam		82·7	332	e 12 51	+29	e 22 39	− 5	e 43·6	52·6
Ksara		82·8	307	e 12 19	− 3	e 22 50	+ 5	—	—
Edinburgh		85·1	341	—	—	e 22 33?	−36	e 50·6	—
De Bilt		85·9	335	—	—	e 23 3	[− 3]	e 44·6	51·5
Triest		87·4	327	—	—	e 23 5	[−11]	—	53·8
Piacenza		89·7	330	—	—	e 23 33	[+ 2]	—	55·5
Florence		90·0	327	e 12 33	−24	23 43	[+10]	30·6	48·6

Additional readings and note :—
Kobe eSN = +1m.41s. = P_g +1s.
Sumoto ePE = +1m.24s., ePN = +1m.27s. = P* − 4s., iEN = +3m.48s., eN = +4m.47s., eE = +5m.22s.
Toyooka ePEZ = +1m.45s., SZ = +3m.16s.
Nanking iEZ = +4m.36s.
Chiufeng P_2 = +5m.0s., S_2 = +9m.6s. (a second shock).
Ekaterinburg L_q = +29·0m.
Potsdam eN = +15m.45s. = PP +19s., +17m.9s. = PPP − 1s., and +20m.3s.
Florence i = +16m.23s. = PP − 2s.
Long waves were also recorded at Phu-Lien, Hong Kong, Berkeley, Baku, and at other European stations.

Oct. 21d. Readings also at 1h. (near Santiago), 2h. (Andijan, near Huancayo, and near Tyosi), 3h. (near Tyosi), 4h. (near Simidu), 5h. (Huancayo), 6h. (Huancayo and near Wellington), 7h. (Bombay, Tashkent, Huancayo (2), and near La Paz (3)), 8h. (Baku, Tashkent, Ekaterinburg (2), Tiflis (2), and Bombay), 9h. (San Juan and near Nagasaki), 10h. (Tiflis), 12h. (Glenmuick and Wellington), 13h. (near Huancayo), 16h. (Wellington), 17h. (near Algiers), 18h. (Granada and Mizusawa), 19h. (Honolulu T.H.), 20h. (Hong Kong, Tashkent, Tiflis, and Ekaterinburg), 21h. (Tiflis), 22h. (Amboina, Baku, Ekaterburg, and Tashkent).

Oct. 22d. 11h. 53m. 44s. Epicentre 51°·6N. 155°·0E. N.3.

$A = -\cdot563$, $B = +\cdot263$, $C = +\cdot784$; $D = +\cdot423$, $E = +\cdot906$; $G = -\cdot710$, $H = +\cdot331$, $K = -\cdot621$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari		9·4	243	4 37	S*	—	—	—	—
Oiwake		19·2	224	4 25	+ 4	8 16	+26	—	—
Nagoya		20·9	225	e 4 32	− 7	—	—	—	—
Kobe		22·0	228	e 4 42	− 9	e 8 36	−10	—	13·9
Sumoto		22·4	228	—	—	e 9 2	+ 9	—	14·0
Koti		23·7	229	5 10	+ 3	e 9 16	− 2	—	—
Chiufeng		28·8	262	e 6 32	PP	11 18	SS	15·0	20·0
Zi-ka-wei	z.	31·9	243	e 6 28	+ 6	—	—	—	14·5
Sitka		39·2	53	e 9 6	PPP	e 13 26	+ 2	—	—
Hong Kong		42·8	242	14 30	S	(14 30)	+12	—	31·0
Manila		45·9	229	8 22	+ 2	15 0	− 3	21·3	25·3
Ekaterinburg		50·9	316	e 8 59	+ 1	i 16 17	+ 4	29·7	35·1
Frunse		52·4	295	e 16 44	S	(e 16 44)	+10	—	—
Tashkent		56·5	296	—	—	e 24 46	?	e 42·3	50·7
Berkeley	E.	57·1	69	—	—	e 17 28	−10	—	—
Mount Wilson	z.	62·1	69	e 10 15	− 4	—	—	—	—
Pasadena	z.	62·1	69	e 10 25	+ 6	—	—	—	—
Baku		67·4	308	—	—	e 19 55	+ 5	35·3	47·0
Copenhagen		68·3	339	—	—	18 16?	?	36·3	—
Bombay		70·4	276	—	—	e 20 22	− 4	—	42·0
Edinburgh		71·0	348	—	—	e 25 16?	SS	e 43·3	—
Potsdam		71·2	337	e 18 34	?	—	—	e 38·3	50·3
De Bilt		73·2	342	—	—	e 21 4	+ 5	e 38·3	49·0
Feldberg	N.	74·3	339	—	—	e 20 34	−38	e 41·6	52·6
Uccle		74·6	342	—	—	e 21 20	+ 5	e 37·3	—
Stuttgart		75·5	338	e 15 52	PPP	—	—	e 39·3	50·0
Strasbourg		76·0	339	e 15 16?	PP	e 21 16?	−16	e 40·3	—
Paris		76·9	342	—	—	e 21 40	− 2	45·3	47·3
Triest		77·2	334	e 7 50	?	—	—	—	42·3
Oak Ridge	N.E.	77·6	33	—	—	e 21 48	− 1	e 41·3	—
Piacenza		78·8	337	—	—	23 48	PS	—	46·9
Florence		79·6	334	—	—	e 32 16	SSSS	41·3	46·3

Additional readings :—
Kobe eZ = +8m.46s., eEN = +8m.54s.
Sumoto eSZ = +12m.22s., eSE = +12m.55s.
Sitka e = +14m.58s. and +23m.28s.
Ekaterinburg e = +18m.36s. = S_cS − 14s. and +20m.7s., L_q = +27·0m.
Tashkent i = +32m.22s.
Baku eSS = +28m.34s.
Feldberg eN = +32m.56s.
Stuttgart eSS = +26m.22s.
Long waves were also recorded at Bozeman, San Juan, Nanking, Phu-Lien, Hyderabad, and other European stations.

Oct. 22d. **Readings also at 0h. (Baku, Ekaterinburg, Tashkent, Bombay, Ksara, and Tananarive), 1h. (Feldberg), 2h. (Mount Wilson and Pasadena), 5h. (near Bagnères), 8h. (Huancayo), 13h. (Hyderabad and near Tyosi), 14h. (Andijan, Frunse, Baku, Ekaterinburg, Bombay, Agra, Calcutta, Kodaikanal, Pulkovo, Copenhagen, De Bilt, Feldberg, and Stuttgart), 18h. (Glenmuick and near Manila), 19h. (near Tyosi and near Mizusawa), 21h. (near La Paz), 22h. (near Tyosi).**

Oct. 23d. 0h. 41m. 41s. Epicentre 39°·7N. 143°·7E. (as on 1933 Sept. 12d.). X.

A = −·620, B = +·455, C = +·639; D = +·592, E = +·806; G = −·515, H = +·378, K = −·769.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Mizusawa	2·1	254	i 0 28	− 2	i 0 55	+ 1	—	—
Tyosi	4·6	210	e 1 4	− 2	2 29	S_g	—	3·0
Nagoya	7·2	233	e 1 47	+ 5	3 16	+12	—	—
Chiufeng	21·1	280	e 4 51	+10	e 8 27	− 1	—	12·0
Ekaterinburg	54·1	319	e 9 14	− 8	e 17 0	+ 3	34·8	35·3

Ekaterinburg gives Lq = +26·8m.
Long waves were also recorded at Hong Kong, Vladivostok, Tashkent, Kucino, Copenhagen, Feldberg, De Bilt, Uccle, and Stuttgart.

Oct. 23d. 13h. A shock from an epicentre in the Indian Ocean, for which no determination is possible.

Tananarive iPN = 13h.36m.26s., SE = 39m.39s., SN = 39m.42s., iL = 40m.1s., M = 41m.
Florence L = 13h.40m.
Johannesburg 13h.41m.54s., M = 44m.30s.
Venice P = 13h.42m.0s., S = 56m.0s.
Cape Town P? = 13h.42m.18s., 43m.9s., 45m.52s., 47m.33s., and 49m.41s.
Bombay e = 13h.42m.20s., i = 50m.4s., M = 14h.3m.42s.
Ksara eP = 13h.44m.2s., S = 53m.8s.
Tiflis ePN = 13h.44m.18s., eE = 54m.4s., and 59m.9s., eSSSE = 14h.4m.27s., eLE = 8m.30s., M = 12m.30s.
Baku eP = 13h.45m.15s., iS = 54m.1s., L = 14h.7m., M = 12m.
Triest eP = 13h.45m.19s., S = 56m.4s., ePS = 57m.0s., SS = 14h.1m.59s., eL = 14m.26s., M = 24m.35s.
Tashkent iP = 13h.45m.28s., eS = 54m.54s., eL = 14h.54s., M = 13m.36s.
Vienna eZ = 13h.45m.36s.
Piacenza P = 13h.46m.0s., M = 14h.27m.26s.
Stuttgart e = 13h.46m., 56m.36s., and 14h.3m.0s., eL = 18m.
Strasbourg e = 13h.47m., eL = 56m.
Paris e = 13h.47m. and 53m., L = 14h.21m., M = 26m.
Colombo P = 13h.48m.23s., M = 59m.44s.
Feldberg eN = 13h.49m.34s. and 56m.17s., iN = 14h.3m.32s., eLN = 23m.12s., MN = 34m.6s.
Pulkovo e = 13h.52m.2s. and 58m.39s., L = 14h.18m., M = 28m.18s.
Pasadena eZ = 13h.52m.35s. and 57m.55s.
Potsdam eEN = 13h.54m., eLN = 14h.12m., MEN = 30m.
Budapest e = 13h.55m.
Uccle e = 13h.55m. and 14h.3m.57s., eL = 19m.
Hong Kong S? = 13h.55m.20s., L? = 14h.0m.30s.
Ekaterinburg e = 13h.56m.8s., 14h.2m.24s., and 26m.30s., L = 40m.48s.
San Fernando S = 13h.57m.6s., M = 14h.28m.30s.
Copenhagen 13h.57m.26s. and 58m.48s., e = 14h.4m.6s., L = 18m.
Huancayo e = 14h.1m.30s. and 7m.28s., eL = 20m.0s.
Chiufeng e = 14h.3m.23s., M = 23m.13s.
Sydney e = 14h.9m.42s., L = 12m.30s., M = 13m.30s.
Kew e = 14h.4m.26s., eL = 20m., M = 28m.51s.
Edinburgh e = 14h.5m., eL = 29m.
Long waves were also recorded at Perth, Wellington, Oak Ridge, Algiers, and other European stations.

Oct. 23d. Readings also at 3h. (Huancayo, Port au Prince, San Juan, Suva, Christchurch, and near Wellington), 4h. (Arapuni, Wellington (2), Adelaide, Melbourne, Riverview, Sydney, Andijan, Bombay, Chiufeng, Tashkent, De Bilt, Stuttgart, Huancayo, Ukiah, Berkeley, Haiwee, Pasadena, Mount Wilson, La Jolla, Tinemaha, and near Simidu), 5h. (Kucino, Ekaterinburg, Baku, Copenhagen, Edinburgh, Uccle, Feldberg, Strasbourg, Stuttgart, Kew, San Fernando, Oak Ridge, San Juan, La Paz, Nagasaki, and near Simidu), 7h. (near Tananarive), 8h. (Kobe), 9h. (Venice and near Triest), 10h. (Almeria), 11h. (Kodaikanal), 12h. (Hong Kong, Phu-Lien, Bombay, Calcutta, and Yalta), 13h. (Chiufeng, Nanking, Tashkent, Medan, Baku, Ekaterinburg, and Uccle), 14h. (Huancayo and near Tyosi (2)), 15h. (near La Paz), 17h. (near Tyosi and near Sumoto), 18h. (Ekaterinburg and Hong Kong), 19h. (Tashkent and near Tiflis), 20h. (Tananarive), 21h. (Baku, Tiflis, Ekaterinburg, Budapest, Copenhagen, De Bilt, Feldberg, Strasbourg, Stuttgart, and Triest), 22h. (Baku, Bombay, Triest, and near Tyosi), 23h. (Ekaterinburg).

Oct. 24d. 16h. 25m. 12s. Epicentre 42°·5N. 45°·4E. (as on 1913 April 20d.). X.

A = +·518, B = +·525, C = +·676 ; D = +·712, E = −·702 ;
G = +·474, H = +·481, K = −·737.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis		0·9	210	i 0 10	− 3	i 0 21	− 2	i 0·6	—
Baku		4·0	121	e 1 0	+ 3	(i 2 9)	S_g	i 2·2	—
Ksara		11·4	224	e 2 44	+ 4	e 5 18	S*	e 6·6	7·8
Ekaterinburg		17·3	29	e 3 45	−13	i 6 45	−24	12·0	—
Tashkent		17·8	85	i 3 51	−13	i 7 11	− 9	9·2	11·6
Pulkovo		19·6	337	e 4 24	− 1	e 7 55	− 3	10·8	12·9
Andijan		20·1	85	e 4 26	− 5	—	—	—	—
Vienna	Z.	21·0	296	e 4 51	+11	—	—	—	—
Frunse		21·3	78	e 4 55	+12	—	—	—	—
De Bilt		28·5	304	—	—	e 11 30	+50	e 14·8	—
Kew		31·8	302	—	—	e 9 48?	?	—	—

Additional readings :—
Tiflis i = +30s.
Baku i = +1m.11s. = P_g −1s.
Ekaterinburg L_q = +10·9m.
Long waves were also recorded at other European stations.

Oct. 24d. Repetitions of the shock at 16h. were recorded at Tiflis as follows. The times recorded are those of the P phase except when otherwise noted.

h.	m.	s.	h.	m.	s.	h.	m.	s.
16	35	3	17	48	46	20	36	43
16	40	41	17	49	32	20	40	0 (L)
16	54	24	17	55	44	21	4	13 (L)
16	55	50	18	20	11	21	13	31 (L)
16	58	49	18	28	9	21	30	11
17	4	47	18	40	45	22	4	39
17	10	3	19	11	59	22	18	57
17	11	17	19	13	5 (L)	22	40	31
17	16	12	19	20	15	22	52	39
17	21	54 (L)	20	5	51	23	20	29
17	30	52						

Oct. 24d. Readings also at 1h. (Baku, Tashkent, Ksara, and near Sumoto), 5h. (Andijan, Baku, Tashkent, Calcutta, Bombay, Medan, Phu-Lien, Hong Kong, and Chiufeng), 6h. (Ekaterinburg, De Bilt, and Feldberg), 10h. (Bombay), 11h. (Batavia, Wellington, and near Soengei Langka), 16h. (near Manila), 18h. (San Juan, Florence, near Prato, near Mizusawa, Nagoya, and Tyosi), 19h. (Pulkovo, Tashkent, Ekaterinburg, Ksara, and near Baku), 21h. (Nanking, Taihoku, and Hong Kong), 22h. (Ekaterinburg, Chiufeng, Tashkent, De Bilt, Uccle, and Kew).

Oct. 25d. 23h. 28m. 16s. Epicentre 23°·5S. 66°·5W. N.1.

A = +·366, B = −·841, C = −·399 ; D = −·917, E = −·399 ;
G = −·159, H = +·366, K = −·917.

A *depth* of focus 0·030 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		+0·5	2·3	292	0 43	+ 3	1 15	+ 3	—	—
Sucre	N.	+0·1	4·6	15	i 1 11	+ 4	i 1 56	− 4	—	—
La Paz		−0·2	7·2	347	i 1 45k	+ 6	i 3 7	+ 8	—	4·3
Santiago		−0·4	10·6	199	2 21	− 3	4 16	− 2	—	6·3
La Plata	E.	−0·7	13·6	149	i 3 1a	0	5 34	+ 9	6·7	6·9
	N.	−0·7	13·6	149	i 3 1	0	5 24	− 1	6·3	6·9
	Z.	−0·7	13·6	149	i 3 2	+ 1	5 38	+13	6·4	8·2
Huancayo		−0·7	14·2	322	i 3 15	+ 6	i 5 41	+ 2	—	—
Balboa Heights		−2·3	34·9	337	e 6 36	+ 8	—	—	—	—
Fort de France		−2·4	38·5	9	i 7 41	+42	i 12 37	− 1	—	—

Continued on next page.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
San Juan	−2·6	41·9	0	i 7 28	+ 2	i 13 21	− 5	—	—
Port au Prince	−2·6	42·4	353	e 7 30	0	i 13 35	+ 2	—	—
Columbia	−3·6	59·1	346	e 9 36	+ 4	i 17 25	+ 9	e 25·2	—
Charlottesville	−3·7	62·6	349	e 9 58	+ 1	e 18 12	+11	—	—
Georgetown	−3·7	63·2	351	i 9 56	− 5	i 18 16	+ 7	e 26·7	—
Fordham	−3·7	64·8	354	i 10 15	+ 3	i 18 37	+ 7	27·7	—
Cincinnati	−3·7	64·9	345	i 10 10a	− 3	—	—	—	—
Pittsburgh	−3·7	65·2	349	i 10 14	− 1	i 18 36	0	e 26·2	—
St. Louis	−3·7	66·1	340	i 10 22	+ 1	i 18 48	+ 1	e 24·6	—
Oak Ridge	−3·7	66·2	357	—	—	i 18 55	+ 7	e 29·7	—
Florissant	−3·7	66·2	340	i 10 22	0	i 18 49	+ 1	—	—
Buffalo	−3·7	67·4	351	i 10 30	0	i 19 14	+10	—	—
Ann Arbor	−3·8	67·7	347	—	—	i 19 14	+ 8	e 28·2	—
Toronto	−3·8	68·2	351	i 10 35	0	i 19 21	+ 9	31·1	36·5
Chicago	−3·8	68·3	343	i 10 32	− 3	19 9	− 5	e 31·3	—
Ottawa	−3·8	69·4	353	e 10 44	+ 2	e 19 32	+ 5	e 32·7	36·7
Tucson	−3·8	70·1	321	i 9 49	−58	i 19 42	+ 6	—	—
Cape Town	−3·9	73·1	120	11 13	+ 7	20 6	− 5	34·7	—
La Jolla	−3·9	74·3	317	e 11 15	+ 2	e 20 32	+ 6	—	—
Riverside	−3·9	75·1	318	i 11 19	+ 1	e 20 41	+ 6	—	—
Mount Wilson	−3·9	75·7	318	i 11 23	+ 1	e 20 46	+ 3	—	—
Pasadena	−3·9	75·7	318	i 11 22k	0	i 20 47	+ 4	—	—
Santa Barbara	−3·9	76·9	317	i 11 28	− 1	e 21 4	+ 7	—	—
Haiwee	−3·9	77·0	320	i 11 30	+ 1	i 21 2	+ 4	—	—
Tinemaha	−4·0	77·7	320	i 11 34k	+ 1	e 20 59	− 6	—	—
Lick	−4·0	79·9	318	i 11 46	+ 1	e 21 31	+ 1	—	—
Bozeman	−4·0	80·1	330	e 11 47	0	i 21 34	+ 1	—	—
Branner	−4·0	80·3	318	i 11 49	+ 1	—	—	—	—
Berkeley	−4·0	80·6	318	e 11 49	0	—	—	—	—
Ukiah	−4·0	82·0	319	e 11 56	− 1	i 21 52	− 2	e 33·0	—
San Fernando	−4·1	82·6	45	12 2	+ 2	21 58	− 1	—	53·2
Malaga	−4·1	83·9	45	e 12 2	− 5	e 22 4	−10	35·7	—
Granada	−4·1	84·7	45	i 12 38k	+27	i 22 41	+19	38·9	—
Almeria	−4·1	85·4	46	e 12 13	− 2	i 22 21	− 9	e 32·6	—
Toledo	−4·1	86·0	43	e 12 17	− 1	i 22 26	−10	e 39·0	45·5
Ivigtut	−4·1	86·0	8	12 16	− 2	e 22 29	− 7	—	—
Seattle	−4·1	87·0	326	—	—	(e 22 32)	−14	e 22·5	—
Alicante	−4·1	87·4	45	e 12 28	+ 3	i 22 38	−12	e 34·6	—
Victoria E.	−4·2	88·0	326	e 12 24	− 3	i 22 35	−20	e 36·2	41·4
Algiers	−4·2	88·9	49	i 12 32	0	i 23 2	− 3	41·2	—
Tortosa	−4·2	89·4	44	12 37	+ 3	22 44	−26	e 33·7	—
Bagnères	−4·2	90·6	42	e 17 17	?	e 23 0	−21	32·7	—
Barcelona	−4·2	90·8	44	13 42	+61	23 17	− 6	e 35·3	57·9
Puy de Dôme	−4·3	93·5	41	12 44?	−10	e 22 59	[−54]	e 45·7	—
Hastings	−4·3	93·6	224	—	—	22 44?	[−69]	—	—
Wellington	−4·3	93·9	222	12 58	+ 2	23 49	− 3	—	—
Tunis	−4·3	94·0	52	i 13 3	+ 7	i 23 55	+ 2	—	—
Oxford	−4·3	94·3	34	—	—	i 23 12	[−45]	—	—
Kew	−4·3	94·7	34	e 12 58	− 1	i 23 46	−14	e 39·7	52·6
Paris	−4·3	94·8	38	e 16 58	PP	e 23 18	[−42]	29·7	49·7
Stonyhurst	−4·3	94·9	32	11 57	−63	23 19	[−41]	—	—
Arapuni	−4·3	95·3	224	—	—	i 24 8	+ 3	—	—
Edinburgh	−4·3	95·7	30	—	—	i 23 20	[−44]	—	53·7
Neuchatel	−4·3	96·5	41	e 13 5	− 3	e 23 21	[−47]	—	—
Uccle	−4·3	96·8	36	13 7a	− 2	i 23 26	[−44]	e 40·7	—
Piacenza	−4·3	97·3	43	13 16	+ 5	i 23 28	[−45]	37·2	57·6
Zurich	−4·4	97·7	41	e 13 10	− 3	e 23 30	[−45]	—	—
Prato	−4·4	97·7	46	e 17 12	PP	i 23 32	[−43]	e 30·7	—
Strasbourg	−4·4	97·7	40	e 13 8	− 5	e 23 33	[−42]	e 44·7	—
Florence	−4·4	97·8	46	i 13 28	+15	i 23 14	[−61]	42·7	—
Catania	−4·4	97·9	53	—	—	27 29	PS	45·2	61·0
De Bilt	−4·4	97·9	36	i 13 19	+ 5	e 23 22	[−54]	e 40·7	42·2
Chur	−4·4	98·0	41	e 13 12	− 2	e 23 34	[−42]	—	—
Stuttgart	−4·4	98·6	40	e 13 15	− 2	i 24 24	−11	e 40·7	—
Naples N.	−4·4	98·6	49	e 23 21	SKS	(e 23 21)	[−58]	39·7	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Feldberg	N.	−4·4	98·8	39	e 14 19	+61	e 24 24	−13	—	—
Padova		−4·4	98·8	44	e 13 59	+41	23 37	[−43]	—	—
Sitka		−4·4	98·9	329	e 17 26	PP	e 23 34	[−46]	e 46·0	—
Treviso		−4·4	99·1	44	i 13 18	− 1	i 23 39	[−42]	61·7	—
Venice		−4·4	99·2	44	e 13 10	−10	i 23 42	[−40]	—	—
Trenta		−4·4	99·4	51	—	—	e 23 34	[−49]	—	—
Triest		−4·4	100·2	44	e 13 22	− 2	i 24 41	− 8	e 40·7	54·7
Göttingen		−4·4	100·3	37	—	—	e 23 44	[−43]	—	41·3
Jena		−4·4	101·0	39	—	—	e 23 44	[−47]	—	—
Cheb		−4·4	101·1	40	e 17 44?	PP	i 23 50	[−41]	e 31·7	—
Hamburg		−4·4	101·2	35	e 12 44?	−45	i 23 49	[−43]	—	52·7
Zagreb		−4·4	101·7	45	e 13 29	− 2	e 23 44?	[−50]	—	—
Graz		−4·4	101·8	44	e 17 21	PP	i 23 49	[−45]	44·7	52·4
Bergen		−4·4	101·9	28	—	—	25 24	+20	43·7	—
Prague		−4·4	102·3	40	e 12 56	−38	e 23 56	[−41]	e 31·7	41·7
Potsdam		−4·4	102·4	38	e 14 38	+64	i 23 58	[−39]	e 37·7	—
Vienna		−4·4	102·8	43	e 13 24	−12	23 54	[−45]	e 31·7	56·7
Tananarive		−4·4	102·9	117	—	—	23 56	[−44]	43·3	—
Copenhagen		−4·4	103·3	34	17 50	PP	24 0	[−42]	—	—
Suva		—	104·2	243	—	—	i 24 38	{−47}	—	—
Budapest		—	104·2	44	e 19 44?	?	23 58	[−48]	e 29·7	53·7
Upsala		—	107·3	31	e 15 18	?	i 24 17	[−44]	—	—
Helwan		—	107·9	65	e 13 59	−22	24 17	[−47]	—	68·8
Melbourne		—	111·9	207	—	—	e 24 39	[−43]	—	—
Riverview		—	112·4	213	—	—	e 24 38	[−46]	e 28·3	35·7
Ksara		—	112·7	62	19 1	PP	28 31	PS	—	—
Sebastopol		—	113·2	49	e 24 38	SKS	(e 24 38)	[−49]	—	—
Pulkovo		—	113·5	33	e 19 4	PP	i 24 35	[−53]	48·7	58·2
Yalta		—	113·6	50	e 17 21	[−68]	—	—	—	—
Simferopol		—	113·7	49	e 16 0	?	—	—	—	—
Theodosia		—	114·5	49	e 19 19	PP	—	—	—	—
Adelaide		—	116·9	203	—	—	i 24 59	[−41]	—	—
Kucino		—	117·3	38	e 19 34	PP	e 24 51	[−51]	—	52·5
Tiflis		—	120·9	54	e 18 29	[−19]	e 25 5	[−48]	e 56·7	—
Perth		—	124·5	183	e 36 44	SS	—	—	—	—
Ekaterinburg		—	129·6	34	i 18 42	[−24]	i 25 32	[−46]	53·7	58·6
Tashkent		—	139·2	53	(e 18 32)	[−48]	(28 22)	{−57}	(e 57·5)	(89·9)
Andijan		—	141·6	53	e 16 6	?	—	—	—	—
Bombay		—	141·9	89	e 19 1	[−23]	32 18	SKSP	—	70·8
Colombo		—	143·7	112	19 14	[−16]	—	—	—	82·6
Almata		—	144·1	47	e 19 15	[−16]	—	—	—	—
Hyderabad		—	146·7	94	19 16	[−21]	32 2	?	62·9	77·4
Malabar		—	148·8	168	19 11	[−29]	—	—	—	—
Amboina		—	149·4	210	i 19 3	[−38]	—	—	41·6	—
Batavia		—	149·6	167	i 19 20	[−21]	—	—	—	—
Mizusawa	E.	—	151·9	310	e 19 31	[−13]	i 20 19	?	—	—
	N.	—	151·9	310	e 19 29	[−15]	e 20 12	?	—	—
Tokyo		—	154·3	304	19 19	[−28]	—	—	—	—
Oiwake		—	154·9	307	19 31	[−17]	—	—	—	—
Vladivostok		—	155·2	327	i 19 30	[−18]	i 30 6	{−46}	42·7	—
Medan		—	155·6	142	19 34	[−15]	—	—	47·7	—
Nagoya		—	156·6	305	e 19 37	[−13]	—	—	—	—
Gihu		—	156·6	306	19 36	[−14]	—	—	—	—
Calcutta		—	156·9	88	19 35	[−15]	27 59	?	42·6	—
Sumoto		—	158·4	305	e 19 32	[−19]	—	—	—	50·1
Koti		—	159·8	304	e 19 35	[−19]	e 23 59	PP	—	—
Keizyo		—	161·8	324	e 33 58	?	—	—	e 43·7	—
Zinsen		—	162·0	324	e 32 29	?	—	—	e 44·2	—
Miyazaki		—	162·1	302	19 37	[−19]	—	—	—	—
Chiufeng		—	163·3	353	i 19 38k	[−19]	i 34 38	SKSP	—	—
Manila		—	168·7	219	20 2	[− 1]	—	—	—	—
Zi-ka-wei	Z.	—	169·6	319	19 41	[−23]	24 49	PP	—	81·7
Nanking		—	170·3	333	i 19 16	[−48]	—	—	i 45·5	48·2
Phu-Lien		—	173·1	112	e 25 4	PP	31 44?	{−44}	—	—
Hong Kong		—	178·7	207	21 44?	{−25}	32 0	{−57}	46·4	47·4

For Notes see next page.

NOTES TO OCT. 25d. 23h. 28m. 16s.

Additional readings and note :—

Huancayo i = +4m.35s. and +6m.0s.
San Juan e = +7m.50s., ePP = +9m.10s., e = +10m.24s., and +11m.1s., isS = +14m.44s., i = +16m.10s. =SS +10s. and +16m.49s. =SSSS +13s.
Port au Prince iPNE = +7m.35s., PP = +8m.37s., PPP = +9m.29s., SS = +15m.54s., SSS = +16m.58s.
Columbia ipP = +10m.33s., e = +12m.50s., +13m.2s., +18m.22s., +18m.50s., +20m.16s., and +21m.16s.
Charlottesville epP = +10m.57s., i = +19m.32s. =S_cS −38s., i = +24m.44s.
Georgetown iP_cP = +11m.1s., iPP = +12m.43s., esS? = +19m.40s.
Fordham iNZ = +11m.11s.
Cincinnati i = +11m.6s. and +12m.10s. =PP −11s.
Pittsburgh i = +19m.40s., e = +21m.29s.
St. Louis ipPN = +11m.6s., ePPPEN = +13m.38s., iE = +19m.56s., isS = +20m.20s., iEN = +21m.36s. ; T_0 =23h.28m.28s.
Oak Ridge iNE = +19m.59s., eNE = +21m.14s., and +26m.5s.
Florissant ipPZ = +10m.58s., isPZ = +11m.18s., iP_cPZ = +11m.24s., iPPZ = +11m.34s., isSEN = +19m.55s., iS_cSEN = +20m.37s., iSSEN = +23m.19s.
Buffalo pP = +11m.26s., +15m.26s., sS = +20m.44s.
Ann Arbor iE = +20m.8s., i = +20m.50s.
Toronto iN = +11m.30s., iPP = +13m.7s., iPSE = +19m.58s., iPSN = +20m.9s., iN = +20m.45s., SSN = +23m.56s., SSSN = +26m.7s. ; T_0 =23h.28m.16s.
Ottawa iN = +11m.42s., i = +19m.37s., S_cS = +21m.7s., SSSE = +27m.8s., SSSS = +27m.52s. ; T_0 =23h.28m.12s.
Tucson eSS = +25m.22s., i = +28m.15s.
Cape Town PP = +13m.49s., PPP = +15m.16s., SS = +25m.1s., SSS = +27m.29s.
Pasadena iP_cPZ = +11m.41s., ipPZ = +12m.19s., esPZ = +12m.48s., iS_cSE = +21m.35s., ePSEN = +22m.28s., ePKPPKPZ = +38m.36s., iSKPPKPZ = +41m.57s.
Lick eE = +21m.46s.
Bozeman ePP = +15m.14s., iPS = +22m.36s., i = +23m.14s., eSS = +26m.42s.
Ukiah e = +26m.56s. and +29m.8s.
Malaga iP = +12m.6s., i = +12m.14s., iS = +22m.8s., i = +22m.17s., PS = +22m.48s.
Granada P_cP = +13m.11s., PP = +15m.53s.
Ivigtut eE = +24m.4s., eN = +24m.32s., SS = +28m.13s.
Alicante PP = +15m.24s.
Algiers SKS = +22m.41s., PS = +24m.11s.
Tortosa SN = +22m.36s.
Barcelona SKS = +22m.50s.
Puy de Dôme ePS? = +23m.39s.
Wellington SKS? = +23m.9s.
Kew isPZ = +13m.50s., ePPN = +16m.59s., iSKSEN = +23m.12s., isSZ = +25m.18s., ePSN = +25m.22s.
Paris PS = +23m.55s.
Neuchatel epP = +14m.1s., ePP = +17m.1s.
Uccle iZ = +14m.5s., eZ = +15m.4s., iPSN = +24m.8s., iN = +25m.37s.
Zurich epP = +14m.12s., ePP = +17m.3s., e = +24m.17s. =S −10s.
Strasbourg epP = +14m.4s., ePP = +17m.11s., epPP = +18m.3s., ePS = +24m.18s. =S −9s., esS = +25m.41s., eSS = +28m.46s.
Florence PS = +24m.29s., i = +26m.4s. =PS −17s., SS = +30m.44s.
De Bilt eZ = +14m.7s., e = +17m.14s., eEN = +23m.32s., eN = +24m.17s. = SKKS −12s. and +25m.53s. =PS −9s.
Stuttgart esPEZ = +14m.14s., ePP = +17m.9s., epPP = +18m.6s., esPP = +18m.44s., SKS = +23m.36s., ipS = +25m.53s., e = +26m.57s.
Feldberg eN = +17m.34s., iN = +18m.39s., and +23m.42s. =SKS −38s.
Sitka eSS = +31m.23s., e = +32m.56s., and +36m.44s.
Treviso PP = +17m.29s., SS = +24m.37s.
Triest PP = +17m.21s., i = +26m.14s. =PS −34s.
Göttingen eN = +24m.38s. =SKKS −17s., eEN = +26m.20s.
Jena eN = +24m.44s. =SKKS −27s., and +26m.18s. =PS −39s., eN = +40m.44s., eE = +41m.38s.
Zagreb eNW = +24m.55s. =SKKS −11s. and +26m.28s. =PS −35s., e = +31m.24s. =SS +0s. and +33m.24s.
Bergen e = +31m.44s. =SS +17s.
Potsdam eE = +16m.56s. =PP −32s. and +18m.44s. =PPP −42s., iE = +19m.43s., eEN = +23m.44s.?, iSPEN = +24m.58s. =SKKS −13s., iEN = +25m.44s. and +26m.30s. =PS −41s., eN = +29m.44s.?, iN = +33m.28s.
Vienna PP = +17m.52s., iZ = +18m.44s., iN = +18m.52s., iE = +19m.9s. = PPP −20s., PPP = +20m.22s. =PPPP −42s., iN = +22m.5s., SKKS = +25m.3s., PS = +26m.39s., PPS = +27m.41s., iE = +28m.16s.
Tananarive SE = +26m.34s. =PS −42s., PSN = +27m.47s.
Copenhagen +24m.39s. =SKKS −39s., +25m.5s. =S +50s., and +26m.41s. = PS −39s.
Upsala SKSW = +25m.37s. =SKKS −10s., eN = +33m.3s. =SS −39s.

Continued on next page.

Helwan PP = +18m.24s.
Melbourne i = +26m.17s. =SKKS −3s., e = +27m.58s. =PS −14s., i = +34m.14s. and +35m.44s.
Ksara SS = +34m.34s.
Pulkovo i = +25m.47s. and +26m.29s. =SKKS −3s., e = +28m.10s., +31m.30s., and +34m.33s. =SS −33s.
Adelaide e = +26m.9s. =SKKS −46s.
Kucino e = +26m.8s. =SKKS −50s., +27m.26s., and +30m.44s.?
Tiflis ePPE = +19m.39s., ePPPE = +23m.15s., iPKKPE = +26m.39s. = SKKS −43s., iE = +29m.26s. =PS −44s., iPSE = +30m.4s.
Ekaterinburg i = +19m.48s., +20m.55s. =PP −20s., +21m.44s., +22m.53s., +23m.33s. =PPP −22s., +26m.22s., and +28m.47s., e = +29m.57s., i = +37m.35s. and +39m.29s.
Tashkent readings have been *increased* by 6m.
Bombay SKP = +23m.14s.
Batavia P = +19m.28s.
Vladivostok i = +20m.26s., +23m.34s., and +24m.32s.
Sumoto ePE = +19m.41s., eN = +20m.5s.
Chiufeng iNZ = +20m.30s. =PKP_2 −29s., iZ = +21m.18s., i = +24m.14s. = PP −19s., iNZ = +25m.14s., and +28m.0s. =PPP −13s., iN = +30m.45s., iE = +44m.20s. =SS −46s., iN = +44m.24s.
Manila PP = +25m.15s.
Zi-ka-wei PPZ = +20m.50s. =PKP_2 −38s., iZ = +24m.57s., +25m.50s., +35m.32s., and +40m.37s.
Nanking PEN = +19m.48s., iN = +20m.1s., eNZ = +20m.54s. =PKP_2 −37s., iZ = +25m.54s., eNZ = +36m.51s., iZ = +40m.54s.
Hong Kong PP = +25m.39s.

Oct. 25d. Readings also at 0h. (Huancayo, near Berkeley, near Manila, and near Tiflis), 3h. (Trenta), 4h. and 5h. (Huancayo), 6h. (Baku, Ekaterinburg, Huancayo, Ksara, Tashkent, and near Tiflis (4)), 9h. (Andijan and near Tiflis), 10h. (Tiflis (2) and Yalta), 11h. (near Tiflis), 13h. (Huancayo and near Tananarive), 14h. (La Paz and Tiflis), 15h., 20h., and 22h. (near Tiflis), 23h. (Triest).

Oct. 26d. 12h. 7m. 8s. Epicentre 60°·0S. 60°·0W. N.3.

A = +·250, B = −·433, C = −·866; D = −·866, E = −·500; G = −·433, H = +·750, K = −·500.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata	E.	25·1	4	5 27	+ 6	10 5	+22	13·6	23·3
	N.	25·1	4	5 23	+ 2	9 51	+ 8	13·6	21·8
	Z.	25·1	4	5 26	+ 5	—	—	12·8	20·9
Santiago		27·5	341	5 48	+ 5	10 41	+17	13·7	—
Montezuma		37·9	347	e 7 16	+ 2	e 13 22	+17	e 20·9	—
Sucre		41·2	353	e 7 31	−11	i 14 10	+16	20·4	—
La Paz	N.	43·9	349	e 8 3	− 1	i 14 53	+19	24·4	28·3
Huancayo		49·3	340	e 8 44	− 2	i 16 8	+17	i 24·8	—
Cape Town		55·5	99	9 31	− 1	17 2	−14	26·9	—
Christchurch		67·9	218	i 11 10	+12	i 20 20	+24	33·2	—
Wellington		69·2	221	11 5	− 1	20 17	+ 6	33·9	—
San Juan		78·6	354	i 12 12	+12	i 21 46	−14	—	—
Port au Prince		79·1	348	i 12 15	+12	e 23 30	?	—	—
Melbourne		80·0	200	12 32	+24	22 12	− 4	33·6	36·9
Tananarive		81·4	114	19 52?	?	e 22 37	+ 6	35·7	43·9
Riverview		82·8	206	e 12 34	+12	e 22 28	−17	e 34·8	47·9
Adelaide		83·8	195	e 12 28	+ 1	e 22 58	+ 3	e 35·4	47·6
Suva		88·8	233	—	—	e 23 28	[+ 3]	—	—
Fordham		101·5	349	e 18 4	PP	i 23 40	?	e 46·9	—
St. Louis		101·7	336	e 18 12	PP	e 26 18	?	e 50·4	—
Oak Ridge		103·0	351	—	—	i 28 4	?	e 45·9	—
Ann Arbor		104·2	342	—	—	e 32 58	SS	e 53·7	64·0
Chicago		104·4	338	—	—	e 24 57	[+10]	e 51·8	—
Toronto		104·9	345	e 18 52?	?	e 24 31	[−18]	52·9	—
Pasadena		105·5	313	e 18 24	[+21]	—	—	e 44·8	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ottawa		106·1	348	e 18 52?	PP	e 27 52?	PS	e 45·9	57·9
Malaga		106·9	44	e 16 59	?	e 29 13	?	44·9	—
Haiwee		107·4	314	e 18 59	PP	—	—	—	—
Granada		107·6	44	i 19 11	PP	e 29 46	?	47·4	63·2
Almeria		107·8	45	e 18 34	[+24]	—	—	e 46·1	—
Tinemaha		108·2	314	e 19 2	PP	—	—	—	—
Alicante		109·8	45	e 19 3	PP	e 28 57	PS	e 44·7	—
Toledo		109·9	43	e 18 57	PP	e 28 57	PS	e 45·0	64·9
Batavia		113·0	166	e 20 25	?	e 30 29	?	—	—
Barcelona		113·5	46	e 19 54	PP	e 29 43	?	e 46·4	73·6
Bozeman		113·6	323	e 15 8	−20	—	—	e 48·9	—
Catania		115·1	58	e 19 51	PP	—	—	—	—
Helwan		116·2	75	e 19 50	PP	e 36 2	SS	i 56·4	91·2
Florence		118·9	51	19 7	[+24]	30 42	?	46·4	—
Prato		118·9	51	e 19 52	PP	—	—	e 60·9	—
Piacenza		119·4	48	19 8	[+24]	29 44	PS	—	82·9
Victoria	E.	119·9	317	17 58	?	—	—	50·9	53·0
Paris		120·0	42	—	—	e 29 52?	PS	46·9	49·9
Kodaikanal		121·1	128	20 14	PP	—	—	—	—
Triest		121·4	51	e 18 32	[−17]	i 25 44	[−11]	e 49·2	59·5
Kew		121·5	38	—	—	e 32 52?	?	e 47·9	—
Strasbourg		121·6	46	e 19 12	[+23]	30 46	PS	e 46·9	—
Ksara		121·7	76	e 20 24	PP	—	—	61·9	68·9
Ivigtut		122·1	6	—	—	30 16	PS	58·9	—
Stuttgart		122·3	47	e 20 22	PP	—	—	e 48·9	76·4
Uccle		122·3	42	e 18 52?	[+ 1]	e 30 52?	PS	49·9	—
Feldberg	N.	123·2	45	e 20 10	PP	e 25 56	[− 4]	—	—
De Bilt		123·7	42	—	—	e 32 52?	?	e 50·9	52·3
Edinburgh		124·4	34	—	—	e 37 52?	SS	—	—
Budapest		125·0	53	e 22 52?	?	—	—	e 50·9	90·9
Hamburg		126·5	43	e 18 52?	[− 8]	—	—	e 65·9	78·9
Potsdam	N.	126·7	46	—	—	e 26 34	[+24]	e 62·9	82·9
Bombay		127·0	120	e 20 52	PP	—	—	—	86·9
Hyderabad		127·7	126	23 28	PPP	33 19	?	52·1	62·7
Copenhagen		129·1	43	19 6	[+ 1]	22 34	?	52·9	—
Sebastopol		129·1	65	e 22 9	?	—	—	—	—
Yalta		129·3	67	e 21 7	PP	—	—	—	—
Simferopol		129·6	66	e 20 10	[+64]	—	—	—	—
Theodosia		130·2	67	e 19 17	[+10]	—	—	—	—
Sitka		131·2	316	e 23 2	?	e 27 22	[+59]	—	—
Tiflis		132·2	77	19 5	[− 5]	e 28 20	{−15}	e 56·9	65·5
Baku		133·7	82	e 19 54	[+41]	—	—	58·9	82·1
Upsala	N.	134·0	42	e 23 22	PKS	—	—	e 55·9	—
Calcutta		136·5	135	23 5	PKS	35 5	?	65·6	—
Pulkovo		138·5	49	e 19 21	[+ 1]	—	—	56·9	71·1
Tashkent		145·0	98	e 19 27	[− 7]	—	—	65·9	80·2
Andijan		145·1	102	e 19 32	[− 2]	—	—	—	—
Frunse		147·9	101	e 19 35	[− 4]	—	—	—	—
Ekaterinburg		149·8	69	e 19 28	[−14]	i 30 0	{−21}	60·9	95·9
Zi-ka-wei	Z.	151·2	183	e 19 44	[+ 1]	—	—	73·1	93·5
Nanking		152·0	177	e 19 47	[+ 3]	—	—	—	85·2
Nagoya		152·9	211	e 18 20	?	20 17	PKP_2	—	—
Chiufeng		159·9	179	19 59	[+ 5]	—	—	—	—
Vladivostok		161·6	209	e 20 3	[+ 7]	—	—	e 37·9	—

Additional readings :—
La Paz PPPN = +10m.26s., SSN = +18m.4s. = S_cS − 1s., SSSN = +19m.19s.
Huancayo i = +8m.54s., +11m.8s., +12m.56s., +18m.8s., +19m.37s., +19m.58s., and +24m.8s.
Cape Town PP = +11m.53s., PPP = +12m.20s., PS = +17m.48s., SS = +20m.15s., SSS = +22m.16s.
Christchurch SS = +24m.47s., L_q = +28·5m.
San Juan i = +12m.22s., e = +14m.37s. = PP − 15s., and +17m.58s. = PPPP + 14s., i = +21m.59s., eSS = +26m.52s., eSSS = +30m.28s., e = +32m.22s.

Continued on next page.

Melbourne e = +13m.18s., i = +27m.37s. =SS +25s.
Adelaide iPS = +23m.34s.
Fordham iN = +27m.16s. =PS +15s., i = +32m.39s. =SS +16s.
St. Louis e = +32m.40s. =SS +15s.
Oak Ridge eNE = +28m.10s. and +32m.44s. =SS +1s., eNW = +32m.58s., eNE = +35m.14s.
Toronto eN = +32m.31s.
Pasadena iZ = +18m.44s. =PP +20s. and +20m.55s. =PPP +23s.
Ottawa e = +33m.52s.? =SS +26s.
Malaga e = +18m.17s. =PKP +9s., +19m.19s., +21m.31s., and +35m.37s.
Haiwee e = +11m.32s.
Almeria PP = +24m.44s. =SKS −19s.
Tinemaha e = +11m.32s.
Toledo i = +19m.10s. =PP +14s., PS? = +29m.25s.
Bozeman e = +31m.0s., +35m.32s. =SS +25s., and +39m.22s. =SSS +9s.
Florence i = +34m.52s. and +38m.7s.
Triest ePP = +22m.14s., e = +22m.44s. =PPP −4s., i = +30m.19s. =PS +4s., SS = +36m.9s.
Strasbourg e = +20m.14s. =PP −6s. and +30m.24s. =PS +7s.
Ksara PP = +22m.24s., PPP = +25m.14s., PS = +32m.41s., PPS = +34m.6s.
Ivigtut +37m.4s. =SS +5s.
Stuttgart e = +23m.10s. =PPP +15s. and +34m.52s.
De Bilt eEN = +37m.28s. =SS +8s.
Potsdam eN = +31m.16s. =PS +13s. and +34m.16s.
Sitka e = +32m.2s. =PS +20s., eSS = +38m.22s., e = +39m.24s., eSSS = +44m.22s., e = +54m.52s.
Tiflis iPPZ = +21m.29s., iPKSZ = +22m.35s., ePPPZ = +25m.21s., eSSE = +40m.19s.
Baku i = +22m.50s. =PKS +1s., e = +34m.5s., +39m.27s. =SS +1s. and +44m.22s. =SSS +10s.
Pulkovo i = +22m.57s. =PKS +8s., e = +25m.55s., +28m.45s., +35m.33s., and +40m.17s. =SS −7s.
Tashkent e = +19m.39s., +21m.58s., and +43m.29s.
Ekaterinburg e = +19m.48s., i = +20m.59s., +21m.51s., +22m.22s., +23m.26s. =PP +7s., +26m.25s. =PPP −8s., +30m.59s., +33m.47s. =SKSP +10s., +42m.18s. =SS −20s., and +47m.52s. =SSS −8s.
Zi-ka-wei iZ = +23m.22s. =PP −5s.
Nanking iPZ = +20m.0s. =PKP$_2$ −8s., eZ = +23m.11s. =PP −21s., iZ = +26m.2s.
Chiufeng iN = +21m.24s., iNZ = +22m.24s., iE = +35m.24s.
Long waves were also recorded at Johannesburg, Perth, Honolulu T.H., Hong Kong, Algiers, and other European stations.

Oct. 26d. Readings also at 3h. (near Malabar), 6h. (Nagoya (2)), 7h. (Andijan, Tashkent, Medan, Bombay, Calcutta, and Ekaterinburg), 8h. (Baku, Tiflis, Ekaterinburg, Tashkent, Bombay, Pulkovo, Chiufeng, Vladivostok, and Mizusawa), 9h. (near Tyosi), 13h. (La Paz), 14h. (Alicante and Fort de France), 15h. (Ksara and Tiflis), 16h. (Ekaterinburg and near Tiflis), 17h. (Wellington), 20h. (Bombay and near Tyosi), 22h. (Sydney), 23h. (near Apia).

Oct. 27d. 5h. 40m. 23s. Epicentre 0°·0 119°·5E. (given by the Russian station) N.3.

A = −·492, B = +·870, C = ·000; D = +·870, E = +·492;
G = ·000, H = ·000, K = −1·000.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	9·4	113	2 16	+ 3	i 3 59	0	—	—
Malabar	13·9	239	2 39	−35	i 4 54	−55	—	—
Batavia	14·1	244	2 53	−24	5 9	−44	—	—
Manila	14·7	6	4 20	+55	6 42	+34	7·9	9·1
Medan	21·1	280	6 12	+91	—	—	—	—
Andijan	59·0	320	e 10 4	+ 7	—	—	—	—
Tashkent	61·3	319	10 14	0	18 29	− 4	—	—
Ekaterinburg	73·5	332	11 28	− 4	20 51	−12	—	—
Baku	74·6	312	—	—	e 21 6	− 9	e 24·1	—
Huancayo	161·0	130	e 19 6	[−49]	—	—	—	—

Batavia gives P = +2m.57s.

Oct. 27d. 10h. 59m. 7s. Epicentre 38°·7N. 117°·9W. (as on 1933 June 11d.) R.2.

A = −·365, B = −·690, C = +·625 ; D = −·884, E = +·468 ;
G = −·293, H = −·553, K = −·780.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Tinemaha		1·6	190	i 0 25	+ 2	i 0 53	+12	—
Haiwee	z.	2·6	181	e 0 37	0	i 1 22	S_g	—
Lick	E.	3·2	·245	e 0 45	− 1	i 1 36	S*	—
Branner		3·6	249	e 0 51	0	i 1 48	S*	—
Berkeley		3·6	257	e 0 47	− 4	i 1 40	S*	—
San Francisco		3·7	255	e 0 48	− 5	i 1 45	S*	—
Ukiah		4·2	277	e 1 17	P_g	i 2 2	S*	i 2·5
Mount Wilson		4·5	182	i 1 5	+ 1	—	—	—
Santa Barbara	z.	4·5	200	e 1 9	+ 5	—	—	—
Pasadena		4·6	183	i 1 6	0	—	—	—
Riverside	z.	4·7	174	i 1 8	+ 1	—	—	—
La Jolla	z.	5·8	174	e 1 37	P*	—	—	—
Tucson		8·6	136	e 2 35	+33	e 3 59	+20	i 5.4
Bozeman		8·6	34	—	—	e 4 15	S*	—

Additional readings :—
Lick iE = +56s. = P_g − 2s. and +1m.38s. = S_g − 2s.
Branner iPEN = +1m.0s. = P* + 2s., iEN = +1m.3s. = P_g − 3s.
Berkeley iP = +55s., = P* − 3s., iPEN = +59s., iSE = +1m.43s.
San Francisco iP = +58s. = P* − 2s.
Tucson i = +4m.24s., +4m.33s., +4m.39s. and +4m.47s.
Bozeman-e = = +5m.21s.
Long waves were also recorded at Seattle.

Oct. 27d. Readings also at 4h. (San Juan and La Paz), 6h. (La Paz and La Plata), 7h. (Haiwee, Mount Wilson, Pasadena, Riverside, and Tinemaha), 9h. (Wellington), 14h. (Huancayo and Tiflis (2)), 15h. (near Osaka), 17h. (near Andijan, Frunse, and Tashkent), 21h. (Huancayo).

Oct. 28d. Readings at 0h. (near Tyosi and near Wellington), 1h. (near Andijan), 2h. (Fordham), 3h. (near Andijan), 6h. (near Tiflis), 8h. (Huancayo), 10h. (Haiwee La Jolla, Mount Wilson, Pasadena, Riverside, Santa Barbara, Tinemaha, and Tiflis), 11h. (Tiflis), 12h. (La Paz), 15h. (Fordham and Nagoya), 16h. and 17h. (Nagoya), 18h. (Huancayo), 20h. (near Tyosi), 21h. (Nagoya), 23h. (Riverview and Sydney).

Oct. 29d. Readings at 3h. (Fordham), 11h. (Riverview), 15h. (Huancayo), 16h. (Christchurch and near Wellington (2)), 17h. (Wellington), 22h. (La Paz).

Oct. 30d. 6h. 59m. 56s. Epicentre 16°·3S. 167°·3E. N.3.

A = −·936, B = +·211, C = −·281 ; D = +·220, E = +·975 ;
G = +·274, H = −·062, K = −·960.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M
	°	°	m. s.	s.	m. s.	s.	m.	m
Suva	10·8	101	3 1	+29	5 22	S*	6·5	12·1
Apia	20·4	86	4 5	−29	—	—	—	—
Riverview	22·8	217	e 4 57	− 2	e 9 5	+ 4	e 11·3	14·1
Sydney	22·8	217	e 4 40	−19	e 8 58	− 3	11·3	12·(
Arapuni	23·0	163	—	—	i 9 10	+ 5	—	12·1
Wellington	25·8	167	5 20	− 7	9 39	−16	12·1	17·1
Christchurch	27·6	172	i 5 51	+ 7	10 17	− 8	12·9	—
Melbourne	29·1	218	e 5 52	− 5	10 48	− 2	13·2	17·3
Adelaide	31·7	227	e 9 34	(+19)	12 52	SS	—	18·4
Amboina	40·5	284	i 7 35	− 1	—	—	—	—
Perth	49·0	241	e 14 4	?	(e 15 39)	− 8	—	28·4
Manila	55·2	301	9 1	−29	16 29	−43	28·6	33·1
Nagoya	59·0	332	e 9 32	−25	e 10 29	P_cP	—	—
Batavia	60·0	272	e 6 33	?	—	—	—	—
Mizusawa E.	60·6	338	(e 10 15)	+ 6	e 10 15	P	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Hong Kong		64·8	305	—	—	19 54	?	23·7	28·5
Nanking		67·1	316	11 50	+58	—	—	e 24·1	—
Vladivostok		67·7	333	10 58	+ 2	e 20 0	+ 7	27·6	—
Chiufeng		73·8	322	11 33	0	21 1	− 5	—	—
Berkeley	E.	85·4	48	e 36 2	?	—	—	—	—
Santa Barbara	Z.	85·8	53	e 12 37	0	—	—	—	—
Pasadena		86·9	53	i 12 43	0	—	—	—	—
Mount Wilson		87·0	53	i 12 43	0	—	—	—	—
La Jolla	Z.	87·2	55	e 12 46	+ 2	—	—	—	—
Riverside	Z.	87·4	53	i 12 46	+ 1	—	—	—	—
Haiwee		87·8	51	i 12 44	− 3	—	—	—	—
Tinemaha		87·9	51	i 12 48	+ 1	—	—	—	—
Bombay	E.	99·3	287	e 17 25	PP	—	—	—	—
Tashkent		106·6	309	14 10	− 4	e 25 22	{−20}	e 45·1	60·0
Huancayo		111·9	111	—	—	e 28 53	PS	e 52·3	—
Ekaterinburg		112·7	326	e 19 13	PP	e 29 6	PS	45·1	—
Ottawa		120·4	47	—	—	e 30 16	PS	e 55·1	—
Baku		121·2	308	e 21 6	PP	e 29 33	PS	58·1	64·3
Tiflis		124·7	310	e 20 51	PP	e 29 56	PS	e 59·1	75·1
Pulkovo		126·6	335	21 4	PP	—	—	56·1	70·0
Upsala		131·2	341	e 22 34	PKS	—	—	e 69·1	—
Ksara		133·1	300	e 19 23	[+11]	e 22 48	PKS	—	—
Vienna	Z.	140·2	330	e 19 29	[+ 8]	—	—	—	—
De Bilt		141·5	342	e 19 28	[+ 5]	—	—	e 74·1	—
Uccle		142·9	343	19 32	[+ 5]	—	—	e 63·1	—
Stuttgart		143·0	337	e 19 27	[0]	—	—	e 65·1	—
Paris		145·2	343	—	—	e 39 4?	?	71·1	71·1
Neuchatel		145·3	336	e 19 34	[− 1]	—	—	—	—
Piacenza		145·6	333	e 19 39	[+ 4]	—	—	—	—
Florence		145·9	328	i 19 39	[+ 3]	(41 4)	SS	41·1	65·1
Prato		145·9	329	e 19 39	[+ 3]	i 19 53	?	—	—
Trenta		145·9	318	e 19 44	[+ 8]	—	—	—	—

Additional readings and note :—
Riverview ePZ = +5m.4s.
Christchurch iP_cPN = +9m.23s. L_qE = +11m.34s., S_cS = +16m.51s.
Melbourne e = +7m.38s.
Perth PPP = +15m.59s., eS = +19m.34s. = SS + 30s., P_cS = +20m.6s. = SSS − 13s., true S is given as PP.
Batavia i = +7m.20s.
Bombay eN = +21m.4s. = PPPP − 9s.
Tashkent ePP = +18m.41s., ePPP = +21m.1s., PS = +28m.10s., ePPS = +28m.58s., eSS = +33m.52s.
Huancayo e = +34m.59s. = SS + 15s.
Ekaterinburg PPS = +30m.16s., eSS = +35m.31s., eSSS = +39m.19s.
Ottawa eZ = +36m.16s. = SS − 21s.
Baku e = +46m.17s.
Pulkovo eSS = +38m.7s., eSSS = +43m.4s.
Uccle ePP = +23m.49s.
Paris e = +44m.4s. ?
Long waves were also recorded at Cape Town, Kucino, Copenhagen, Kew, Potsdam, and American stations.

Oct. 30d. Readings also at 0h. (near Tyosi), 1h. (Hastings, Riverview, and near Wellington), 4h. (near La Paz), 5h. (La Paz, Sucre near Huancayo, and near Tyosi (2)), 6h. (Apia and Huancayo), 10h. (Catania and Trenta), 11h. (Bombay, Calcutta, Kodaikanal, Tucson, Huancayo, and near Tyosi), 13h. (Tiflis), 14h. (near Nagoya), 15h. (Huancayo), 16h. (La Paz), 18h. (near Mizusawa), 22h. (Berkeley, near Lick and Branner).

Oct. 31d. Readings at 8h. (La Paz), 9h. (Christchurch, Catania (2), and near Messina), 11h. (Tiflis and near Apia), 15h. (La Paz), 16h. (Christchurch, Melbourne, Riverview, Sydney, Nagoya, Mount Wilson, Pasadena, Riverside, and Tinemaha), 21h. and 23h. (Huancayo),

Nov. 1d. 8h. 21m. 58s. Epicentre 35°·6N. 140°·8E. (as on 1931 July 10d.). X.

A = −·630, B = +·514, C = +·582.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tyosi		0·2	17	i 0 3	0	0 7	+ 2	0·2
Susaki		1·7	238	0 24k	0	0 50	S*	—
Nagoya		3·2	262	e 0 48	+ 2	e 1 31	S*	2·1
Mizusawa	E.	3·5	4	e 0 52	+ 2	i 1 37	+ 7	—
	N.	3·5	4	e 0 50	0	e 1 35	+ 5	—
Osaka		4·4	259	1 4	+ 1	2 11	S*	2·7
Kobe	E.	4·7	260	e 0 57	−10	e 1 55	− 5	2·6
	N.	4·7	260	e 1 4	− 3	e 1 50	−10	2·6
	Z.	4·7	260	e 0 54	−13	i 1 59	− 1	2·6
Sumoto		5·0	257	e 1 30	P_g	e 2 19	+11	2·8
Koti		6·3	256	e 1 31	+ 1	—	—	—

Additional readings :—
Osaka i = +1m.21s. = P_g −1s.
Sumoto ePZ = +1m.33s., SN = +2m.26s. = S* −1s.
Long waves were also recorded at Tashkent and Ekaterinburg.

Nov. 1d. 15h. A shock probably off the west coast of Mexico or Central America, for which the readings are as follows :—

Columbia e = 15h.36m.28s., 38m.21s., and 42m.18s., eL = 48m.12s.
Tucson eP = 15h.38m.34s., S = 42m.45s., eL = 46m.0s.
Cincinnati iPZ = 15h.39m.46s.
San Juan e = 15h.40m.43s., 44m.45s., and 45m.5s., eL = 48m.30s.
Oak Ridge e = 15h.44m.30s., eL = 53m.0s.
Pittsburgh e = 15h.44m.42s. and 51m.0s.
Huancayo e = 15h.45m.21s., eL = 48m.17s.
Ann Arbor eN = 15h.46m.42s., eLN = 54m.54s., e?E = 55m.24s.
Ukiah e = 15h.52m.48s.
Tashkent e = 15h.53m.44s., 53m.56s., 16h.3m.52s., and 10m.42s., eL = 39m.12s., M = 54m.0s.
Victoria eP = 15h.56m.4s., eL = 58m.9s., M = 16h.1m.11s.
Ekaterinburg e = 15h.58m.21s., L = 16h.24m.
Kucino e = 15h.59m.18s., 16h.0m.0s., and 5m.42s., eL = 22m.12s., M = 29m.18s.
Sebastopol eP = 16h.6m.12s.
Long waves were also recorded at Baku, Pulkovo, and at other American and European stations.

Nov. 1d. Readings also at 0h. (Huancayo), 1h. (Apia, Suva, and Wellington), 2h. (Ekaterinburg, Tashkent, Riverview, and Oak Ridge), 3h. (Baku), 6h. (Wellington and near Amboina), 7h. (Batavia, near Malabar, Soengei Langka, and near Wellington), 8h. (near Tyosi), 10h. (Ekaterinburg, Tashkent, near Nagoya (2), and Tyosi (2)), 11h. (Mizusawa, near Tyosi, and near Baku), 18h. (Huancayo, Nagoya, Tyosi, and near Tokyo), 19h. (near Calcutta and near Tiflis), 20h. (Ekaterinburg, Tashkent, near Chiufeng, and near Tyosi), 21h. (Baku, Tiflis, Andijan, Pulkovo, Copenhagen, Strasbourg, and Stuttgart), 22h. (Wellington and near Tyosi), 23h. (near Tyosi).

Nov. 2d. 12h. 27m. 2s. Epicentre 52°·0N. 176°·0W. (as on 1926 Aug. 9d.). R.1

Probable error of epicentre ±0°·24.

A = −·614, B = −·043, C = +·788 ; D = −·070, E = +·998 ; G = −·786, H = −·055, K = −·616.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M
		°	°	m. s.	s.	m. s.	s.	m.	m
Sitka		23·7	62	i 5 10	+ 3	i 9 21	+ 3	i 11·8	—
Victoria	E.	33·2	76	i 6 30	− 4	i 11 49	− 5	e 15·6	16·4
	N.	33·2	76	i 6 38	+ 4	i 11 56	+ 2	—	—
Honolulu T.H.		33·8	148	i 7 33	PP	i 12 0	− 3	15·3	—
Seattle		34·1	76	—	—	e 12 22	+14	e 17·0	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Vladivostok		35·4	277	i 6 54	+ 1	i 12 26	− 1	15·5	18·2
Oiwake		35·4	263	6 56	+ 3	12 23	− 4	—	—
Misima		36·0	262	7 0	+ 2	—	—	—	—
Ukiah		38·2	89	e 7 23	+ 6	13 12	+ 3	17·8	—
Kobe		38·6	263	e 7 18	− 2	—	—	—	18·8
Berkeley		39·5	90	e 7 10	−18	i 13 14	−15	—	—
Koti		40·3	264	e 7 34	− 1	—	—	—	21·0
Keizyo		41·7	274	e 7 47	+ 1	e 14 0	− 2	18·7	—
Bozeman		41·8	72	—	—	e 14 1	− 2	e 20·2	—
Zinsen	E.	42·0	274	e 7 42	− 7	e 14 8	+ 2	—	—
Tinemaha		42·5	88	i 7 54	+ 1	—	—	—	—
Miyazaki		42·7	264	7 55	+ 1	14 15	− 1	—	—
Santa Barbara	Z.	43·3	92	e 7 59	0	—	—	—	—
Haiwee		43·3	88	i 8 1	+ 2	e 17 58	(− 4)	—	—
Pasadena		44·5	90	i 8 5	− 4	e 14 39	− 4	e 18·0	—
Mount Wilson		44·5	90	e 8 5	− 4	—	—	—	—
Riverside	Z.	45·0	90	e 8 12	− 1	—	—	—	—
La Jolla	Z.	45·9	91	e 8 26	+ 6	—	—	—	—
Chiufeng		46·8	285	i 8 28a	+ 1	i 15 15	− 1	22·4	27·6
Zi-ka-wei	Z.	49·4	273	e 8 46a	− 1	15 58	+ 6	24·4	31·0
Tucson		50·2	88	e 9 3	+10	e 16 1	− 3	—	—
Nanking		50·4	275	i 8 48a	− 6	16 15	+ 9	—	26·5
Madison		55·6	63	i 9 32	− 1	i 17 9	− 8	e 26·3	—
Chicago		57·4	64	e 9 49	+ 3	e 17 38	− 4	e 27·6	—
St. Louis		57·8	68	e 9 49	0	i 17 49	+ 2	e 29·5	—
Florissant		57·9	68	i 9 50	0	i 17 48	0	e 29·0	—
Ivigtut		59·4	27	—	—	(20 58?)	?	21·0	—
Little Rock	N.	59·6	72	e 9 55	− 7	—	—	—	—
Hong Kong		60·3	271	10 8	+ 1	18 37	+17	—	33·9
Toronto		60·5	57	e 10 7	− 1	i 18 19	− 4	28·0	35·0
Ottawa		61·1	53	—	—	e 18 28	− 2	e 27·0	—
Buffalo		61·3	56	i 10 12	− 2	—	—	—	—
Ekaterinburg		61·7	330	i 10 20	+ 4	i 19 18	+40	34·1	40·8
Manila		62·1	260	10 17	− 2	19 2	+19	32·0	—
Charlottesville		65·0	60	—	—	e 19 17	− 3	e 35·0	—
Oak Ridge		65·3	53	—	—	e 19 28	+ 4	e 27·0	—
Fordham		65·3	56	i 10 40	− 1	e 19 23	− 1	e 31·0	—
Pulkovo		66·2	348	e 10 35	−12	19 32	− 3	33·0	41·8
Columbia		66·6	65	e 10 50	+ 1	e 19 39	− 1	e 33·0	—
Frunse		67·3	312	e 10 48	− 6	—	—	—	—
Upsala	N.	67·6	354	—	—	e 19 52	0	e 34·0	39·5
Andijan		70·0	312	e 11 9	− 2	—	—	—	—
Suva		70·3	187	e 9 58?	?	—	—	32·0	—
Tashkent		70·9	315	i 11 14	− 2	i 20 29	− 3	e 32·2	44·9
Edinburgh		71·9	5	—	—	e 23 58?	?	e 40·0	—
Copenhagen		72·0	356	11 23	0	20 45	0	33·0	—
Amboina		72·9	240	i 11 13	−15	i 20 57	+ 1	—	—
Hamburg		74·3	357	e 11 35	− 1	e 21 29	PS	e 36·0	38·0
Potsdam		75·4	356	e 11 40	− 3	i 21 22	− 3	e 38·0	41·0
Calcutta		75·7	289	12 28	+44	22 4	PS	39·5	—
De Bilt		75·9	359	11 47	+ 2	e 21 16	−14	e 37·0	40·1
Oxford		76·0	5	—	—	21 29	− 3	e 35·7	55·7
Göttingen		76·4	357	e 11 46	− 2	e 21 34	− 2	e 38·0	40·0
Kew		76·5	4	e 11 54	+ 5	—	—	e 33·0	56·3
Uccle		77·2	0	e 11 49	− 4	22 8	PS	37·0	—
Feldberg		77·7	358	—	—	e 22 11	PS	—	43·5
Agra	E.	78·0	299	11 55	− 2	22 0	+ 6	—	50·4
Stuttgart		79·1	358	e 12 2a	− 1	e 22 10	+ 4	e 39·0	—
Paris		79·2	1	e 10 58	−66	(20 58?)	−69	21·0	45·0
Baku		79·4	327	e 12 5	0	e 22 6	− 3	41·0	49·9

Continued on next page,

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Strasbourg	79·4	358	e 11 58?	− 7	(e 21 58?)	−11	e 22·0	—
Budapest	79·7	350	—	—	e 21 58?	−14	44·0	46·5
Tiflis	79·9	331	12 6	− 1	e 22 10	− 5	e 39·5	49·7
Zagreb	81·6	353	e 10 58?	−78	e 22 34	+ 1	e 43·0	—
Triest	82·0	354	e 12 15	− 3	e 22 57	+20	—	e 42·0
Venice	82·3	355	i 12 27	+ 7	—	—	—	—
Piacenza	82·8	357	12 46	+24	22 42	− 3	44·0	53·1
Florence	84·0	355	12 29	+ 1	23 18	+20	36·0	44·0
Hyderabad	85·5	293	12 9	−27	22 45	[−18]	43·3	51·8
Batavia	87·1	259	e 11 58?	−46	e 23 54	+26	—	—
San Juan	87·1	64	e 12 45	+ 1	23 5	[− 9]	e 40·7	—
Bombay	87·4	300	12 45	0	24 19	PS	e 46·0	54·7
Toledo	87·9	7	—	—	e 22 43	[−36]	—	—
Alicante	89·6	5	—	—	e 23 42	−10	e 48·1	—
Ksara	89·7	335	13 14	+18	24 25	+32	—	—
Granada	90·6	7	17 17	?	e 24 58	PS	45·3	53·4
Riverview	90·6	208	e 23 21	SKS	(e 23 21)	[−15]	e 44·0	47·6
Almeria	90·9	6	—	—	e 23 48	−16	e 45·6	—
Kodaikanal	91·9	290	13 9	+ 3	—	—	—	—
Wellington	93·6	187	—	—	e 36 58?	SSSS	45·0	—
Christchurch	96·0	189	e 13 20	− 5	23 44	[−22]	45·3	—
Melbourne	96·0	210	—	—	e 24 4	[− 2]	48·5?	51·5
Huancayo	106·0	90	e 18 51	PP	e 26 5	−10	e 50·7	—
La Paz	113·9	89	e 17 38	[−52]	—	—	56·0	—

Additional readings :—
Sitka i = +9m.29s.
Honolulu T.H. e = +13m.41s. =SS − 18s.
Ukiah eSS = +15m.28s., eSSS = +16m.4s.
Berkeley eZ = +7m.12s., eE = +7m.14s., eN = +7m.25s. and +7m.27s., eZ = +18m.0s.
Bozeman e = +17m.33s. =S_cS − 20s.
Chiufeng pP = +8m.45s., PPE = +10m.7s., iPPPE = +10m.49s., SSN = +18m.9s.
Zi-ka-wei iZ = +9m.6s.
Tucson e = +18m.44s. =S_cS − 2s., +19m.1s. =SS − 24s. and +21m.34s.
Madison e = +17m.47s.
Chicago e = +17m.50s. and +22m.35s.
St. Louis ePPN = +12m.3s., iPS = +18m.17s. ; T_0 =12h.27m.8s.
Florissant ipPZ = +10m.6s., isSEN = +18m.13s. ; T_0 =12h.27m.8s.
Ekaterinburg PP = +12m.58s., PPP = +14m.5s., SS = +23m.16s., SSS = +26m.28s.
Copenhagen +21m.28s. and +25m.52s.
Potsdam iNZ = +12m.43s., PP = +14m.40s., ePPPEZ = +15m.34s., ePPPN = +15m.52s., eSN = +21m.16s., eSZ = +21m.28s., eSSN = +26m.40s., eSSSN = +29m.46s., eZ = +30m.58s.
Göttingen eSSN = +26m.58s.?
Uccle e = +26m.58s.? =SS +27s.
Feldberg eN = +33m.8s.
Stuttgart ePP = +16m.58s., eSS = +27m.46s., eSSSS = +33m.28s.
Tiflis ePN = +12m.10s., ePPZ = +15m.15s., ePPPZ = +17m.6s.
Florence i = +26m.28s., +27m.58s. =SS − 14s., and +30m.58s.
San Juan e = +16m.48s., i = +23m.20s. =S − 8s. and +23m.38s., iPS = +24m.18s.
Ksara SKS = +23m.38s., PS = +25m.43s.
Riverview iN = +23m.47s. =S − 15s.
Granada e = +26m.35s.
Christchurch eZ = +23m.14s., e = +25m.24s., PSNZ = +25m.48s., iPPSN = +26m.42s., SS = +31m.12s., SSSN = +34m.47s., L_gN = +40·8m.
Melbourne i = +24m.36s. =S − 15s., +31m.5s. =SS − 2s., and +34m.46s. = SSS +0s.
La Paz PP? = +21m.16s.
Long waves were also recorded at Toyooka, Phu-Lien, Perth, Arapuni, Ann Arbor, Theodosia, Simferopol, Yalta, and at other European stations.

Nov. 2d. 17h. 16m. 45s. Epicentre 41°·2S. 174°·0E. N.3.
(as given by Wellington).

A = −·748, B = +·079, C = −·659.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Wellington	0·6	98	0 9	0	0 18	+ 3	—
Takaka	1·0	291	0 26	S	0 38	S_g	—
Bunnythorp	1·5	53	1 11	+50	1 31	+52	—
Glenmuick	1·8	200	e 0 35	+ 9	e 0 54	+ 8	—
New Plymouth	2·1	1	2 15?	?	—	—	—
Christchurch	2·5	204	e 0 36	0	i 1 6	+ 2	1·5
Hastings	2·7	55	2 15?	?	2 42	?	—
Arapuni	3·4	22	—	—	1 45	S_g	—

Additional readings :—
Takaka S_g? = +46s.
Bunnythorp i = +1m.34s., S_g? = +1m.39s.
Glenmuick eP_g = +42s., eS_g = +58s.
Christchurch ePZ = +41s. = P* +1s., i = +1m.2s., +1m.16s. = S_g +0s., and +1m.27s.
Hastings i = +2m.26s. and +2m.36s., S_g? = +2m.55s.
Long waves were recorded at Melbourne.

Nov. 2d. Readings also at 2h., 3h., and 5h. (near Tyosi), 6h. (Tyosi, near Apia, and near Tananarive), 7h. (Huancayo, La Paz, and near Tyosi), 9h. (Tiflis), 10h. (Nagoya, Riverview, Melbourne, Huancayo, and near Amboina), 13h. (Andijan and near Tyosi), 14h. (Cheb and Stuttgart), 15h. (Huancayo and Nanking), 16h. (Amboina), 17h. (Ekaterinburg, Frunse, Tashkent, Wellington (4), near Huancayo, and near La Paz), 18h. (Tyosi, Ekaterinburg, near Wellington (2), near Andijan, and Tashkent), 19h. (Hastings and near Messina), 20h. (Trenta and Triest), 21h. and 22h. (near Wellington), 23h. (Wellington and near Santiago).

Nov. 3d. 4h. 14m. 39s. Epicentre 22°·5S. 70°·2W. (as on 1933 Oct. 10d.). X.

A = +·313, B = −·869, C = −·383 ; D = −·941, E = −·339 ;
G = −·130, H = +·360, K = −·924.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		1·2	95	e 0 53	?	—	—	—	—
Sucre	N.	5·8	53	i 1 27	+ 5	i 2 47	S*	—	—
La Paz		6·3	18	i 1 24	− 6	i 2 44	+ 3	3·1	3·5
Huancayo		11·6	334	e 2 34	− 9	i 4 59	+ 6	i 5·9	—
La Plata		16·4	142	4 22	+36	7 43	+55	10·2	10·6
La Jolla	Z.	71·3	319	e 11 21	+ 2	—	—	—	—
Riverside	Z.	72·1	320	i 11 24	+ 1	—	—	—	—
Mount Wilson		72·7	320	i 11 28	+ 1	—	—	—	—
Pasadena		72·7	320	i 11 26k	− 1	—	—	—	—
Haiwee		74·0	322	i 11 35	0	—	—	—	—
Tinemaha		74·8	322	i 11 40	+ 1	—	—	—	—

Additional readings :—
Montezuma i = +1m.21s.
Huancayo eP = +2m.51s., e = +3m.47s., and +4m.31s.
La Plata SN = +7m.54s.
Pasadena iZ = +11m.45s. and +11m.53s.

Nov. 3d. Readings also at 0h. (Wellington (2), near Tiflis and Ksara), 1h. (Hastings and Tyosi), 2h. (Huancayo), 3h. (Huancayo and Wellington (3)), 5h. (near Nagoya, Huancayo, and near Tyosi (2)), 7h. and 9h. (2) (near Tyosi), 10h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, St. Louis, near Mizusawa, near Triest, near Frunse, near Tyosi, and near Nagoya), 12h. (Ferndale), 13h. (Andijan, Baku, Tashkent, Tiflis, Bombay, Frunse, Ksara, Pulkovo, Copenhagen, Stuttgart, near La Paz, and near Wellington), 14h. (Florence and near Wellington), 16h. (Nanking, Taihoku, and Wellington), 21h. (Huancayo (2) and near La Paz), 22h. (near Tashkent), 23h. (near Wellington).

Nov. 4d. 8h. 41m. 20s. Epicentre 8°·7N. 71°·5W. N.2.

A = +·314, B = −·938, C = +·151 ; D = −·948, E = −·317 ;
G = +·048, H = −·143, K = −·989.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		8·0	273	—	—	e 3 16	− 8	—	—
Port au Prince		9·9	355	e 2 14	− 5	i 6 13	?	—	—
San Juan		11·0	27	i 2 39	+ 4	i 5 0	+22	i 5·3	—
Huancayo		21·1	190	i 4 35	− 6	e 8 15	−13	i 11·2	—
La Paz	N.	25·3	173	i 5 24a	+ 1	i 9 58	+12	12·7	16·6
Columbia		26·7	342	e 5 56	+21	e 10 15	+ 5	e 15·2	—
Sucre		28·2	168	e 5 57	+ 8	i 11 0	+25	15·0	—
Charlottesville		30·0	349	—	—	e 11 2	− 2	—	—
Pittsburgh		32·6	349	—	—	e 11 40	− 5	—	—
Oak Ridge		33·8	1	i 6 42	+ 3	e 12 7	+ 4	18·7	—
St. Louis		34·3	334	e 6 43	0	i 12 8	− 3	e 14·5	—
Florissant		34·5	334	e 6 43	− 2	e 12 12	− 2	e 13·7	—
Ann Arbor		35·3	345	—	—	e 12 22	− 4	e 21·1	—
Toronto	N.	35·6	351	e 7 0	+ 6	e 12 33	+ 3	—	—
Chicago		36·1	339	—	—	e 12 35	− 3	e 20·3	—
Ottawa		36·8	355	—	—	i 12 52	+ 4	e 20·7	—
Tucson		43·4	309	—	—	e 14 25	− 2	—	—
La Jolla		48·6	307	e 8 43	+ 2	—	—	—	—
Mount Wilson	z.	49·6	309	i 8 49	+ 1	—	—	—	—
Pasadena		49·7	309	e 8 48	− 1	—	—	—	—
Bozeman		50·2	325	—	—	e 16 2	− 2	e 29·5	—
Tinemaha		50·8	311	i 8 57	0	—	—	—	—
Uccle		74·3	39	e 11 37	+ 1	e 21 16	+ 4	e 32·7	—
De Bilt		74·9	38	11 43	+ 3	21 22	+ 3	e 34·7	46·0
Neuchatel		75·8	44	e 12 24	+39	—	—	—	—
Strasbourg		76·4	42	e 11 48	0	e 21 40?	+ 4	e 33·7	—
Stuttgart		77·3	42	e 11 52	− 2	e 21 40	− 6	e 35·7	—
Florence		78·8	47	e 12 2	+ 1	22 40	PS	—	36·7
Triest		80·5	45	12 9	− 1	22 18	− 3	—	—
Pulkovo		88·4	30	12 49	− 1	23 37	− 4	38·7	52·3
Ekaterinburg		103·7	25	—	—	e 25 59	0	45·7	—

Additional readings :—
Port au Prince PP = +2m.39s., PPP = +2m.59s., SS = +7m.4s.
Huancayo e = +5m.37s., i = +8m.21s.
Oak Ridge iE = +7m.23s., iPPPN = +8m.5s., ePPPNW = +8m.49s., eSSNW = +13m.43s.
Ann Arbor e = +15m.16s.
Chicago eSS = +14m.54s., eSSS = +15m.14s.
Ottawa e = +15m.20s. = SSS − 7s.
Tucson eSS = +17m.46s.
Bozeman eSS = +20m.6s., e = +23m.55s.
Strasbourg e = +18m.8s., +22m.40s.?, and +25m.40s.?
Florence S = +30m.40s.
Long waves were also recorded at La Plata, Paris, Stonyhurst, Copenhagen, Baku, Tiflis, and Tashkent.

Nov. 4d. 11h. 57m. 15s. Epicentre 8°·7N. 71°·5W. (as at 8h.). X.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		8·0	273	—	—	e 3 10	−14	—	—
San Juan		11·0	27	—	—	e 5 4	+26	e 6·3	—
Huancayo		21·1	190	i 4 34	− 7	e 8 19	− 9	e 11·0	—
La Paz		25·3	173	i 5 22a	− 1	i 9 59	+13	12·6	13·6
Columbia		26·7	342	—	—	e 10 31	+21	e 16·6	—
Sucre		28·2	168	e 5 47	− 2	e 10 53	+18	14·8	—
Oak Ridge	z.	33·8	1	i 6 41k	+ 2	—	—	e 21·8	—
Pasadena		49·7	309	e 8 46	− 3	—	—	—	—
Tinemaha	z.	50·8	311	e 9 7	+10	—	—	—	—

Huancayo gives also e = +5m.0s. = PP + 3s.
Long waves were also recorded at La Plata and De Bilt.

Nov. 4d. 20h. 29m. 56s. Epicentre 16°·0N. 103°·0W. (as on 1932 July 12d.). X.

A = −·216, B = −·937, C = +·276; D = −·974, E = +·225; G = −·062, H = −·269, K = −·961.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Tucson		17·8	338	e 4 7	+ 3	e 7 17	− 3	e 8·6
La Jolla	Z.	21·2	325	e 4 42	0	—	—	—
Mount Wilson		22·7	326	i 4 59	+ 1	—	—	—
Pasadena		22·7	326	i 4 58a	0	—	—	—
Santa Barbara	Z.	23·8	324	e 5 8	0	—	—	—
Haiwee		24·2	329	i 5 11	− 1	—	—	—
Tinemaha		25·0	330	e 5 20	0	—	—	—
Florissant		25·4	23	e 5 18	− 6	e 9 35	−13	—
Cincinnati		28·2	31	i 4 23k	−86	i 9 18	−77	i 15·9

Long waves were also recorded at Bozeman, Oak Ridge, De Bilt, Uccle, Stuttgart, and at the Russian stations.

Nov. 4d. Readings also at 0h. (Wellington), 1h. (near Tyosi), 2h. (Huancayo and La Paz), 3h. (Taihoku), 4h. (Nagoya, Sumoto, and Fort de France), 7h. (Baku, Ekaterinburg, Pulkovo, and Tashkent), 8h. (Perth and Sitka), 9h. (near Apia), 10h. (near Tyosi), 15h. (Simidu), 16h. (near Wellington), 17h. (New Plymouth), 18h. (near Taihoku and near Zagreb (2)), 19h. (Nagoya and near Apia), 20h. (Strasbourg, La Paz, and near Huancayo).

Nov. 5d. 7h. 11m. 56s. (I) } Epicentre 0°·0 83°·0W. N.3.
8h. 35m. 54s. (II) } X.

Epicentre suggested by San Juan, very rough.

A = +·122, B = −·993, C = ·000; D = −·993, E = −·122; G = ·000, H = ·000, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I	Huancayo	14·3	148	i 3 17	− 2	5 40	−18	—	—
II		14·3	148	i 3 12	− 7	i 5 26	−32	i 6·4	—
I	La Paz	22·1	139	e 4 46	− 6	i 8 43	− 5	11·5	14·6
II		22·1	139	e 4 53	+ 1	8 47	− 1	11·7	14·4
I	San Juan	24·8	41	e 5 25	+ 7	e 9 55	+18	14·4	—
II		24·8	41	e 5 18	0	e 9 46	+ 9	—	—
I	Sucre	25·8	138	e 5 30	+ 3	i 9 57	+ 2	14·1	—
II		25·8	138	e 5 30	+ 3	9 54	− 1	—	—
II	Pasadena Z.	47·4	320	e 9 8	+36	—	—	—	—

Huancayo I gives also iPP = +3m.41s., i = +5m.32s., and +6m.25s.
Long waves to Shock I were recorded at De Bilt and La Plata.

Nov. 5d. 20h. 27m. 20s. Epicentre 26°·0N. 98°·4E. (as on 1933 Aug. 12d.). X.

A = −·131, B = +·889, C = +·438.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta		9·7	251	2 16	− 1	5 58	?	8·0	11·8
Hong Kong		14·9	101	6 35	S	(6 35)	+22	8·1	8·2
Agra	E.	18·2	278	4 2	− 7	7 40	+11	e 9·9	—
Nanking		18·8	66	i 4 17k	+ 1	e 8 12	+30	10·3	11·4
Hyderabad		20·3	249	4 38	+ 5	8 34	+22	10·0	14·7
Chiufeng		20·4	42	4 37	+ 3	8 29	+15	i 10·9	12·2
Zi-ka-wei	Z.	20·8	70	8 36	S	(8 36)	+14	i 11·8	15·0
Medan		22·4	179	e 4 55	0	i 12 25	L	(i 12·4)	—
Manila		24·0	114	5 10	0	9 40	+17	11·9	13·7
Bombay		24·6	259	5 14	− 2	9 43	+ 9	13·0	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Kodaikanal		25·3	235	i 5 22	− 1	7 15	−151	i 9·9	10·2
Andijan		26·1	311	e 5 29	− 1	10 45	+45	—	—
Tashkent		28·4	310	i 5 46	− 5	i 10 58	+20	16·8	17·8
Kobe		32·7	66	e 7 53	+84	—	—	—	19·4
Ekaterinburg		40·9	330	6 42	−58	13 4	−46	19·7	22·3
Baku		42·5	303	e 12 0	?	e 17 35	(+22)	23·0	26·2
Tiflis		46·4	305	—	—	e 15 14	+ 4	e 25·7	28·6
Kucino		52·3	322	—	—	(e 19 34)	?	e 19·6	26·1
Ksara	E.	53·9	294	e 9 21	0	17 9	+15	—	—
Strasbourg		71·2	317	(e 17 40?)	?	—	—	e 17·7	—
De Bilt		71·7	321	—	—	e 28 58	?	e 35·7	40·1

Additional readings :—
Medan i = +11m.2s., +11m.21s., and +12m.2s.
Tiflis eZ = +19m.39s.
Long waves were also recorded at Batavia, Pulkovo, Huancayo, Sitka, Taihoku, and other European and Japanese stations.

Nov. 5d. Readings also at 0h. (near Wellington), 1h. (Ekaterinburg and Tashkent), 2h. (Wellington and New Plymouth), 3h. (Ekaterinburg, Tashkent, Strasbourg, Stuttgart, Nagoya, Osaka, Sumoto, near Nagasaki, and near Mizusawa), 6h. (Strasbourg and near Tyosi), 7h. (Ebingen, near Stuttgart, and near Apia), 9h. (Mount Wilson, Pasadena, Huancayo, near La Paz, and Sucre), 10h. (Mizusawa, Christchurch, New Plymouth, and near Wellington), 12h. and 16h. (Huancayo), 17h. (Kobe, Sumoto, Mizusawa, Osaka, Tyosi, and Nagoya), 18h. and 19h. (Huancayo), 20h. (Huancayo and near La Paz), 21h. (Glenmuick and near Malaga), 22h. (Huancayo and near La Paz), 23h. (Huancayo).

Nov. 6d. 7h. 7m. 16s. Epicentre 39°·0N. 43°·5E. N.3.

A = +·564, B = +·535, C = +·629 ; D = +·688, E = −·725 ;
G = +·456, H = +·433, K = −·777.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tiflis	2·9	19	e 0 43	+ 2	e 1 15	+ 1	1·4	2·1
Baku	5·1	72	e 1 10	− 3	i 2 17	S*	2·9	4·9
Ksara	8·0	232	e 2 1	P*	3 59	S*	4·6	5·3
Helwan	13·5	231	i 3 6	− 3	i 5 47	+ 8	7·8	9·8
Tashkent	19·8	75	e 4 38	+11	—	—	—	12·1
Ekaterinburg	21·1	27	e 4 41	0	e 8 40	+12	i 11·5	12·7
Andijan	22·1	76	e 4 47	− 5	—	—	—	—
Pulkovo	22·4	342	—	—	e 9 14	+21	12·2	12·7
Stuttgart	26·3	302	—	—	e 10 44?	+41	e 15·7	—
De Bilt	29·4	309	—	—	e 10 14	−41	e 12·7	19·2

Additional readings :—
Tiflis ePE = +50s. = P_g − 2s.
Long waves were also recorded at Bombay, Kucino, Cape Town, and other European stations.

Nov. 6d. Readings also at 0h. (La Paz), 2h. (near Tyosi), 3h. (La Paz and Montezuma), 6h. (Barcelona, La Paz, and near Tyosi), 7h. (Nanking, Keizyo, Zinsen, Taikyu, Tyosi, near Hukuoka, and Nagasaki), 9h. (near Tyosi), 11h. (near Zagreb), 12h. (Susaki (2)), 13h. (near Santiago), 14h. (near Nagoya and near Tyosi), 15h. (Florence, Prato, Kobe, near Nagoya (3), and Tyosi (9)), 16h. (near Nagasaki), 17h. (near Nagoya and near Tyosi (2)), 18h. (near Apia and near Tyosi (3)), 19h. (near Tyosi (2)).

Nov. 7d. 6h. 39m. 50s. Epicentre 17°·0N. 144°·5E. N.3.

$A = -\cdot779$, $B = +\cdot555$, $C = +\cdot292$; $D = +\cdot581$, $E = +\cdot814$; $G = -\cdot238$, $H = +\cdot170$, $K = -\cdot956$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Siomisaki		18·3	336	4 8	− 2	7 31	0	—	—
Koti		19·3	331	e 4 22	0	7 51	− 1	—	—
Osaka		19·4	337	3 41	−42	5 44	−131	—	7·3
Sumoto		19·4	335	e 4 22	− 1	7 50	− 4	—	8·1
Kobe		19·6	337	(e 4 24)	− 1	e 4 24	P	—	—
Oiwake		20·1	346	4 28	− 3	8 5	− 3	—	—
Nagasaki		20·6	323	4 38	+ 2	e 8 25	+ 7	—	—
Mizusawa	E.	22·3	353	(e 4 56)	+ 2	e 4 56	P	—	—
Manila		22·8	266	5 14	PP	9 4	+ 3	11·5	13·2
Bombay		67·7	284	e 11 10	+14	—	—	—	—
Tashkent		67·9	308	—	—	e 20 16	PS	e 35·3	44·3
Ekaterinburg		72·5	325	i 11 27	+ 1	e 20 53	+ 2	32·2	—
Tinemaha		85·4	53	i 12 36	+ 1	—	—	—	—
Haiwee		85·9	53	i 12 38	0	—	—	—	—
Mount Wilson		86·4	55	i 12 40	0	—	—	—	—
Pasadena		86·4	55	i 12 40 a	0	—	—	—	—
La Paz	Z.	148·7	94	i 19 59	[+19]	—	—	—	—

Additional readings :—
Osaka i = +6m.38s.
Sumoto eS? E = +7m.55s.
Kobe epZ? = +3m.0s.
Bombay eE = +13m.0s. = PP − 18s.
Tashkent e = +27m.46s.
Pasadena iZ = +12m.58s.
Long waves were also recorded at Hong Kong and Baku.

Nov. 7d. 11h. Epicentre probably in Bengal or Bihar, but the data is insufficient to suggest a determination.

The readings of the recording stations are as follows :—
Calcutta P = 11h.11m.35s., S = 12m.33s., L = 12m.56s.
Medan eP = 11h.14m.38s., S = 18m.15s.
Bombay P = 11h.14m.45s., S = 18m.33s., L = 20m.33s., M = 22m.31s.
Nanking eP = 11h.15m.23s., eS = 20m.4s.
Andijan eP = 11h.15m.42s.
Agra eN = 11h.16m.20s.
Frunse eP = 11h.16m.46s.
Tchimkent eP = 11h.17m.22s.
Maximum of long waves recorded at Hyderabad.

Nov. 7d. 12h. 8m. 10s. Epicentre 30°·2S. 177°·7W. (as on 1926 April 24d.). X.

$A = -\cdot864$, $B = -\cdot035$, $C = -\cdot503$; $D = -\cdot040$, $E = +\cdot999$; $G = +\cdot503$, $H = +\cdot020$, $K = -\cdot864$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Hastings	10·5	205	—	—	5 50?	S_g
New Plymouth	11·2	215	2 53	+16	4 43	0
Suva	12·6	343	e 2 56	0	i 5 26	+ 9
Wellington	12·7	206	3 3	+ 5	5 7	−13
Christchurch	15·4	207	—	—	e 6 4	−20
Santa Barbara	84·7	45	e 12 31	− 1	—	—
Pasadena	85·4	46	12 34k	− 1	—	—
Mount Wilson	85·5	46	i 12 35	− 1	—	—
Haiwee	86·8	44	i 12 42k	0	—	—
Tinemaha	87·3	44	i 12 44	− 1	i 23 6	−24

Christchurch gives also eEN = +7m.12s.

Nov. 7d. 16h. 59m. 0s. Epicentre 35°·0N. 142°·0E. (as on 1933 July 12d.). X.

A = −·646, B = +·504, C = +·574.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Tyosi		1·2	308	i 0 17	0	0 23	− 8	0·4
Mizusawa	E.	4·2	351	e 1 34	P_g	i 2 10	S*	—
Nagoya		4·2	274	e 0 59	− 1	e 1 47	− 1	—
Osaka		5·4	268	1 19	+ 2	2 22	+ 4	3·3
Kobe		5·7	268	e 1 36	P*	e 2 24	− 1	2·7
Sumoto		5·9	265	e 2 8	P_g	2 48	S*	2·9

Mizusawa eSN = +2m.15s. = S_g + 2s.
Kobe eE = +1m.58s.

Nov. 7d. Readings also at 1h. (near Nagoya (2) and Tyosi (5)), 2h. (Apia and near Tyosi (2)), 4h. (2) and 5h. (near Tyosi), 7h. (Huancayo (3), La Paz, and near Tyosi), 8h. (La Paz), 9h. (near Grenoble), 10h. (near Ksara), 11h. (Hong Kong, and near Glenmuick), 14h. (Huancayo (2), Mount Wilson, Pasadena, Tinemaha, Oak Ridge, San Juan, and near Tyosi), 17h. (near Tyosi (5)), 18h. (Huancayo, Triest, New Plymouth, near Wellington, and near Tyosi), 19h. (near Apia and near Tyosi (2)), 20h. (near Hukuoka, and Nagasaki), 21h. (Baku, Tiflis, Tashkent (2), Tchimkent, Pulkovo, Simferopol, Mount Wilson, Pasadena, Tinemaha, near Apia, and near Tyosi).

Nov. 8d. 0h. 50m. 41s. Epicentre 47°·4N. 10°·5E. (as on 1933 May 22d.). R.2.

A = +·666, B = +·123, C = +·736; D = +·182, E = −·983;
G = +·724, H = +·134, K = −·677.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ravensburg	0·7	302	e 0 9k	− 1	i 0 22	+ 4	—	—
Ebingen	1·3	307	e 1 18	+60	i 1 40	+67	—	—
Zurich	1·3	269	e 0 20	+ 2	i 0 40	+ 7	—	—
Stuttgart	1·6	328	e 0 23a	0	i 0 38	− 3	—	1·0
Karlsruhe	2·1	319	0 34	+ 4	1 6	S_g	1·5	1·9
Treviso	2·1	146	i 0 31	+ 1	—	—	—	1·2
Padova	2·2	155	0 34	+ 3	1 6	+ 9	—	—
Strasbourg	2·2	303	e 0 31	0	i 1 5	+ 8	—	—
Venice	2·3	147	e 0 37	+ 4	i 1 26	S_g	—	2·2
Neuchatel	2·4	261	e 0 35	+ 1	i 1 15	S*	—	—
Pavia	2·4	202	e 0 50	P_g	—	—	—	—
Piacenza	2·4	194	e 0 43	+ 9	1 11	+ 9	1·5	2·7
Sion	2·4	242	i 0 41	+ 7	i 1 15	S_g	—	—
Triest	2·8	129	i 0 38	− 2	i 1 15	+ 3	—	—
Cheb	3·0	25	e 0 37	− 6	e 1 27	S*	e 1·5	—
Feldberg	3·1	334	e 0 46	+ 2	e 1 18	− 2	—	2·1
Graz	3·4	94	e 0 51	+ 2	i 1 32	+ 5	i 1·6	1·7
Prato	3·5	173	i 0 47	− 3	i 1 35	+ 5	—	1·9
Florence	3·6	171	e 0 50	− 1	—	—	—	1·8
Jena	3·6	12	e 0 43	− 8	—	—	e 1·3	1·8
Göttingen	4·1	356	i 0 56	− 2	i 2 6	S_g	—	2·9
Vienna	4·1	76	e 1 5	P*	i 1 44	− 1	—	2·5
Zagreb	4·1	111	1 4	+ 6	e 1 45	0	—	2·2
Potsdam	5·2	17	—	—	e 2 7	− 6	e 2·8	3·6
Uccle	5·2	213	e 1 15	+ 1	e 2 15	+ 2	—	—
Puy de Dôme	5·4	255	e 1 15	− 2	e 2 55	S_g	—	—
Paris	5·5	288	e 1 49?	P_g	—	—	3·3	4·3
De Bilt	5·8	325	—	—	e 3 4	S_g	—	4·0
Hamburg	6·2	357	1 19?	− 9	—	—	—	3·3
Kew	8·1	304	—	—	e 3 25	− 1	—	—

For Notes see next page.

NOTES TO Nov. 8d. 0h. 50m. 41s.

Additional readings :—
Ravensburg i = +12s., i_Q = +20s.
Ebingen P_g = +1m.20s.
Stuttgart iP_g = +25s., iS^* = +44s., iS_g = +48s.
Treviso PS = +1m.3s. = S^* +2s.
Strasbourg iP_g = +36s., PP = +44s., PS = +1m.0s., SS = +1m.17s., SSS = +1m.41s.
Venice eP = +41s.
Neuchatel iP_g = +43s.
Triest iP_g = +44s. = P^* − 1s., i = +1m.0s., +1m.5s., iS_g = +1m.22s.
Cheb e = +44s.
Feldberg i = +58s. = P_g +2s., e = +1m.0s. and +1m.4s., eN = +1m.7s., i = +1m.22s., iN = +1m.34s. = S^* +3s., and iE = +1m.37s. = S_g +1s., eN = +1m.41s., iN = +1m.44s.
Jena eE = +47s., iE = +49s. and +55s. = P^* − 3s., iNZ = +1m.3s., iE = +1m.7s. = P_g +1s. , +1m.13s. and +1m.17s.
Göttingen ePE = +1m.0s., ePZ = +1m.7s. = P^* +0s., eP_gEN = +1m.14s., eP_gEZ = +1m.18s., eE = +1m.29s., iN = +1m.39s., eEN = +1m.46s. = S +1s.
Vienna P = +1m.7s., iZ = +1m.9s., P^* = +1m.11s., iN = +1m.15s., P_g = +1m.18s., PP = +1m.22s., iEN = +1m.29s., i = +1m.35s., S = +1m.48s., iZ = +1m.57s., S^* = +2m.7s., S_g = +2m.14s.
Zagreb eP_g = +1m.8s., eNW = +1m.15s., eNE = +1m.21s., i = +2m.5s. = S_g −4s.
Potsdam eZ = +2m.19s., iN = +2m.31s. = S^* − 2s., iE = +2m.39s., i = +2m.45s. = S_g − 1s.
Uccle e = +2m.38s. = S^* +5s. and +2m.45s. = S_g − 1s., i = +2m.51s., +2m.59s. and +3m.20s.
Puy de Dôme eP_g? = +1m.59s.

Nov. 8d. 5h. 44m. 6s. Epicentre 41°·5N. 142°·7E. (as on 1933 Jan. 8d.). R.2.

The Japanese stations give epicentre 41°·3N. 142°·3E. The above position seems to fit rather better.

A = −·596, B = +·454, C = +·663 ; D = +·606, E = +·795 ; G = −·527, H = +·402, K = −·749.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	M. m.
Hakodate	1·5	280	0 24	+ 3	0 42	+ 3	—
Obihiro	1·5	15	0 31	+10	0 56	+17	—
Aomori	1·6	245	0 19	− 4	0 35	− 6	—
Kusiro	1·9	49	0 26	− 2	0 54	+ 5	—
Miyako	1·9	196	0 22a	− 6	0 44	− 5	—
Sapporo	1·9	328	0 29	+ 1	0 54	+ 5	—
Morioka	2·2	213	0 26a	− 5	0 48	− 9	—
Asahigawa	2·3	354	0 40	+ 7	1 12	+13	—
Mizusawa	2·7	208	i 0 34	− 5	i 1 1	− 8	—
Akita	2·7	227	0 41	+ 2	1 4	− 5	—
Nemuro	2·8	49	0 48	+ 8	1 18	+ 6	—
Hukusima	4·2	206	0 53	− 7	1 36	−12	—
Mito	5·4	200	1 4	−13	2 2	−16	—
Kakioka	5·7	201	1 10	−11	2 10	−15	—
Tukubasan	5·7	202	1 14	− 7	2 12	−13	—
Maebasi	5·8	210	1 23	+ 1	2 29	+ 1	—
Tyosi	6·0	194	e 1 23	− 2	2 42	+ 9	2·9
Nagano	6·0	217	1 24	− 1	2 47	+14	—
Tokyo	6·3	203	1 31	+ 1	—	—	—
Kohu	6·7	210	1 36	+ 1	2 58	+ 7	—
Hunatu	6·8	208	1 42	+ 5	2 54	+ 1	—
Misima	7·0	205	1 45	+ 6	2 59	0	—
Nagoya	7·8	217	e 1 47	− 4	e 3 10	− 9	—

Muroran (△ = 1°·5) gives S − P = 18s.

Nov. 8d. 17h. 38m. 44s. Epicentre 35°·7N. 137°·3E. (as on 1933 June 29d.). X.

$A = -\cdot597$, $B = +\cdot551$, $C = +\cdot584$.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Nagoya	0·6	207	1 0 7a	− 2	0 13	− 2	0·3
Osaka	1·8	234	0 28	+ 2	0 50	+ 4	0·8
Kobe	2·0	240	—	—	0 54	+ 3	0·9
Toyooka	2·0	265	0 30	+ 1	0 53	+ 2	0·9

Osaka gives also i = +42s.

Nov. 8d. Readings also at 0h. (near Tyosi), 1h. (Berkeley and Lick), 2h. (near Tyosi), 3h. (Huancayo), 6h. (Wellington), 7h. (near Tyosi), 14h. (Andijan, Frunse, Tchimkent, Tashkent, Ekaterinburg, Bombay, and Calcutta), 15h. (Huancayo (2) and Tyosi), 18h. (Huancayo), 19h. (Huancayo and La Paz), 21h. (Tyosi), 23h. (near Tiflis).

Nov. 9d. Readings at 3h. (Mizusawa, Wellington, near Batavia, and Malabar), 4h. (near Batavia and Malabar), 6h. (Alicante and Fort de France), 7h. (Batavia, Manila, Perth, and Tashkent), 8h. (Ekaterinburg and Paris), 9h. (La Paz), 10h. (near Taihoku and near Huancayo), 12h. (Wellington), 17h. (Ebingen, Ravensburg, Stuttgart, near Chur, Zurich, La Paz, near Hukuoka, and Nagasaki), 21h. (Wellington), 23h. (Oak Ridge (2), Port au Prince, and San Juan).

Nov. 10d. Readings at 0h. (De Bilt, Strasbourg, Stuttgart, Uccle, Ekaterinburg, Tashkent, and Oak Ridge), 2h. and 4h. (Mizusawa), 5h. (Kobe, Mizusawa, Osaka, Nagoya, Nagasaki, Sumoto, Ekaterinburg, Pasadena, and Tinemaha), 6h. (Huancayo and Tashkent), 8h. (Mount Wilson, Pasadena, and Tinemaha), 12h. (Mizusawa), 13h. (near Hukuoka), 16h. (near Fort de France), 17h. (Ferndale), 19h. (Mizusawa), 23h. (near Tyosi).

Nov. 11d. Readings at 9h. (near Nagoya and Tyosi), 11h. (Wellington and near Hastings), 13h. (Tyosi and near Nagoya), 14h. (near Mizusawa), 16h. (Tashkent), 18h. (Mount Wilson, Pasadena, Tinemaha, Ekaterinburg, Kucino, Perth, Melbourne, and Riverview), 21h. (Lick), 22h. (Tyosi and near Nagoya).

Nov. 12d. Readings at 0h. (San Juan and near Tyosi), 2h. (Glenmuick, Kobe, and near Huancayo), 3h. (Christchurch, Glenmuick, near Wellington, and near Tyosi), 7h. (Nagoya and near Tyosi), 8h. (Taihoku and Wellington), 10h. (Ksara), 16h. (near Andijan), 17h. (near Tchimkent), 19h. (Ekaterinburg, Kucino, Tashkent, Apia, Adelaide, Melbourne, Riverview, Perth, and Mineo), 20h. (Tashkent, near Andijan, and Tchimkent), 22h. (Riverview, Mount Wilson, and Pasadena).

Nov. 13d. Readings at 0h. (Apia), 1h. (Andijan, Frunse, and near Manila), 2h. (near Huancayo and near Wellington), 3h. (near Santiago), 4h. (Wellington, near Simferopol, Theodosia, and Yalta), 5h. (near Kobe and near Wellington), 6h. (Tucson), 8h. (near Batavia, Malabar, Soengei Langka, and near Huancayo), 9h. (near Taihoku), 19h. (Branner and near Taihoku), 20h. (near Amboina).

Nov. 14d. 14h. 5m. 10s. Epicentre 33°·8S. 70°·0W. N.2.

A = +·284, B = −·781, C = −·556; D = −·940, E = −·342; G = −·190, H = +·523, K = −·831.

A *depth* of focus 0·020 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata		−0·2	10·0	100	i 2 19	+ 1	4 2	− 6	4·5	6·1
Montezuma		−0·3	11·2	4	3 8	+35	e 5 5	+29	6·5	—
Sucre		−0·5	15·4	17	3 27	0	i 6 9	− 4	7·7	—
La Paz		−0·6	17·4	6	3 52	0	i 7 1	+ 4	9·2	11·6
Huancayo		−0·9	22·2	346	i 4 46	+ 3	i 8 41	+ 9	—	—
Fort de France		−2·1	49·1	11	e 7 55	−34	—	—	e 22·8	—
San Juan		−2·2	52·3	5	e 8 55	+ 3	i 16 1	− 1	—	—
Columbia		−2·6	68·6	350	e 11 22	+37	e 20 12	+40	—	—
Cape Town		−2·6	70·8	118	20 18	S	(20 18)	+19	39·8	—
Little Rock	N.	−2·6	71·7	340	i 11 5	0	e 20 12	+ 2	—	—
Charlottesville		−2·6	72·2	353	e 11 8	0	e 20 18	+ 2	—	—
Georgetown		−2·6	73·0	355	i 11 18k	+ 5	i 20 33	+ 7	—	—
Cincinnati	Z.	−2·6	74·2	348	i 9 17k	?	—	—	—	—
Fordham	N.	−2·6	74·8	357	i 11 25	+ 1	i 20 48	+ 1	—	—
St. Louis		−2·6	74·8	344	i 11 22	− 2	e 20 44	− 3	—	—
Florissant		−2·6	75·0	344	i 11 24	− 1	i 20 48	− 2	—	—
Oak Ridge		−2·6	76·3	359	11 32	− 1	e 20 56	− 9	—	—
Tucson		−2·6	76·4	325	e 11 37	+ 4	e 21 8	+ 2	—	—
Ann Arbor		−2·6	77·1	350	—	—	i 21 14	0	—	—
Toronto		−2·7	77·9	353	i 11 42	+ 1	i 21 14	− 8	—	—
Ottawa		−2·7	79·3	356	i 11 32	−17	i 21 32	− 6	e 34·8	—
La Jolla		−2·7	80·1	321	e 11 55	+ 1	—	—	—	—
Riverside		−2·7	81·0	322	i 11 59	0	e 21 59	+ 2	—	—
Mount Wilson		−2·7	81·5	322	i 12 4k	+ 3	e 22 5	+ 2	—	—
Pasadena		−2·7	81·5	322	i 12 3k	+ 2	i 22 5	+ 2	—	—
Santa Barbara	Z.	−2·7	82·6	320	e 12 8	+ 1	—	—	—	—
Haiwee		−2·7	83·0	323	i 12 10	+ 1	e 22 20	+ 1	—	—
Tinemaha		−2·7	83·9	323	i 12 17	+ 3	e 22 29	+ 1	—	—
Branner		−2·7	86·2	321	i 12 29	+ 3	—	—	—	—
Berkeley		−2·7	86·5	321	i 12 28	+ 1	i 22 55	0	—	—
Ukiah		−2·8	88·0	321	e 12 34	0	e 23 8	− 2	—	—
Sitka		—	106·1	329	—	—	e 27 42	PS	—	—
De Bilt		—	107·9	39	—	—	e 25 50?	[+46]	e 58·8	—
Ksara		—	119·9	68	e 20 0	PP	e 30 52	PPS	—	—
Ekaterinburg		—	139·6	40	e 22 35	PP	—	—	61·8	—
Bombay		—	143·8	105	e 19 50	[+20]	—	—	—	—
Tashkent		—	147·2	65	i 19 27	[−10]	e 30 16	PS	e 55·8	86·3
Tchimkent		—	147·4	63	e 21 26	?	—	—	—	—
Andijan		—	149·5	66	e 19 34	[− 7]	—	—	—	—
Frunse		—	151·0	61	e 19 39	[− 4]	—	—	—	—
Almata		—	152·6	60	e 19 50	[+ 5]	—	—	—	—
Mizusawa	E.	—	154·5	291	—	—	20 5	?	—	—
Chiufeng		—	172·0	324	i 19 55k	[−10]	e 25 7	PP	—	—
Nanking	Z.	—	172·4	259	e 19 58	[− 7]	—	—	—	—

Additional readings :—
La Plata Z = +2m.49s., E = +3m.4s., eSE = +3m.56s., N = +3m.46s., and +4m.11s.
Huancayo i = +5m.8s., iPP = +5m.22s., i = +8m.23s.
San Juan i = +9m.42s., +16m.27s., and +16m.41s., e = +18m.48s., eSS = +19m.31s., i = +20m.29s.
Columbia e = +20m.26s.
Cape Town PP = +22m.36s., PPP = +23m.36s., S? = +28m.11s., PS? = +28m.35s.
Georgetown P_cPZ = +12m.1s., iPSE = +21m.23s., eSSEZ = +25m.18s.
Cincinnati i = +9m.48s., +10m.1s., and +11m.21s.; T_0 = 14h.5m.12s.
Fordham iP_cPN = +12m.4s., iPSE = +21m.38s.
St. Louis ipP = +11m.43s., iP_cP = +12m.4s., ePSN = +21m.19s., esSN = +21m.33s.; T_0 = 14h.5m.13s.

Continued on next page.

Florissant ipPZ = +11m.52s., isPZ = +12m.6s., iPPZ = +14m.50s., isSEN = +21m.36s.
Oak Ridge iZ = +12m.14s., iPS = +21m.54s.
Toronto iN = +12m.11s., ePPPE = +16m.32s.; T_0 = 14h.5m.26s.
Ottawa iN = +12m.32s., PSE = +22m.25s., SSN = +27m.2s.; T_0 = 14h.4m.42s.
La Jolla eP_cPZ = +12m.23s.
Riverside ipPZ = +12m.40s.
Pasadena eP_cPZ = +12m.25s., ipPZ = +12m.44s., esPN = +13m.8s.
Haiwee epPZ = +12m.52s.
Tinemaha ipPN = +12m.52s.
Berkeley iZ = +13m.11s., iN = +13m.34s.
Ukiah eSKS = +22m.53s.
Sitka e = +28m.12s.
Ekaterinburg e = +23m.22s. = PKS +14s., i = +28m.49s., e = +29m.47s.
Tashkent ePPS = +33m.48s.
Chiufeng ipP = +20m.27s., i = +21m.19s., and +21m.59s.
Nanking iZ = +21m.21s. and +25m.11s. = PP − 7s.
Long waves were also recorded at Hong Kong.

Nov. 14d. Readings also at 0h. (La Paz, near Mizusawa, Tyosi, and Nagoya), 7h. (Wellington), 9h. (Huancayo), 10h. (near Santiago (3)), 13h. (Huancayo), 15h. (near Santiago), 16h. (near La Paz), 19h. (Apia), 20h. (Huancayo), 23h. (Amboina).

Nov. 15d. Readings at 2h. (near Huancayo), 4h. (Tyosi, Ekaterinburg, Tananarive, and Huancayo), 5h. (Cape Town, Bombay, Tashkent, and near Tyosi), 6h. (near Trenta), 7h. (near Tyosi), 9h. (Huancayo and near Ksara), 12h. (near Tyosi), 13h. (near Huancayo and near Tyosi), 16h. (near Batavia and Malabar), 22h. (near Santiago), 23h. (near Amboina).

Nov. 16d. 13h. 54m. 30s. (I) } Epicentre 33°·7N. 137°·0E. X.
13h. 57m. 31s. (II) } (as on 1933 May 20d.). X.

A = −·608, B = +·567, C = +·555.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
I **Nagoya**	1·5	359	e 0 19	− 2	0 33	− 6	—
II	1·5	359	e 0 20	− 1	0 35	− 4	0·8
I **Osaka**	1·5	308	0 20	− 1	0 38	− 1	0·8
II	1·5	308	0 23	+ 2	0 41	+ 2	1·0
I **Kobe**	1·8	303	e 0 27	+ 1	0 47	+ 1	0·8
II	1·8	303	e 0 25	− 1	i 0 47	+ 1	0·9
I **Sumoto**	1·8	290	0 29	+ 3	0 51	S*	0·9
II	1·8	290	0 29	+ 3	0 54	S_g	—
II **Muroto**	2·4	259	e 0 25	− 9	e 1 6	+ 4	—
II **Toyooka**	2·5	315	0 42	+ 6	1 12	+ 8	1·3
II **Koti**	2·9	267	e 0 51	P_g	e 1 29	S_g	—

Nov. 16d. 20h. 33m. 2s. Epicentre 33°·3N. 134°·0E. N.3.

A = −·581, B = +·601, C = +·549.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Muroto	0·2	108	0 2	− 1	0 6	+ 1	—
Koti	0·5	303	i 0 7	0	i 0 15	+ 2	0·3
Simidu	1·0	239	0 21	+ 7	—	—	—
Sumoto	1·3	35	0 16	− 2	0 29	− 4	0·5
Kobe	1·7	35	0 24	0	0 43	− 1	0·7
Osaka	1·9	43	0 29	+ 1	0 50	+ 1	1·3

Nov. 16d. Readings also at 1h. (Almata), 3h. (La Paz, Ksara, and Tiflis), 6h. (Huancayo), 8h. (Baku and Tiflis), 9h. (near Florissant and St. Louis), 10h. (Huancayo and Tyosi), 11h. (Huancayo and Tiflis), 14h. (Little Rock), 15h. (Tashkent and near Andijan), 16h. (Camerino, Florence, and Manila), 18h. (Huancayo), 20h. (La Paz), 21h. (near Nagoya), 22h. (Ekaterinburg, Tiflis, Chiufeng, Kucino, Tashkent, and Pulkovo), 23h. (near Amboina).

Nov. 17d. Readings at 1h. (Andijan), 3h. (La Paz), 4h. (La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, St. Louis, Chicago, Toronto, and Strasbourg), 5h. (Huancayo), 7h. (near Medan (2)), 8h. (Balboa Heights, San Juan, Huancayo, La Paz, Mount Wilson, Pasadena, Riverside, and near Amboina), 9h. (San Juan, Chiufeng, Manila, Hong Kong, Phu-Lien, Tashkent, and Ekaterinburg), 10h. (De Bilt and near Medan), 11h. (Messina, near Trenta, and near Medan), 14h. (Nanking), 16h. (Edinburgh), 17h. (Huancayo), 18h. (near Branner), 23h. (Ekaterinburg and Tashkent).

Nov. 18d. 2h. 20m. 54s. Epicentre 2°·0N. 122°·0E. (as on 1932 Oct. 18d.). X.

A = −·530, B = +·847, C = +·035 ; D = +·848, E = +·530 ;
G = −·018, H = +·030, K = −·999.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	8·4	133	e 1 48	−11	3 21	−13	—	—
Manila	12·6	356	e 2 52	− 4	5 39	+22	7·1	8·6
Hong Kong	21·7	340	—	—	8 56	+16	—	13·4
Tashkent	61·5	317	i 10 18	+ 3	18 32	− 4	e 35·2	43·6
Ekaterinburg	73·0	330	e 11 31	+ 2	e 20 48	− 9	35·1	—

Nov. 18d. 3h. 54m. 0s. Epicentre 7°·0S. 155°·0E. (as on 1931 July 23d.). R.3.

A = −·900, B = +·420, C = −·122 ; D = +·423, E = +·906 ;
G = +·111, H = −·052, K = −·993.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva	25·4	118	—	—	e 11 0?	SS	—	—
Amboina	26·9	276	i 5 25	−12	11 5	SS	—	—
Riverview	27·1	187	e 5 40	+ 1	e 10 16	− 1	14·7	18·0
Sydney	27·1	187	e 8 54	(− 7)	—	—	14·2	15·3
Adelaide	31·8	206	e 3 10?	?	e 11 30	− 2	21·7?	28·7
Melbourne	32·1	195	—	—	e 11 27?	−10	17·3	18·4
Wellington	38·6	156	9 0?	PP	—	—	—	—
Christchurch	39·7	160	7 57	+28	i 14 36	+64	e 22·5	—
Manila	40·1	303	7 29k	− 4	13 31	− 7	19·1	—
Perth	44·1	230	e 14 35	SS	(e 14 35)	− 2	—	26·0
Batavia	47·9	267	e 8 37	+ 2	15 28	− 3	—	—
Hong Kong	49·6	309	9 22	+34	15 52	− 3	—	28·5
Nanking	52·2	320	9 2	− 6	16 23	− 8	—	—
Chiufeng	59·2	326	e 9 57	− 2	17 56	− 9	—	—
Bombay	85·0	290	—	—	e 23 0	− 8	—	—
Frunse	87·9	313	e 13 40	+53	—	—	—	—
Andijan	89·0	312	e 12 50	− 3	—	—	—	—
Santa Barbara z.	90·2	55	e 12 59	+ 1	—	—	—	—
Pasadena	91·4	56	i 13 3k	− 1	—	—	—	—
Tashkent	91·4	313	e 13 29	+25	i 23 56	−13	e 45·7	55·5
Mount Wilson	91·5	56	i 13 4	0	—	—	—	—
Tinemaha z.	91·6	53	e 13 6	+ 1	—	—	—	—
La Jolla z.	92·0	58	i 13 8	+ 1	—	—	—	—
Riverside z.	92·0	56	i 13 7	0	—	—	—	—
Ekaterinburg	98·2	326	—	—	e 31 28	SS	44·0	—
Baku	106·0	310	—	—	e 26 5	− 9	76·0	87·9
Pulkovo	113·0	333	—	—	e 28 56	PS	67·0	—

Additional readings :—
Riverview e = +6m.30s., iE = +11m.44s.
Adelaide e = +13m.24s. = SS +12s. and +16m.50s. = S_cS −4s.
Melbourne i = +15m.0s.
Hong Kong SS? = +18m.40s. = S_cS −2s.
Pasadena iZ = +13m.15s., +13m.32s., and +13m.41s.
Tinemaha eZ = +13m.34s.
Riverside iZ = +13m.18s., +13m.36s., and +13m.44s.
Baku e = +28m.10s. = PS +22s., +32m.35s., and +54m.22s.
Long waves were also recorded at De Bilt and Strasbourg.

Nov. 18d. Readings also at 0h. (Huancayo and Strasbourg), 5h. (Riverview and near Tyosi), 6h. (Adelaide, Riverview, Perth, Christchurch, Wellington, and Suva), 9h. (near Amboina), 10h. (Zi-ka-wei), 13h. (Huancayo, Christchurch, Glenmuick, and near Wellington), 14h. (near Nanking and near Wellington), 15h. (near Tyosi), 16h. (Melbourne, Riverview, and near Manila), 17h. (Baku, Tiflis (2), Bombay, Ekaterinburg (2), Tashkent (2), Almata, Andijan, Frunse, Tananarive, Riverview, Perth, Wellington, Hong Kong, Strasbourg, and near Chiufeng), 18h. (De Bilt, Stuttgart, Granada, and Paris), 19h. (Wellington, near Batavia, and Soengei Langka), 20h. (near Apia), 22h. (near Manila), 23h. (Ksara and Tiflis).

Nov. 19d. 1h. 33m. 40s. Epicentre 32°·6N. 139°·0E. N.2.
(given by the Japanese stations).

$A = -\cdot636$, $B = +\cdot553$, $C = +\cdot539$; $D = +\cdot656$, $E = +\cdot755$; $G = -\cdot407$, $H = +\cdot353$, $K = -\cdot842$.

A *depth* of focus 0·035 has been assumed.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.
Hatidyozima		+1·0	0·9	55	0 51	+23	1 20	+31	—
Susaki		+0·8	2·1	0	0 43	+ 2	1 19	+ 5	—
Omaesaki		+0·8	2·1	342	0 43a	+ 2	1 17	+ 3	—
Hamamatu		+0·7	2·4	333	0 43	− 1	1 19	− 1	—
Mera		+0·7	2·4	17	0 47	+ 3	1 25	+ 5	—
Misima		+0·7	2·5	359	0 47k	+ 1	1 25	+ 3	—
Numadu		+0·7	2·5	357	0 47	+ 1	1 25	+ 3	—
Siomisaki		+0·6	2·8	287	0 47	− 2	1 25	− 2	—
Yokosuka		+0·6	2·8	11	0 49	0	1 24	− 3	—
Yokohama		+0·6	2·9	11	0 39	−11	1 19	−11	—
Hunatu		+0·6	2·9	356	0 51	+ 1	1 30	0	—
Nagoya		+0·5	3·1	326	e 0 51	0	1 30	− 2	—
Kameyama		+0·5	3·1	318	0 49	− 2	1 30	− 2	—
Kobu		+0·5	3·1	353	0 53	+ 2	1 33	+ 1	—
Tokyo		+0·5	3·1	11	0 54	+ 3	1 38	+ 6	1·6
Gihu		+0·4	3·3	327	0 53	0	1 31	− 4	—
Tyosi		+0·4	3·5	26	—	—	1 44	+ 4	—
Hikone		+0·4	3·5	320	0 46	−10	1 28	−12	—
Kumagaya		+0·4	3·6	5	0 55	− 2	1 43	+ 1	—
Wakayama		+0·4	3·6	298	0 53a	− 4	1 36	− 6	—
Kakioka		+0·4	3·7	15	0 58	0	1 43	− 2	—
Tukubasan		+0·4	3·7	13	0 57	− 1	1 43	− 2	—
Sumoto		+0·3	3·8	298	0 55a	− 3	1 40	− 5	1·7
Mito		+0·3	4·0	17	1 2	+ 1	1 51	+ 1	—
Nagano		+0·3	4·1	351	1 2	− 1	1 48	− 5	—
Hukusima		0·0	5·3	14	1 12	− 3	2 9	− 6	—
Mizusawa	E.	−0·3	6·7	14	—	—	e 2 50	+ 7	—

Nov. 19d. 3h. 11m. 23s. Epicentre 16°·7S. 167°·8E. N.2.

$A = -\cdot936$, $B = +\cdot202$, $C = -\cdot287$; $D = +\cdot211$, $E = +\cdot977$ $G = +\cdot281$, $H = -\cdot061$, $K = -\cdot958$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Suva		10·2	100	2 49?	+25	5 13	S*	6·2	6·6
Apia	E.	19·9	84	4 31	+ 2	—	—	9·4	—
Arapuni		22·5	164	e 8 1	?	8 58	+ 3	10·3	11·6
Sydney		22·7	218	e 4 49	− 9	i 9 7	+ 8	11·4	13·1
Riverview		22·8	218	i 4 56k	− 3	i 9 5	+ 4	e 10·7	12·6
Wellington		25·3	168	5 18	− 5	9 44	− 2	12·7	13·6
Christchurch		27·2	172	i 5 43	+ 3	10 30	+12	13·6	—
Melbourne		29·1	219	5 57	0	10 49	− 1	14·1	19·1
Adelaide		31·8	228	e 6 22	+ 1	i 11 32	0	16·2	19·7
Palau		40·8	304	8 41	+62	—	—	—	—

Continued on page next.

		△	Az.	P.	O − C.	S.	O − C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina		41·0	285	i 7 34	− 6	—	—	e 20·8	—
Perth		49·3	242	6 37	?	16 2	+11	24·2	30·6
Titizima		50·3	331	8 58	+ 4	15 56	− 9	—	—
Honolulu T.H.		51·1	43	—	—	e 21 19	SSS	e 23·5	—
Manila		55·8	302	9 33a	− 1	17 9	−11	25·9	31·2
Nagoya		59·6	332	e 10 17	+15	—	—	—	—
Miyazaki		59·8	325	9 6	−57	16 45	?	—	—
Kobe		60·0	330	e 8 31	?	e 18 7	− 9	26·9	31·5
Batavia		60·5	272	10 6k	− 2	18 12	−11	e 33·6	—
Mizusawa	E.	61·1	338	e 9 40	−32	18 7	−23	26·1	—
	N.	61·1	338	e 10 7	− 5	18 26	− 4	25·4	—
Hong Kong		65·4	305	10 46	+ 5	19 27	+ 2	31·9	32·9
Nanking		67·7	317	10 58k	+ 2	i 19 57	+ 4	—	35·0
Chiufeng		74·4	322	i 11 35k	− 2	i 21 7	− 6	e 35·6	41·2
Ukiah		85·1	47	—	—	e 22 57	[− 3]	e 39·9	—
Berkeley	E.	85·2	48	—	—	e 23 9	− 1	—	—
Pasadena		86·7	53	i 12 40a	− 2	—	—	i 40·0	—
Mount Wilson		86·8	53	i 12 43	+ 1	—	—	—	—
La Jolla	Z.	86·9	55	e 12 42	− 1	—	—	—	—
Riverside		87·2	53	i 12 44	0	e 23 23	− 6	—	—
Sitka		87·4	27	—	—	e 23 23	[+ 7]	—	—
Haiwee		87·6	52	e 12 49	+ 3	—	—	—	—
Tinemaha		87·8	50	i 12 47	0	e 23 30	− 5	—	—
Victoria		89·1	38	e 23 27	S	(e 23 27)	[0]	e 42·0	55·3
Tucson		91·8	57	—	—	e 23 39	[− 4]	e 42·6	—
Bozeman		95·9	45	e 23 19	?	e 24 49	− 1	e 45·6	—
Bombay		99·9	287	e 16 37	?	—	—	—	—
St. Louis		109·5	54	—	—	26 8	{+ 5}	e 51·5	—
Huancayo		111·3	111	—	—	e 24 37	[−42]	—	—
Chicago		111·8	50	—	—	e 24 43	[−38]	e 56·0	—
Ekaterinburg		113·3	325	e 19 22	PP	e 25 18	[− 9]	45·6	55·5
Cincinnati		114·0	54	e 27 34	?	—	—	e 53·6	—
Toronto		117·8	49	e 19 4	[+24]	i 24 41	[−62]	45·6	—
Ottawa		120·3	46	—	—	e 25 55	[+ 4]	e 53·6	—
Baku		121·8	307	e 20 51	PP	e 25 55	[− 1]	59·6	84·9
Oak Ridge		123·6	49	e 22 7	?	e 26 4	[+ 3]	e 58·1	—
Tiflis	E.	125·5	310	e 20 58	PP	e 26 14	[+ 7]	e 61·1	65·9
Pulkovo		127·2	335	—	—	e 34 33	?	58·6	77·7
San Juan		128·7	79	—	—	e 22 37	?	e 60·1	—
Theodosia		131·3	316	e 22 37	PKS	—	—	—	—
Upsala		132·2	340	e 22 35	PKS	—	—	e 71·6	—
Yalta		132·3	315	e 22 37	PKS	—	—	—	—
Sebastopol		132·7	316	e 22 42	PKS	—	—	—	—
Ksara		133·8	300	e 19 37	[+24]	—	—	—	—
Copenhagen		136·7	340	—	—	42 37?	?	—	—
Potsdam		139·2	337	e 18 37?	[−43]	—	—	e 68·6	81·6
Vienna	Z.	140·8	329	e 19 24	[+ 1]	—	—	—	—
De Bilt		142·0	343	e 19 49	[+25]	e 41 24	SS	e 69·6	90·1
Uccle		143·4	343	e 19 30	[+ 1]	e 41 37?	SS	58·6	—
Stuttgart		143·5	336	e 19 30k	[+ 1]	e 28 13	?	e 69·6	—
Oxford		143·9	348	—	—	e 29 23	{−24}	e 78·6	88·0
Triest		143·9	329	i 19 30k	[− 1]	—	—	e 60·6	72·6
Kew		144·0	346	e 19 34	[+ 3]	—	—	e 69·6	—
Strasbourg		144·2	337	i 19 31k	[− 1]	—	—	e 48·6	—
Treviso		144·6	330	i 19 33	[0]	—	—	—	—
Zurich		144·8	335	e 19 35	[+ 2]	—	—	—	—
Chur		144·9	335	e 19 33	[− 1]	—	—	—	—
Padova		145·0	330	e 19 36	[+ 2]	—	—	—	—
Neuchatel		145·8	336	e 19 36	[0]	—	—	—	—
Paris		145·8	342	i 19 37	[+ 1]	—	—	70·6	100·6
Piacenza		146·2	332	19 45	[+ 9]	—	—	—	90·9
Florence		146·4	328	i 20 7	[+31]	i 31 2	{+60}	57·6	71·6
Prato		146·4	329	e 19 37	[+ 1]	—	—	—	—
Trenta		146·6	318	e 19 52	[+15]	—	—	—	—
Catania		148·2	316	19 47	[+ 8]	—	—	—	—
Toledo		155·8	345	e 20 21	{− 4}	—	—	—	—
Granada		158·2	341	e 20 4	[+13]	—	—	88·6	101·2

For Notes see next page.

NOTES TO Nov. 19d. 3h. 11m. 32s.

Additional readings :—
Riverview iPZ = +5m.0s., PP? = +5m.30s., iSE = +9m.8s., SS? = +9m.43s.
Christchurch iP$_c$P = +10m.12s.
Melbourne i = +10m.12s.
Adelaide iSS = +13m.10s., i = +15m.6s.
Perth P$_c$P = +9m.7s., PP = +11m.32s. = PPPP +2s., PS = +16m.12s., SS = +19m.47s.
Kobe ePZ = +9m.47s., ePPPE = +13m.17s., eEN = +19m.58s. = S$_c$S +6s., eSSN = +21m.52s.
Nanking eZ = +24m.39s.
Chiufeng iEN = +21m.20s. = PS −16s. ; T$_0$ = 3h.11m.31s.
Ukiah eSS = +28m.47s., e = +35m.7s.
Pasadena ePP = +16m.15s.
Sitka e = +23m.39s. = S +8s. and +36m.1s.
Tucson eSS = +30m.45s.
Bozeman e = +26m.11s. = PS +10s.
St. Louis PS = +28m.23s., SS = +34m.7s., SSS = +38m.12s.
Huancayo e = +28m.49s. = PS +8s.
Chicago ePS = +28m.25s., eSS = +34m.43s.
Ekaterinburg e = +28m.57s. = PS −3s.
Cincinnati e = +29m.14s. = PS +7s., i = +30m.36s. and +38m.29s.
Ottawa eE = +30m.17s. = PS +12s., e = +36m.45s. = SS +9s.
Oak Ridge eNE = +25m.57s., eNW = +27m.51s., +30m.35s. = PS +0s., +32m.17s., +33m.19s., +36m.1s., +37m.15s. = SS −4s., +40m.23s., +41m.29s. = SSS −13s., eNE = +42m.9s., eNW = +44m.19s. and +46m.3s., eL$_g$ = +50·6m.
Tiflis PSE = +31m.32s., eSSSE = +44m.36s.
Pulkovo e = +38m.17s. = SS +12s., +40m.57s., and +51m.13s.
San Juan ePPS = +32m.27s.
Ksara ePP = +22m.8s.
De Bilt eEN = +43m.1s.
Stuttgart ePKP$_2$ = +20m.13s., eSSEN = +41m.25s.
Oxford e = +40m.9s., +43m.15s., and +43m.33s.
Triest iSS = +41m.31s.
Kew eSS = +41m.42s., e = +43m.8s.
Strasbourg ePP = +22m.33s., eSS = +41m.7s., e = +43m.7s.
Florence i = +22m.8s., +26m.47s., PS = +41m.7s.
Granada e = +20m.44s.
Long waves were also recorded at Hyderabad, La Paz, La Plata, and other American and European stations.

Nov. 19d. 9h. 8m. 33s. Epicentre 24°·0N. 97°·0E. (as on 1931 July 29d.). X.

A = −·111, B = +·907, C = +·407 ; D = +·993, E = +·122 ;
G = −·050, H = +·404, K = −·914.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta		8·0	261	4 3	S*	6 47	L	8·1	10·2
Hong Kong		15·9	93	6 37	S	(6 37)	+ 1	8·8	9·1
Agra	E.	17·3	285	3 58	0	7 22	SS	e 10·2	13·0
Hyderabad		18·5	253	—	—	9 1	?	11·6	14·6
Medan		20·5	173	e 5 29	+54	i 11 48	L	(i 11·8)	—
Nanking		20·8	63	4 27	−11	e 8 10	−12	i 11·6	—
Chiufeng		22·8	40	4 41	−18	e 8 37	−24	10·9	12·9
Bombay		23·0	262	5 31	+30	10 1	+56	13·3	—
Manila		24·5	108	5 22	+ 7	9 52	+20	12·8	—
Almata		25·4	323	e 5 29	+ 5	—	—	—	—
Frunse		26·4	320	e 5 49	+16	—	—	—	—
Andijan		26·5	315	e 6 38	+64	—	—	—	—
Tashkent		28·8	314	e 5 53	− 1	e 10 37	− 8	e 15·6	18·6
Ekaterinburg		42·0	330	i 6 45	−64	e 16 2	SS	18·4	—

Additional readings :—
Hong Kong S = +8m.9s.
Nanking iZ = +10m.33s.
Chiufeng P = +4m.45s., iS = +8m.50s.
Tashkent i = +6m.4s., e = +13m.51s.
Ekaterinburg i = +6m.50s., e = +12m.59s.
Long waves were also recorded at Taihoku, Copenhagen, De Bilt, and Strasbourg

Nov. 19d. Readings also at 2h. (near Apia and near Nanking), 3h. (near Amboina), 4h. (Vladivostok and near Tyosi), 6h. (near Tokyo, Tyosi, and near Triest), 7h. (Wellington), 8h. (Wellington, Trenta, near Triest, near Frunse, and near Manila), 10h. (near Amboina), 14h. (Melbourne, Riverview, Perth, Suva, Christchurch, Wellington, and Neuchatel), 15h. (Baku, Ekaterinburg, and near Apia), 17h. (San Fernando), 19h. (near Nanking), 20h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Suva, near Apia, near Nagoya, and Tyosi), 22h. (Chur, Zurich, Neuchatel, Triest, Florence, Trenta, and Ksara), 23h. (near Apia (2), near Nagasaki, Hukuoka, and near Tananarive).

Nov. 20d. 23h. 21m. 38s. Epicentre 73°·3N. 70°·7W. N.1.

Probable error of epicentre ±0°·19.

A = +·095, B = −·271, C = +·958; D = −·944, E = −·331; G = +·317, H = −·904, K = −·287.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Ivigtut		14·7	134	3 18	− 7	e 6 10	− 2	—	—
Reykjavik		19·1	91	4 31	+11	8 12	+24	—	—
Saskatoon		26·0	235	i 5 24	− 5	i 9 56	− 2	—	—
Ottawa		28·0	187	i 5 45	− 2	i 10 26	− 6	i 13·4	—
Halifax		28·8	170	e 5 47	− 7	i 10 37	− 8	—	—
Sitka		29·5	272	i 6 5	+ 4	i 11 3	+ 7	i 14·2	—
Bergen		29·8	74	6 39	+36	11 56	+55	15·4	—
Toronto		30·0	193	i 6 4	− 1	i 10 55	− 9	13·3	15·4
Buffalo		30·6	190	i 6 10	0	i 11 10	− 4	12·7	—
Oak Ridge		30·8	180	i 6 11a	− 1	i 11 18	+ 1	e 12·2	—
Weston		30·9	181	e 6 12	− 1	11 12	− 6	e 15·1	17·8
Edinburgh		31·3	86	i 6 19	+ 2	i 11 19	− 5	—	—
Madison		31·5	207	i 6 18	0	i 11 16	−12	i 14·9	—
Ann Arbor		31·6	198	i 6 22	+ 3	i 11 34	+ 5	14·9	17·6
Chicago		32·4	204	i 7 30	+64	i 12 41	+60	e 16·5	—
Fordham		32·5	185	i 6 26	− 1	i 11 41	− 2	—	22·4
Durham		32·7	86	6 27	− 2	11 37	− 9	—	19·4
Bozeman		33·1	236	i 6 36	+ 3	i 11 51	− 1	i 15·8	—
Pittsburgh		33·1	192	i 6 32	− 1	i 11 53	+ 1	—	—
Stonyhurst		33·2	87	i 6 37	+ 3	i 11 52	− 2	14·4	20·9
Bidston		33·4	88	i 6 36	+ 1	i 11 55	− 2	15·4	22·4
Upsala		33·6	65	i 6 36	− 1	i 11 58	− 2	e 16·4	19·0
Victoria	E.	33·7	252	i 6 40	+ 2	i 12 3	+ 2	—	23·0
	N.	33·7	252	i 6 36	− 2	i 12 2	+ 1	—	23·9
	Z.	33·7	252	i 6 49	+11	e 12 19	+18	i 21·8	22·4
Woodstock		34·1	187	i 6 41	0	i 12 4	− 4	15·7	15·8
Seattle		34·1	250	e 6 53	+12	12 19	+11	16·4	—
Georgetown		34·6	187	i 6 43a	− 3	i 12 14	− 1	—	—
Oxford		35·4	88	i 6 55a	+ 2	i 12 25	− 2	e 14·4	25·4
Charlottesville		35·5	190	i 6 51	− 2	i 12 22	− 7	i 16·4	—
Florissant		35·8	207	i 6 55	− 1	i 12 32	− 1	—	—
Copenhagen		35·8	73	6 57	+ 1	e 12 15	−18	15·4	—
Kew		36·0	87	e 6 56a	− 2	i 12 32	− 4	e 15·4	23·1
St. Louis		36·0	207	i 6 55	− 3	i 12 31	− 5	e 15·8	18·5
Pulkovo		36·8	55	i 7 6	+ 1	i 12 47	− 1	17·4	20·6
Hamburg		37·0	76	i 7 8a	+ 2	e 12 31?	−20	e 17·0	28·4
De Bilt		37·0	81	7 7	+ 1	12 50	− 1	e 16·8	20·1
Denver		37·4	225	i 7 14	+ 4	i 12 56	− 1	i 17·9	20·4
Uccle		37·8	84	i 7 12a	− 1	12 58	− 5	15·9	21·4
Göttingen		38·8	78	i 7 21	− 1	i 13 4	−14	e 18·4	19·6
Potsdam		38·9	75	i 7 24	+ 1	i 13 21	+ 1	e 18·4	26·4
Paris		39·1	86	i 7 23a	− 1	i 13 19	− 3	18·4	19·4
Feldberg	E.	39·6	80	e 7 27	− 2	i 13 40	+10	e 18·4	24·7
	N.	39·6	80	i 7 27	− 2	e 13 9	−21	—	—
Columbia		39·7	193	i 7 27	− 2	i 13 24	− 8	i 18·4	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Leipzig		39·7	76	i 7 32	+ 3	i 13 33	+ 1	e 18·4	20·9
Jena		39·9	76	e 7 24	− 7	e 13 16	−19	e 18·2	19·9
Little Rock		40·1	208	i 7 29	− 4	i 13 33	− 5	—	—
Hof	N.W.	40·4	76	e 7 22	−13	i 13 47	+ 5	e 17·4	27·4
	N.E.	40·4	76	i 7 38	+ 3	i 13 44	+ 2	e 17·4	19·9
Karlsruhe		40·6	81	7 41	+ 4	13 52	+ 7	e 23·4	26·8
Cheb		40·8	76	e 7 38	− 1	e 13 50	+ 2	e 19·4	27·4
Strasbourg		40·8	81	i 7 38a	− 1	i 13 45	− 3	19·4	28·4
Stuttgart		41·1	80	i 7 41a	0	i 13 50	− 3	e 19·9	25·3
Prague		41·4	75	7 44	0	i 13 52	− 5	e 19·9	23·4
Neuchatel		42·1	83	e 7 47	− 2	e 13 57	−11	—	—
Puy de Dôme		42·1	88	e 7 48	− 1	14 6	− 2	19·4	—
Zurich		42·2	82	e 7 48	− 2	e 14 9	0	—	—
Kucino		42·2	53	i 7 53	+ 3	14 13	+ 4	e 21·4	22·9
Ukiah		42·3	246	i 7 53	+ 2	i 14 19	+ 9	20·2	—
Denton		42·3	213	i 7 50	− 1	i 13 40	−30	—	22·2
Tinemaha		42·9	239	i 7 56a	0	—	—	—	—
Chur		42·9	82	e 7 56	0	e 14 24	+ 5	—	—
Berkeley		43·2	244	i 8 0	+ 2	e 14 30	+ 6	—	—
San Francisco		43·4	244	e 8 0	0	e 14 29	+ 2	e 26·8	—
Grenoble		43·4	86	8 3	+ 3	e 14 31	+ 4	19·4	—
Lick		43·5	244	i 8 3	+ 2	e 14 37	+ 9	—	—
Vienna		43·6	74	e 8 1	− 1	14 33	+ 3	i 20·9	31·4
Branner		43·6	244	e 8 3	+ 1	e 14 35	+ 5	—	—
Bagnères		43·7	91	i 8 2	0	14 34	+ 3	19·4	—
Haiwee		43·8	238	i 8 4a	+ 1	—	—	—	—
Coimbra		43·9	102	i 8 0	− 4	14 20	−14	—	—
Lemberg		44·2	67	e 8 16	+10	e 14 44	+ 5	e 21·7	26·4
Pavia		44·4	82	i 8 10	+ 2	—	—	—	—
Graz		44·4	76	i 8 7	− 1	i 14 44	+ 3	e 22·4	26·5
Loyola		44·5	204	i 6 19	?	i 11 31	?	—	—
Piacenza		44·6	82	8 10	0	i 14 52	+ 8	21·9	28·8
Treviso		44·8	80	i 8 12	+ 1	i 14 53	+ 6	22·4	28·4
Padova		44·9	80	i 8 13	+ 1	i 14 52	+ 3	—	—
Budapest		45·0	72	i 8 13	0	(14 52)	+ 2	14·9	25·9
Venice		45·0	80	i 8 12	− 1	i 14 51	+ 1	23·4	29·4
Laibach		45·1	77	e 8 12	− 2	(e 14 49)	− 3	—	22·8
Triest		45·2	78	i 8 12a	− 2	i 14 50	− 4	e 21·4	27·2
Toledo		45·5	98	i 8 16	− 1	i 14 57	0	e 21·1	29·6
Mount Wilson		45·6	237	i 8 18	0	e 15 9	+10	—	—
Zagreb		45·7	76	e 8 17	− 1	i 14 58	− 2	i 23·6	27·0
Pasadena		45·7	237	i 8 19a	+ 1	e 15 2	+ 2	i 21·5	—
Riverside		45·7	237	i 8 17a	− 1	i 15 9	+ 9	—	—
Santa Barbara		45·8	239	i 8 21a	+ 2	—	—	—	—
Tucson		45·8	230	i 8 19	0	i 15 8	+ 6	i 23·0	—
Barcelona		45·8	91	8 22	+ 3	i 15 4	+ 2	19·7	33·0
Tortosa	E.	45·8	93	8 21	+ 2	14 55	− 7	20·2	32·0
	N.	45·8	93	8 19	0	14 59	− 3	20·6	36·3
Prato		46·1	81	i 8 22	+ 1	i 14 55	−11	—	33·8
Florence		46·2	81	i 8 20a	− 2	15 8	+ 1	18·4	23·4
Livorno		46·2	82	8 21	− 1	14 24	−43	—	—
La Jolla		46·7	236	i 8 31	+ 5	e 15 24	+10	—	—
Camerino		47·3	79	8 22	− 9	15 9	−14	—	—
Belgrade		47·8	72	e 8 35	0	i 15 33	+ 3	e 24·6	—
Alicante		47·9	96	i 8 41	+ 6	i 15 28	− 3	e 21·2	31·4
San Fernando		48·0	102	8 25	−11	15 25	− 8	19·4	28·4
Granada		48·1	99	i 8 51	+14	i 15 42	+ 8	22·9	32·6
Malaga		48·3	100	e 8 37	− 1	i 15 37	0	22·6	34·1
Almeria		48·7	99	i 8 36	− 5	i 15 24	−19	e 23·3	34·6
Benevento		49·5	80	i 8 49	+ 2	16 12	+18	24·4	37·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Carloforte		49·7	86	8 48	− 1	23 28	L	(23·5)	—
Naples	E.	49·8	80	e 8 45	− 5	e 19 15	SS	24·4	36·4
Bari		50·2	78	8 51	− 2	16 9	+ 5	28·3	—
Algiers		50·3	93	i 8 51	− 3	i 16 7	+ 2	i 23·2	32·4
Taranto		51·0	78	9 6	+ 7	16 16	+ 1	—	—
Simferopol		51·3	61	9 1	0	16 21	+ 2	29·9	—
Sebastopol		51·5	62	9 3	0	16 23	+ 1	27·5	—
Theodosia		51·6	60	9 7	+ 4	16 33	+10	—	—
Trenta		51·8	79	e 9 22	+17	e 16 52	+27	25·8	35·2
Yalta		51·8	61	9 6	+ 1	16 29	+ 4	29·8	32·9
Tunis		52·4	85	i 9 16	+ 7	—	—	—	—
Messina		52·6	80	9 7	− 4	16 34	− 3	28·6	32·7
Catania		53·1	81	9 16	+ 1	16 41	− 2	26·6	32·5
Mineo		53·3	81	8 0	−76	—	—	—	—
Port au Prince		54·8	182	i 9 24	− 3	i 17 5	− 1	i 26·2	36·3
San Juan		54·9	176	i 9 24	− 4	i 17 1	− 7	26·0	—
Sikka		55·3	334	e 12 34	?	—	—	—	23·1
Tiflis	N.	57·0	53	9 43	0	17 41	+ 5	e 26·4	—
Ootomari		57·9	334	9 55	+ 5	17 50	+ 2	30·3	—
Fort de France		59·0	168	i 9 56	− 1	i 18 1	− 2	28·4	—
Baku		59·4	49	i 10 2	+ 2	18 4	− 4	—	—
Tchimkent		61·2	32	i 9 52	−21	18 12	−20	—	—
Almata		61·3	26	i 10 18	+ 4	—	—	—	—
Sapporo		61·5	334	10 18	+ 3	18 43	+ 7	—	—
Hsinking		62·2	346	10 5	−15	18 17	−28	—	—
Tashkent		62·2	33	10 22	+ 2	18 50	+ 5	22·9	33·4
Ksara		62·3	64	10 20	0	i 18 50	+ 4	30·4	36·4
Vladivostok		62·6	341	i 10 23	+ 1	18 53	+ 3	—	43·9
Andijan		63·1	31	10 27	+ 1	19 3	+ 7	36·0	—
Aomori		63·8	334	10 33	+ 2	19 10	+ 5	—	—
Helwan		64·8	69	i 10 35	− 2	i 19 20	+ 3	33·7	44·8
Akita		65·0	334	10 39	0	19 18	− 2	—	—
Mizusawa	E.	65·5	333	i 10 46	+ 4	i 19 28	+ 2	32·6	—
	N.	65·5	333	i 10 44	+ 2	i 19 26	0	28·9	—
Sendai		66·4	333	10 47	− 1	19 40	+ 3	—	—
Chiufeng		66·5	354	i 10 50	+ 1	i 19 40	+ 1	30·4	42·7
Hukusima		66·9	333	10 51	0	19 46	+ 3	—	—
Heizyo		67·1	346	i 10 52	0	e 20 8	PS	i 13·1	45·9
Dairen		67·5	350	10 55	0	19 56	+ 5	—	—
Wazima		67·7	335	10 55	− 1	19 55	+ 2	—	—
Nagano		68·3	334	11 0	0	20 5	+ 4	—	—
Keizyo		68·4	345	11 4	+ 3	19 40	−22	33·0	43·7
Zinsen		68·5	346	11 2	+ 1	i 20 7	+ 4	e 31·1	45·5
Kumagaya		68·6	334	11 5	+ 3	20 11	+ 7	—	—
Tyosi		68·8	333	i 10 4a	−59	19 14	−53	e 35·0	47·5
Honolulu T.H.		68·8	273	i 11 3	0	i 20 9	+ 2	31·7	—
Tokyo Imp. Univ.		69·1	334	11 5	0	20 16	+ 6	34·3	45·6
Tokyo		69·1	334	11 6	+ 1	20 18	+ 8	—	—
Toyooka		69·8	337	11 9a	0	e 20 22	+ 3	e 35·4	47·4
Nagoya		69·9	336	11 10	0	—	—	28·5	—
Hikone		69·9	337	11 10	0	20 26	+ 6	—	—
Taikyu		70·0	343	11 11	0	20 28	+ 7	32·0	—
Susaki		70·1	335	11 11	0	21 20	(+15)	36·3	40·2
Osaka		70·5	338	11 15	+ 1	20 32	+ 5	33·0	45·6
Kobe		70·6	338	e 11 13	− 1	e 20 16	−12	e 31·8	46·2
Wakayama		71·0	338	11 18	+ 1	20 40	+ 7	—	—
Sumoto		71·0	338	11 17	0	e 20 31	− 2	e 28·5	45·9
Hatidyozima		71·6	334	11 21	+ 1	20 41	+ 1	—	—
Koti		71·8	339	11 22	0	e 20 46	+ 3	e 35·3	49·4
Muroto		72·1	339	11 25	+ 2	e 19 54	−52	e 29·5	—

Continued on next page.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	L. m.	M. m.
Hukuoka	72·1	342	11 25	+ 2	20 52	+ 6	e 33·7	44·4
Hukuoka B.	72·2	342	11 26	+ 2	21 1	PS	—	—
Simidu	72·7	339	11 28	+ 1	i 20 58	+ 5	e 32·8	47·1
Nagasaki	73·0	342	11 29a	0	21 0	+ 3	e 39·4	44·9
Dehra Dun	74·2	28	11 32	− 4	21 12	+ 1	34·5	46·4
Nanking	74·4	352	i 11 37a	0	i 21 16	+ 3	37·7	53·3
Zi-ka-wei	75·2	349	11 44	+ 3	21 22	0	41·1	49·5
Titizima	77·2	330	11 52	− 1	21 38	− 7	—	—
Nake	77·4	342	11 53	− 1	21 43	− 4	—	—
Agra	77·4	28	11 53	− 1	21 44	− 3	40·3	43·4
Taihoku	81·3	348	12 18	+ 3	22 28	− 2	—	53·0
Karenko	82·3	348	12 29	+ 9	22 54	+14	—	—
Calcutta	83·2	19	11 19	−65	21 39	−70	42·2	54·4
Hong Kong	84·3	356	12 29	− 1	22 55	[+ 1]	—	61·5
Bombay	84·7	35	12 33	+ 1	22 52	[− 5]	42·6	54·9
Huancayo	85·4	185	i 12 33	− 2	i 23 1	[− 1]	i 37·7	—
Phu-Lien	85·9	2	i 12 38	0	23 5	[− 1]	40·4	57·2
Hyderabad	87·0	29	14 18	?	25 16	?	43·5	62·8
La Paz	89·8	177	i 12 52k	− 4	i 23 48	− 6	46·2	54·8
Manila	91·8	348	13 5a	− 1	i 24 57	PS	—	—
Sucre	92·4	174	i 13 2	− 7	i 23 46	[− 1]	41·9	—
Kodaikanal	94·0	32	i 13 16	0	i 24 25	− 8	i 51·7	61·0
Colombo	97·7	29	e 13 37	+ 4	24 34	{− 2}	48·1	53·9
Palau	97·8	335	13 51	+18	—	—	—	—
Medan	102·8	11	e 14 12	+16	—	—	—	—
La Plata	108·6	169	14 22	− 2	25 9	[+ 2]	45·0	65·1
Amboina	109·4	340	e 14 33	+ 5	i 28 23	PS	—	—
Batavia	112·9	2	e 14 31	−14	—	—	57·1	—
Suva	113·3	285	e 14 52	+ 5	i 28 46	PS	69·4	—
Tananarive	116·0	68	20 13	PP	e 29 35	PS	—	65·5
Johannesburg	117·5	89	19 52	PP	29 40	PS	60·4	62·4
Cape Town	122·1	102	20 18	PP	30 11	SKSP	61·9	71·1
Riverview	135·4	308	e 19 16	[+ 1]	—	—	e 60·7	72·9
Wellington	136·2	279	18 20	[−56]	34 48	PS	60·4	65·4
Perth	138·5	350	e 19 22	[+ 2]	—	—	—	—
Christchurch	138·9	280	i 19 15	[− 5]	i 29 53	{+36}	e 65·3	72·3
Adelaide	139·0	322	e 19 17	[− 3]	—	—	63·3	78·4
Melbourne	140·5	313	19 22	[0]	35 13	?	62·4	—

Additional readings and notes :—
Ivigtut i = +3m.30s. = PP + 2s., eE = +5m.46s., iE = +6m.27s.
Reykjavik PP = +4m.44s., PPP = +4m.56s., SS = +8m.47s.
Ottawa PPN = +6m.18s., PPPN = +6m.29s., PPPPN = +6m.48s., iN = +7m.36s., eE = +10m.40s., SSSN = +12m.14s., SSSSN = +12m.46s.
Sitka iSS = +12m.44s., i = +13m.32s.
Toronto iEN = +10m.50s. ; T_0 = 23h.21m.48s.
Oak Ridge iZ = +6m.50s. = PP − 17s. and +9m.13s. = P_cP + 1s., iNW = +9m.45s. eZ = +10m.2s., iSNW = +11m.15s., eLE = +12m.0s. ; T_0 = 23h.21m.55s.
Edinburgh i = +6m.45s., PPP = +7m.42s., i = +9m.0s. = P_cP − 14s., +11m.51s. and +14m.54s.
Ann Arbor iE = +12m.10s., iSSE = +13m.16s., iSSN = +13m.52s.
Fordham iPE = +6m.31s., iPPN = +7m.15s., iN = +11m.31s.
Durham ? = +6m.30s.
Bozeman PP = +7m.31s., e = +10m.54s., i = +11m.57s.
Stonyhurst PP = +7m.30s., PPP = +7m.59s.
Bidston PP = +7m.32s., PPP = +8m.4s., PPPP = +8m.18s., i = +8m.58s. and +9m.8s. = P_cP − 13s., SS = +13m.43s. ; T_0 = 23h.21m.44s.
Upsala PP = +7m.21s., iSSS = +14m.5s.
Woodstock SSS? = +14m.19s.
Seattle iPP = +8m.2s., i = +12m.30s., e = +15m.17s.
Georgetown iP_cPZ = +8m.51s.
Oxford PPP = +8m.23s.
Charlottesville ePPP = +8m.22s., i = +15m.49s.
Florissant ipP = +7m.6s., iPPZ = +8m.0s., iPPPZ = +8m.22s., iP_cPZ = +9m.24s., isSEN = +12m.49s. ; T_0 = 23h.21m.40s.
Copenhagen iSN = +12m.31s., eE = +12m.49s.
Kew iP = +7m.1s., iPP = +8m.30s., iP_cPZ = +9m.26s., iSSE = +14m.38s.

Continued on next page.

St. Louis iPPN = +7m.56s., iP$_c$PN = +9m.41s. ; T$_o$ = 23h.21m.42s.
Hamburg eE = +13m.3s,, eSSE = +15m.44s.
Uccle i = +7m.16s., PP = +8m.39s., iS = +13m.4s.
Göttingen eEN = +8m.28s., eZ = +8m.46s. = PP − 1s., eEN = +9m.46s. = P$_c$P + 8s., eZ = +10m.4s., eN = +11m.22s., iSN = +12m.56s., iP$_c$SEN = +13m.22s.
Potsdam iE = +7m.32s., iPPNZ = +9m.17s., iPPPE = +9m.35s. = P$_c$P − 3s., iEN = +13m.58s., iE = +16m.47s. and +16m.56s., iNZ = +17m.1s., iEZ = +18m.19s., iENZ = +19m.11s., iE = +19m.18s.
Paris PP = +9m.12s. = PPP + 5s.
Feldberg eE = +8m.25s. and +9m.48s. = P$_c$P + 8s.
Columbia i = +13m.30s., e = +16m.27s. = SS + 19s.
Leipzig e = +8m.59s. = PP + 3s., eE = +13m.7s.
Jena iPZ = +7m.28s., iPEN = +7m.32s., e = +9m.3s., iNZ = +9m.13s. = PPP − 4s., iE = +9m.20s., iZ = +9m.49s., iN = +10m.0s., eSN = +13m.4s., iSN = +13m.20s., iSE = +13m.24s., e = +14m.22s.
Little Rock iPP = +8m.49s., iPPP = +9m.20s., i = +13m.1s., iSS = +15m.54s., iSSS = +16m.40s.
Hof e = +9m.22s. = PP + 16s., eNE = +9m.49s. = P$_c$P + 6s.
Cheb e = +9m.16s. = PP + 8s.
Strasbourg i = +8m.41s., iPP = +9m.11s., iPPP = +9m.36s., PPPP = +9m.56s. = P$_c$P + 12s., i = +14m.22s., SS = +17m.16s., SSS = +17m.29s.
Stuttgart iP = +7m.45s., i = +8m.44s., iPP = +9m.7s., i = +14m.40s.
Prague ePP = +9m.21s.
Neuchatel iP = +7m.52s.
Puy de Dôme e = +9m.48s. = P$_c$P − 1s.
Ukiah i = +9m.35s. = PP + 11s., +17m.17s. = SS + 18s. and +17m.33s. = SSS − 7s.
Denton SSS = +17m.29s.
Berkeley eN = +17m.56s. = S$_c$S − 5s., eE = +21m.35s.
Grenoble iSS = +17m.46s.
Vienna iNZ = +8m.42s., PP = +9m.46s., PPP = +10m.14s., iN = +12m.32s., P$_c$S = +13m.47s., iN = +14m.12s. and +15m.14s., iE = +20m.39s.
Bagnères PP = +9m.57s., SS = +17m.57s. = S$_c$S − 7s.
Graz ipS = +14m.54s., iSS = +18m.24s., iSSS = +19m.50s.
Piacenza PPN = +8m.50s., PPE = +8m.56s., PPPN = +10m.10s., PPPE = +10m.50s., PPPPN = +13m.6s., PPPPE = +13m.22s., PPPPN = +13m.50s., iSSEN = +15m.22s., iSSSN = +18m.22s., iSSSE = +18m.34s., iSSSN = +20m.20s., iSSSSE = +20m.52s.
Treviso PP = +9m.20s., PPP = +10m.13s.
Laibach ePP = +9m.10s., eS = +13m.2s., e = +18m.12s. = S$_c$S − 1s.; true S is given as eSS.
Triest iPPP? = +10m.14s., iPS? = +14m.53s., iN = +15m.8s., iSSS = +18m.39s.
Toledo i = +8m.19s., +8m.21s. and +8m.25s., PP = +9m.43s., PPP = +10m.25s., SS = +18m.26s. = S$_c$S + 11s.
Zagreb iNE = +8m.50s., i = +9m.32s. and +11m.2s., iP$_c$S = +13m.54s., e = +15m.49s., i = +18m.35s. = S$_c$S + 18s., e = +19m.10s., i = +22m.1s., and +22m.40s.
Pasadena eS = +15m.6s., iSSN = +18m.22s.
Tucson iPP = +10m.9s., i = +10m.19s., iSS = +17m.59s.
Barcelona SS = +18m.45s.
La Jolla iPPZ = +10m.22s.
Belgrade iPP = +10m.36s., iSS = +19m.13s.
Alicante PP = +10m.18s., PPP = +10m.58s.
San Fernando P = +8m.39s., S = +15m.30s. and +15m.38s.
Granada S$_c$S = +18m.45s., SS = +19m.3s., SSS = +20m.9s.
Malaga i = +8m.44s., PP = +10m.37s., PPP = +11m.17s., P$_c$S = +14m.20s., i = +15m.51s., and +16m.20s., SS = +18m.55s., i = +19m.19s., SSS = +20m.24s. ; T$_o$ = 23h.21m.40s.
Almeria PP = +10m.34s.
Algiers iPP = +10m.44s., iPPP = +12m.44s., PS = +16m.35s., iSS = +19m.44s.
Messina PP = +10m.56s., PPP = +11m.42s., SS = +20m.25s., SSS = +21m.52s.
San Juan iPPP = +12m.44s., iSS = +20m.39s., i = +20m.51s.
Tiflis iN = +9m.49s., ePPN = +12m.5s., ePPPN = +13m.19s., eSSN = +21m.52s.
Ksara SSN = +23m.9s.
Chiufeng iE = +11m.5s. = P$_c$P − 14s., P$_c$PZ = +12m.30s., P$_c$PE = +12m.36s., P$_c$PN = +12m.40s., PPNZ = +13m.23s., PPE = +13m.29s., PPPZ = +14m.44s., PPP?E = +14m.56s., iSEN = +19m.44s., PS?E = +20m.8s., SSE = +24m.4s., iN = +27m.56s. ; T$_o$ = 23h.21m.45s.
Zinsen ePPZ = +13m.32s., ePPPNZ = +15m.17s.
Honolulu T.H. eSS = +25m.6s., e = +27m.56s.
Toyooka PE = +11m.13s. ; T$_o$ = 23h.21m.36s.
Nagoya PP = +12m.18s., PPP = +13m.28s.
Kobe iZ = +11m.27s. = P$_c$P − 7s., eN = +11m.49s., eE = +13m.16s. = PP − 27s., PPPN = +15m.47s., eSZ = +20m.21s., eE = +24m.47s. = SS − 4s., eN = +24m.56s., eEZ = +28m.24s. ; T$_o$ = 23h.21m.36s.

Continued on next page.

Sumoto eE = +18m.5s., eN = +18m.17s., eSE = +21m.20s.
Koti iP_cPZ = +11m.36s., iPPZ = +14m.11s.
Muroto PP = +14m.7s., PPP? = +15m.20s., eSS = +24m.34s.
Nanking P_cPNZ = +12m.30s., PPNZ = +14m.19s., iN = +14m.28s., eE = +15m.20s., iN = +24m.10s., SS = +26m.8s., iZ = +30m.1s., iEN = +31m.1s., iE = +35m.37s.
Zi-ka-wei iN = +11m.49s., +12m.11s., and +21m.28s.
Hong Kong PP = +15m.44s., SS = +28m.29s.
Huancayo i = +15m.22s., e = +15m.52s. = PP + 4s., i = +16m.2s., e = +23m.36s., i = +24m.48s., eSS = +28m.18s.
Phu-Lien PP = +15m.57s.
La Paz pPE = +14m.26s., iPPN = +16m.26s., SKSN = +23m.18s., iPS = +24m.35s., SSN = +29m.34s., L_q = +43·0m.
Manila PPE = +16m.47s., iE = +19m.8s., PSE = +25m.22s.?
Colombo iP = +17m.34s. = PP + 9s.
Medan i = +17m.17s. and +17m.59s. = PP − 5s.
La Plata PKPN = +17m.58s., N = +18m.42s., PPE = +19m.22s., PPN = +21m.8s., PSN = +28m.12s., SSN = +33m.56s., PPP(△ >180°) = +36m.57s., N = +41m.23s.
Amboina i = +18m.28s. and +19m.1s. = PP + 8s.
Batavia e = +18m.15s. = PKP − 11s.
Suva i = +19m.43s. = PP + 22s.
Tananarive e = +32m.28s., eSS = +34m.50s.
Cape Town PP = +25m.10s., SKP = +26m.52s., PPP = +27m.47s. = SKKS + 17s., PS? = +34m.17s., PPS = +36m.58s. = SS − 1s., SS? = +41m.9s. = SSS − 11s., SSS = +46m.0s.
Riverview eE = +12m.46s., eN = +21m.41s. = PP − 11s., iN = +22m.48s. = PKS − 7s.
Wellington PKP = +21m.46s. = PP − 12s., PP = +27m.30s., PPPP = +31m.2s., SS = +41m.27s.
Perth N = +23m.22s.
Christchurch iPP = +22m.10s., iSKP = +22m.43s., iN = +22m.49s., iPPP = +25m.38s., iSKS = +26m.18s., iN = +29m.3s., iEZ = +29m.20s., iN = +29m.50s., iSKSP? = +32m.22s., iEZ = +33m.13s., iPSN = +33m.24s., iEZ = +34m.14s., iPPP'Z = +34m.40s., iPPSZN = +34m.46s., iEN = +35m.15s., i = +36m.56s. and +38m.39s., eSS = +40m.41s., iSSSEN = +45m.56s., L_qE = +57·4m., eN = +64m.30s., iE = +64m.46s.
Adelaide iPKP = +22m.16s. = PP + 1s., i = +22m.58s. = PKS − 8s., iPPP = +27m.32s., iPS = +34m.52s., SS = +41m.42s.
Melbourne PKP = +22m.14s. = PP − 10s., PP = +25m.7s. = PPP − 15s., PPP = +27m.47s. = PPPP + 26s., PPPP = +30m.30s., PPS = +36m.27s., SS = +42m.52s.
Long waves were also recorded at Sydney and Arapuni.

Nov. 20d. Readings also at 1h. (near Nagoya and Tyosi), 2h. (near Santiago), 4h. (San Fernando and Tiflis), 7h. (Tucson), 8h. (near Mizusawa), 9h. (near Neuchatel), 11h. (Balboa Heights), 14h. (near Heizyo), 17h. (near Nanking), 18h. (near Santiago), 20h. (Tiflis), 21h. (near Nanking (2)), 22h. (Huancayo and near Tyosi).

Nov. 21d. 2h. 6m. 1s. Epicentre 42°·7N. 10°·2E. (Isola dell'Elba). N.3.

A = +·723, B = +·130, C = +·678; D = +·177, E = −·984;
G = +·667, H = +·120, K = −·735.

	△	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Livorno	0·8	5	0 21	+10	0 32	+11	—
Florence	1·3	35	e 0 20	+ 2	0 51	+18	1·2
Prato	1·4	29	i 0 20	0	i 0 51	+15	1·0
Camerino	2·1	78	0 19	−11	—	—	—
Pavia	2·4	343	e 0 39	+ 5	—	—	—
Piacenza	2·4	351	e 0 37	+ 3	—	—	—
Triest	3·9	39	e 1 22	P_g	i 2 10	S_g	—
Chur	4·3	354	e 0 58	− 3	—	—	—
Neuchatel	4·8	333	e 1 4	− 4	e 2 3	0	—
Zurich	4·8	347	e 1 3	− 5	—	—	—
Zagreb	5·2	51	—	—	e 2 33	S*	—
Stuttgart	6·1	353	—	—	e 3 23	S_g	—

Nov. 21d. 23h. 48m. 44s. Epicentre 8°·0N. 83°·0W. N.3.
(given by Balboa Heights).

A = +·121, B = −·983, C = +·139; D = −·993, E = −·122;
G = +·017, H = −·138, K = −·990.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		3·5	74	i 1 12	P_g	i 2 0	S_g	2·4	2·7
Port au Prince		14·8	44	i 3 28	+ 2	e 6 22	+12	—	—
San Juan		19·4	56	i 4 18	− 5	i 7 54	0	i 9·6	—
Huancayo		21·4	159	i 4 45	+ 1	i 8 45	+11	e 12·4	—
Fort de France		22·4	71	e 5 43	+48	—	—	—	—
Columbia		26·1	4	—	—	e 9 56	− 4	e 18·3	—
Little Rock		28·1	343	e 5 53	+ 5	e 10 39	+ 5	—	—
La Paz	N.	28·5	149	e 5 49	− 3	e 11 9	+29	14·5	18·1
Charlottesville		30·3	7	—	—	e 12 34	SS	e 14·3	—
Cincinnati		31·2	358	e 6 40a	− 2	e 11 29	+ 6	—	—
St. Louis		31·3	349	i 6 21	+ 4	e 11 36	+12	—	—
Florissant		31·5	349	i 6 24	+ 6	e 11 18	−10	i 13·4	—
Sucre		32·1	147	6 20	− 4	11 54	+17	16·3	—
Pittsburgh		32·6	5	—	—	e 11 49	+ 4	—	—
Chicago		34·2	353	—	—	e 14 56	?	e 18·7	—
Ann Arbor		34·3	0	—	—	e 11 58	−13	e 14·4	—
Tucson		35·5	318	e 6 58	+ 5	e 12 37	+ 8	e 16·7	—
Toronto		35·8	4	(e 6 55)	− 1	(e 11 44)	−49	(15·3)	—
Oak Ridge		36·0	15	e 6 51	− 7	e 12 44	+ 8	e 14·9	—
Ottawa		37·9	9	e 9 49	(+14)	e 12 52	−13	e 16·3	—
La Jolla	Z.	40·3	313	e 7 34	− 1	—	—	—	—
Riverside		41·0	314	e 7 37	− 3	—	—	—	—
Mount Wilson		41·5	314	e 7 43	− 1	—	—	—	—
Pasadena		41·6	314	i 7 44k	− 1	—	—	—	—
Haiwee		42·5	317	i 7 54	+ 1	—	—	—	—
Santa Barbara		42·9	313	e 7 57	+ 1	—	—	—	—
Tinemaha		43·2	318	i 7 55	− 3	—	—	—	—
Bozeman		44·8	333	—	—	e 13 34	−73	e 22·4	—
Berkeley	E.	46·3	316	—	—	e 15 24	+15	—	—
La Plata		49·0	152	—	—	e 15 52	+ 5	27·6	28·8
Victoria		52·7	327	—	—	16 46	+ 8	—	—
Sitka		63·6	331	—	—	e 19 16	+14	e 36·3	—
Edinburgh		77·7	35	—	—	e 18 16?	?	e 37·3	—
Stonyhurst		78·0	37	—	—	e 30 36	?	—	42·3
Oxford		78·6	39	—	—	21 53	− 7	e 40·3	—
Kew		79·2	39	—	—	e 22 16?	+ 9	e 36·3	—
Paris		81·0	42	e 12 16?	+ 3	—	—	38·3	41·3
Uccle		82·1	40	—	—	e 22 27	−11	e 35·3	—
De Bilt		82·5	38	—	—	e 22 37	− 5	e 38·3	45·2
Strasbourg		84·5	41	e 12 16?	−15	e 21 16?	?	e 34·3	—
Stuttgart		85·4	41	e 12 37	+ 2	e 23 4	[+ 2]	e 39·3	—
Piacenza		86·2	45	—	—	e 22 40	−39	—	45·4
Copenhagen		86·4	34	—	—	23 10	[+ 1]	41·3	—
Cheb		87·3	40	—	—	e 22 16?	?	e 41·3	47·3
Florence		87·5	46	e 11 56	−49	23 16	[− 1]	—	42·3
Pulkovo		94·4	28	e 17 6	PP	e 24 19	{+ 8}	41·3	48·7
Ekaterinburg		108·7	21	—	—	e 24 56	[−11]	49·3	59·7

Additional readings and note :—
Huancayo iPP = +5m.16s., e = +9m.26s.
Little Rock e?E = +11m.31s. and +13m.40s.
Cincinnati i = +6m.24s. and +7m.31s.; T_o = 23h.48m.41s.
St. Louis iN = +7m.52s., SSSE = +13m.30s.
Toronto PPP = (+7m.55s.), iSSS = (+12m.49s.); all readings have been *increased* by 4m.
Oak Ridge eNE = +8m.22s. = PPP − 4s., eNW = +12m.26s.
La Plata N = +14m.58s.?
Strasbourg ePS? = +22m.16s.? eSS? = +28m.16s.?
Stuttgart e = +28m.16s. = SS − 17s.
Florence i = +24m.36s. = PS + 14s., +26m.16s., and +29m.16s. = SS + 12s.
Ekaterinburg e = +31m.5s., +33m.58s. = SS − 3s., +37m.22s., and +41m.7s. = SSSS − 6s.
Long waves were also recorded at Ukiah, Seattle, Granada, San Fernando, Feldberg, Prague, Hamburg, Bombay, Baku, Chiufeng, and Wellington.

Nov. 21d. Readings also at 0h. (Potsdam and Tiflis), 1h. (Mizusawa, Simidu, and Malaga), 2h. (Apia and Little Rock (2)), 5h. (Potsdam and Trenta), 11h. (Little Rock), 12h. (Hong Kong), 13h. (near Almata, Andijan, and Frunse), 14h. (Little Rock), 15h. (near Mizusawa), 16h. (near Frunse and Andijan), 17h. (Cincinnati and near Wellington), 18h. (near Mizusawa), 19h. (Sydney and near Andijan), 22h. (near Tyosi).

Nov. 22d. 4h. 52m. 6s. Epicentre 8°·0N. 83°·0W. (as on 21d.). R.2.

A = +·121, B = −·983, C = +·139; D = −·993, E = −·122; G = +·017, H = −·138, K = −·990.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		3·5	74	i 1 6	P_g	i 1 54	S_g	2·3	3·1
San Juan		19·4	56	i 4 24	+ 1	i 8 4	+10	11·2	—
Huancayo		21·4	159	i 4 49	+ 5	i 8 47	+13	e 12·6	—
Fort de France		22·4	71	i 3 18	−97	i 5 59	?	—	—
Columbia		26·1	4	e 5 36	+ 6	e 10 12	+12	e 12·5	—
Little Rock		28·1	343	e 5 27	−21	i 10 36	+ 2	—	—
La Paz	N.	28·5	149	e 5 53	+ 1	e 10 54	+14	14·6	18·5
Charlottesville		30·3	7	—	—	e 12 54?	SS	e 15·4	—
Cincinnati		31·2	358	i 6 12a	− 4	i 11 8	−15	—	—
St. Louis		31·3	349	i 6 15	− 2	i 11 21	− 3	—	—
Florissant		31·5	349	i 6 18	0	i 11 24	− 4	—	—
Sucre	N.	32·1	147	e 6 24	0	11 54	+17	—	—
Pittsburgh		32·6	5	—	—	e 11 17	−28	e 14·0	—
Fordham		33·8	12	e 6 42	+ 3	e 12 8	+ 5	e 14·9	19·4
Chicago		34·2	353	—	—	(e 14 30)	SS	e 14·5	—
Ann Arbor		34·3	0	—	—	e 15 0	?	e 18·3	—
Tucson		35·5	318	e 7 5	+12	i 12 34	+ 5	e 17·2	—
Toronto		35·8	4	e 8 23	PP	(12 54?)	+21	12·9	—
Oak Ridge		36·0	15	i 6 57	− 1	(e 12 28)	− 8	e 12·5	—
Ottawa		37·9	9	e 8 46	PP	e 13 12	+ 7	e 15·9	—
La Jolla		40·3	313	i 7 31	− 4	—	—	—	—
Riverside		41·0	314	i 7 40	0	—	—	—	—
Mount Wilson		41·5	314	i 7 46	+ 2	—	—	—	—
Pasadena		41·6	314	i 7 46k	+ 1	—	—	—	—
Haiwee		42·5	317	i 7 54	+ 1	—	—	—	—
Santa Barbara		42·9	313	i 7 53	− 3	—	—	—	—
Tinemaha		43·2	318	i 7 58	0	—	—	—	—
La Plata	N.	49·0	152	8 43	− 1	15 48	+ 1	31·4	31·8
Granada		76·7	54	i 12 1a	+11	—	—	e 46·9	—
Edinburgh		77·7	35	—	—	e 21 54?	+ 3	e 40·9	—
Kew		79·2	39	—	—	e 21 54?	−13	e 32·9	—
Paris		81·0	42	e 11 50	−23	e 22 54?	PS	37·9	41·9
Uccle		82·1	40	—	—	e 22 54?	PS	e 33·9	—
De Bilt		82·5	38	—	—	e 28 6	SS	e 37·9	45·7
Strasbourg		84·5	41	e 11 54?	−37	e 22 54?	[− 1]	e 32·9	—
Feldberg		84·8	40	—	—	e 29 42	?	—	38·9
Stuttgart		85·4	41	e 12 34	− 1	—	—	e 39·9	—
Piacenza		86·2	45	—	—	e 23 10	[+ 2]	—	45·4
Copenhagen		86·4	34	12 39	− 1	23 12	[+ 3]	37·9	—
Cheb		87·3	40	—	—	e 22 54?	[−21]	e 42·9	46·4
Florence		87·5	46	12 24	−21	22 54	[−23]	—	37·9
Vienna	Z.	90·2	43	e 12 58	0	—	—	—	—
Pulkovo		94·4	28	e 13 24	+ 6	e 25 42	PS	44·9	53·5
Ekaterinburg		108·7	21	—	—	e 27 9	?	44·9	59·7

Additional readings:—
San Juan i = +6m.35s., +8m.52s., and +9m.27s.
Huancayo eSS = +9m.57s.
Cincinnati i = +6m.27s. and +6m.33s.; T_o = 4h.52m.0s.
Ann Arbor eN = +16m.42s.
Tucson e = +15m.40s.
Oak Ridge eNE = +8m.24s.
La Plata ePE = +8m.48s., E = +9m.42s., eSE = +15m.54s.
Strasbourg eSS = +28m.54s.?
Florence i = +29m.54s.
Long waves were also recorded at Berkeley, Ukiah, Sitka, Bozeman, Wellington, Stonyhurst, Prague, Hamburg, Baku, and Tashkent.

Nov. 22d. 8h. 10m. 29s. Epicentre 8°·0N. 83°·0W. (as at 4h.). X.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		3·5	74	i 1 11	P_g	i 1 59	S_g	2·4	2·5
San Juan		19·4	56	i 4 24	+ 1	e 8 3	+ 9	e 10·2	—
Huancayo		21·4	159	(e 4 19)	−25	(e 8 43)	+ 9	e 8·7	—
Columbia		26·1	4	—	—	e 10 3	+ 3	e 13·5	—
La Paz	N.	28·5	149	e 6 49	+57	e 13 17	L	(e 13·3)	—
St. Louis		31·3	349	e 6 13	− 4	—	—	—	—
Riverside	Z.	41·0	314	e 7 40	0	—	—	—	—
Mount Wilson		41·5	314	e 7 44	0	—	—	—	—
Pasadena		41·6	314	e 7 45	0	—	—	—	—
Santa Barbara	Z.	42·9	313	e 8 2	+ 6	—	—	—	—
Tinemaha		43·2	318	i 7 58	0	—	—	—	—
Tashkent		124·5	25	(e 14 7)	?	—	—	e 14·1	35·9

Additional readings and notes :—
San Juan e = +9m.37s.
Huancayo gives P as S and S as L.
Long waves were also recorded at Pittsburgh, Oak Ridge, Ekaterinburg, and several European stations.

Nov. 22d. 12h. 21m. 13s. Epicentre 28°·8N. 128°·7E. (as on 1933 June 3d.). X.

A = −·548, B = +·684, C = +·482 ; D = +·780, E = +·625 ;
G = −·301, H = +·376, K = −·876.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki		4·1	13	e 1 7	P*	e 2 18	S_g	—	—
Hukuoka		5·0	16	e 1 17	+ 6	—	—	—	—
Taikyu		7·1	359	—	—	e 3 54	S_g	—	—
Sumoto		7·6	42	1 43	− 5	—	—	e 5·3	—
Zinsen	E.	8·8	350	e 3 41	S	(e 3 41)	− 3	—	—
Keizyo		8·9	351	e 4 5	S	(e 4 5)	+19	—	—
Nanking		9·2	293	e 2 0	−10	e 4 18	+24	i 5·0	12·7
Nagoya		9·5	46	e 2 14	0	—	—	—	—
Keizyo	E.	10·5	347	e 5 37	S_g	—	—	—	—
Chiufeng		15·3	321	—	—	e 6 27	+ 5	—	—

Additional readings :—
Sumoto PEZ = +1m.46s. =S+1s.
Zinsen eSE = +4m.43s. =S_g−2s.
Keizyo S = +5m.15s.
Nanking eSE = +4m.32s. =S*−9s.
Long waves were also recorded at Koti and Hong Kong.

Nov. 22d. 12h. 42m. 23s. Epicentre 5°·7S. 151°·8E. (as on 1931 Feb. 19d.). R.1.

Probable error of epicentre ±0°·21.

A = −·877, B = +·470, C = −·099 ; D = +·473, E = +·881 ;
G = +·088, H = −·047, K = −·995.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	21·7	307	4 50	+ 2	8 43	+ 3	10·7	—
Amboina	23·6	274	i 4 54	−12	8 55	−21	11·8	—
Riverview	28·2	181	e 5 52	+ 3	i 10 29	− 6	13·8	16·6
Sydney	28·2	181	i 10 19	S	(i 10 19)	−16	14·3	15·4
Suva	28·7	118	5 41?	−12	10 49	+ 6	—	12·6
Adelaide	31·7	200	i 6 23	+ 3	i 11 28	− 3	13·8	23·3
Melbourne	32·7	189	7 1	?	11 43	− 3	13·9	16·6
Titizima	34·1	346	6 40	− 1	12 9	+ 1	—	—
Manila	36·7	305	6 57	− 7	12 18	−29	16·5	19·4
Apia	36·8	103	e 7 10	+ 5	—	—	17·2	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Arapuni		39·0	149	—	—	13 31	+10	17·6	19·6
Isigakizima		40·3	320	7 32	− 3	—	—	—	—
Wellington		41·1	153	7 37	− 4	13 47	− 6	19·7	22·6
Sumoto		42·0	340	7 55a	+ 6	—	—	—	—
Christchurch		42·1	157	i 7 40	− 9	14 0	− 8	20·0	20·5
Muroto		42·4	338	e 7 53	+ 1	e 16 20	?	e 26·3	—
Misima		42·5	344	7 53	0	—	—	—	—
Simidu		42·5	337	7 50	− 3	e 17 20	SS	—	—
Taihoku		42·5	319	e 7 55	+ 2	—	—	—	—
Perth		42·6	228	e 7 49	− 4	14 17	+ 2	—	28·0
Koti		42·9	339	e 7 54	− 2	e 13 36	−43	e 14·5	21·5
Tokyo		42·9	346	9 11	PP	—	—	—	—
Osaka		43·2	341	8 5	+ 7	14 37	+13	17·5	—
Nagoya		43·2	343	e 7 46	−12	—	—	17·8	—
Kobe		43·3	340	e 7 56	− 3	e 13 33	−52	—	24·1
Nagasaki		43·7	334	e 8 1a	− 1	e 14 26	− 5	e 21·7	—
Malabar		44·1	266	8 8	+ 2	—	—	—	—
Hukuoka		44·2	335	8 8	+ 2	e 13 43	−56	e 18·0	—
Batavia		44·7	268	i 7 44a	−26	—	—	e 24·0	—
Mizusawa	E.	45·9	350	e 8 21	+ 1	13 49	?	18·2	—
	N.	45·9	350	e 8 14	− 6	14 9	−54	19·0	—
Hong Kong		46·3	309	8 23	0	15 6	− 3	22·1	23·9
Zi-ka-wei	Z.	46·9	324	i 8 25a	− 3	15 11	− 6	22·9	26·3
Taikyu		46·9	335	8 27	− 1	(15 54)	+37	15·9	—
Nanking		49·1	322	i 8 44a	0	i 15 48	0	e 20·8	26·9
Zinsen	E.	49·1	334	e 8 43	− 1	e 15 40	− 8	—	—
Keizyo		49·1	335	e 8 44	0	e 15 43	− 5	21·9	—
Phu-Lien		51·7	304	e 9 5	+ 1	16 17	− 7	23·1	—
Vladivostok		52·0	341	i 9 9	+ 3	16 26	− 2	22·6	26·7
Medan		53·9	278	e 9 8	−13	17 11	+17	e 30·6	—
Chiufeng		56·3	328	i 9 38	0	i 17 23	− 4	24·1	30·4
Honolulu T.H.		56·3	59	e 9 51	+13	17 32	+ 5	26·2	—
Calcutta		68·1	297	1 40	?	11 57	?	32·1	37·5
Colombo		72·9	279	11 29	+ 1	21 9	+13	36·7	40·6
Kodaikanal		75·8	282	i 10 43	−62	i 20 22	−67	36·6	42·1
Hyderabad		76·0	290	10 30	−76	20 15	−77	33·7	46·9
Agra	E.	78·4	300	e 11 52	− 7	21 41	−17	—	46·3
Bombay		81·5	290	12 14	− 2	22 22	−10	41·9	46·0
Almata		83·0	315	e 12 17	− 6	—	—	—	—
Frunse		84·6	314	12 49	+18	22 52	[− 4]	—	—
Sitka		85·6	31	e 12 37	+ 1	i 23 3	[0]	e 35·6	—
Andijan		85·8	312	12 38	+ 1	22 59	[− 6]	—	—
Tashkent		88·2	314	i 12 50	+ 1	i 23 29	[+ 8]	36·3	49·7
Ukiah		89·7	51	i 23 28	S	(i 23 28)	[− 3]	e 40·6	—
Berkeley		90·2	52	i 13 3	+ 5	i 23 30	[− 4]	e 39·9	—
Victoria	E.	90·8	41	e 13 8	+ 7	i 23 30	[− 7]	i 42·0	51·3
Seattle		91·4	42	e 23 15	S	(e 23 15)	[−26]	e 45·6	—
Pasadena		93·2	56	i 13 13a	+ 1	i 23 46	[− 5]	e 42·6	—
Mount Wilson		93·3	56	i 13 15	+ 2	i 23 47	[− 5]	—	—
Tinemaha		93·4	53	i 13 14	+ 1	e 23 49	[− 3]	—	—
Haiwee		93·5	54	e 13 14	0	e 23 48	[− 5]	—	—
Riverside		93·8	56	i 13 17	+ 2	i 23 52	[− 2]	—	—
La Jolla		93·9	57	e 13 16	+ 1	e 23 50	[− 5]	—	—
Bozeman		99·0	44	—	—	e 24 21	[0]	e 46·2	—
Tucson		99·3	58	e 17 49	PP	i 24 23	[+ 1]	i 45·9	—
Tananarive		101·5	250	24 29	SKS	(24 29)	[− 4]	47·6	54·6
Baku		102·7	311	e 18 7	PP	e 27 20	PS	36·6	46·1
Kucino		108·0	327	e 18 50	PP	i 24 55	[− 9]	e 46·7	54·1
Pulkovo		110·3	333	—	—	i 29 28	PS	51·6	65·0
Simferopol		113·4	317	e 20 0	PP	—	—	—	—
Yalta		113·5	316	e 25 21	SKS	(e 25 21)	[− 7]	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Little Rock		114·4	55	e 19 38	PP	i 25 0	[−31]	e 50·6	—
Ksara		114·6	305	19 31	PP	28 51	PS	—	—
Florissant		115·1	49	i 19 36	PP	i 25 26	[− 8]	53·1	61·6
St. Louis		115·2	49	i 19 35	PP	i 25 23	[−11]	e 53·5	e 59·4
Upsala		115·7	336	—	—	i 25 20	[−16]	e 51·6	58·1
Chicago		116·3	45	e 19 59	PP	e 25 30	[− 8]	e 53·1	—
Ann Arbor	N.	118·9	43	—	—	e 36 7	SS	e 56·2	—
Helwan		119·1	302	e 19 47	PP	30 4	PS	—	68·3
Cincinnati		119·4	47	i 19 15	[+31]	e 29 49	PS	e 56·6	—
Copenhagen		120·5	335	18 51	[+ 4]	e 29 51	SKSP	53·6	—
Cape Town		120·8	225	25 31	SKS	(25 31)	[−22]	56·6	65·6
Toronto		121·3	40	e 20 4	PP	e 25 47	[− 7]	52·6	—
Budapest		122·0	324	e 18 37?	[−13]	—	—	e 57·6	70·1
Buffalo		122·0	42	—	—	i 30 25	PS	e 57·6	—
Pittsburgh		122·2	45	—	—	e 25 34	[−23]	e 54·6	—
Potsdam		122·4	332	i 18 52	[+ 1]	i 25 52	[− 6]	e 57·6	73·6
Ottawa		122·8	37	e 20 37	PP	e 25 49	[−10]	e 51·6	—
Hamburg		123·0	333	e 18 43	[−10]	i 25 54	[− 5]	e 52·6	61·6
Prague		123·1	328	e 22 41	PPP	e 32 37	?	e 56·6	64·6
Vienna		123·1	326	i 18 55	[+ 2]	27 30	{− 8}	e 57·6	73·9
Columbia		123·6	52	e 20 27	PP	e 26 3	[+ 2]	e 59·8	—
Cheb		124·1	330	e 20 24	PP	e 30 53	PS	e 55·6	64·6
Göttingen		124·3	332	e 18 55	[− 1]	e 25 31	[−32]	e 57·6	74·6
Zagreb		124·6	324	e 18 57	[+ 1]	e 30 37?	PS	e 56·2	—
Feldberg	N.	126·0	332	e 20 54	PS	e 27 13	{−43}	e 60·9	77·2
Triest		126·0	325	18 53k	[− 6]	e 30 51	PS	e 56·6	65·1
Edinburgh		126·0	341	e 20 57	PP	e 35 37?	?	e 55·6	77·1
De Bilt		126·1	335	i 19 1	[+ 2]	—	—	e 56·6	63·8
Fordham		126·2	41	e 22 34	?	e 26 5	[− 3]	e 55·6	—
Durham		126·5	341	20 57	PP	—	—	—	71·6
Stuttgart		126·6	330	19 1a	[+ 1]	e 26 13	[+ 3]	e 61·6	75·7
Karlsruhe		126·8	331	i 19 9	[+ 8]	—	—	e 65·6	—
Treviso		126·9	325	i 19 1	[0]	e 31 18	PS	59·6	—
Oak Ridge		126·9	39	i 19 3	[+ 3]	i 27 55	{− 6}	e 58·6	—
Venice		126·9	325	i 21 0	PP	i 30 59	PS	—	—
Padova		127·3	325	e 20 58	PP	i 31 4	PS	—	—
Uccle		127·4	335	i 19 3	[+ 1]	e 27 59	{− 6}	e 56·6	64·6
Strasbourg		127·4	330	i 19 1a	[− 1]	e 31 37?	PS	e 42·6	67·1
Stonyhurst		127·5	339	21 13	PP	—	—	52·6	76·6
Chur		127·7	326	e 19 2	[0]	—	—	—	—
Trenta		127·8	317	e 19 2	[− 1]	—	—	—	—
Zurich		127·8	327	e 19 1	[− 2]	—	—	—	—
Bidston		127·9	339	i 22 12	?	i 27 37	{−31}	e 56·6	77·1
Florence		128·6	324	i 19 12	[+ 8]	31 37	PS	41·6	63·6
Prato		128·6	324	e 19 5	[+ 1]	—	—	e 54·6	—
Kew		128·7	337	i 19 5	[+ 1]	e 26 16	[0]	e 57·6	76·0
Piacenza		128·7	325	19 7	[+ 3]	22 27	?	53·6	74·6
Oxford		128·8	338	i 21 37	PP	i 28 1	{−13}	e 53·6	76·3
Neuchatel		128·9	329	e 19 15	[+10]	—	—	—	—
Catania		129·4	315	e 22 23	PKS	—	—	—	—
Paris		129·6	333	e 19 7	[+ 1]	—	—	58·6	69·6
Huancayo		129·9	111	e 19 13	[+ 6]	i 22 36	PKS	—	—
La Paz		134·7	121	e 19 21	[+ 7]	26 18	[−15]	63·6	78·4
Barcelona		135·2	327	e 22 46	PKS	—	—	—	78·8
Sucre		135·9	125	19 16	[0]	25 57	[−38]	65·1	—
Alicante		138·8	326	e 19 23	[+ 3]	—	—	e 63·9	—
Toledo		139·5	330	19 27	[+ 6]	—	—	e 66·1	—
San Juan		140·9	67	e 19 28	[+ 5]	—	—	e 63·1	—
Almeria		140·9	326	e 19 36	[+13]	—	—	e 67·3	—
Coimbra		141·2	336	e 19 29	[+ 6]	e 29 59	{+28}	—	—
Granada		141·3	328	i 19 33	[+10]	35 3	PS	64·9	81·4
Malaga		142·1	328	e 19 27	[+ 3]	28 57	{−39}	60·6	—
San Fernando		143·2	330	17 57	?	35 42	?	—	97·6
Fort de France		146·5	72	e 23 49	PKS	—	—	—	—

For Notes see next page.

NOTES TO Nov. 22d. 12h. 42m. 23s.

Additional readings :—

Amboina iPE = +4m.57s.
Riverview iSN = +10m.33s., iN = +10m.52s., iE = +13m.0s.
Sydney e = +8m.49s. = P_cP −15s., iS = +12m.7s.
Adelaide i = +13m.31s.
Apia PPZ = +8m.36s.
Wellington PP = +9m.32s. = PPP −2s., SS = +17m.17s. = SSS +5s.
Christchurch iPPZ = +9m.3s., P_cPz = +9m.30s., iZ = +13m.35s., SSE = +16m.37s., L_q = +17m.15s., S_cS = +17m.25s.
Osaka i = +10m.24s. and +17m.58s.
Kobe eZ = +10m.18s. and +16m.53s., iN = +17m.29s., iE = +17m.42s. and +19m.6s., iN = +19m.39s.
Nagasaki eSSS? = +18m.3s. = S_cS −1s.
Hong Kong PP = +10m.21s.
Zi-ka-wei iZ = +8m.47s. and +8m.53s., PPZ? = +10m.33s., iZ = +19m.33s. = SSS +3s.
Taikyu S = +10m.57s. = PPP +7s.
Nanking iZ = +9m.4s. and +14m.1s., iE = +14m.8s.
Chiufeng i = +10m.4s. ; T_0 = 12h.42m.35s.
Honolulu T.H. eSSS = +23m.37s.
Sitka eSS = +28m.28s.
Tashkent ePP = +16m.24s., ePPP = +18m.26s., iSKS = +23m.15s., ePS = +24m.41s., eSS = +28m.43s.
Berkeley iSE = +23m.33s.
Pasadena i = +24m.22s. = S −4s. and +24m.50s.
La Jolla eN = +24m.31s. = S −1s.
Bozeman e = +25m.13s. = S −5s. and +25m.22s.
Tucson ePS = +26m.42s., eSS = +32m.0s.
Tananarive PP = +27m.15s. = PS +13s.
Kucino ePS = +28m.22s., eSS = +33m.49s.
Pulkovo eS = +29m.58s., eSS = +38m.49s.
Little Rock iSKS = +25m.27s., iSKKS = +26m.10s., eS = +27m.31s., ePS = +29m.53s., i = +38m.13s.
Florissant iSKKSE = +26m.42s., i?E = +26m.54s., iSE = +27m.11s., ePSE = +29m.17s., eSSE = +35m.34s. ; T_0 = 12h.42m.26s.
St. Louis iSKKSE = +26m.38s., i = +28m.28s., ePS = +29m.16s.
Upsala e = +29m.12s. = PS −11s.
Chicago ePS = +29m.33s.
Helwan P = +20m.9s.
Cincinnati iPP = +20m.8s. ; T_0 = 12h.42m.26s.
Copenhagen +20m.14s. = PP +2s., eEN = +22m.59s. = PPP +19s.
Cape Town PP = +29m.37s., SS? = +42m.55s., SSS? = +47m.43s.
Toronto iE = +27m.19s. = SKKS −6s.
Pittsburgh eSKKS = +27m.7s., ePS = +30m.1s.
Potsdam eEZ = +19m.55s., iPP = +20m.30s., iPPP = +22m.57s., eN = +25m.49s., iSKKSE = +27m.20s., eN = +27m.25s. and +27m.37s., iE = +28m.24s., ePSEZ = +30m.31s., iPSN = +30m.52s., ePPS = +32m.55s., iSSEZ = +37m.30s., iSSN = +37m.35s., eSSSN = +42m.13s.
Ottawa i = +27m.25s. = SKKS −10s., e = +28m.29s., eE = +30m.25s. = PS −2s., e = +37m.1s. = SS −8s. and +40m.7s.
Hamburg eZ = +18m.53s.
Vienna PKP = +21m.3s., SKPS = +25m.57s., i = +30m.35s. = PS +5s., SKKS = +31m.38s., i = +33m.37s., SKSP = +34m.44s.
Columbia eSKKS = +27m.37s.
Göttingen eNZ = +20m.46s. = PP +7s., eN = +30m.37s. = PS −4s., +33m.13s., and +37m.43s. = SS +15s.
De Bilt iPPZ = +20m.53s., ePPEN = +20m.58s., iZ = +22m.14s., eEN = +22m.19s.
Fordham eSKKS = +27m.48s., eS = +28m.56s.
Stuttgart iZ = +19m.3s., iPP = +20m.57s., PPP = +23m.37s., e = +27m.7s., eS? = +27m.50s. = SKKS −10s., eSS = +38m.13s., eSSS = +43m.7s.
Oak Ridge ePPZ = +20m.59s. = PP +2s., iPPNW = +21m.21s., eSKP = +22m.20s., ePSZ = +30m.45s. = SKSP −3s., PPSNW = +32m.31s., SSNW = +37m.57s., SSSNW = +44m.0s.
Uccle iZ = +21m.1s. = PP +1s. and +22m.19s., eE = +38m.25s. = SS +18s.
Strasbourg i = +21m.0s. = PP +0s., e = +22m.20s. and +25m.37s.?
Bidston e = +38m.37s.? = SS +22s.
Florence iZ = +20m.52s. = PP −16s. and +22m.21s., i = +33m.9s., +33m.37s., +34m.37s., +39m.2s., and +41m.7s.
Kew iPKS = +22m.22s., eSSN = +38m.51s.
Oxford i = +22m.23s.
Neuchatel ePP = +21m.15s.
Paris PP = +21m.20s., i = +22m.27s. = PKS.
Huancayo eP = +19m.25s., ePP = +21m.47s.
La Paz PPN = +22m.59s., SKKS = +28m.50s.

Continued on next page.

Alicante PP = +23m.3s.
Toledo PPP = +22m.58s.
San Juan ePP = +22m.23s., eSKP = +23m.7s., ePPS = +35m.7s., eSS = +40m.55s.
Almeria PP = +23m.6s.
Granada PKP = +21m.45s., PP = +24m.33s., PPP = +27m.33s., SSS = +46m.31s.
Malaga PP = +22m.8s., PKS = +23m.8s., SKSP = +32m.18s., PS? = +33m.6s., e = +39m.38s.
San Fernando PN = +18m.15s.
Long waves were also recorded at Leipzig, Jena, Bergen, Ivigtut, Charlottesville, Dakar, and Toyooka.

Nov. 22d. 18h. 59m. 29s. Epicentre 28°·8N. 128°·7E. (as at 12h.21m.). X.

A = −·548, B = +·684, C = +·482 ; D = +·780, E = +·625 ;
G = −·301, H = +·376, K = −·876.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki		4·1	13	e 0 55	− 3	e 2 9	S_g	2·6	—
Hukuoka		5·0	16	1 16	+ 5	2 45	S_g	—	—
Koti	Z.	6·3	40	e 1 32	+ 2	—	—	—	—
Zi-ka-wei		6·7	292	e 1 39	+ 4	3 52	S_g	—	7·4
Taikyu		7·1	359	e 2 5	P*	3 55	S_g	5·8	—
Taihoku		7·4	241	e 2 1	P*	—	—	—	—
Sumoto		7·6	42	1 47	− 1	e 4 28	S_g	—	5·6
Kobe		8·0	41	e 1 52	− 1	e 3 4	−20	—	4·9
Osaka		8·3	43	2 1	+ 3	4 17	S_g	—	5·7
Zinsen	E.	8·8	350	e 3 34	?	e 4 32	S*	—	—
Keizyo		8·9	351	e 3 42	S	(e 3 42)	− 4	—	—
Nanking		9·2	293	e 2 1	− 9	e 4 59	S_g	i 8·7	11·7
Nagoya		9·5	46	(e 2 15)	+ 1	e 2 15	P	—	—
Heizyo	E.	10·5	347	e 5 21	S*	—	—	—	—
Mizusawa	E.	14·5	42	(e 3 18)	− 4	e 3 18	P	—	—
Vladivostok		14·5	9	3 27	+ 5	i 6 22	+19	8·3	10·8
Chiufeng		15·3	321	3 32k	0	e 6 29	+ 7	e 8·2	11·9
Tashkent		49·2	302	—	—	e 15 41	− 9	e 26·6	30·9
Ekaterinburg		54·3	321	e 9 19	− 4	e 16 56	− 3	25·5	30·6

Additional readings :—
Zi-ka-wei iZ = +4m.4s., +4m.28s., +4m.51s., and +6m.11s.
Kobe eS?N = +2m.55s., eS?E = +3m.10s.
Tashkent e = +20m.37s. =SSSS − 3s. and +22m.37s.
Long waves were also recorded at Hong Kong, Phu-Lien, Baku, Tiflis, Kucino, Pulkovo, and several European stations.

Nov. 22d. 22h. 31m. 58s. Epicentre 28°·8N. 128°·7E. (as at 18h.). R.3.

A = −·548, B = +·684, C = +·482 ; D = +·780, E = +·625 ;
G = −·301, H = +·376, K = −·876.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Nagasaki		4·1	13	e 0 57a	− 1	2 14	S_g	—	2·7
Hukuoka		5·0	16	1 7	− 4	2 26	S*	—	—
Simidu		5·4	41	e 1 9	− 8	—	—	—	—
Koti		6·3	40	e 1 31	+ 1	e 2 56	+15	e 3·5	—
Zi-ka-wei	Z.	6·7	292	e 1 38	+ 3	i 3 7	S*	—	4·9
Taikyu		7·1	359	e 1 46	+ 5	3 54	S_g	6·6	—
Taihoku		7·4	241	e 1 50	+ 5	—	—	—	—
Sumoto		7·6	42	1 49a	+ 1	4 26	S_g	—	4·9
Kobe		8·0	41	e 1 51	− 2	e 3 5	−19	—	5·0
Osaka		8·3	43	1 50	− 8	4 5	S*	—	5·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Toyooka	E.	8·5	36	—	—	4 7	S*	—	—
Zinsen	E.	8·8	350	e 3 7	?	e 4 13	S*	—	—
Keizyo		8·9	351	e 2 56	?	4 41	S_g	—	—
Nanking		9·2	293	2 2	− 8	i 4 40	S_g	5·9	7·8
Nagoya		9·5	46	(e 2 12)	− 2	e 5 9	S_g	—	—
Heizyo	E.	10·5	347	e 4 40	S	(e 4 40)	+14	—	—
Mizusawa	E.	14·5	42	3 32	+10	6 16	+13	—	—
	N.	14·5	42	3 29	+ 7	6 11	+ 8	—	—
Vladivostok		14·5	9	e 3 29	+ 7	i 6 27	+24	7·8	10·9
Chiufeng		15·3	321	3 29a	− 3	6 30	+ 8	8·3	—
Manila		15·9	208	3 42	+ 2	6 47	+11	8·4	—
Tashkent		49·2	302	8 49	+ 4	15 48	− 2	25·6	30·5
Bombay		51·6	272	—	—	e 16 2	−21	—	—
Ekaterinburg		54·3	321	e 9 20	− 3	16 59	0	25·4	30·8
Tiflis		67·1	307	e 10 53	+ 1	e 20 45	(+ 1)	e 34·0	44·0
Pulkovo		69·4	328	—	—	e 20 3	−11	37·0	41·2
Triest		85·1	320	e 10 43k	?	e 21 9	?	e 43·0	49·0

Additional readings and notes :—
Zi-ka-wei iZ = +3m.57s.
Kobe PZ = +1m.54s.
Toyooka eE = +6m.2s.
Nanking iN = +4m.22s., =S* − 10s., iE = +5m.21s.
Nagoya P is given as S of an earlier shock, for which eP? is given as 22h.32m.21s., the P corresponding to true S is +3m.19s.
Chiufeng iP = +3m.38s. =PP + 1s., iS = +6m.43s. ; T_o =22h.31m.48s.
Triest PZ = +10m.52s.
Long waves were also recorded at Hong Kong, Phu-Lien, Baku, Kucino, and other European stations.

Nov. 22d. Readings also at 0h. (Balboa Heights, La Paz (2), and near Nanking), 1h. (Andijan, Balboa Heights, La Plata, Cincinnati, and Oak Ridge), 2h. (St. Louis), 3h. (La Paz), 5h. (La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Balboa Heights (2)), 6h. (Glenmuick, Christchurch, Andijan, and near Balboa Heights (2)), 7h. (Huancayo, San Juan, Columbia, Pittsburgh, Stuttgart (2), Ekaterinburg, and Tashkent), 8h. (Chicago, Ottawa, Huancayo, San Juan, La Paz, Columbia, near Balboa Heights, and near Andijan), 9h. (Apia, Charlottesville, Cheb, De Bilt, and Pittsburgh), 10h. (Columbia, Huancayo, Balboa Heights (2) and San Juan), 11h. (Balboa Heights, Chur, Ravensburg, Stuttgart, Trenta, Vienna, Zurich, near Triest, Zagreb, and near Tyosi), 12h. (Triest, Zagreb, and near Trenta), 14h. (Balboa Heights (2), and Tananarive), 15h. (Apia), 16h. (Nagoya), 18h. (Bombay and Tortosa), 20h. (Ekaterinburg and Tashkent), 21h. (Bidston and Balboa Heights), 23h. (San Juan and Tyosi).

Nov. 23d. 1h. 12m. 46s. Epicentre 42°·0N. 14°·2E. (as on 1933 Sept. 26d.). R.2.

A = +·720, B = +·182, C = +·669 ; D = +·245, E = −·969 ;
G = +·649, H = +·164, K = −·743.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Benevento		0·9	175	i 0 14	+ 1	0 24	+ 1	—	0·6
Naples	E.	1·2	176	i 0 14	− 3	e 0 27	− 4	—	—
Camerino		1·4	324	0 11	− 9	0 35	− 1	—	—
Florence		2·8	309	i 0 43	+ 3	—	—	—	1·7
Prato		2·9	310	e 0 49	P*	i 1 14	0	—	1·8
Livorno		3·2	298	0 46	0	1 26	+ 4	—	—
Trenta		3·2	150	e 0 59	P_g	1 44	S_g	—	—
Venice		3·6	339	e 1 14	P_g	i 2 12	S_g	—	—
Triest		3·6	354	e 0 51k	0	i 1 34	+ 2	—	—
Padova		3·8	334	e 1 22	P_g	2 18	S_g	—	—
Treviso		3·9	338	e 0 51	− 5	e 2 5	S_g	—	2·7
Piacenza		4·5	315	e 1 2	− 2	2 2	+ 7	—	3·3
Catania		4·6	167	e 1 22	P_g	—	—	—	—
Pavia		4·8	313	e 0 49	−19	—	—	—	—
Graz		5·2	9	e 1 21	+ 7	i 2 25	S*	—	2·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Chur		5·9	327	e 1 21	− 3	e 2 25	− 6	—	—
Budapest		6·4	31	e 2 59	S*	3 44	S_g	4·2	—
Vienna		6·4	13	e 1 36	+ 5	2 46	+ 3	i 3·6	4·6
Ravensburg		6·6	332	e 1 56	P*	—	—	—	—
Zurich		6·7	325	e 1 29	− 6	—	—	—	—
Neuchatel		7·1	316	e 1 37	− 4	e 2 58	− 3	—	—
Stuttgart		7·6	334	e 1 54	+ 6	e 3 40	S*	—	5·8
Prague		8·0	1	e 0 50	?	—	—	—	2·7
Strasbourg		8·0	328	e 1 14?	−39	—	—	—	5·7
Cheb		8·1	352	e 2 14?	P*	—	—	—	—
Karlsruhe		8·1	332	3 39	S	(3 39)	+13	—	—
Potsdam		10·4	356	e 5 32	S_g	—	—	—	7·2
Pulkovo		20·3	24	e 0 34	?	—	—	12·2	13·8

Additional readings :—
Florence i = +46s.
Venice +1m.48s. =S* +3s.
Triest iPP = +1m.5s. =P_g −1s., iS_g = +1m.52s., iSS? = +1m.56s., iSSS = +2m.9s., i = +2m.29s.
Treviso P_g = +1m.29s.
Vienna iZ = +1m.42s. =P* −4s., iN = +1m.45s., P* = +1m.54s., P_g = +2m.9s., iN = +2m.14s., iZ = +2m.24s., S = +2m.50s., iZ = +3m.16s., S* = +3m.24s., iN = +3m.27s., SS = +3m.40s.
Stuttgart e = +4m.34s. and +4m.39s.
Potsdam iN = +5m.46s., i = +5m.55s., iN = +6m.1s., iZ = +6m.4s. and +6m.31s.
Long waves were also recorded at Tashkent, Ekaterinburg, Kucino, and at other European stations.

Nov. 23d. 18h. 44m. 18s. Epicentre 17°·0S. 68°·0E. N.3.

A = +·358, B = +·887, C = −·292 ; D = +·927, E = −·375 ;
G = −·110, H = −·271, K = −·956.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tananarive		19·6	261	—	—	8 0	+ 2	8·7	9·4
Bombay		36·2	7	e 8 42	PP	—	—	—	—
Tashkent		58·3	2	9 51	− 1	17 54	+ 1	e 27·7	33·8
Baku		59·8	344	10 5	+ 2	18 14	+ 1	28·2	—
Tiflis	E.	62·5	341	—	—	e 18 44	− 4	e 27·2	—
Ekaterinburg		74·1	357	e 11 33	− 2	—	—	—	—
Pulkovo		82·7	342	—	—	e 22 35	[− 6]	—	—

Nov. 23d. 18h. 57m. 50s. Epicentre 8°·0N. 83°·0W. (as on 22d.). R.2.

A = +·121, B = −·983, C = +·139 ; D = −·993, E = −·122 ;
G = +·017, H = −·138, K = −·990.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	E.	3·5	74	i 1 18	P_g	i 2 6	S*	2·6	2·8
	N.	3·5	74	i 1 30	S	i 2 2	S_g	2·2	2·5
San Juan		19·4	56	i 4 24	+ 1	i 8 3	+ 9	10·7	—
Huancayo		21·4	159	i 4 46	+ 2	i 8 4	+11	e 10·7	—
Fort de France		22·4	71	(i 4 59)	+ 4	i 4 59	P	—	—
Columbia		26·1	4	e 5 33	+ 3	e 10 13	+13	e 13·0	—
Little Rock		28·1	343	e 5 48	0	e 10 34	0	i 13·2	—
La Paz	N.	28·5	149	e 6 59	+67	11 59	+79	15·4	19·3
Charlottesville		30·3	7	e 6 6	− 2	e 11 11	+ 2	e 14·2	—
Cincinnati		31·2	358	i 6 16	0	e 11 21	− 2	i 16·1	—
St. Louis		31·3	349	i 6 16	− 1	i 11 22	− 2	e 16·2	—
Georgetown		31·4	9	i 6 15a	− 2	e 11 5	−21	e 15·2	—
Florissant		31·5	349	i 6 15	− 3	i 11 24	− 4	14·2	—
Sucre		32·1	147	7 52	+88	12 58	+81	17·7	—
Pittsburgh		32·6	5	—	—	e 13 4	S	e 16·3	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Fordham		33·8	12	e 6 40	+ 1	e 12 7	+ 4	e 16·2	19·6
Chicago		34·2	353	—	—|	e 11 50	−19	e 15·4	—
Ann Arbor		34·3	0	e 7 58	PP	e 12 22	+11	i 15·4	20·5
Tucson		35·5	318	e 7 15	+22	e 12 22	− 7	e 15·7	—
Toronto		35·8	4	i 6 55	− 1	i 12 30	− 3	17·3	—
Oak Ridge		36·0	15	e 6 58	0	e 12 28	− 8	e 16·4	—
Ottawa		37·9	9	e 7 12	− 2	13 7	+ 2	e 18·2	—
La Jolla	Z.	40·3	313	e 7 28	− 7	—	—	—	—
Pasadena		41·6	314	e 7 45	0	e 14 3	+ 3	e 21·5	—
Haiwee		42·5	317	e 7 53	0	—	—	—	—
Santa Barbara	Z.	42·9	313	e 7 57	+ 1	—	—	—	—
Bozeman		44·8	333	e 9 16	+65	e 14 44	− 3	e 28·2	—
La Plata		49·0	152	—	—	e 15 46	− 1	27·6	33·4
Malaga		76·1	54	e 14 3	PP	e 21 32	− 1	29·7	—
Toledo		76·4	52	e 11 57	+ 9	21 40	+ 4	e 35·7	—
Granada		76·7	54	i 12 11a	+21	e 22 8	+29	37·1	—
Almeria		77·4	55	e 12 5	+11	e 21 49	+ 2	e 35·6	—
Bidston		77·6	37	—	—	e 21 50	+ 1	e 33·2	—
Edinburgh		77·7	35	—	—	e 21 47	− 4	e 36·2	47·2
Stonyhurst		78·0	37	—	—	e 21 51	− 3	39·2	45·5
Oxford		78·6	39	—	—	e 21 52	− 8	e 34·0	42·2
Alicante		79·2	53	e 11 40	−24	e 21 20	−47	e 38·4	—
Kew		79·2	39	—	—	e 21 59	− 8	e 37·2	40·4
Paris		81·0	42	e 12 12	− 1	e 23 29	PS	38·2	41·2
Uccle		82·1	40	e 12 16	− 3	e 22 36	− 2	e 35·2	—
De Bilt		82·5	38	i 12 23	+ 2	e 22 40	− 2	e 35·2	44·6
Strasbourg		84·5	41	e 12 26	− 5	e 23 0	− 3	e 35·2	—
Feldberg	N.	84·8	40	—	—	e 22 48	[−10]	e 42·0	50·7
Hamburg		85·3	36	—	—	e 27 10?	?	e 42·2	46·2
Stuttgart		85·4	41	e 12 32a	− 3	e 23 5	− 7	e 38·2	—
Göttingen	N.	85·6	39	—	—	e 23 10	− 4	e 37·2	52·4
Piacenza		86·2	45	—	—	23 10	[+ 2]	42·2	58·8
Copenhagen		86·4	34	—	—	23 10	[+ 1]	38·2	—
Cheb		87·3	40	e 12 10?	−35	e 23 18	[+ 3]	e 40·2	47·2
Potsdam		87·4	37	—	—	e 23 10?	[− 6]	e 41·2	54·2
Florence		87·5	46	—	—	e 23 10	[− 7]	—	45·2
Upsala	E.	88·3	30	—	—	e 23 39	− 1	—	—
Triest		88·9	44	e 12 53	+ 1	23 29	[+ 3]	e 41·2	47·2
Pulkovo		94·4	28	e 13 23	+ 5	e 23 49	[− 9]	43·2	47·6
Tiflis	E.	111·1	39	—	—	e 25 20	[+ 2]	e 53·7	68·4

Additional readings :—
San Juan i = +6m.22s.
Huancayo i = +8m.53s.
Fort de France iP = +2m.18s.
Little Rock iPP = +6m.25s., iPPP = +6m.34s., iSS = +11m.47s., iSSS = +12m.24s.
Charlottesville e = +13m.28s.
Cincinnati i = +9m.19s. = P_cP +5s.; T_0 = 18h.57m.50s.
St. Louis iPPN = +7m.7s., iPPPN = +7m.16s., iSS = +12m.46s., iEN = +13m.10s. = SSS −2s. and +15m.10s. ; T_0 = 18h.57m.50s.
Georgetown iS_cSZ = +16m.25s.
Florissant PPZ = +7m.8s., PPPZ = +7m.17s., SSE = +12m.53s.
Fordham eN = +7m.49s. = PP +3s.
Chicago eSS = +14m.5s.
Toronto ePPN = +8m.8s.
Oak Ridge e = +8m.10s. = PP −3s., +8m.16s. and +11m.58s.
Ottawa PPP = +8m.42s., SSSE = +16m.2s. ; T_0 = 18h.57m.48s.
La Plata eSE = +15m.52s.
Malaga e = +21m.58s. = PS −1s.
Uccle eSS = +27m.46s.
De Bilt eSSE = +27m.58s.
Strasbourg eSS = +28m.45s.
Stuttgart ePSE = +24m.7s., eE = +26m.10s., eSS = +28m.58s.
Triest i = +23m.42s. = S −4s.
Pulkovo e = +17m.1s. = PP +1s., +25m.45s. = PS +2s., and +29m.34s.
Tiflis eE = +28m.42s. = PS +3s.
Long waves were also recorded at Ukiah, Sitka, Ivigtut, Christchurch, Bombay, Hong Kong, Chiufeng, and other European and Russian Stations.

Nov. 23d. Readings also at 0h. (Wellington, Port au Prince, near Ootomari and near Taihoku), 2h. (Branner and near Zagreb), 3h. (La Plata, De Bilt, Stuttgart, Copenhagen, Kucino, Pulkovo, Tiflis, Baku, Ekaterinburg (2), Nanking, Nagasaki, near Tashkent (2), near Berkeley, Branner, and Lick), 4h. (Apia, near Nagoya, near Triest, and Zagreb), 7h. (Huancayo), 8h. (Huancayo and near Amboina), 10h. (Nanking and near Taihoku), 11h. (Huancayo), 13h. (Belgrade, near Almata, Andijan, and Frunse), 14h. (Sebastopol, and near Tyosi), 15h. (Tyosi), 16h. (Kodaikanal), 18h. (Glenmuick, and near Christchurch), 19h. (Huancayo), 20h. (near Triest), 23h. (near Tyosi).

Nov. 24d. Readings at 1h. (near Berkeley), 3h. (Calcutta, Port au Prince and Strasbourg), 4h. (Andijan, Bombay, Hong Kong, and Medan), 6h. (Trenta and Triest), 8h. (Balboa Heights and Bombay), 10h. (Christchurch, Wellington, Tiflis, Huancayo, and near Nanking), 11h. (Ekaterinburg and Tashkent), 12h. (Hong Kong and near Chiufeng), 15h. (Suva), 18h. (Christchurch, Glenmuick, Wellington, Hong Kong, and Tashkent), 19h. (Ekaterinberg and Vienna), 21h. (Huancayo), 23h. (Tucson).

Nov. 25d. Readings at 0h. (Hong Kong, Nanking, Nagasaki, and near Huancayo), 1h. (Apia, Wellington, Hong Kong, Chiufeng, Bombay, Tashkent (2), Ekaterinburg (2), Pulkovo, De Bilt, Paris, Strasbourg, Stuttgart, and near Sumoto), 3h. (Huancayo and near Amboina), 12h. (near Almata, Andijan, and Frunse), 14h. (near Almata, Andijan, and Frunse), 17h. (Copenhagen, Stuttgart, San Juan, and Huancayo), 18h. (Ekaterinburg and Tashkent), 21h. (near Amboina).

Nov. 26d. Readings at 0h. (La Paz), 1h. (Huancayo, near Amboina, and near Tyosi), 5h. (Tashkent, Medan, near Batavia, Malabar, Soengei Langka, and near Ekaterinburg), 6h. (near Taihoku), 8h. (Nagoya), 13h. (Christchurch, Wellington, and near Nanking), 14h. (Mount Wilson, Tinemaha, Christchurch, Melbourne, Suva, and near Apia), 20h. (Huancayo (2) and La Paz), 21h. (Huancayo, De Bilt, Florence, Pulkovo, Stuttgart, Ekaterinburg, Tashkent, and Tiflis), 22h. (Tyosi, Chiufeng, Tashkent, and near Manila), 23h. (Ekaterinburg, Koti, and Wellington).

Nov. 27d. 7h. 50m. 11s. Epicentre 36°·3N. 141°·2E. (as on 1933 June 5d.). X.

A = −·628, B = +·505, C = +·592.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tyosi	0·6	207	0 8k	− 1	0 17	+ 2	0·3
Mizusawa	2·8	359	e 0 33	− 7	e 1 11	− 1	—
Nagoya	3·6	253	e 0 53	+ 2	1 41	S*	—
Osaka	4·9	251	1 17	P*	2 29	S*	3·0
Kobe	5·2	252	e 1 15	+ 1	e 2 15	+ 2	—

Nov. 27d. 19h. 14m. 28s. Epicentre 39°·7N. 143°·2E. N.1.

Probable error of epicentre ±0°·15.
Epicentre given by the Japanese stations.

A = −·616, B = +·461, C = +·639; D = +·599, E = +·801;
G = −·511, H = +·383, K = −·769.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Miyako		0·9	266	0 19	+ 6	0 32	+ 9	—	—
Morioka		1·6	270	0 24a	+ 1	0 47	+ 6	—	—
Mizusawa		1·7	250	i 0 27a	+ 3	i 0 47	+ 3	—	—
Aomari		2·2	301	0 34	+ 3	1 13	S_g	—	—
Sendai		2·3	231	0 31a	− 2	1 2	+ 3	—	—
Akita		2·4	270	0 38	+ 4	1 12	S_g	—	—
Urakawa		2·5	353	0 47	P_g	1 20	S_g	—	—
Hukusima		2·9	228	0 39a	− 2	1 19	+ 5	—	—
Sapporo		3·6	339	1 9	P_g	1 57	S_g	—	—
Mito		3·9	214	0 52	− 4	1 45	+ 5	—	—
Nemuro		4·0	25	0 58	+ 1	1 44	+ 2	—	—
Kakioka		4·2	215	0 55	− 5	—	—	—	—
Tukubasan		4·3	216	0 58	− 3	2 12	S_g	—	—
Tyosi		4·4	205	e 0 56	− 7	2 0	+ 7	—	2·3
Maebasi		4·6	225	1 3	− 3	2 7	+ 9	—	—
Kumagaya		4·7	221	1 7	0	2 9	+ 9	—	—
Tokyo		4·9	215	1 9	− 1	2 16	+11	—	—
Nagano		5·0	234	1 11	0	2 18	+10	—	—
Yokohama		5·1	215	1 12	− 1	2 21	+11	—	—
Wazima		5·4	246	1 18	+ 1	2 42	S*	—	—
Kohu		5·5	224	1 17	− 1	2 32	+12	—	—
Mera		5·5	210	1 23	+ 5	2 50	S_g	—	—
Toyama		5·6	239	1 22	+ 2	3 10	S_g	—	—
Misima		5·7	217	1 18	− 3	2 41	S*	—	—
Numadu		5·7	218	1 30	P*	2 33	+ 8	—	—
Omaesaki		6·5	219	1 59	P_g	3 10	S*	—	—
Gihu		6·6	231	1 34	0	2 57	+ 9	—	—
Nagoya		6·7	229	e 1 42	+ 7	e 2 50	− 1	—	3·4
Hatidyozima		7·1	203	1 40	− 1	—	—	—	—
Kameyama		7·2	229	1 55	P*	3 19	S*	—	—
Osaka		7·9	233	1 58	+ 6	4 10	S_g	—	4·8
Kobe		8·2	235	e 1 52	− 4	—	—	—	5·8
Wakayama		8·4	232	2 20	+21	4 24	S_g	—	—
Sumoto	E.	8·5	233	e 2 4	+ 4	4 35	S_g	—	4·7
	N.	8·5	233	e 2 6	+ 6	4 29	S_g	—	5·0
Vladivostok		9·1	295	2 12	+ 3	4 12	+21	4·9	6·0
Koti		9·9	234	—	—	e 3 32?	−39	—	—
Chiufeng		20·7	280	e 4 36	− 1	e 8 33	+13	—	13·0
Nanking	E.	21·1	256	i 4 37	− 4	—	—	—	—
Ekaterinburg		53·9	318	i 9 22	+ 1	—	—	26·5	—

Additional readings :—
Tyosi S_g = +2m.17s.
Osaka 1 = +3m.47s. = S* − 6s.
Kobe eN = +2m.1s.
Long waves were also recorded at Hong Kong and other European and Russian stations.

Nov. 27d. Readings also at 0h. (Florence), 2h. (Huancayo and La Paz), 3h. (Florence and near Apia), 4h. (near Soengei Langka), 5h. (Almata (2) and Andijan (2)), 6h. (Almata, Andijan, Frunse, Tashkent, Baku, Ekaterinburg, and Chiufeng), 7h. (De Bilt and Copenhagen), 8h. (Branner and Triest), 9h. (Wellington), 10h. (Mineo and near Wellington), 12h. (Wellington), 14h. (near Almata, Andijan, Frunse, and near Triest), 16h. (near Berkeley, Branner, Lick, and near Tashkent), 17h. (Branner and near Lick), 18h. (near Wellington), 19h. (near Tyosi (2)), 20h. (Adelaide, Melbourne, Riverview, Sydney, Perth, Suva, Christchurch, Wellington, and near Apia), 21h, (Baku, Ekaterinburg, Kucino, Pulkovo, Uccle, and Tashkent),

Nov. 28d. 11h. 9m. 26s. Epicentre 32°·0N. 56°·1E. N.1.

Probable error of epicentre ±0°·26.

A = +·473, B = +·704, C = +·530; D = +·830, E = −·558; G = +·296, H = +·440, K = −·848.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		9·7	331	e 2 16	− 1	e 4 16	+10	—	—
Tiflis		13·2	320	i 3 1	− 4	e 5 42	+10	i 6·5	—
Ksara		17·0	282	i 3 54	0	i 7 15	+13	—	—
Frunse		18·2	48	e 4 37?	+28	8 5	+36	—	—
Dehra Dun		18·8	89	7 54	S	(7 54)	+12	10·6	11·6
Agra		19·6	99	4 20	− 5	8 1	+ 3	10·2	11·9
Almata		19·9	50	i 4 31	+ 2	8 33	+29	—	—
Bombay		20·0	127	4 25	− 5	8 23	+17	10·6	17·9
Yalta		21·1	313	4 39	− 2	8 38	+10	15·6	—
Helwan		21·3	271	i 4 40	− 3	i 8 41	+ 9	—	14·7
Simferopol		21·4	314	4 41	− 3	8 42	+ 8	—	—
Sebastopol		21·6	312	4 44	− 2	—	—	—	—
Hyderabad		24·8	120	6 4	+46	10 18	+41	13·1	15·8
Ekaterinburg		25·0	6	i 5 16	− 4	i 9 44	+ 3	i 11·9	—
Kucino		26·9	337	5 43	+ 6	10 11	− 3	13·6	16·8
Kodaikanal		29·3	133	6 4	+ 5	i 11 44	+51	i 20·0	21·1
Lemberg	N.	29·7	317	6 4	+ 2	—	—	—	14·3
Calcutta	E.	30·1	100	5 50	−16	10 28	−38	15·0	18·1
	N.	30·1	100	5 41	−25	10 17	−49	14·8	16·1
Belgrade		30·3	305	e 6 11	+ 3	e 11 45	+36	19·3	—
Pulkovo		32·6	336	i 6 23	− 5	e 11 40	− 5	17·1	21·5
Colombo		33·5	133	6 33	− 3	14 39	?	22·6	25·9
Zagreb		33·7	306	e 6 34	− 4	e 11 58	− 3	e 17·1	—
Catania		33·8	290	6 39	0	11 51	−12	22·3	31·4
Vienna		33·9	310	e 6 38k	− 1	13 43	SS	—	25·6
Graz		34·3	307	i 6 42	− 1	e 13 14	+63	e 17·6	22·1
Benevento		34·4	297	e 6 54	+10	12 9	− 3	17·2	21·8
Triest		35·2	306	i 6 51k	0	i 12 45	+21	i 17·6	19·2
Venice		36·2	305	i 6 57	− 3	i 12 53	+14	—	—
Treviso		36·3	305	e 7 1	+ 1	—	—	e 55·6	—
Padova		36·5	305	e 8 54	PP	—	—	—	—
Florence		36·8	302	7 5	0	i 12 49	+ 1	18·6	23·6
Cheb		36·8	312	e 7 7	+ 2	e 12 52	+ 4	e 19·6	25·6
Prato		36·9	302	i 7 6	0	i 12 48	− 2	e 20·1	23·8
Potsdam		37·0	317	i 7 4	− 2	i 12 52	+ 1	e 20·6	23·6
Leipzig		37·2	313	e 7 9	+ 1	e 13 3	+ 9	e 20·6	24·1
Jena		37·6	313	e 7 10	− 2	i 13 2	+ 2	e 15·6	24·1
Upsala		37·6	329	e 7 6	− 6	e 12 53	− 7	e 18·6	25·0
Tunis		37·9	290	7 19	+ 5	—	—	—	—
Piacenza		38·0	305	7 48	+33	i 16 20	?	e 22·1	25·9
Chur		38·3	308	e 7 12	− 6	—	—	—	—
Copenhagen		38·5	322	7 15	− 4	e 13 10	− 4	—	—
Göttingen		38·6	315	e 7 20k	0	i 13 26	+11	e 16·0	18·6
Stuttgart		38·7	310	e 7 18	− 3	e 13 12	− 5	e 18·6	25·6
Zurich		38·9	308	e 7 18	− 5	—	—	—	—
Hamburg		39·1	318	e 7 23	− 1	e 13 23	+ 1	e 23·5	27·6
Karlsruhe		39·2	310	(e 6 34?)	−51	e 6 34?	P	e 28·6	—
Feldberg	N.	39·4	312	—	—	i 13 34	+ 7	—	27·1
Strasbourg		39·6	310	i 8 59a	PP	i 13 28	− 2	e 18·6	25·2
Neuchatel		40·0	307	e 7 25	− 7	e 13 39	+ 3	—	—
De Bilt		41·7	315	7 49	+ 3	i 14 14	+12	e 18·6	24·1
Uccle		42·1	312	e 7 48	− 1	e 14 15	+ 7	20·6	—
Paris		43·1	309	i 7 59	+ 1	e 17 44	SS	21·6	31·6
Bergen		43·4	327	—	—	14 34	+ 7	23·2	—
Algiers		43·5	291	i 8 0	− 1	—	—	—	29·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Barcelona		43·5	298	—	—	(e 17 28)	SS	e 17·5	28·0
Tortosa		44·8	297	8 12	+ 1	14 45	− 2	18·2	—
Kew		45·0	313	i 8 18	+ 5	e 14 45	− 5	e 17·6	29·8
Durham		46·0	318	15 3	S	(15 3)	− 1	—	25·6
Alicante		46·0	294	e 8 24	+ 3	e 15 7	+ 3	e 23·6	—
Phu-Lien		46·2	91	e 8 18	− 4	—	—	—	—
Stonyhurst		46·4	316	7 39	−45	15 11	+ 1	26·6	31·0
Bidston		46·8	315	—	—	i 15 28	+12	e 21·6	28·6
Edinburgh		47·0	318	—	—	i 15 20	+ 1	e 24·6	30·7
Almeria		47·8	292	e 8 38	+ 3	e 15 24	− 6	e 19·6	—
Chiufeng		48·3	62	e 8 43	+ 5	15 43	+ 6	e 24·3	30·7
Toledo		48·4	296	8 36	− 3	i 15 39	+ 1	e 23·3	37·6
Granada		48·6	293	i 8 55a	+14	i 15 55	+14	23·7	—
Medan		48·9	116	e 9 29	+46	—	—	28·6	—
Malaga		49·4	293	e 8 45	− 2	e 15 52	0	21·1	—
San Fernando		50·8	293	8 4	−53	15 40	−32	19·6	34·6
Tananarive		51·6	190	9 8	+ 5	16 24	+ 1	26·0	33·8
Nanking	N.	52·3	72	e 9 15	+ 6	i 16 40	+ 7	e 27·2	33·0
Zi-ka-wei	Z.	54·7	72	e 9 23	− 3	—	—	33·6	35·8
Zinsen	E.	56·8	63	e 9 47	+ 5	—	—	e 32·3	—
Keizyo		57·1	63	e 9 48	+ 4	—	—	34·8	—
Vladivostok		59·1	55	10 4	+ 6	e 19 48	?	29·6	36·3
Manila		61·2	89	10 10	− 3	i 18 39	+ 7	30·1	35·2
Batavia		61·5	118	e 10 45	(−14)	i 18 30	− 6	e 35·6	—
Koti		63·5	65	—	—	e 19 5	+ 4	e 34·6	37·1
Sumoto		64·2	64	e 19 13	S	(e 19 13)	+ 3	e 36·1	—
Mizusawa	E.	66·9	57	e 10 16	−35	e 11 5	P_cP	—	—
Ivigtut		68·7	329	—	—	20 5	0	32·6	—
Cape Town		74·9	211	21 21	S	(21 21)	+ 2	37·1	41·3
Ottawa		91·2	328	—	—	e 23 34?	[− 6]	e 36·6	—
Oak Ridge		91·4	324	—	—	e 24 34	+25	e 37·8	—
Melbourne		108·2	123	—	—	e 34 10	SS	e 55·1	59·7
Pasadena		113·7	355	e 18 34?	[+ 5]	—	—	e 52·6	—
Sucre		126·2	268	e 19 58	[+59]	—	—	61·6	—
Huancayo		131·3	283	e 19 7	[− 2]	—	—	e 57·5	—

Additional readings and note :—
Tiflis eE = +5m.11s.
Ksara SS = +7m.53s.
Dehra Dun S = +9m.24s.
Agra ePN = +4m.26s.
Helwan PP = +6m.46s.
Lemberg ePE = +6m.10s.
Zagreb eNE = +7m.1s., e = +7m.52s., eZ = +10m.56s., and +15m.11s.
Vienna iP = +6m.46s., P_cP = +7m.57s. =PPP +0s., PPP = +10m.1s., iN = +10m.54s., P_cS = +11m.59s. =S − 5s., iE = +12m.38s., iN = +14m.45s., iE = +15m.11s., S_cS = +16m.31s., iN = +16m.54s. =S_cS − 12s., SSS = +18m.32s.
Graz i = +8m.10s.
Triest iPP = +8m.13s., iN = +12m.26s., i = +12m.31s., iSS = +15m.7s.
Florence i = +8m.4s. =PP − 19s. and +9m.44s. =P_cP +13s.
Cheb i = +8m.32s. =PPP − 4s.
Potsdam i = +7m.12s. and +7m.30s., iSZ = +12m.59s., iE = +13m.3s., iSSE = +15m.32s., iSSN = +15m.36s., i = +15m.43s., iS_cSEN = +17m.30s.
Leipzig eE = +8m.9s., eN = +15m.27s. =SSS − 10s.
Jena eEZ = +8m.34s. =PP + 1s., eN = +9m.2s., eSN = +12m.54s., eSE = +13m.0s. and +13m.6s., iSE = +13m.12s.
Upsala iP = +7m.14s., iPPN = +8m.24s., iPPE = +8m.28s., iPPPE = +8m.41s., iS = +13m.1s.
Piacenza PP = +8m.58s., PPP = +12m.50s.
Copenhagen iP = +7m.24s., iSEN = +13m.16s., iN = +13m.23s. and +15m.58s. =SS +14s.
Göttingen eE = +8m.11s., eZ = +8m.49s. =PP +4s., iEZ = +9m.1s. =PPP +1s., eP_cSE = +13m.20s.
Stuttgart iPEZ = +7m.23s., ePPEZ = +8m.45s., ePPP = +9m.1s., eSS = +15m.54s., iZ = +16m.16s. =SS +5s.
Hamburg eSN = +13m.26s.
Karlsruhe i = +19m.51s.
Strasbourg i = +9m.8s., +9m.45s., e = +16m.23s.

Continued on next page.

De Bilt ePPZ = +9m.31s., iN = +17m.19s., iE = +17m.31s.
Uccle iPEZ = +7m.52s.
Bergen e = +17m.29s. = SS + 9s.
Durham S? = +18m.31s.
Stonyhurst SS? = +19m.4s. = SSS − 14s.
Bidston i = +18m.52s.
Chiufeng iPPEZ = +10m.45s., PPN = +10m.48s., SS?N = +19m.27s., SS?E = +19m.30s. ; T_o = 11h.9m.37s.
Toledo iP = +8m.41s.
Granada PP = +10m.52s.
Malaga iP = +8m.49s., PP = +10m.38s., PPP = +11m.15s., iS = +15m.56s., S_eS = +18m.42s.
San Fernando SN = +16m.5s.
Tananarive PP = +11m.8s., SS = +19m.47s.
Zi-ka-wei iZ = +9m.40s. and +21m.52s.
Keizyo eS = +32m.39s.
Manila iE = +11m.26s.
Sumoto eS? = +31m.12s.
Ivigtut +27m.34s.?
Cape Town PP = +23m.21s., PPP = +24m.7s., +25m.53s. = SS − 3s., S = +28m.50s. = SSS − 11s. and +30m.25s. = SSSS − 19s., SS = +32m.5s., SSS = +33m.53s. ; the trace has been misinterpreted and there is no true P.
Ottawa eE = +32m.10s.
Oak Ridge e = +32m.52s.
Huancayo e = +21m.26s. = PP + 0s. and +39m.28s.
Long waves were also recorded at Kobe, Nagasaki, Dakar, Christchurch, Wellington, Riverview, Sydney, Perth, La Paz, San Juan, and the American stations.

Nov. 28d. Readings also at 0h. (Suva, Wellington, and near Apia), 4h. (Suva), 8h. (Baku, Tiflis, Almata, Frunse, Tashkent, Bombay, Ekaterinburg, and Pulkovo), 10h. (Perth, Pasadena, Mount Wilson, Haiwee, Riverside, and Sitka), 11h. (Batavia and Medan), 12h. (near Nagoya), 14h. (near Lick and near Wellington), 15h. (Baku, Ekaterinburg, and Nanking), 16h. (Agra, Bombay, Andijan, Frunse, Baku, Ekaterinburg, Pulkovo, and Ksara), 18h. (Triest), 20h. (Andijan, Baku, Tiflis, Ekaterinburg, Ksara, Tashkent, Christchurch, and near Tyosi (2)).

Nov. 29d. 5h. 3m. 28s. Epicentre 7°·4N. 83°·1W. N.2.

A = +·119, B = −·984, C = +·129 ; D = −·993, E = −·120 ; G = +·015, H = −·128, K = −·992.

		△	Az.	P.	O − C.	S.	O − C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights		3·8	64	i 1 2	+ 8	i 1 46	+ 9	2·2	2·5
Port au Prince		15·3	42	e 3 29	− 3	e 6 2	−20	—	—
San Juan		19·8	55	i 4 22	− 5	i 8 3	+ 1	13·4	—
Huancayo		20·9	158	i 4 41	+ 2	e 8 32	+ 8	i 10·8	—
Fort de France		22·8	70	e 6 30	?	—	—	—	—
Columbia		26·7	4	—	—	e 10 26	+16	—	—
La Paz	N.	28·2	148	e 5 50	+ 1	10 53	+18	14·6	18·2
Sucre	N.	31·8	147	e 6 20	− 1	i 11 46	+14	16·5	—
Cincinnati		31·8	358	i 6 15a	− 6	—	—	e 14·7	—
St. Louis		31·9	349	e 6 1	−21	e 13 22	SS	e 20·7	—
Florissant		32·1	349	e 6 0	−24	e 13 22	SS	—	—
Pittsburgh		33·2	5	e 6 6	−28	—	—	e 13·7	—
Fordham		34·5	12	e 6 41	− 4	—	—	e 16·5	19·5
Chicago		34·7	353	—	—	e 14 32	SS	e 18·4	—
Tucson		35·9	318	6 58	+ 1	e 12 33	− 2	e 17·2	—
Ottawa		38·5	9	—	—	e 12 32?	−42	e 18·5	—
Riverside	Z.	41·3	314	i 7 39	− 4	—	—	—	—
Pasadena		41·9	314	i 7 45a	− 3	—	—	e 18·0	—
Mount Wilson	Z.	41·9	314	i 7 45	− 3	—	—	—	—
Haiwee	Z.	42·9	317	e 7 53	− 3	—	—	—	—
Santa Barbara	Z.	43·2	313	e 8 0	+ 2	—	—	—	—
Tinemaha		43·6	318	e 8 4	+ 2	—	—	—	—
Berkeley		46·7	316	e 8 31	+ 5	e 15 14	0	—	—
La Plata	E.	48·6	152	e 8 50	+ 9	e 15 50	+ 9	27·2	29·5
	N.	48·6	152	e 8 41	0	e 15 43	+ 2	27·5	29·5
Neuchatel		84·7	43	e 12 26	− 6	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Cheb		87·8	40	—	—	e 27 32?	?	e 40·5	49·5
Potsdam	z.	87·9	37	i 12 47	0	e 24 32?	PS	e 41·5	—
Florence		88·0	46	—	—	e 24 32	PS	42·5	91·5
Triest		89·4	44	i 12 56	+ 1	—	—	—	—
Vienna	z.	90·7	41	e 13 0k	− 1	—	—	—	—
Pulkovo		95·0	28	—	—	e 39 59	?	44·5	48·7
Wellington		104·0	229	—	—	(33 32?)	SS	33·5	—
Ekaterinburg		109·2	21	—	—	e 24 59	[−11]	51·5	59·5
Tashkent		125·1	26	—	—	e 29 53	?	e 59·5	80·5

Additional readings :—
San Juan e = +4m.57s.
Huancayo i = +5m.31s.
Cincinnati i = +6m.25s. and +6m.40s.
St. Louis iPN = +6m.7s., SS = +16m.36s. = S_6S − 18s.
Tucson i = +12m.55s.
Toronto (Δ = 36°·4), iN = 5h.2m.45s., i = 5h.6m.47s., L? = 5h.19m.10s.
Pasadena iZ = +9m.39s. = PP + 20s.
Vienna iPZ = +13m.3s.
Ekaterinburg e = +34m.41s.
Tashkent e = +37m.26s. = PP − 12s. and +42m.2s. = SSS − 2s.
Long waves were also recorded at Cape Town, Sydney, Hong Kong, Chiufeng, Kucino, Tiflis, and other European and American stations.

Nov. 29d. 5h. Earthquake in the Pacific Ocean West of Mexico.
Tucson eP = 5h.51m.41s., e = 54m.32s., iS = 55m.43s., L = 56m.48s.
La Jolla ePZ = 5h.52m.19s.
Riverside iPZ = 5h.52m.28s.
Mount Wilson iPZ = 5h.52m.34s.
Pasadena iP = 5h.52m.34s.
Santa Barbara iP = 5h.52m.46s.
Haiwee iP = 5h.52m.49s.
Tinemaha iP = 5h.52m.59s., eZ = 6h.0m.35s.
Berkeley e = 5h.53m.25s.
St. Louis iPN = 5h.53m.55s., iE = 56m.3s., iSN = 6h.0m.7s.
Huancayo e = 5h.56m.4s.
La Paz ePZ = 5h.57m.3s.

Nov. 29d. 19h. Epicentre in the Atlantic Ocean, probably West of the Canary Islands.
Alicante eP = 19h.38m.22s., eS = 41m.34s., eL = 44m.8s.
Toledo eP = 19h.38m.50s., eL = 44m.13s.
Hamburg eP = 19h.39m., eL = 51m.
Florence e = 19h.40m.0s., S = 48m.30s., M = 51m.0s.
Stuttgart e = 19h.40m.20s., eL = 49m.
Triest eP = 19h.40m.44s., eS = 46m.37s., M = 54m.35s.
Cheb e = 19h.40m.47s., 41m.15s., and 45m.30s., eL = 52m., M = 56m.
Almeria e = 19h.43m.34s., eL = 46m.18s.
La Paz ePZ = 19h.43m.37s.
Edinburgh e = 19h.44m., eL = 48m.
Ekaterinburg iP = 19h.44m.5s., eS = 54m.0s., e = 57m.10s., L_q = 20h.2m., e = 4m.30s., L_r = 6m.18s., M = 8m.18s.
De Bilt eE = 9h.44m.30s., eL = 47m.30s., M = 51m.25s.
Bidston 19h.45m.
San Juan e = 19h.47m.12s., eL = 47m.32s.
Long waves were also recorded at Chiufeng, Tashkent, Pulkovo, and other European stations.

Nov. 29d. Readings also at 0h. (near Camerino), 1h. and 2h. (2) (near Tyosi), 3h. (Bombay and near Tyosi), 4h. (Christchurch and near Tyosi), 5h. (Tyosi), 6h. (Bombay and Port au Prince), 8h. (Almata, Frunse, Ekaterinburg, Tashkent, Tiflis, and Ksara), 10h. (Messina), 11h. (Alicante and near Nanking), 12h. (near Apia and near Taihoku), 14h. (Bagnères), 19h. (Piacenza), 20h. (Ekaterinburg and Pulkovo).

Nov. 30d. Readings at 2h. (near Huancayo), 4h. (La Paz, San Juan, Oak Ridge, Florence, Paris, De Bilt, Strasbourg, Stuttgart, Uccle, Kew, Edinburgh, and Copenhagen), 5h. (Cheb), 6h. (Andijan, Tashkent, and Ekaterinburg), 7h. (Berkeley and Trenta), 16h. (La Paz (2)), 19h. (near Santiago), 23h. (Amboina).

Dec. 1d. 10h. 27m. 8s. Epicentre 20°·5S. 170°·0E. (as on 1933 July 14d.). R.3.

A = −·923, B = +·163, C = −·350; D = +·174, E = +·985; G = +·345, H = −·061, K = −·937.

A *depth* of focus 0·090 has been assumed.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva	−0·5	8·3	75	1 52	+ 1	3 22	+ 3	—	3·9
Wellington	−3·8	21·2	170	3 52?	− 7	—	—	—	—
Riverview	−3·8	21·4	227	e 3 53	− 9	i 7 49	+34	—	—
Sydney	−3·8	21·4	227	e 2 58	?	—	—	9·6	11·2
Melbourne	−5·0	27·8	226	e 4 40?	−19	i 9 28	+27	13·6	15·2
Adelaide	−5·7	31·1	235	—	—	e 10 2	+14	12·5?	12·8
Amboina	−7·2	44·0	286	e 6 58	− 7	—	—	—	—
Perth	−7·9	49·5	245	e 18 52	?	—	—	—	22·9
Manila	−8·9	59·6	303	9 24	+27	16 52	+41	—	—
Batavia	−9·1	62·7	275	e 9 1	−17	i 17 37	+47	—	—
Branner	−10·5	86·1	47	e 11 46	+ 2	—	—	—	—
Berkeley z.	−10·5	86·2	47	e 11 43	− 1	—	—	—	—
Santa Barbara	−10·5	86·4	51	i 11 47	+ 2	—	—	—	—
Pasadena	−10·5	87·4	51	i 11 50a	− 1	—	—	—	—
Mount Wilson	−10·5	87·5	52	e 11 52	0	—	—	—	—
La Jolla	−10·5	87·5	54	e 11 52	0	—	—	—	—
Riverside z.	−10·6	87·9	52	e 11 52a	− 2	—	—	—	—
Haiwee	−10·6	88·5	50	i 11 58	+ 1	—	—	—	—
Tinemaha	−10·6	88·7	49	i 11 57	− 1	—	—	—	—
Bombay	−11·0	102·8	286	e 20 52	?	—	—	—	—
Tashkent	—	111·2	308	—	—	e 27 20	?	—	—
La Paz	—	112·0	118	e 16 40	[−104]	—	—	—	—
Ekaterinburg	—	117·5	324	—	—	e 26 32	?	45·9	—
Zagreb	—	146·9	326	e 18 28	[−69]	—	—	—	—
Stuttgart	—	147·8	335	18 45a	[−54]	—	—	—	—
Chur	—	149·2	334	e 18 47	[−53]	—	—	—	—
Zurich	—	149·2	334	e 18 44	[−56]	—	—	—	—
Neuchatel	—	150·1	336	e 18 49	[−53]	—	—	—	—

Additional readings:—
Suva S_g? = +3m.42s.
Riverview eZ = +3m.55s.
Melbourne i = +11m.20s.
Ekaterinburg e = +34m.47s.
Stuttgart e = +19m.16s.
Hong Kong records a maximum of long waves.

Dec. 1d. 17h. 44m. 35s. Epicentre 30°·5N. 131°·0E. (as on 1931 Jan. 29d.). X.

A = −·565, B = +·650, C = +·508; D = +·755, E = +·656; G = −·333, H = +·383, K = −·862.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Nagasaki	2·4	337	e 0 29a	− 5	0 57	− 5	—
Simidu	2·8	36	e 0 42	+ 2	e 1 15	+ 3	—
Hukuoka	3·1	351	0 42	− 2	1 13	− 7	1·4
Koti	3·7	34	e 0 55	+ 2	i 1 46	S*	1·9
Muroto	3·8	45	e 1 17	P_g	e 1 59	S_g	—
Sumoto	5·0	40	e 1 11	0	2 27	S*	2·6
Kobe	5·4	39	e 1 32	P*	2 43	S*	3·0
Osaka	5·6	41	1 32	P*	2 47	S*	3·8
Toyooka	6·0	31	e 1 36	P*	2 49	S*	3·0
Nagoya	6·8	45	e 2 20	P_g	3 32	S_g	—

Additional readings:—
Sumoto Z = +2m.16s.
Toyooka PN = +1m.43s.
Hong Kong also records a maximum of long waves.

Dec. 1d. Readings also at 1h. (Huancayo), 2h. (near Amboina), 6h. (Sydney, Suva, and Wellington), 7h. (Adelaide, Melbourne, Riverview, Sydney, Apia, Christchurch, Nanking, and Trenta), 8h. (Berkeley, Branner, and Lick), 9h. (near Frunse), 10h. (near Chiufeng), 13h. (Wellington), 14h. (near Medan), 15h. (La Paz and Huancayo), 16h. (Huancayo, La Paz, near Balboa Heights, near Santiago, and near Frunse), 17h. (Andijan and near Huancayo (2)), 18h. (Andijan, Ekaterinburg, Tashkent, Tiflis, and near Huancayo), 19h. (Huancayo), 20h. (Tiflis, Simferopol, Theodosia, Yalta, and near Sebastopol), 22h. (near Medan), 23h. (Huancayo).

Dec. 2d. 2h. 15m. 21s. Epicentre 36°·3N. 69°·4E. (as on 1932 March 9d.). X.

A = +·284, B = +·754, C = +·592; D = +·936, E = −·352;
G = +·208, H = +·554, K = −·806.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Andijan		5·0	27	e 1 14	+ 3	2 23	S*	—	—
Frunse		7·7	30	e 1 43	− 6	3 15	− 1	—	4·2
Almata		9·1	37	e 2 11	+ 2	4 14	S*	—	5·6
Agra	E.	11·8	139	2 51	+ 5	4 47	−11	—	—
Bombay		17·7	169	e 4 1	− 2	—	—	—	10·2
Hyderabad		20·5	155	4 33	− 2	8 33	+17	10·6	13·2
Ekaterinburg		21·3	347	i 4 44	+ 1	8 32	0	i 13·6	13·8
Calcutta		21·5	125	5 0	+15	9 9	+33	11·8	—
Kodaikanal		27·1	163	10 29	S	(10 29)	+12	i 13·6	14·2
Ksara		27·4	275	e 6 8?	+26	e 10 37?	+15	—	—
Pulkovo		34·2	327	6 44	+ 2	e 12 7	− 2	17·6	19·6
De Bilt		47·0	311	—	—	e 17 39?	?	e 26·6	—

Additional readings:—
Andijan S_g = +2m.55s.
Frunse S_g = +3m.58s.
Kodaikanal S = +12m.47s.
Long waves were also recorded at Hong Kong, Chiufeng, Kucino, and a few European stations.

Dec. 2d. 3h. 0m. 30s. Epicentre 7°·4N. 83°·1W. (as on Nov. 29d.). X.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Balboa Heights	E.	3·8	64	i 1 2	+ 8	i 1 42	+ 5	1·9	1·9
	N.	3·8	64	i 1 16	P_g	i 1 46	+ 9	2·1	2·2
San Juan		19·8	55	i 4 22	− 5	e 8 0	− 2	—	—
Huancayo		20·9	158	e 4 45	+ 6	(e 8 40)	+15	e 8·7	—
La Paz		28·2	148	e 5 52	+ 3	—	—	17·6	—
Riverside	Z.	41·3	314	e 7 43	0	—	—	—	—
Pasadena	Z.	41·9	314	e 7 46	− 2	—	—	—	—
Mount Wilson	Z.	41·9	314	e 7 47	− 1	—	—	—	—
Tinemaha	Z.	43·6	818	e 7 57	− 5	—	—	—	—

Long waves were also recorded at Oak Ridge.

Dec. 2d. 5h. 17m. 18s. Epicentre 53°·0S. 161°·0E. N.3.

A = −·569, B = +·196, C = −·799; D = +·326, E = +·946;
G = +·755, H = −·260, K = −·602.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Christchurch	12·2	44	i 2 47	− 4	i 5 1	− 7	—	10·4
Wellington	14·9	44	3 27	0	6 12	− 1	7·2	8·7
Arapuni	18·0	40	4 12	+ 5	7 27	+ 2	8·7	10·2
Melbourne	18·8	318	i 4 11	− 5	7 40	− 2	9·4	9·9
Riverview	20·4	336	i 4 30k	− 4	i 8 29	+15	9·7	11·7
Sydney	20·4	336	i 4 42	+ 8	i 8 24	+10	10·1	11·1
Adelaide	24·0	310	i 5 8	− 2	i 9 33	+10	i 11·1	13·3
Perth	38·5	285	—	—	i 13 17	+ 3	15·7	17·7
Batavia	64·2	296	i 10 38	+ 4	i 19 9	− 1	e 31·7	—
Manila	75·9	320	i 11 39k	− 6	i 21 22	− 8	—	21·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Medan		76·8	295	e 11 26	−24	—	—	e 35·7	—
Hong Kong		85·6	317	20 12	?	23 2	[− 1]	—	35·7
La Plata	E.	85·8	149	—	—	e 23 18	+ 2	44·1	—
	N.	85·8	149	—	—	e 23 4	[− 1]	46·2	48·0
Cape Town		87·1	210	35 50	?	—	—	49·2	—
La Paz		98·7	133	e 15 46	?	24 22	[+ 3]	48·8	61·4
Huancayo		99·2	125	e 21 2	PPPP	e 23 42	[−40]	i 42·0	—
Vladivostok		99·3	338	17 32	PP	25 22	+ 2	32·7	—
Bombay		103·9	282	e 17 27	?	—	—	—	62·2
Pasadena		111·6	62	e 18 40	[+17]	—	—	e 53·5	—
Ukiah		112·9	55	—	—	e 29 6	PS	e 53·7	—
San Juan		129·9	115	e 22 32	(0)	—	—	—	—
Ekaterinburg		136·7	309	e 19 17	[0]	—	—	54·7	77·1
Tiflis	E.	136·9	281	19 57	[+39]	—	—	e 67·7	73·7
Ksara		137·1	265	e 23 8	(+ 7)	—	—	72·7	—
Ottawa		143·2	78	—	—	e 41 42?	SS	e 65·7	—
Oak Ridge	N.E.	144·1	85	—	—	e 47 6	?	e 67·7	—
Theodosia		144·3	279	e 19 32	[0]	—	—	—	—
Yalta		144·8	278	e 19 40	[+ 7]	—	—	—	—
Simferopol		145·1	278	e 19 39	[+ 5]	—	—	—	—
Pulkovo		152·6	304	—	—	e 42 52	SS	67·7	96·2

Additional readings :—
Christchurch eP = +2m.50s., iN = +5m.5s., iZ = +5m.57s. = S* − 4s., e = +6m.42s. = S_g +5s., iZ = +7m.1s., i = +7m.31s. and +9m.47s.
New Plymouth (Δ = 16°·6), i = 5h.16m., L = 5h.21m.
Riverview i = +4m.33s.
Adelaide i = +6m.31s. and +9m.50s.
Hong Kong ? = +25m.51s.
Cape Town +44m.58s.
Huancayo e = +25m.18s. and +25m.32s., eSS = +32m.12s.
Ekaterinburg e = +9m.3s., +14m.25s., +19m.29s., +21m.59s. = PP − 2s., and +22m.53s. = PKS − 6s.
Tiflis eE = +21m.40s. = PP − 22s., +23m.6s. = PKS +6s., +24m.56s. = PPP +3s., +31m.14s., +34m.25s., +38m.43s., and +44m.48s. = SSS − 9s.
Ottawa eE = +56m.42s. ?
Oak Ridge eNW = +58m.48s.
Long waves were also recorded at Glenmuick, Kucino, Tashkent, Bozeman, Chicago, Tucson, and several European stations.

Dec. 2d. 8h. 43m. 10s. Epicentre 20°·4N. 122°·2E. (as on 1930 Dec. 21d.). R.2.

A = −·499, B = +·793, C = +·349 ; D = +·846, E = +·533 ;
G = −·186, H = +·295, K = −·937.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku		4·6	351	e 1 9	+ 3	2 0	+ 2	—	—
Manila		6·0	191	i 1 26$_a$	+ 1	i 2 35	+ 2	—	—
Hong Kong		7·7	286	1 49	0	3 48	S*	4·6	6·7
Zi-ka-wei	Z.	10·8	356	e 2 33	+ 1	—	—	6·0	8·4
Nanking		12·0	346	e 2 48	0	e 5 38	+35	i 7·5	—
Nagasaki		14·1	27	e 3 15	− 2	e 6 28	+35	—	—
Phu-Lien		14·6	274	e 3 19	− 4	—	—	6·8	—
Zinsen		17·5	12	e 4 2	+ 2	e 7 18	+ 5	e 10·1	—
Sumoto		17·9	36	e 4 8	+ 3	—	—	—	—
Kobe		18·3	36	e 4 8	− 2	e 7 48	+17	e 8·1	—
Osaka		18·5	37	4 10	− 3	8 4	+28	—	8·4
Nagoya		19·6	38	e 3 45	−40	4 47	PP	—	—
Chiufeng		20·3	347	e 4 33	0	8 28	+16	e 10·5	—
Vladivostok		24·1	18	5 15	+ 4	9 42	+17	12·8	16·3
Mizusawa	E.	24·8	37	(e 5 39)	+21	e 5 39	P	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Medan		28·4	237	e 5 56	+ 5	—	—	—	—
Bombay	E.	46·3	278	e 7 50	−33	—	—	—	—
Tashkent		49·1	309	e 8 42	− 2	i 15 50	+ 2	e 24·8	27·8
Ekaterinburg		57·5	326	e 9 47	0	e 17 44	+ 1	—	51·2
Tiflis	E.	67·4	309	e 10 51	− 3	e 20 5	+15	e 37·3	45·0
Pulkovo		73·4	330	e 11 46	+15	e 20 56	− 5	e 36·8	46·6
La Paz	Z.	169·4	70	e 24 14	?	—	—	—	—

Additional readings :—
Taihoku S = +2m.21s. = S_g − 5s.
Kobe e = +4m.15s. = PP − 4s., eEN = +7m.51s. = SS + 6s.
Chiufeng iS = +8m.40s. = SS + 6s.
Bombay eN = +8m.50s.
Tashkent e = +16m.2s., +19m.44s., and +20m.5s.
Ekaterinburg i = +17m.57s., e = +19m.40s. = S_eS + 5s. and +24m.13s.
Long waves were also recorded at Baku, Kucino, and a few European stations.

Dec. 2d. 20h. 5m. 4s. Epicentre 51°·5S. 44°·0W. N.3.

A = +·448, B = −·432, C = −·783 ; D = −·695, E = −·719 ;
G = −·563, H = +·544, K = −·623.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata	E.	19·4	324	—	—	7 57	+ 3	10·2	11·6
	N.	19·4	324	i 4 27	+ 4	e 8 2	+ 8	10·4	17·5
	Z.	19·4	324	e 4 28	+ 5	—	—	10·9	14·0
Santiago		26·4	303	5 8	−25	10 26	+21	—	—
Sucre		36·5	325	e 7 12	+10	12 58	+14	17·3	—
La Paz		40·0	323	e 7 30	− 2	e 13 35	− 1	20·0	23·2
Huancayo		46·9	317	i 8 15	−13	i 14 54	−23	i 21·4	—
Cape Town		47·4	94	16 57	?	23 12	?	28·4	—
San Juan		72·6	338	e 12 29	+63	e 20 28	−24	—	—
Tananarive	N.	76·2	103	—	—	e 23 39	?	37·4	42·2
Christchurch		79·8	206	i 12 6	− 1	22 12	− 2	e 36·2	—
Wellington		81·3	208	—	—	e 21 56?	?	34·9	—
Melbourne		90·3	187	—	—	e 23 30	[− 4]	37·6	—
Columbia		91·5	330	—	—	e 23 56	[+15]	e 43·9	—
Adelaide		93·5	182	e 20 11	PPPP	e 25 7	PS	43·5?	52·9
Riverview		93·6	193	e 15 50	?	e 24 44	+15	e 38·2	59·9
Perth		94·7	163	35 26	?	—	—	—	59·9
Georgetown		95·0	335	e 14 30	?	i 25 50	PS	e 46·9	—
Oak Ridge	N.E.	97·1	340	—	—	e 25 56	PS	e 38·4	—
Pittsburgh		97·2	333	—	—	e 29 14	?	e 44·1	—
Algiers		97·4	36	(e 22 56?)	?	—	—	e 22·9	—
Alicante		97·5	33	—	—	e 34 11	?	e 51·0	—
Toledo		97·8	30	—	—	e 33 46	?	e 47·2	—
Toronto		100·0	334	—	—	e 25 10	−16	40·9	—
Ottawa		100·7	337	—	—	e 25 56?	+23	e 40·9	—
Suva		101·1	220	—	—	e 24 56?	{− 5}	—	—
Florence		106·6	38	30 1	?	—	—	60·9	65·9
Piacenza		107·1	36	e 30 23	?	—	—	57·9	82·0
Mount Wilson	Z.	107·4	303	e 18 15	[+ 6]	—	—	—	—
Pasadena		107·4	303	e 17 55	[−14]	e 24 53	[− 8]	i 52·3	—
Paris		107·9	30	—	—	e 47 56?	?	55·9	60·9
Trieste		109·1	38	—	—	e 29 56?	?	e 48·9	58·9
Strasbourg		109·4	33	(e 23 56?)	?	—	—	e 23·9	71·9
Stuttgart		110·0	34	—	—	(e 24 3)	[−70]	e 55·9	66·9
Ksara		110·2	61	e 19 26	PP	—	—	53·9	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Uccle		110·2	29	—	—	e 30 2	?	54·9	67·8
Bidston		110·4	24	—	—	e 30 56?	?	—	—
De Bilt		111·6	30	—	—	e 30 56?	?	e 51·9	63·0
Cheb		112·3	35	—	—	e 39 56?	?	e 54·9	71·9
Edinburgh		112·6	23	—	—	e 37 56?	?	e 58·9	—
Göttingen		112·7	32	—	—	e 37 56?	?	e 49·9	64·9
Bozeman		113·0	315	—	—	e 35 36	SS	e 52·3	—
Prague		113·0	36	—	—	e 42 56?	SSSS	e 62·9	67·9
Ukiah		113·8	303	—	—	e 34 20	SS	e 55·2	—
Potsdam		114·4	34	—	—	e 30 56?	?	e 54·9	72·9
Copenhagen		116·9	31	—	—	31 56?	?	54·9	—
Tiflis	E.	120·7	60	e 17 28	?	—	—	e 51·6	60·8
Bombay	N.	121·3	99	e 21 13	?	—	—	—	111·6
Pulkovo		126·3	37	e 19 47	[+47]	—	—	62·9	69·5
Kucino		126·7	44	e 22 38	?	—	—	e 54·2	74·8
Calcutta		133·4	110	23 8	PKS	35 35	?	65·4	—
Tashkent		134·5	75	e 19 24	[+10]	—	—	e 58·9	77·6
Andijan		136·1	78	e 19 57	[+41]	—	—	—	—
Frunse		138·7	77	e 19 26	[+ 6]	—	—	—	—
Almata		140·3	77	e 19 56	[+34]	—	—	—	—
Manila		141·2	157	18 56?	[−27]	—	—	—	—
Hong Kong		146·3	142	31 17	?	43 6	?	—	82·9
Chiufeng		162·1	123	e 20 11	[+15]	32 46	{+76}	e 67·9	99·4
Vladivostok		171·1	160	e 20 20	[+16]	—	—	84·9	112·7

Additional readings and note :—
La Plata PPPE = +4m.49s., eZ = +5m.33s., +7m.44s. and +8m.20s.
La Paz PPN = +9m.50s. = P_cP +8s.
Huancayo e = +9m.26s., i = +9m.33s., ePPP = +13m.57s., iSS = +19m.2s.
Cape Town PP = +18m.17s., PPP = +18m.46s., SSS = +26m.14s.
San Juan e = +15m.6s., ePS = +21m.18s., e = +30m.2s.
Christchurch eZ = +23m.6s. = PS +20s.
Wellington i = +27m.11s.
Melbourne e = +24m.23s. = S +24s., i = +30m.20s.
Columbia ePS = +25m.8s., eSS = +29m.44s.
Adelaide i = +26m.26s.
Georgetown ePPZ = +18m.17s.
Oak Ridge e = +32m.33s.
Ottawa eE = +32m.8s. = SS − 3s.
Pasadena eN = +25m.57s. = SKKS +9s.
Triest eS = +36m.56s. ?
Stuttgart eSKKS = +30m.28s., eSS = +41m.56s. ; SKS is given as ePP.
Uccle e = +37m.20s.
De Bilt e = +36m.56s.?
Copenhagen +39m.2s.
Tiflis eE = +21m.58s., +25m.57s., and +38m.5s.
Pulkovo e = +22m.44s., +23m.59s., +24m.30s., +33m.8s., +40m.35s., +43m.6s., and +44m.38s.
Kucino e = +24m.8s., +30m.32s., +31m.38s., and +40m.38s.
Tashkent e = +20m.56s., +23m.15s., +24m.16s. = PPP − 17s., +37m.56s., +40m.46s., +41m.26s., +41m.56s., +48m.56s., and +52m.56s.
Chiufeng i = +21m.6s. = PKP_2 +12s., iPP = +24m.50s., iE = +46m.3s., +46m.26s. and +46m.42s.
Vladivostok e = +33m.32s. and +47m.4s.
Long waves were also recorded at Honolulu T.H., Ivigtut, Scoresby Sund, Baku, Phu-Lien, and at other American and European stations.

Dec. 2d. Readings also at 4h. (Tyosi), 5h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Chiufeng, Ekaterinburg, Apia, and near Suva (2)), 6h. (Nagoya, and near Tyosi (2)), 7h. (near La Paz), 9h. (Taihoku), 12h. (near Tyosi and near Wellington), 14h. (Almata), 23h. (Berkeley, Branner (2), and near Lick (2)).

Dec. 3d. 2h. 8m. 20s. (I) } Epicentre 34°·2N. 135°·2E. R.3.
22h. 35m. 37s. (II) } (as on 1933 June 6d.). R.3.

A = −·587, B = +·583, C = +·562.

		△	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
I	Sumoto	0·3	300	i 0 1k	− 3	i 0 5	− 3	0·2
II		0·3	300	0 0k	− 4	i 0 4	− 4	0·1
I	Kobe	0·5	358	0 5	− 2	i 0 13	0	0·2
II		0·5	358	i 0 5	− 2	i 0 12	− 1	0·2
I	Osaka	0·6	32	0 4	− 5	0 13	− 2	0·6
II	Muroto	1·3	222	0 21	+ 3	0 35	+ 2	—
I	Toyooka	1·4	347	0 23	+ 3	0 38	+ 2	0·7
II		1·4	347	0 20	0	0 36	0	0·6
I	Koti z.	1·5	245	e 0 24	+ 3	e 0 41	+ 2	—
II		1·5	245	e 0 24	+ 3	e 0 42	+ 3	—
I	Nagoya	1·7	56	e 0 30	+ 6	0 52	+ 8	—
II		1·7	56	e 0 28	+ 4	0 51	+ 7	—
II	Simidu	2·3	233	e 0 36	+ 3	—	—	—

Toyooka I gives also ePE = +27s.

Dec. 3d. 12h. 25m. 1s. Epicentre 54°·0N. 160°·5W. (as on 1930 Nov. 2d.). R.3.

A = −·554, B = −·196, C = +·809.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		14·5	68	—	—	e 5 29	−34	—	—
Tinemaha		33·4	103	e 6 34	− 1	—	—	—	—
Haiwee		34·2	103	e 6 42	0	—	—	—	—
Mount Wilson		35·5	106	i 6 54a	+ 1	—	—	—	—
Pasadena		35·6	107	i 6 53a	− 1	—	—	e 16·9	—
Riverside	z.	36·1	106	i 6 57	− 2	—	—	—	—
La Jolla	z.	37·0	108	e 7 7	+ 1	—	—	—	—
Pulkovo		65·9	354	e 10 46	+ 1	e 19 29	− 2	35·0	41·8
Tashkent		75·6	324	11 42	− 2	i 21 21	− 6	e 40·0	40·9

Long waves were also recorded at Bozeman, Columbia, Oak Ridge, Pittsburgh, Chiufeng, Baku, and Bombay.

Dec. 3d. Readings also at 0h. (near Sumoto), 1h. (Suva and near Wellington), 2h. (Mizusawa), 3h. (Huancayo, Amboina, Nanking, near Taihoku, and near Sumoto), 6h. (Camerino), 7h. (Huancayo, Wellington, Nagoya, near Sumoto, and Kobe), 9h. (near Fort de France), 17h. (Mizusawa and near Tyosi), 18h. (Wellington), 19h. (Ksara, Mizusawa, Nagoya, and near Tyosi), 21h. (Simidu and Wellington), 22h. (near Osaka).

Dec. 4d. 14h. 40m. 14s. Epicentre 25°·8N. 95°·7E. (as on 1932 Aug. 14d.). X.

A = −·089, B = +·896, C = +·435; D = +·995, E = +·099;
G = −·043, H = +·433, K = −·900.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta		7·4	245	1 22	−23	3 13	+ 4	4·2	—
Phu-Lien		11·2	114	e 2 37	0	—	—	—	—
Hong Kong		17·2	98	3 55	− 2	7 19	+13	—	10·4
Nanking		21·1	67	4 44	+ 3	e 8 33	+ 5	—	—
Bombay	N.	22·2	257	4 59	+ 6	8 35	−15	—	—
Medan		22·4	172	i 4 44	−11	i 8 42	−11	—	—
Kodaikanal		23·2	231	5 46	PP	—	—	—	—
Frunse		24·3	320	e 5 32	PP	—	—	—	—
Andijan		24·4	314	e 5 10	− 4	—	—	—	—
Tashkent		26·7	312	i 5 43	+ 8	i 10 36	+26	16·3	19·8
La Paz	z.	162·3	299	e 19 48	[− 8]	—	—	—	—

Nanking gives also eSN = +9m.19s.

Dec. 4d. 19h. 33m. 56s. Epicentre 47°·2N. 144°·0E. (as on 1932 Oct. 25d.). **R.1.**

The Japanese stations give the epicentre as 45°·2N. 144°·0E.

$A = -\cdot550$, $B = +\cdot399$, $C = +734$; $D = +\cdot588$, $E = +\cdot809$; $G = -\cdot594$, $H = +\cdot431$, $K = -\cdot679$.

A *depth* of focus 0·040 has been assumed.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	+1·3	1·0	237	i 0 38a	+ 5	i 1 13	+14	—	1·3
Sikka	+0·9	2·1	344	1 19a	S	2 3	?	—	2·4
Haboro	+0·6	3·2	210	0 37k	−17	—	—	—	—
Asahigawa	+0·6	3·6	199	1 2a	+ 2	1 53	+ 5	—	—
Nemuro	+0·3	4·0	164	0 58	− 3	1 46	− 4	—	—
Obihiro	+0·3	4·3	188	1 10k	+ 4	2 21	+23	—	—
Sapporo	+0·2	4·5	204	1 11a	+ 4	2 7	+ 7	—	—
Urakawa	+0·1	5·1	191	1 16a	+ 2	2 14	+ 1	—	—
Muroran	+0·1	5·4	204	1 23	+ 5	2 19	− 1	—	—
Morioka	−0·2	7·8	197	1 44a	− 4	3 0	−14	—	—
Akita	−0·3	8·0	202	1 49	0	3 3	−13	—	—
Mizusawa	−0·3	8·3	195	i 1 50	− 3	i 3 16	− 8	—	—
Sendai	−0·4	9·2	196	2 1a	− 4	3 34	−10	—	—
Vladivostok	−0·4	9·4	246	i 2 15	+ 8	i 3 56	+ 7	—	7·9
Hukusima	−0·5	9·8	197	2 8a	− 3	3 51	− 5	—	—
Mito	−0·6	11·1	195	2 23a	− 5	4 21	− 5	—	—
Wazima	−0·6	11·1	211	2 27a	− 1	4 21	− 5	—	—
Tukubasan	−0·6	11·3	196	2 27a	− 4	4 21	−10	—	—
Maebasi	−0·6	11·4	201	2 28a	− 4	4 27	− 6	—	—
Nagano	−0·6	11·4	204	2 31k	− 1	4 31	− 2	—	—
Kakioka	−0·6	11·4	196	2 26a	− 6	4 22	−11	—	—
Kumagaya	−0·7	11·6	199	1 29a	?	2 32	P	—	—
Tyosi	−0·7	11·7	192	i 2 31a	− 4	4 29	− 9	—	4·7
Toyama	−0·7	11·7	208	3 32a	+57	5 35	+57	—	—
Tokyo	−0·7	12·0	197	2 34a	− 5	4 45	0	—	—
Kohu	−0·7	12·2	201	2 38	− 4	4 43	− 7	—	—
Hunatu	−0·7	12·3	200	2 41a	− 2	4 44	− 9	—	—
Mera	−0·8	12·7	196	2 42	− 5	4 50	−10	—	—
Misima	−0·8	12·7	199	2 43a	− 4	4 51	− 9	—	—
Gihu	−0·8	13·0	207	2 48a	− 3	5 3	− 5	—	—
Nagoya	−0·8	13·1	206	i 2 51a	− 1	5 4	− 6	—	5·2
Susaki	−0·8	13·1	198	2 47	− 5	5 1	− 9	—	—
Hikone	−0·8	13·3	209	2 52	− 3	5 7	− 8	—	—
Hamamatu	−0·8	13·4	203	2 52k	− 4	4 53	−24	—	—
Toyooka	−0·9	13·5	213	e 2 55a	− 1	5 17	0	—	5·5
Sinkyo	−0·9	13·5	262	2 41	−15	5 9	− 8	—	—
Kameyama	−0·9	13·6	207	2 55	− 3	5 16	− 4	—	—
Kyoto	−0·9	13·7	210	2 56a	− 3	5 20	− 2	—	—
Osaka	−0·9	14·1	210	3 2	− 3	5 30	− 2	—	5·7
Osaka B.	−0·9	14·1	210	3 2	− 3	5 32	0	—	—
Kobe	−0·9	14·2	211	3 2	− 4	i 5 30	− 4	—	5·6
Hatidyozima	−1·0	14·5	194	3 6a	− 3	5 35	− 4	—	—
Sumoto	−1·0	14·6	211	i 3 6k	− 4	5 34	− 7	—	5·8
Wakayama	−1·0	14·6	210	3 6a	− 4	5 35	− 6	—	—
Siomisaki	−1·0	15·1	207	3 11	− 6	5 43	−10	—	—
Hamada	−1·0	15·2	220	3 17a	− 1	4 47	− 9	—	—
Heizyo	−1·1	15·6	245	i 3 24k	+ 2	i 6 12	+ 9	—	6·3
Koti	−1·1	15·8	214	e 3 20k	− 5	i 5 59	− 9	—	6·7
Matuyama	−1·1	15·8	216	3 22k	− 3	6 5	− 3	—	—
Keizyo	−1·1	15·8	238	i 3 26	+ 1	6 9	+ 1	—	—
Muroto	−1·1	15·9	211	i 3 21	− 5	6 1	− 9	—	—
Zinsen	−1·1	16·1	238	i 3 28k	0	i 6 15	0	—	7·0
Taikyu	−1·1	16·1	231	i 3 28k	0	6 16	+ 1	—	—
Simidu	−1·2	16·7	214	i 3 31k	− 4	i 6 21	− 6	—	6·6
Hukuoka	−1·3	17·1	222	i 3 36k	− 3	i 6 29	− 5	—	6·7

Continued on next page.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Hukuoka B.	−1·3	17·1	222	3 36	− 3	6 31	− 3	—	—
Kumamoto	−1·3	17·6	220	3 42k	− 3	—	—	—	—
Nagasaki	−1·4	18·0	225	i 3 47k	− 2	e 6 52	0	—	7·1
Miyazaki	−1·4	18·0	217	3 47k	− 2	6 52	0	—	—
Tomie	−1·5	18·7	224	3 54k	− 3	7 9	+ 3	—	—
Titizima	−1·6	20·2	185	4 3	−11	7 22	−16	—	—
Chiufeng	−1·7	21·3	260	i 4 22k	− 3	i 7 58	0	i 9·7	—
Nake	−1·8	22·0	216	4 24k	− 8	8 10	0	—	—
Zi-ka-wei z.	−1·9	23·6	235	i 4 43k	− 5	8 38	− 2	—	11·7
Nanking	−2·1	24·5	241	i 4 50	− 5	i 8 56	+ 3	i 11·6	—
Isigakizima	−2·4	27·8	222	5 14	−10	10 4	+16	—	—
Taihoku	−2·5	28·5	227	e 5 27	− 2	10 17	+19	—	—
Hong Kong	−3·0	34·5	234	6 15	− 3	11 14	−14	14·1	17·1
Manila	−3·2	37·9	218	i 6 43k	− 3	i 12 5	−12	i 16·1	—
Phu-Lien	−3·3	40·1	241	7 5	0	12 41	− 7	16·1	—
Almata	−3·7	45·9	291	e 8 32	+42	—	—	—	—
Sitka	−3·8	47·5	47	i 8 10	+ 8	i 14 44	+13	—	—
Frunse	−3·8	47·6	291	i 8 10	+ 7	14 43	+10	—	—
Andijan	−4·0	50·1	290	i 8 32	+11	15 10	+ 4	—	—
Calcutta	−4·1	50·6	260	8 28	+ 3	14 18	−54	20·2	—
Tashkent	−4·1	51·8	293	i 8 40	+ 6	i 15 36	+ 7	e 25·5	31·5
Amboina	−4·2	52·8	199	i 8 21	−20	i 15 14	−27	—	—
Honolulu T.H.	−4·3	53·1	97	e 8 46	+ 4	e 15 52	+ 8	—	—
Medan	−4·5	58·5	236	i 9 24	+ 3	i 16 0	−56	—	—
Kucino	−4·6	60·0	321	—	—	17 24	+ 9	e 30·5	35·3
Pulkovo	−4·6	60·3	327	e 9 38	+ 4	i 17 26	+ 7	—	—
Batavia	−4·7	62·7	222	i 9 46k	− 4	17 44	− 5	—	—
Bombay	−4·7	63·6	268	e 10 1	+ 4	—	—	—	—
Saskatoon	−4·7	63·8	41	i 10 9	+11	i 18 19	+15	—	—
Baku	−4·7	64·1	301	i 10 7	+ 7	i 18 22	+14	26·1	—
Ukiah	−4·7	64·1	59	e 10 6	+ 6	e 18 14	+ 6	—	—
Upsala	−4·7	64·4	334	e 10 15	+13	i 18 18	+ 6	e 32·6	—
Berkeley	−4·7	65·4	60	e 10 4?	− 5	—	—	—	—
Branner	−4·7	65·8	60	i 10 15	+ 3	—	—	—	—
Lick	−4·7	66·2	60	e 10 18	+ 3	—	—	—	—
Bozeman	−4·7	66·2	48	e 10 18	+ 3	e 18 43	+ 7	—	—
Tinemaha	−4·8	68·3	58	i 10 33a	+ 4	i 19 8	+ 7	—	—
Theodosia	−4·9	68·6	312	10 34	+ 4	19 12	+ 8	—	—
Haiwee	−4·9	69·1	59	i 10 35a	+ 1	i 19 14	+ 4	—	—
Santa Barbara	−4·9	69·2	62	i 10 36	+ 2	e 19 16	+ 5	—	—
Copenhagen	−4·9	69·4	334	10 40	+ 5	19 20	+ 6	—	—
Yalta	−4·9	69·5	313	10 41	+ 5	19 23	+ 8	—	—
Mount Wilson	−4·9	70·4	60	i 10 43a	+ 1	i 19 28	+ 2	—	—
Pasadena	−4·9	70·5	60	i 10 42a	0	i 19 28	+ 1	—	—
Riverside	−4·9	71·0	60	i 10 35a	−11	e 19 35	+ 1	—	—
Ivigtut	−4·9	71·1	7	—	—	i 19 42	+ 7	—	—
La Jolla	−4·9	71·8	61	e 10 50	− 1	e 19 45	+ 2	—	—
Hamburg	−4·9	71·9	334	—	—	i 19 52	+ 7	—	—
Potsdam	−4·9	72·0	332	i 10 55	+ 3	i 19 50	+ 4	e 38·1	—
Prague	−5·0	73·5	329	—	—	e 20 14	+11	—	—
Göttingen	−5·0	73·7	333	—	—	i 20 10	+ 5	e 31·1	—
Cheb	−5·0	74·1	330	—	—	e 20 15	+ 5	—	—
Vienna	−5·0	74·3	326	i 11 8a	+ 2	20 19	+ 6	—	—
De Bilt	−5·0	74·7	335	—	—	i 20 22	+ 4	e 30·1	—
Stonyhurst	−5·0	75·0	340	—	—	20 22	+ 1	—	—
Feldberg	−5·0	75·3	333	—	—	(20 58)	+33	—	21·0
Graz	−5·0	75·6	327	i 11 17	+ 3	(20 34)	+ 6	—	20·6
Tucson	−5·0	75·9	58	i 11 16	0	i 20 33	+ 1	—	—
Uccle	−5·0	76·0	336	e 11 16	− 1	i 20 34	+ 1	—	—
Stuttgart	−5·0	76·4	332	11 21	+ 2	i 20 37	− 1	—	—

Continued on next page.

		Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	°	m. s.	s.	m. s.	s.	m.	m.
Zagreb		−5·0	76·4	325	e 11 22	+ 3	e 20 38	0	—	—
Ksara		−5·0	76·5	305	11 24	+ 4	i 20 46	+ 7	—	—
Oxford		−5·0	76·6	339	—	—	i 20 47	+ 7	—	—
Kew	E.	−5·0	76·7	338	—	—	i 20 43	+ 2	—	—
Strasbourg		−5·0	77·0	332	e 11 28	+ 5	i 20 44	+ 1	e 33·1	—
Triest		−5·0	77·4	327	i 11 24	− 1	i 20 47	− 3	—	—
Zurich		−5·1	77·8	330	e 11 25	− 2	e 21 3	+10	—	—
Chur		−5·1	77·9	330	e 11 27	− 1	e 20 56	+ 2	—	—
Madison		−5·1	78·1	37	i 11 28	− 1	20 53	− 4	—	—
Venice		−5·1	78·1	328	11 33	+ 4	21 23	+26	—	—
Padova		−5·1	78·3	328	—	—	21 0	+ 1	—	—
Paris		−5·1	78·3	335	—	—	e 20 59	0	31·1	—
Neuchatel		−5·1	78·6	330	e 11 31	− 1	e 21 2	− 1	—	—
Piacenza		−5·1	79·4	330	e 12 4	+28	i 21 12	0	—	43·9
Chicago		−5·1	79·8	37	e 16 10	?	—	—	—	—
Florence		−5·1	80·1	327	e 11 4	−36	i 21 18	− 2	32·8	39·1
Ann Arbor		−5·1	81·0	34	—	—	i 21 22	− 8	e 33·7	—
Ottawa		−5·1	81·0	27	i 11 42	− 3	i 21 24	− 6	e 37·1	—
Naples	E.	−5·2	81·3	324	—	—	e 21 31	− 2	—	—
Toronto		−5·2	81·4	30	e 11 43	− 4	i 21 20	−14	e 35·9	—
St. Louis		−5·2	81·5	40	i 11 50	+ 2	i 21 33	− 2	—	—
Trenta		−5·2	81·8	322	e 11 24	−25	21 24	−14	—	—
Helwan		−5·2	82·1	306	11 47	− 4	21 33	− 9	—	—
Cincinnati		−5·2	83·4	36	i 11 56a	− 2	i 21 44	−12	—	—
Little Rock		−5·2	83·7	44	i 11 56	− 4	i 21 44	−15	—	—
Pittsburgh		−5·3	84·0	32	—	—	i 21 49	−13	—	—
Oak Ridge		−5·3	84·9	25	—	—	i 21 54	−17	—	—
Melbourne		−5·3	85·0	179	—	—	i 21 49	−23	—	—
Barcelona		−5·3	85·1	333	—	—	i 22 9	− 5	—	—
Fordham		−5·3	85·6	28	i 12 6	− 3	21 56	−23	—	—
Tortosa	N.	−5·3	86·2	333	—	—	i 22 22	− 3	—	—
Georgetown		−5·3	86·4	31	i 12 8a	− 6	i 21 59	−28	—	—
Tunis		−5·3	86·4	325	—	—	e 22 16	−11	—	—
Toledo		−5·4	88·5	336	e 12 21	− 3	e 22 41	− 7	e 35·3	—
Alicante		−5·4	88·8	333	—	—	i 22 48	− 3	—	—
Columbia		−5·4	89·3	36	—	—	e 22 44	−12	—	—
Almeria		−5·4	90·7	334	—	—	i 22 57	−14	—	—
Granada		−5·4	90·8	335	e 12 16	−19	i 23 4	− 8	—	—
Malaga		−5·4	91·5	336	e 13 28	+49	e 23 1	−17	—	—
San Fernando	N.	−5·4	92·2	337	—	—	22 43	−42	—	—
Wellington		−5·5	92·6	158	—	—	i 23 4	−24	—	—
San Juan		—	109·0	30	—	—	e 23 52	[−77]	—	—
Huancayo		—	131·8	56	e 18 36	[−34]	—	—	—	—
La Paz		—	139·4	51	e 18 52	[−28]	25 52	[−45]	—	—
Sucre		—	143·0	50	18 53	[−34]	—	—	—	—

Additional readings and notes :—
Toyooka SZ = +5m.22s.
Osaka i = +3m.29s.
Kobe S_cSE = +14m.37s.
Sumoto SNZ = +5m.38s.
Koti i = +3m.24s., iS_cSE = +14m.43s.
Muroto S_cS = +14m.43s.
Zinsen iEN = +4m.55s., iZ = +4m.59s., iSN = +6m.19s.
Taikyu i = +14m.46s.
Simidu iS_cSE = +14m.43s.
Nagasaki iSZ = +6m.55s., iSE = +6m.58s., S_cS = +14m.46s.
Chiufeng PPZ = +5m.28s.
Zi-ka-wei iZ = +5m.40s. and +6m.32s.
Nanking iPPE = +5m.21s., iPPPZ = +5m.50s., iN = +5m.57s., iE = +10m.24s.
Sitka e = +20m.28s.
Tashkent e = +9m.12s. and +16m.36s.
Honolulu T.H. esS = +17m.58s. = S_cS − 67s., e = +22m.22s.
Medan i = +9m.59s.
Kucino i = +18m.52s. = S_cS − 60s., e = +19m.36s., and +21m.12s.
Pulkovo e = +10m.58s., i = +18m.58s. = S_cS − 56s.

Continued on next page.

Batavia iZ = +11m.4s., i = +19m.45s. = S_cS − 77s.
Upsala i = +19m.23s. = S_cS − 61s.
Lick iN = +10m.26s., eE = +10m.40s., iE = +12m.55s.
Copenhagen eZ = +12m.0s., +20m.4s. = S_cS − 57s. and +21m.46s.
Pasadena iP_cPZ = +11m.0s., ipPEZ = +12m.4s., iEN = +20m.11s., iPKP,PKPZ = +38m.30s., iSKP,PKSZ = +41m.37s.
Potsdam ipPZ = +12m.15s., isPZ = +12m.55s., iPPPN = +14m.34s., iSZ = +19m.53s., iE = +20m.10s., iN = +20m.19s., iEZ = +20m.26s., iEN = +20m.28s., iN = +21m.46s., and +22m.0s., iEN = +22m.19s., iSSN = +24m.41s., iSSSN = +28m.26s.
Prague e = +20m.39s. = PS − 44s.
Göttingen iE = +20m.42s. = PS − 45s., eEN = +22m.40s.
Cheb e = +20m.45s. = PS − 48s.
Vienna iE = +13m.14s. = PP − 18s., PP = +14m.22s., S_cS = +21m.7s.
De Bilt iE = +20m.52s. = PS − 48s.
Graz eS = +13m.15s. = PP − 28s. ; true S is given as M.
Tucson ePP = +12m.35s., ePPP = +14m.14s., e = +20m.48s.
Stuttgart e = +11m.35s., epP = +12m.38s., iPS = +21m.4s., esS = +23m.4s., sSS = +29m.4s. ; T_0 = 19h.34m.5s.
Zagreb e = +12m.42s.
Kew iPSE = +21m.5s.
Strasbourg ipP = +13m.27s., iSP = +21m.8s., sS = +23m.51s., sSS = +29m.12s.
Triest iS_cS = +20m.54s., iPS = +21m.10s.
Madison e = +22m.34s.
Neuchatel epP = +12m.51s.
Florence i = +21m.49s. = PS − 62s. and = +29m.34s.
Ottawa SSS = +31m.4s.? ; T_0 = 19h.33m.54s.
St. Louis epPN = +11m.57s., i = +12m.7s., esS = +21m.46s., i = +22m.14s. = PS − 54s. ; T_0 = 19h.34m.11s.
Cincinnati i = +12m.14s. and +15m.13s. ; T_0 = 19h.33m.54s.
Pittsburgh e = +32m.46s.
Oak Ridge eNE = +24m.30s.
Melbourne i = +24m.9s.
Fordham iE = +22m.10s. = SKS − 53s.
Georgetown iZ = +22m.16s. = SKS − 53s. ; T_0 = 19h.34m.15s.
Toledo eS = +22m.18s. = SKS − 65s. ; S is given as PS.
Columbia e = +22m.16s. = SKS − 72s., SP = +23m.47s.
Malaga PPP? = +17m.46s., e = +23m.9s. = SKS − 32s., PS = +24m.8s.
San Fernando SE = +23m.6s. = SKS − 40s.
San Juan e = +24m.34s. = SKS − 35s.
Huancayo e = +20m.49s., i = +21m.5s. and +21m.28s.
La Paz PPN = +21m.56s.
Sucre PP = +22m.6s.

Dec. 4d. Readings also at 7h. (near Amboina), 8h. (Simidu, Sumoto, near Hukuoka, Nagasaki, and near Algiers), 9h. (Wellington (2)), 10h. (Sumoto, near Amboina, and near Santiago), 18h. (Sumoto and near Branner), 19h. (near Huancayo), 22h. (Kodaikanal and La Paz).

Dec. 5d. Readings at 1h. (near Huancayo), 3h. (La Plata), 7h. (near Tyosi), 12h. (Alicante), 14h. (near Tyosi (2)), 17h. (near Santiago, near Batavia, and Malabar), 18h. (Wellington), 20h. (Apia), 21h. (Huancayo), 22h. (near Lick), 23h. (Chiufeng and New Plymouth).

Dec. 6d. Readings at 0h. (Bombay, Ferndale, New Plymouth, Wellington, and near Hastings), 1h. (Taihoku), 4h. (near Balboa Heights), 5h. (Huancayo and La Paz), 6h. (near Balboa Heights), 7h. (near Wellington), 9h. (Glenmuick, near Christchurch, New Plymouth (2), Takaka (2), and Wellington (2)), 10h. (Huancayo, Phu-Lien, Batavia, Medan, and near Balboa Heights), 11h. (Hastings and near Medan), 13h. (La Paz and Wellington), 14h. (Wellington), 15h. (Chiufeng, Phu-Lien, Nanking (2), Hong Kong (2), and Taihoku (2)), 16h. (Andijan, Nanking, and Hong Kong), 19h. (Hong Kong, near Medan, near Mizusawa, Nagoya, and Tyosi), 23h. (Kucino and Tashkent).

Dec. 7d. 18h. 35m. 26s. Epicentre 35°·1N. 139°·0E. (as on 1931 Sept. 18d.). R.3.

A = −·617, B = +·537, C = +·575; D = +·656, E = +·755; G = −·434, H = +·377, K = −·818.

		Δ	Az.	P.	O−C.	S.	O−C.	M.
		°	°	m. s.	s.	m. s.	s.	m.
Susaki		0·4	182	2 6k	+120	—	—	—
Tokyo		0·8	47	0 11	0	0 22	+ 1	0·4
Tyosi		1·7	67	i 0 22k	− 2	0 42	− 2	1·1
Nagoya		1·7	272	i 0 27a	+ 3	0 51	S_g	0·9
Osaka		2·8	261	0 39	− 1	1 22	S*	1·7
Kobe		3·2	263	0 48	+ 2	i 1 25	+ 3	1·7
Sumoto		3·4	257	e 0 58	P*	1 35	S*	2·0
Toyooka		3·4	280	e 0 49	0	1 43	S_g	1·8
Mizusawa	E.	4·4	22	e 1 4	+ 1	i 1 53	0	—
	N.	4·4	22	e 1 2	− 1	e 1 50	− 3	—
Muroto		4·4	246	e 1 21	P_g	e 2 5	S*	—
Koti		4·7	253	e 1 34	P_g	—	—	2·8
Simidu		5·5	247	—	—	e 2 56	S_g	—
Nagasaki		7·9	255	—	—	e 4 4	S*	—
Chiufeng		18·7	292	—	—	e 7 53	+13	12·6

Additional readings:—
Sumoto SN = +1m.42s., SZ = +1m.47s. = S_g + 1s.
Toyooka ePEN = +52s. = P* − 3s., PEZ = +56s., PN = +59s., iEN = +1m.30s. = S + 3s.

Dec. 7d. Readings also at 0h. (Baku and Pulkovo), 1h. (Mizusawa and Wellington), 2h. (Christchurch, Glenmuick, and near Tyosi), 3h. (Suva and Wellington, and near Mizusawa), 5h. (near Taihoku), 6h. (near Apia and near Tyosi), 7h. (Simferopol, near Sebastopol, Theodosia, and Yalta), 9h. (Suva), 10h. (Wellington), 12h. (near Almata), 17h. (Ksara), 21h. (Fort de France, Huancayo, La Paz (2), and Port au Prince).

Dec. 8d. Readings at 0h. (Apia), 1h. (near Nagoya), 3h. (Apia and Chiufeng), 4h. (Mizusawa), 8h. (Algiers), 10h. (Glenmuick), 11h. (near Apia), 12h. (near Huancayo), 13h. (near Chiufeng), 16h. (Amboina and Andijan), 17h. (Huancayo and Manila), 19h. (Christchurch and near Zagreb), 20h. (Andijan), 21h. (Balboa Heights), 23h. (Berkeley, near Branner, and Lick).

Dec. 9d. 7h. 52m. 16s. Epicentre 38°·0N. 69°·5E. (as on 1927 April 28d.). X.

A = +·276, B = +·738, C = +·616; D = +·937, E = −·350; G = +·216, H = +·577, K = −·788.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tashkent		3·3	358	e 0 58	P_g	(i 1 30)	+ 5	i 1·5	4·7
Andijan		3·5	38	e 1 1	P_g	1 58	S_g	—	2·9
Frunse		6·2	40	e 1 34	+ 6	2 53	S*	—	4·0
Almata		7·7	50	e 1 55	+ 6	3 20	+ 4	—	5·0
Agra		13·0	143	2 29	−33	4 34	−53	e 5·7	—
Baku		15·3	285	e 3 29	− 3	7 10	+48	9·3	14·9
Tiflis		19·2	290	i 4 16	− 5	e 8 14	SS	e 12·0	21·7
Bombay	E.	19·3	170	e 3 58	−24	7 13	−39	e 8·7	—
Ekaterinburg		19·7	346	i 4 31	+ 5	i 8 32	+32	i 13·0	13·5
Calcutta		22·4	128	4 54	− 1	8 50	− 3	11·2	—
Ksara		27·4	270	e 5 41	− 1	e 11 18	SS	—	—
Kodaikanal		28·7	163	10 16	?	12 26	?	13·6	14·2
Chiufeng		35·8	72	e 12 34	S	(e 12 34)	+ 1	e 19·4	23·6
Copenhagen		41·4	315	8 44?	+60	—	—	22·7	—
Triest		41·4	300	e 3 16	?	—	—	e 25·7	—
Florence		43·4	297	e 2 44	?	9 44	?	25·7	28·7
Stuttgart		43·9	305	e 8 6	+ 2	e 18 39	(+34)	e 25·7	—
De Bilt		45·9	310	—	—	e 15 44?	+41	e 26·7	29·3

Additional readings:—
Andijan P* = +1m.14s., PP = +1m.23s. = S − 7s., S_g = +2m.23s.
Tiflis eE = +9m.31s.
Ekaterinburg iL_g = +11·5m.
Long waves were also recorded at Hong Kong, Kucino, Scoresby Sund, and other European stations.

Dec. 9d. Readings also at 1h. (near Neuchatel and Zurich), 3h. (Kobe and Sumoto), 6h. (Florence, and near Prato), 7h. (Huancayo), 8h. (near Little Rock and near Wellington), 10h. (Cheb), 11h. (Huancayo), 12h. (Florence), 13h. (Mount Wilson, Pasadena, and Riverside), 14h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, and Tinemaha), 19h. (near Nanking), 23h. (Mizusawa).

Dec. 10d. 7h. 49m. 4s. Epicentre 29°·5S. 71°·0W. (as on 1932 June 21d.). X.

A = +·283, B = −·823, C = −·492; D = −·946, E = −·326;
G = −·160, H = +·466, K = −·870.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Santiago		4·0	176	0 54	−3	1 42	0	1·7	1·8
Sucre		11·7	28	e 3 1	+17	5 47	S*	—	6·6
La Plata	E.	12·3	119	2 54	+2	5 6	−4	e 6·0	7·3
	N.	12·3	119	3 13	+21	5 8	−2	6·2	6·8
	Z.	12·3	119	e 3 15	+23	e 5 10	0	e 6·2	7·5
La Paz	E.	13·3	12	e 3 12	+6	i 6 12	S*	6·9	7·8
Huancayo		17·9	346	4 6	+1	—	—	7·4	—
Riverside	Z.	77·1	323	e 11 47	−6	—	—	—	—
Pasadena	Z.	77·6	322	e 11 50	−5	—	—	—	—
Mount Wilson	Z.	77·7	322	e 11 49	−7	—	—	—	—
Haiwee	Z.	79·0	323	e 12 4	+1	—	—	—	—
Tinemaha	Z.	79·9	323	e 12 2	−5	—	—	—	—

Additional readings and note:—
La Plata eN = +5m.30s.
Tinemaha e = +12m.8s.; probably the true reading of P by comparison with Haiwee.

Dec. 10d. Readings also at 3h. (Apia), 4h. (near Berkeley, Branner, and Lick), 7h. (Amboina), 8h. (near Tyosi), 10h. (Copenhagen, De Bilt, Florence, Naples, Paris, Piacenza, Potsdam, Trenta, Strasbourg, Stuttgart, and Zagreb), 12h. (near Malabar), 14h. (near Mizusawa, Nagoya, and Tyosi), 17h. (Nanking and near Taihoku), 18h. (Apia), 19h. (La Paz, near Huancayo, and near Tyosi), 23h. (near Zagreb).

Dec. 11d. Readings at 0h. (Huancayo, near Berkeley, Branner, and Lick), 1h. (La Paz), 2h. (near Sumoto), 3h. (Tiflis), 4h. (La Paz), 5h. (Florence and Prato), 8h. (near Wellington), 9h. (near Berkeley, Branner, Lick, San Francisco, and near Tyosi), 12h. (La Paz), 14h. (Glenmuick), 15h. (Nagoya), 17h. (near Mizusawa, Nagoya, Tyosi, and near Nagasaki), 19h. (Tananarive), 22h. (Nagoya, near Mizusawa, and Tyosi), 23h. (La Paz).

Dec. 12d. 5h. 21m. 46s. Epicentre 32°·2N. 55°·8E. X.
(fore-shock of epicentre of Dec. 14d. 18h.).

A = +·476, B = +·700, C = +·533; D = +·827, E = −·562;
G = +·300, H = +·441, K = −·846.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		9·4	331	e 2 14	+1	e 4 3	+4	6·2	7·4
Tashkent		14·1	46	e 3 12	−5	6 4	+11	7·7	11·8
Ksara	E.	16·7	281	e 3 54	+4	e 7 16	+21	—	—
Frunse		18·3	49	e 4 20	+10	7 50	+19	—	—
Agra	E.	19·9	99	4 20	−9	8 3	−1	10·8	13·9
Almata		20·0	50	e 4 31	+1	—	—	—	—
Bombay		20·3	127	i 4 25	−8	i 8 20	+8	—	17·1
Theodosia		20·4	315	e 4 34	0	e 8 28	+14	—	—
Yalta		20·8	313	e 8 11	S	(e 8 11)	−11	—	—
Helwan		21·0	270	8 36	S	(8 36)	+10	(11·6)	15·3
Ekaterinburg		24·8	6	i 5 16	−2	9 53	+16	16·0	—
Pulkovo		32·3	336	—	—	(e 12 14?)	+34	e 12·2	—

Helwan gives S as P and L as S.
Ekaterinburg L_q = +13·7m.
Long waves were also recorded at Tiflis, Chiufeng, Kucino, Copenhagen, and De Bilt.

Dec. 12d. 14h. 11m. 16s. Epicentre 4°·3S. 153°·0E. N.1.

Probable error of epicentre ±0°·19.

A = −·889, B = +·453, C = −·075; D = +·454, E = +·891; G = +·067, H = −·034, K = −·997.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Palau		21·7	302	4 52	+ 4	8 54	+14	—	—
Amboina		24·6	271	i 6 7	+51	i 7 15	?	14·7	—
Suva		28·4	121	5 4	−47	9 47	−51	12·7	16·7
Riverview		29·5	183	i 6 2	+ 1	i 10 54	− 2	15·1	17·0
Sydney		29·5	183	e 5 50	−11	i 10 44	−12	14·2	17·1
Adelaide		33·4	201	i 6 37	+ 2	i 11 54	− 3	15·3	19·5
Melbourne		34·3	192	6 43	0	12 12	+ 1	15·2	18·9
Manila		36·9	301	i 7 7k	+ 1	11 49	−61	—	16·4
Arapuni		39·5	151	—	—	13 49	+20	20·7	21·7
New Plymouth		39·7	154	7 6	−23	(17 12)	(−28)	17·2	—
Nake		39·7	327	7 33	+ 4	13 32	0	—	—
Isigakizima		40·0	317	7 34	+ 2	13 34	− 2	—	—
Miyazaki		41·6	332	7 46	+ 1	13 55	− 5	—	—
Wellington		41·8	155	7 47	0	14 1	− 2	18·7	22·7
Koti		42·1	336	e 7 47	− 2	e 17 17	SS	—	—
Sumoto		42·2	338	e 7 44	− 6	(17 2)	SS	17·0	17·5
Taihoku		42·3	316	e 8 25	+34	—	—	—	—
Kobe		42·4	339	e 7 36	−16	—	—	e 23·0	—
Christchurch		42·9	159	i 7 54	− 2	i 14 16	− 3	e 20·6	—
Nagasaki		43·0	331	7 57a	0	e 14 17	− 4	—	—
Hukuoka		43·5	332	e 8 2	+ 1	e 14 25	− 3	—	—
Sendai		44·0	347	8 4	− 1	14 32	− 4	—	—
Perth		44·4	227	8 14	+ 6	e 14 44	+ 3	—	24·7
Mizusawa	E.	44·7	347	e 8 8	− 2	e 14 27	−19	e 18·5	—
	N.	44·7	347	e 8 5	− 5	e 14 43	− 3	18·8	—
Batavia		45·9	266	i 8 15	− 5	—	—	e 24·7	—
Taikyu		46·2	333	8 23	+ 1	15 6	− 1	—	—
Hong Kong		46·3	307	8 27	+ 4	15 8	− 1	—	25·4
Keizyo		48·3	332	e 8 41	+ 3	e 15 34	− 3	e 20·9	—
Zinsen		48·4	331	e 8 41	+ 2	i 15 36	− 2	—	—
Nanking		48·7	320	i 8 44a	+ 3	i 15 45	+ 2	23·7	33·8
Vladivostok		51·1	340	i 9 2	+ 2	i 16 14	− 2	—	24·2
Phu-Lien		51·9	301	e 9 9	+ 3	e 16 28	+ 1	21·7	—
Honolulu T.H.		54·5	60	e 9 30	+ 5	e 17 26	+24	e 25·0	—
Medan		54·8	278	e 9 29	+ 2	—	—	e 33·7	—
Chiufeng		55·8	326	i 9 34a	0	i 17 15	− 5	25·7	34·1
Calcutta		68·5	296	12 35	+94	20 34	+31	31·6	—
Hyderabad		76·6	289	11 50	+ 1	21 25	−13	34·7	50·0
Kodaikanal		76·6	282	11 49	0	(21 32)	− 6	21·5	22·3
Agra	E.	78·7	299	12 1	0	—	—	—	—
Bombay		82·1	290	12 21	+ 2	22 29	− 9	—	52·5
Almata		82·9	315	e 11 59	−24	—	—	—	—
Sitka		83·8	31	i 12 25	− 2	i 22 50	− 5	38·0	—
Frunse		84·5	314	e 12 30	− 1	22 56	− 7	—	—
Ukiah		87·9	51	—	—	e 23 20	[+ 1]	e 39·0	—
Tashkent		88·2	312	i 12 49	0	i 23 26	−13	e 36·1	49·3
Victoria	E.	88·9	41	i 23 23	S	(i 23 23)	[− 3]	e 41·1	46·5
Pasadena		91·4	56	i 13 4a	0	—	—	e 41·7	—
Mount Wilson	z.	91·5	56	i 13 5a	+ 1	—	—	—	—
Tinemaha	z.	91·6	53	i 13 5a	0	—	—	—	—
Haiwee	z.	91·7	54	i 13 6	+ 1	—	—	—	—
La Jolla	z.	92·1	57	i 13 8	+ 1	—	—	—	—
Riverside	z.	92·1	56	i 13 7	0	—	—	—	—
Ekaterinburg		94·9	327	i 13 20	0	—	—	54·4	56·1
Bozeman		97·2	45	—	—	e 24 9	[− 3]	e 45·2	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		102·8	311	e 13 57	+ 1	e 24 55	[+16]	44·2	68·9
Tananarive		103·2	250	—	—	e 24 21	[−20]	48·5	56·7
Kucino		107·5	328	e 18 42	PP	e 26 11	{+22}	46·2	59·0
Pulkovo		109·7	333	e 18 18	[+ 1]	e 26 22	{+17}	49·7	62·4
Theodosia		112·3	318	e 19 32	PP	—	—	—	—
Florissant		113·3	50	i 19 36	PP	i 25 38	[+11]	—	—
Yalta		113·3	317	e 19 14	PP	—	—	—	—
St. Louis		113·5	50	e 19 20	PP	i 25 20	[− 8]	—	—
Scoresby Sund		113·7	358	19 37	PP	29 7	PS	54·7	—
Sebastopol		113·7	318	e 19 34	PP	—	—	—	—
Chicago		114·4	46	e 19 20	PP	e 25 21	[−10]	e 51·0	—
Ksara		114·8	305	e 19 53	PP	29 33	PS	—	—
Upsala		115·0	336	e 19 26	PP	i 25 20	[−14]	e 57·7	—
Ann Arbor		117·1	44	—	—	e 42 2	?	e 61·1	—
Cincinnati		117·6	48	18 44?	[+ 4]	—	—	—	—
Toronto		119·5	41	i 22 23	PPP	—	—	—	—
Copenhagen		119·7	336	18 48	[+ 3]	36 39	SS	54·7	—
Potsdam		121·7	333	i 18 52	[+ 3]	i 25 51	[− 5]	e 60·7	67·7
Columbia		121·8	52	—	—	e 25 53	[− 3]	e 58·0	—
Hamburg		122·3	336	e 18 53	[+ 2]	—	—	e 53·7	71·7
Cape Town		122·6	225	20 27	PP	31 41	?	58·7	67·2
Vienna		122·6	327	i 18 55k	[+ 3]	25 54	[− 4]	e 50·7	73·7
Georgetown		123·0	45	i 18 53	[0]	i 30 48	PS	e 60·7	—
Cheb		123·5	330	e 20 44?	PP	—	—	e 48·7	74·7
Göttingen		123·7	334	i 18 55	[+ 1]	—	—	e 55·7	74·7
Zagreb		124·2	325	e 18 58	[+ 3]	e 25 59	[− 4]	e 55·7	61·6
Fordham		124·4	42	—	—	e 25 56	[− 7]	e 53·7	62·7
Edinburgh		125·0	344	—	—	e 37 44?	SS	e 60·7	—
Oak Ridge		125·1	39	i 18 59k	[+ 2]	e 25 54	[−11]	e 52·3	—
De Bilt		125·3	337	i 18 59	[+ 1]	e 30 44?	PS	e 55·7	61·3
Feldberg		125·3	333	e 20 44	PP	—	—	—	78·2
Triest		125·6	326	18 58k	[0]	(i 26 0)	[− 7]	e 56·7	63·7
Stuttgart		126·0	331	19 0a	[+ 1]	e 30 44	PS	e 56·7	—
Venice		126·5	327	e 19 3	[+ 3]	—	—	—	—
Stonyhurst		126·6	342	—	—	e 42 44?	SSS	62·7	—
Uccle		126·6	337	e 19 2	[+ 2]	—	—	e 60·7	—
Strasbourg		126·8	332	i 19 1	[0]	—	—	e 48·7	—
Chur		127·1	330	e 19 2	[+ 1]	—	—	—	—
Bidston		127·1	343	—	—	e 26 4	[− 7]	—	73·9
Zurich		127·2	330	e 19 2	[+ 1]	—	—	—	—
Kew		127·9	339	i 19 4	[+ 1]	e 26 8	[− 5]	e 55·7	68·1
Oxford		128·0	340	i 19 4k	[+ 1]	e 26 5	[− 9]	e 57·7	61·9
Florence		128·1	325	e 19 5	[+ 2]	30 44	SKSP	53·7	61·7
Prato		128·1	325	i 19 6	[+ 3]	i 23 21	PPP	—	—
Neuchatel		128·2	331	e 19 4	[+ 1]	—	—	—	—
Piacenza		128·2	328	19 8	[+ 5]	28 44	{+34}	63·7	77·7
Paris		128·9	336	e 19 7	[+ 2]	—	—	59·7	66·7
Huancayo		129·3	110	e 19 9	[+ 3]	22 30	PKS	—	—
Puy de Dôme		131·1	333	e 19 10	[+ 1]	22 32	PKS	—	—
La Plata	E.	131·2	146	e 19 14	[+ 5]	22 36	PKS	—	—
	N.	131·2	146	e 19 8	[− 1]	22 36	PKS	67·4	89·4
Port au Prince		133·5	69	e 19 27	[+14]	—	—	—	—
La Paz		134·4	119	e 19 15	[+ 1]	i 26 16	[−16]	66·7	100·3
Sucre		135·8	124	e 19 18	[+ 2]	26 15	[−20]	70·7	—
Alicante		138·3	329	e 19 22	[+ 3]	e 29 34	{+20}	79·3	—
Toledo		138·9	333	e 19 16	[− 4]	—	—	—	—
Almeria		140·4	329	e 19 33	[+11]	e 29 53	{+27}	e 46·5	—
Granada		140·8	331	i 19 27	[+ 4]	—	—	59·4	—
Malaga		141·6	331	e 19 29	[+ 5]	e 29 47	{+13}	—	—

Additional readings and note :—
Adelaide ePP = +7m.48s., iPPP = +7m.56s., i = +12m.21s.
Wellington PP = +10m.7s., SS = +17m.29s.
Koti ipP = +9m.33s., esP = +10m.29s., iZ = +13m.33s.
Sumoto ePNZ = +7m.49s.

Continued on next page,

Kobe eE = +17m.19s., eN = +17m.31s.
Christchurch iE = +8m.26s., iEN = +14m.36s., S_cS = +17m.54s., iEN = +18m.4s. = S_cS +5s., iEZ = +18m.14s.
Nagasaki iPS? = +14m.37s., eSS = +17m.37s.
Hukuoka e = +6m.23s., +10m.23s., and +17m.47s. = SS +25s.
Hong Kong SS = +18m.17s.
Nanking iN = +16m.3s., iSS = +21m.50s.
Honolulu T.H. e = +16m.44s. and +23m.0s. = SSSS +2s.
Chiufeng PPN = +11m.41s. = PP +8s., SSEN = +21m.0s.; T_0 = 14h.11m.28s.
Kodaikanal S = +15m.54s.
Bombay SS = +28m.29s.
Sitka iPS = +23m.42s., e = +23m.57s. = PS +21s.
Ukiah ePS = +24m.54s.
Tashkent iSKS = +23m.11s., SS = +29m.14s.
Pasadena iN = +14m.59s., iEZ = +16m.42s. = PP +5s., iZ = +16m.57s., eE = +21m.10s.
Mount Wilson iZ = +16m.43s. = PP +6s.
Tinemaha iEZ = +16m.44s. = PP +6s.
Haiwee eE = +16m.46s. = PP +7s.
Ekaterinburg iPP = +17m.12s.
Kucino eSKS = +24m.54s., PS = +28m.0s., eSS = +33m.50s.
Pulkovo iPP = +18m.54s., eSKS = +25m.0s., ePS = +28m.18s., ePPS = +29m.17s., eSS = +34m.20s.
Scoresby Sund +35m.26s. = SS +18s.
Florissant i = +25m.21s., +26m.28s. = SKKS −2s., +26m.45s., and +29m.14s. = PS +14s.
Chicago ePS = +29m.1s., eSSS = +40m.1s.
Ann Arbor eN = +57m.32s., eE = +59m.32s.
Potsdam eEN = +20m.20s. = PP −1s., iPPEZ = +21m.1s., ePPN = +21m.8s., iN = +22m.30s., eEZ = +23m.26s., iPPPE = +23m.51s., iSKKSN = +27m.19s., ePSE = +30m.44s.?, eSSE = +37m.8s., iSSN = +37m.13s., iE = +39m.46s.
Columbia PS = +30m.23s.
Cape Town +21m.7s., +25m.56s. = SKS −2s. and +51m.11s.
Vienna PP = +20m.44s., PPP = +21m.40s., iE = +23m.15s., P_cS = +23m.52s., iN = +26m.53s., iE = +32m.41s.
Georgetown eNZ = +31m.32s.; T_0 = 14h.11m.5s.
Zagreb eNE = +19m.13s., e = +21m.3s. = PP +19s. and +32m.44s.?
Fordham iN = +38m.59s.
Oak Ridge eNW = +32m.20s. and +37m.56s. = SS +18s. and eNE = +37m.59s. and +44m.27s.
De Bilt ePPZ = +20m.55s.
Feldberg e = +10m.37s., i = +15m.57s.
Triest e = +21m.20s., i = +22m.42s., +31m.24s. and +39m.1s., iSS? = +39m.42s., SKS is given as iPPP.
Stuttgart ePP = +20m.56s., ePPP = +24m.12s., eSN? = +29m.40s., eSS = +37m.50s.
Uccle eZ = +20m.55s.
Strasbourg iPP = +21m.1s., eSS = +38m.7s.
Kew ePKSZ = +22m.19s.
Florence i = +22m.25s.
Neuchatel ePP = +21m.3s.
Piacenza PP = +22m.24s.
Paris e = +22m.24s.
Huancayo ePS = +31m.44s., eSS = +39m.2s.
La Plata SSE = +39m.8s.
Port au Prince e = +21m.44s. = PP +4s. and +22m.29s. = PKS −19s., i = +23m.42s., and +34m.1s.
La Paz iPKPN = +19m.20s., iPPEN = +22m.51s., iPPPN = +25m.3s., SSN = +30m.9s., PPSN = +35m.21s.
Sucre iPP = +22m.55s.
Toledo iP = +18m.57s., PP = +22m.57s. = PKS −9s.
Almeria PP = +23m.3s. = PKS −7s.
Granada PKP = +23m.6s. = PKS −7s., iPP = +24m.0s., SS = +39m.36s., SSS = +44m.34s.
Malaga PP? = +22m.41s., e = +22m.55s., +23m.47s., and +26m.0s., SKSP? = +32m.43s.
Long waves were also recorded at Seattle, Charlottesville, San Juan, Ivigtut, and Graz.

Dec. 12d. Readings also at 2h. (La Paz), 3h. (Baku, Ekaterinburg, Tashkent, Pulkovo, and Bombay), 4h. (La Paz), 7h. (near Sumoto), 9h. (Cape Town, Huancayo, La Paz, Baku, Tashkent, near Batavia, and Malabar), 10h. (Apia and Wellington), 11h. (Wellington, Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Mizusawa), 13h. (Berkeley, Branner, Lick, and near Huancayo), 16h. (near Mizusawa), 17h. (La Paz and near Tyosi), 19h. (Phu-Lien), 20h. (La Paz), 23h. (Berkeley, Branner, Lick, near Hastings, near Mizusawa, and Tyosi).

Dec. 13d. 8h. 48m. 30s. Epicentre 40°·0S. 175°·5E. (given by Wellington). N.3.

A = −·764, B = +·060, C = −·643; D = +·078, E = +·997; G = +·641, H = −·039, K = −·766.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Bunnythorp	0·3	165	0 30	?	0 36	?
Hastings	1·1	71	1 30	?	1 42	?
Wellington	1·4	203	0 20	0	0 36	0
New Plymouth	1·4	310	−0 7	?	—	—
Takaka	2·2	247	0 30?	− 1	—	—
Glenmuick	3·4	210	e 0 46	− 3	e 1 25	− 2
Christchurch	4·1	211	e 0 59	+ 1	e 1 38	− 7

Additional readings:—
Glenmuick e = +52s. = P* − 3s., eP_g = +55s., e = +1m.7s. = P_g +5s., eS_g? = +1m.28s.
Christchurch eN = +1m.24s., i = +2m.20s.

Dec. 13d. 21h. 23m. 51s. Epicentre 19°·2N. 104°·2W. (as on 1932 Sept. 8d.). R.1.

Probable error of epicentre ±0°·19.

A = −·232, B = −·915, C = +·329; D = −·969, E = +·245; G = −·081, H = −·319, K = −·944.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson	14·4	336	i 3 20	− 1	i 6 8	+ 7	i 7·6	—
La Jolla	18·0	322	e 4 5	− 2	i 7 41	+16	—	—
Little Rock	18·7	32	i 4 21	+ 6	e 7 58	+18	i 14·3	—
Riverside	18·8	324	i 4 17	+ 1	e 8 4	+22	—	—
Mount Wilson	19·4	323	i 4 24	+ 1	e 8 19	+25	—	—
Pasadena	19·4	323	i 4 22a	− 1	i 8 13	+19	i 10·5	—
Santa Barbara z.	20·5	321	e 4 34	− 1	—	—	—	—
Haiwee	20·8	327	i 4 38	0	e 8 43	+21	—	—
Tinemaha	21·7	328	i 4 47	− 1	i 9 4	+24	—	—
St. Louis	22·9	29	i 5 0	0	i 9 10	+ 7	i 12·1	—
Florissant	23·0	28	i 5 0	− 1	i 9 17	+12	—	—
Lick	23·7	324	e 5 7	0	e 9 27	+ 9	—	—
Branner	24·0	323	i 5 13	+ 3	—	—	—	—
Berkeley	24·4	324	e 5 12	− 2	e 9 45	+15	—	—
Columbia	25·3	50	i 5 26	+ 3	10 7	+21	—	—
Ukiah	25·8	324	e 5 30	+ 3	i 10 2	+ 7	i 13·8	—
Cincinnati	26·2	36	i 5 33	+ 2	i 10 21	+19	—	—
Chicago	26·6	28	i 5 30	− 5	i 10 22	+13	i 14·2	—
Bozeman	27·0	349	i 5 38	0	e 10 21	+ 6	i 15·1	—
Madison	27·0	24	i 5 35	− 3	i 10 44	+29	i 14·2	—
Ann Arbor	28·9	32	e 6 45	+50	i 11 33	+46	e 15·3	18·6
Charlottesville	29·2	44	e 6 41	+43	11 9	+18	e 15·1	—
Pittsburgh	29·7	39	e 5 58	− 4	i 11 9	+10	i 14·9	—
Georgetown	30·6	44	i 6 13k	+ 3	i 11 21	+ 7	e 14·1	—
Buffalo	31·9	36	i 6 21	− 1	—	—	e 17·1	—
Seattle	32·0	337	e 6 33	+10	e 11 54	+19	e 15·1	—
Toronto	32·1	35	e 6 18	− 6	11 38	+ 1	i 17·5	18·1
Victoria	33·0	337	i 6 27	− 5	i 11 51	0	e 17·2	22·6
Fordham	33·7	44	e 6 36	− 2	i 12 19	+18	18·1	22·1
Ottawa	35·2	35	6 49	− 2	e 12 37	+13	i 16·9	—
San Juan	36·0	85	i 6 59	+ 1	e 12 42	+ 6	17·1	—
Oak Ridge	36·1	43	i 6 58a	− 1	i 12 40	+ 2	i 17·0	19·7
Fort de France	41·4	90	e 8 24	+40	—	—	19·3	—
Huancayo	42·3	135	i 7 52	+ 1	i 14 12	+ 2	e 21·1	—
Sitka	44·3	337	i 8 4	− 3	i 14 24	−16	e 20·9	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Honolulu T.H.		50·1	283	—	—	e 20 39	?	e 22·9	—
La Paz		50·3	133	i 8 53k	− 1	i 16 4	− 1	23·4	27·6
Sucre	N.	54·1	133	9 22	0	i 17 4	+ 7	25·6	—
Ivigtut		57·1	28	—	—	18 3	+25	30·1	—
Scoresby Sund		69·4	20	11 4	− 3	e 20 35	PS	36·1	—
La Plata		69·7	141	—	—	20 14	− 4	36·4	43·2
Edinburgh		80·2	34	12 12	+ 3	22 21	+ 3	38·1	49·8
Stonyhurst		81·2	36	i 12 13	− 1	i 22 30	+ 2	44·2	48·5
Durham		81·4	35	—	—	22 34	+ 3	—	48·1
Coimbra		82·0	50	e 11 47	−31	22 36	− 1	—	—
Kew		83·3	37	i 12 25a	0	i 22 48	− 2	e 39·1	49·4
Suva		84·6	249	—	—	i 22 24	[−32]	38·1	61·1
San Fernando		84·9	53	—	—	22 12	[−46]	30·1	53·6
Toledo		85·2	50	i 12 34	0	i 23 15	+ 5	e 42·3	52·8
Paris		86·1	40	i 12 39	0	e 23 7	[0]	41·1	49·1
De Bilt		86·2	35	i 12 40	+ 1	e 23 11	[+ 3]	41·1	51·4
Uccle		86·2	37	12 39	0	e 23 9	[+ 1]	41·1	51·6
Granada		86·5	52	e 12 45	+ 4	i 23 26	+ 4	46·1	—
Almeria		87·5	52	e 13 1	+16	e 23 33	+ 1	e 45·2	—
Copenhagen		88·0	30	12 46	− 2	23 21	[+ 1]	42·1	—
Upsala		88·0	26	—	—	i 23 16	[− 4]	e 45·1	53·6
Hamburg		88·0	33	e 16 9?	PP	e 23 20	[0]	e 40·1	53·1
Alicante		88·3	49	—	—	e 23 53	+13	e 53·7	—
Feldberg		88·8	36	i 12 59	+ 7	i 23 35	[+10]	e 47·3	53·3
Göttingen		89·0	34	e 12 45	− 8	e 23 27	[+ 1]	e 42·1	56·4
Strasbourg		89·2	38	i 12 52	− 2	e 23 20	[− 8]	e 36·1	53·1
Neuchatel		89·6	39	e 12 54	− 2	—	—	—	—
Stuttgart		90·0	37	12 57a	0	e 23 27	[− 6]	e 44·1	53·1
Potsdam		90·2	33	—	—	e 24 9?	+11	e 48·1	54·1
Cheb		91·1	35	e 13 3	0	e 23 36	[− 3]	e 49·1	55·1
Piacenza		92·1	40	14 17	+70	23 45	[0]	—	58·3
Pulkovo		92·8	21	13 8	− 2	24 21	− 1	50·1	56·6
Treviso		93·4	39	e 14 9	+56	—	—	53·1	56·7
Florence		93·8	41	e 11 17	?	—	—	31·1	46·1
Trieste		94·3	38	e 14 17	+60	e 25 39	PS	e 45·1	55·9
Vienna		94·3	35	e 13 15	− 2	24 1	[+ 4]	—	56·1
Wellington		96·1	229	—	—	23 59	[− 7]	43·6	—
Kucino		98·4	21	e 17 33	PP	e 24 3	[−15]	47·1	59·1
Vladivostok		99·2	322	13 40	0	—	—	32·2	67·4
Ekaterinburg		102·9	8	13 55	− 2	e 25 47	− 5	61·6	65·4
Chiufeng		109·8	328	e 14 26	− 4	—	—	e 65·1	72·9
Riverview		112·4	240	—	—	e 26 21	{− 3}	e 51·4	60·1
Tiflis	E.	112·7	26	e 19 17	PP	i 29 1	PS	e 51·1	67·8
Ksara		114·7	36	e 19 43	PP	e 29 23	PS	—	—
Melbourne		117·8	236	—	—	i 29 44	PS	54·6	68·1
Frunse		117·9	1	e 21 49	?	—	—	66·1	—
Tashkent		119·2	5	i 15 36	+21	e 26 54	{−17}	e 51·1	73·1
Hong Kong		124·0	316	20 28	PP	30 33	PS	—	84·4
Manila	E.	124·1	303	e 18 55	[0]	30 44	PS	58·1	—
Bombay		141·8	5	19 18	[− 6]	29 33	{− 2}	e 70·1	92·1
Batavia		147·1	288	19 31	[− 6]	i 21 9	?	—	—

Additional readings and notes :—
Tucson i = +5m.4s.
Little Rock iPP = +4m.39s., iPPPE = +4m.45s. ; T_0 = 21h.23m.47s.
St. Louis iPPEN = +5m.27s., iPPPEN = +5m.36s., iEN = +6m.2s., eSSN = +9m.49s. ; T_0 = 21h.23m.47s.
Florissant iPPZ = +5m.29s., iPPPZ = +5m.44s., iP$_c$P?Z = +8m.18s.
Lick eN = +13m.29s., iEN = +23m.17s.
Berkeley eE = +5m.15s. and +16m.45s.
Columbia i = +9m.58s., e = +15m.10s.
Ukiah iSS = +11m.9s.
Cincinnati i = +6m.53s. ; T_0 = 21h.23m.47s.
Chicago i = +13m.2s.
Bozeman e = +10m.44s. and +13m.14s.
Madison iPP = +6m.16s., i = +9m.23s.

Continued on next page.

Ann Arbor iSS = +13m.15s. ; T_0 =21h.24m.6s.
Charlottesville e = +10m.45s. and +13m.9s.
Pittsburgh iPP = +6m.40s.
Georgetown iPPEZ = +7m.1s., iPPPN = +7m.32s.
Buffalo iPP = +7m.19s., i = +12m.21s.
Seattle e = +7m.53s.
Toronto iPP = +7m.19s., iEN = +11m.26s. ; T_0 =21h.23m.38s.
Fordham eN = +7m.28s., iEN = +7m.45s., iE = +14m.11s. =SSS +0s.
Ottawa PPP = +8m.3s. =PP +0s., iN = +9m.43s., SSE = +14m.31s., SSS = +15m.14s. ; T_0 =21h.23m.36s.
San Juan e = +8m.20s. =PPP −5s., iS = +12m.47s.
Oak Ridge iPPNE = +8m.21s., ePPNW = +8m.24s., iZ = +12m.29s., iSSNE = +14m.34s. ; T_0 =21h.24m.5s.
Huancayo iSSS = +17m.34s.
Sitka ePP = +9m.49s., ePPP = +10m.39s., eSS = +17m.14s.
La Paz PPE = +10m.35s., iSE = +16m.8s., i = +18m.46s. =S_cS +0s. and +20m.14s., iSSS = +20m.58s.
Scoresby Sund +13m.45s. =PP +12s., eN = +20m.49s., SSE = +25m.3s.
La Plata S?N = +20m.27s.
Edinburgh i = +22m.29s.
Kew i = +12m.32s., iN = +21m.48s., iE = +26m.39s., eEN = +31m.55s.
San Fernando SN = +23m.5s. =S −2s.
De Bilt iPPZ = +16m.0s.
Uccle eSS = +29m.8s., eSSS = +33m.9s.
Copenhagen +16m.15s. =PP +6s., e = +24m.39s. =PS +11s.
Feldberg i = +16m.22s. =PP +6s.
Göttingen ePPZ = +16m.21s.
Strasbourg i = +13m.24s., iPP = +16m.24s., ePS = +23m.57s. =S +9s., e = +25m.4s., eSS = +29m.9s.
Stuttgart ePP = +16m.26s., eZ = +20m.23s., ePS = +25m.9s., eSS = +30m.3s.
Pulkovo PP = +16m.51s., PPP = +19m.17s., iSKS = +23m.42s., iPS = +25m.32s.
Florence i = +13m.14s. and +14m.9s., e = +19m.39s.
Triest e = +24m.9s.? =SKKS +0s.
Kucino ePS = +26m.27s., eSS = +32m.9s.
Vladivostok PP = +17m.40s.
Ekaterinburg iPP = +18m.7s., iSKS = +24m.37s., iPS = +27m.20s., iPPS = +28m.9s., L_q = +48·2m.
Chiufeng iPP = +19m.0s., PS = +28m.35s.
Riverview e = +28m.51s. =PS +0s. and +35m.15s.
Tiflis ePPPE = +23m.5s., eSSSE = +39m.57s.
Melbourne i = +36m.32s.
Tashkent ePP = +20m.22s., ePPP = +23m.6s., eSKS = +25m.48s., eSKKS = +27m.24s., eSS = +37m.9s.
Hong Kong SS = +37m.15s.
Manila PP = +20m.35s.
Bombay PPN = +22m.36s., SSN = +41m.52s.
Long waves were also recorded at La Plata, Sydney, Cape Town, Hyderabad, Phu-Lien, Nanking, Baku, Simferopol, Sebastopol, Theodosia, Yalta, Algiers, and other European stations.

Dec. 13d. Readings also at 0h. (near Santiago and near Tyosi), 1h. (near Chiufeng), 4h. (Huancayo), 9h. (New Plymouth and Wellington), 10h. (Huancayo and Wellington), 12h. (Perth), 13h. (New Plymouth, near Wellington, and near Prato), 15h. (Perth, Branner, Lick, and near Berkeley), 17h. (near Wellington), 19h. (near Mizusawa), 21h. (Branner).

Dec. 14d. 7h. 16m. 34s. Epicentre 18°·4N. 103°·6W. N.2.

A = −·223, B = −·922, C = +·316 ; D = −·972, E = +·235 ;
G = −·074, H = −·307, K = −·949.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tucson		15·3	336	i 3 33	+ 1	e 6 38	+16	7·8	—
Loyola		16·8	44	· —	—	e 6 6	−51	14·4	—
La Jolla		18·9	323	i 4 17	0	e 8 11	+27	—	—
Little Rock		19·1	29	e 4 15	− 5	e 7 42	− 6	i 10·7	—
Riverside	z.	19·8	324	i 4 28	+ 1	—	—	—	—
Mount Wilson		20·4	324	i 4 34	0	e 8 43	SS	—	—
Pasadena		20·4	323	i 4 33$_s$	− 1	i 8 35	SS	e 11·2	—
Santa Barbara	z.	21·5	321	e 4 46	+ 1	—	—	—	—
Haiwee		21·8	327	i 4 47	− 2	e 9 1	+19	—	—
Tinemaha		22·6	328	i 4 58	+ 1	e 9 20	+23	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Florissant		23·4	27	i 5 2	− 3	i 9 19	+ 7	e 11·7	14·2
St. Louis		23·4	27	i 5 1	− 4	e 9 13	+ 1	e 11·9	—
Branner		25·0	323	i 5 23	+ 3	—	—	—	—
Berkeley	Z.	25·3	324	e 5 23	0	—	—	—	—
Columbia		25·4	48	e 5 31	+ 7	e 9 52	+ 4	e 15·0	—
Cincinnati		26·5	35	e 5 30	− 4	i 10 32	+25	e 15·9	17·5
Ukiah		26·8	325	—	—	e 10 26	+14	—	—
Chicago		27·1	27	e 5 39	0	e 10 32	+15	i 14·4	—
Bozeman		28·0	349	e 5 47	0	e 10 33	+ 1	e 14·9	—
Charlottesville		29·4	43	e 6 39	+39	e 11 8	+13	e 16·4	—
Pittsburgh		30·0	37	e 6 54	+49	e 11 13	+ 9	e 19·3	—
Georgetown		30·9	43	e 6 44	+31	i 11 29	+11	e 15·4	—
Buffalo		32·3	35	i 6 24	− 1	e 11 49	+ 9	e 15·7	17·6
Toronto		32·4	34	e 6 28	+ 2	i 11 52	+11	17·4	18·5
Seattle		33·0	336	—	—	e 13 20	SS	e 18·9	—
Victoria		34·0	336	e 12 33	S	(e 12 33)	+27	e 17·4	39·5
Fordham		34·0	42	e 7 50	PP	e 12 23	+17	e 19·4	21·4
Ottawa		35·5	34	6 54	+ 1	12 41	+12	i 18·9	—
San Juan		35·5	83	e 6 38	−15	e 12 35	+ 6	e 17·4	—
Oak Ridge		36·3	41	e 6 56	− 4	e 12 54	+13	e 21·1	22·2
Fort de France		40·9	88	e 8 28	+48	—	—	—	—
Huancayo		41·3	135	e 7 47	+ 4	e 13 52	− 4	e 21·9	—
Sitka		45·3	336	e 8 15	0	i 15 0	+ 5	i 21·5	—
La Paz	E.	49·4	132	e 8 47	0	i 15 57	+ 5	23·1	27·9
Sucre	N.	53·1	132	9 14	− 1	16 50	+ 7	24·4	—
Edinburgh		80·5	34	—	—	e 32 26?	?	e 42·4	—
San Fernando	E.	84·9	53	23 27	S	(23 27)	+20	—	—
Paris		86·3	40	—	—	e 33 26?	?	48·4	51·4
De Bilt		86·4	35	i 12 41	+ 1	e 23 20	− 1	e 41·4	51·7
Puy de Dôme		87·8	42	e 30 53	?	e 35 38	?	e 38·4	—
Copenhagen		88·5	30	—	—	24 49	PS	49·4	—
Stuttgart		90·2	37	e 12 58	0	e 23 56	− 2	e 48·4	53·4
Piacenza		92·4	40	e 19 26	?	—	—	—	57·5
Treviso		93·6	39	e 37 26?	?	—	—	—	53·4
Florence		94·0	41	37 56	?	43 26	?	49·4	56·4
Triest		94·5	39	e 37 34	?	e 45 14	?	—	56·4
Christchurch		98·2	227	e 19 56	PPP	e 30 47	?	—	—
Ekaterinburg		103·6	9	e 18 14	PP	e 24 36	[− 7]	50·4	67·0
Tashkent		119·9	6	e 20 5	PP	e 25 50	[0]	e 62·9	76·3

Additional readings :—
Tucson eS = +6m.44s.
Pasadena iEN = +8m.43s.
Florissant iPPZ = +5m.33s., iSSN = +10m.3s. ; T_0 = 7h.16m.30s.
St. Louis iPPEN = +5m.33s., iE = +5m.48s. ; T_0 = 7h.16m.28s.
Branner iN = +5m.28s.
Berkeley eE = +5m.28s.
Cincinnati iPP = +6m.6s. ; T_0 = 7h.16m.30s.
Bozeman e = +13m.44s.
Georgetown i = +7m.8s. = PP − 1s. ; T_0 = 7h.16m.50s.
Buffalo iPP = +7m.10s., iSS = +13m.32s.
Toronto iPP = +7m.42s. ; T_0 = 7h.16m.26s.
Seattle e = +14m.17s.
Fordham eSSN = +14m.17s.
Ottawa PP = +8m.6s., SS = +14m.38s. ; T_0 = 7h.16m.24s.
Oak Ridge ePPZ = iPPNE = +8m.26s., ePPNW = +8m.32s., eNE = +18m.20s., eNW = +20m.6s.
Huancayo e = +13m.32s. and +17m.26s.
Sitka e = +18m.23s.
La Paz SSS = +20m.5s.
San Fernando SE = +30m.29s.
Stuttgart ePP = +16m.39s. ; T_0 = 7h.16m.30s.
Ekaterinburg e = +27m.29s. = PS +6s. and +33m.2s. = SSS +11s.
Tashkent e = +22m.39s. = PPP +4s., i = +30m.11s. = PS +10s., e = +31m.26s.
Long waves were also recorded at Ann Arbor, Ivigtut, Cape Town, Wellington, Hong Kong, Chiufeng, Bombay, Kucino, Baku, Scoresby Sund, Pulkovo, and other European stations.

Dec. 14d. 18h. 51m. 49s. Epicentre 32°·2N. 55°·8E. N.2.
(as adopted for Dec. 12d. 5h.).

$A = +\cdot476$, $B = +\cdot700$, $C = +\cdot533$; $D = +\cdot827$, $E = -\cdot562$; $G = +\cdot300$, $H = +\cdot441$, $K = -\cdot846$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Baku		9·4	331	e 2 19	+ 6	e 4 19	+20	7·2	10·2
Tashkent		14·1	46	i 3 12	− 5	i 6 6	+13	e 7·2	11·8
Ksara		16·7	281	e 3 58	+ 8	i 7 20	+25	—	—
Frunse		18·3	49	e 4 13	+ 3	7 31	0	—	—
Dehra Dun		19·1	90	4 31	+11	8 11	+23	11·4	13·2
Agra	E.	19·9	99	e 4 29	0	8 17	+13	11·1	—
Almata		20·0	50	e 4 32	+ 2	8 19	+13	—	—
Bombay		20·3	127	4 32	− 1	8 25	+13	10·6	—
Theodosia		20·4	315	e 8 32	S	(e 8 32)	+18	—	—
Yalta		20·8	313	e 8 38	S	(e 8 38)	+16	—	—
Helwan		21·0	270	4 42	+ 2	i 8 38	+12	—	15·6
Simferopol		21·1	313	e 8 46	S	(e 8 46)	+18	—	—
Sebastopol		21·3	312	e 8 41	S	(e 8 41)	+ 9	—	—
Ekaterinburg		24·8	6	i 5 19	+ 1	i 9 45	+ 8	i 16·0	—
Hyderabad		25·1	120	5 21	0	10 1	+18	12·2	17·5
Calcutta		30·4	100	e 7 31	+82	13 1	?	17·0	19·2
Pulkovo		32·3	336	6 24	− 1	11 42	+ 2	19·2	23·7
Triest		34·9	305	e 2 20	?	i 12 20	0	e 17·1	—
Florence		36·4	302	2 11	?	8 11	?	13·7	19·2
Cheb		36·5	311	—	—	e 13 11?	+27	e 22·2	23·2
Potsdam		36·7	316	i 7 3	− 1	i 12 53	+ 6	e 20·2	31·2
Upsala	N.	37·3	329	—	—	e 13 2	+ 6	—	—
Copenhagen		38·1	320	7 11	− 5	13 11	+ 3	—	—
Göttingen	N.	38·3	314	—	—	e 12 11?	−60	—	—
Stuttgart		38·4	309	e 5 29	?	e 16 44	?	e 21·7	—
Zurich		38·6	307	e 7 18	− 2	—	—	—	—
Hamburg		38·8	317	—	—	e 13 11?	− 7	e 22·2	—
Feldberg		39·1	311	—	—	e 13 22	0	e 27·0	31·5
Strasbourg		39·3	309	—	—	(e 11 11?)	?	e 11·2	—
Neuchatel		39·6	307	e 7 25	− 4	—	—	—	—
De Bilt		41·4	314	e 7 45	+ 1	e 14 5	+ 8	e 26·2	27·6
Uccle		41·7	312	e 7 48	+ 2	e 14 10	+ 8	20·2	—
Oxford		45·3	313	—	—	e 14 52	− 3	—	29·3
Chiufeng		48·4	63	8 40k	+ 1	i 15 52	+14	27·4	31·5
Hong Kong		52·2	85	16 34	S	(16 34)	+ 3	—	34·4
Nanking	E.	52·5	72	e 9 9	− 1	—	—	—	36·2
Scoresby Sund		55·8	337	—	—	22 47	SSS	32·2	—
Vladivostok		59·2	56	e 9 56	− 3	—	—	30·7	—

Additional readings :—
Agra ePN = +4m.17s.
Ekaterinburg iL_q = +12·4m.
Triest i = +15m.16s.
Uccle eSS = +16m.11s.
Chiufeng iEZ = +10m.37s. = PP +12s., iE = +19m.23s. = SS +30s.
Hong Kong S? = +20m.45s.
Long waves were also recorded at Phu-Lien and other European stations.

Dec. 14d. 20h. A shock for which no determination is possible was recorded as follows :—
Tashkent e = 20h.26m.7s., i = 28m.14s., 29m.26s., and 30m.19s., iS = 31m.3s., e = 31m.8s. and 32m.8s., eL = 32m.30s., M = 34m.36s.
Ksara eP = 20h.27m.12s., e = 30m.31s., eS = 32m.37s., M = 38m.30s.
Almata eP = 20h.27m.54s.
Baku e = 20h.28m.12s.
Ekaterinburg iP = 20h.28m.34s., e = 33m.8s., L = 36m.
Frunse eP = 20h.31m.30s.

Dec. 14d. Readings also at 1h. (Ivigtut, Reykjavik, Edinburgh, Durham, Stonyhurst, Strasbourg, Paris, Florence, Scoresby Sund, Copenhagen, Nanking, and near Taihoku), 2h. (Ekaterinburg, Tashkent, Hamburg, De Bilt, Uccle, Feldberg, Stuttgart, and San Fernando), 6h. (Ekaterinburg and Tashkent), 7h. (Suva), 12h. (Chiufeng, Hong Kong, Phu-Lien, Tashkent, Bombay, Hyderabad, and near Calcutta), 13h. (Ekaterinburg), 14h. (near Mizusawa), 15h. (near Tananarive (2) and near Tyosi), 16h. (Apia), 17h. (near Tyosi), 18h. (Tananarive and near Batavia), 19h. (Cape Town and La Paz), 20h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Tananarive), 22h. (La Paz and Riverview), 23h. (Tananarive).

Dec. 15d. 7h. 42m. 14s. Epicentre 56°·1N. 33°·9W. N.1.

Probable error of epicentre ±0°·28.

A = +·463, B = −·311, C = +·830; D = −·558, E = −·830; G = +·689, H = −·463, K = −·558.

Shallow.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ivigtut	9·0	310	1 56	−11	3 54	+ 5	—	—
Reykjavik	10·0	31	2 17	− 4	4 22	+ 9	4·6	6·5
Scoresby Sund	15·3	15	3 23	− 9	6 25	+ 3	6·8	—
Edinburgh	17·0	78	e 3 48	− 6	i 7 18	+16	(i 8·7)	11·8
Stonyhurst	18·0	84	i 4 8	+ 1	7 45	+20	8·6	10·3
Durham	18·2	81	4 3	− 6	7 39	+10	—	10·4
Oxford	19·5	89	4 18	− 6	i 8 17	+21	9·2	10·9
Kew	20·2	89	i 4 33	+ 1	i 8 31	+21	9·5	11·0
Bergen	20·8	62	4 34	− 4	8 29	+ 7	9·8	—
Coimbra	22·9	123	5 6	+ 6	9 20	+17	—	—
De Bilt	22·9	83	i 5 2	+ 2	i 9 15	+12	e 10·8	13·6
Paris	23·0	93	e 5 2	+ 1	e 9 20	+15	10·8	13·8
Uccle	23·1	86	5 0	− 2	i 9 15	+ 8	10·8	13·4
Toledo	25·4	117	e 5 30	+ 6	e 9 45	− 3	e 12·0	13·8
Copenhagen	25·5	72	5 25	0	9 56	+ 6	11·8	—
Feldberg	25·7	85	e 5 26	0	i 10 17	+24	—	15·6
Göttingen	25·8	81	i 5 27	0	i 10 18	+23	—	15·8
Strasbourg	26·0	89	e 5 30	+ 1	i 10 6	+ 8	e 12·8	14·1
Karlsruhe	26·2	88	e 5 46?	+15	—	—	e 14·8	—
Neuchatel	26·6	93	e 5 34	− 1	e 10 13	+ 4	—	—
Stuttgart	26·8	88	e 5 39	+ 3	e 10 21	+ 9	e 12·8	14·5
Upsala	26·8	60	5 35	− 1	10 9	− 3	e 11·8	—
Jena	27·1	82	e 3 34	−125	e 10 20	+ 3	e 11·8	16·8
Potsdam	27·1	78	5 39	0	i 10 20	+ 3	e 12·8	15·8
Zurich	27·2	90	e 5 42	+ 2	—	—	—	—
Leipzig	27·3	80	e 5 52	+11	—	—	e 12·8	16·8
Oak Ridge	27·6	257	i 5 45a	+ 1	e 10 6	−19	e 12·8	—
Granada	27·7	120	e 5 36	− 8	e 9 57	−30	—	—
Cheb	27·9	83	e 1 46?	?	e 10 24	− 6	e 13·8	16·3
Chur	28·0	91	e 5 46	− 1	e 10 2	−30	—	—
Ottawa	28·0	265	e 5 48	+ 1	i 10 38	+ 6	e 13·3	—
Alicante	28·4	115	e 5 13	−38	e 9 31	−67	e 13·7	—
Almeria	28·5	119	—	—	e 10 50	+10	e 13·4	16·4
Piacenza	29·2	93	e 4 46	−72	—	—	14·8	19·6
Fordham	30·0	256	e 6 7	+ 2	e 11 10	+ 6	e 14·8	18·8
Treviso	30·2	92	e 6 46?	+39	e 10 46?	−21	—	17·1
Florence	30·9	95	6 21	+ 8	11 33	+15	—	14·3
Triest	31·1	90	i 6 51	+36	i 11 29	+ 8	e 14·8	16·6
Vienna	31·1	84	e 6 13	− 2	i 11 45	+24	—	—
Graz	31·2	87	e 6 46	+30	(e 10 46?)	−37	e 10·8	18·0
Toronto	31·2	265	e 6 15	− 1	i 11 27	+ 4	15·4	—
Buffalo	31·3	263	i 6 18	+ 1	e 13 46	?	e 16·8	—
Algiers	31·3	114	e 6 16	− 1	e 10 46?	−38	e 14·8	—
Pulkovo	32·9	58	6 31	0	i 11 49	0	13·7	18·7
Georgetown	33·1	256	i 6 28k	− 5	e 11 56	+ 4	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Pittsburgh		33·6	262	e 6 10	−27	e 12 3	+ 3	e 16·5	—
Ann Arbor		34·4	267	—	—	e 12 28	+16	e 17·8	—
Charlottesville		34·5	257	e 6 46	+ 1	e 12 22	+ 8	e 18·8	—
Chicago		36·9	271	—	—	e 12 36	−14	e 19·1	—
Madison		37·1	274	e 7 9	+ 2	e 12 50	− 3	e 17·3	—
Cincinnati	z.	37·1	264	i 7 7a	0	i 12 56	+ 3	e 19·3	—
Columbia		38·9	256	e 8 48	PP	e 13 26	+ 6	e 21·0	—
Florissant		40·5	268	i 7 36	0	i 13 51	+ 7	e 20·1	—
St. Louis		40·6	268	e 7 35	− 2	e 13 49	+ 4	e 20·1	22·8
Theodosia		43·4	75	e 14 28	S	(e 14 28)	+ 1	23·8	—
Little Rock		44·5	266	e 8 4	− 5	e 14 40	− 3	—	—
San Juan		44·8	226	e 8 34	+23	e 15 2	+15	22·6	—
Bozeman		47·2	291	e 8 26	− 4	e 15 22	+ 1	e 23·6	—
Ekaterinburg		47·8	48	i 8 31	− 4	e 15 30	0	25·4	26·8
Sitka		50·5	316	e 9 2	+ 7	e 15 59	− 9	e 23·8	—
Victoria		51·4	301	e 16 19	S	(e 16 19)	− 1	e 26·4	29·8
Ksara		51·5	85	e 9 19	+16	16 36	+14	—	30·3
Tucson		56·7	280	—	—	e 17 37	+ 5	e 28·3	—
Tinemaha		57·1	289	i 9 40	− 4	—	—	—	—
Haiwee	z.	57·6	288	e 9 44	− 3	—	—	—	—
Riverside	z.	58·9	286	i 9 53	− 4	—	—	—	—
Mount Wilson	z.	59·1	286	e 9 54	− 4	—	—	—	—
Pasadena		59·2	286	i 9 55	− 4	—	—	e 31·4	—
Tashkent		63·1	56	i 10 22	− 4	18 55	− 1	e 29·8	42·6
Huancayo		76·4	222	e 11 46	− 2	e 21 36	0	e 38·3	—
La Paz	n.	78·1	213	11 56	− 2	22 3	+ 8	45·8	—
Vladivostok		80·1	10	e 12 22	+14	e 22 11	− 6	e 44·8	—
Chiufeng		80·5	23	e 12 6	− 4	—	—	e 45·8	56·0

Additional readings and notes :—
Reykjavik PPP = +2m.25s.
Edinburgh iP = +3m.53s. ; S is given as i and L as iS.
Kew i = +4m.36s., iPPEZ = +4m.54s.
Uccle iE = +5m.24s. = PP +0s.
Strasbourg i = +10m.21s.
Stuttgart ePP = +6m.16s., eSS = +11m.10s. ; T_0 = 7h.42m.5s.
Jena eE = +7m.46s.
Potsdam iPPEN = +6m.47s., iE = +8m.41s. and +8m.47s., iEN = +10m.38s., iE = +10m.46s.
Oak Ridge iPNE = +5m.50s., eZ = +7m.50s., eNW = +8m.0s., iSSNE = +11m.35s.
Granada PP = +6m.0s.
Ottawa SSE = +11m.46s. ; T_0 = 7h.42m.12s.
Fordham eZ = +6m.47s. = PP − 10s., eN = +7m.0s. = PPP − 3s., eE = +7m.7s. = PPPP + 1s., eEN = +10m.47s.
Florence i = +7m.6s. = PP − 3s.
Vienna P = +9m.8s. = P_cP − 5s., PP = +11m.11s., PPP = +15m.12s., iPPS = +23m.48s.
Toronto ePP = +6m.59s. ; T_0 = 7h.42m.8s.
Chicago eSS = +15m.36s.
Cincinnati iPPZ = +8m.20s., iZ = +8m.40s. ; T_0 = 7h.42m.14s.
Florissant iPPZ = +9m.10s., ePPPZ = +9m.40s. ; T_0 = 7h.42m.15s.
St. Louis iPPEN = +9m.8s. ; T_0 = 7h.42m.14s.
Little Rock ePP = +9m.41s.
San Juan SS = +18m.24s. = S_cS +13s.
Bozeman eSS = +19m.10s.
Ekaterinburg L_0 = +22·4m.
Sitka ePP = +10m.46s., eSS = +19m.49s.
Long waves were also recorded at Ukiah, Seattle, Yalta, Simferopol, Baku, Tiflis, Cape Town, Hong Kong, and other European stations.

Dec. 15d. Readings also at 1h. (near Berkeley, Branner, and Lick), 3h. (near Tyosi), 4h. and 5h. (near Tananarive), 7h. (Christchurch, near Chur, Zurich, Neuchatel, and near Prato), 8h. (Toledo, Lick, Berkeley, and near Branner), 15h. (near Tyosi), 17h. (near Apia), 20h. (La Paz and Taikyu), 21h. (Christchurch), 22h. (La Paz, Tyosi, and near Mizusawa).

Dec. 16d. Readings at 13h. (Cincinnati, near Port au Prince, and San Juan), 14h. (Oak Ridge, Pittsburgh, Stuttgart, and La Paz), 15h. (Sumoto), 19h. (near Kobe, Sumoto (2), and Nagoya), 20h. (La Paz), 22h. (Apia).

Dec. 17d. 23h. 4m. 21s. Epicentre 44°·8N. 81°·7E. (as on 1928 Dec. 13d.). X.

$A = +\cdot102$, $B = +\cdot702$, $C = +\cdot705$; $D = +\cdot990$, $E = -\cdot144$; $G = +\cdot102$, $H = +\cdot698$, $K = -\cdot710$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Almata		3·8	248	1 1	+ 7	1 23	−14	—	2·0
Frunse		5·5	253	1 16	− 2	—	—	—	2·3
Tashkent		9·7	253	i 2 6	−11	i 3 39	−27	i 4·2	5·2
Ekaterinburg		17·8	320	e 4 7	+ 3	i 8 47	+87	i 9·5	9·6
Baku		23·7	271	e 4 11	−56	e 8 12	−66	12·6	—
Tiflis	E.	26·9	277	e 5 37	0	e 10 15	+ 1	e 11·3	12·7
Bombay		27·0	199	e 5 39	+ 1	e 10 39	+24	—	—
Kucino		29·5	308	—	—	e 11 9	+13	e 14·7	16·6
Pulkovo		33·7	318	6 42	+ 4	e 12 52	+51	19·1	—

Additional readings :—
Almata $P_g = +1$m.5s.
Frunse $P_g = +1$m.25s. $= P^* - 6$s., $PP = +1$m.51s. $= P_g + 7$s., $S^* = +1$m.57s. $= S_g + 1$s., $iS_g = +2$m.9s.
Ekaterinburg $iL_q = +8\cdot5$m.
Tiflis $eE = +8$m.55s. $= P_cP - 6$s.
Pulkovo $L_q = +17\cdot0$m.
Long waves were also recorded at Chiufeng, Copenhagen, and De Bilt.

Dec. 17d. Readings also at 0h. (near Nagoya and Tyosi), 2h. (Pasadena, Riverside, Tinemaha, near La Paz, and Sucre), 6h. (La Paz and near Amboina), 7h. (La Paz and near Medan), 12h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Christchurch, Wellington, and near Amboina (2)), 13h. (Amboina, Montezuma, near La Paz, and Sucre), 18h. (Manila), 21h. (Apia, Wellington, and Christchurch), 23h. (Port au Prince).

Dec. 18d. Readings at 1h. (Apia), 5h. (near Sitka), 6h. (Huancayo, Pittsburgh, and near Wellington), 8h. (La Paz, Sucre, and near Wellington), 10h. (Bombay, Hyderabad, Baku, Tiflis, Ekaterinburg, Tashkent, Ksara, and near Taihoku), 14h. (near Tiflis and near Tortosa), 16h. (Alicante and near Tortosa), 18h. (Kobe and near Sumoto), 20h. (Haiwee, Mount Wilson, Pasadena, La Jolla, Riverside, Tinemaha, Vienna, Manila, Suva, Wellington, and near Apia), 21h. (De Bilt, Paris, Kew, Ekaterinburg, Baku, Tiflis, and Oak Ridge), 23h. (La Paz, Sucre, Huancayo, and Potsdam).

Dec. 19d. 5h. 40m. 5s. Epicentre 86°·5N. 35°·0E. N.3.

$A = +\cdot050$, $B = +\cdot035$, $C = +\cdot998$; $D = +\cdot574$, $E = -\cdot819$
$G = +\cdot818$, $H = +\cdot573$, $K = -\cdot061$.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Scoresby Sund		17·9	246	4 7	+ 2	—	—	—	—
Pulkovo		26·8	185	—	—	e 10 10	− 2	13·6	15·1
Ekaterinburg		30·1	152	i 5 7	−59	—	—	13·1	16·4
Kucino		30·7	177	—	—	e 11 14	− 2	e 14·2	19·0
Stuttgart		38·1	208	e 7 18	+ 2	e 13 10	+ 2	e 20·9	—
Strasbourg		38·3	209	i 7 15	− 3	e 13 26	+15	e 17·9	—
Triest		41·1	200	—	—	e 13 29	−24	e 21·3	—
Tashkent		45·8	144	—	—	e 15 7	+ 5	e 21·9	32·5
Ottawa		45·9	294	—	—	e 14 55?	− 8	e 21·9	—
Baku		46·2	164	e 8 25	+ 3	15 19	+12	23·1	27·8
Oak Ridge		48·6	290	—	—	e 15 55	+14	e 24·9	—
Chiufeng		49·5	96	e 8 46	− 1	i 15 56	+ 2	—	—
Georgetown		52·5	295	e 8 12	→58	e 16 37	+ 2	e 25·9	—
Tinemaha	Z.	56·1	334	e 9 30	− 7	—	—	—	—
Haiwee	Z.	57·0	334	i 9 44	+ 1	—	—	—	—
Mount Wilson	Z.	58·9	334	i 9 56	→ 1	—	—	—	—
Pasadena	Z.	59·0	334	e 9 57	0	—	—	—	—
Riverside	Z.	59·1	334	i 10 1	+ 3	—	—	—	—
La Jolla	Z.	60·2	333	i 10 5	− 1	—	—	—	—
Bombay	N.	68·3	141	i 10 48	−12	i 19 59	− 2	—	—

Additional readings :—
Ekaterinburg $i = +10$m.27s. and $+10$m.38s.
Strasbourg $ePP? = +10$m.15s., $eSS? = +15$m.55s. ?
Tashkent $e = +17$m.55s. $= SS - 11$s. and $+18$m.30s.
Ottawa $e = +18$m.55s. ?
Long waves were also recorded at Ivigtut, Chicago, Cincinnati, Simferopol, Yalta, and other European stations.

Dec. 19d. 17h. 48m. 30s. Epicentre 74°·0N. 70°·0W. N.3.

A = +·094, B = −·259, C = +·961; D = −·940, E = −·342; G = +·329, H = −·903, K = −·276.

The Pasadena group of stations are in disagreement with the hypothesis of a repetition of the shock of Nov. 20d.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Scoresby Sund		14·8	79	3 24	− 2	5 53	−17	—	—
Ottawa		28·7	188	e 5 54	+ 1	e 10 32	−11	e 13·1	—
Sitka		29·7	273	—	—	e 14 7	?	i 15·2	—
Toronto		30·7	193	—	—	i 11 6	−10	16·9	—
Oak Ridge	N.E.	31·5	181	—	—	e 11 19	− 9	e 14·5	—
Ann Arbor		32·4	198	e 12 36	S	(e 12 36)	+55	e 18·7	—
Fordham		33·0	185	e 9 30	(+11)	e 13 7	?	i 16·5	17·1
Chicago		33·1	204	—	—	e 13 57	SSS	e 16·0	—
Bozeman		33·7	235	—	—	e 13 43	SS	e 18·2	—
Pittsburgh		33·9	193	e 12 58	?	i 16 49	(−17)	e 19·0	—
Oxford		35·2	90	—	—	i 12 39	+15	e 19·7	22·5
Georgetown		35·3	188	e 13 40	SS	—	—	e 19·0	—
Cincinnati		35·6	199	e 6 31	−23	i 12 17	−13	i 17·7	—
Charlottesville		36·2	191	—	—	e 13 54	?	e 21·0	—
Pulkovo		36·3	57	e 6 54	− 6	e 13 0	+19	21·0	23·9
Florissant		36·5	207	e 6 27	−35	—	—	17·8	—
St. Louis		36·7	207	e 6 58	− 6	e 12 15	−32	e 18·2	—
De Bilt		36·7	83	—	—	e 12 30?	−17	e 16·5	23·2
Feldberg		39·4	81	—	—	e 13 44	+17	—	24·5
Columbia		40·4	193	—	—	e 16 39	SS	20·6	—
Strasbourg		40·6	82	i 6 43	−54	—	—	e 16·5	—
Stuttgart		40·8	81	e 7 41	+ 2	e 14 0	+12	e 21·5	25·9
Little Rock		40·8	208	e 12 44	?	—	—	25·7	—
Neuchatel		41·9	84	e 7 49	+ 1	—	—	—	—
Tinemaha		43·5	239	i 8 0	− 1	—	—	i 22·7	—
Haiwee		44·3	239	i 8 12	+ 5	—	—	e 23·0	—
Ekaterinburg		45·1	36	e 9 28	PP	e 14 8	−44	20·5	—
Mount Wilson		46·2	238	i 8 23	+ 1	—	—	e 24·3	—
Riverside		46·2	238	i 8 22	0	—	—	e 24·2	—
Pasadena		46·3	238	i 8 22	− 1	—	—	e 24·4	—
Santa Barbara		46·3	239	i 8 25	+ 2	—	—	e 24·1	—
Tucson		46·3	229	—	—	e 18 35	SS	24·7	—
La Jolla	Z.	47·2	236	i 8 31	+ 1	—	—	e 24·7	—
San Juan		55·6	175	—	—	e 17 6	−11	e 26·5	—
Tiflis	E.	56·4	54	—	—	23 30	SSSS	e 29·5	36·4
Baku		58·8	51	—	—	e 18 19	+19	e 33·0	—
Tashkent		61·5	34	e 9 50	−25	i 18 50	+14	e 31·5	40·1
Huancayo		86·1	185	e 12 36	− 3	—	—	—	—

Additional readings:—
Ottawa PP = +6m.16s.; T_0 = 17h.48m.48s.
Sitka e = +14m.38s.
Toronto i = +15m.13s.
Ann Arbor ePP = +13m.0s., e = +15m.12s., eS = +16m.30s., eSSN = +17m.30s.
Fordham i = +14m.30s.
Bozeman e = +15m.48s. and +16m.43s., i = +17m.42s.
Pittsburgh iP = +13m.42s. = SS − 19s., e = +15m.23s.
Georgetown iP = +14m.4s. = SS − 29s.
Cincinnati eZ = +6m.57s., iZ = +7m.27s., iE = +8m.9s. = PP + 1s. and +9m.44s. = P_cP +17s., eZ = +16m.48s. = S_cS − 28s.
Charlottesville e = +15m.12s. and +17m.10s. = S_cS − 9s., i = +18m.6s. and +18m.51s.
St. Louis ePPN = +7m.50s., eN = +7m.55s.
Columbia e = +19m.4s. and +20m.30s.
Strasbourg i = +7m.43s.
Tinemaha eN = +9m.44s. = P_cP − 9s.
Pasadena iZ = +8m.31s., iSSNZ? = +28m.10s.
Tucson e = +22m.55s. and +23m.10s.
La Jolla iZ = +10m.20s. = PP + 7s.
Baku e = +25m.35s.
Tashkent e = +22m.30s. = SS − 2s. and +27m.6s.
Long waves were also recorded at Ivigtut, Berkeley, Ukiah, Chiufeng, Kucino, and other European stations.

Dec. 19d. Readings also at 5h. (Glenmuick and near Malabar), 8h., 12h., and 13h. (La Paz), 14h. (Manila), 16h. (near Sumoto), 17h. (Nagoya, near Mizusawa, and Tyosi), 19h. (New Plymouth and near Apia), 20h. (Ravensburg (2), Stuttgart (2), near Chur, Neuchatel, and Zurich), 21h. (Port au Prince, San Juan, Berkeley, near Branner, and Lick), 22h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, and Tinemaha), 23h. (Huancayo, and near Wellington).

Dec. 20d. Readings at 3h. (Glenmuick), 14h. (Taikyu), 19h. (near Santiago), 20h. (near Apia), 22h. (near Mizusawa), 23h. (near Amboina and near Apia).

Dec. 21d. 4h. 31m. 56s. Epicentre 30°·5S. 68°·5W. N.3.

A = +·316, B = −·802, C = −·508; D = −·930, E = −·367; G = −·186, H = +·472, K = −·862.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Santiago		3·5	212	0 41	− 9	1 9	−21	1·2	1·3
La Plata		9·9	119	i 2 20	+ 1	4 10	− 1	4·9	5·9
Sucre		11·9	15	2 57	+10	i 5 29	+29	6·2	—
La Paz		14·0	1	i 3 25	+10	i 6 4	+13	6·7	7·0
Huancayo		19·5	339	i 4 27	+ 3	i 8 5	+ 9	8·2	—
San Juan		49·0	4	e 8 38	− 6	e 15 35	−12	19·1	—
St. Louis		72·1	343	e 11 12	−11	e 20 25	−21	—	—
Florissant		72·3	343	e 8 4?	?	i 20 27	−21	—	—
La Jolla		78·4	321	i 11 47k	−12	—	—	—	—
Riverside	z.	79·3	321	i 11 52k	−12	—	—	—	—
Mount Wilson		79·8	321	i 11 56k	−11	—	—	—	—
Pasadena		79·9	321	i 11 56k	−11	—	—	—	—
Santa Barbara		81·0	320	i 12 2k	−11	—	—	—	—
Haiwee		81·3	322	i 12 3k	−12	—	—	—	—
Tinemaha		82·1	322	i 12 7k	−12	—	—	—	—
Almata		149·9	55	e 19 44	[+ 2]	—	—	—	—

Additional readings:—
La Plata eZ = +4m.28s. and +5m.28s. = S_g +7s.
Huancayo iPP = +4m.51s., iPPP = +5m.2s., i = +6m.36s.
San Juan e = +11m.24s.
Pasadena eZ = +12m.25s.

Dec. 21d. 18h. 40m. 57s. Epicentre 40°·5N. 33°·5E. (as on 1933 May 26d.). R.3.

A = +·634, B = +·420, C = +·649; D = +·552, E = −·834; G = +·542, H = +·358, K = −·760.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sebastopol	4·1	0	1 0	+ 2	(i 1 40)	− 5	i 1·7	1·8
Yalta	4·1	7	e 0 54	− 4	(e 1 36)	− 9	e 1·6	2·8
Simferopol	4·5	6	e 0 58	− 6	(e 1 45)	−10	e 1·8	—
Theodosia	4·7	17	1 4	− 3	(i 1 53)	− 7	i 1·9	2·8
Ksara	6·9	163	e 1 53	P*	e 3 54	S_g	—	—
Tiflis	8·5	79	e 2 4	+ 4	—	—	4·2	5·0
Triest	15·1	296	e 3 26	− 4	—	—	—	—
Florence	16·8	289	e 0 3	?	—	—	—	9·0
Chur	18·4	298	e 4 17	+ 6	—	—	—	—
Stuttgart	19·1	304	e 4 20	0	—	—	e 12·0	—
Zurich	19·2	299	e 4 23	+ 2	—	—	—	—
Pulkovo	19·4	355	4 14	− 9	8 9	+15	11·6	13·2
Neuchatel	20·1	298	e 4 32	+ 1	e 7 55	−13	—	—
Ekaterinburg	24·0	38	i 5 9	− 1	9 25	+ 2	12·6	—
Tashkent	26·8	77	i 5 37	+ 1	e 10 21	+ 9	e 16·0	17·4

Additional readings:—
Tiflis eE = +2m.18s. and +2m.31s.
Triest PPP = +5m.8s., SSS = +9m.13s., i = +10m.23s.
Long waves were also recorded at Kucino and other European stations.

Dec. 21d. 23h. 9m. 0s. Epicentre 30°·6N. 141°·8E. (as on 1927 May 20d.). X.

A = −·677, B = +·532, C = +·509; D = +·618, E = +·786; G = −·400, H = +·315, K = −·861.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi		5·2	352	e 1 31	P_g	2 54	S_g	—	3·5
Nagoya		6·2	319	e 2 10	P_g	e 3 14	S_g	—	—
Mizusawa	E.	8·5	355	—	—	3 52	+16	—	—
Chiufeng		22·9	302	e 5 2	+·2	e 8 58	− 5	e 13·0	15·4
Hong Kong		26·0	258	5 51	+22	10 11	+13	—	15·9
Tashkent		58·0	304	i 9 49	− 1	e 17 44	− 5	e 29·0	37·0
Ekaterinburg		60·1	322	i 10 7	+ 2	18 27	+10	31·0	—
Tinemaha		79·1	53	i 12 0	− 3	—	—	—	—
Haiwee		79·8	54	i 12 7	0	—	—	—	—
Mount Wilson	Z.	80·7	55	i 12 7	− 5	—	—	—	—
Riverside	Z.	80·7	55	i 12 9	− 3	—	—	—	—
Pasadena	Z.	81·3	55	e 12 3	−12	—	—	—	—
Strasbourg		90·9	332	—	—	—	—	e 21·0	—

Chiufeng eEZ = +5m.57s.
Long waves were also recorded at other European and Russian stations.

Dec. 21d. Readings also at 0h. (Baku, Ekaterinburg, Melbourne, Riverview, Christchurch, Wellington, Tinemaha, Haiwee, Pasadena, Mount Wilson, and Oak Ridge), 1h. (Copenhagen and Paris), 2h. (near Sumoto), 3h. (Nagoya and near Santiago), 7h. (near Berkeley), 8h. (near Tiflis), 9h. (La Paz), 10h. (Adelaide, Melbourne, Riverview, and Wellington), 11h. (near Malabar), 15h. (Hong Kong, Nanking, and near Taihoku), 23h. (near Wellington).

Dec. 22d. Readings at 2h. (Huancayo, Tucson (2) and near Apia), 3h. (Tucson), 7h. (near La Paz), 8h. and 12h. (near Huancayo), 15h. (Florence and Zagreb), 16h. (near Tiflis), 17h. (near Manila), 18h. (Tyosi), 19h. (Chur, Neuchatel, Zurich, Stuttgart, La Jolla, Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Manila), 23h. (Ekaterinburg).

Dec. 23d. Readings at 0h. (Baku and near Santiago), 1h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Baku, Ekaterinburg, Tiflis, near Sebastopol, Simferopol, and Yalta), 2h. (Haiwee, Mount Wilson, Pasadena, Riverside, Santa Barbara, and Tinemaha), 7h. (near Apia), 8h. (Taihoku), 10h. (Tashkent), 11h. (Wellington and near Santiago), 12h. (Huancayo and La Paz), 16h. and 18h. (Alicante).

Dec. 24d. 10h. 46m. 0s. Epicentre 1°·2S. 149°·5E. (as on 1923 July 26d.). R.3.

A = −·862, B = +·508, C = −·021; D = +·508, E = +·862; G = +·018, H = −·011, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Palau		17·3	300	4 1	+ 3	8 8	+59	—	—
Amboina		21·4	263	(i 4 15?)	−29	(8 5?)	−29	(10·0?)	—
Manila		32·4	302	e 6 20	− 6	11 45	+ 4	16·2	—
Riverview		32·7	178	e 6 12	−17	e 11 0	−46	e 13·5	17·0
Sydney		32·7	178	e 10 24	?	i 14 18	?	16·2	17·6
Adelaide		35·3	195	e 7 9	+17	e 11 45	−41	14·5	22·0
Melbourne		36·8	188	—	—	12 3	−45	18·0	—
Sumoto		38·1	342	e 7 41	+25	13 24	+16	—	—
Kobe	E.	38·3	342	e 7 34	+16	e 13 6	− 5	—	21·6
	N.	38·3	342	e 7 16	− 2	e 13 8	− 3	—	21·4
	Z.	38·3	342	e 7 24	+ 6	e 12 51	−20	—	21·6
Hong Kong		41·7	306	7 50	+ 4	14 3	+ 1	—	22·2
Batavia		42·9	264	9 11	PP	12 30	?	—	—
Arapuni		43·9	150	—	—	i 19 45	?	—	—
Zinsen		44·1	334	e 8 10	+ 4	e 14 54	+17	—	—
Nanking	Z.	44·2	322	e 8 10	+ 4	—	—	—	24·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Perth		44·2	222	—	—	14 0	−39	20·4	27·0
Wellington		46·1	154	—	—	i 14 35	−31	23·1	—
Christchurch		47·0	158	13 57	?	18 43	SS	—	—
Vladivostok		47·0	343	e 8 42	+13	—	—	—	—
Phu-Lien		47·3	300	—	—	15 0?	−23	—	—
Medan		51·0	277	e 9 15	+16	e 13 45	?	—	—
Chiufeng		51·3	328	e 9 2	+ 1	e 16 22	+ 3	e 24·9	31·7
Calcutta		64·1	296	17 36	?	e 23 6	SS	28·0	—
Agra		74·2	299	11 34	− 2	21 0	−11	—	—
Bombay		77·8	290	e 11 56	− 1	i 21 37	−15	—	—
Sitka		83·0	33	—	—	e 23 4	PS	e 34·6	—
Tashkent		83·5	312	e 13 23	+57	i 22 48	− 4	e 34·0	42·2
Ukiah		88·7	51	—	—	e 39 30	?	—	—
Ekaterinburg		90·4	327	e 16 23	PP	e 23 27	[− 8]	44·0	53·7
Tinemaha	z.	92·6	54	e 13 9	0	—	—	—	—
Pasadena	z.	92·7	57	i 13 8	− 2	—	—	—	—
Mount Wilson	z.	92·8	57	i 13 11a	+ 1	—	—	—	—
Riverside	z.	93·3	57	i 13 10	− 3	—	—	—	—
Baku		98·1	311	e 14 33?	+58	e 24 59?	−11	47·0	61·4
Kucino		103·0	327	—	—	e 28 10	?	e 47·7	61·9
Pulkovo		105·3	333	—	—	e 27 59	PS	54·0	57·7
Feldberg		120·9	332	—	—	e 30 12	PS	e 60·0	73·5
De Bilt		121·0	335	—	—	e 33 0?	?	e 60·0	68·4
Triest		121·1	325	e 30 45	PS	—	—	e 59·0	68·3
Stuttgart		121·6	331	—	—	e 30 38	PS	e 66·0	—
Strasbourg		122·3	331	e 18 0?	[−51]	(e 38 0?)	?	e 38·0	—
Kew		123·6	339	—	—	e 41 0?	?	e 60·0	—
Huancayo		133·6	108	e 22 24	PP	e 55 13	?	e 64·5	—

Additional readings and notes :—
Amboina readings have been *increased* by 2m.
Manila PPPN = +7m.48s., iE = +9m.15s. = P_cP −2s.
Riverview e = +7m.0s.
Melbourne i = +14m.42s.
Sumoto ePZ = +7m.54s.
Kobe eEN = +16m.37s.
Hong Kong PP? = +9m.44s., SS = +17m.20s.
Perth SS = +17m.0s.
Vladivostok SSS = +15m.42s. = S +23s.
Chiufeng SEZ = +16m.28s. ; T_e = 10h.46m.5s.
Ekaterinburg e = +25m.4s. = PS +8s. and +30m.1s. = SS +15s.
Tinemaha eZ = +22m.36s.
Pasadena eZ = +22m.25s.
Mount Wilson eZ = +22m.30s.
Riverside eZ = +22m.29s.
Kucino e = +32m.42s. = SS −1s.
Pulkovo e = +33m.40s. = SS +25s. and +38m.3s.
Feldberg e = +36m.55s. = SS +11s. and +39m.0s.
Stuttgart iPSZ = +30m.46s., eSSEN = +37m.30s.
Long waves were also recorded at Suva, Tucson, San Juan, Cape Town, and other European stations.

Dec. 24d. Readings also at 0h. (Tyosi, Nagoya, and near Koti), 1h. (San Juan), 3h. (near Huancayo), 6h. (La Plata and near Santiago), 9h. and 10h. (near Apia), 14h. (La Paz), 18h. (Bombay, Frunse, Tashkent, Baku, and Ekaterinburg), 20h. (De Bilt, Stuttgart, and Uccle), 22h. (Simidu).

Dec. 25d. Readings at 7h. (La Paz), 8h. (near Tyosi), 17h. (near Wellington), 20h. (Huancayo, La Paz and near Nagoya), 21h. (Mizusawa), 22h. (La Plata).

Dec. 26d. Readings at 0h. (Hong Kong), 3h. (near Tiflis), 5h. (Nagoya), 9h. (near Santiago), 10h. (Bombay, Calcutta, Tashkent, and Ekaterinburg), 12h. (near Apia), 18h. (near Tyosi), 19h. (near Santiago), 20h. (Almeria), 22h. (Bombay and Chiufeng).

Dec. 27d. 4h. 43m. 53s. Epicentre 46°·7N. 12°·8E. N.2.

A = +·669, B = +·152, C = +·728 ; D = +·222, E = −·975 ; G = +·710, H = +·161, K = −·686.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Treviso		1·1	203	i 0 8	− 8	i 0 15	−13	—	0·4
Triest		1·2	148	i 0 18k	+ 1	i 0 35	+ 4	—	—
Venice		1·3	194	i 0 18	0	i 0 32	− 1	—	—
Padova		1·5	207	0 9	−12	—	—	—	—
Graz		1·8	78	e 0 43	S	e 1 3	?	—	1·4
Chur		2·3	274	e 0 31	− 2	e 0 56	− 3	—	—
Ravensburg		2·4	297	e 0 40	+ 6	e 1 11	S*	1·3	—
Zagreb		2·4	112	e 0 44	P_g	i 1 19	S_g	—	1·4
Vienna		2·9	57	e 1 0	P_g	1 32	S_g	—	2·6
Zurich		3·0	283	e 0 42	− 1	e 1 25	S*	—	—
Prato		3·1	203	e 0 45	+ 1	i 1 7	−13	—	1·3
Florence		3·1	201	e 0 49	P*	—	—	—	1·4
Stuttgart		3·2	311	e 0 46	0	(1 27)	+ 5	—	—
Karlsruhe		3·7	311	(0 42)	−11	—	—	—	—
Strasbourg		3·9	301	1 22	?	1 57	S*	—	—
Neuchatel		4·0	276	e 0 54	− 3	e 1 53	S*	—	—
Jena	E.	4·3	350	e 1 1	0	e 1 24	P_g	e 2·1	2·5
Göttingen		5·2	340	e 1 19	+ 5	e 2 47	S_g	—	3·0

Additional readings and notes :—
Triest iPP = +26s., iSS = +37s.
Venice iP = +26s.
Zagreb e = +50s.
Vienna S* = +1m.51s., S? = +1m.54s.
Stuttgart P_g = +58s., eS* = (+1m.39s.), eS_g = (+1m.44s.) ; the S readings have been *diminished* by 1m.
Karlsruhe readings have been *increased* by 2m.
Strasbourg SS = +2m.5s. ? = S_g +2s., SSS = +2m.27s.
Neuchatel eP_g = +1m.5s. = P_g +0s.
Göttingen eP_g = +1m.41s.

Dec. 27d. Readings also at 7h. (Cheb and San Juan), 8h. (Huancayo), 10h. (Christchurch and Manila), 11h. (Adelaide, Melbourne, Riverview, Perth, Suva, Wellington, Chiufeng, Bombay, Haiwee, Mount Wilson (2), Pasadena, Riverside (2), and Tinemaha), 12h. (Baku and Kucino), 16h. (Manila), 21h. (Huancayo), 22h. (Simidu), 23h. (Almata).

Dec. 28d. Readings at 0h. (Tyosi), 1h. (La Paz), 2h. (Huancayo), 4h. (near Amboina and near Simidu), 7h. (near Berkeley, Branner, and Lick), 11h. (near Tyosi), 12h. (Karlsruhe), 14h. (Nagoya, near Mizusawa, and Tyosi), 15h. (near Apia and near Mizusawa), 16h. (near Chur), 18h. (Tyosi and near Mizusawa), 19h. (near Wellington), 21h. (near Sumoto), 23h. (near Apia).

Dec. 29d. 8h. 17m. 1s. Epicentre 5°·0S. 81°·5W. (as on 1926 July 1d.). R.3.

A = +·147, B = −·985, C = −·087 ; D = −·989, E = −·148 ; G = −·013, H = +·086, K = −·996.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Huancayo		9·4	140	i 2 16	+ 3	i 4 0	+ 1	—	—
La Paz		17·4	132	4 0	+ 1	i 7 15	+ 4	8·8	10·4
Sucre	N.	21·2	133	i 4 43	+ 1	i 8 30	0	—	—
Riverside	Z.	51·6	322	i 9 2k	− 1	—	—	—	—
Mount Wilson	Z.	52·2	322	i 9 7	− 1	—	—	—	—
Tinemaha	Z.	54·2	324	i 9 22	− 1	—	—	—	—

Huancayo gives i = +4m.19s. and +4m.43s. = S* +5s.

Dec. 29d. Readings also at 3h. (Nagoya, near Mizusawa, and Tyosi), 7h. (near Lick), 9h. (near Berkeley, and near Manila), 10h. (near Amboina), 11h. (near Apia), 15h. (near Amboina), 16h. (near Medan), 20h. (Tiflis and near Tashkent), 21h. (Huancayo), 22h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, and Tiflis).

Dec. 30d. 2h. 43m. 42s. Epicentre 48°·3N. 9°·0E. (as on 1933 Oct. 10d.). X.

A = +·657, B = +·104, C = +·747.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Ebingen	0·1	190	−i 0 5	− 6	− i 0 4	− 7
Stuttgart	0·4	16	e 0 7	+ 1	i 0 15	+ 5
Hohenheim	0·5	19	e 0 6?	− 1	i 0 13	0
Ravensburg	0·6	141	—	—	e 0 18?	+ 3
Strasbourg	0·9	289	—	—	i 0 29	+ 6
Zurich	1·0	197	e 0 15	+ 1	i 0 28	+ 2
Neuchatel	1·9	227	e 0 32	+ 4	e 0 55	+ 6

Additional readings :—
Stuttgart i = +18s.
Hohenheim i = +15s.
Strasbourg i = +34s.

Dec. 30d. 8h. 46m. 2s. Epicentre 24°·0N. 123°·0E. (as on 1933 Jan. 29d.). X.

A = −·498, B = +·766, C = +·407 ; D = +·839, E = +·545 ;
G = −·224, H = +·341, K = −·913.

	Δ	Az.	P.	O−C.	S.	O−C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Taihoku	1·7	308	e 0 23	− 1	i 0 44	0	0·8
Nanking	8·9	336	2 4	− 2	—	—	5·4
Manila	9·6	192	e 2 11	− 5	4 42	S*	7·0
Chiufeng	17·1	342	e 3 58	+ 3	—	—	11·6
Tiflis	65·9	309	e 10 48	+ 3	—	—	—

Nanking gives also iN = +4m.13s. = S* +10s., iEN = +4m.32s. and +4m.44s. = S_g −4s.
Long waves were also recorded at Hong Kong, Phu-Lien, Ekaterinburg, Tashkent, and Kucino.

Dec. 30d. Readings also at 1h. (near Wellington), 2h. (Nagoya, near Mizusawa, and Tyosi), 5h. (Amboina (2), Batavia, Perth, Melbourne, Hong Kong, Manila, Tashkent, Baku, Tiflis, Ekaterinburg, Huancayo, and near La Paz), 9h. (near Berkeley, Branner, and Lick), 10h. (La Paz), 12h. (Adelaide, Melbourne, Riverview, Perth, Amboina, and near Santiago), 15h. (near Amboina), 16h. (Frunse).

Dec. 31d. 21h. 39m. 42s. Epicentre 20°·0S. 70°·2W. (as on 1933 Feb. 23d.). X.

A = +·318, B = −·884, C = −·342 ; D = −·941, E = −·339 ;
G = −·116, H = +·322, K = −·940.

		Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Montezuma		2·9	154	e 0 42	+ 1	e 1 10	− 4	—	—
La Paz	N.	4·0	29	1 1	+ 4	i 1 53	S*	2·0	2·1
Sucre		4·8	79	i 0 53?	−15	i 1 59	− 4	—	—
Huancayo		9·3	327	e 2 9	− 2	e 3 51	− 5	i 4·6	—
Oak Ridge	Z.	62·5	359	i 10 17a	− 5	—	—	—	—

Additional readings :—
Montezuma i = +55s. = P_g +7s.
Huancayo e = +2m.56s. and +4m.13s.
Oak Ridge iZ = +10m.30s., +10m.41s. and +11m.1s. = P_cP −2s.

Dec. 31d. Readings also at 1h. (La Paz and near Frunse), 2h. (Tyosi), 3h. (Wellington), 4h. (La Paz), 6h. (near Sumoto), 11h. (Neuchatel), 12h. (Bombay, Mizusawa, Sumoto, Tyosi, and near Nagoya), 16h. (near Tiflis), 17h. (near Huancayo (2)), 21h. (near Santiago).

HELSINGFORS, 1933.

July 9d. 1h. 30m. 7s. Epicentre 45°·0N. 150°·0E. N.1.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	E.	65·7	334	e 10 40	− 3	i 19 40	PS	26·9	—
	N.	65·7	334	i 10 42	− 1	e 19 19	−10	26·9	—

ePPPN = +15m.4s. = PPPP − 3s., iS_cSN? = +20m.33s., iSSE = +22m.53s.

July 9d. 9h. 28m. 5s. Epicentre 45°·0N. 150°·0E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	65·7	334	—	—	e 19 41	PS	30·9	—

iN = +20m.32s. = S_cS − 1s.

July 9d. 11h. 21m. 40s. Epicentre 45°·0N. 150°·0E. R.3.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	E.	65·7	334	i 10 31	−12	—	—	34·3	—

July 9d. 12h. 30m. 43s. Epicentre 44°·7N. 150°·2E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	66·0	333	i 10 40	− 5	i 19 31	− 1	26·3?	—

iPPPN = +14m.46s., iSN = +19m.25s., iS_cSN = +20m.31s., iS_cSE = +20m.37s., iSSN = +24m.13s., iSSE = +24m.25s.

July 9d. 16h. 7m. 9s. Epicentre 45°·0N. 150°·0E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	65·7	334	—	—	e 20 45	(+12)	33·9	—

July 10d. 0h. 21m. 37s. Epicentre 39°·1N. 144°·7E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	69·1	333	i 11 3	− 2	—	—	35·4	—

July 10d. 3h. 22m. 10s. Epicentre 19°·1N. 103°·6W. N.1.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	N.	90·6	23	—	—	e 23 28	[− 8]	46·8	—
	E.	90·6	23	—	—	e 23 32	[− 4]	46·8	—

eSZ = +23m.26s., eE = +28m.32s.

July 18d. 19h. 5m. 26s. Epicentre 11°·5N. 140°·0E. N.2.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	92·0	333	—	—	i 24 59	+44	48·6	—

iZ = +25m.19s. = PS + 4s.

July 19d. 10h. 45m. 35s. Epicentre 51°·8N. 174°·1W. N.2.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	67·0	350	—	—	i 20 13	PS	42·4	—

iE = +29m.40s.

July 19d. 13h. 32m. 27s. Epicentre 51°·8N. 174°·1W. R.1.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors		67·0	350	10 54	+ 2	e 19 46	+ 1	34·5	—

eN = +12m.13s., eSN = +19m.37s.

July 19d. 14h. 59m. 57s. Epicentre 51°·8N. 174°·1W. R.1.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	E.	67·0	350	e 10 47	− 5	e 20 47	(+ 4)	33·0	—
	N.	67·0	350	i 10 49	− 3	e 19 55	PS	33·0	—

July 19d. 20h. 7m. 10s. Epicentre 38°·0N. 29°·5E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	22·4	354	e 4 53	− 2	i 8 56	+ 3	—	—

iP = +4m.56s., iPPEN? = +5m.23s., ePPPN = +5m.38s., eSSN? = +9m.45s., iSSE = +9m.53s., iSSSE = +10m.23s., eP_cSE = +11m.47s.

July 20d. 23h. 14m. 4s. Epicentre 38°·5N. 144°·8E. N.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	−0·9	69·8	333	—	—	e 20 8	0	e 37·9	—

eSE = +20m.58s.

July 21d. 20h. 6m.51s. Epicentre 56°·0S. 25°·0W. X.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	122·7	26	e 19 40	[−12]	e 27 22	{−12}	e 56·1	—

eEN = +30m.29s. = SKSP +14s.

July 31d. 11h. 35m. 40s. Epicentre 53°·2N. 35°·4W. N.2.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	32·7	53	e 6 21	− 8	—	—	16·3	—

Aug. 11d. 8h. 54m. 7s. Epicentre 26°·0N. 98°·4E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	59·5	326	i 9 58	− 3	i 18 8	− 1	e 24·9	—

ePPE = +12m.5s., ePPN = +12m.11s., ePPPE = +13m.35s., iSEN = +18m.11s., ePSE = +18m.38s., iSSE = +22m.17s.

Aug. 13d. 9h. 28m. 4s. Epicentre 34°·0S. 57°·0E. R.1.

		△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	N.	97·8	344	e 17 34	PP	e 26 32	PS	52·9	—

Aug. 20d. 11h. 45m. 11s. Epicentre 13°·0N. 124°·7E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	83·5	330	i 12 15	−11	—	—	42·8	—

Aug. 25d. 7h. 50m. 33s. Epicentre 31°·7N. 103°·4E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	57·3	325	i 9 25	−20	i 17 25	−15	e 29·4	—

eP_cPEN = +10m.25s., iPPZ = +11m.44s., iPPPE = +12m.27s., iSN = +17m.27s., iSKKS = +19m.23s. = S_cS −10s., iSKS = +19m.46s., iSSN = +21m.26s., iSSE = +21m.29s., iSSSE = +23m.27s., eSSSN = +23m.31s.

Aug. 28d. 22h. 19m. 44s. Epicentre 59°·0S. 25°·0W. N.2.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	125·3	28	18 53	[− 5]	26 8	[+ 2]	e 48·3	—

iPKPZ = +18m.57s., iPP = +20m.50s., iPPPN = +23m.47s., iSKSE = +26m.12s., iSKKSZ = +27m.24s., eSKKSE = +27m.28s., iN = +27m.46s., iSKSPN = +29m.32s., iPSN = +29m.49s., ePPSE = +31m.11s., ePPSN = +31m.17s., eSSN = +36m.59s., iSSE = +37m.8s., iPSSN = +37m.50s., iPSSE = +37m.53s.

Sept. 2d. 16h. 41m. 19s. Epicentre 30°·3N. 139°·4E. N.1.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	−8·0	75·0	332	10 48	− 4	i 20 12	+27	e 40·7	—

iPE = +10m.50s., ePN = +10m.52s., iE = +12m.26s., iZ = +12m.30s., i = +13m.45s., ePKP = +14m.2s., ePPE = +15m.8s., iSKS = +19m.50s., iSKKSN = +22m.28s., iSKKSE = +22m.31s., iPSZ = +24m.30s., iPSN = +24m.41s., iPSE = +24m.49s., eSSE = +31m.2s.

Sept. 6d. 22h. 8m. 26s. Epicentre 21°·3S. 178°·6W. N.1.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	—	137·7	343	i 18 44	[−35]	e 28 21	?	47·6	—

iPN = +18m.48s., iPKPN = +21m.18s., iPKPZ = +21m.22s., iEN = +22m.18s., iZ = +23m.54s., iPPE = +24m.15s., ePPN = +24m.18s., ePKSZ = +24m.54s., iPKSEN = +25m.5s., iZ = +25m.43s., iPPPEN = +27m.28s., iSKKSE = +30m.54s., iN = +33m.51s., eSKSPE = +34m.21s., eSKSPN = +34m.27s., ePSN = +35m.28s., iPPSN = +36m.27s., iPPSE = +36m.30s., iE = +40m.51s., eSSN = +42m.39s.

Sept. 9d. 21h. 20m. 10s. Epicentre 12°·4S. 167°·2E. N.2.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	—	124·8	338	e 18 15	[−41]	i 27 27	{−21}	e 42·8	—

iZ = +18m.32s., iE = +25m.29s. =SKS − 36s., eZ = +29m.23s., eN = +32m.33s.

Sept. 21d. 9h. 47m. 59s. Epicentre 38°·8N. 143°·8E. R.1.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	69·1	334	i 11 2	− 3	—	—	e 38·0	—

eN = +11m.8s., eZ = +16m.28s., iE = +16m.35s.

Sept. 24d. 15h. 19m. 41s. Epicentre 52°·0N. 176°·9W. N.1.

	Δ	Az.	P.	O−C.	S.	O−C.	L	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	66·5	350	i 10 46	− 3	i 19 34	− 5	e 27·3	—

ePcPE = +11m.34s., iPPNZ = +13m.32s., iPPPN = +15m.10s., iPPPZ = +15m.13s., iPSNZ = +20m.4s., iScS = +20m.39s.

Sept. 25d. 13h. 45m. 49s. Epicentre 5°·6N. 126°·3E. R.2.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors E.	90·7	331	—	—	e 23 44	{+ 3}	e 51·2	—

eE = +41m.45s.

Sept. 25d. 18h. 51m.29s. Epicentre 38°·3N. 86°·8E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	43·8	321	e 7 56	− 7	e 14 36	+ 3	e 17·7	—

iPPEZ = +9m.50s., ePPPN = +10m.33s., iPeSE = +12m.33s., iSN = +14m.39s., iSSZ = +17m.20s., iSSE = +17m.27s., iSSN = +17m.31s.

Sept. 26d. 3h. 33m. 29s. Epicentre 42°·0N. 14°·2E. N.2.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	19·3	16	i 4 18	− 4	e 7 50	− 2	e 10·0	—

ePPZ = +4m.51s., eE = +7m.31s.

Oct. 2d. 15h. 29m. 27s. Epicentre 2°·1S. 81°·2W. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	99·8	29	e 13 33	−10	e 24 6	[−19]	e 41·6	—

ePEZ = +13m.41s., ePPE = +18m.16s., eE = +22m.9s., iN = +25m.8s. = S − 18s., eSSN = +31m.37s., eSSE = +31m.43s.

Oct. 3d. 18h. 38m. 58s. Epicentre 37°·2N. 138°·8E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors N.	68·6	331	12 40	?	—	—	e 40·0	—

eN = +13m.50s.

Oct. 5d. 13h. 29m. 53s. Epicentre 35°·1N. 57°·8E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	32·8	330	e 6 27	− 3	e 11 20	−28	e 13·1	—

ePP = +7m.22s.

Oct. 10d. 20h. 55m. 15s. Epicentre 48°·3N. 9°·0E. R.2.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors E.	16·3	25	e 0 15	?	—	—	—	—

eE = +1m.6s.

Oct. 14d. 22h. 19m. 7s. Epicentre 53°·9N. 163°·7W. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors N.	65·8	355	e 14 28	PPP	—	—	—	—

eE = +16m.31s.

Oct. 25d. 23h. 28m. 16s. Epicentre 23°·5S. 66°·5W. N.1.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors E.	—	110·9	31	—	—	e 24 29	[−48]	e 51·7	—

eE = +25m.29s. = SKKS − 44s., iE = +27m.59s. = PS − 36s.

Oct. 26d. 12h. 7m. 8s. Epicentre 60°·0S. 60°·0W. N.3.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	136·8	46	e 22 52	PKS	—	—	e 54·9	—

eE = +25m.36s.

Nov. 2d. 12h. 27m. 2s. Epicentre 52°·0N. 176°·0W. R.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors		66·5	349	e 10 10	−39	e 19 30	− 9	e 27·0	—

ePPPN = +14m.50s., eE = +21m.58s.

Nov. 20d. 23h. 21m. 38s. Epicentre 73°·3N. 70°·7W. N.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors		35·2	59	i 6 48	− 3	i 12 22	− 2	e 16·4	—

iPPZ = +7m.53s., iPPN = +7m.56s., iPPE = +7m.58s., iPPPE = +8m.19s., iPPPNZ = +8m.22s., iP$_c$SEN = +12m.51s., iSSEN = +15m.2s., iSSSEN = +15m.44s.

Nov. 22d. 12h. 42m. 23s. Epicentre 5°·7S. 151°·8E. R.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors		112·5	335	18 57	[+32]	e 28 57	PS	—	—

ePN = +19m.7s.? = PP − 8s., ePPN = +23m.27s., ePPPEN = +25m.15s. = SKS − 9s., eSSE? = +37m.37s. ?

Nov. 28d. 11h. 9m. 26s. Epicentre 32°·0N. 56°·1E. N.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors		34·8	333	e 6 35	−12	i 12 10	− 8	e 14·1	—

ePZ = +6m.42s., iPE = +6m.55s., ePPZ = +7m.40s., iPPPEN = +8m.10s., iP$_c$P = +9m.30s.

Dec. 4d. 19h. 33m. 56s. Epicentre 47°·2N. 144°·0E. R.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors	−4·6	61·8	331	e 11 4?	(− 4)	i 19 2	?	e 23·1	—

ePE? = +11m.44s.?, iP$_c$SE = +17m.48s.

Dec. 13d. 21h. 23m. 51s. Epicentre 19°·2N. 104°·2W. R.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors		90·6	22	e 15 17	?	e 23 35	[− 1]	e 48·1	—

eE = +25m.17s. = PS + 18s.

Dec. 15d. 7h. 42m. 14s. Epicentre 56°·1N. 33°·9W. N.1.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors E.		30·3	58	e 6 58	PP	e 11 18	+ 9	e 14·9	—

eN = +8m.8s.

Dec. 19d. 5h. 40m. 5s. Epicentre 86°·5N. 35°·0E. N.3.

	Corr. for Focus	△	Az.	P.	O−C.	S.	O−C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Helsingfors E.		26·4	191	e 5 29	− 4	e 10 29	+22	—	—

eP$_c$PE = +8m.27s.

SERRA DO PILAR, 1933.

Jan. 21d. 19h. 21m. 14s. Epicentre 34°·0S. 57°·0E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	96·3	318	17 22	PP	—	—	—	—

Feb. 23d. 8h. 9m. 19s. Epicentre 20°·0S. 70°·2W. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	83·6	42	15 24	PP	—	—	—	—

March 2d. 17h. 31m. 1s. Epicentre 39°·1N. 144°·7E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	96·2	340	13 31	+ 5	—	—	—	—

April 23d. 5h. 57m. 38s. Epicentre 36°·8N. 27°·5E. R.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	28·2	290	i 5 49	0	10 56	+21	13·6	—

April 27d. 2h. 36m. 11s. Epicentre 61°·2N. 150°·9W. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	73·2	29	e 11 34	+ 4	e 21 16	PS	40·2	—

May 11d. 19h. 9m. 50s. Epicentre 40°·4N. 23°·7E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	24·4	283	i 5 9	− 5	i 8 40	P_cP	10·5	—

May 19d. 17h. 58m. 6s. Epicentre 1°·7S. 15°·1W. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	43·3	7	e 7 53	− 6	e 14 23	− 2	22·8	—

June 18d. 21h. 37m. 36s. Epicentre 38°·5N. 142°·8E. N.1.

	△	Az.	P.	O−C	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	96·2	339	i 14 30	+64	24 16	[+ 9]	—	—

June 24d. 21h. 54m. 51s. Epicentre 5°·0S. 104°·2E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	110·2	312	19 26	PP	26 29	{+21}	31·5	—

July 18d. 6h. 4m. 45s. Epicentre 36°·0N. 5°·0W. X.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	5·8	332	—	—	2 26	− 2	—	—

Aug. 25d. 7h. 50m. 33s. Epicentre 31°·7N. 103°·4E. N.1.

	△	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	84·0	315	12 32	+ 4	—	—	—	—

Aug. 28d. 22h. 19m. 44s. Epicentre 59°·0S. 25°·0W. N.2.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	101·0	13	14 26	+38	—	—	—	—

Aug. 29d. 14h. 52m. 37s. Epicentre 11°·0S. 69°·5W. N.2.
Depth of focus 0·085.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	−9·3	76·4	43	e 10 50	− 2	—	—	—	—

Sept. 6d. 22h. 8m. 26s. Epicentre 21°·3S. 178°·6W. N.1.
Depth of focus 0·075.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	—	158·4	21	e 18 59	[−53]	—	—	—	—

Oct. 2d. 15h. 29m. 27s. Epicentre 2°·1S. 81°·2W. N.1.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	78·4	47	12 15	+16	—	—	—	—

Oct. 25d. 23h. 28m. 16s. Epicentre 23°·5S. 66°·5W. N.1.
Depth of focus 0·030.

	Corr. for Focus	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	−4·0	84·0	40	12 10	+ 2	—	—	—	—

Nov. 20d. 23h. 21m. 38s. Epicentre 73°·3N. 70°·7W. N.1.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	43·0	103	7 51	− 6	—	—	—	—

Nov. 22d. 12h. 42m. 23s. Epicentre 5°·7S. 151°·8E. R.1.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	140·5	337	e 19 26	[+ 4]	—	—	—	—

Dec. 15d. 7h. 42m. 14s. Epicentre 56°·1N. 33°·9W. N.1.

	Δ	Az.	P.	O−C.	S.	O−C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Serra do Pilar	22·2	121	4 53	0	—	—	—	—

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