

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

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The International Seismological Summary. 1930 October, November, December.

FORMERLY THE BULLETIN OF THE
BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

There are 213 epicentres in this quarter, 59 of these are new and 154 are old epicentres. The quality of the material according to the new notation is as follows :—

N1=11	R1= 6	X=109
N2=14	R2=14	
N3=84	R3=25	

There are four earthquakes of abnormal focal depth :

	Date.	Epicentre.	Focal Depth
	d. h. m. s.	° °	Below Normal.
Nov.	8 3 22 39	3·5N. 122·5E.	+0·075
Dec.	13 14 22 53	42·8N. 142·4E.	+0·020
	21 14 51 32	20·4N. 122·2E.	+0·025
	23 23 55 8	43·1N. 143·4E.	+0·015

UNIVERSITY OBSERVATORY,
OXFORD.

1935 January 17.

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1930 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. 2h. 53m. 17s. Epicentre 17°-0N. 122°-0E. (as on 1927 Jan. 12d.). R.3.

A = -·507, B = +·811, C = +·292; D = +·848, E = +·530;
G = -·155, H = +·248, K = -·956.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	2·6	202	i 0 50	P _g	i 1 4	- 3	—	—
Tahoku	E. 8·1	357	1 52	- 3	(3 10)	-16	3·2	—
Hong Kong	9·1	307	2 1	- 8	3 50	- 1	4·5	6·3
Phu-Lien	15·1	287	3 35	+ 5	—	—	7·7	—
Koti	19·6	30	e 4 16	- 9	7 52	- 6	—	—
Sumoto	20·8	31	(e 4 32)	- 6	e 4 32	P	—	—
Kobe	21·2	31	e 4 45	+ 3	—	—	—	—
Osaka	21·4	32	4 37	- 7	(8 53)	+19	8·9	9·6
Toyooka	21·8	29	e 4 45	- 4	e 9 0	+18	—	—
Nagoya	22·5	33	e 4 55	- 1	—	—	—	—
Kumagaya	24·6	36	5 29	+13	10 2	+28	—	—
Hukushima	26·3	34	6 35	+63	—	—	—	—
Medan	26·5	242	i 4 39	-55	i 9 23	-44	—	—
Vladivostok	27·4	16	e 5 42	0	e 10 15	- 7	e 16·0	—
Batavia	27·6	214	e 6 47	+63	—	—	—	—
Mizusawa	E. 27·7	33	5 50	+ 6	10 13	-14	14·2	—
Irkutsk	38·0	342	e 7 11	- 4	e 12 54	-12	18·7	23·6
Almata	46·2	315	e 7 43	-39	—	—	—	—
Bombay	46·7	280	7 57	-29	15 15	+ 1	25·0	—
Andijan	48·7	310	e 9 0	+19	—	—	—	—
Tashkent	51·1	311	e 8 11	-49	15 13	-63	e 23·7	28·2
Samarkand	52·5	309	e 9 9	- 1	—	—	—	—
Ekaterinburg	60·2	327	e 9 59	- 7	18 8	-11	27·7	32·9
Baku	65·6	309	e 11 4	(-11)	e 19 27	0	30·7	39·7
Pulkovo	76·3	330	e 11 50	+ 2	e 21 24	-11	41·7	48·2
Helsingfors	N. 78·8	330	—	—	e 22 9	+ 6	e 42·7	—
De Bilt	92·0	328	—	—	e 24 19	+ 4	e 45·7	50·6
Rocca di Papa	92·4	316	e 7 1	?	—	—	1 55·5	56·2
Florence	92·5	317	23 43	SKS	(23 43)	[- 4]	50·7	73·7

Additional readings:—

Koti e = +4m.37s.

Toyooka iP = +4m.52s.

Baku SSS = +27m.31s.

Helsingfors eE = +21m.8s.

Florence S = +31m.43s.

Long waves were also recorded at other European stations.

Oct. 1d. Readings also at 2h. (Ekaterinburg, Ksara, Tashkent, near Almata, Andijan, and near Nagoya), 10h. (near Batavia and Malabar), 11h. (near Tashkent), 12h. (Andijan and near Samarkand), 13h. (Manzanillo and Tacubaya), 14h. (Berkeley, Victoria, Florissant, La Paz, Sucre, Scoresby Sund, Strasbourg, Uccle, Paris, De Bilt, Kew, Stuttgart, Copenhagen, Ekaterinburg, Baku, and Tashkent), 20h. (Strasbourg and Stuttgart).

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Oct. 2d. 0h. 41m. 30s. Epicentre 8°·0N. 136°·2E. N.3.

A = -·715, B = +·685, C = +·139; D = +·692, E = +·722;
G = -·100, H = +·096, K = -·990.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	16·4	295	i 3 46	0	i 7 42	+54	i 9·9	10·1
Hong Kong	25·6	306	6 38	+73	11 39	+108	15·7	20·0
Koti	25·7	355	e 6 5	+39	9 12	-41	—	—
Sumoto	26·4	358	e 4 47	-46	e 9 43	-22	—	—
Kumagaya	28·3	5	5 55	+5	12 23	L	(12·4)	—
Nagano	28·7	3	5 11	-42	10 23	-20	—	—
Melbourne	46·5	170	—	—	e 16 17	+65	27·1	30·0
Irkutsk	51·4	336	9 0	-2	16 18	-2	25·5	32·1
Bombay	62·3	289	11 2	(- 0)	20 22	(+14)	37·8	—
Tashkent	67·5	313	i 11 17	(- 6)	i 19 57	+6	e 36·5	45·9
Ekaterinburg	75·4	328	i 11 44	+1	21 26	+1	35·5	47·6
Baku	82·1	311	12 41	+22	i 22 58	+20	40·0	55·9
Victoria	90·9	40	22 16	?	—	—	39·9	45·6
Pulkovo	91·0	331	13 1	-1	23 56	-9	48·5	57·9
Scoresby Sund	100·1	354	—	—	24 42	[+16]	60·5	—
Copenhagen	101·3	332	18 30?	?	24 30	[-2]	48·5	—
Potsdam	102·7	329	—	—	e 24 30?	[-9]	e 54·5	63·5
De Bilt	106·9	332	e 18 44	[+36]	e 27 59	PS	e 53·5	—
Stuttgart	106·9	329	e 18 40	[+32]	e 24 50	[-8]	e 59·5	—
Strasbourg	107·7	329	e 18 51	[+41]	e 28 12	PS	e 58·5	—
Uccle	108·1	331	e 18 30?	[+19]	e 24 30?	[-34]	e 54·5	—
Florence	108·3	322	24 57	SKS	(24 57)	[-8]	—	67·0
Paris	110·2	330	e 19 9	PP	—	—	67·5	69·5
La Paz	154·7	112	e 19 54	[+6]	—	—	70·8	77·9

Additional readings :-

Hong Kong PP = +7m.22s.

Pulkovo SKS = +23m.32s.

De Bilt eEN = +34m.9s.

Long waves were also recorded at Adelaide, Riverview, Wellington, Phu-Lien, Vladivostok, Ivigtut, and other European stations.

Oct. 2d. 10h. 1m. 18s. Epicentre 42°·3N. 142°·4E. N.2.

A = -·586, B = +·451, C = +·673; D = +·610, E = +·792;
G = -·533, H = +·410, K = -·740.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Urakawa	0·3	118	0 11	P _r	0 18	S _r	—	—
Muroran	1·1	272	0 19	+3	0 35	S _r *	—	—
Sapporo	1·2	312	0 26	P _r	0 44	S _r	—	—
Aomori	1·9	219	0 29	+1	0 48	-1	—	—
Akita	3·1	214	0 45	+1	1 17	-3	—	—
Mizusawa	3·3	198	0 49	+2	1 27	+2	—	—
Sendai	4·2	198	0 57	-3	1 52	+4	—	—
Ootomari	4·4	2	1 23	P*	—	—	2·3	—
Tyosi	6·6	191	e 1 32	-2	e 2 36	-12	e 3·2	—
Tokyo	6·9	199	i 1 38	0	2 48	-8	—	—
Numadu	7·7	203	1 56	+7	3 38	+22	—	—
Vladivostok	7·8	280	2 0	+9	(i 3 36)	+17	i 3·6	—
Nagoya	8·3	213	e 2 4	+6	—	—	—	—
Osaka	9·3	218	e 2 20	+9	—	—	4·6	5·4
Kobe	9·5	219	e 2 34	+20	e 4 11	+10	—	—
Irkutsk	27·3	305	5 43	+2	e 10 18	-2	14·7	—
Ekaterinburg	51·6	318	19 3	0	16 24	+1	23·7	34·2
Tashkent	52·8	297	19 44	+32	i 17 6	+27	26·3	32·9
Pulkovo	63·8	330	e 10 31	0	e 19 53	+48	33·7	41·0
Heisingfors	E. 65·5	331	e 10 37	-5	—	—	—	—
Baku	65·7	305	e 10 44	+1	e 19 43	+14	33·4	42·8
Copenhagen	73·3	334	—	—	21 24	PS	40·7	—

Baku gives e = +19m.56s. = PS + 16s.

Long waves were also recorded at several other European stations.

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Oct. 2d. 15h. 33m. 12s. Epicentre 35°·8N. 52°·1E. N.3.

A = +·498, B = +·640, C = +·585; D = +·789, E = -·614;
G = +·359, H = +·462, K = -·811.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	4·9	340	e 1 9	- 1	i 2 13	+ 8	—	—
Samarkand	12·4	67	e 2 58	+ 4	e 6 19	L	(e 6·3)	—
Ksara	13·4	267	3 12	+ 5	6 6	+29	7·0	—
Tashkent	14·5	62	3 13	- 9	i 6 21	+18	e 6·6	11·7
Theodosia	15·7	311	3 37	- 1	6 37	+ 6	9·8	—
Yalta	16·2	308	e 3 42	- 2	6 52	+ 9	—	—
Andijan	16·6	66	e 3 48	- 1	e 7 43	+51	9·7	—
Helwan	18·4	257	4 6	- 5	7 41	+ 8	—	12·5
Almata	20·5	60	e 4 48	+13	—	—	—	—
Ekaterinburg	21·8	13	4 44	- 5	8 45	+ 3	12·8	15·5
Dehra Dun	22·3	97	5 58	+64	8 48	- 4	11·3	15·8
Bombay	24·9	127	5 19	0	9 55	+16	12·9	17·1
Belgrade	25·6	300	—	—	e 10 3	+12	e 12·0	—
Budapest	27·0	309	e 5 48?	+10	10 48?	+33	e 15·3	—
Pulkovo	27·8	336	5 46	+ 1	10 33	+ 5	16·8	19·3
Hyderabad	29·7	121	—	—	10 58	- 1	15·1	16·8
Helsingfors	29·9	333	—	—	e 11 27	+24	e 17·8	—
Cheb	31·9	310	—	—	e 11 48?	+14	e 18·8	20·8
Florence	32·0	297	6 48?	+25	11 48?	+13	13·8	15·8
Potsdam	32·0	315	—	—	e 11 48?	+13	—	21·8
Lund	33·0	320	—	—	11 54	+ 3	20·8	—
Copenhagen	33·4	320	—	—	12 1	+ 4	20·8	—
Stuttgart	33·8	309	—	—	e 11 53	-10	e 18·3	—
Hamburg	34·1	316	e 7 48?	PP	—	—	e 21·1	23·8
Kodaikanal	34·4	133	13 42	SS	—	—	—	—
Strasbourg	34·7	308	e 1 48?	?	—	—	—	—
De Bilt	36·7	312	—	—	e 12 56	+ 9	e 18·8	23·8
Colombo	38·5	134	15 38	SS	—	—	—	24·1
Irkutsk	39·9	49	e 9 5	PP	e 13 35	0	21·8	24·9
Kew	40·0	312	e 7 30	- 2	—	—	19·8	—
Toledo	43·8	293	—	—	e 17 10	SS	—	—
Scoresby Sund	51·3	337	—	—	16 24	+ 5	26·8	—

Additional readings:—

Belgrade e = +9m.22s.
Stuttgart e = +14m.38s.
Irkutsk e = +16m.34s.

Long waves were also recorded at Hong Kong and several other European stations.

Oct. 2d. Readings also at 3h. (Port au Prince), 4h. (La Paz and Port au Prince), 5h. (Port au Prince, near Batavia, and Malabar), 7h. (Adelaide, Melbourne, Riverview, Christchurch, Wellington, Mizusawa, Baku, and Irkutsk), 8h. (Pulkovo), 10h. (near Andijan and Samarkand), 11h. (La Paz and Victoria), 12h. (near Sumoto), 15h. and 16h. (near La Paz), 17h. (St. Louis), 21h. (Almata, Samarkand, and near Andijan), 23h. (La Paz).

Oct. 3d. 18h. 9m. 10s. Epicentre 2°·0N. 135°·5E. N.3.

A = -·713, B = +·700, C = +·035; D = +·701, E = +·713;
G = -·025, H = +·024, K = -·999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	9·2	232	12 13	+ 3	13 17	-37	—	—
Manila	19·1	312	14 23	+ 3	18 7	SS	—	—
Hong Kong	29·0	316	6 9	+13	11 0	+12	—	13·7
Adelaide	37·1	176	e 8 56	+109	1 14 48	+115	18·2	20·8
Sydney	38·8	160	e 15 8	SS	e 20 8	L	24·0	26·3

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Melbourne	40.7	169	—	—	e 13 12	-35	22.8	25.1
Wellington	56.1	145	—	—	e 16 50?	-34	30.8	33.8
Irkutsk	56.6	339	9 47	+ 7	17 39	+ 8	26.8	36.5
Almata	66.2	318	e 10 47	0	—	—	—	—
Andijan	68.6	314	e 11 8	+ 6	e 20 1	- 3	—	—
Tashkent	71.0	315	1 11 9	- 8	20 22	-11	—	42.1
Samarkand	72.3	313	e 11 24	- 1	—	—	—	—
Ekaterinburg	80.1	329	12 5	- 3	22 13	- 4	33.8	42.7
Pulkovo	95.8	331	—	—	e 25 8	+19	55.8	—
De Bilt	111.7	330	—	—	e 28 50	PS	e 59.8	—
Strasbourg	112.3	325	e 19 20	PP	—	—	64.8	—
Rocca di Papa	112.4	318	—	—	e 30 17	?	e 41.1	49.0
Uccle	112.9	329	—	—	e 28 50?	PS	e 60.8	—
La Paz	152.4	123	e 19 55	[+10]	—	—	—	—

Additional readings :—

Hong Kong e = +7m.0s., S = +9m.40s.

Melbourne e = +17m.26s. = S_cS - 20s.

Strasbourg ePS = +30m.7s.

Long waves were also recorded at Scoresby Sund and other European stations.

Oct. 3d. Readings also at 1h. (Baku, Ekaterinburg, Pulkovo, and Scoresby Sund), 3h. (Samarkand), 7h. (near Algiers), 10h. (near Tacubaya), 11h. (Ekaterinburg, Tashkent, and near Taihoku), 12h. (Irkutsk), 15h. (near Mizusawa and near Tyosil), 16h. (Alicante), 20h. (Uccle), 23h. (De Bilt, Uccle, Paris, Strasbourg, Stuttgart, Edinburgh, Kew, Oxford, Stonyhurst, Florence, Almeria, Granada, and Scoresby Sund).

Oct. 4d. Readings at 0h. (Copenhagen, Pulkovo, and Tashkent), 2h. (near La Paz), 3h. (near Sumoto), 5h. (Granada), 6h. (Baku, Ekaterinburg, Irkutsk, Tashkent, Kew, De Bilt, Paris, and Tananarive), 7h. (Samarkand, near Almata, and Andijan), 17h. (near Berkeley, near Bagnères, and Tortosa), 19h. (Bombay), 20h. (Tyosil).

Oct. 5d. 12h. 4m. 20s. Epicentre 35°·5N. 140°·0E. (as on 1930 June 23d.). X.

Tokyo gives 35°33'·8N. 140°2'·7E. 80Km. deep.

A = -·624; B = +·523; C = +·581.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Tokyo	0.3	312	0 5	+ 1	—	—	—	—
Tukuba	0.7	11	0 2	- 8	—	—	—	—
Tyosil	0.7	72	e 0 8	- 2	0 19	+ 1	0.4	—
Nagoya	2.5	262	e 0 47	P*	—	—	—	—

No additional readings.

Oct. 5d. 18h. 37m. 6s. Epicentre 18°·0S. 170°·1E. (as on 1920 Aug. 29d.). X.

A = -·937, B = +·164, C = -·309; D = +·172, E = +·985;

G = +·304, H = -·053, K = -·951.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Suva	7.9	92	1 54	+ 2	3 42	+21	3.9	—
Sydney	23.2	223	e 3 30	-93	19 30	+22	12.4	13.9
Wellington	23.7	171	4 31	-36	8 21	-57	10.6	11.4
Christchurch	25.6	176	—	—	9 42	- 9	—	12.0
Melbourne	29.6	223	e 6 7?	+ 6	11 4	+ 6	14.3	17.1
Adelaide	32.7	233	—	—	11 24?	-22	14.2	—
Irkutsk	90.4	326	—	—	e 24 54?	PS	e 46.9	—
Tashkent	109.7	309	e 18 54?	[+37]	e 29 5	PS	e 45.2	61.2
Ekaterinburg	115.6	325	—	—	e 36 37	SSS	48.9	67.4
Pulkovo	129.2	335	e 22 42	?	e 33 36	?	62.9	74.7
Stuttgart	z. 145.6	338	e 19 54	[+19]	—	—	e 81.9	—

Additional readings :—

Tashkent e = +35m.6s. = SS + 51.

Long waves were also recorded at Berkeley, Victoria, and other European stations.

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Oct. 5d. Readings also at 0h. (Andijan and Samarkand), 2h. (Adelaide, Melbourne, Riverview, Ekaterinburg, Irkutsk, and Tashkent), 3h. (Florence), 5h. (Bombay), 6h. (Messina), 8h. (La Paz (2), Almata, Ekaterinburg, Tashkent, near Andijan and Samarkand), 10h. (near Sumoto), 14h. (near Florissant and St. Louis), 18h. (near Mizusawa and Tyosi), 22h. (near La Paz).

Oct. 6d. 18h. 8m. 18s. Epicentre 37°-0N. 58°-5E. (as on 1929 July 13d.). X.
 $A = +.417$, $B = +.681$, $C = +.602$; $D = +.853$, $E = -.522$;
 $G = +.314$, $H = +.513$, $K = -.799$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand	7.2	66	e 1 36	- 6	—	—	10.7	15.0
Baku	7.5	300	e 0 58	-48	—	—	6.1	7.2
Tashkent	9.4	59	i 2 29	+16	e 4 12	+13	5.5	—
Andijan	11.4	66	e 2 40	0	e 4 33	-15	—	8.0
Bombay	22.0	141	e 4 46	- 5	—	—	—	—

Additional readings:—

Baku e = +6m.29s.

Tashkent i = +4m.19s.

Long waves appear to have been recorded at Taihoku.

Oct. 6d. Readings also at 0h. (Ksara and Tyosi), 1h. (Tyosi and near Oaxaca), 3h. (near Tyosi), 4h. (Irkutsk, Vladivostok, Tashkent, Pulkovo, and Melbourne), 5h. (Ekaterinburg, Granada, and La Paz), 9h. (near Medan and near Tacubaya), 10h. (Samarkand and Perth), 13h. (near Sumoto), 14h. and 15h. (Manila), 17h. (Andijan and Tyosi), 18h. (near Manila and near Tyosi), 20h. (Andijan, Tyosi, near Matuyama, Osaka, Sumoto, and Koti), 21h. (Ekaterinburg, Tashkent, Stuttgart, Granada, La Paz, and Rio de Janeiro), 22h. (Hong Kong, and near Taihoku).

Oct. 7d. 2h. 27m. 20s. Epicentre 25°-5N. 98°-5E. (as on 1930 Sept. 25d.). X.
 $- .133$, $B = +.893$, $C = +.431$; $D = +.989$, $E = +.148$;
 $G = -.064$, $H = +.426$, $K = -.903$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Phu-Lien	8.9	120	1 40 [†]	-26	—	—	—	8.8
Hong Kong	14.7	99	—	—	6 12	+ 4	17.9	8.8
Hyderabad	20.3	251	7 52	S	(7 52)	-20	—	14.7
Manila	23.7	113	i 5 12	+ 5	i 9 44	+26	—	—
Bombay	24.6	260	9 27	S	(9 27)	- 7	e 17.5	—
Almata	24.9	321	e 6 10	+51	—	—	—	—
Irkutsk	27.1	8	e 10 18	S	(e 10 18)	+ 1	14.4	15.6
Tashkent	28.8	311	—	—	e 10 8	-37	e 15.7	17.4
Samarkand	29.8	306	e 6 14	+11	—	—	—	—
Ekaterinburg	41.4	330	e 7 43	- 1	e 13 43	-14	19.7	23.1

Additional readings:—

Bombay S = +14m.7s.

Tashkent e = +12m.38s.

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

Oct. 7d. 20h. 53m. 6s. Epicentre 35°-8N. 52°-1E. (as on 2d.). R3.
 $A = +.498$, $B = +.640$, $C = +.585$; $D = +.789$, $E = -.614$;
 $G = +.359$, $H = +.462$, $K = -.811$.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	4.9	340	1 12	+ 2	12 14	+ 9	2.6	7.1
Samarkand	12.4	67	2 53	- 1	—	—	—	—
Ksara	13.4	267	3 6	- 1	6 59	+82	9.2	—
Tashkent	14.5	62	i 3 21	- 1	16 26	+23	8.2	10.1
Simferopol	16.4	309	e 3 56	+10	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sebastopol	16.6	309	e 4 8	+19	—	—	—	—
Andijan	16.6	66	e 3 53	+ 4	e 7 59	+67	10.1	—
Helwan	18.4	257	4 6	- 5	7 44	+11	—	—
Almata	20.5	60	e 4 42	+ 7	—	—	—	—
Ekaterinburg	21.8	13	i 4 48	- 1	i 8 50	+ 8	10.9	15.6
Bombay	24.9	127	5 19	0	e 9 52	+13	e 14.5	—
Pulkovo	27.8	336	e 5 39	- 6	e 10 29	+ 1	15.4	19.5
Hyderabad	29.7	121	—	—	13 3	?	16.5	17.1
Florence	32.0	297	e 10 53	?	i 11 22	-13	—	15.9
Copenhagen	33.4	320	—	—	11 54	- 3	18.9	—
Neuchatel	35.2	303	i 6 48	- 3	—	—	—	—
Irkutsk	39.9	49	e 7 33	+ 2	e 13 16	-19	18.9	—

Additional readings: Irkutsk e = +14m.24s. Long waves were also recorded at other European stations.

Oct. 7d. 23h. 27m. 15s. Epicentre 47°·4N. 10°·5E. N1.

(See Geophy. Supp. M.N.R.A.S., Vol. 3, No. 3, p. 138).

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.
Innsbruck	0.6	102	i 0 0	- 9	—	—	—	0.5
Ravensburg	0.7	302	i 0 10	0	i 0 21	+ 3	—	0.5
Chur	0.9	230	i 0 10	- 3	i 0 26	+ 3	—	—
Zurich	1.3	269	i 0 22	+ 4	i 0 42	+ 9	—	—
Hohenheim	1.6	327	i 0 22	- 1	i 0 47	+ 6	—	—
Stuttgart	1.6	328	i 0 23	0	i 0 36	- 5	—	—
Karlsruhe	2.1	319	0 33	+ 3	1 0	+ 6	—	1.7
Treviso	2.1	146	i 0 30	0	i 1 0	+ 6	—	1.1
Padova	2.2	155	i 0 28	- 3	e 0 56	- 1	—	—
Strasbourg	2.2	303	e 0 31	0	1 9	S _r	—	1.8
Neuchatel	2.4	261	e 0 35	+ 1	e 1 8	+ 6	—	—
Piacenza	2.4	194	0 41	+ 7	1 8	+ 6	1.3	1.8
Besançon	3.0	267	e 0 40	- 3	1 35	S _r *	—	—
Cheb	3.0	25	e 0 37	- 6	e 1 27	S _r *	—	1.5
Feldberg	3.1	334	(e 0 47)	+ 3	(i 1 23)	+ 3	(1.6)	(1.8)
Graz	3.4	94	e 0 43	- 6	e 1 23	- 4	—	1.7
Florence	3.6	171	i 0 56	+ 5	—	—	—	—
Jena	3.6	12	e 0 51	0	i 1 20	-13	e 1.7	2.0
Prague	3.7	43	e 0 54	+ 1	i 1 44	+ 9	e 2.0	3.0
Livorno	3.8	182	e 1 45	- 9	2 37	+60	—	—
Göttingen	4.1	356	i 0 57	- 1	e 2 4	+19	—	2.4
Vienna	4.1	76	0 56	- 2	1 41	- 4	—	2.5
Zagreb	4.1	111	e 0 57	- 1	i 1 38	- 7	2.0	2.2
Potsdam	5.2	17	i 1 37	P*	i 2 10	- 3	e 2.3	4.2
Uccle	5.2	313	e 1 12	- 2	e 2 45	S _r	—	—
Marselles	5.4	223	e 1 13	- 4	2 19	+ 1	—	—
Paris	5.5	288	e 1 27	P*	e 2 56	S _r	3.3	3.3
Rome	5.7	165	e 1 41	P*	2 31	S _r	e 4.5	—
Budapest	5.8	86	1 37	P*	2 55	S _r *	3.2	—
De Bilt	5.8	325	e 1 45	P*	—	—	3.2	4.1
Rocca di Papa	5.8	164	i 1 15	- 7	e 2 28	0	4.2	4.5
Hamburg	6.2	357	e 1 51	P*	i 3 7	S _r *	—	4.8
Mostar	6.6	125	i 3 1	?	i 3 41	S _r	—	3.8
Belgrade	7.4	107	—	—	e 3 13	+ 4	—	—
Kew	8.1	304	e 2 35	P*	e 4 8	S _r *	4.5	4.7

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Copenhagen	8.4	8	—	—	3 45?	+11	—	—
Lund	8.5	11	2 50	?	—	—	—	—
Oxford	8.8	305	—	—	13 39	- 5	4.7	5.3
Tortosa	N. 9.7	231	e 2 18	+ 1	e 5 0	S*	5.4	5.7
Königsberg	9.8	36	—	—	e 4 20	+12	e 5.4	8.2
Uppsala	13.1	16	—	—	5 45?	+16	—	—
Pulkovo	17.0	36	3 54	0	e 7 6	+ 4	9.2	10.7

Additional readings and note :-

Ravensburg $i = +12s.$
 Zurich $i = +20s.$
 Hohenheim $iP_s = +25s., i = +28s.$
 Stuttgart $iP_s = +25s., i = +29s., +31s., +33s.,$ and $+41s., iSN^* = +48s.$
 Strasbourg $iP_s = +36s.$
 Neuchatel $iP_s = +41s. = P_s, eS_s = +1m.16s.$
 Besançon $iN = +55s. = P^*.$
 Cheb $e = +46s.$ and $+49s.$
 Feldberg $(+50s.) (+52s.) (+54s.) (+59s.) (+1m.2s.) (+1m.7s.)$ and $(+1m.13s.)$
 readings have been *increased* by 20m.
 Graz $iP_s = +50s.$
 Florence $P_s = +1m.20s.$
 Jena $iZ = +53s., iP_sNZ = +1m.1s. = P^*, iP_sE = +1m.3s., iE = +1m.7s.$
 Prague $iP_s = +1m.1s.$
 Göttingen $iP_s = +1m.14s. = P^*.$
 Vienna $P^* +1m.4s., P_s = +1m.10s., iPP = +1m.12s., PP = +1m.15s., d? = +1m.29s., PSZ = +1m.37s., SS = +2m.8s.$
 Zagreb $eNE = +1m.1s., eNW = +1m.3s., i = +1m.12s.,$ and $+1m.15s., iNW = +1m.28s., iNE = +1m.31s., i = +1m.53s.$
 Potsdam $iEN = +1m.45s., +1m.48s., +1m.55s.,$ and $+2m.0s.$
 Uccle $i = +2m.50s.$
 Marseilles $SS = +2m.58s.$
 Paris $ePP = +2m.28s.$
 Hamburg $e = +1m.59s., iE = +3m.13s.$
 Mostar $iP_s = +3m.9s., i = +3m.21s., iPPS = +3m.31s.$
 Belgrade $e = +2m.57s., +3m.52s.,$ and $+4m.9s.$
 Kew $eZ = +3m.57s., eN = +4m.13s.$
 Long waves were also recorded at Helsingfors, Tashkent, and Stonyhurst.

Oct. 7d. Readings also at 0h. (La Paz and near Lick (3), 1h. (Lick, Nagoya, near Kobe, Osaka, and Sumoto), 4h. (Nagoya, near Mizusawa, and Tyos), 5h. (Samarkand), 7h. (Wellington and near Manila), 8h. (near La Paz), 9h. (near Rome and Rocca di Papa), 19h. (Mizusawa), 21h. (near Andijan), 22h. (near Andijan and near La Paz).

Oct. 8d. 0h. 28m. 48s. Epicentre $47^{\circ}4N. 10^{\circ}5E.$ (as on 7d.).

X.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Innsbruck	0.6	102	e 0 0	- 9	—	—	—	—
Ravensburg	N. 0.7	302	e 0 13	+ 3	10 22	+ 2	10.4	—
Chur	0.9	230	10 12	- 1	10 26	+ 3	—	—
Zurich	1.3	269	10 19	+ 1	10 40	+ 7	—	—
Hohenheim	1.6	327	e 0 24	+ 1	e 0 40	- 1	10.8	—
Stuttgart	1.6	328	e 0 25	+ 2	—	—	10.8	—
Strasbourg	2.2	303	e 0 37	+ 6	—	—	11.1	—
Neuchatel	N. 2.4	261	e 0 34	0	e 1 6	+ 4	—	—
Cheb	3.0	2.5	—	—	e 1 26	+ 9	—	1.5

Additional readings :-

Hohenheim $i = +27s., eN = +32s.$
 Neuchatel $eP_s = +40s., eS_s = +1m.13s.$

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Oct. 8d. 10h. 19m. 21s. Epicentre 13°5S. 169°0E. N.1.

A = - .954, B = + .186, C = - .233 ; D = + .191, E = + .982 ;
G = + .229, H = - .045, K = - .972.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	Δ	\circ	m. s.	s.	m. s.	s.	m.	m.
Suva	10.2	118	2 27	+ 3	3 27	-51	—	—
Riverview	26.0	215	15 27	- 2	i 10 1	+ 3	12.9	15.8
Sydney	26.0	215	i 5 33	+ 4	i 10 15	+17	13.1	14.6
Wellington	28.3	171	e 6 5	+15	10 25	-12	12.0	13.2
Christchurch	30.2	176	e 6 57	PP	11 21	+14	14.0	17.7
Melbourne	32.4	219	6 22	- 4	11 41	0	15.8	16.8
Adelaide	34.8	228	i 6 47	0	i 12 11	- 7	i 15.3	21.2
Palau	39.8	300	7 38	+ 8	—	—	—	—
Amboina	41.4	280	17 44	+ 0	—	—	22.6	—
Honolulu T.H.	47.7	43	i 8 35	+ 1	i 15 38	+ 9	21.4	—
Titizima	48.3	329	8 35	- 3	15 39	+ 2	—	—
Manila	55.2	300	9 30	0	i 17 25	+13	27.4	35.3
Tyosi	55.9	334	e 9 37	+ 2	e 18 29	+68	e 22.7	—
Nagoya	57.3	330	e 9 47	+ 2	18 12	+32	—	—
Osaka	57.7	328	9 44	- 4	13 44	?	16.5	20.0
Sumoto	57.7	329	9 47	- 1	17 53	+ 7	e 24.3	25.3
Isigakizima	57.8	312	9 43	- 6	17 50	+ 3	—	—
Kobe	57.9	328	i 9 49	- 1	e 17 46	- 2	e 24.9	25.4
Koti	57.9	327	9 49	- 1	17 50	+ 2	—	—
Sendai	58.1	336	9 50	- 1	17 56	+ 5	—	—
Mizusawa	58.7	337	9 56	+ 1	18 3	+ 4	24.1	—
Toyooka	58.7	329	i 6 55	?	—	—	e 25.6	—
Nagasaki	59.4	323	9 59	- 1	—	—	—	—
Akita	59.7	336	10 6	+ 4	18 14	+ 2	—	—
Taihoku	E. 60.1	311	e 10 16	+11	—	—	—	—
Batavia	61.5	273	10 16	+ 1	—	—	37.6	—
Zi-ka-wei	63.8	318	i 10 31	0	18 59	- 6	30.3	33.2
Hong Kong	64.5	304	10 35	0	i 19 19	+ 5	—	28.5
Otomari	64.6	341	e 9 25	-71	e 18 6	-69	e 25.6	—
Vladivostok	65.9	332	10 44	- 1	i 19 45	+14	e 31.1	—
Phu-Lien	70.2	299	e 11 10	- 2	20 9	-15	30.6	—
Medan	71.8	279	(11 15)	- 7	(21 23)	+40	(39.6)	—
Ohlufeng	E. 72.6	321	11 36	+10	—	—	—	—
Berkeley	82.2	48	i 12 23	+ 4	e 23 20	PS	e 37.0	43.0
Lick	82.5	48	e 12 25	+ 4	e 22 45	+ 3	e 37.1	—
Sitka	84.1	27	12 44	+15	22 59	0	35.1	—
Victoria	85.9	38	12 44	+ 6	23 10	- 7	38.8	44.4
Irkutsk	86.0	327	12 37	- 1	23 3	[- 3]	40.6	46.3
Caloutta	E. 86.7	295	14 16	?	24 29	PS	34.6	—
Tucson	89.0	56	e 13 0	+ 7	e 24 27	PS	e 39.8	—
Colombo	90.8	277	12 28	-33	23 28	[- 9]	39.2	53.9
Kodakanal	93.8	280	23 3	S	(23 3)	[-51]	i 52.9	58.9
Hyderabad	94.5	288	13 21	+ 3	23 48	[-10]	44.6	51.8
Bombay	100.0	288	14 5	+21	24 23	[- 3]	44.6	69.6
Almata	100.7	314	e 15 39	?	—	—	—	—
Andijan	103.7	310	e 14 45	+44	—	—	41.9	—
Tashkent	106.1	311	e 14 6	- 6	25 39	{ 0 }	42.6	57.6
Florissant	106.7	52	e 14 20	+ 5	i 25 53	{ +10 }	—	51.6
St. Louis	106.8	52	—	—	e 26 27	?	e 49.2	54.1
Samarkand	107.7	310	e 18 9	[- 1]	—	—	—	—
Chicago	108.9	50	—	—	e 26 10	{ +11 }	50.3	—
Ekatereburg	111.2	326	e 14 36	0	e 26 49	{ +34 }	45.6	58.8
Ann Arbor	111.8	48	—	—	i 28 51	PS	e 52.0	62.1
Tananarive	113.9	243	—	—	27 16	?	53.2	58.2
Toronto	114.9	46	e 18 25	[- 8]	e 29 10	PS	e 54.1	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Charlottesville	115-9	52	—	—	e 29 23	PS	40-6	—
La Paz	116-1	115	18 53	[+18]	i 26 56	{+ 6}	59-0	68-0
Georgetown	117-0	51	e 15 3	- 2	i 25 37	{- 4}	e 53-6	—
Ottawa	117-3	44	e 19 57	PP	e 26 24	{-34}	e 50-6	—
Sucre	117-5	120	18 51	[+11]	—	—	—	—
Fordham	119-3	50	e 20 12	PP	e 31 52	?	54-4	—
Baku	120-7	310	—	—	i 27 23	{+ 2}	—	—
Harvard	121-0	47	i 20 20	PP	—	—	156-6	—
Scoresby Sund	122-6	4	22 39?	PPP	—	—	46-6	—
Pulkovo	124-7	337	e 17 46	[-70]	—	—	52-6	71-3
Ivigtut	125-3	20	20 52	PP	31 57	?	52-6	—
Helsingfors	126-4	339	—	—	e 26 26	[+17]	e 55-6	—
Upsala	129-1	342	e 21 25	PP	—	—	e 56-6	75-2
Bergen	131-6	350	e 20 16	?	—	—	e 66-6	—
Königsberg	131-9	336	—	—	i 22 43	PKS	e 57-6	—
Rio de Janeiro	131-9	138	e 21 39	PP	e 33 28	?	e 57-5	—
Ksara	E. 133-0	304	20 20	?	—	—	65-9	—
Lund	133-8	340	21 39?	PP	—	—	58-6	—
Copenhagen	134-1	341	19 15	[+ 2]	—	—	58-6	—
Hamburg	136-6	342	e 19 21	[+ 4]	—	—	e 58-9	67-6
Potsdam	136-6	339	e 21 45	PP	—	—	e 60-6	75-6
Budapest	137-8	330	22 14	PP	—	—	61-6	69-6
Prague	137-9	336	e 15 39?	?	—	—	e 58-6	62-6
Jena	138-3	339	e 22 3	PP	—	—	e 60-6	69-2
Göttingen	138-4	341	e 22 39?	PP	—	—	e 66-6	79-6
Cheb	138-7	337	—	—	e 34 39	?	—	76-6
De Bilt	139-3	345	e 22 39	PP	—	—	e 59-6	75-4
Zagreb	140-4	330	e 18 39?	[-43]	—	—	e 63-6	e 70-6
Stuttgart	141-0	340	e 19 29	[+ 6]	—	—	e 62-6	—
Kew	141-1	350	—	—	e 46 39?	SSS	e 62-6	83-1
Strasbourg	141-6	340	i 19 27	[+ 3]	—	—	e 94-6	—
Treviso	142-3	334	i 19 33	[+ 8]	28 29	?	73-6	—
Padova	142-7	334	e 18 58	[-28]	i 22 55	PP	—	—
Paris	142-9	346	e 19 39?	[+12]	—	—	69-6	78-6
Neuchatel	143-3	340	e 19 30	[+ 2]	—	—	—	—
Piacenza	143-9	335	19 39	[+ 8]	—	—	—	79-1
Florence	144-2	331	19 39	[+ 7]	—	—	41-3	82-2
Trenta	144-7	322	19 24	[- 9]	—	—	—	—
Naples	144-9	326	e 19 19	[-15]	e 21 33	?	—	—
Rocca di Papa	N. 145-0	329	i 19 35	[+ 1]	i 32 14	?	e 71-7	91-5
Rome	145-0	329	i 20 41	[+67]	—	—	—	—
Messina	145-9	321	20 44	[+68]	—	—	—	—
Catania	146-6	320	19 35	[- 2]	—	—	e 80-2	87-4
Toledo	152-9	348	e 19 56	[+10]	—	—	e 70-7	86-4
Algiers	153-5	334	e 20 7	PKP	34 39	SKSP	73-6	88-6
Alicante	153-5	341	e 19 59	[+13]	—	—	e 74-5	—
Almeria	155-4	343	i 19 52	[+ 4]	—	—	75-1	83-6
Granada	155-4	346	i 19 54	[+ 6]	30 34	{-19}	e 71-6	84-8
Malaga	156-0	347	19 54	[+ 5]	e 35 51	?	e 52-1	—

Additional readings and note :-

Riverview i = +5m.32s., iPP = +6m.2s., iPPP = +6m.16s., iSS = +11m.15s., iSSS = +11m.38s., iSSSS = +11m.50s.

Christchurch IPS? = +12m.18s. = SS - 17s.

Melbourne PP = +7m.28s., SS = +13m.59s.

Adelaide iPPP = +8m.1s., iS = +12m.25s., i = +12m.31s., iSS = +14m.17s., iSSS = +14m.49s.

Ambolna i = +9m.26s. = PP + 12s.

Honolulu T.H. PP = +10m.9s., iPPP = +11m.3s., SS = +17m.27s., iSSS = +19m.39s.

Batavia iP = +10m.23s.

Zi-ka-wai PPZ = +12m.51s., iZ = +15m.27s. and +16m.45s., PSZ = +19m.21s., SSZ = +23m.33s.

Hong Kong S = +15m.40s.

Medan readings have been increased by 6m.

Continued on next page.

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Berkeley eE = +12m.55s., eN = +13m.22s., ePP = +15m.34s., eN = +16m.4s., ePPE = +17m.36s., eN = +17m.40s., ePPPP = +18m.57s., eSZ = +23m.28s., IS = +23m.30s., eSE = +23m.42s., eSSN = +27m.53s., eSSSN = +32m.55s., eSSSN = +35m.9s.
 Lick eN = +13m.4s., eE = +15m.10s., PP = -15s., and +15m.40s., ePPN = +16m.0s., eE = +16m.8s., ePPPN = +16m.55s., eSN = +22m.53s., eN = +24m.51s.
 Sitka eSS = +28m.15s.
 Irkutsk PP = +16m.15s.
 Tucson eSKS = +23m.28s., e = +27m.48s., eSS = +29m.57s.
 Tashkent iPP = +18m.2s., SKS = +24m.51s.
 Florissant iPZ = +17m.58s. = PKP - 9s., iPPZ = +18m.43s., iN = +26m.22s., PSNZ = +27m.59s., eSSN = +33m.8s.
 St. Louis ePPE = +18m.44s., eE = +27m.39s., ePSE = +28m.2s.
 Chicago iPP = +18m.57s., SKS = +25m.6s., eS = +26m.40s., iPS = +28m.20s., eSS = +33m.14s.
 Ekaterinburg PP = +19m.1s., eSKS = +25m.9s., iPS = +28m.41s.
 Ann Arbor ePP = +19m.21s., eN = +27m.15s., eSSE = +35m.3s., eSSN = +35m.45s.; T₀ = 10h.19m.18s.
 Tananarive PS = +29m.22s., SS = +35m.52s.
 Toronto eP? = +15m.56s., eE = +18m.54s., I = +35m.25s. = SS + 1s.
 Charlottesville e = +35m.57s. = SS + 19s. and +39m.39s. = SSS - 8s.
 La Paz PPN = +21m.13s., iN = +29m.49s., iPSN = +31m.37s., PPS = +32m.51s., iN = +35m.59s.
 Georgetown i = +19m.27s., iPP = +19m.53s., iPS = +29m.40s., iSS = +36m.4s.
 Ottawa eE = +29m.31s. = PS - 6s., I = +35m.55s. = SS - 1s.
 Fordham ePN = +20m.38s., ePPP = +26m.52s.
 Baku ePP = +20m.17s., iPS = +30m.4s., iPPS = +31m.40s.
 Harvard ePP = +21m.17s., ePPS = +31m.48s., eSS = +36m.24s., eSSS = +41m.9s., eSSS = +46m.9s.
 Pulkovo PP = +20m.34s., PPS = +30m.43s., SS = +37m.27s., SSS = +41m.15s.
 Helsingfors ePPN = +21m.4s., ePPE = +21m.36s., eN = +22m.14s., and +29m.44s., ePSE = +31m.2s., eEN = +33m.21s., eN = +36m.17s., eSSSN = +42m.17s., eSSSE = +42m.35s.
 Upsala iN = +22m.28s.
 Rio de Janeiro eSE = +33m.26s.
 Ksara PPE = +22m.52s., PPE = +24m.22s., PSE = +31m.58s., SSE = +38m.54s.
 Copenhagen +22m.3s. = PP + 19s.
 Hamburg eZ = +22m.5s. = PP + 5s.
 Potsdam eE = +22m.39s., eN = +24m.3s., eE = +39m.33s. = SS - 28s., eN = +39m.51s. = SS - 10s.
 Zagreb ePKP = +22m.27s. = PP + 3s., ePP = +23m.8s. = PKS - 2s.
 Stuttgart e = +22m.27s. = PP - 1s., iN = +23m.19s. = PKS + 8s., e = +25m.15s. = PPP - 11s., eEN = +40m.57s. = SS + 3s.
 Kew e = +53m.17s.
 Strasbourg iPP = +22m.31s.
 Almeria PP = +23m.6s., PPP = +25m.30s.
 Granada PP = +20m.53s., SPP? = +24m.2s., i = +26m.29s., PPP = +27m.18s., and +32m.51s., PPS = +36m.50s.
 Long waves were also recorded at La Plata and a few other European stations.

Oct. 8d. Readings also at 3h. (Andijan and Samarkand), 4h. (Ootomari), 15h. (near Lick), 16h. (Taihoku), 19h. (Adelaide, Melbourne, Riverview, Sydney, Suva, Wellington, Honolulu T.H., Vladivostok, Irkutsk, Ekaterinburg, Tashkent, and near Mizusawa), 20h. (Baku, Pulkovo, Florence, Granada, and Scoresby Sund), 21h. (near Sumoto).

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Oct. 9d. 4h. 33m. 40s. (I) } Epicentre 39°·3N. 18°·0E. X.
 4h. 51m. 36s. (II) } (as on 1929 Jan. 17d.). X.

A = +·736, B = +·239, C = +·633; D = +·309, E = -·951;
 G = +·602, H = +·196, K = -·774.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Trenta	1·2	269	(0 20)	+ 3	(0 50)	+19	—	—
II	1·2	269	0 4	-13	—	—	—	—
I Messina	2·2	240	0 23	- 8	—	—	—	—
II	2·2	240	0 37	+ 6	—	—	—	—
I Catania	2·9	232	e 0 39	- 2	1 9	- 5	e 1·4	1·8
II	2·9	232	e 1 7	S	(e 1 7)	- 7	1·8	2·2
I Mineo	3·3	232	(0 48)	+ 1	—	—	—	—
I Naples	3·3	298	e 0 47	0	e 1 35	+10	—	2·4
II	3·3	298	e 1 12	S	(e 1 12)	-13	(e 2·0)	3·3
I Casamicciola	3·5	297	0 54	+ 4	1 30	0	—	2·4
II	3·5	297	0 48	- 2	1 24	- 6	—	1·9
I Rocca di Papa	4·7	303	1 9	+ 2	—	—	i 2·8	3·4
II	4·7	303	e 1 36	P _r	—	—	e 3·0	3·8
I Rome	4·9	304	e 0 46	-24	2 15	+10	—	—
II	4·9	304	e 1 41	P _r	2 22	+17	—	4·1
I Zagreb	6·7	348	e 2 17	S	(e 2 17)	-34	e 3·8	3·9
II	6·7	348	e 2 39	S	(e 2 39)	-12	e 4·1	4·4
I Florence	6·8	314	2 43	S	(2 43)	-10	—	3·8
I Piacenza	8·4	316	—	—	e 3 40	+ 6	—	6·0
II	8·4	316	e 2 36	+37	—	—	—	6·2

Additional readings and notes:—

Trenta readings for shock I have been increased by 1m.

Mineo reading has been increased by 2m.

Naples gives S as P and L as S for shock II

Zagreb, shock I iNW = +2m.50s., eS = +3m.45s. = S_r; shock II e = +3m.40s.,

eSNE = +3m.48s. = S_r.

Zurich ($\Delta = 10^{\circ}6$, Az. = 323°) gives e = 4h.30m.0s.

Long waves were also recorded for shock I at Budapest, Vienna, and Stuttgart, and for shock II at Belgrade, Budapest, Florence, Strasbourg, and Stuttgart.

Oct. 9d. 21h. 30m. 30s. Epicentre 21°·0N. 60°·0E. N3.

A = +·467, B = +·809, C = +·358; D = +·866, E = -·500;
 G = +·179, H = +·310, K = -·934.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Bombay	12·2	97	4 53	S	(4 53)	-15	12·2	12·7
Agra	17·6	66	—	—	e 7 28	+13	e 8·9	9·8
Dehra Dun	18·7	56	9 0	?	10 10	?	11·3	12·5
Samarkand	19·6	16	e 4 25	0	7 28	-30	—	8·0
Baku	21·2	338	—	—	e 9 31	SS	13·7	—
Tashkent	21·8	19	14 48	- 1	—	—	e 6·8	—
Andijan	22·4	25	e 4 56	+ 1	e 8 59	+ 6	11·3	—
Almata	26·4	29	5 44	+11	—	—	—	11·7
Calcutta	E. 26·4	82	9 53	S	(9 53)	-12	13·1	—
	N. 26·4	82	10 5	S	(10 5)	0	13·0	—
Ekaterinburg	35·9	1	e 7 46	+49	e 12 26	- 9	14·5	20·2
Pulkovo	44·2	339	—	—	e 14 15	-24	23·5	29·7
Florence	46·2	311	—	—	e 15 0	- 7	—	26·5
Irkutsk	46·2	37	e 9 1	+39	e 14 30?	-37	21·5	—

Additional readings:—

Bombay S = +9m.16s.

Baku e = +12m.53s.

Tashkent e = +5m.36s.

Ekaterinburg e = +12m.41s. and +13m.18s.

Long waves were recorded at many other European stations, also at Scoresby

Sund, Ksara, Kodaikanal, Hong Kong, and Phu-Lien.

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Oct. 9d. Readings also at 1h. (Wellington), 2h. (Samarkand and near Andijan), 5h. (Neuchatel, Andijan, Samarkand, Tashkent, Pul'kovo, Ksara, Baku, and Victoria), 6h. (Tananarive), 11h. (Port au Prince and Trenta), 12h. (near Tananarive), 13h. (Ekaterinburg), 16h. (Andijan), 21h. (Vienna and near Tyosi).

Oct. 10d. 0h. 37m. 18s. Epicentre 25°·5N. 98°·5E. (as on 7d.). R.2.

A = -·133, B = +·893, C = +·431; D = +·989, E = +·148;
G = -·064, H = +·426, K = -·903.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Phu-Lien	8·9	120	2 5	- 1	e 3 56	+10	4·6	5·6
Calcutta	9·7	254	2 10	- 7	4 2	- 4	5·2	—
Hong Kong	14·7	99	i 3 22	- 3	6 22	+14	7·8	8·6
Hyderabad	20·3	251	2 39	-114	6 21	-111	8·5	—
Chiufeng	20·7	41	4 33	- 4	8 34	+14	—	11·3
Taihoku	20·9	86	e 5 42?	+63	—	—	—	—
Zi-ka-wei	21·0	69	e 4 42	+ 2	—	—	—	13·9
Medan	21·9	179	4 50	0	—	—	i 12·2	—
Manila	23·7	113	i 5 11	+ 4	19 18	0	11·7	21·1
Bombay	24·6	260	5 15	- 1	9 37	+ 3	13·0	13·5
Almata	24·9	321	5 20	+ 1	9 54	+15	—	—
Andijan	26·5	312	e 5 36	+ 2	10 18	+11	e 11·9	—
Irkutsk	27·1	8	e 5 35	- 4	10 14	- 3	14·4	15·5
Tashkent	28·8	311	i 5 51	- 3	e 10 36	- 9	e 16·0	18·3
Miyazaki	29·5	70	12 2	S	(12 2)	+66	(16·1)	—
Samarkand	29·8	306	e 6 2	- 1	—	—	—	—
Vladivostok	32·4	48	6 38	+12	11 58	+17	15·5	—
Batavia	32·8	165	i 6 34	+ 4	—	—	i 17·7	—
Osaka	33·2	64	7 58	PP	14 2	SS	18·0	19·1
Ekaterinburg	41·4	330	e 7 24	-20	i 13 47	-10	19·7	25·4
Theodosia	53·6	310	—	—	e 16 48	- 2	—	—
Yalta	54·5	310	—	—	e 17 1	- 1	—	—
Pulkovo	57·3	327	9 44	- 1	17 35	- 5	21·7	34·9
Helsingfors	59·9	328	—	—	e 18 8	- 7	e 29·7	—
Copenhagen	67·0	323	—	—	19 39	- 6	34·7	—
Stuttgart	70·7	318	—	—	e 20 23	- 7	e 40·2	—
Florence	70·8	310	20 42	S	(20 42)	+11	—	39·7
Piacenza	71·5	314	20 34	S	(20 34)	- 5	—	41·7
De Bilt	72·1	320	—	—	e 20 45	- 1	e 38·7	40·1
Uccle	73·0	319	—	—	e 20 42?	-15	e 38·7	—
Paris	74·8	319	—	—	e 25 42?	SS	e 42·7	46·7
Kew	75·4	320	—	—	e 33 42?	?	40·7	—

Additional readings and note:—

Calcutta PE = +1m.57s.

Medan S = +13m.54s.

Miyazaki gives S as P and L as S.

Helsingfors eSN = +18m.11s., eSSSN = +25m.2s.

Stuttgart eSSE = +25m.2s., eEN = +28m.37s.

Florence S = +25m.12s.

Uccle e = +29m.12s.

Long waves were also recorded at Kobe, Sumoto, Dehra Dun, Baku, Upsala, Lund, Hamburg, Stonyhurst, Strasbourg, Granada, Scoresby Sund, and La Plata.

Oct. 10d. Readings also at 3h. (Manila), 8h., 10h., and 12h. (Wellington), 13h. (near Manila), 15h. (Wellington), 17h. (Taihoku), 18h. (Naples and Ravensburg (2)), 19h. (Ekaterinburg, Irkutsk, and Taihoku), 20h. (Ksara and near Manila), 21h. (Almata and Andijan), 23h. (near Sumoto).

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Oct. 11d. 3h. 6m. 22s. Epicentre 72°·5N. 12°·0W. (as on 1927 Nov. 19d.). R.2.

A = +·294, B = -·063, C = +·954; D = -·208, E = -·978;
G = +·933, H = -·198, K = -·301.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Scoresby Sund	3·7	243	0 43	-10	—	—	—	—
Reykjavik	9·1	209	1 57	-12	e 3 38	-13	—	5·1
Bergen	13·9	142	e 3 9	-5	—	—	6·1	—
Dyce	15·8	160	3 43	+5	—	—	e 7·0	9·8
Upsala	N. 17·1	122	i 3 59	+4	e 7 11	+7	e 8·5	10·3
Ivigtut	17·7	249	4 2	-1	—	—	—	8·6
Helsingfors	18·8	112	e 4 25	+9	e 8 0	SS	e 9·6	—
Stonyhurst	19·1	162	4 18	-2	7 48	0	9·0	10·0
Bidston	19·5	164	i 4 20	-4	e 8 8	SS	e 8·6	11·1
Copenhagen	19·6	135	i 4 27	+2	8 6	+8	8·6	—
Lund	19·8	135	i 4 29	+2	8 8	+6	9·6	—
Pulkovo	20·6	106	4 50	+14	8 45	SS	10·6	11·2
Hamburg	21·1	142	e 4 43	+2	e 8 38	+10	e 11·0	14·7
Oxford	21·3	161	i 4 40	-3	18 38	+6	i 10·2	12·4
Kew	21·7	160	i 4 45	-3	i 8 43	+3	10·1	11·4
De Bilt	21·7	151	e 4 47	-1	8 47	+7	9·9	12·3
Königsberg	22·3	125	e 5 15	+21	19 10	+18	e 11·6	—
Uccle	22·9	153	4 57	-3	19 8	+5	10·6	—
Potsdam	22·9	138	5 2	+2	19 8	+5	e 10·6	13·6
Göttingen	23·1	144	i 5 4	+2	i 9 21	+14	e 10·9	—
Jena	24·0	141	e 5 8	-2	e 9 29	+6	e 11·6	15·1
Paris	24·6	156	e 5 14	-2	9 31	-3	11·6	13·6
Cheb	24·8	141	e 5 23	+5	e 9 51	+14	e 14·6	18·1
Prague	25·3	138	e 5 26	+3	e 9 57	+11	e 12·6	16·1
Stuttgart	25·6	146	i 5 27	+2	i 9 52	+1	e 12·1	18·4
Strasbourg	25·6	149	i 5 26	+1	19 56	+5	11·6	—
Besançon	26·6	152	5 37	+2	10 7	-2	14·6	—
Zurich	26·9	148	e 5 39	+2	e 10 23	+9	—	—
Neuchatel	27·0	151	e 5 38	0	i 10 13	-2	—	—
Chur	27·5	147	e 5 45	+2	—	—	—	—
Graz	28·4	139	e 5 54	+3	i 10 50	+12	14·6	17·8
Budapest	28·8	133	e 6 26	+32	10 54	+9	15·6	18·1
Piacenza	29·3	148	6 18	+19	—	—	—	20·1
Zagreb	29·7	139	e 6 16	+14	e 11 6	+7	e 14·3	18·6
Florence	30·8	145	6 23	+11	11 8	-9	15·8	17·3
Belgrade	31·6	133	e 6 31	+12	—	—	e 19·1	—
Barcelona	31·8	159	e 5 50	-31	—	—	e 15·2	17·3
Ekaterinburg	32·1	81	16 46	+22	12 9	+32	14·6	18·2
Tortosa	N. 32·3	164	4 13	?	11 34	-6	15·1	19·8
Toledo	32·9	169	e 6 33	+2	e 11 41	-8	e 14·9	16·6
Rocca di Papa	33·0	144	e 6 43	+11	i 11 53	+2	—	27·2
Alicante	34·7	165	e 6 53	+7	e 12 14	-3	e 17·5	—
Granada	35·6	169	16 56	+2	i 12 26	-4	i 16·3	18·6
Almeria	36·0	167	6 57	-1	12 33	-3	17·0	20·6
Malaga	36·0	169	7 2	+4	12 32	-4	15·9	—
Ottawa	39·4	265	e 7 23	+1	e 13 28	+1	e 17·9	—
Harvard	40·8	258	e 7 36	-3	i 13 50	+2	e 19·1	—
Toronto	N. 42·1	268	e 7 52	+3	e 14 9	+1	e 20·3	24·2
Baku	43·5	102	e 8 30	+29	i 14 58	+30	20·6	29·9
Ann Arbor	N. 44·6	270	—	—	e 14 2	-42	e 22·4	—
Georgetown	45·7	261	i 9 22	+64	15 8	+8	—	—
Chicago	46·3	273	—	—	i 15 14	+5	23·0	—
Charlottesville	47·0	263	—	—	e 18 26	SS	—	—
Irkutsk	47·7	49	e 8 53	+19	e 15 50	+21	27·6	34·6
Tashkent	48·5	84	i 8 59	+19	i 16 13	+33	e 24·2	28·7
Samarkand	49·3	85	e 9 8	+22	—	—	—	—
Florissant	49·8	273	i 8 55	+5	i 16 6	+8	e 24·1	—
St. Louis	49·9	273	e 8 55	+4	e 16 6	+7	e 24·6	—
Victoria	N. 50·2	308	9 19	+26	16 34	+30	27·2	30·9
Tucson	N. 50·2	308	9 21	+28	16 52	+48	26·7	27·4
	61·9	290	e 10 28	+10	e 18 50	+9	e 31·0	—

For Notes see next page.

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NOTES TO Oct. 11d. 3h. 6m. 22s.

Additional readings:

Scoresby Sund $iE = +50s$, $iN = +1m.9s. = P^*$.
 Helsingfors IPZ = +4m.28s., $eZ = +5m.1s.$, and +5m.15s., $eE = +5m.49s.$,
 $SZ = +8m.12s.$, $iE = +8m.19s.$, $eSSN = +9m.12s.$
 Copenhagen +8m.24s.
 Lund +8m.24s.
 De Bilt $iZ = +4m.50s.$, $eN = +8m.53s.$
 Potsdam $iE = +5m.38s.$, $eE = +5m.43s.$, $iE = +6m.14s.$, $iZ = +6m.50s.$, $eZ = +8m.56s.$, $iEN = +9m.13s.$
 Stuttgart $iNZ = +5m.35s.$
 Belgrade $e = +7m.0s. = PP - 18s.$
 Granada $PP = +7m.45s.$, $i = +9m.16s. = PcP - 11s.$, +12m.39s., and +15m.11s.
 Ottawa $ePPP = +8m.54s.$, $SSS = +16m.16s.$; $T_0 = 3h.6m.16s.$
 Ann Arbor $eN = +14m.56s. = S + 12s.$, $eN = +20m.56s.$
 Georgetown $SS = +18m.22s. = S_0S + 5s.$; $T_0 = 3h.6m.6s.$
 Chicago $eSS = +18m.24s.$, $iSS = +18m.31s.$
 Florissant $eE = +18m.35s. = S_0S - 8s.$ and +19m.38s. = $SS + 20s.$
 Tucson $ePP = +12m.50s.$
 Long waves were also recorded at Vienna, Berkeley, Bombay, and Hong Kong.

Oct. 11d. Readings also at 0h. (Kodaikanal), 1h. (near Lick), 3h. (Simferopol, Theodosia, and Yalta), 5h. (Wellington), 7h. (Scoresby Sund), 9h. (Alicante), 10h. (Scoresby Sund), 12h. (near Samarkand), 16h. (Wellington, Sydney, and Manila), 17h. (Manila), 19h. (Florence), 20h. (Baku, Ekaterinburg, Tashkent, and St. Louis), 21h. (Andijan and near Samarkand), 22h. (Budapest).

Oct. 12d. 8h. 57m. 52s. Epicentre $35^{\circ}0'N$, $142^{\circ}0'E$. (as on 1930 May 15d.). X.

Tokyo gives epicentre $35^{\circ}58'N$, $140^{\circ}30'E$, but the readings do not fit this determination.

$$A = -.646, B = +.504, C = +.574; \quad D = +.616, E = +.788;$$

$$G = -.452, H = +.353, K = -.819.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	1.2	308	0 12	- 5	e 0 16	-15	0.3	—
Tukuba	1.9	308	0 40	P ₁	—	—	—	—
Tokyo	2.0	291	0 16	-13	—	—	—	—
Nagoya	4.2	274	0 54	- 6	1 47	- 1	—	—
Mizusawa	E. 4.2	351	1 1	+ 1	1 48	0	—	—
Osaka	5.4	268	1 18	+ 1	(2 23)	+ 5	2.4	2.7
Kobe	5.7	268	e 1 42	P*	2 32	+ 7	—	—
Sumoto	5.9	265	e 1 34	+10	2 43	+12	—	2.8

Oct. 12d. 15h. 6m. 43s. Epicentre $37^{\circ}3'N$, $69^{\circ}7'E$. N.3.

(Epicentre given by the Central Asia Stations).

$$A = +.268, B = +.726, C = +.633; \quad D = +.938, E = -.347;$$

$$G = +.220, H = +.594, K = -.774.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tashkent	2.0	352	i 0 19	-10	—	—	—	—
Samarkand	2.1	280	i 0 30	0	—	—	1 1.1	—
Andijan	2.2	65	0 39	P*	—	—	—	—
Almata	6.7	62	1 37	+ 2	3 3	+12	1 1.2	2.4
Baku	15.2	280	e 4 29	+58	6 38	+18	3.4	3.8
Bombay	20.6	172	4 41	+ 5	8 39	SS	e 11.2	—
Kuchino	26.7	319	—	—	e 10 49	+39	e 15.0	16.6
Irkutsk	27.0	50	e 5 34	- 4	e 10 24	+ 9	14.3	—
Pulkovo	32.0	323	—	—	e 11 56	+21	19.3	19.4

Additional readings:

Almata $i = +2m.11s. = P^*$.
 Pulkovo $e = +17m.13s.$

Long waves were also recorded at Scoresby Sund and other European stations.

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Oct. 12d. Readings also at 1h. (near Andijan), 2h. (Scoresby Sund and near Andijan (2)), 3h. (Tyosi), 8h. (Ekaterinburg, Tashkent, near Almata, Andijan, Samarkand, and near Lick), 9h. (Tokyo, Tukuba, near Nagoya, and Tyosi), 10h. (La Paz, St. Louis, and near Tacubaya), 11h. (near Merida), 14h. (Andijan), 15h. (La Plata, Sucre, La Paz, Andijan, Tashkent, and near Samarkand), 16h. (Tashkent and near Tyosi), 17h. (near Naples, near Andijan and Samarkand), 18h. (Ekaterinburg, Irkutsk, Samarkand, Andijan, Almata, and near Tashkent), 19h. (Irkutsk, Tashkent, and Hong Kong), 20h. (Baku, Ekaterinburg, Kucino, Bombay, and Hyderabad).

Oct. 13d. Readings at 4h. (Baku and Tashkent), 6h. (La Paz and Samarkand), 8h. (Andijan, Samarkand, Bombay, Ekaterinburg, Baku, Irkutsk, and Phu-Lien), 16h. (Almata and Andijan), 17h. (near Manila), 18h. (near Bagnères, Barcelona, and Tortosa), 19h. (Ekaterinburg, Irkutsk, Samarkand, near Andijan, and Tashkent), 20h. (Baku, Pulkovo, Copenhagen, and Kucino), 23h. (Andijan and Samarkand).

Oct. 14d. Readings at 0h. (near Mizusawa), 1h. (Andijan and Samarkand), 2h. (Almata, Ekaterinburg, near Andijan, Samarkand, Tashkent, near Batavia, and Malabar), 4h. (near Batavia and Malabar), 5h. and 8h. (2) (near Taihoku), 10h. (Samarkand), 15h. (Melbourne, Riverview, and Wellington), 16h. (Tyosi (2)), 17h. (Matuyama), 21h. (near Tyosi).

Oct. 15d. 22h. 19m. 7s. Epicentre 47°·7N. 7°·6E. N.2.

$$A = +.667, B = +.089, C = +.740; \quad D = +.132, E = -.991; \\ G = +.733, H = +.098, K = -.673.$$

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Zurich	0·7	117	i 0 9	- 1	i 0 19	+ 1	—	—
Neuchatel	0·8	213	i 0 10	- 1	i 0 22	+ 1	—	—
Strasbourg	0·9	7	e 0 9	- 4	i 0 23	0	—	—
Besançon	1·2	248	0 17	0	i 0 32	+ 1	—	—
Ravensburg	1·4	86	—	—	e 0 38	+ 2	—	—
Karlsruhe	1·4	23	0 3	-17	—	—	—	—
Stuttgart	1·5	45	e 0 23	+ 2	i 0 41	+ 2	—	—
Hohenheim	1·5	47	e 0 22	+ 1	i 0 41	+ 2	—	—
Chur	1·5	123	e 0 22	+ 1	i 0 46	S*	—	—
Cheb	3·9	51	—	—	e 2 0	S*	—	—
Göttingen	N.	4·1	21	e 1 11	P*	—	—	2·1
Jena	E.	4·1	38	—	e 1 59	S*	i 2·1	2·1

Additional readings:—

Strasbourg SS = +30s. = S*.

Ravensburg i = +42s., iE = +46s., +49s., and +54s.

Stuttgart eN = +36s., i = +44s. and +46s.

Chur iP_r = +24s.

Oct. 15d. Readings also at 2h. (Tyosi), 3h. (near Manila), 5h. (near Sumoto), 7h. (Messina), 8h. (near Tacubaya), 9h. (Baku, Pulkovo, Ekaterinburg, Irkutsk, Kucino, Tashkent, Andijan, Samarkand, Hong Kong, Manila, and Phu-Lien), 10h. (Copenhagen and Taihoku (2)), 11h. (Ekaterinburg, Irkutsk, Hong Kong, Phu-Lien, Samarkand, Bombay, Calcutta, and Lick), 15h. (Tokyo and near Manila), 16h. (La Paz), 19h. (Baku, Ekaterinburg, Irkutsk, Phu-Lien, Tashkent, Andijan, and Chiufeng), 20h. (Lick (2)), 21h. (La Paz, Granada, De Bilt, Paris, Florence, Ekaterinburg, Osaka, Nagoya, near Mizusawa and Tyosi), 22h. (Baku, Copenhagen, Tashkent, and Victoria), 23h. (Baku, Ekaterinburg, and Lick (3)).

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Oct. 16d. 20h. 46m. 12s. Epicentre 14°·5S. 175°·0E. N.3.

A = -·964, B = +·084, C = -·250; D = +·087, E = +·996;
G = +·249, H = -·022, K = -·968.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva	4·9	139	1 6	- 4	2 0	- 5	2·2	—
Wellington	26·8	181	5 39	+ 3	10 15	+ 3	13·3	—
Riverview	29·0	224	e 3 25	?	e 7 8	?	—	10·6
Sydney	29·0	224	e 6 18	+22	i 10 48	0	13·9	15·3
Christchurch	29·1	184	—	—	i 12 6	SS	15·4	17·0
Melbourne	35·4	223	e 7 40	+47	i 12 13	-14	16·3	18·7
Adelaide	37·7	231	e 3 46?	?	i 13 8	+ 6	—	22·1
Irkutsk	90·1	325	e 12 48?	-10	e 23 48?	- 9	—	—
Ekaterinburg	115·3	327	—	—	e 29 47	PS	61·8	—
Zagreb	144·1	334	e 19 57	[+26]	—	—	e 93·2	—
Strasbourg	144·4	346	i 19 55	[+23]	—	—	76·8	—
Paris	145·0	350	e 19 48?	[+14]	—	—	83·8	—
Rocca di Papa	148·7	333	i 20 7	[+27]	e 32 40	?	e 97·5	104·0
Rome	148·7	333	e 20 4	[+24]	—	—	—	—

Long waves were also recorded at other European stations.

Oct. 16d. 21h. 32m. 29s. (I) } Epicentre 36°·3N. 136°·3E. N.2.
21h. 36m. 3s. (II) } R.2.

(as given by Tokyo in Geophys. Mag., Vol. IV, No. 4).

A = -·583, B = +·557, C = +·592; D = +·691, E = +·723;
G = -·428, H = +·409, K = -·806.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Hukui	0·3	186	0 7	+ 3	0 12	+ 4	—	—
II Husiki	0·8	51	0 6	- 5	0 17	- 4	—	—
I Gihu	1·0	157	0 14	0	0 26	0	—	—
I Hikone	1·0	182	0 13	- 1	0 27	+ 1	—	—
I Nagoya	1·2	155	i 0 6	-11	0 34	+ 3	—	0·6
II	1·2	155	0 17	0	0 35	+ 4	—	1·4
I Wazima	1·2	24	0 12	- 5	0 20	-11	—	—
II	1·2	24	0 14	- 3	0 28	- 3	—	—
II Kyoto	1·3	200	0 19	+ 1	0 39	+ 6	—	—
I Toyooka	1·4	238	i 0 18	- 2	i 0 36	0	—	0·6
II	1·4	238	i 0 19	- 1	i 0 37	+ 1	—	0·6
I Nagano	1·6	77	0 19	- 4	0 43	+ 2	—	—
II	1·6	77	0 21	- 2	0 44	+ 3	—	—
I Osaka	1·7	200	0 23	- 1	(0 48)	+ 4	0·8	1·6
II	1·7	200	0 24	0	(0 50)	+ 6	0·8	0·9
I Hamamatu	1·9	144	0 19	- 9	0 45	- 4	—	—
II	1·9	144	0 21	- 7	0 47	- 2	—	—
I Kobe	1·9	209	i 0 24	- 4	0 49	0	—	0·9
II	1·9	209	0 24	- 4	0 50	+ 1	—	1·0
I Sumoto	2·2	210	0 27	- 4	1 5	S*	—	1·1
II	2·2	210	0 35	+ 4	1 7	S*	—	1·2
II Misima	2·5	119	0 41	+ 5	1 8	+ 4	—	—
I Tokyo	2·8	102	0 45	P*	1 24	S*	—	—
II	2·8	102	0 48	P*	1 27	S*	—	—
II Siomisaki	2·9	189	0 41	0	1 14	0	—	—
I Koti	3·5	221	e 0 58	+ 8	1 35	+ 5	—	—
II	3·5	221	e 0 57	+ 7	1 43	S*	e 1·8	1·9
I Hukusima	3·6	65	0 58	+ 7	—	—	—	—
II	3·6	65	0 52	+ 1	1 34	+ 2	—	—
I Hamada	3·7	249	0 53	0	1 46	S*	—	—
II	3·7	249	0 53	0	1 46	S*	—	—
I Matuyama	3·8	231	i 0 49	- 5	(1 45)	+ 8	i 1·8	2·0
II	3·8	231	i 0 54	0	(1 49)	S*	i 1·8	2·1

Continued on next page.

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		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
I Tyosi		3.8	98	e 1 0	+ 6	(e 1 46)	+ 9	e 1.8	—
II Mizusawa	E.	3.8	98	e 1 3	+ 9	(1 51)	S*	1.9	—
I Sendai		4.1	60	1 7	+ 9	2 9	S*	—	—
II Hatidyoizima		4.1	60	1 1	+ 3	2 3	S*	—	—
II Hatidyoizima		4.3	137	1 10	+ 9	1 54	+ 4	—	—
I Akita		4.5	40	1 16	+12	2 16	S*	—	—
I Mizusawa	E.	4.7	52	1 19	P*	2 28	S*	—	—
II Morioka	E.	4.7	52	1 8	+ 1	2 37	S*	—	—
II Morioka	N.	4.7	52	1 11	+ 4	2 29	S*	—	—
II Morioka		5.1	46	1 12	- 1	2 7	- 3	—	—
I Hukuoka		5.5	242	1 26	+ 8	2 46	S*	—	2.9
II Hukuoka		5.5	242	1 25	+ 7	2 48	S*	—	2.9
II Kumamoto		5.8	235	1 22	0	2 54	S*	—	—
I Miyazaki		5.9	224	1 23	- 1	2 59	S*	—	—
I Nagasaki		6.4	238	—	—	3 2	S*	—	—
II Nagasaki		6.4	238	1 47	P*	3 2	S*	—	3.4
II Zi-ka-wei	Z.	13.4	252	e 3 7	0	4 45	-52	8.2	8.8
II Hong Kong		24.0	240	5 6	- 4	9 27	+ 4	11.1	13.7
II Manila		25.7	216	e 5 10	-16	i 9 41	-12	—	12.5
II Irkutsk		27.6	316	e 5 53	+ 9	e 10 23	- 2	14.0	16.6
II Andijan		49.1	297	e 8 44	0	—	—	—	—
II Ekaterinburg		52.8	319	9 7	- 5	—	—	27.0	33.2
II Bombay		57.8	273	—	—	e 17 57	+10	—	—
II Kucino		65.0	322	—	—	e 24 15	?	35.6	41.4
II Baku		65.1	305	—	—	e 19 3	-18	33.8	41.2
II Pulkovo		66.5	328	e 10 44	- 5	e 19 29	-10	32.0	40.6
II Florence		85.4	324	22 47	S	(22 47)	-25	42.0	45.0
II La Paz		150.6	54	e 19 52	[+ 9]	—	—	—	—

Additional readings: —

Toyouka I $iP_s = +20s.$, $iSNZ = +33s.$; II $iP_s = +22s.$, $iSZ = +41s.$

Kobe I $iP_s = +26s.$, $S_N = +51s.$; II $P_s = +26s.$, $iPE = +29s.$, $SE = +54s.$, $SN = +56s.$

Koti II $iP^* = +1m.3s.$

Zi-ka-wei II $iN = +7m.33s.$, $iE = +7m.57s.$

Long waves were also recorded at Phu-Lien, Taihoku, Wellington, and Granada.

Oct. 16d. Readings also at 0h. (Andijan and near Samarkand), 1h. (La Paz and near Manila), 2h. (Trenta), 5h. (Baku, Ekaterinburg, Keara, and Yalta), 6h. (Matuyama), 7h. (near Tyosi), 8h. (near Phu-Lien and near Sumoto), 12h. (Rocca di Papa, near Casamicciola (2), near Matuyama, and near Santiago), 14h. (near Oaxaca), 16h. (near Phu-Lien).

Oct. 17d. 1h. 29m. 50s. Epicentre $13^{\circ}0N. 105^{\circ}0W.$ N.3.

A = - .252, B = - .941, C = + .225; D = - .966, E = + .259;
G = - .058, H = - .217, K = - .974.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Manzanillo		6.0	6	1 24	- 1	—	—	1.7	1.8
Guadalajara		7.8	11	1 39	-12	—	—	2.2	2.3
Tacubaya		8.4	41	1 54	- 5	—	—	2.8	3.0
Vera Cruz		10.5	53	(2 38)	+10	(3 58)	-28	(4.0)	(4.1)
Tucson		20.0	345	—	—	e 8 24	SS	9.4	—
St. Louis	E.	28.8	25	1 5 57	+ 3	e 10 49	+ 4	—	—
Florissant		28.9	24	e 5 56	+ 1	e 10 49	+ 2	—	15.7

Vera Cruz readings have been increased by 1m.
Long waves were also recorded at Victoria.

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Oct. 17d. 8h. 46m. 37s. Epicentre 32°0S. 71°0W. N.2.

A = +.276, B = -.802, C = -.530; D = -.946, E = -.326;
G = -.173, H = +.501, K = -.848.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Plata	11.3	108	2 43	+ 4	4 41	- 4	5.6	—
Sucre	14.0	23	13 24	+ 9	—	—	—	—
La Paz	15.7	10	13 50	+12	16 56	+25	9.1	9.6
Rio de Janeiro	26.3	77	15 33	+ 1	19 56	- 7	11.9	—
Dakar	69.3	56	e 11 9	+ 3	e 20 8	- 5	31.9	42.4
Charlottesville	70.4	355	e 11 11	- 2	1 20 21	- 5	e 27.7	—
Georgetown	71.1	356	i 11 20	+ 3	20 27	- 7	—	—
Cape Town	72.4	120	—	—	20 45	- 5	—	—
Fordham	72.8	358	i 11 45	+17	1 20 53	- 1	e 34.4	—
St. Louis	72.8	346	i 11 27	- 1	1 20 46	- 8	—	—
Florissant	73.1	346	i 11 27	- 2	1 20 47	-11	—	—
Harvard	74.4	0	—	—	i 21 5	- 8	—	—
Tucson	74.5	327	i 11 42	+ 5	e 21 6	- 8	e 34.8	—
Ann Arbor	75.2	352	e 11 41	+ 0	e 21 11	-11	e 35.0	—
Chicago	75.3	349	11 58	+16	1 21 14	-10	e 30.3	—
Toronto	76.0	355	112 1	+15	1 21 27	- 5	35.8	—
Ottawa	77.6	358	i 12 15	+20	1 21 38	-11	e 37.4	—
Berkeley	84.7	323	e 12 32	- 0	e 23 17	+12	—	—
Wellington	84.9	225	12 32	- 1	22 51	-16	39.4	—
Victoria	92.9	329	—	—	23 8	[-41]	42.2	46.7
	92.9	329	—	—	22 41	[-68]	45.4	48.9
Granada	93.5	48	i 13 54	+40	i 25 14	PS	e 43.0	52.7
Almeria	94.1	49	13 33	+17	49	—	44.0	46.2
Toledo	94.8	46	—	—	e 30 45	SS	—	—
Alicante	96.1	49	—	—	e 24 2	[- 4]	e 36.2	—
Algiers	97.5	51	e 13 35	+ 3	24 40	{ + 6 }	44.4	49.4
Tortosa	98.2	47	e 15 7	?	24 7	[-10]	e 39.4	61.3
Tananarive	102.2	122	—	—	25 44	- 2	49.5	56.4
Melbourne	102.5	210	e 18 1	PP	e 24 23	[-15]	47.6	—
Riverview	103.1	216	—	—	1 24 56	[-15]	e 47.6	52.9
Kew	103.9	38	—	—	e 24 32	[-13]	53.4	55.8
Paris	103.9	41	e 17 45	PKP	e 24 33	[-12]	49.4	59.4
Stonyhurst	104.2	36	e 18 32	PP	e 24 22	[-24]	51.4	60.4
Edinburgh	105.0	33	—	—	e 24 47	[- 3]	—	57.4
Uccle	106.0	40	14 29	+18	1 24 43	[-12]	e 41.4	—
Catania	106.1	55	e 16 44	?	e 23 38	?	54.5	65.9
Piacenza	106.1	46	e 18 15	PP	24 46	[- 9]	—	61.9
Dyce	106.3	31	i 17 52	[-14]	e 24 41	[-15]	e 45.9	58.9
Rome	106.4	50	e 18 39	[+33]	—	—	—	—
Rocca di Papa	106.5	50	e 17 47	[-19]	e 24 51	[- 6]	e 57.4	65.2
Florence	106.5	48	10 13	?	e 19 23	?	—	43.4
Strasbourg	106.7	42	e 14 23	+ 8	24 47	[-11]	43.4	—
De Bilt	107.0	39	e 14 48	+32	e 24 50	[- 9]	e 52.4	56.9
Adelaide	107.5	206	e 19 35	?	e 24 28	[-34]	—	—
Stuttgart	107.6	42	e 19 3	PP	—	—	e 51.4	—
Göttingen	109.4	40	e 19 12	PP	e 28 17	PS	e 56.4	—
Cheb	110.1	42	e 19 29	PP	e 26 41	{+33}	e 55.4	—
Hamburg	110.3	38	e 19 6	PP	—	—	e 57.4	—
Zagreb	110.4	47	e 18 53	PP	e 25 0	[-15]	e 53.4	—
Copenhagen	112.5	37	19 23	PP	26 23	{- 2}	49.4	—
Lund	112.9	37	19 29	PP	—	—	55.4	—
Budapest	113.0	46	19 23?	PP	—	—	e 54.4	64.9
Helwan	114.9	70	e 19 54	PP	29 15	PS	—	63.0
Upsala	N. 116.6	34	e 20 0	PP	e 29 29	PS	e 62.4	—
Kaara	120.0	66	20 19	PP	—	—	63.4	—
Helsingfors	E. 120.2	35	—	—	e 26 13	{+22}	e 64.4	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Yalta	122.0	53	e 18 52	[+ 2]	—	—	—	—
Simferopol	122.1	53	e 18 54	[+ 4]	—	—	—	—
Pulkovo	122.8	35	e 17 30	?	25 37	[- 22]	59.4	67.6
Theodosia	123.0	52	e 18 58	[+ 5]	—	—	—	—
Kucino	126.4	41	e 22 4?	—	26 42	[+ 33]	56.3	74.8
Baku	132.4	61	19 23	[+ 12]	—	—	e 60.4	72.9
Ekaterinburg	138.8	38	e 19 16	[- 4]	i 29 1	{ - 16}	57.4	79.0
Batavia	141.9	175	e 20 23	?	—	—	—	—
Colombo	143.0	126	12 14	?	—	—	—	77.4
Bombay	145.0	100	19 42	[+ 8]	33 5	SKSP	69.1	79.3
Samarkand	145.4	62	e 19 38	[+ 3]	—	—	—	—
Hyderabad	148.8	110	18 23	[- 7]	26 38?	?	70.9	78.4
Andijan	149.5	60	e 19 44	[+ 3]	—	—	—	—
Medan	150.0	159	i 19 34	?	—	—	—	—
Mizusawa	e. 153.1	294	(19 57)	[+ 11]	19 57	PKP	—	—
Akita	153.8	296	20 9	[+ 22]	—	—	—	—
Kumagaya	154.6	288	19 51	[+ 3]	—	—	—	—
Manila	159.4	214	20 0	[+ 7]	30 51	{ - 24}	—	—
Irkutsk	159.4	8	19 55	[+ 2]	30 54	{ - 21}	e 65.4	93.9
Miyazaki	161.0	276	19 39	[- 16]	—	—	—	—
Hong Kong	169.3	207	—	—	35 32	SKSP	—	83.4

Additional readings:—

La Paz i = + 4m.20s., iE = + 8m.46s.

Charlottesville e = + 24m.54s. = SS + 6s.

Georgetown IPPZ = + 14m.20s.; T₀ = 8h.46m.42s.

Fordham iSE = + 20m.48s.

St. Louis iP = + 11m.51s., i = + 11m.58s., iS = + 21m.21s., iE = + 21m.54s.

Florissant iPZ = + 11m.50s., iZ = + 16m.41s., iSE = + 21m.21s. = PS + 2s.

Harvard iE = + 21m.41s. = PS + 5s.

Tucson e = + 16m.33s., eSS = + 29m.39s.

Ann Arbor iPS = + 21m.47s., eSS?E = + 25m.59s., eSS?N = + 28m.41s., eSSSE =

+ 29m.41s.; T₀ = 8h.46m.48s.

Chicago iS₀? = + 21m.42s.

Toronto iPN = + 5m.44s., iN = + 12m.41s., iS = + 21m.27s., iE = + 21m.47s.,

iN = + 21m.50s.; T₀ = 8h.46m.54s.

Berkeley eE = + 22m.45s. = SKS - 12s. and + 23m.22s., eN = + 23m.29s. and

+ 24m.4s.

Granada PP = + 17m.4s., PPP = + 18m.4s., PS = + 23m.40s. = SKS - 13s.

Almeria iPP = + 17m.19s., PS = + 23m.43s. = SKS - 13s.

Algiers PS = + 24m.3s. = SKS - 9s.

Tananarive SKS = + 24m.20s., SS = + 32m.43s.

Melbourne i = + 25m.3s. = SKKS - 9s.

Riverview e = + 21m.7s. and + 24m.30s. = SKS - 9s., eE = + 27m.11s. = PS - 7s.,

eN = + 28m.39s.; T₀ = 8h.46m.32s.

Kew eSEN = + 25m.8s. = SKKS - 14s.

Uccle PP = + 18m.37s., e = + 27m.52s. = PS + 4s.

Strasbourg ePP = + 18m.53s., PS = + 27m.52s.

De Bilt ePPZ = + 19m.0s., e = + 28m.5s. = PS + 7s.

Adelaide e? = + 12m.47s.

Zagreb e = + 19m.9s. = PP + 9s., and + 28m.37s. = PS + 6s.

Ksara PPPN = + 26m.2s. = SKS + 12s., PPPPN = + 28m.31s., PPPPE =

+ 30m.7s. = SKSP + 11s.

Helsingfors ePPE = + 20m.37s., eE = + 30m.1s. = SKSP + 5s., ePSE = + 30m.24s.,

eSSE = + 36m.25s.

Pulkovo PP = + 20m.30s., PS = + 30m.11s., SS = + 36m.53s.

Kucino PPP = + 23m.26s., PS = + 31m.38s., SS = + 38m.5s.

Baku PP = + 21m.39s., PKS = + 22m.42s., SS = + 38m.59s.

Ekaterinburg iPP = + 22m.16s., iPS = + 32m.33s., SS = + 40m.29s.

Batavia i = + 23m.0s. = PKS - 13s.

Hyderabad S = + 32m.14s.

Medan P = + 18m.39s.

Manila iPPNZ = + 24m.19s.

Irkutsk PP = + 24m.35s., SS = + 44m.23s.

Hong Kong e = + 22m.57s. and + 45m.49s. = SS - 19s.

Long waves were also recorded at Kodaikanal, Honolulu T.H., Königsberg, and

Potsdam.

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Oct. 17d. 17h. 15m. 42s. Epicentre 43°·8N. 15°·7E. (as on 1928 Feb. 11d.). X.

A = +·695, B = +·195, C = +·692; D = +·271, E = -·963;
G = +·666, H = +·187, K = -·722.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Zagreb	2·0	6	0 46	P _s	i 1 36	+45	—	1·8
Venice	2·9	304	e 1 23	S	(e 1 23)	+ 9	—	—
Rocca di Papa	3·0	228	i 0 40	- 3	(e 1 18)	+ 1	e 1·3	1·5
Rome	3·0	232	e 0 43	0	1 11	- 6	—	2·3
Naples	3·1	205	e 0 44	0	e 1 1	P _s	—	—
Treviso	3·1	307	e 1 42	+58	e 2 17	+57	—	2·9
Padova	3·2	302	e 2 9	S	(e 2 9)	+47	—	—
Florence	3·2	272	1 18	S	(1 18)	- 4	—	2·8
Casamicciola	3·3	205	1 40	+53	2 8	+43	—	2·4
Taranto	3·5	160	0 28	-22	1 8	-22	—	—
Trente	4·6	174	i 1 43	+37	2 3	+ 5	—	—

Additional readings:—

Zagreb i = +56s., +1m.8s. =S_s, +1m.25s., +1m.32s., +1m.34s., +1m.38s., and +1m.40s.

Venice IPN = +1m.59s. =S*.

Long waves were recorded at Potsdam.

Oct. 17d. Readings also at 1h. (near Lick and near Tacubaya), 3h. (Reykjavik), 4h. (Ksara), 5h. (Reykjavik), 7h. (Ksara), 8h. (near Lick (2)), 11h. (Florence), 12h. (Melbourne, Riverview, and Wellington), 13h. (De Bilt and Granada), 17h. (Samarkand and near Sumoto), 18h. (Andijan and Zagreb), 19h. (Almata, near Andijan, and Samarkand), 21h. (Calcutta), 22h. (near Taihoku).

Oct. 18d. 1h. 2m. 20s. Epicentre 29°·4N. 51°·4E. (as on 1930 Sept. 2d.). X.

A = +·544, B = +·681, C = +·491; D = +·782, E = -·624;
G = +·306, H = +·384, K = -·871.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	11·0	354	e 2 28	- 7	e 4 44	+ 6	7·9	9·1
Ksara	13·9	293	3 11	- 3	9 19	?	—	—
Samarkand	16·4	47	e 2 45	-61	—	—	—	—
Andijan	20·5	51	e 4 38	+ 3	e 8 21	+ 5	e 11·6	—
Ekaterinburg	28·2	11	—	—	(9 40?)	-55	9·7	18·4
Irkutsk	44·8	44	—	—	e 17 40?	SS	23·7	—

Baku gives also e = +6m.29s.

Oct. 18d. 4h. 23m. 8s. Epicentre 36°·3N. 136°·3E. (as on 16d.). X.

A = -·583, B = +·557, C = +·592.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya	1·2	155	0 16	- 1	0 33	+ 2	—	—
Toyooka	1·4	238	0 19	- 1	1 0 38	+ 2	—	0·6
Osaka	1·7	200	e 0 24	0	(0 49)	+ 5	0·8	1·3
Kobe	1·9	209	i 0 28	0	i 0 52	+ 3	—	0·9
Sumoto	2·2	210	0 33	+ 2	1 5	S*	—	1·1

Oct. 18d. Readings also at 2h. (Manila), 3h. (Baku and Ekaterinburg), 7h. (near Lick), 16h. (Almata and Andijan), 17h. (Alicante and Andijan), 18h. (near Mizusawa), 19h. (Baku and Ekaterinburg), 22h. (Andijan and near Tacubaya), 23h. (Samarkand).

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Oct. 19d. 2h. 43m. 3s. Epicentre 35°·0N. 5°·0W. (as on 1926 Oct. 15d.). X.

A = +·816, B = -·071, C = +·574; D = -·087, E = -·996;
G = +·571, H = -·050, K = -·819.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
San Fernando	1·7	326	0 30	+ 6	0 40	- 4	0·7	—
Malaga	1·8	15	0 21	- 5	0 31	-15	—	—
Granada	2·4	27	1 0 34	0	1 1 2	0	—	1·3
Almeria	2·8	48	e 0 39	- 1	1 20	S*	—	—
Toledo	4·9	9	e 1 40	P _r	e 2 11	S _r	—	—

Additional readings:—

Granada P = +39s., P₀P = +42s. and +58s., S₀S = +1m.7s.
Almeria PP = +49s., PPP = +55s., SS = +1m.28s., SSS = +1m.34s.

Oct. 19d. 11h. 4m. 45s. Epicentre 51°·8N. 171°·0W. N.3.

A = -·611, B = -·097, C = +·786; D = -·156, E = +·988;
G = -·776, H = -·123, K = -·618.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	21·1	62	—	—	e 8 39	+11	—	—
Victoria	E. 30·2	77	—	—	11 10	+ 3	14·5	16·2
	N. 30·2	77	—	—	11 14	+ 7	13·4	15·0
Berkeley	E. 36·4	92	—	—	e 12 47	+ 5	e 17·7	—
Irkutsk	49·0	307	e 8 42	- 2	e 15 20	-27	25·2	31·2
Florissant	55·2	70	e 9 30	0	i 17 11	- 1	—	—
St. Louis	55·4	70	e 9 31	- 1	i 17 14	- 1	32·8	—
Ekaterinburg	63·4	331	—	—	e 19 0	0	31·2	36·4
Pulkovo	67·1	349	e 9 22	-90	—	—	36·2	—
Samarkand	75·6	319	e 11 43	- 1	—	—	—	—
Baku	81·3	330	—	—	e 22 37	+ 7	41·2	54·6

Additional readings:—

Baku e = +28m.29s.

Long waves were also recorded at Honolulu T.H., Andijan, Kucino, Copenhagen, De Bilt, and Scoresby Sund.

Oct. 19d. Readings also at 0h. (near Sumoto), 1h. (near La Paz, near Tacubaya, and near Tyosi), 2h. (Mizusawa), 3h. (Bagnères and Lick), 6h. (La Paz, La Plata, and near Santiago), 7h. (Toledo and near Malaga), 8h. (Tyosi (2)), 10h. (La Paz), 12h. (Georgetown, Florissant, and St. Louis), 15h. (near Tyosi), 16h. (Baku, Tashkent, and near Reykjavik), 17h. (near Reykjavik (7)), 18h. (La Paz), 19h. (Tortosa), 21h. (Andijan, Samarkand, and Lick).

Oct. 20d. 2h. 7m. 47s. Epicentre 36°·3N. 136°·3E. (as on 18d.). X.

A = -·583, B = +·557, C = +·592.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Nagoya	1·2	155	e 0 16	- 1	0 33	+ 2	—	—
Toyooka	1·4	238	1 0 19	- 1	0 39	+ 3	—	0·6
Osaka	1·7	200	0 24	0	(0 49)	+ 5	0·8	1·3
Sumoto	2·2	210	e 0 36	+ 5	e 1 15	S*	—	—

Sumoto gives also iEN = +1m.4s.

Oct. 20d. Readings also at 1h. (near Tyosi), 3h. (Lick), 6h. (near Tacubaya), 7h. (Alicante), 10h. (Samarkand), 14h. (La Paz and Sucre), 18h. (Honolulu T.H.), 19h. (Baku, Ekaterinburg, Irkutsk, Manila, and Victoria), 20h. (near Tyosi), 23h. (Hong Kong, Manila, Zi-ka-wei, near Taihoku, and Hokoto), 23h. (Phu-Lien).

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Oct. 21d. 5h. 25m. 24s. Epicentre 33°1N. 132°3E. N.3.

A = -·564, B = +·620, C = +·546; D = +·740, E = +·673;
G = -·368, H = +·404, K = -·838.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Matuyama	0·8	27	e 0 11	0	i 0 20	- 1	—	0·4
Hukuoka	1·6	287	0 21	- 2	0 40	- 1	—	0·7
Nagasaki	2·1	260	0 31	+ 1	1 11	+17	—	—
Sumoto	2·5	60	0 32	- 4	1 9	+ 5	—	1·2
Kobe	2·9	57	0 45	+ 4	1 18	+ 4	—	1·4
Osaka	3·1	60	0 39	- 5	(1 24)	+ 4	1·4	2·0
Toyooka	3·3	40	i 0 47	0	e 1 19	- 6	—	1·5
Nagoya	4·4	60	1 0	- 3	1 43	-10	—	—

Toyooka gives also $iS = +1m.26s.$

Oct. 21d. 19h. 5m. 54s. Epicentre 36°5N. 23°5W. N.3.

A = +·737, B = -·321, C = +·595; D = -·399, E = -·917;
G = +·545, H = -·237, K = -·804.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Azores	2·1	305	3 18	?	—	—	—	3·9
Malaga	15·4	83	3 34	0	e 6 34	+10	e 8·4	—
Toledo	15·7	72	—	—	(e 6 38)	+ 7	e 6·6	—
Granada	15·9	82	i 3 44	+ 4	17 6	+30	i 8·1	11·6
Almeria	16·9	82	(5 26)	?	—	—	5·4	10·0
Alicante	18·3	77	—	—	e 7 55	+24	e 9·3	—
Kew	22·3	41	e 4 50	- 4	e 8 49	- 3	10·3	—
Stonyhurst	22·7	33	—	—	19 0	+ 1	—	12·8
Uccle	24·5	46	e 5 18	+ 3	e 9 37	+ 5	e 11·5	—
Dyce	25·1	28	—	—	e 9 42	- 1	—	—
De Bilt	25·5	43	—	—	e 10 3	+13	e 12·1	—
Strasbourg	25·8	52	e 5 6?	-21	—	—	e 12·1	—
Stuttgart	26·7	52	—	—	e 10 18	+ 8	—	—
Florence	27·4	64	(5 36)	- 6	e 5 36	P	—	12·1
Rocca di Papa	28·4	68	—	—	e 10 37	- 1	—	18·7
Copenhagen	30·9	40	—	—	11 16	- 2	18·1	—
Scoresby Sund	34·0	1	—	—	12 6?	- 0	—	—
Pulkovo	41·2	37	e 7 40	- 2	13 48	- 6	19·1	24·6
Kucino	45·0	44	—	—	e 15 18	+28	e 22·1	26·2
Baku	56·0	61	—	—	e 17 27	+ 4	26·1	—
Ekaterinburg	57·2	40	9 44	- 1	17 34	- 5	26·1	32·9

Additional readings :-

Granada $i = +7m.45s.$

Florence $P = 19h.3m.0s.$

Kucino $e = +10m.30s.$ and $+18m.36s.$

Long waves were also recorded at Irkutsk and Paris.

Oct. 21d. Readings also at 0h. (Rocca di Papa (2) and Rome), 6h. (Padova), 10h. (near Tyosi), 11h. (Batavia and Medan), 15h. (near Andijan and Samarkand), 19h. (near Santiago and near Tyosi).

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Oct. 22d. 18h. 6m. 5s. Epicentre 5°7S. 151°8E. (as on 1930 July 5d.). R.3.

A = -0.877, B = +0.470, C = -0.099; D = +0.473, E = +0.881;
G = +0.088, H = -0.047, K = -0.995.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Amboina	23.6	274	4 58	- 8	9 4	-12	—	—
Riverview	28.2	181	e 5 57	+ 8	e 10 28	- 7	e 14.1	17.6
Sydney	28.2	181	—	—	e 10 37	+ 2	14.2	16.3
Adelaide	31.7	200	e 6 15	- 5	i 11 25	- 6	i 15.2	19.1
Melbourne	32.7	189	—	—	i 11 37	- 9	16.2	19.4
Manila	36.7	305	i 7 3	- 1	12 3	-44	15.8	—
Wellington	41.1	153	7 43	+ 2	13 55	+ 2	20.9	—
Batavia	44.7	268	i 8 11	+ 1	i 14 51	+ 5	—	—
Hong Kong	46.3	309	8 22	- 1	15 5	- 4	e 21.1	24.1
Calcutta	68.1	297	19 12	S	(19 12)	-46	33.9	—
Irkutsk	70.6	332	e 11 12	- 2	e 20 21	- 7	35.9	38.4
Almata	83.0	315	e 12 28	+ 5	—	—	—	—
Andijan	85.8	312	e 12 37	0	e 22 57	[- 8]	—	—
Samarkand	89.6	311	e 13 19	+23	—	—	—	—
Berkeley	90.2	52	—	—	e 23 13	[-21]	e 43.4	46.5
Victoria	90.8	41	—	—	23 57	- 7	43.4	47.3
Ekaterinburg	95.4	327	13 21	- 1	23 50	[-13]	40.9	55.3
Baku	102.7	311	e 18 33	PP	e 27 47	PS	45.4	60.9
Pulkovo	110.3	333	e 19 8	PP	i 25 3	[-12]	50.9	65.4
Chur	127.7	326	e 19 9	[+ 7]	—	—	—	—
Zurich	127.8	327	e 19 13	[+10]	—	—	—	—
Florence	128.6	324	e 21 55	PP	—	—	57.9	66.9
Neuchatel	128.9	329	e 19 5	[0]	—	—	—	—
La Paz	134.7	121	e 19 23	[+ 9]	—	—	64.9	—

Additional readings:—

Riverview e = +10m.46s., i = +12m.53s.

Adelaide SSS = +13m.27s.

Melbourne i = +13m.55s.

Manila iZ = +8m.29s. = PP + 7s., iN = +10m.0s.

Wellington ePP = +9m.35s.

Berkeley eN = +23m.15s., eE = +41m.52s.

Victoria S?E = +23m.32s. = SKS - 5s.

Ekaterinburg ePP = +17m.15s., PPS = +26m.15s., SS = +31m.19s.

Pulkovo ePS = +28m.17s.

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

Oct. 22d. Readings also at 3h. (Strasbourg, near Chur, Neuchatel, Zurich, and near Zagreb), 4h. (Samarkand and near Matuyama), 6h. (near Zagreb), 17h. (Andijan (2), Samarkand, Baku, Ekaterinburg, and Kaara), 19h. (La Paz), 20h. (La Paz, St. Louis, and Tacubaya), 21h. (La Plata), 22h. (near Zagreb), 23h. (Andijan).

Oct. 23d. 8h. 56m. 0s. Epicentre 14°5S. 179°5W. N.3.

A = -0.968, B = -0.008, C = -0.250; D = -0.009, E = +1.000;
G = +0.250, H = +0.002, K = -0.968.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Suva	4.2	209	-1 0?	?	2 0?	+12	—	—
Wellington	27.3	189	e 5 50	+ 9	11 27	SS	14.0	15.0
Christchurch	29.8	191	e 5 56	- 7	e 11 50	+49	18.4	20.5
Riverview	32.8	230	e 6 24	- 6	i 11 38	-12	e 15.4	18.2
Sydney	32.8	230	e 11 12	S	(e 11 12)	-36	17.3	18.7
Melbourne	39.1	228	8 35	PP	i 13 42	+20	i 16.2	23.3
Honolulu T.H.	41.6	31	—	—	e 14 0	0	e 17.0	—
Adelaide	42.8	235	—	—	14 10	- 8	18.7?	23.5
Perth	61.0	242	i 18 25	S	(i 18 25)	- 4	i 30.7	—
Manila	65.6	295	i 10 46	+ 4	i 16 10?	?	20.6	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
Batavia	72.7	270	e 12 10	+43	i 22 25	?	—	—
Hong Kong	74.6	300	12 12	+34	21 44	+29	40.6	—
Berkeley	74.9	43	e 10 35	-65	e 21 5	-14	e 31.0	32.7
Victoria	80.2	35	—	—	22 2	-16	37.4	42.3
Tucson	80.5	53	e 11 52	-18	e 22 10	-11	e 32.8	—
Irkutsk	93.2	323	e 13 17	+ 5	e 23 29	[-22]	45.0	61.0
Florissant	N. 98.4	50	e 1 7	?	—	—	—	46.0
St. Louis	N. 98.8	50	e 1 5	?	—	—	e 39.5	—
Colombo	102.0	274	21 34	PPPP	—	—	—	64.0
La Paz	105.5	110	20 52	PPP	—	—	48.1	57.9
Harvard	E. 113.2	47	e 19 30	PP	—	—	e 58.0	—
Ekaterinburg	118.2	327	e 19 9	[+28]	e 28 3	?	47.0	65.5
Kucino	129.7	333	e 19 8	[+ 2]	—	—	55.8	80.2
Pulkovo	129.7	340	e 19 53	[+47]	—	—	62.0	69.7
Baku	129.9	311	e 20 1	[+54]	—	—	52.0	84.3
Helsingfors	N. 131.0	344	e 24 52	?	e 31 12	SKSP	e 65.0	—
Copenhagen	137.7	349	—	—	e 39 0?	SS	70.0	—
Hamburg	140.2	351	e 22 0?	PP	—	—	—	—
De Bilt	142.2	354	i 19 23	[- 2]	e 20 49	?	e 67.0	80.2
Göttingen	Z. 142.2	351	e 20 0?	[+35]	—	—	—	—
Ksara	E. 142.6	308	(19 26)	[- 0]	19 26	PKP	—	—
Kew	143.0	1	e 19 21	[- 6]	—	—	73.0	—
Cheb	143.1	346	—	—	e 57 0?	?	e 81.0	87.0
Uccle	143.5	356	19 24	[- 5]	—	—	e 68.0	—
Budapest	143.6	338	19 25	[- 4]	—	—	e 75.0	—
Stuttgart	145.0	349	e 19 29	[- 5]	—	—	e 69.0	86.0
Strasbourg	145.4	350	i 19 29	[- 6]	—	—	e 44.0	—
Paris	145.6	357	e 19 31	[- 4]	—	—	74.0	104.0
Zagreb	146.1	340	e 19 30	[- 6]	—	—	—	—
Treviso	147.3	342	19 37	[- 1]	—	—	—	—
Florence	149.3	343	19 0	[- 41]	—	—	—	66.0
Rocca di Papa	150.7	341	e 19 41	[- 2]	—	—	e 85.0	98.0
Granada	157.0	8	i 20 11	[+21]	—	—	e 75.0	84.2
Algiers	157.5	355	—	—	30 17	?	81.0	92.0

Additional readings:—

Christchurch PS? = +12m.46s.
 Riverview ePE = +6m.33s., iSSN = +13m.16s., SSSSN = +14m.6s.
 Sydney iS = +15m.12s.
 Adelaide i = +17m.22s. = SS +13s.
 Perth iS = +25m.20s.
 Hong Kong +12m.31s.
 Berkeley ePN = +10m.38s., ePPN = +14m.29s., eSSN = +27m.38s.
 Tucson e = +15m.38s. = PP +30s. and +20m.47s.
 Irkutsk e = +18m.1s. and +30m.0s. ? = SS -25s.
 Ekaterinburg e = +36m.30s.
 Kucino e = +22m.36s., +25m.56s., and +30m.22s.
 Pulkovo i = +22m.31s., e = +33m.23s., and +39m.8s.
 Baku e = +22m.36s., +26m.18s., and +39m.17s.
 Ksara ePE = +18m.30s.
 Kew eZ = +20m.49s., eEN = +30m.33s., iEN = +53m.53s.
 Stuttgart eZ = +22m.7s., eE = +40m.30s.
 Strasbourg e = +22m.8s. and +29m.0s. ?
 Zagreb e = +19m.41s. and +24m.0s. ?
 Rocca di Papa e = +19m.21s.
 Granada i = +20m.30s., +27m.12s., and +31m.50s.
 Long waves were also recorded at Bombay, Tananarive, Chicago, Sitka, Ivigtut, Scoresby Sund, and several other European stations.

Oct. 23d. Readings also at 2h. (Stonyhurst, near Matuyama, and Sumoto), 8h. (Irkutsk and Wellington), 9h. (Ekaterinburg and Harvard), 11h. (Wellington) 13h. (Catania), 16h. (near Sumoto), 17h. (Catania), 19h. (Chur and near Malaga), 20h. (Catania, Florence, Mineo, near Mizusawa, and Tyost), 21h. (Baku, Ekaterinburg, Irkutsk, Tashkent, near Almata, Andjan, and Samarkand, Zurich, Treviso, Catania (4), near Chur, Neuchatel, Padova, Zagreb, and near Santiago), 23h. (Padova).

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Oct. 24d. 0h. 51m. 37s. Epicentre 44°·5N. 11°·0E. (as on 1929 Oct. 22d.). R.2.

A = +·700, B = +·136, C = +·701; D = +·191, E = -·982;
G = +·688, H = +·134, K = -·713.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Florence	0·7	166	0 10	0	—	—	—	—
Padova	1·1	35	e 0 10	- 6	i 0 26	- 2	—	—
Piacenza	1·1	300	0 15	- 1	(0 32)	+ 4	0·5	0·8
Venice	1·3	45	e 0 16	- 2	0 38	+ 5	—	—
Treviso	1·4	36	0 16	- 4	e 0 41	+ 5	—	1·4
Chur	2·6	337	e 0 33	- 4	e 1 14	S*	—	—
Rome	2·8	157	e 0 43	+ 3	—	—	—	1·9
Laibach	2·9	58	e 0 42	+ 1	e 1 26	S*	—	1·7
Rocca di Papa	3·0	154	e 0 42	- 1	—	—	—	2·3
Zurich	N. 3·3	330	e 0 42	- 5	e 1 37	+S*	—	—
Ravensburg	3·4	344	e 0 55	+ 6	i 1 25	- 2	e 1·6	—
Neuchatel	N. 3·7	313	e 0 48	- 5	e 1 36	+ 1	—	—
Graz	4·1	50	e 1 5	+ 7	e 1 59	S*	—	2·3
Stuttgart	4·4	345	e 1 12	+ 9	—	—	i 2·4	3·1
Naples	E. 4·4	146	e 2 0	S	(e 2 0)	+ 7	(e 2·6)	—
Strasbourg	4·6	336	1 11	+ 5	2 20	S*	—	—
Karlsruhe	4·8	340	1 41	P _r	2 19	S*	e 2·6	2·9
Puy de Dôme	5·8	285	—	—	e 2 52	S*	—	—
Budapest	6·3	59	3 13	S*	—	—	—	—
Jena	E. 6·4	4	e 1 59	P _r	e 3 5	S*	—	3·6
Potsdam	8·0	9	—	—	e 3 35	+11	—	10·9
Pulkovo	19·2	31	e 3 51	-30	—	—	—	—

Additional readings and notes :-

Florence P_r = +16s.

Laibach e = +44s. and +1m.7s.

Rocca di Papa e_r = +29s., eP = +49s.

Zurich eP_r = +56s.

Ravensburg eP_rN = +1m.2s., iN = +1m.11s.

Neuchatel eP_r = +1m.2s.

Stuttgart i = +1m.19s. and +1m.25s., iP_rN = +1m.29s., iNZ = +2m.6s., iE = +2m.19s.

Naples gives S as P and L as S.

Strasbourg P_r = +1m.23s., SS = +2m.26s., SSS = +2m.40s.

Potsdam eEN = +3m.59s. = S*, iEN = +4m.50s., eEN = +5m.5s., iE = +9m.2s., i = +9m.12s.

Long waves were also recorded at Ekaterinburg, Tashkent, and several other European stations.

Oct. 24d. 10h. 47m. 16s. Epicentre 10°·3N. 42°·7E.

N.2.

A = +·723, B = +·667, C = +·179; D = +·678, H = -·735;
G = +·131, H = +·121, K = -·984.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Helwan	22·2	333	e 4 51	- 2	8 57	+ 7	—	14·1
Ksara	24·3	346	e 5 15	+ 2	9 36	+ 8	11·4	—
Tananarive	29·6	170	—	—	12 3	SS	15·1	18·7
Bombay	30·4	70	7 12	PP	11 17	+ 7	14·0	15·3
Baku	30·7	10	i 6 13	+ 2	i 11 14	- 2	14·7	21·3
Samarkand	36·4	32	e 6 59	- 2	—	—	—	—
Delra Dun	38·4	54	13 54	S	(13 54)	+42	20·1	24·7
Tashkent	38·8	32	17 23	+ 1	e 13 19	+ 1	21·2	21·6
Andijan	40·9	37	e 7 22	-12	e 14 52	+73	e 23·4	—
Rocca di Papa	41·0	326	e 9 26	PP	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Rome	41.2	326	e 8 50	PP	11 2	?	—	—
Almata	44.4	37	e 9 46	PP	—	—	—	—
Calcutta	45.3	69	15 6	S	(15 6)	+11	29.1	—
Kucino	45.6	357	e 8 15	- 3	14 49	-10	21.5	27.9
Alicante	47.6	315	—	—	19 20	SS	30.9	—
Strasbourg	48.1	330	e 9 44?	+67	(15 44?)	+10	15.7	—
Almeria	48.4	312	e 8 40	+ 1	—	—	25.2	33.4
Ekaterinburg	48.6	13	i 8 40	- 1	i 15 40	- 1	21.7	31.3
Granada	49.5	312	i 8 50	+ 3	e 16 12	+18	i 27.6	29.4
Malaga	49.9	311	e 9 0	+ 9	16 4	+ 5	26.8	—
Pulkovo	50.3	354	i 8 52	- 2	e 16 4	- 1	25.7	30.0
Copenhagen	51.2	340	—	—	16 20	+ 2	24.7	—
Helsingfors	51.5	350	—	—	e 16 23	+ 1	e 27.2	—
De Bilt	51.6	332	—	—	e 16 32	+ 9	e 29.7	—
Irkutsk	64.7	37	e 10 34	- 3	e 19 2	-14	e 32.7	38.6

Additional readings :—

Tananarive SS = +13m.9s.

Dehra Dun S = +16m.54s.

Calcutta S = +22m.8s.

Granada i = +10m.47s. = PP + 12s. and +20m.5s.

Copenhagen +20m.2s.

Helsingfors eE = +18m.41s. = ScS - 13s., eSSE = +20m.14s.

Long waves were also recorded at La Paz, Algiers, and other European stations.

Oct. 24d. 20h. 15m. 11s. Epicentre 18° 3N. 146° 8E. N.1.

Probable error of epicentre $\pm 0^{\circ}.2$.

A = -.794, B = +.520, C = +.314; D = +.548, E = +.837;
G = -.263, H = +.172, K = -.949.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Titizima	9.8	335	2 14	- 4	4 0	- 8	—	—
Hatidyozima	16.0	338	3 39	- 2	—	—	—	—
Mera	17.7	341	4 2	- 1	7 23	+ 6	—	—
Siomisaki	18.0	329	3 57	-10	7 14	-11	—	—
Misima	18.2	339	4 8	- 1	7 30	+ 1	—	—
Tyosi	18.2	345	4 8	- 1	—	—	7.5	8.0
Numadu	18.2	339	4 16	+ 7	7 32	+ 3	—	—
Yokohama	18.3	341	4 9	- 1	—	—	—	—
Tokyo	18.4	342	4 12	+ 1	7 39	+ 6	—	—
Muroto	18.7	325	4 17	+ 2	7 38	- 2	—	—
Kakioka	18.8	343	4 17	+ 1	7 37	- 5	—	—
Mito	18.9	344	4 17	0	7 48	+ 4	—	—
Nagoya	19.0	335	4 17	- 2	8 4	SS	11.6	25.1
Kumagaya	19.0	341	4 18	- 1	7 47	+ 1	—	—
Osaka	19.2	331	4 20	- 1	(7 52)	+ 2	7.9	8.2
Gihu	19.2	335	4 22	+ 1	8 1	+11	—	—
Sumoto	19.2	329	i 4 21	0	7 48	- 2	—	7.9
Koti	19.3	325	i 4 23	+ 1	e 7 52	0	—	10.9
Kobe	19.4	330	4 22	- 1	7 56	+ 2	—	8.1
Miyazaki	19.4	317	4 24	+ 1	8 5	+11	—	—
Oiwake	19.4	340	4 22	- 1	7 58	+ 4	—	—
Kagosima	19.8	316	4 26	- 1	8 2	0	—	—
Matuyama	20.0	324	i 4 28	- 2	(i 8 9)	+ 3	i 8.1	—
Oita	20.2	321	4 32	0	8 16	+ 6	—	—
Hukusima	20.2	345	4 33	+ 1	8 4	- 6	—	—
Toyooka	20.2	331	i 4 30	- 2	8 8	- 2	—	—
Kumamoto	20.5	318	4 36	+ 1	8 19	+ 3	—	—
Sendai	20.6	347	4 37	+ 1	8 22	+ 4	—	—
Wazima	20.9	338	4 44	+ 5	8 36	+12	—	—
Nagasaki	21.0	317	4 38	- 2	8 27	+ 1	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	.	.	m. s.	s.	m. s.	s.	m.	m.
Hamada	21.1	325	4 43	+ 2	8 29	+ 1	—	—
Hukuoka	21.1	319	i 4 43	+ 2	i 8 34	+ 6	—	—
Mizusawa	21.4	348	4 45	+ 1	8 40	+ 6	—	—
Morioka	22.0	348	4 51	+ 0	8 49	+ 3	—	—
Akita	22.1	347	4 55	+ 3	9 0	+12	—	—
Husan	23.0	320	5 0	- 1	9 3	- 2	—	—
Urakawa	24.1	352	5 13	+ 2	9 30	+ 5	—	—
Taihoku	24.3	290	e 5 18	+ 5	(9 15)	-13	9.2	10.3
Nemuro	25.0	359	5 21	+ 1	9 47	+ 6	—	—
Manila	25.0	265	i 5 24	+ 4	i 9 40	- 1	i 12.1	17.1
Zi-ka-wei	26.3	304	5 35	+ 3	9 59	- 4	—	13.9
Otomari	28.5	354	i 5 52	+ 0	(10 36)	- 4	10.6	16.8
Amboina	28.6	222	i 4 56	-57	11 25	+43	21.3	—
Hong Kong	30.8	284	6 11	- 1	11 9	- 8	14.0	16.4
Chiufeng	E. 34.2	318	6 39	- 3	i 12 2	- 7	15.6	21.2
Phu-Lien	37.9	282	i 7 17	+ 3	i 13 6	+ 1	17.8	21.5
Malabar	46.3	241	i 8 34	+11	15 8	- 1	—	—
Batavia	46.4	243	i 8 25	+ 1	15 10	- 0	23.8	—
Irkutsk	47.4	327	i 8 33	+ 1	15 23	- 1	22.8	29.5
Suva	47.9	139	7 49†	-46	14 31†	-60	21.8	—
Medan	49.2	260	i 8 48	+ 3	i 15 53	+ 3	—	—
Honolulu T.H.	59.0	77	e 9 7	+ 1	i 16 26	- 2	i 23.4	—
Riverview	59.3	176	e 9 9	+ 0	i 16 30	- 3	e 23.1	28.3
Sydney	52.3	176	—	—	i 15 7	-86	23.8	25.3
Adelaide	53.8	189	i 9 20	+ 0	i 16 50	- 3	i 25.1	29.2
Calcutta	54.5	286	9 58	+33	17 29	+27	23.1	33.4
Melbourne	56.1	182	9 47	+10	17 24	- 0	26.0	31.8
Perth	58.3	211	i 9 49	- 3	i 17 49	- 4	27.0	—
Dehra Dun	62.9	297	11 9	+44	19 39	+45	30.1	35.8
Almata	63.0	311	10 28	+ 3	18 55	0	25.3	—
Agra	E. 63.3	293	10 22	- 5	18 37	-22	32.5	38.7
Hyderabad	N. 63.3	293	e 9 44	-43	18 41	-18	32.9	35.6
Wellington	64.6	281	10 11	-25	18 46	-29	31.9	41.5
Coolombo	65.0	158	10 35	- 4	19 14	- 6	33.8	37.8
	66.0	271	10 38	- 7	19 24	- 8	27.6	34.2
Christchurch	66.2	160	—	—	19 30	- 5	31.0	—
Andijan	66.5	309	10 51	+ 2	19 38	- 1	34.8	—
Kodaikanal	67.3	275	19 31	S	(19 31)	-17	35.4	39.7
Sitka	68.1	35	—	—	i 19 53	- 5	i 30.3	—
Tashkent	68.8	310	i 11 5	+ 2	e 20 49†	(- 7)	27.8	44.9
Bombay	69.5	285	11 6	- 2	19 36	-39	36.0	41.2
Samarkand	70.7	309	11 17	+ 2	20 22	- 8	34.8	—
Ekaterinburg	72.6	326	i 11 28	+ 2	i 20 47	- 5	31.8	44.8
Victoria	76.3	42	11 48	0	21 34	- 1	34.4	39.8
Berkeley	79.5	52	e 12 5	0	22 1	- 9	e 35.8	49.6
Lick	80.2	52	e 12 9	0	—	—	e 34.9	—
Kucino	85.0	329	12 34	+ 1	22 50	[- 9]	29.8	51.7
Saskatoon	85.3	37	i 12 39	+ 4	i 22 58	[- 3]	—	—
Pulkovo	86.7	334	i 12 40	- 2	23 0	[-11]	41.8	50.8
Helsingfors	88.6	335	e 12 51	0	i 23 26	[+ 2]	e 42.8	—
Tucson	90.2	55	i 13 2	+ 4	i 23 31	[- 3]	e 36.5	—
Scoresby Sund	90.9	356	13 15	+13	i 23 56	+13	38.8	—
Theodosia	91.2	320	13 4	+ 1	23 36	[- 4]	43.8	58.6
Upsala	91.7	338	e 12 59	- 6	i 24 2	-10	e 42.8	54.8
Denver	91.7	47	i 12 59	- 6	i 23 28	[-15]	—	45.3
Simferopol	92.2	320	13 9	+ 1	23 37	[- 9]	—	—
Yalta	92.3	320	13 9	+ 1	23 37	[- 9]	44.8	—
Sebastopol	92.6	320	e 13 7	- 2	23 39	[- 9]	—	—
Königsberg	93.9	332	e 13 28	+13	i 24 10	[+ 4]	e 43.8	54.7
Bergen	96.1	342	14 19	+58	24 53	+10	31.8	52.8
Lemberg	E. 95.2	326	e 13 27	+ 6	e 23 53	[- 9]	e 49.6	52.3
	N. 95.2	326	e 13 31	+10	e 23 56	[- 6]	50.0	52.3
Ksara	96.0	310	e 13 22	- 3	i 24 0	[- 6]	40.8	—
Lund	96.3	336	13 34	+ 8	24 37	[+12]	—	—
Copenhagen	96.6	336	13 26	- 2	24 40	[+13]	44.8	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	Δ	Δ	m. s.	s.	m. s.	s.	m.	m.
Potsdam	98-7	334	e 13 49	+11	i 24 8	[-11]	e 48-8	55-4
Hamburg	99-1	337	e 13 38	-1	—	—	e 47-8	66-0
Budapest	99-3	327	e 13 51	+11	i 24 12	[-10]	e 40-8	55-8
Prague	99-8	331	e 13 4	-39	i 24 23	[-2]	e 48-8	52-8
Dyce	100-1	345	e 17 38	PP	i 24 17	[-9]	e 37-5	55-1
Vienna	100-1	330	e 13 45	+1	e 24 8	[-18]	e 48-0	62-8
Belgrade	100-2	324	e 13 53	+9	e 24 24	[-3]	e 42-2	59-1
Jena	100-4	335	e 13 49	+4	e 24 13	[-15]	e 38-8	56-1
Cheb	100-7	332	e 17 4	?	e 26 53	PS	e 49-4	52-8
Göttlingen	100-7	336	i 14 9	+22	i 25 16	-17	e 46-8	59-4
Graz	101-3	329	e 17 9	?	i 25 25	-13	e 46-8	64-6
Helwan	101-4	308	e 13 59	+9	i 24 25	[-8]	—	63-0
Edinburgh	101-6	344	—	—	i 32 33	SS	e 44-8†	—
Chicago	101-7	38	e 14 6	+15	e 25 34	-7	e 41-8	—
Florissant	101-8	42	i 13 53	+1	i 24 29	[-5]	e 41-8	50-8
Zagreb	102-0	328	e 13 49†	-4	e 24 26	[-9]	e 49-3	55-5
St. Louis	102-0	42	e 13 52	-1	i 24 29	[-6]	e 42-5	—
De Bilt	102-1	337	i 18 6	PP	e 24 30	[-6]	e 47-8	52-4
Feldberg	N. 102-3	336	i 18 10	PP	i 24 26	[-11]	e 48-8	59-9
Innsbruck	103-1	331	e 17 1	?	(24 27)	[-14]	e 55-1	63-5
Stonyhurst	103-1	342	—	—	i 24 34	[-7]	e 45-8	56-6
Stuttgart	103-1	334	e 13 56	-2	i 25 39	-15	e 49-8	61-3
Karlsruhe	103-2	334	e 18 13	PP	e 24 40	[-1]	e 49-8	—
Uccle	103-4	337	e 14 1	+2	i 24 36	[-6]	e 47-8	62-1
Ann Arbor	103-6	36	e 14 13	+13	i 24 37	[-6]	e 47-2	58-5
Bidston	103-7	342	e 13 53	8	e 24 37	[-7]	e 49-8	57-5
Strasbourg	103-8	334	e 13 58	-3	e 24 34	[-10]	e 44-8	71-8
Treviso	104-0	330	e 17 9	?	i 24 36	[-9]	e 51-8	61-8
Venice	104-1	329	—	—	35 11	?	—	—
Tananarive	104-2	256	e 16 58	?	e 24 37	[-9]	e 49-8	52-8
Naples	K. 104-3	325	e 18 26	PP	e 25 26	[+1]	e 55-8	63-8
Padova	104-3	330	e 18 22	PP	i 24 42	[-4]	—	—
Chur	104-4	333	e 14 0	-4	—	—	—	—
Zurich	104-4	333	e 14 2	-2	—	—	—	—
Kew	104-6	340	e 14 23	+18	i 25 52	[+24]	e 42-8	51-4
Oxford	E. 104-6	341	e 17 40	PP	i 25 50	[+22]	e 46-7	60-2
	N. 104-6	341	e 18 34	PP	i 24 39	[-9]	e 49-3	63-6
Toronto	105-0	32	i 14 18	+12	i 24 40	[-10]	e 51-7	—
Tacubaya	105-1	64	e 18 28	PP	e 27 47	PS	e 48-1	—
Neuchatel	105-4	334	e 14 7	-2	—	—	—	—
Ottawa	105-5	29	e 14 25	-16	i 24 46	[-6]	e 43-2	—
Piacenza	105-6	331	e 18 35	PP	i 25 58	[+23]	e 48-2	59-5
Paris	105-7	337	e 14 49	+39	—	—	e 49-8	51-8
Florence	105-8	329	e 13 29	-59	e 24 39	[-15]	—	—
Trenta	106-1	321	e 18 19	[+14]	e 28 19	PS	—	64-8
Livorno	106-4	330	e 18 44	?	e 25 47	[+6]	—	—
Rocca di Papa	106-5	326	—	—	i 24 48	[-9]	e 52-8	66-8
Fuy de Dôme	108-0	335	e 18 29	[+18]	—	—	e 45-8	—
Catania	108-0	320	e 18 57	PP	e 26 22	[+29]	e 54-1	67-8
Marselles	108-9	332	e 14 35	+9	e 29 0	?	e 64-8	—
Charlottesville	109-4	35	—	—	e 26 40	[+37]	e 54-8	—
Georgetown	109-8	34	e 14 26	+4	e 28 4	PS	e 47-8	—
Fordham	109-9	30	e 14 30	-1	i 25 4	[-9]	e 49-2	—
Harvard	110-0	38	e 14 49†	+18	i 26 46	[+39]	e 44-8	—
Barcelona	111-9	331	e 19 8	PP	e 28 36	PS	e 42-4	60-9
Tortosa	113-1	333	e 19 26	PP	e 29 49	?	e 53-8	66-0
Algiers	115-1	329	e 15 0	+4	e 29 8	PS	e 46-8	60-8
Alicante	115-6	332	e 19 18	PP	—	—	e 37-5	61-0
Toledo	115-8	335	e 15 7	+8	e 26 49	[+1]	e 45-1	63-7
Almeria	117-6	333	e 18 39	[0]	e 31 24	?	e 56-1	59-3
Granada	117-9	334	e 18 34	[-6]	—	?	e 57-6	64-5
Malaga	118-6	334	e 19 9	[+17]	e 31 39	?	e 37-8	59-6
San Fernando	119-6	335	e 17 49	[-56]	e 35 49	SS	e 60-3	71-3

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m.	s.	m.	s.	m.	s.	m.	m.
Port au Prince	126.8	46 e	19 27	[+27]	—	—	63.0	—
Dakar	143.6	334 e	19 40	[+11]	e 30 50	?	48.9	75.3
La Paz	146.7	90 i	19 41	[+4]	26 52	?	174.0	108.9
Sucre	149.7	93 i	19 52	[+11]	—	—	—	—
La Plata	152.5	132	20 1	[+16]	—	—	72.8	—
Rio de Janeiro	169.6	118 e	20 1	[-3]	i 29 57	?	i 45.2	—

Additional readings and notes:—

Kobe i = +4m.48s.

Toyooka iEN = +4m.35s., iZ = +4m.44s., SNZ = +8m.11s.

Nagasaki SS = +8m.50s.

Hukuoka iPP = +5m.15s.

Taihoku iPE = +5m.24s., eSE = +6m.17s.

Zi-ka-wei PPE = +6m.19s., PPPPE = +6m.33s., PPPPE? = +6m.41s., iE = +7m.13s. and +8m.11s., SSN? = +11m.23s., SSSN = +11m.49s., SSSSN = +11m.57s.

Amboina i = +5m.47s.

Hong Kong PP = +7m.6s., i = +10m.40s., SS = +12m.41s.

Chiufeng iE = +6m.54s.

Phu-Lien iSSS = +15m.51s.

Honolulu T.H. iP = +9m.13s., iPP = +11m.31s., iSS = +18m.42s., iSSS = +20m.57s.

Riverview iPNZ = +9m.12s., iPcPN = +10m.29s., PPE = +11m.24s., PPPN = +12m.12s., PPPPN = +12m.25s., PSEN = +16m.46s., iScSE = +19m.2s., SsSN = +19m.5s., SSSSE = +22m.28s.

Adelaide i = +11m.49s. = PP + 34s., iS = +16m.54s. = PS - 1s., i = +19m.9s. = SsS - 1s., iSSS = +22m.55s., iSSSS = +23m.24s., i = +24m.1s.

Melbourne i = +21m.9s. = SS + 3s.

Perth SS = +22m.39s., SSS = +22m.59s.

Wellington PP = +12m.3s., SS = +23m.49s.?, +26m.49s.?

Sitka ePP = +13m.57s., iSS = +24m.27s., iSSS = +26m.54s.

Berkeley iPN = +12m.8s., iPPE = +15m.13s., iPPPE = +17m.2s., iPPPPE = +18m.12s., eSEN = +22m.6s., eSSE = +28m.6s., eSSSE = +33m.13s.

Lick eN = +12m.12s., eE = +12m.15s.

Helsingfors eZ = +13m.15s., ePP = +16m.21s., eE = +19m.50s. = PPPP + 22s., iSKSEN = +23m.14s., iSE = +23m.30s., SZ = +23m.34s., eZ = +23m.53s., ePPEN = +24m.51s. = PS + 16s., eSSEN = +29m.27s., eEN = +36m.15s.

Tucson ePP = +16m.7s., iPS = +24m.6s. = S + 8s., eSS = +30m.34s.

Scoreby Sund +16m.19s. = PP - 14s., +25m.2s. = PS + 0s., eE = +21m.1s., SKS = +23m.19s., SS = +29m.49s.?

Upsala PP = +16m.39s., iSKS = +23m.30s., SKKS = +23m.54s., i = +24m.15s.

Denver ePSN = +25m.21s.

Königsberg ePPE = +17m.23s., iEN = +23m.46s. = SKS - 9s., iSN = +24m.16s. = SKKS + 10s., iPSE = +25m.28s., iE = +29m.45s., eEN = +31m.38s.

Bergen PP = +18m.6s.

Lund +17m.20s. = PP + 5s., i = +23m.59s. = SKS - 9s., e = +24m.20s., and +25m.5s., PS = +26m.2s., SS = +31m.5s.

Copenhagen eZ = +16m.37s., PP = +17m.23s., eZ = +18m.19s. and +19m.43s., SKS = +24m.1s., PS = +26m.4s., SS = +31m.9s.

Potsdam iPPN = +17m.37s., iPPEN = +17m.41s., iEN = +17m.49s.?, iE = +18m.26s., iN = +18m.34s., iE = +19m.2s., iE = +19m.39s., iEN = +23m.49s.?, iSN = +24m.11s., iE = +26m.11s. = PS - 20s., eN = +26m.19s., iSSEN = +31m.11s., iEN = +31m.46s.

Hamburg iPPZ = +17m.41s., iPSZ = +26m.30s.

Budapest i = +17m.51s.

Prague ePP = +17m.49s., ePPP = +19m.44s., SKKS = +25m.13s., ePS = +26m.43s., eSS = +32m.7s.

Dyce i = +25m.11s. = S - 16s., +26m.50s. = PS + 4s., and +31m.49s.

Vienna PKP = +17m.3s., PP = +18m.45s., PKP = +20m.17s., PPP = +21m.47s., SKKS = +25m.17s., PS = +26m.51s., PPP? = +33m.2s., SSS = +41m.51s.

Belgrade e = +18m.6s., +20m.52s., and +26m.46s. = PS - 2s.

Jena iE = +17m.49s., iNZ = +17m.52s. = PP + 6s., e = +24m.19s., eNE = +26m.49s. = PS - 1s., eN = +32m.7s. = SS + 0s., eE = +32m.9s., eZ = +32m.13s.

Cheb e = +17m.55s. = PP + 7s., +24m.24s. = SKS + 5s., +25m.20s. = S - 13s., +32m.18s. = SS + 7s. and +41m.43s.

Göttingen eEN = +16m.55s., iPP = +17m.54s., iSKS = +24m.22s., iPPSEN = +26m.47s., iSSEN = +32m.14s.

Graz i = +20m.41s.

Chicago ePP = +18m.3s., iSKS = +24m.29s., ePS = +27m.0s., iPS = +27m.10s., iSS = +32m.42s.

Florissant iPKPZ = +17m.51s., iPPZ = +18m.11s., iSKKSEN = +24m.57s., iN = +25m.29s., iPSEN = +27m.11s.

Zagreb e = +17m.12s., +18m.3s. = PP + 5s., +18m.19s., and +25m.4s. = SKKS - 4s., ePS = +25m.29s., e = +26m.26s., and +28m.2s., eSS = +30m.14s., eNW = +30m.36s., e = +31m.25s., and +32m.19s. = SS - 10s., eSSS = +33m.40s., eNE = +35m.49s.?, eSSSSNW = +36m.42s.

Continued on next page.

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St. Louis eEN = +17m.28s., iPSEN = +27m.12s.
 De Bilt eZ = +26m.58s. = PS - 10s.
 Feldberg iN = +25m.34s. = S - 13s. and +32m.38s. = SS + 4s., eN = +33m.13s., +40m.26s., and +43m.16s.
 Innsbruck i = +18m.31s. = PP + 25s., ePS? = +32m.43s. = SS - 1s.; SKS is given as PPP.
 Stonyhurst PP? = +18m.14s., PPS = +28m.7s., SS = +33m.17s.
 Stuttgart iPZ = +14m.16s., iPPZ = +17m.56s., ePPEN = +18m.4s., ePPPZ = +20m.19s., ePPPEN = +20m.39s., iSKSEN = +24m.31s. and +24m.52s., i = +25m.59s. = S + 5s., iPS = +27m.12s., iPPSEN = +28m.1s., iSSEN = +32m.50s., iSSZ = +33m.4s.
 Ucle PP = +18m.15s., SKKS = +25m.35s., iPS = +27m.15s., SS = +32m.52s.
 Ann Arbor eN = +17m.43s., e = +18m.25s. = PP + 15s., i = +27m.25s. = PS + 2s., e = +33m.1s. = SS + 10s.
 Bidston PP = +18m.29s.
 Strasbourg iPP = +18m.17s., ePPP = +20m.37s., SKKS = +25m.19s., PS = +27m.18s., SS = +32m.58s.
 Tananarive PP = +18m.32s., e = +20m.24s. = PPP + 4s., i = +24m.41s., iPS = +27m.28s., PPS = +28m.20s., eSS = +33m.23s., e = +35m.59s., SSS = +37m.51s., e = +43m.9s.
 Chur ePP = +18m.21s., eSS = +33m.9s.
 Zurich ePKP = +17m.23s., ePP = +18m.20s., eSS = +33m.10s.
 Kew ePP = +18m.8s., ePPPEN = +20m.33s., iSKSEN = +24m.38s., iPSEN = +27m.26s., iSSEN = +33m.14s.
 Oxford eE = +22m.57s., iN = +27m.14s.
 Toronto iEN = +17m.16s., PSN = +27m.48s., PPSN = +28m.21s., SSN = +33m.54s.; T₀ = 20h.14m.51s.
 Neuchatel ePP = +18m.32s., eSS = +33m.24s.
 Ottawa PPN? = +17m.55s., PKP - 8s., i = +18m.32s. = PP + 8s., e = +27m.41s. = PS - 2s., i = +34m.7s.
 Piacenza e = +17m.9s.
 Paris iPP = +18m.17s., eSS = +27m.41s. = PS - 4s.
 Florence iPP = +17m.49s.
 Rocca di Papa e = +17m.17s. and +17m.45s., i = +18m.45s. and +26m.13s.
 Marseilles e = +19m.49s.
 Charlottesville PS = +28m.39s.
 Georgetown iPP = +19m.0s.; T₀ = 20h.14m.48s.
 Fordham iPKPZ = +18m.19s. = PKP + 2s., iPS = +28m.30s., iSS = +34m.28s.
 Harvard iPP = +18m.58s., iSKS = +25m.8s., iPS = +28m.28s., eSS = +34m.19s., eSSS = +38m.4s.
 Algiers PP = +19m.41s.
 Toledo PP = +19m.14s.
 Almeria i = +19m.16s. and +20m.13s.
 Granada i = +19m.52s. = PP - 2s., iPKP = +20m.22s., PP = +21m.2s., i = +32m.31s. = PPP + 13s., PPP = +23m.6s., PS = +31m.10s., G = +45m.10s.
 Malaga P = +19m.55s. = PP - 4s.
 La Paz iPPZ = +23m.18s., iZ = +24m.15s., SKSE = +27m.0s., PPSZ = +36m.0s., SSZ = +41m.52s., SSSN = +47m.45s.
 Rio de Janeiro ePE = +20m.4s., PP = +24m.0s.

Oct. 24d. 22h. 21m. 57s. Epicentre 36° 2N. 139° 6E. N.3.
 (given in Seismometrical Report of the Earthquake Research Institute).

A = -·615, B = +·523, C = +·591; D = +·648, E = +·762;
 G = -·450, H = +·383, K = -·807.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m.	s.	m.	s.	m.	s.	m.	m.
Tokyo	0·6	166	0 7	- 2	0 16	+ 1	—	0·3
Tyosi	1·1	115	0 12	- 4	0 20	- 8	0·4	—
Nagoya	2·4	244	0 42	P*	1 18	S*	—	—
Mizusawa	3·1	23	0 48	+ 4	1 24	+ 4	—	—
Osaka	3·7	245	0 51	- 2	—	—	1·9	2·2
Toyooka	E.	3·9	261	e 1 24	S	(e 1 24)	-16	—
Kobe		4·0	249	e 0 50	- 7	2 0	S*	— 2·4
Sumoto		4·3	246	e 1 34	P _r	2 11	S*	— 2·3

Toyooka gives also eS = +2m.4s.

Oct. 24d. Readings also at 0h. (Almata), 1h. (Chur, Padova, Andijan, Bombay, and near Calcutta), 2h. (Berkeley, Victoria, Tucson, St. Louis, Padova, La Paz, and Tacubaya), 3h. (Baku, Ekaterinburg, Irkutsk, and Tashkent), 7h. (Padova, Tyosi, and near Manila), 8h. (near Tyosi), 9h. (Almeria and Toledo), 10h. (near Sumoto), 16h. (near Mizusawa), 20h. (Tyosi, Andijan, and Samar-kand), 22h. (Tananarive and near Manila), 23h. (Catania and Mineo).

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Oct. 25d. 12h. 3m. 18s. Epicentre 61°·7N. 154°·2W.

N.1.

A = -·427, B = -·206, C = +·880; D = -·435, E = +·900;
G = -·793, H = -·383, K = -·474.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	10·6	108	—	—	i 4 26	- 2	i 5·6	—
Victoria	21·8	113	e 4 55	+ 6	8 57	+15	12·6	13·4
Saskatoon	27·0	89	e 5 42	+ 4	i 10 28	+13	—	—
Lick	31·6	127	e 6 22	+ 3	—	—	—	—
Denver	36·8	103	e 8 0	+55	—	—	—	19·6
Honolulu T.H.	40·5	185	—	—	e 13 42	- 2	e 18·3	—
Chicago	43·4	86	8 2	+ 2	i 14 22	- 5	22·2	—
Florissant	44·4	90	i 8 7	- 1	i 14 40	- 1	—	23·7
Mizusawa	E. 44·5	272	(8 43)	+34	8 43	P	—	—
St. Louis	44·6	90	i 8 8	- 2	i 14 44	0	e 24·0	—
Ann Arbor	44·8	82	e 8 12	+ 1	i 14 48	+ 1	e 23·6	24·8
Toronto	45·8	78	e 8 15	- 4	14 56	- 6	22·4	—
Ottawa	46·1	73	e 8 19	- 2	15 3	- 3	e 21·3	—
Irkutsk	50·3	310	8 56	+ 2	e 18 44	(- 2)	e 24·7	—
Harvard	50·5	72	—	—	e 16 8	0	e 25·2	—
Fordham	50·5	77	e 8 58	+ 3	i 16 8	0	i 24·1	—
Charlottesville	50·6	81	—	—	e 16 14	+ 5	25·4	—
Georgetown	50·6	80	8 56	0	16 11	+ 2	—	—
Chiufeng	N. 55·3	292	9 33	+ 2	—	—	—	—
Helsingfors	N. 58·1	0	i 9 55	+ 4	—	—	e 35·7	—
Ekaterinburg	58·4	339	i 9 55	+ 2	i 18 1	+ 6	23·7	39·7
Pulkovo	58·5	357	9 55	+ 1	e 18 3	+ 7	29·7	38·2
Copenhagen	62·1	8	10 19	0	—	—	32·7	—
Kucino	62·2	352	10 21	+ 1	—	—	e 29·7	44·4
De Bilt	65·0	13	e 10 41	+ 2	e 19 30	+10	e 32·7	43·4
Almata	67·2	323	e 10 58	+ 5	—	—	—	—
Paris	67·9	16	e 9 42	- 76	—	—	40·7	—
Stuttgart	68·8	12	i 10 59	- 4	—	—	e 40·7	—
Strasbourg	68·8	12	e 11 0	- 3	—	—	40·7	—
Zurich	70·1	12	i 11 9	- 2	—	—	—	—
Neuchatel	70·2	13	i 11 10	- 2	—	—	—	—
Chur	70·7	12	i 11 14	- 1	—	—	—	—
Andijan	70·8	325	e 11 17	+ 1	—	—	—	—
Tashkent	71·2	328	e 11 20	+ 2	e 20 45	+10	36·7	46·4
Hong Kong	71·2	282	e 11 15	- 3	20 42	+ 7	35·1	46·2
Simferopol	73·1	355	e 12 25	+56	—	—	—	—
Samarkand	73·3	329	e 11 32	+ 1	—	—	—	—
Yalta	73·6	355	11 33	+ 1	e 21 7	+ 3	—	—
Florence	73·9	11	e 20 42	S	(e 20 42)	-25	36·7	41·7
Manila	74·7	273	e 11 29	-10	i 21 20	+ 3	i 36·3	—
Rocca di Papa	76·0	10	i 11 45	- 1	—	—	—	—
Granada	78·3	24	i 11 58	- 1	22 7	+10	41·7	—
Almeria	78·8	23	11 59	- 2	—	—	—	49·4
Ksara	84·1	351	(e 11 30)	-59	e 11 30	P	—	—
Bombay	91·1	317	13 1	- 2	23 25	[-14]	e 47·0	58·4
La Paz	102·7	100	e 17 42	PP	—	—	—	—

Additional readings:—

Lick eE = +7m.4s. and +7m.55s.
Chicago PP = +9m.44s., SS = +17m.37s.
Florissant eSSE = +17m.59s.
St. Louis iSSE = +18m.6s.
Ann Arbor eSSN = +18m.12s., eSSSE = +18m.54s.; T₁ = 12h.3m.6s.
Toronto PP = +9m.54s., SS = +18m.11s.; T₁ = 12h.2m.57s.
Ottawa PPN = +10m.14s., SSN = +18m.12s.; T₁ = 12h.3m.6s.
Irkutsk e = +10m.46s. = PP + 1s.
Harvard eSS = +18m.42s.
Fordham iSS = +20m.3s.
Charlottesville e = +20m.58s.
Georgetown PP = +10m.56s.; T₁ = 12h.2m.54s.
Helsingfors ePPN = +13m.23s.
Kucino eFP = +12m.36s., PS = +19m.49s.
Hong Kong SS = +25m.56s.
Manila iNZ = +11m.38s., iZ = +12m.32s., and +13m.5s., PSE = +21m.56s.
Granada I = +14m.54s. = PP + 4s.
Long waves were also recorded at Kew, Uccle, Upsala, Piacenza, Kodaikanal, and Colombo.

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Oct. 25d. 16h. 28m. 46s. (I) } Epicentre 11°·5N. 42°·0E. X.
 17h. 41m. 55s. (II) } (as on 1929 May 18d.). X.

A = +·728, B = +·656, C = +·199; D = +·669, E = -·743;
 G = +·148, H = +·133, K = -·980.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
II Helwan	20·9	333	e 4 47	+ 8	e 8 45	+21	—	13·5
I Ksara	23·1	347	5 4	+ 2	9 27	+20	12·2	—
II	23·1	347	5 3	+ 1	9 23	+16	11·1	—
I Baku	29·7	12	e 6 5	+ 3	e 11 5	+ 6	14·7	21·0
II	29·7	12	e 6 6	+ 4	11 7	+ 8	14·6	21·5
I Bombay	30·6	72	—	—	e 11 14	0	—	—
II	30·6	72	—	—	e 11 5	- 9	—	—
I Samarkand	35·8	34	e 6 56	0	—	—	—	—
I Tashkent	38·2	34	—	—	i 13 6	- 3	e 20·2	24·7
II	e 38·2	34	e 7 13	- 4	i 13 0	- 9	19·1	24·9
I Andijan	39·6	38	e 7 57	+28	—	—	—	—
I Calcutta	45·4	69	19 23	?	—	—	29·8	—
I Ekaterinburg	47·6	15	e 8 30	- 3	e 15 25	- 2	22·2	—
II	47·6	15	8 29	- 4	15 28	+ 1	23·1	27·9
I Pulkovo	49·1	354	—	—	e 19 48	SS	26·2	31·3
I Copenhagen	49·9	340	—	—	16 20	+21	25·2	—
II	49·9	340	—	—	16 11	+12	30·1	—
I Irkutsk	64·1	37	—	—	19 14?	+ 5	34·2	41·5
II	64·1	37	—	—	e 19 1	- 8	e 34·1	41·5

Additional readings:—

Tashkent I e = +13m.32s. and +17m.14s. = SeS - 17s.

Ekaterinburg I e = +19m.9s.

Long waves were also recorded for shock I at De Bilt, Florence, and Granada;
 for shock II at Granada.

Oct. 25d. 23h. 34m. 25s. Epicentre 37°·9N. 45°·1E. (as on 1930 June 4d.). R.3.

A = +·557, B = +·559, C = +·614; D = +·708, E = -·706;
 G = +·434, H = +·435, K = -·789.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Baku	4·5	55	e 1 0	- 4	(i 1 56)	+ 1	i 1·9	4·0
Ksara	8·5	244	2 16	+16	4 14	S*	5·1	—
Theodosia	10·2	317	e 2 22	- 2	—	—	—	—
Yalta	10·5	312	e 2 39	+11	—	—	13·6	—
Helwan	14·0	239	e 3 17	+ 2	e 6 17	+26	—	—
Samarkand	17·1	77	3 51	- 4	—	—	—	—
Tashkent	18·9	72	i 4 16	- 1	i 7 38	- 6	e 11·6	15·5
Budapest	21·2	305	e 4 27	-15	—	—	e 12·6	—
Andijan	21·5	74	e 4 42	- 3	e 8 52	+16	e 12·1	—
Ekaterinburg	21·6	24	e 4 39	- 7	i 8 29	- 9	9·6	14·2
Pulkovo	23·8	342	5 3	- 5	9 12	- 7	12·6	14·5
Almata	24·6	67	e 5 19	+ 3	—	—	—	—
Florence	26·1	294	e 6 35	+ 5	10 5	+ 5	—	13·6
Cheb	26·2	308	—	—	e 8 35?	-87	—	—
Bombay	30·7	120	6 17	+ 6	11 25	+ 9	15·5	19·4
Calcutta	40·0	100	13 54	S	(13 54)	+18	23·3	—
Irkutsk	42·9	50	e 7 50	- 6	e 14 16	- 3	22·6	—

Long waves were also recorded at Hong Kong and European stations.

Oct. 25d. Readings also at 0h. (Sumoto and near Zagreb), 3h. (near Almata and Andijan), 4h. (Almata, Andijan, Samarkand, Tashkent, Bombay, Ekaterinburg, Irkutsk, near Calcutta, and near Manila), 5h. (Ekaterinburg, Tashkent, and La Paz), 6h. (Sumoto) 15h. (Baku, Ekaterinburg, Tashkent, Irkutsk, and Ksara), 16h. (Baku, Ekaterinburg, Tashkent, Irkutsk, and near Ksara), 17h. (Irkutsk, Tashkent, and near Ksara), 18h. (Ksara and Tashkent), 19h. (Baku, Ekaterinburg, Ksara, Andijan, near Samarkand, and Tashkent), 20h. (Irkutsk), 21h. (Andijan and Samarkand).

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Oct. 26d. 7h. 14m. 14s. (I) } Epicentre 44°-5N. 11°-0E. (as on 24d.). R.3.
 7h. 30m. 42s. (II) } R.3.

A = +.700, B = +.136, C = +.701; D = +.191, E = +.982;
 G = +.688, H = +.134, K = -.713.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
			m. s.	s.	m. s.	s.	m.	m.
I Florence	0.7	166	0 2	- 8				0.5
II	0.7	166	0 19	+ 9				1.0
I Piacenza	1.1	300	e 0 12	- 4	(0 30)	+ 2	0.5	0.5
II	1.1	300	e 0 18	+ 2			0.6	0.7
I Padova	1.1	35	e 0 9	- 7	i 0 23	- 5		
II	1.1	35	e 0 9	- 7	0 23	- 5		
I Livorno	1.1	207	(0 18)	+ 2	(0 34)	S _e		
I Venice	1.3	45	e 0 11	- 7	i 0 36	S _e		
I Treviso	1.4	36	i 0 11	- 9	0 34	- 2		1.4
II	1.4	36	i 0 18	- 2	0 40	+ 4		1.4
I Chur	2.6	337	e 0 31	- 6				
II	2.6	337	e 0 36	- 1				
I Innsbruck	2.8	6	e 0 40	0	1 4	- 8	1.2	
II	2.8	6	e 0 36	- 4	1 22	S _e	i 1.4	
I Laibach	2.9	58	e 0 36	- 5	e 1 8	- 6		1.6
II	2.9	58	e 0 45	+ 4	e 1 22	S _e		1.7
I Zurich	3.3	330	e 0 46	- 1	e 1 23	- 2		
II	3.3	330	i 0 39	- 8	e 1 25	0		
I Ravensburg	3.4	344	e 0 57	P*	e 1 36	S _e		
II	3.4	344	e 1 0	P*	i 1 45	S _e		
I Neuchatel	3.7	313	e 0 47	- 6	e 1 32	- 3		
II	3.7	313	i 0 52	- 1	e 1 35	0		
I Zagreb	3.8	68	e 0 59	+ 5	e 1 41	+ 4		2.4
II	3.8	68	e 1 0	+ 6	e 1 43	+ 6		2.7
I Graz	4.1	50	e 1 19	P*	e 1 57	S _e		2.3
II	4.1	50	e 1 33	P _e	e 2 17	S _e		3.1
I Marseilles	4.2	255	e 1 34	P _e	e 2 10	S _e		
II	4.2	255	i 1 14	P*	e 1 56	+ 8		
I Stuttgart	4.4	345	e 1 14	P*	i 1 58	+ 5		3.1
II	4.4	345	e 1 16	P*	i 1 49	+ 4		3.2
I Strasbourg	4.6	336	0 56	-10	2 4	+ 6		
II	4.6	336	1 3	- 3	2 7	+ 9		
I Karlsruhe	4.8	340	1 41	P _e	2 23	S _e		2.8
II	4.8	340	1 44	P _e	2 24	S _e		3.0
I Vienna	5.2	44	1 41	P _e				
II	5.2	44	0 31	-43				
I Cheb	5.6	9	e 1 46?	+26				3.1
II	5.6	9	e 1 18?	- 2				3.3
I Puy de Dôme	5.8	285	e 0 24	-58				
II	5.8	285			e 2 24	- 4		
I Budapest	6.3	59	2 49	S	(2 49)	+ 8		
I Jena	E.	6.4	4	e 2 16	P _e		e 3.3	3.7
II	E.	6.4	4	e 2 18	P _e	e 2 39	- 4	e 3.3
I Göttingen	N.	7.0	355	e 1 52	P*			3.9
II	N.	7.0	355	e 1 30	- 9			3.7
I Paris		7.2	310			e 2 59	- 5	3.8
II		7.2	310			e 3 2	- 2	
I Uccle		7.7	327	e 2 22	P*	e 3 46?		
II		7.7	327	e 2 45	P _e	e 3 48		
I Potsdam		8.0	9			e 3 56		i 4.4
II		8.0	9			e 4 3		1.4.2
I Kew		10.2	317			e 5 33		e 6.4
II		10.2	317			e 5 26		e 6.4
II Ekaterinburg		32.9	50	e 6 32	+ 1			16.3

Additional readings and note:

Florence I P_e = +16s., II P_e = +34s.

Livorno I readings have been *diminished* by 15m.

Laibach I e = +49s. = P*, eSS = +1m.26s., II ePP = +50s.

Zurich I e = +54s. = P*, II e = +59s. = P*.

Ravensburg I e = +1m.9s. = P_e, i = +1m.20s. = S - 7s., II e = +1m.14s. = P_e,

i = +1m.26s. = S - 1s.

Continued on next page.

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Neuchâtel I eP = +1m.0s. = P*, e = +2m.27s., II eP_g = +1m.6s.
 Stuttgart I IN = +1m.44s. = P_g, +2m.5s. = S*, iE = +2m.16s., iN = +2m.24s.,
 II eE = iN = +1m.26s. = P_g, iN = +1m.33s., iEN = +1m.54s., iN = +2m.2s.
 and +2m.9s., iE = +2m.23s. = S_g.
 Strasbourg I SS = +2m.10s., SSS = +2m.26s., II P_g = +1m.11s., SS = +2m.12s.,
 SSS = +2m.27s.

Göttingen I eP_gN = +2m.3s., II eP_gN = +2m.7s.
 Long waves were also recorded for both shocks at many other European and Russian stations.

Oct. 26d. 13h. 45m. 9s. Epicentre 34° 0'N. 135° 5'E. (as on 1930 Sept. 19d.). X.

A = -591, B = +581, C = +559; D = +701, E = +713;
 G = -399, H = +392, K = -829.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Sumoto	0.6	304	i 0 5	- 4	0 11	- 4	—	0.2
Osaka	0.7	355	0 8	- 2	(0 18)	0	0.3	0.7
Kobe	0.7	339	0 10	0	0 19	+ 1	—	0.3
Toyooka	1.7	340	0 32	P*	0 44	0	—	0.8
Nagoya	1.7	45	0 29	+ 5	0 52	S*	—	—
Koti	1.7	255	e 0 24	0	0 44	0	—	0.8
Matuyama	2.3	266	i 0 35	+ 2	(i 1 5)	+ 6	i 1.1	1.2

Additional readings:—

Koti S_g = +49s.

Long waves were also recorded at Taihoku and the Russian stations.

Oct. 26d. Readings also at 1h. (Lick, Samarkand, near Kobe, and Sumoto (2)), 2h. (Chur, Padova (2), and near Treviso), 4h. (Baku, Irkutsk, Tashkent, and La Paz), 5h. (Mizusawa), 9h. (Tananarive), 10h. (La Paz), 11h. (near Manila), 14h. (Andijan and near Samarkand), 17h. (near La Paz), 22h. (Copenhagen, Baku, Ekaterinburg, Irkutsk, Tashkent, Kucino, Pulkovo, Hong Kong, and De Bilt).

Oct. 27d. 23h. 28m. 41s. Epicentre 11° 5'N. 43° 5'E. (as on 1929 Jan. 22d.). R.2.

A = +711, B = +675, C = +199; D = +688, E = -725;
 G = +145, H = +137, K = -980.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Helwan	21.6	330	e 4 29	-17	8 51	+13	—	15.3
Ksara	23.4	344	5 6	+ 1	9 30	+18	12.5	—
Bombay	29.2	72	6 4	+ 6	10 46	- 5	14.3	15.1
Baku	29.5	10	6 4	+ 3	11 5	+ 9	15.0	19.1
Tananarive	30.6	174	—	—	11 30	+16	15.4	18.6
Hyderabad	34.3	74	5 51	-52	11 19	-52	16.3	22.1
Tashkent	37.4	32	—	—	i 13 1	+ 4	—	—
Florence	42.6	325	e 11 19	†	—	—	—	—
Calcutta	44.1	70	13 38	S	(13 38)	-59	28.4	—
Algiers	44.2	314	e 7 49	-17	—	—	e 21.3	23.3
Kucino	44.5	356	8 9	0	14 43	0	22.2	27.8
Prague	45.4	335	—	—	e 16 13	+77	e 28.3	41.3
Stuttgart	46.9	330	—	—	e 15 24	+ 7	e 25.8	—
Ekaterinburg	47.3	12	e 8 29	- 2	i 15 31	+ 8	21.3	32.6
Strasbourg	47.5	329	e 8 19†	-13	e 15 19†	- 7	e 21.3	—
Pulkovo	49.3	352	8 45	- 1	15 51	0	25.3	31.5
Granada	49.3	310	18 49	+ 3	i 15 24	-27	e 24.0	28.3
Copenhagen	50.4	340	—	—	16 7	+ 1	25.3	—
Paris	50.5	326	—	—	e 16 19†	+11	28.3	30.3
Ucole	50.6	328	—	—	e 16 19†	+10	—	—
De Bilt	51.0	330	8 55	- 4	16 16	+ 1	e 25.3	—
Irkutsk	63.3	37	e 10 29	+ 2	e 19 8	+ 9	34.3	38.6

Additional readings:—

Tananarive ePP = +7m.18s., E = +13m.1s., SS = +13m.21s.

Calcutta S = +20m.8s.

Stuttgart e = +13m.54s.

Long waves are also recorded at La Paz, Scoresby Sund, and other European stations.

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Oct. 27d. Readings also at 0h. (Andijan), 2h. (Baku, Tashkent, Melbourne, near Riverview, and Sydney), 4h. (La Paz), 5h. (Baku and Ekaterinburg), 9h. (Manila), 11h. (near Taihoku), 12h. (Adelaide, Riverview, Melbourne, Suva, Wellington, Baku, Ekaterinburg, Hong Kong, and Manila), 13h. (Ksara), 14h. (Berkeley, Pulkovo, Ekaterinburg, Adelaide, Riverview, and Wellington), 15h. (Baku, Taihoku, and near Tananarive), 19h. (Lick), 20h. (Hong Kong, Zi-ka-wei, and near Taihoku (2)), 21h. (Melbourne, Riverview, and Manila).

Oct. 28d. 21h. 10m. 22s. Epicentre 18°3N. 146°8E. R.1.

(as on 24d.).

Probable error of epicentre $\pm 0^{\circ}.22$.

A = - .794, B = + .520, C = + .314; D = + .548, E = + .837;
G = - .263, H = + .172, K = - .949.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o	o	m. s.	s.	m. s.	s.	m.	m.
Hatidyozima	16.0	338	3 50	+ 9	—	—	—	—
Mera	17.7	341	4 10	+ 7	7 27	+10	—	—
Tyosai	18.2	345	e 4 6	- 3	e 7 22	- 7	e 7.6	—
Yokohama	18.3	341	4 13	+ 3	7 38	+ 7	—	—
Tokyo	18.4	342	4 12	+ 1	7 24	- 9	—	—
Muroto	18.7	325	4 17	+ 2	7 45	+ 5	—	—
Kumagaya	19.0	341	4 18	- 1	7 49	+ 3	—	—
Nagoya	19.0	335	4 20	+ 1	8 7	SS	e 12.6	—
Gihu	19.2	335	4 24	+ 3	7 57	+ 7	—	—
Osaka	19.2	331	4 18	- 3	(7 38)	-12	7.6	9.6
Sumoto	19.2	329	4 20	- 1	7 52	+ 2	e 10.0	11.4
Koti	19.3	325	e 4 23	+ 1	e 7 54	+ 2	10.6	12.0
Kobe	19.4	330	4 23	0	i 7 58	+ 4	e 9.1	10.7
Kyoto	19.4	332	4 23	0	8 1	+ 7	—	—
Miyazaki	19.4	317	4 26	+ 3	8 5	SS	—	—
Oiwake	19.4	340	4 22	- 1	8 52	- 2	—	—
Toyooka	20.2	331	4 32	0	8 12	+ 2	e 11.0	—
Kumamoto	20.5	318	4 35	0	8 21	+ 5	—	—
Sendai	20.6	347	4 36	0	8 23	+ 5	—	—
Nagasaki	21.0	317	e 4 48	+ 8	e 8 27	+ 1	11.4	—
Hamada	21.1	325	4 42	+ 1	8 30	+ 2	—	—
Hukuoka	21.1	319	e 4 43	+ 2	8 38	+10	10.8	11.8
Mizusawa	21.4	348	4 39	- 5	8 37	+ 3	—	—
Isigakizima	21.9	290	4 54	+ 4	8 56	+12	—	—
Morioka	22.0	348	4 50	- 1	8 45	- 1	—	—
Taihoku	N. 24.3	290	e 5 40	+27	(9 53)	+25	9.9	—
Manila	25.0	265	e 5 23	+ 3	19 53	+12	i 12.7	14.3
Zi-ka-wei	26.3	304	e 5 34	+ 2	11 48	?	—	18.8
Amboina	28.6	222	1 6 5	+12	—	0	13.2	—
Hong Kong	30.8	284	6 9	- 3	i 11 17	0	14.1	17.1
Chiufeng	E. 34.2	318	6 48	+ 6	—	—	—	—
Phu-Lien	37.9	282	e 7 16	+ 2	e 13 6	+ 1	17.6	23.7
Batavia	46.4	243	e 8 28	+ 4	115 5	- 5	26.6	—
Irkutsk	47.4	327	e 8 31	- 1	115 14	-10	22.6	28.6
Medan	49.2	260	(19 10)	+25	(15 53)	+ 3	—	—
Honolulu T.H.	52.0	77	—	—	e 16 38	+10	e 18.5	—
Riverview	52.3	176	1 9 8	- 1	116 32	- 1	e 24.2	36.4
Sydney	52.3	176	i 16 32	S	(116 32)	- 1	30.5	32.1
Adelaide	53.8	189	9 16?	- 4	116 51	- 2	24.7	34.5
Calcutta	54.5	286	13 40	?	21 13	SS	32.3	—
Melbourne	56.1	182	—	—	17 26	+ 2	26.8	32.6
Perth	58.3	211	—	—	17 53	0	36.0	—
Almata	63.0	311	e 10 47	+22	—	—	—	—
Agra	N. 63.3	293	18 22	S	(18 22)	-37	30.4	35.8
Hyderabad	64.6	281	10 20	-16	19 8	- 7	32.9	42.8

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	65.0	158	10 34	- 5	19 26	+ 6	34.6	37.6
Colombo	66.0	271	9 28	- 77	19 28	- 4	32.7	37.8
Andijan	66.5	309	e 10 58	+ 9	19 38	- 1	35.6	—
Sitka	68.1	35	—	—	e 20 2	+ 4	—	—
Tashkent	68.8	310	10 38?	- 25	19 38?	- 29	33.6	42.6
Bombay	69.5	285	20 11	S	(20 11)	- 4	30.8	45.0
Samarkand	70.7	309	e 11 48	+ 33	—	—	—	—
Ekaterinburg	72.6	326	i 11 26	0	i 20 46	- 6	31.2	43.9
Victoria	E. 76.3	42	11 45	- 3	21 43	+ 8	35.0	40.9
	N. 76.3	42	11 47	- 1	21 41	+ 6	36.0	37.8
Berkeley	79.5	52	e 12 3	- 2	i 22 22	+ 12	e 36.1	45.2
Lick	80.2	52	e 12 7	- 2	—	—	—	—
Baku	83.3	311	e 12 25	0	i 22 46	- 4	40.3	46.6
Kucino	85.0	329	12 34	+ 1	23 2	- 6	44.2	52.6
Pulkovo	86.7	334	12 38	- 4	23 5	[- 6]	41.6	53.0
Helsingfors	88.6	335	—	—	e 23 20	[- 4]	44.6	—
Tucson	90.2	55	e 12 59	+ 1	—	—	e 43.6	—
Scoresby Sund	90.9	356	—	—	23 55	- 9	43.6	—
Ksara	96.0	310	—	—	e 23 58	[- 8]	68.6	—
Lund	96.3	336	—	—	31 38?	SS	49.6	—
Copenhagen	96.6	336	13 38	+ 10	24 1	[- 8]	43.6	—
Potsdam	98.7	334	e 16 38?	?	e 23 38?	[- 41]	e 49.6	57.6
Hamburg	Z. 99.1	337	e 17 38	PP	—	—	e 54.6	60.6
Budapest	99.3	327	e 17 38?	PP	—	—	e 49.6	53.6
Dyce	100.1	345	—	—	e 25 7	{+ 13}	e 52.2	65.1
Belgrade	100.2	324	—	—	e 25 11	- 17	e 53.0	—
Zagreb	102.0	328	e 17 38?	PP	e 24 29	{- 6}	e 53.6	e 62.2
De Bilt	102.1	337	i 18 7	PP	e 25 26	{+ 17}	e 48.6	60.4
Stonyhurst	103.1	342	—	—	32 38?	SS	—	56.6
Stuttgart	103.1	334	—	—	e 25 38?	- 16	e 42.6	64.2
Uccle	103.4	337	18 22	PP	e 25 38?	- 18	e 47.6	—
Strasbourg	103.8	334	—	—	25 49	- 11	49.6	—
Treviso	104.0	330	e 18 13	PP	e 29 8	?	51.6	59.6
Tananarive	104.2	256	—	—	24 40	[- 6]	—	53.4
Zurich	104.4	333	e 17 48	PP	—	—	—	—
Kew	104.6	340	—	—	(e 25 51)	- 16	51.6	61.0
Toronto	105.0	32	e 24 46	SKS	(e 24 46)	[- 4]	46.6	—
Ottawa	105.5	29	e 24 44	SKS	(e 24 44)	[- 8]	e 47.6	—
Piacenza	105.6	331	19 30	?	24 38	[- 15]	—	64.7
Paris	105.7	337	e 18 38?	PP	—	—	54.6	62.6
Florence	105.8	329	e 24 40	SKS	(e 24 40)	[- 14]	40.6	51.6
Rocca di Papa	106.5	326	e 18 11	[+ 4]	25 57	{+ 16}	e 53.2	67.0
Charlottesville	109.4	35	—	—	e 44 38	?	e 52.4	—
Georgetown	109.8	34	i 18 58	PP	28 23	PS	—	—
Harvard	110.0	28	—	—	e 26 32	{+ 25}	e 55.6	—
Alicante	115.6	332	—	—	(e 35 12)	SS	e 35.2	—
Toledo	115.8	335	—	—	e 35 56	SS	—	71.5
Granada	117.9	334	i 20 1	PP	i 36 13	SS	e 63.6	74.2
Malaga	118.6	334	—	—	e 36 12	SS	—	—
La Paz	146.7	90	i 19 43	[+ 6]	i 33 23	SKSP	69.4	75.2
Sucre	149.7	93	19 49	[+ 8]	—	—	—	—
Rio de Janeiro	169.6	118	e 25 8	PP	—	—	e 81.6	—

Additional readings and notes :—

- Koti i = +4m.30s. = PP - 2s.
- Toyooka i = +4m.46s. = PP + 1s.
- Mizusawa PN = +4m.44s.
- Manila i = +5m.27s.
- Zi-ka-wel PPZ? = +6m.44s., PPPZ = +7m.50s., SSZ = +14m.32s.
- Hong Kong PP = +7m.13s.
- Medan i = (+10m.52s.) readings have been *diminished* by 4m.
- Riverview 1N = +9m.18s., 1ScSE = +19m.1s., SS1N = +21m.18s.
- Sydney 1S = +22m.20s.
- Adelaide i = +17m.0s., e = +22m.0s.

Continued on next page.

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Perth ? = +6m.38s., SS = +24m.38s.
 Agra eSN = +24m.17s.
 Hyderabad SKS = +19m.59s.
 Wellington PP = +13m.20s.
 Bombay S = +25m.44s.
 Berkeley eE = +15m.33s., eZ = +15m.46s., eE = +27m.21s. = SS + 16s.
 Lick eE = +12m.12s., eN = +12m.16s., eE = +12m.21s., eN = +12m.26s.
 Helsingfors eEN = +24m.30s.
 Tucson e = +30m.0s. = SS + 17s. and +39m.42s.
 Scoresby Sund +23m.32s. = SKS - 6s. and +30m.38s.?
 Copenhagen PP = +17m.26s., PS = +26m.38s., SS = +31m.20s.
 Potsdam eEN = +30m.38s.?
 Dyce i = +33m.12s.
 Belgrade e = +42m.56s.
 Zagreb ePS = +25m.25s.
 Stuttgart ePPEN = +18m.18s., e = +32m.48s. = SS + 4s.
 Strasbourg PP? = +18m.16s., PS? = +27m.21s., PPS? = +28m.45s., SS? = +32m.38s.?
 Tananarive PPE = +18m.44s., PS = +27m.27s., SS = +41m.53s.
 Kew ePPZ = +18m.21s., true S is given as PS.
 Toronto iSN? = +32m.19s., iSE? = +32m.31s.
 Ottawa eS? = +33m.44s.
 Rocca di Papa S = +32m.35s.
 Georgetown PP = +22m.8s.
 Harvard e = +39m.20s. and +46m.56s.
 Granada PP = +22m.50s.
 La Paz PPE = +23m.9s., SKSE = +27m.5s., PPSE = +29m.50s., SKSP = +36m.55s., iSSE = +42m.53s., SSSE = +50m.38s.
 Long waves were also recorded at Ann Arbor, Chicago, Dehra Dun, Algiers, and other European stations.

Oct. 28d. Readings also at 1h. (Tashkent), 2h. (Ekaterinburg), 3h. (Andijan and Samarkand), 10h. and 11h. (Tananarive), 12h. (Koti and La Paz), 13h. (Lick and near Malabar), 15h. (Andijan), 18h. (near Tyosl, near Kobe, Koti, and Sumoto), 21h. (near Medan), 22h. (Gihu, Misima, Miyazaki, and Oiwake), 23h. (Andijan and Samarkand).

Oct. 29d. 12h. 29m. 36s. Epicentre 19°·0N. 149°·0E. N.3.

A = -·811, B = +·487, C = +·326; D = +·515, E = +·857;
 G = -·279, H = +·168, K = -·946.

	Δ	Az.	P.	O-C.	S	O-C	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Oiwake	19·6	334	4 27	+ 2	8 7	+ 9	—	—
Miyazaki	20·4	313	4 32	- 2	8 13	- 1	—	—
Manila	27·2	265	i 5 39	- 1	i 9 9	- 69	i 10·8	—
Irkutsk	45·0	324	e 8 39	+ 3	e 15 26	- 7	24·4	32·8
Ekaterinburg	73·3	325	e 11 34	+ 3	e 21 2	+ 2	35·4	—

Long waves were also recorded at Hong Kong and Baku.

Oct. 29d. 14h. 27m. 19s. Epicentre 34°·2N. 135°·2E. N.3.

A = -·587, B = +·583, C = +·562.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sumoto	0·3	300	10 1	- 3	0 5	- 3	—	0·
Kobe	0·5	358	0 7	0	0 15	+ 2	—	0·
Osaka	0·6	32	0 9	0	(0 17)	+ 2	0·3	0·
Toyooka	1·4	347	0 28	P _f	0 41	+ 5	—	0·
Koti	1·5	245	e 0 34	+13	0 54	+15	—	—
Nagoya	1·7	56	0 32	P*	—	—	—	—

No additional readings.

Oct. 29d. Readings also at 0h. (Lick), 3h. (Taihoku), 4h. (near Catania), 5h. (Bak Samarkand, Riverview, Christchurch, and near Wellington), 6h. (Ekaterinburg, Simferopol, Manila, and Melbourne), 7h. (Tashkent, Baku, and Ekaterinburg), 8h. (Baku and Ekaterinburg), 10h. (Perth), 11h. (near Taihoku), 13h. (Berkeley and Taihoku (2)), 14h. (near Taihoku), 17 (Bagnères), 18h. and 23h. (Perth), 23h. (near Koti).

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Oct. 30d. 7h. 13m. 13s. Epicentre 43°·6N. 13°·5E. R.I.
(as on 1928 May 30d.).

Probable error of epicentre $\pm 0^{\circ} \cdot 3$.

A = +·704, B = +·169, C = +·690; D = +·233, E = -·972;
G = +·671, H = +·161, K = -·724.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	1·6	276	i 0 19	- 4	—	—	—	—
Rome	1·9	204	e 0 28	0	—	—	—	—
Rocca di Papa	2·0	198	i 0 30	+ 1	i 1 6	S*	i 1·0	—
Venice	2·0	338	i 0 27	- 2	i 1 4	S*	—	—
Padova	2·1	327	0 27	- 3	—	—	—	5·4
Monte Cassino	2·2	174	0 29	- 2	0 45	-12	—	—
Livorno	2·3	268	0 23	-10	0 45	-14	—	—
Treviso	2·3	336	i 0 28	- 5	0 52	- 7	—	1·3
Laibach	2·5	16	i 0 34	- 2	i 1 16	S*	—	1·4
Benevento	2·6	167	i 0 29	- 8	—	—	2·7	4·2
Naples	Z.	2·8	168	e 1 8	+28	e 1 46	+34	—
Zagreb		2·8	37	i 0 39	- 1	i 1 22	S*	3·5
Casamiciolo		2·9	174	0 54	+13	1 24	+10	2·4
Piacenza		3·1	298	0 37	- 7	i 1 12	- 8	2·4
Mostar		3·2	94	i 0 40	- 6	i 1 20	- 2	11·4
								5·4
Bari		3·5	134	1 7	P*	1 59	S*	2·4
Graz		3·7	21	0 51	- 2	1 51	S*	—
Innsbruck		3·9	339	0 55	- 1	1 33	- 7	2·4
Chur		4·2	318	e 0 44	-16	i 2 11	—	2·2
Trenta		4·9	153	1 17	+ 7	e 2 57	S*	—
								—
Vienna		5·0	22	e 1 8	- 3	2 25	S*	—
Ravensburg		5·0	328	e 1 4	- 7	i 1 51	-17	2·8
Zurich		5·1	319	e 1 4	- 9	e 2 8	- 2	—
Belgrade		5·1	77	e 1 13	0	i 2 28	S*	—
Messina		5·7	163	1 42	P*	2 52	S*	3·6
								—
Neuchatel		5·7	308	e 1 13	- 8	e 2 12	-13	—
Stuttgart		5·9	331	e 1 17	- 7	i 2 33	+ 2	—
Marselles		5·9	270	1 27	+ 3	i 2 41	+10	13·0
Carloforte		6·0	223	i 1 30	+ 5	i 2 55	S*	4·4
Catania		6·2	168	e 1 41	+13	3 16	S*	4·5
								5·2
Karlsruhe		6·4	329	1 27	- 4	2 45	+ 2	—
Mineo		6·4	172	1 37	+ 6	—	—	2·9
Prague		6·4	4	e 1 15	-16	i 2 25	-18	3·6
Strasbourg		6·4	324	i 1 7	-24	e 2 26	-17	e 3·3
Cheb		6·5	354	e 1 46	+14	e 2 49	+ 3	4·1
								4·4
Jena		7·4	350	e 1 41	- 4	13 6	- 3	e 3·2
Feldberg	N.	7·4	334	e 1 25	-20	e 3 18	+ 9	e 3·8
Puy de Dôme		7·8	291	e 2 41	—	e 3 36	+17	5·4
Göttingen		8·2	345	e 1 50	- 6	(e 3 35)	+ 6	6·3
Barcelona		8·6	260	1 54	- 8	—	+ 6	e 3·6
								5·7
								6·3
Potsdam		8·7	358	e 2 17	+14	13 42	+ 1	e 3·9
Paris		9·2	308	e 2 11	+ 1	e 4 15	+21	5·6
Uccle		9·5	322	e 2 22	+ 8	e 3 59	- 2	5·1
Lemberg		9·5	46	(e 2 40)	+26	4 14	+13	14·9
Tortosa	N.	10·0	258	2 17	- 4	4 16	+ 3	6·1
								7·0
De Bilt		10·1	329	2 23	+ 1	e 4 24	+ 8	—
Hamburg		10·3	348	e 2 53	+28	14 41	+20	4·9
Algiers		10·5	232	e 2 23	- 5	5 0	+34	6·2
Alicante		11·8	248	e 2 42	- 4	e 5 19	+21	7·1
Kew		12·1	315	e 2 54	+ 4	e 6 8	+63	6·6
								10·1
								10·3
								7·9
Copenhagen		12·1	357	2 59	+ 9	5 22	+17	—
Lund		12·1	359	2 53	+ 3	(5 47)	+42	—
Oxford		12·8	315	e 2 55	- 4	e 5 32	+10	5·8
Toledo		13·6	260	e 3 2	- 8	e 5 46	+ 5	e 5·8
West Bromwich		13·6	316	2 50	-20	5 34	- 7	8·6
								9·4

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almeria	13.8	247	i 3 17	+ 4	6 4	+18	—	6.8
Sebastopol	14.4	79	3 21	0	—	—	—	—
Granada	14.5	249	i 3 21	- 1	1 6 27	+24	18.4	9.8
Stonyhurst	14.6	320	e 5 12	+109	—	—	17.7	—
Bidston	14.7	318	e 3 20	- 5	e 6 6	- 2	6.6	10.0
Simferopol	14.8	78	e 3 26	0	—	—	—	—
Yalta	14.9	79	e 3 24	- 3	—	—	—	—
Malaga	15.3	249	3 26	- 6	6 31	+ 9	7.6	11.4
Theodosia	15.7	77	e 3 36	- 2	e 7 52	L	(7.9)	—
Edinburgh	16.2	325	—	—	e 6 47?	+ 4	18.4	11.3
Upsala	16.4	7	e 3 43	- 3	1 6 46	- 2	e 7.8	10.8
San Fernando	16.7	251	5 17	?	6 17	-38	8.1	8.4
Dyce	16.8	330	—	—	e 6 54	- 3	e 8.5	12.7
Bergen	17.5	346	6 9	+129	9 9	+116	—	11.8
Helsingfors	17.9	19	e 4 0	- 5	e 7 11	-11	e 9.6	—
Pulkovo	19.1	26	4 16	- 4	7 41	- 7	9.8	12.3
Kucino	19.8	44	4 28	+ 1	8 2	0	8.7	13.1
Helwan	19.8	128	i 4 29	+ 2	i 8 11	+ 9	—	18.3
Ksara	19.9	112	e 4 34	+ 5	8 18	+14	8.9	—
Baku	27.0	84	i 5 46	+ 8	i 10 19	+ 4	14.0	20.5
Scoresby Sund	32.1	339	—	—	12 47?	?	16.8	—
Ekaterinburg	32.1	49	e 5 23	-61	i 10 29	-68	14.8	19.5
Samarkand	39.5	76	e 7 32	+ 4	—	—	—	—
Tashkent	40.4	73	1 8 35	+60	i 14 43	+61	20.8	27.3
Andijan	42.8	72	e 8 0	+ 5	e 14 46	+28	e 23.1	—
Bombay	55.1	96	9 36	+ 6	17 16	+ 5	28.9	32.9
Irkutsk	57.4	47	e 9 46	0	e 17 38	- 4	30.8	37.5
Harvard	59.0	302	e 12 3	PP	e 17 56	- 7	e 25.8	—
Hyderabad	60.1	94	18 15	S	(18 15)	- 2	33.0	43.2
Toronto	63.3	308	—	—	i 18 55	- 4	27.2	—
Georgetown	64.7	301	—	—	i 19 7	- 9	—	—
Chicago	69.2	310	—	—	e 20 9	- 2	—	—
Phu-Lien	77.8	73	—	—	20 47?	-65	—	—
Victoria	80.5	333	—	—	23 18	PS	38.4	44.8
Hong Kong	82.1	67	—	—	22 30	- 8	—	55.3
Manila	92.1	68	13 47	+40	i 23 39	[- 61]	—	—
La Paz	95.4	254	5 53	?	—	—	52.6	—

Additional readings and notes :

Laibach $iP_2 = +39m.$, $iPPS = +1m.4s.$
 Zagreb $iP_2 + 45s.$, $iPPNE = +54s.$, $iPPNE = +56s.$, $iNW = +58s.$, $iPPNE + 1m.0s.$, $iNW = +1m.3s.$, $iPPS = +1m.5s.$, $iPS = +1m.10s.$, $i = +1m.15s.$ and $+1m.18s.$, $iPPSSNE = +1m.20s.$
 Mostar $iP^* = +44s.$, $iPP = +52s.$
 Innsbruck $P^* = +1m.1s.$, $P_2 = +1m.6s.$, $S^* = +1m.51s.$
 Vienna $P^* = +1m.20s.$, $P_2 = +1m.26s.$, $d = +1m.55s.$, $PPS = +2m.8s.$, $S^* = +2m.19s.$
 Ravensburg $eE = +1m.14s.$
 Belgrade $P_2 = +1m.34s.$, $i = +1m.42s.$, $e = +2m.39s.$, $iS_2 = +2m.57s.$
 Neuchatel $eP_2 = +1m.41s.$, $e = +2m.36s.$
 Stuttgart $i = +1m.50s.$ = P^* , $+2m.3s.$ = P_2 and $+2m.16s.$
 Marseilles $SS = +3m.12s.$, $SSS = +3m.26s.$
 Strasbourg $SS = +3m.24s.$, $SSS = +3m.35s.$
 Jena $iE = +1m.49s.$ = $PP + 4s.$, $+1m.55s.$ and $+2m.32s.$ = P_2 , $iSZ = +2m.50s.$
 Feldberg $eN = +1m.35s.$, $+2m.17s.$, $+2m.27s.$ = P_2 and $+2m.56s.$
 Puy de Dôme $e = +2m.47s.$ and $+4m.13s.$ = S_2 .
 Göttingen $eN = +2m.26s.$
 Potsdam $iEN = +2m.28s.$, $iN = +2m.43s.$ = P^* , $iEN = +3m.14s.$ and $+3m.29s.$
 Uccle $i = +4m.21s.$
 Lemberg P has been increased by $4m.$
 Kew $eSN = +5m.55s.$
 Copenhagen $+5m.32s.$
 Almeria $i = +3m.33s.$ and $+4m.23s.$
 Granada $i = +6m.41s.$, $SS = +7m.13s.$
 Stonyhurst $S = +8m.27s.$, $i = +9m.55s.$
 Helsingfors $eE = +5m.50s.$
 Ekaterinburg $i = +10m.37s.$
 Harvard $eN = +19m.44s.$ = $S_2S - 1s.$
 Hyderabad $S = +25m.3s.$
 Georgetown $iE = +19m.13s.$, $eN = +23m.59s.$
 Chicago $e = +31m.47s.$
 Manila $iEN = +19m.51s.$
 Long waves were also recorded at Budapest and Königsberg.

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Oct. 30d. 8h. 12m. 40s. Epicentre 43°·6N. 13°·5E. (as at 7h.). R.2.

A = +·704, B = +·169, C = +·690; D = +·233, E = -·972;
G = +·671, H = +·161, K = -·724.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	1·6	276	10 22	- 1	—	—	—	—
Rome	1·9	204	e 0 27	- 1	i 1 4	S _g	1 1·5	2·0
Rocca di Papa	2·0	198	e 0 33	+ 4	i 1 1	S _g *	1·2	1·8
Livorno	2·3	268	1 18	S _g *	1 30	S _g	—	—
Treviso	2·3	336	i 0 58	P _g	1 27	S _g	—	1·8
Laibach	2·5	16	e 0 36	0	e 2 18	?	—	2·8
Zagreb	2·8	37	0 41	+ 1	1 20?	S _g *	—	2·8
Naples	2·8	168	e 1 20	S _g *	—	—	—	—
Casamicciolo	2·9	174	1 33	S _g *	2 3	?	—	2·7
Placenza	3·1	298	1 10	S	1 44	S _g	2·0	2·7
Graz	3·7	21	e 1 4	P*	i 2 2'	S _g	—	2·6
Innsbruck	3·9	339	1 2	+ 6	e 1 26	-14	i 2·3	2·6
Chur	4·2	318	e 0 57	- 3	e 3 14	?	—	—
Trenta	4·9	153	e 1 50	P _g	—	—	—	—
Vienna	5·0	22	1 33	P _g *	i 2 44	S _g	—	3·3
Ravensburg	5·0	328	e 1 41	P _g	i 2 25	S _g *	—	—
Zurich	5·1	319	e 1 5	- 8	—	—	—	—
Belgrade	5·1	77	—	—	e 2 13	+ 3	—	—
Budapest	5·5	43	1 54	P _g	—	—	3·3	—
Neuchatel	5·7	308	e 1 16	- 5	e 2 43	S _g *	—	—
Stuttgart	5·9	331	e 1 47	P*	i 2 48	S _g *	—	—
Karlsruhe	6·4	329	3 8	S	(3 8)	S _g *	4·1	4·7
Prague	6·4	4	e 1 44	+13	2 48	+ 5	—	4·3
Strasbourg	6·4	324	1 47	P*	2 57	+14	—	—
Cheb	6·5	354	e 2 20?	P _g	—	—	—	5·3
Jena	7·4	350	e 2 14	P*	e 3 0	- 9	e 3·5	4·8
Göttingen	8·2	345	e 2 22	P*	e 3 42	S _g *	—	5·0
Potsdam	8·7	358	—	—	i 4 5	+24	—	5·3
Uccle	9·5	322	e 3 20?	P _g	i 5 32	S _g	—	—

Additional readings:—

Rome eP = +35s. = P*

Rocca di Papa eP = +37s. = P*

Laibach P* = +41s., ePPS = +2m.7s., eSS = +2m.33s.

Zagreb i = +55s. = P_g, +1m.5s. = S - 7s. and +1m.9s., iNW = +1m.15s., i =

+1m.27s., iNW = +1m.30s. = S_g.

Vienna i = +2m.22s. = S* and +3m.9s.

Belgrade e = +2m.30s. = S*, +3m.16s., and +3m.44s.

Neuchatel eP_g = +1m.45s.

Stuttgart i = +3m.31s.

Jena eEN = +3m.20s.

Potsdam iE = +4m.33s., iN = +4m.42s., and +4m.51s., iE = +4m.59s.

Long waves were also recorded at De Bilt, Paris, Hamburg, Lund, and Venice.

Minor repetitions from the epicentre 43°·6N. 13°·5E., all classified as X.

Oct. 30d. 7h. 34m. 20s. (I)
7h. 49m. 6s. (II)
8h. 29m. 10s. (III)
8h. 44m. 10s. (IV)
9h. 5m. 4s. (V)
10h. 13m. 10s. (VI)

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
III Florence	1·6	276	10 47	S	(10 47)	+ 6	—	—
V	1·6	276	10 28	P*	—	—	—	—
I Rome	1·9	204	e 0 30	+ 2	0 52	+ 3	—	1·6
II	1·9	204	0 54	S	(0 54)	+ 5	—	1·7
III	1·9	204	e 0 26	- 2	1 5	+16	—	1·3
IV	1·9	204	e 0 26	- 2	—	—	—	—
V	1·9	204	e 0 39	P _g	—	—	—	1·6
VI	1·9	204	e 0 36	P*	e 0 50	+ 1	—	1·7

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
II Rocca di Papa	2-0	198	e 0 25	- 4	—	—	—	0-9
III	2-0	198	e 0 30	+ 1	0 50	- 1	—	1-1
IV	2-0	198	e 0 12	-17	0 33	-18	—	0-9
V	2-0	198	e 0 9	-20	0 39	-12	—	0-9
VI	2-0	198	e 0 26	- 3	i 0 54	+ 3	—	1-1
III Treviso	2-3	336	e 0 35	+ 2	e 1 0	+ 1	—	1-1
V	2-3	336	e 0 31	- 2	0 51	- 8	—	—
VI	2-3	336	e 0 30	- 3	e 0 50?	- 9	—	—
II Zagreb	2-8	37	e 0 43	+ 3	e 1 11	- 1	—	—
III	2-8	37	0 40	0	e 1 21	+ 9	i 1-6	—
IV	2-8	37	e 0 43	+ 3	i 1 4	- 8	—	—
V	2-8	37	0 26	-14	—	—	—	—
VI	2-8	37	0 34	- 6	i 1 15	+ 3	—	—
II Innsbruck	3-9	339	—	—	1 18	-22	—	—
III	3-9	339	—	—	1 26	-14	—	—
V	3-9	339	0 56?	0	—	—	—	—
VI	3-9	339	1 8	+12	—	—	—	—

Additional readings:—

Rocca di Papa III i = +33s., S = +1m.3s., V i = +16s., VI i = +41s.
Zagreb II eNE = +53s., v e = +32s., i = +52s.

Oct. 30d. 10h. 35m. 58s. (VII)
10h. 41m. 47s. (VIII)
10h. 56m. 36s. (IX)
11h. 0m. 44s. (X)
11h. 6m. 0s. (XI)
11h. 34m. 10s. (XII)

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
VII Florence	1-6	276	i 0 25	+ 2	—	—	—	—
IX	1-6	276	i 0 22	- 1	—	—	—	—
VII Rome	1-9	204	0 30	+ 2	1 2	+13	—	1-7
VIII	1-9	204	e 0 28	0	—	—	—	—
IX	1-9	204	e 0 28	0	1 0	+11	—	1-9
X	1-9	204	e 0 28	0	—	—	—	—
XII	1-9	204	e 0 22	- 6	—	—	—	1-4
VII Rocca di Papa	2-0	198	e 0 25	- 4	i 0 57	+ 6	—	1-1
VIII	2-0	198	e 0 26	- 3	—	—	—	0-7
IX	2-0	198	e 0 31	+ 2	i 0 59	S*	—	1-5
XII	2-0	198	e 0 15	-14	i 0 39	-12	—	0-8
IX Padova	2-1	327	0 15	-15	—	—	—	—
VII Treviso	2-3	336	e 0 38	+ 5	e 0 55	- 4	—	—
VIII Zagreb	2-8	37	e 0 36	- 4	e 1 17	+ 5	—	—
VIII	2-8	37	e 0 43	+ 3	—	—	—	—
IX	2-8	37	0 41	+ 1	e 1 19	+ 7	—	—
XI	2-8	37	e 0 40	0	—	—	—	—
XII	2-8	37	e 0 46	+ 6	—	—	—	—
VII Innsbruck	3-9	339	1 14	P*	—	—	—	—
VII Vienna	z. 5-0	22	—	—	2 34	S*	—	—

Rocca di Papa VII gives also i = +27s.

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Oct. 30d. 12h. 13m. 44s. (XIII)
 13h. 12m. 20s. (XIV)
 13h. 23m. 47s. (XV)
 13h. 40m. 59s. (XVI)
 13h. 47m. 10s. (XVII)
 13h. 49m. 56s. (XVIII)

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
XIII Rome	1.9	204	i 0 28	0	0 58	S*	—	1.0
XIV	1.9	204	0 56	S	(0 56)	+ 7	—	2.4
XVI	1.9	204	0 28	0	—	—	—	1.3
XVII	1.9	204	0 21	- 7	—	—	—	0.9
XVIII	1.9	204	e 0 23	- 5	—	—	—	—
XIII Rocca di Papa	2.0	198	e 0 30	+ 1	—	—	—	—
XIV	2.0	198	e 0 31	+ 2	i 1 2	S*	—	1.3
XVI	2.0	198	i 0 23	- 6	—	—	—	0.8
XVII	2.0	198	i 0 38	P*	—	—	—	0.7
XVIII	2.0	198	e 0 12	- 17	—	—	—	1.2
XIV Treviso	2.3	336	e 0 20	- 13	0 40?	- 19	—	—
XIV Zagreb	2.8	37	e 0 38	- 2	e 1 14	+ 2	e 1.4	—
XV	2.8	37	e 0 40	0	e 0 52	- 20	—	—
XVII	2.8	37	e 0 48	+ 8	e 1 7	- 5	—	—
XVIII	2.8	37	e 0 45	+ 5	—	—	—	—
XIV Strasbourg	6.4	324	1 38	+ 7	—	—	—	—

No additional readings.

Oct. 30d. 16h. 11m. 22s. (XIX)
 16h. 30m. 26s. (XX)
 17h. 0m. 38s. (XXI)
 17h. 3m. 31s. (XXII)
 22h. 0m. 50s. (XXIII)
 23h. 56m. 32s. (XXIV)

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
XIX Florence	1.6	276	i 0 22	- 1	—	—	—	—
XXI	1.6	276	i 0 21	- 2	—	—	—	—
XXII	1.6	276	i 0 23	0	—	—	—	—
XIX Rome	1.9	204	e 0 39	P _r	—	—	—	0.8
XX	1.9	204	e 0 39	P _r	—	—	—	1.8
XXI	1.9	204	e 0 29	+ 1	1 3	S _r	—	1.1
XXII	1.9	204	e 0 30	+ 2	i 0 57	S*	—	1.2
XIX Rocca di Papa	2.0	198	e 0 17	- 12	—	—	—	1.1
XX	2.0	198	e 0 25	- 4	i 0 56	+ 5	—	1.4
XXI	2.0	198	e 0 29	0	i 0 40	- 11	e 1.0	1.6
XXII	2.0	198	e 0 22	- 7	i 0 59	+ 8	1.1	1.3
XXIII	2.0	198	e 0 35	+ 6	—	—	—	1.0
XXIV	2.0	198	e 0 34	+ 5	—	—	i 1.1	1.5
XXIV Padova	2.1	327	0 53	S	(0 53)	- 1	—	—
XXI Treviso	2.3	336	e 0 42	+ 9	1 5	+ 6	—	—
XXII	2.3	336	e 0 39	+ 6	1 0	+ 1	—	—
XIX Zagreb	2.8	37	e 0 33	- 7	e 1 14	+ 2	—	—
XX	2.8	37	e 0 34	- 6	e 1 13	+ 1	—	—
XXI	2.8	37	e 0 32	- 8	e 1 20	+ 8	—	—
XXII	2.8	37	e 0 40	0	i 1 21	+ 9	—	—
XXIII	2.8	37	e 0 42	+ 2	—	—	—	—
XXIV	2.8	37	e 0 40	0	e 1 21	+ 9	—	—
XXI Innsbruck	3.9	339	—	—	1 40	0	—	—

Zagreb gives also for shock XIX eNW = +47s., XXII i = +56s., XXIII e = +1m.2s.
 Long waves were recorded for shocks VII, XIII, XXIV at Neuchatel.

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Oct. 30d. Readings also at 1h. (Samarkand), 3h. (near La Paz), 4h. (Ekaterinburg, Manila, Lick, and near Catania), 5h. (Hong Kong, Irkutsk, and Tashkent), 6h. (near Port au Prince), 7h. (Sumoto (2)), 8h. (Rocca di Papa), 9h. (Neuchatel, Zagreb, Andijan, and near Samarkand), 11h. (Rocca di Papa (2)), 12h. (Padova, Zagreb, and near Taihoku), 13h. (Berkeley and Padova), 14h. (near Irkutsk), 15h. (Neuchatel (3)), 16h. (Baku, Ekaterinburg, Irkutsk, Padova (3), near Almata, Andijan, and Samarkand), 17h. (Andijan, Samarkand, and La Paz), 20h. (Samarkand and near Andijan), 22h. (Manila, Mineo, and Catania), 23h. (Lick, Alicante, Andijan, and near Samarkand).

Oct. 31d. 10h. 24m. 6s. Epicentre 11°0S. 162°3E. N.2.

A = -.935, B = +.298, C = -.191; D = +.304, E = +.953;
G = +.182, H = -.058, K = -.982.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m. s.	o.	m. s.	s.	m. s.	s.	m.	m.
Riverview	25.0	202	15 23	+ 3	19 46	+ 5	e 12.8	14.9
Sydney	25.0	202	15 24	+ 4	110 18	SS	12.4	13.1
Melbourne	31.0	207	6 22	+ 8	111 39	+19	13.7	17.6
Adelaide	32.2	219	16 25	+ 1	111 40	+ 2	14.7	18.8
Wellington	33.2	162	6 25	- 9	11 37	-17	13.9	18.9
Christchurch	33.7	167	—	—	11 52	- 9	15.2	23.2
Manila	48.3	301	e 8 37	- 1	115 54	+17	23.6	—
Honolulu T.H.	50.8	50	—	—	e 16 17	+ 5	e 23.6	—
Batavia	55.0	271	—	—	e 15 54	?	28.9	—
Hong Kong	57.8	306	9 56	+ 7	18 4	+17	25.0	30.2
Phu-Lien	63.3	300	—	—	18 54?	- 5	—	—
Medan	65.0	279	e 9 54	-45	—	—	37.4	—
Irkutsk	80.4	329	e 12 10	0	—	—	35.9	49.3
Colombo	84.0	278	13 35	+67	22 45	-13	41.0	47.8
Sitka	84.9	29	—	—	e 23 6	- 1	e 39.6	—
Kodalkanal	87.0	281	35 48	?	—	—	53.3	58.6
Victoria	88.1	40	—	—	23 38	0	40.4	48.6
Bombay	93.1	289	e 14 25	+73	—	—	—	66.9
Tucson	93.2	57	—	—	e 23 54	[+ 3]	e 42.5	—
Tashkent	99.5	311	e 13 42	+ 1	e 24 12	[-11]	41.5	59.1
Ekaterinburg	105.6	327	—	—	26 3	?	43.9	64.4
Tananarive	109.1	245	—	—	e 25 20	[+11]	e 54.6	60.5
Chicago	112.2	49	—	—	e 28 54	PS	e 55.9	—
Baku	114.1	310	e 19 47	PP	25 39	[+ 9]	51.9	59.5
Ann Arbor	E. 115.2	47	—	—	e 48 36	?	e 59.5	—
Kucino	118.0	328	—	—	27 57	?	52.6	72.7
Pulkovo	119.7	335	—	—	e 30 12	PS	60.9	72.2
Scoresby Sund	120.5	2	—	—	37 1	SS	65.9	—
La Paz	123.0	117	19 47	?	30 43	PS	53.9	62.2
Harvard	124.1	45	e 21 43	?	e 31 47	?	e 60.9	—
Copenhagen	129.5	338	—	—	35 54?	?	59.9	—
Cheb	133.8	333	—	—	e 39 54?	SS	e 63.9	83.9
De Bilt	135.0	340	e 21 54?	PP	e 39 57	SS	e 58.9	72.8
Stuttgart	136.1	335	—	—	e 39 54?	SS	e 67.9	84.9
Uccle	136.3	340	—	—	e 40 6	SS	e 60.9	—
Strasbourg	136.9	335	e 22 54?	PKS	e 39 54?	SS	e 59.9	—
Kew	137.2	345	—	—	e 40 22	SS	69.9	86.7
Paris	138.6	340	e 22 54?	PKS	—	—	72.9	85.9
Florence	138.8	327	—	—	e 25 54?	?	—	80.9
Rocca di Papa	139.2	323	e 22 34	PP	e 58 10	?	e 69.2	74.9
Catania	140.4	317	e 23 11	PP	—	—	—	—
Granada	150.9	336	119 30	[-13]	—	—	e 77.9	92.6

Additional readings :-

Riverview iEN = +5m.27s. and +9m.59s., iN = +12m.41s.

Melbourne PPP = +7m.22s.

Adelaide i = +7m.45s. and +14m.4s.

Manila iZ = +8m.52s., iN = +12m.47s., iE = +17m.31s., S_cS_t = +18m.54s.

Honolulu T.H. e = +20m.54s.

Continued on next page.

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Irkutsk PS = +22m.12s., eSS = +26m.57s.
 Tucson e = +30m.58s.
 Tashkent ePP = +17m.42s.
 Ekaterinburg ePP = +19m.2s., PS = +27m.48s., SS = +33m.30s., SSS = +38m.6s.
 Tananarive eN = +26m.46s., E = +27m.53s. and +29m.50s., EN = +34m.28s., E = +38m.8s. and +48m.17s.
 Chicago ePP = +21m.22s., ePPP = +24m.31s., eSSS = +42m.30s.
 Baku PPS = +29m.19s., SS = +33m.54s.
 Ann Arbor e?N = +50m.48s.
 Kucino eSS = +36m.12s., eSSS = +39m.54s.
 Pulkovo eSS = +42m.0s.
 La Paz PSN = +32m.30s.
 Harvard eE = +39m.10s. and +55m.39s.
 Uccle e = +45m.24s.
 Granada PP = +23m.37s., i = +26m.19s. and +46m.9s.
 Long waves were also recorded at Nagasaki, Taihoku, Berkeley, Ksara, Dakar, and other European stations.

Oct. 31d. 21h. 32m. 0s. (I) } Epicentre 42°·5N. 71°·0E. N.3.
 21h. 35m. 20s. (II) } (given by the stations). X.

A = +·240, B = +·697, C = +·676.

	Δ	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	s.	m. s.	s.	m.	m.
I Tashkent	1·8	10 18	- 8	(10 39)	- 7	10·6	1·2
II Andijan	1·8	10 18	- 8	(10 41)	- 5	10·7	1·5
II Samarkand	2·0	10 36	P*	—	—	1·1	1·2
II Ekaterinburg	2·0	0 40	P*	—	—	1·1	1·4
II Baku	4·2	0 56	- 4	(1 58)	+10	2·0	2·2
	15·8	e 3 49	+11	—	—	13·7	—
	15·9	3 30	-10	—	—	—	—

Additional readings:—

Ekaterinburg II e = +4m.24s., +4m.47s., and +8m.23s.
 Long waves were also recorded at Samarkand for shock II and at Irkutsk for both shocks I and II.

Oct. 31d. 23h. 16m. 43s. Epicentre 55°·3N. 12°·8E. N.3.

A = +·555, B = +·126, C = +·822; D = +·222, E = -·975;
 G = +·802, H = +·182, K = -·569.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Copenhagen	0·4	332	10 5	- 1	10 12	+ 2	—	—
Lund	0·5	28	10 6	- 1	0 14	+ 1	—	—
Hamburg	2·4	223	e 0 37	+ 3	11 7	+ 5	—	—
Göttingen	N.	4·1	205	e 0 53	- 5	11 35	-10	1·7
Jena	E.	4·5	190	e 1 5	+ 1	—	—	e 2·3
Upsala	5·2	28	—	—	e 2 27	+14	12·7	—

Additional readings:—

Göttingen iN = +1m.0s. and +1m.4s., eN = +1m.9s. and +1m.17s.
 Jena eE = +1m.21s. = P*, iE = +1m.43s.
 Long waves were also recorded at Potsdam, Stuttgart, and Vienna.

Oct. 31d. Readings also at 1h. (Baku, Ekaterinburg, Tashkent, Tananarive, La Paz, and Rio de Janeiro), 2h. (Baku, Irkutsk, Granada, Rocca di Papa, and Strasbourg), 3h. (Baku, Irkutsk, Rocca di Papa, Rome, and near Zagreb), 5h. (Rome and Rocca di Papa), 7h. (Rocca di Papa and Zagreb), 8h. (La Paz and Messina), 9h. (near Tacubaya), 10h. (Rocca di Papa and Rome), 11h. (Piacenza), 12h. (Rocca di Papa and Rome), 13h. (Bombay, Ekaterinburg, Irkutsk, Tashkent, Samarkand, Rocca di Papa, and near Treviso), 14h. (Rocca di Papa (2), Rome, Zagreb, and near Padova), 15h. (Alicante, Zagreb, Chur, near Zurich (2), near Nagoya, and Tyost), 16h. (Berkeley, Baku (2), Ekaterinburg (2), Irkutsk, Tashkent (2), Hong Kong, Manila, Adelaide, Melbourne, Riverview, Wellington, and near Sumoto), 17h. (La Plata, Florence, Innsbruck, Padova, Zagreb, Irkutsk, near Rocca di Papa, and Naples), 18h. (Adelaide (2), Melbourne (2), Riverview (2), Wellington, Manila, Honolulu T.H., Berkeley, Victoria, Granada, and Zurich), 19h. (Harvard, Tucson, Hong Kong, Rocca di Papa, and Zagreb (2)), 20h. (Hong Kong, Manila, Irkutsk, Tashkent, and Granada), 21h. (Baku, Ekaterinburg, near Rocca di Papa, and Zagreb), 22h. (Adelaide, Melbourne, Riverview, near Lick, and near Taihoku).

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Nov. 1d. 22h. 9m. 11s. Epicentre 43°·6N. 13°·5E. (as on Oct. 30d.).

R.3.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	s.	°	m. s.	s.	m. s.	s.	m.	m.
Florence	1·6	276	0 19	- 4	—	—	—	1·3
Rocca di Papa	2·0	198	1 0 16	-13	1 1 3	S*	1 1·6	1·8
Padova	2·1	327	0 36	+ 6	1 16	S _r	—	—
Treviso	2·3	336	e 0 35	+ 2	1 0 59	S _r	—	1·6
Laibach	2·5	16	(e 0 43)	P*	(e 1 32)	S _r	—	(1·7)
Naples	2·8	168	e 1 14	S	(e 1 14)	+ 2	—	2·4
Zagreb	2·8	37	0 28	-12	e 1 9	- 3	1 1·4	2·3
Piacenza	3·1	298	e 1 9	P*	—	—	—	3·0
Graz	3·7	21	1 1 40	S	(1 1 40)	+ 5	(1 2·4)	2·5
Innsbruck	3·9	339	e 1 13	P*	—	—	—	2·6
Vienna	5·0	22	1 46	S	(1 46)	-22	—	3·2
Ravensburg	5·0	328	—	—	e 2 9	+ 1	—	—
Stuttgart	5·9	331	—	—	e 2 29	- 2	e 3·6	4·2
Strasbourg	6·4	324	—	—	e 2 49?	+ 6	—	—
Göttingen	N.	8·2	345	e 2 49?	P _r	—	—	—

Additional readings and notes :—

Rocca di Papa 1P = +19s.

Laibach ePP = (+59s.); all readings have been diminished by 20m.

Zagreb eP_r = +32s., eNW = +1m.7s., iNE = +1m.17s.

Graz gives S as P and L as S.

Long waves were recorded at Karlsruhe, Chur, Neuchatel, and Zurich.

Nov. 1d. Minor shocks from the epicentre 43°·6N. 13°·5E.

(Classified as X).

8h. 40m. 54s. (i)
8h. 48m. 56s. (ii)
9h. 40m. 41s. (iii)
9h. 50m. 11s. (iv)
10h. 19m. 46s. (v)
17h. 21m. 0s. (vi)
19h. 55m. 35s. (vii)

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	s.	°	m. s.	s.	m. s.	s.	m.	m.
VII Florence	1·6	276	0 25	+ 2	—	—	—	0·6
I Rocca di Papa	2·0	198	—	—	e 1 0	S*	1 2·4	2·5
II	2·0	198	e 0 22	- 7	0 33	-18	1 1·1	1·3
III	2·0	198	e 0 24	- 5	1 0 58	+ 7	—	1·2
IV	2·0	198	e 0 26	- 3	—	—	1 1·0	1·0
V	2·0	198	0 32	+ 3	—	—	1 1·2	1·7
VI	2·0	198	0 22	- 7	—	—	—	0·7
VII	2·0	198	e 0 24	- 5	(1 0 55)	+ 4	1 0·9	1·2
I Padova	2·1	327	2 20	?	—	—	—	—
II	2·1	327	0 29	- 1	0 51	- 3	—	—
III	2·1	327	0 22	- 8	0 46	- 8	—	—
IV	2·1	327	0 37	+ 7	—	—	—	—
V	2·1	327	0 29	- 1	0 50	- 4	—	—
VII	2·1	327	0 45	P _r	—	—	—	—
I Treviso	2·3	336	e 1 46	+73	2 6	+67	—	—
II	2·3	336	0 44	P*	1 1 11	S*	—	—
III	2·3	336	e 0 48	P _r	e 1 4	+ 5	—	—
V	2·3	336	0 24	- 9	—	—	—	—
VII	2·3	336	1 0 26	- 7	e 0 45	-14	—	—
I Zagreb	2·8	37	e 0 40	0	1 1 5	- 7	—	1·4
II	2·8	37	e 0 39	- 1	e 1 23	+11	—	—
III	2·8	37	e 0 38	- 2	e 1 16	+ 4	—	—
IV	2·8	37	e 0 36	- 4	e 1 17	+ 5	—	—
V	2·8	37	e 0 41	+ 1	—	—	—	1·4
VI	2·8	37	e 0 48	+ 8	—	—	—	—
VII	2·8	37	0 35	- 5	e 1 17	+ 5	—	1·8

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		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
II Innsbruck		3.9	339	—	—	1 22	-18	—	—
III		3.9	339	0 55	-1	—	—	—	—
IV		3.9	339	—	—	1 25	-15	—	—
V		3.9	339	1 2	+6	—	—	—	—
VII		3.9	339	—	—	1 25	-15	—	—
I Vienna	Z.	5.0	22	e 2 44	S*	—	—	—	—
V		5.0	22	2 20	S	(2 20)	+12	—	—

Additional readings :—

Rocca di Papa I eS = +1m.28s., II i = +50s., VI i = +38s., VII iP = +29s.

Zagreb I iP_g = +44s., II eP_g = +43s., V eP_g = +45s., VI P_g = +52s., VII iP_g = +37s.

Long waves were also recorded at Innsbruck for shock I, Strasbourg, Chur, Neuchatel, and Zurich for shocks I, II, III, IV, V.

Nov. 1d. Readings also at 0h. (Zagreb and Rocca di Papa (2)), 1h. (Riverview), 2h. (Baku, Ekaterinburg, Manila, Melbourne, Wellington, near Andijan, Samarkand, and Tashkent), 3h. (Christchurch, Batavia, and near Malabar), 5h. (Lick and near Manila), 8h. (Zagreb), 9h. (La Paz), 10h. (Hong Kong and near Manila), 12h. (Melbourne, Riverview, Adelaide, Wellington, Hong Kong, Manila, Suva, Perth, Victoria, Ekaterinburg, Zagreb, near Chur, and Zurich), 13h. (Berkeley, Harvard, Cucino, and Tashkent), 14h. (Granada), 16h. (St. Louis), 17h. (Andijan, Riverview, Adelaide, Wellington, Victoria, and Zagreb), 18h. (Ekaterinburg, Tashkent, Samarkand, and near Andijan), 19h. (Alicante, Samarkand, and near Andijan), 20h. (near Mizusawa), 22h. (Zagreb (2)), 23h. (Tucson).

Nov. 2d. 8h. 18m. 24s. Epicentre 43°-6N. 13°-5E. (as on 1d.). X.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Florence		1.6	276	0 8	-15	—	—	—	0.8
Rocca di Papa		2.0	198	e 0 25	-4	i 1 1	S*	—	1.2
Padova		2.1	327	0 41	—	P _g	—	—	—
Treviso		2.3	336	0 28	-5	0 48	-11	—	—
Naples		2.8	168	e 1 6	S	(e 1 6)	-6	(1.7)	2.3
Zagreb		2.8	37	e 0 42	+2	i 1 20	+8	—	2.0
Piacenza		3.1	298	e 1 9	P _g	—	—	—	1.9
Innsbruck		3.9	339	1 12	P _g	—	—	—	—
Vienna	Z.	5.0	22	e 1 42	P _g	—	—	—	—

Naples gives S as P and L as S.

Long waves were recorded at Chur, Neuchatel, and Zurich.

Nov. 2d. Minor shocks from the origin 43°-6N. 13°-5E. (classified as X.).

0h. 37m. 35s. (I)
 1h. 27m. 20s. (II)
 3h. 20m. 53s. (III)
 5h. 22m. 20s. (IV)
 5h. 25m. 13s. (V)
 10h. 5m. 6s. (VI)

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
II Florence		1.6	276	0 32	P _g	—	—	—	0.9
III		1.6	276	0 20	-3	—	—	—	0.6
IV		1.6	276	0 32	P _g	—	—	—	0.7
V		1.6	276	0 34	P _g	—	—	—	0.6
I Rocca di Papa		2.0	198	0 29	0	i 0 46	-5	10.9	1.0
II		2.0	198	e 0 31	+2	—	—	11.1	1.3
IV		2.0	198	e 0 24	-5	—	—	11.0	1.1
V		2.0	198	e 0 29	0	—	—	11.0	1.6
VI		2.0	198	e 0 22	-7	0 32	-19	11.0	1.2

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
III Padova	2.1	327	0 34	+ 4	—	—	—	—
IV	2.1	327	0 45	P _g	—	—	—	—
V	2.1	327	0 27	- 3	—	—	—	—
VI	2.1	327	0 42	P _g	—	—	—	—
II Treviso	2.3	336	e 0 15	-18	0 35	-24	—	—
V	2.3	336	0 27	- 6	0 48	-11	—	—
II Zagreb	2.8	37	0 40?	—	e 1 23	+11	—	—
III	2.8	37	0 22	-18	e 1 2	-10	e 1.4	—
IV	2.8	37	0 37	- 3	e 1 17	+ 5	—	—
V	2.8	37	e 0 36	- 4	i 1 18	+ 6	—	—
VI	2.8	37	0 34	- 6	e 1 17	+ 5	—	—
III Innsbruck	3.9	339	1 13	P*	—	—	—	—

Additional readings:—

Zagreb III eNE = +52s., v eP_g = +41s., VI P_g = +38s.

Long waves were also recorded for shocks II, III, IV, and VI, at Chur, Neuchatel, and Zurich, also for shock I at Zagreb.

Nov. 2d. 16h. 38m. 8s. Epicentre 54°0N. 160°5W. (as on 1930 April 23d.). R.3.

A = -554, B = -196, C = +809; D = -334, E = +943;
G = -763, H = -270, K = -588.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Victoria	E. 23.7	88	5 4	- 3	(8 58)	-20	9.0	11.4
	N. 23.7	88	5 6	- 1	(9 14)	- 4	9.2	11.6
Lick	31.3	105	e 6 19	+ 2	—	—	—	—
Irkutsk	52.6	310	e 9 17	+ 6	e 16 41	+ 4	e 27.9	—
Ekaterinburg	63.9	337	i 10 32	+ 1	19 21	+15	31.9	41.4
Almata	71.0	320	e 11 25	+ 8	—	—	—	—
Andijan	74.9	322	e 11 43	+ 3	—	—	—	—
Tashkent	75.6	324	i 11 42	- 2	e 14 28	PP	e 39.2	48.6
Samarkand	77.9	325	e 11 56	- 1	—	—	—	—
Zurich	78.2	8	i 11 52?	- 6	—	—	—	—
Neuchatel	78.4	10	i 11 53	- 6	—	—	—	—
Zagreb	80.1	2	e 12 7	- 1	—	—	—	—
Baku	82.1	337	i 12 19	0	e 22 52	+14	40.0	55.6

Lick gives also e = +6m.30s., eE = +6m.42s.

Long waves were also recorded at Berkeley, Harvard, and Scoresby Sund.

Nov. 2d. Readings also at 0h. (Zagreb), 1h. (Andijan and Zagreb), 3h. (Andijan, Naples, Lick, and Zagreb), 4h. (near Zagreb and La Paz (2)), 5h. (Strasbourg and Naples), 6h. (Berkeley, Victoria, and Zagreb), 7h. (Chur, Neuchatel, and Zurich), 8h. (Almata, Andijan, and Samarkand), 9h. (Innsbruck, Sebastopol, Simferopol, Theodosia, Yalta, Neuchatel, Messina, Mineo, Ksara (2), and near Catania), 13h. (Zagreb), 18h. (Alicante), 22h. (Samarkand and near Treviso).

Nov. 3d. 18h. 36m. 50s. Epicentre 3°5S. 149°5E. N.3.

A = -860, B = +507, C = -061; D = +508, E = +862;
G = +053, H = -031, K = -998.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Riverview	30.4	178	e 7 8	+59	e 11 4	- 6	e 16.2	21.8
Sydney	30.4	178	—	—	i 11 22	+12	17.2	18.7
Suva	31.8	120	e 7 10?	+49	—	—	e 13.2	26.2
Manila	33.6	305	e 7 22	PP	i 11 40	-20	i 14.0	—
Melbourne	34.6	187	—	—	12 18	+ 3	i 14.7	21.9

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Perth	42.5	226	—	—	17 10	SS	—	—
Batavia	42.6	267	i 8 47	+54	—	—	—	—
Hong Kong	43.1	310	8 4	+ 6	14 26	+ 4	—	19.9
Wellington	44.1	153	8 1	- 5	14 24	-13	20.2	22.2
Phu-Lien	48.5	305	—	—	15 10?	-30	—	—
Calcutta	65.1	299	e 20 7	SeS	(e 20 7)	(-22)	(29.1)	—
Irkutsk	67.5	333	e 10 55	0	19 51	0	32.2	—
Agra	N. 75.3	301	e 9 1	?	—	—	—	—
Bombay	78.6	291	12 9	+ 9	21 59	- 1	40.2	—
Andijan	82.6	314	e 12 27	+ 6	—	—	—	—
Sitka	85.0	32	—	—	e 35 26	?	—	—
Tashkent	85.0	314	i 12 29	- 4	i 23 1	- 7	e 35.2	49.3
Samarkand	86.5	312	e 12 41	0	—	—	—	—
Berkeley	E. 90.8	52	—	—	23 55	- 9	e 44.3	51.1
Victoria	E. 90.8	41	24 13	S	(24 13)	+ 9	39.4	44.2
	N. 90.8	41	23 48	S	(23 48)	{ + 7 }	37.2	41.6
Ekaterinburg	92.3	329	e 13 9	+ 1	23 56	{ + 3 }	43.2	—
Baku	99.5	313	—	—	e 25 17	- 5	46.2	56.1
Kucino	104.8	329	—	—	24 52	[+ 3]	46.1	61.9
Pulkovo	107.3	334	e 18 55	PP	—	—	56.2	64.7
Scoresby Sund	112.8	357	—	—	29 5	PS	53.2	—
La Paz	137.8	120	e 20 46	?	—	—	69.8	75.6

Additional readings and notes :—

Manila iN = +9m.50s. = P_eP + 29s.

Hong Kong S = +12m.22s.

Calcutta gives S as P and L as S.

Berkeley eE = +29m.45s. = SS - 7s. and +41m.58s.

Ekaterinburg iPP = +17m.3s., PS = +25m.23s., SS = +30m.22s., SSS = +35m.4s.

Baku PP = +17m.57s., e = +39m.23s.

Kucino SS = +33m.10s., SSS = +37m.46s.

Long waves were also recorded at Honolulu T.H., Sitka, and several European stations.

Nov. 3d. Readings also at 1h. (Samarkand), 3h. (Innsbruck and near Treviso), 16h. (near Calcutta), 17h. (Innsbruck, Rocca di Papa, Vienna, Chur, Neuchatel, and Zurich, near Treviso, Almata, near Andijan, and Samarkand), 20h. (Ekaterinburg, Tashkent, La Paz, Almata, and near Samarkand), 21h. (Samarkand), 22h. (Almata and Samarkand).

Nov. 4d. 4h. 32m. 33s. Epicentre 22°·5N. 120°·5E. N.3.

A = -·469, B = +·796, C = +·383; D = +·862, E = +·508;

G = -·194, H = +·330, K = -·924.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Taihoku	2.7	21	0 39	0	0 44	P*	1.1	1.3
Manila	7.9	176	1 1 52	0	1 3 47	S*	14.8	6.7
Tashkent	46.6	306	—	—	e 15 13	0	e 24.5	30.5
Samarkand	48.1	304	e 17 44	?	—	—	—	—
Ekaterinburg	54.9	325	e 9 27	- 1	—	—	25.5	—

Additional readings :—

Manila iE = +4m.10s.

Tashkent e = +19m.3s. = SSS - 19s.

Long waves were also recorded at Hong Kong, Phu-Lien, Irkutsk, Baku, Pulkovo, and Copenhagen.

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Nov. 4d. 15h. 38m. 2s. Epicentre 24°·3N. 97°·9E. N.2.

A = -·125, B = +·903, C = +·412; D = +·991, E = +·137;
G = -·057, H = +·408, K = -·911.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Phu-Lien	8·8	112	e 2 6	+ 1	4 3	+19	4·7	—
Hong Kong	15·1	94	3 29	- 1	6 29	+12	7·7	9·0
Agra	18·1	284	4 7	- 1	7 27	0	9·4	11·0
Dehra Dun	18·6	293	3 38	-36	7 38	0	10·0	10·0
Medan	20·7	177	4 59	+22	—	—	—	—
Zi-ka-wei	21·9	66	4 48	- 2	11 22	L	(11·4)	—
Manila	23·8	110	i 5 15	+ 7	19 38	+19	—	—
Bombay	23·9	262	5 22	+13	9 54	SS	13·2	13·4
Colombo	24·6	228	10 3	S	(10 3)	+29	—	25·3
Almata	25·6	323	5 25	0	9 57	+ 6	—	—
Andijan	26·9	314	e 5 38	+ 1	e 10 29	+15	15·1	—
Zinsen	27·8	55	10 20	S	(10 20)	- 8	13·9	—
Irkutsk	28·4	8	5 43	- 8	e 10 22	-16	14·0	15·0
Tashkent	29·2	312	5 59	+ 1	e 10 42	- 9	—	18·5
Samarkand	30·1	308	6 9	+ 3	11 5	- 1	—	—
Miyazaki	30·5	68	11 51	S	(11 51)	+39	15·6	—
Ekaterinburg	42·1	330	e 7 48	- 1	i 14 3	- 5	20·0	23·4
Baku	43·0	305	e 8 5	+ 8	—	—	—	—
Kucino	53·4	323	—	—	16 46	- 1	26·0	31·3
Ksara	54·2	295	e 9 33	+10	17 10	+12	—	—
Pulkovo	58·0	328	9 47	- 3	17 42	- 7	30·0	33·8
Helsingfors	60·6	328	—	—	e 18 16	- 8	e 32·0	—
Copenhagen	67·6	323	10 52	- 4	19 50	- 2	34·0	—
Scoresby Sund	76·4	343	—	—	21 28	- 8	40·0	—
La Paz	164·8	298	e 20 7	[+ 8]	—	—	—	—

Additional readings:—

Agra SE = +7m.37s. =SS-3s.

Medan i = +9m.19s., iN = +10m.52s., S = +12m.34s.

Zi-ka-wei iE = +4m.56s. and +14m.4s.

Manila iZ = +6m.16s., iE = +6m.34s., iZ = +6m.40s.

Tashkent e = +6m.51s.

Kucino e = +20m.22s. =SS+2s.

Long waves were also recorded at Calcutta, Kodaikanal, Batavia, Koti, Tananarive, and several other European stations.

Nov. 4d. Readings also at 0h. (Samarkand), 5h. (La Paz (2), Port au Prince, Florissant, and St. Louis), 7h. (Lick, Bombay, and near Calcutta), 13h. (Wellington), 14h. (Amboina), 17h. (near La Paz and near Amboina), 19h. (Andijan and Samarkand), 21h. (Tananarive and near Tyosi).

Nov. 5d. Readings at 0h. (Victoria), 1h. (La Paz (2), Tananarive, Tashkent (2), Irkutsk, Baku, Uccle, and near Nagoya), 2h. (Irkutsk), 11h. (Hong Kong and Phu-Lien), 12h. (Almata), 14h. (near Tyosi), 21h. (Almata, Andijan, and Samarkand).

Nov. 6d. Readings at 0h. (Ekaterinburg and Irkutsk), 2h. (Lick and Tucson), 4h. (Ekaterinburg and Tashkent), 5h. (Baku and Ekaterinburg), 6h. (La Paz and Kucino), 7h. (Tyosi), 10h. (Baku, Ekaterinburg, and Tashkent), 14h. (Baku, Ekaterinburg, and Tashkent), 17h. (La Paz (2) and Rocca di Papa), 18h. (La Paz), 21h. (Ksara, Rocca di Papa, Trenta, and Zagreb), 22h. (near Tyosi).

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Nov. 7d. 5h. 56m. 52s. Epicentre 42°0N. 42°0E. N.3.
(as given by the Russian stations).

A = +.552, B = +.497, C = +.669; D = +.669, E = -.743;
G = +.497, H = +.448, K = -.743.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Theodosia	5.6	304	e 1 15	- 5	—	—	2.4	3.5
Baku	6.1	103	e 1 52	+25	—	—	i 3.4	7.3
Yalta	6.2	297	e 1 27	- 1	2 28	-10	—	—
Simferopol	6.4	300	e 2 36	S	(e 2 36)	- 7	—	—
Ksara	N. 9.5	212	e 2 34	+20	5 20	+79	5.9	—
Ekaterinburg	19.0	33	e 4 8	-11	7 37	- 9	9.1	11.3
Zagreb	19.0	290	e 4 23	+ 4	—	—	—	—
Samarkand	19.0	88	e 4 16	- 3	—	—	—	—
Pulkovo	19.2	342	—	—	i 7 37	-13	9.6	12.6
Tashkent	20.3	83	3 30	-63	i 7 14	-58	—	12.2
Helsingfors	20.9	336	e 4 28	-11	—	—	e 10.1	—
Andijan	22.7	83	e 3 33	-85	e 7 16	-103	e 13.0	—
Lund	23.1	316	4 56	- 6	9 8	+ 1	—	—
Copenhagen	23.5	316	5 1	- 4	9 8	- 6	12.1	—
Almata	25.6	75	e 8 29	(-28)	—	—	—	—
De Bilt	26.7	305	—	—	e 10 31	+21	e 15.1	—

Zagreb gives also eNE = +4m.32s.

Nov. 7d. Readings also at 1h. (Samarkand and near Tananarive), 7h. (La Paz and Lick), 9h. (Andijan), 15h. (Andijan, Samarkand, and near La Paz), 18h. (Ekaterinburg, Tashkent, Andijan, and Samarkand), 19h. (Andijan and Samarkand).

Nov. 8d. 3h. 22m. 39s. Epicentre 3°5N. 122°5E. N.2.

A = -.536, B = +.842, C = +.061; D = +.843, E = +.537;
G = -.033, H = +.051, K = -.998.

A depth of focus 0°075 has been assumed.

	Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	-0.4	9.2	142	i 2 20	+15	4 9	+25	—	—
Manila	-1.0	11.2	352	i 2 33	+ 9	i 4 32	+14	—	—
Palau	-1.2	12.6	71	2 51	+11	5 12	+24	—	—
Malabar	-2.7	18.3	234	e 3 43	+ 7	i 6 35	+ 6	—	—
Batavia	-2.7	18.4	238	i 3 37	- 1	i 6 31	0	—	—
Hong Kong	-3.0	20.5	337	i 3 55	- 5	6 27	-46	i 7.0	7.1
Phu-Lien	-3.5	23.2	320	i 4 19	- 7	—	—	13.4	—
Medan	-3.5	23.7	271	i 4 22	-10	i 7 52	-18	—	—
Zi-la-wei	-4.3	27.7	358	5 5	0	8 59	-13	i 12.2	—
Koti	-4.8	31.8	18	—	—	e 9 58	-17	—	—
Sumoto	-4.9	32.9	20	—	—	e 10 18	-14	(e 13.6)	—
Kobe	-4.9	33.3	20	e 5 39	-12	i 10 25	-13	—	—
Osaka	-5.0	33.5	20	e 5 35	-17	10 29	-11	15.1	15.4
Gihu	-5.0	34.5	21	5 40	-21	10 22	-34	—	—
Calcutta	-5.4	38.1	305	6 30	+ 1	11 30	-16	15.3	—
Mizusawa	E. -5.6	39.4	23	6 39	0	15 39	L	(15.6)	—
Adelaide	-5.8	41.3	160	—	—	i 10 26	- 3	i 17.6	23.3
Colombo	-5.9	42.6	276	7 1	- 3	12 31	-16	19.7	26.0
Kodaiikanal	-6.2	45.2	281	e 12 45	S	(e 12 45)	-36	—	—
Hyderabad	-6.2	45.3	291	7 24	0	—	—	29.7	—

Continued on next page.

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	Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m. m.	m. m.
Riverview	-6.3	46.1	146	i 7 35	+ 5	i 13 42	+ 9	e 24.0	28.4
Melbourne	-6.3	46.3	155	i 7 36	+ 3	i 13 53	+ 17	19.6	27.1
Agra	-6.6	48.5	306	e 7 45	- 3	i 13 35	- 32	—	24.0
Bombay	-6.8	50.8	292	8 5	0	i 14 29	- 7	21.8	29.1
Almata	-7.2	56.5	322	8 44	- 2	15 48	- 3	—	—
Andijan	-7.3	58.3	318	8 57	- 2	16 11	- 4	—	—
Tashkent	-7.4	60.7	318	i 9 34	+ 18	i 17 26	+ 40	—	37.7
Samarkand	-7.5	61.7	314	i 9 17	- 6	16 51	- 11	—	—
Wellington	-7.7	65.3	139	9 36	- 11	i 17 33	- 11	26.4	39.4
Baku	-8.3	74.5	311	i 10 37	- 10	i 19 22	- 13	33.4	45.0
Kucino	-8.9	84.1	325	—	—	e 20 9	- 73	e 25.8	—
N. Ksara	-8.9	85.2	305	11 38	- 10	14 57	PP	16.4	—
Theodosia	-8.9	85.5	316	e 11 33	- 16	—	—	—	—
Yalta	-8.9	86.3	315	e 11 36	- 18	—	—	—	—
Sebastopol	-8.9	86.8	315	11 39	- 18	—	—	—	—
Pulkovo	-9.0	88.1	330	i 11 44	- 19	i 21 9	[-132]	36.4	—
Helwan	-9.0	89.3	300	e 11 46	- 23	15 31	PP	—	21.2
Helsingfors	-9.1	90.7	330	—	—	i 21 51	[-106]	—	—
Upsala	-9.2	94.3	330	16 12	PP	i 21 43	[-134]	—	—
Budapest	-9.2	96.4	319	16 30	PP	i 21 56	[-132]	—	—
Lund	-9.2	97.8	328	—	—	i 22 4	[-131]	—	—
Vienna	-9.2	98.0	321	e 12 29	- 23	i 22 7	[-129]	—	—
Copenhagen	-9.2	98.2	328	—	—	i 22 7	[-130]	—	—
Potsdam	-9.2	98.9	325	i 16 49	PP	i 22 10	[-130]	—	—
Zagreb	-9.2	98.9	319	e 16 45	PP	e 23 58	+ 5	—	—
Trenta	-9.3	100.1	311	e 16 1	PP	22 1	[-145]	—	—
Hamburg	-9.3	100.2	325	e 16 21	PP	i 22 20	[-127]	—	—
Naples	—	101.3	314	e 15 51	?	21 31	[-181]	—	—
E. Treviso	—	101.5	319	i 17 10	PP	i 22 28	[-125]	—	—
Catania	—	101.5	310	e 17 4	PP	22 25	[-128]	—	—
Rocca di Papa	—	102.2	315	e 16 24	PP	i 22 27	[-129]	—	—
Rome	—	102.3	315	e 17 11	PP	i 22 37	[-120]	—	—
Stuttgart	—	102.4	323	i 17 15	PP	e 23 26	[-71]	e 55.4	—
Florence	—	102.6	317	17 17	PP	22 39	[-119]	—	—
Chur	—	102.8	320	e 15 53	?	i 22 27	[-112]	—	—
Zurich	—	103.2	320	e 16 37	PP	e 22 31	[-130]	—	—
Piacenza	—	103.3	318	17 21	PP	19 41	?	—	—
Strasbourg	—	103.3	322	e 17 16	PP	i 22 31	[-131]	31.4	—
De Bilt	—	103.5	326	—	—	i 23 49	[-54]	e 48.4	—
Neuchatel	—	104.4	320	e 17 2	PP	e 22 35	[-132]	—	—
Paris	—	106.4	325	e 17 37	PP	e 25 52	PS	—	—
Kew	—	106.8	329	e 17 49	PP	e 25 48	PS	—	—
Alicante	—	112.9	315	e 18 32	PP	e 23 13	[-133]	—	—
Toledo	—	114.6	318	e 18 39	PP	e 23 23	[-129]	e 24.9	—
Almeria	—	114.8	314	i 18 36	PP	i 23 18	[-135]	26.9	—
Granada	—	115.6	315	i 18 45	PP	i 23 23	[-133]	—	—
Malaga	—	116.4	315	19 16	PP	23 26	[-133]	26.4	—
La Plata	—	148.6	180	(18 39)	[-61]	—	—	18.6	—
La Paz	—	163.3	142	i 18 57	[-60]	—	—	—	—

Additional readings and note :—

Amboina $i = +13m.31s.$

Malabar $i = +13m.53s.$

Medan $i = +4m.25s. = PP - 20s.$

Koti $e = +14m.51s., eE = +16m.8s. = S_eS - 19s.$

Sumoto L is given as $eS.$

Kobe $S = +15m.0s.$

Adelaide $i = +15m.43s.$

Riverview $iP_ePZ = +9m.28s.; T_0 = 3h.22m.16s.$

Agra $iPE = +7m.23s.$

Kucino $e = +6m.33s. \text{ and } +16m.9s.$

Helsingfors $e = +20m.4s., i = +21m.24s., e = +23m.5s. = SKS - 32s., +24m.48s.$

$= PS - 12s. \text{ and } +27m.27s.$

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Vienna $i = +16m.24s.$ = PP + 8s., and +23m.52s.
 Copenhagen +16m.41s.
 Potsdam $iN = +21m.11s.$
 Zagreb $eNW = +15m.1s., eNE = +15m.37s., = +18m.55s., +19m.40s.,$ and +20m.12s.
 $e = +22m.8s., eNW = +22m.28s., eNE = +23m.5s., +25m.40s.,$ and
 +25m.59s.
 Rocca di Papa $i = +16m.56s.$
 Stuttgart $eEZ = +19m.27s., iE = eNZ = +22m.26s.$
 Strasbourg $i = +17m.21s., e = +19m.37s.$
 De Bilt $iPPZ = +17m.22s., iEN = +22m.35s.$
 Kew $iEN = +22m.47s.$
 Almeria $SS = +24m.30s.$
 Granada $i = +21m.11s.$
 La Paz $iE = +24m.5s.$ = PP - 28s., +29m.57s., and +35m.47s.

Nov. 8d. 4h. 1m. 57s. Epicentre $33^{\circ}7'N. 135^{\circ}2'E.$ (as on 1930 July 4d.) R.3.

$A = -590, B = +586, C = +555.$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sumoto	0.7	338	0 8	- 2	0 15	- 3	—	0.3
Kobe	1.0	359	0 15	+ 1	10 23	- 3	—	0.5
Osaka	1.0	12	0 12	- 2	(0 22)	- 4	0.4	0.8
Koti	1.4	264	—	—	0 46	S_2	—	—
Toyoooka	1.9	350	e 0 29	+ 1	0 50	+ 1	—	0.9
Nagoya	2.0	45	0 32	+ 3	0 58	S^*	—	—

No additional readings.

Nov. 8d. Readings also at 0h. (Lick), 1h. (Ekaterinburg, Berkeley, Florissant, St. Louis, Chicago, Victoria, Tucson, La Paz, near Santiago, and near Port au Prince), 2h. (Tashkent, near Port au Prince, and near Tacubaya), 4h. (Zagreb, near Batavia, and Malabar), 5h. (Zagreb (2)), 9h. (Sebastopol, Simferopol, Theodosia, and Yalta), 10h. (Vienna), 11h. (Almata, Samarkand, near Andijan, and near Sumoto), 12h. (Tyosi), 14h. (near La Paz), 18h. (near Manila and near Santiago), 20h. (Almata, near Andijan (2), and Samarkand (2)), 21h. (La Paz).

Nov. 9d. 19h. 8m. 42s. Epicentre $0^{\circ}7'S. 131^{\circ}8'E.$ N.1.

Probable error of epicentre $\pm 0.3.$

$A = -666, B = +745, C = -012; D = +745, E = +667;$
 $G = +008, H = -009, K = -1000.$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	4.7	231	i 1 19	+12	i 2 21	+21	—	—
Palau	8.5	18	1 47	-13	3 33	- 3	—	—
Manila	18.7	325	i 4 14	- 1	i 7 55	+15	i 9.8	12.7
Malabar	25.0	254	e 5 37	+17	10 19	+38	—	—
Batavia	25.5	257	5 28	+ 3	10 29	+39	14.3	—
Isigakizima	26.1	344	5 33	+ 3	10 29	+29	—	—
Tainan	26.2	335	5 1	-30	9 38	-24	—	—
Taihoku	27.6	340	e 6 10	PP	8 10	?	10.9	16.5
Hong Kong	28.7	324	i 5 52	- 1	i 10 38	- 5	13.4	18.1
Titizima	29.5	19	5 58	- 3	10 34	-22	—	—
Miyazaki	32.6	0	6 43	+15	11 27	-18	—	—
Phu-Lien	32.7	313	e 6 29	0	11 46	0	14.3	17.2
Zi-ka-wei	33.4	346	6 36	+ 1	11 54	- 3	14.5	—
Medan	33.4	278	(6 24)	-11	(11 50)	- 7	—	—
Nagasaki	33.5	358	6 21	-15	11 17	-41	14.0	—
Hukuoka	34.3	359	e 6 49	+ 6	e 12 4	- 7	e 14.1	15.3
Koti	34.3	5	6 45	+ 2	12 1	-10	13.9	33.4
Perth	34.7	205	16 53	+ 7	12 40	+23	17.6	19.5
Adelaide	34.8	169	i 6 49	+ 2	i 12 10	- 8	i 15.4	26.0
Sumoto	35.1	6	6 46	- 4	e 14 30	SS	e 18.1	24.4

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	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Kobe	35.5	6	e 6 47	- 6	e 12 7	-22	e 16.8	24.7
Osaka	35.5	6	e 6 32	-21	11 38	-51	14.9	14.9
Nagoya	36.2	8	e 6 55	- 5	—	—	15.9	—
Toyouka	36.4	5	7 6	+ 5	e 14 12	SS	e 19.2	—
Tyosi	37.4	13	e 8 53	PP	(e 13 18)	+21	e 13.3	—
Kumagaya	37.5	10	7 16	+ 5	12 38	-21	—	—
Kakioka	37.7	11	7 25	+13	12 53	- 9	—	—
Riverview	37.8	152	i 7 9	- 4	i 12 59	- 4	18.8	25.0
Sydney	37.8	152	i 6 36	-37	i 13 12	+ 9	21.1	25.5
Melbourne	39.0	164	i 7 25	+ 1	13 26	+ 5	18.6	24.1
Hukusima	39.2	11	7 29	+ 4	13 26	+ 2	—	—
Mizusawa	40.7	12	7 55	+17	13 40	- 7	21.0	—
	40.7	12	7 37	- 1	13 45	- 2	19.3	—
Chiufeng	43.2	344	7 54	- 4	13 53	-31	17.6	—
Ootomari	48.0	10	e 8 29	- 7	15 2	-31	21.7	23.7
Colombo	52.4	280	9 8	- 1	16 8	-26	29.0	29.9
Kodaikanal	55.2	284	i 9 42	+12	(i 19 6)	(-12)	i 19.1	36.8
Wellington	55.8	141	9 28	—	17 23	+ 3	24.3	35.3
Christchurch	56.2	145	—	—	17 32	+ 7	28.2	39.3
Irkutsk	57.8	340	9 45	- 4	17 38	- 9	24.3	28.6
Agra	58.6	305	9 33	-22	17 38	-19	30.5	38.6
Dehra Dun	59.7	308	10 11	+36	18 38	+26	25.6	39.3
Bombay	61.0	294	10 18	0	18 27	- 2	31.9	36.5
Almata	65.7	320	e 10 43	0	19 35	+ 6	—	—
Andijan	67.8	317	e 10 55	- 2	19 59	+ 5	e 35.3	—
Tashkent	70.2	316	i 11 11	- 1	i 20 23	- 1	30.3	40.7
Samarkand	71.3	314	11 20	+ 1	20 36	- 1	—	—
Honolulu T.H.	72.0	67	—	—	14 4	PP	e 18.3	—
Ekaterinburg	80.4	330	i 12 5	- 5	i 22 6	-14	38.3	49.1
Baku	84.3	311	i 12 30	0	i 22 56	- 5	39.3	59.5
Tananarive	84.3	251	12 32	+ 2	22 59	- 2	38.9	43.2
Sitka	92.1	33	—	—	23 33	[-12]	36.6	—
Kucino	92.8	326	i 13 6	- 4	e 26 16	?	42.8	54.2
Theodosia	95.1	317	e 16 54	PP	—	+ 1	33.3	—
Ksara	95.3	304	13 31	+ 9	24 46	—	47.3	—
Yalta	95.9	316	e 16 55	PP	—	—	46.3	—
Pulkovo	96.4	330	e 13 25	- 2	e 24 38	-17	41.3	59.9
Helsingfors	99.0	331	—	—	25 0	-18	e 47.3	—
Helwan	99.4	300	13 39	- 2	26 46	PS	—	64.6
Victoria	100.3	40	—	—	24 15	[-12]	48.6	58.3
Upsala	102.5	332	—	—	e 25 18	{+ 6}	e 44.3	64.1
Berkeley	102.9	50	—	—	125 38	{+23}	e 48.8	70.2
Belgrade	105.5	316	e 16 55	?	e 27 20	PS	e 40.7	59.7
Budapest	105.7	320	17 27	PP	25 0	{+ 7}	43.3	70.3
Lund	106.0	330	18 18?	[+13]	27 42	PS	45.3	—
Copenhagen	106.7	330	18 36	PP	e 26 4	{+21}	45.3	—
Vienna	107.2	321	e 18 10	[+ 1]	28 56	PS	e 44.3	55.3
Prague	107.7	323	e 20 18?	PPP	e 34 48	?	e 44.3	56.3
Potsdam	107.7	325	i 18 46	PP	e 28 18?	PS	e 49.3	61.3
Bergen	107.7	335	16 21	?	e 28 18?	PS	44.5	—
Scoresby Sund	108.1	350	21 18?	PPP	28 18	PS	—	—
Graz	108.1	320	e 19 4	PP	e 29 8	?	44.3	55.8
Zagreb	108.2	318	14 47	+25	e 28 40	PS	e 50.3	e 56.1
Cape Town	108.8	234	14 12	-13	26 54	?	—	56.1
Hamburg	108.8	329	e 18 18?	[+ 4]	28 24	PS	e 52.7	56.3
Cheb	108.9	324	e 18 52	PP	e 28 13	PS	e 44.3	57.3
Jena	109.1	325	e 19 18	PP	e 29 18	?	e 44.3	55.8
Laibach	109.1	320	(e 30 23)	?	(e 31 21)	?	e 59.6	—
Güttingen	109.7	327	e 18 48	PP	e 44 45	?	e 48.3	55.3
Trevise	110.8	320	16 53	?	26 18?	{+ 5}	—	—
Naples	111.0	314	19 18?	PP	—	—	—	—
Catania	111.3	310	e 19 41	PP	e 29 59	?	64.7	77.6
Stuttgart	111.4	324	—	—	e 26 52	{+35}	e 55.3	68.1
Rocca di Papa	111.8	316	e 19 14	PP	1 29 56	?	34.5	57.6
Chur	112.0	321	e 18 30	+ 6	—	—	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	112-1	317	16 30	?	26 47	{+26}	—	34-3
De Bilt	112-1	328	i 19 19	PP	e 29 55	?	e 52-3	71-6
Zurich	112-3	321	e 18 48	{+23}	e 28 47	PS	—	—
Strasbourg	112-3	323	e 14 18?	-25	e 28 2	PS	41-3	70-6
Piacenza	112-6	320	19 16	PP	26 42	{+17}	34-9	76-5
Livorno	112-8	317	17 58	[-28]	—	—	—	—
Uccle	113-2	327	—	—	e 26 18?	{-11}	e 45-3	71-6
Tucson	113-3	53	—	—	e 25 15	[-12]	35-3	—
Neuchatel	113-6	322	e 18 32	{+ 3}	e 26 50	{+18}	—	—
Edinburgh	114-0	334	—	—	i 30 18	?	46-3	72-5
Besançon	114-0	322	e 19 34	PP	e 30 12	?	58-3	—
Durham	114-0	332	22 55	?	33 43	?	e 44-3	59-3
Stonyhurst	114-9	331	19 40	PP	—	—	54-3	60-3
Paris	115-2	325	e 19 43	PP	e 30 31	?	52-3	56-3
Kew	115-3	330	e 19 39	PP	e 28 34	PS	46-5	57-0
Bidston	115-5	331	—	—	e 30 18	?	—	—
Oxford	115-6	330	i 19 49	PP	i 29 34	PS	e 50-6	61-6
Bagnères	119-5	320	(e 20 18?)	PP	—	—	e 20-3	—
Algiers	120-5	313	20 18	PP	—	—	47-3	65-3
Tortosa	120-5	319	20 23	PP	36 46	SS	e 51-3	69-6
Alicante	122-4	316	e 20 25	PP	e 29 10	?	e 37-0	—
Toledo	123-9	320	20 39	PP	?	?	e 55-9	85-8
Almeria	124-4	315	e 18 52	[- 4]	i 30 34	PS	e 63-2	87-3
Granada	125-1	316	19 2	{+ 5}	31 13	PS	e 57-7	87-4
Florissant	125-8	39	e 18 18	[-41]	i 25 53	[-14]	—	173-3
Chicago	125-8	35	e 20 58	PP	e 25 38	[-29]	e 47-1	—
Malaga	125-9	316	e 18 53	[- 6]	27 17	{+69}	29-2	73-6
St. Louis	N. 126-0	39	e 21 48	?	e 38 18	SS	—	—
San Fernando	127-2	316	18 48	[-13]	25 48	[-23]	36-3	88-3
Ann Arbor	127-6	31	e 22 6	?	e 32 48	?	61-5	88-1
Toronto	N. 128-9	29	e 21 1	PP	e 26 6	[-10]	—	—
Ottawa	129-2	23	e 21 8	PP	38 48	SS	e 54-3	—
Charlottesville	133-4	31	e 22 38	PKS	e 45 54	?	60-3	—
Harvard	133-5	22	e 22 43	PKS	e 39 43	SS	e 65-3	—
Georgetown	133-6	30	e 15 54	?	31 29	SKSP	—	—
Fordham	133-6	26	e 21 34	PP	—	—	e 58-3	—
La Plata	143-3	168	19 27	[- 1]	—	—	69-0	—
Port au Prince	150-4	52	e 19 18?	[-24]	—	—	—	—
La Paz	153-9	132	i 19 48	{+ 1}	27 10	?	70-3	86-6
Sucre	154-2	140	19 40	[- 7]	—	—	—	—
Rio de Janeiro	155-9	191	—	—	e 23 58	PKS	e 43-7	78-9

Additional readings and notes :—

Malabar i = +5m.43s. = PP - 7s. and +6m.34s.

Batavia iP = +5m.30s., iPZ = +5m.33s., i = +6m.26s., iZ = +10m.40s.

Hong Kong iPP = +6m.48s.

Zi-ka-wei iN = +6m.56s.

Median readings have been diminished by 5m.

Perth ePP = +7m.58s., ePPP = +8m.39s., SS = +14m.58s., SSS = +15m.38s.

Adelaide i = +8m.1s. = PP + 3s., +12m.44s., +13m.53s., and +15m.1s.

Sumoto eSN = +16m.23s.

Kobe iNE = +9m.4s. = P_cP - 23s.

Toyooka PE = +7m.12s., ePZ = +7m.52s.

Riverview iN = +7m.14s., PPN = +8m.58s., PPPN = +9m.13s., PSN =

+13m.7s., iEN = +15m.19s. = SS - 11s., iE = +18m.1s.; T₁ = 19h.8m.12s.

Melbourne iPPP = +9m.4s.

Wellington SS = +21m.18s. ?

Christchurch PP = +12m.14s., PPP = +13m.23s., SS = +22m.34s.

Tananarive P_cP = +12m.47s., eN = +15m.14s., PPE = +16m.5s., PPPE =

+18m.12s., SKSN = +23m.8s., iS₀S = +23m.32s., iPS = +24m.8s., EN =

+25m.23s., E = +26m.20s., SPSE = +28m.26s., SSN = +28m.54s.,

SSSSN = +34m.56s.

Pulkovo SKS = +24m.8s.

Helingsfors ePPE = +17m.38s., eSKSE = +24m.15s., eE = +29m.34s., eSS =

+31m.59s., eN = +33m.54s., eE = +37m.25s., ePPPZ = +39m.1s.

Upsala e = +32m.38s. = SS + 2s., eN = +42m.29s.

Berkeley iE = +23m.32s., eZ = +24m.1s., eZ = +25m.43s. = S - 9s., iN =

+28m.14s. and +29m.23s., iE = +31m.55s., eN = +45m.2s. and +47m.25s.

Continued on next page.

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Belgrade e = +18m.32s. and +24m.59s. = SKS + 7s.
 Lund +26m.0s. and +33m.18s. ? = SS - 6s.
 Copenhagen eN = +26m.11s. = SKKS + 27s., eE = +28m.12s. = PS + 17s., e = +33m.42s. = SS + 8s.
 Vienna PP = +21m.36s., PKKP = +35m.50s., SSS = +39m.26s.
 Potsdam eEN = +18m.48s., iZ = +19m.41s.
 Scoresby Sund +29m.18s., +29m.48s., +34m.18s. = SS + 25s., and +38m.12s.
 Zagreb ePKP = +19m.2s. = PP + 18s., ePPS = +30m.8s., eNW = +34m.2s. = SS + 8s., eSS = +35m.49s., ePPP = +37m.50s. = SSS - 2s., ePPPPP = +44m.5s.
 Jena eE = +19m.0s. = PP + 9s., eN = +34m.6s. = SS + 0s.
 Laibach gives separate L readings.
 Stuttgart iPPeZ = ePPN = +19m.12s., eEN = +20m.4s., ePPS = +29m.38s., eSSN = +35m.0s., ePPP = +37m.28s., e = +45m.28s., eN = +48m.18s. $\frac{1}{2}$
 Rocca di Papa i = +19m.29s. = PP + 19s.
 De Bilt eE = +19m.28s. = PP + 16s.
 Strasbourg ePP = +19m.20s., iPPS = +29m.56s.
 Uccle PP = +19m.20s., i = +29m.10s. = PS + 11s.
 Tucson e = +28m.52s.
 Durham i = +35m.23s.
 Stonyhurst PS? = +31m.36s., i = +35m.42s., SSSS? = +46m.31s.
 Kew ePPSEN = +30m.31s., eSSEN = +35m.39s., eSSSE = +38m.38s., eN = +39m.26s. and +45m.45s.
 Bidston e = +35m.58s. = SS + 26s.
 Oxford i = +24m.5s., e = +35m.50s. = SS + 16s.
 Almeria iPP = +20m.44s., PPP = +24m.5s.
 Granada PP = +20m.48s., PPP = +25m.28s., SPP = +32m.21s., SS = +33m.11s., SSS = +42m.25s.
 Florissant eZ = +20m.48s. = PP + 9s., iZ = +21m.47s., and +35m.53s.
 Chicago e = +28m.38s., +32m.19s., and +37m.8s.
 Malaga P = +20m.59s.
 St. Louis eN = +25m.48s. and +32m.18s.
 San Fernando SE = +26m.48s.
 Ann Arbor eN = +23m.36s. = PPP - 3s., eE = +34m.18s., e = +38m.48s., eE = +47m.6s.
 Toronto eN = +38m.48s.
 Georgetown PKP = +19m.7s., ePP = +21m.12s.; T₀ = 19h.8m.36s.
 Fordham iPKP? = +25m.18s., PS? = +35m.22s.
 La Paz ePKPE = +19m.50s., SKSE? = +27m.7s., iSSE = +43m.37s., SSSE = +47m.31s.
 Long waves were also recorded at Johannesburg, Dakar, Barcelona, Karlsruhe, and Königsberg.

Nov. 9d. Readings also at 1h. (Florence, Naples, Rocca di Papa, and Rome), 3h. (Tyosi and near Mizusawa), 6h. (Almata, Samarkand, near Granada, near Christchurch and Wellington (2)), 7h. (La Paz), 9h. (Messina, Naples, Rocca di Papa, Rome, Taranto, near Trenta, and Wellington), 10h. (Florissant and Tacubaya), 12h. (Almata (2), Samarkand, Andijan, Ekaterinburg, and Tashkent), 17h. (Lick), 19h. (Andijan and Samarkand), 20h. (Berkeley, Andijan, near Samarkand, and near Manila), 21h. (Hamburg, Adelaide, Riverview, Medan, Batavia, Andijan, Samarkand, La Paz, Manila, and near Ambona).

Nov. 10d. 8h. 30m. 33s. Epicentre 0°-7S. 131°-8E. (as on 9d.). X.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	4.7	231	1 13	+ 6	12 14	+14	—	—
Manila	18.7	325	1 4 15	0	17 53	+13	—	—
Irkutsk	57.8	340	—	—	e 17 39	- 8	e 28.4	—
Samarkand	71.3	314	e 11 17	- 2	—	—	—	—
Ekaterinburg	80.4	330	e 12 4	- 6	e 23 1	PS	41.4	—

Additional readings: —

Irkutsk e = +23m.27s.?

Long waves were also recorded at Hong Kong, Adelaide, Riverview, and Melbourne.

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Nov. 10d. 13h. 35m. 36s. Epicentre 36°3N. 141°2E. N.3.
(given in the Seismometrical report of the Earthquake Research Institute of Tokyo).

A = -0.628, B = +0.505, C = +0.592; D = +0.627, E = +0.779;
G = -0.461, H = +0.371, K = -0.806.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	0.6	207	0 8	- 1	0 17	+ 2	0.3	0.6
Tukuba	0.8	260	0 10	- 1	0 22	+ 1	—	—
Tokyo	1.3	242	0 19	+ 1	0 37	+ 4	—	—
Mizusawa	E. 2.8	359	0 41	+ 1	1 6	- 6	—	—
	N. 2.8	359	0 48	P*	1 9	- 3	—	—
Nagoya	3.6	253	1 6	P*	1 55	S*	- 5	—
Osaka	4.9	251	1 29	P*	—	—	2.5	2.8
Kobe	5.2	252	e 1 57	P*	e 2 38	S*	—	—
Toyooka	5.2	263	e 2 22	S	(e 2 22)	+ 9	—	—
Sumoto	5.5	250	e 2 31	S	e 2 54	S*	—	3.1

Nov. 10d. 13h. 44m. 12s. Epicentre 2°5S. 138°0E. R.1.

(as on 1917 May 23d.).

Probable error $\pm 0^{\circ}33$.

A = -0.742, B = +0.668, C = -0.044; D = +0.669, E = +0.743;
G = +0.032, H = -0.029, K = -0.999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	9.8	263	1 2 32	+14	i 5 51	S _r	6.1	9.8
Palau	10.5	340	2 28	0	4 57	+31	—	—
Manila	24.0	316	1 5 10	0	i 11 26	?	11.8	—
Batavia	31.3	262	e 6 13	- 4	—	—	20.8	—
Taihoku	31.8	331	7 43	PP	11 39	+ 7	14.1	—
Adelaide	32.5	179	e 6 18	- 9	i 11 43	0	i 14.9	22.0
Riverview	33.7	160	e 6 34	- 4	i 12 3	+ 2	—	19.4
Sydney	33.7	160	i 6 48	+10	i 12 18	+17	18.5	22.1
Hong Kong	34.0	319	e 6 40	0	i 12 18	+12	e 14.4	17.0
Miyazaki	35.0	351	6 23	-26	12.13	- 8	—	—
Melbourne	35.9	171	7 2	+ 5	12 31	- 4	16.5	20.9
Nagasaki	36.1	350	e 7 2	+ 3	e 12 40	+ 2	e 16.6	—
Perth	36.1	213	7 13	+14	12 53	+15	18.1	22.1
Koti	36.3	356	6 54	- 6	12 39	- 2	—	19.4
Hukuoka	36.8	351	e 6 56	- 9	e 12 45	- 3	—	—
Sumoto	37.0	357	7 8	+ 2	e 12 46	- 5	e 15.9	16.4
Zi-ka-wel	N. 37.2	336	e 7 9	+ 1	8 43	PP	19.7	22.4
Kobe	37.3	357	7 7	- 2	e 16 2	?	—	18.3
Osaka	37.3	359	3 55	?	9 9	?	12.9	25.5
Phu-Lien	37.7	310	e 7 12	0	e 13 17	+15	18.8	24.1
Nagoya	37.7	359	e 7 26	+14	—	—	e 16.1	—
Gihu	37.9	359	7 13	- 1	13 9	+ 4	—	—
Toyooka	38.2	357	—	—	e 13 8	- 1	e 16.0	—
Tyosi	38.3	5	e 13 4	S	(e 13 4)	- 7	e 16.2	—
Kumagaya	38.7	2	7 9	-12	13 8	- 9	—	—
Medan	39.8	279	6 1	-89	13 1	-32	—	—
Mizusawa	E. 41.8	4	7 54	+ 7	13 54	- 9	17.7	—
	N. 41.8	4	7 48	+ 1	14 0	- 3	17.6	—
Akita	42.3	4	7 54	+ 3	14 6	- 4	—	—
Chiufeng	N. 47.1	339	8 30	+ 1	15 30	+10	—	—
Wellington	50.9	144	8 57	- 1	16 7	- 6	25.8	34.8
Christchurch	51.2	148	—	—	i 16 28	+10	25.8	—
Kodaikanal	61.6	283	e 9 54	-22	—	—	123.2	26.0
Irkutsk	61.8	337	e 10 12	- 5	18 39	0	29.8	37.1
Hyderabad	62.0	292	10 27	+ 9	18 50	+ 8	32.3	38.0

Continued on next page.

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		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Agra	E.	64.8	303	10 29	- 8	19 29	+12	34.0	—
	N.	64.8	303	e 10 4	-33	18 59	-18	34.7	35.6
Dehra Dun		65.8	306	—	—	19 18	-12	—	—
Honolulu T.H.		67.1	66	—	—	e 19 42	- 4	e 30.4	—
Bombay		67.5	292	11 0	+ 5	19 56	+ 5	34.9	40.5
Almata		71.2	319	11 28	+10	—	—	—	—
Andijan		73.5	315	11 32	0	e 21 2	- 1	e 37.8	—
Tashkent		75.9	314	—	—	i 21 35	+ 5	e 36.8	45.4
Samarkand		77.2	313	e 11 53	0	21 44	- 1	—	—
Ekaterinburg		85.2	328	i 12 35	+ 1	i 22 57	-13	40.8	49.4
Tananarive	E.	89.6	251	—	—	23 38	[+ 8]	43.2	49.5
Baku		90.2	311	e 13 4	+ 6	i 23 58	+ 0	42.8	51.6
Sitka		90.3	33	23 44	S	(23 44)	-15	41.9	—
Victoria	E.	97.7	42	24 7	SKS	(24 7)	[- 8]	44.4	50.2
	N.	97.7	42	25 5	S	(25 5)	- 1	39.9	40.1
Kucino		97.8	327	—	—	e 39 48	?	48.8	58.1
Berkeley		99.2	52	—	—	i 24 17	[- 5]	e 55.6	57.6
Pulkovo		101.0	331	e 14 47	+59	e 25 21	-14	47.8	57.7
Ksara	N.	101.5	305	—	—	e 24 53	{-11}	—	—
Helsingfors		103.5	332	—	—	e 25 43	-14	—	—
Upsala		107.0	334	—	—	e 33 48	SS	e 52.8	73.3
Lund		111.0	331	17 54	[-27]	28 42	PS	57.8	—
Copenhagen		111.4	331	—	—	e 27 48?	?	57.8	—
Potsdam		112.6	327	e 15 48?	?	e 27 48?	?	51.8	69.8
Zagreb		113.6	320	e 14 48?	0	e 28 48?	PS	e 56.2	59.5
Cheb		114.0	326	—	—	e 29 48?	PS	e 56.8	70.3
Stuttgart		116.5	326	—	—	e 27 53	?	e 59.8	74.3
De Bilt		116.9	330	i 20 3	PP	e 29 33	PS	e 55.8	67.9
Catania		117.2	311	e 20 4	PP	—	—	—	—
Strasbourg		117.4	326	e 19 48?	PP	—	—	e 40.8	75.3
Rocca di Papa		117.4	317	e 19 5	[+26]	—	—	—	—
Rome		117.5	317	e 19 2	[+23]	—	—	—	—
Florence		117.5	320	19 31	PP	e 29 19	PS	—	55.8
Piacenza		118.0	321	—	—	e 28 8	{+65}	—	75.9
Uccle		118.0	330	e 20 6	PP	e 29 48?	PS	e 55.8	—
Neuchatel		118.7	325	e 18 51	[+ 9]	—	—	e 75.8	—
Stonyhurst		119.3	334	—	—	e 41 48?	SS	61.8	65.5
Kew		120.0	331	—	—	e 27 48?	{+32}	55.8	64.8
Paris		120.1	328	e 19 48?	PP	—	—	41.8	76.8
Florissant		123.0	44	i 20 23	PP	e 27 30	{- 7}	e 57.8	—
St. Louis		123.2	44	e 20 23	PP	e 27 23	{-15}	—	63.8
Ann Arbor	N.	125.6	37	—	—	e 37 36	SS	e 53.6	—
Tortosa	N.	125.9	321	—	—	38 3	SS	e 56.8	73.9
Algiers		126.3	316	e 18 18	[-42]	—	—	e 71.8	77.8
Toronto		127.2	33	i 18 9	[-52]	—	—	152.6	—
Ottawa		127.9	30	e 23 12	?	e 38 12	SS	e 51.8	—
Alcapte		127.9	320	e 20 43	PP	—	—	e 42.9	—
Toledo		129.3	322	e 21 14	PP	—	—	—	83.3
Almeria		130.0	319	i 21 27	PP	—	—	66.7	83.1
Granada		130.6	319	i 21 32	PP	31 29	PS	e 67.3	88.3
Malaga		131.4	320	e 21 41	PP	—	—	—	—
Georgetown		131.6	37	i 19 13	[+ 3]	i 26 22	[- 2]	—	—
Fordham		132.1	33	e 22 25	PKS	—	—	e 59.8	—
San Fernando		133.1	320	21 18	PP	26 48?	[+20]	72.8	85.8
La Paz		147.9	127	e 19 45	[+ 6]	30 32	{+22}	74.3	82.3
Sucre		148.6	134	19 50	[+10]	—	—	—	—
Rio de Janeiro		154.6	179	e 39 48	?	—	—	e 65.3	—

For Notes see next page.

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NOTES TO Nov. 10d. 13h. 44m. 12s.

Additional readings :-

- Batavia i = +6m.21s.
 - Adelaide i = +6m.33s.
 - Riverview iP = +6m.39s., iPPN = +7m.43s., SSSE = +14m.43s., SSSSN = +14m.55s.; T₀ = 13h.43m.36s.
 - Sydney SS = +14m.48s.
 - Hong Kong PP = +8m.3s., S = +10m.26s.
 - Melbourne i = +8m.52s., SS = +15m.38s.
 - Perth SS = +15m.18s., SSSS = +16m.28s.
 - Koti PP = +7m.2s.
 - Kobe eP = +7m.10s.
 - Medan i = +7m.9s.
 - Christchurch SSS = +21m.58s.
 - Honolulu T.H. e = +27m.48s.
 - Tananarive ePPN = +16m.57s., N = +19m.2s., E = +21m.56s., SKKSE = +23m.58s., S = +6s., SKKSN = +24m.8s., SE = +24m.32s. = PS - 15s., N = +27m.1s., E = +23m.40s., N = +30m.6s.
 - Baku iPP = +16m.44s.
 - Sitka ePS = +36m.34s.
 - Victoria SE = +32m.12s.
 - Kucino e = +45m.36s.
 - Berkeley eN = +41m.1s., eE = +46m.9s., and eZ = +47m.33s.
 - Pulkovo PP = +17m.58s., SS = +32m.18s.
 - Helsingfors ePP = +18m.22s., eE = +26m.19s., ePSE = +27m.27s., ePPSE = +28m.15s., eE = +29m.1s., eSSN = +32m.55s., eSSE = +33m.5s., eSSSE = +36m.55s., eE = +40m.55s.
 - Zagreb ePKP = +18m.48s.?, e = +31m.24s.
 - Stuttgart ePPPEZ = +19m.55s., ePSEZ = +29m.42s., eSS = +36m.0s., eSSSN = +39m.48s.?, eN = +44m.18s.
 - Rome eP = +19m.27s. = PP - 24s.
 - Uccle e = +36m.48s.?
 - Kew ePPNZ = +31m.0s., eSSSN = +49m.51s.
 - Florissant e = +31m.32s., iN = +37m.7s. = SS - 4s.
 - St. Louis eN = +31m.33s. and +35m.48s.
 - Almeria PP = +24m.15s. = PPP + 17s.
 - Granada i = +23m.4s., +25m.10s.
 - Georgetown PP = +22m.36s.; T₀ = 13h.43m.30s.
 - Fordham iPPPPZ? = +31m.56s. = PS + 6s.
 - La Paz PPZ = +23m.27s., PPE = +23m.47s. = PKS + 23s., SKSZ? = +27m.59s., i = +43m.21s.
- Long waves were also recorded at La Plata, Tucson, and other European stations.

Nov. 10d. Readings also at 4h. (Tashkent, Catania, Messina, Mineo, Lick (2), Tyosi, near Nagoya, and near Amboina (2)), 5h. (Andijan and near Samarkand), 6h. (Granada), 7h. (near Amboina), 8h. (near Trenta), 9h. (Tokyo and Tyosi), 13h. (near Port au Prince and near Tacubaya), 18h. (Lick), 20h. (Tyosi), 22h. (Manila).

Nov. 11d. 8h. 29m. 45s. Epicentre 24° 5N. 122° 2E. (as on 1930 Aug. 20d.). R.2.

Probable error of epicentre ± 0°.4.

$$A = -.485, B = +.770, C = +.415; D = +.846, E = +.533; G = -.221, H = +.351, K = -.910.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	0.8	311	10 20	+ 9	4 29	+ 8	—	0.7
Hokoto	2.7	248	0 38	- 1	1 6	- 3	—	—
Zi-ka-wei	N.	6.7	354	1 37	+ 2	2 27	-24	13.5
Hong Kong		7.7	255	1 54	+ 5	(3 2)	-14	3.0
Manila	10.0	187	12 29	+ 8	14 30	+17	—	—
Nagasaki	10.6	37	2 31	+ 2	4 31	+ 3	—	—
Hukuoka	11.6	37	12 45	+ 2	4 53	0	—	5.0
Koti	13.4	45	e 3 8	+ 1	e 5 53	+16	—	—
Sumoto	14.8	45	e 3 31	+ 5	6 53	+43	—	6.9
Phu-Lien	14.9	259	13 28	+ 1	6 15?	+ 2	7.2	10.5

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Kobe	N. 15.1	45	e 4 44	+74	—	—	—	—
Osaka	15.4	46	3 52	+18	(6 53)	+29	6.9	7.6
Chitufeng	E. 16.4	343	3 45	-1	—	—	—	—
Mizusawa	E. 21.6	43	3 53	-53	9 22	+44	—	—
	N. 21.6	43	4 15	-31	9 10	+32	—	—
Medan	30.8	232	6 11	-1	11 7	-10	—	—
Irkutsk	30.9	340	6 7	-6	10 58	-20	17.2	20.2
Calcutta	N. 31.0	275	7 29	+75	12 11	+51	15.7	—
Batavia	34.2	210	e 6 46	+4	i 11 59	-10	—	—
Hyderabad	41.3	273	8 4	+21	13 47	-9	19.6	24.6
Almata	41.3	310	e 8 5	+22	—	—	—	—
Andijan	44.3	306	e 8 8	+1	e 14 28	-12	e 20.8	—
Bombay	46.0	275	8 41	+20	14 51	-13	21.8	25.5
Tashkent	46.7	308	e 8 9	-17	i 15 1	-13	e 21.2	25.2
Samarkand	48.4	306	e 8 37	-2	e 15 26	-12	—	—
Ekaterinburg	54.2	325	i 9 16	-7	i 16 42	-16	23.2	28.0
Baku	61.4	307	i 10 8	-6	i 18 24	-10	—	—
Ksara	N. 73.8	300	e 11 29	-4	—	—	—	—
Helwan	78.8	298	12 21	+20	21 43	-20	—	—
Vienna	Z. 81.7	322	e 12 10	-7	—	—	—	—

Additional readings:—

Nagasaki PP = +2m.33s., PPP = +2m.38s., SS = +4m.39s.

Koti PP = +3m.22s., eSE = +5m.57s.

Sumoto PNZ = +3m.39s. = PP + 9s.

Vienna IZ = +12m.37s.

Long waves were also recorded at De Bilt, Paris, Strasbourg, and Stuttgart.

Nov. 11d. Readings also at 0h. (Ekaterinburg, Tashkent, Almata, Andijan, and Samarkand), 5h. (Simferopol, Sebastopol, Theodosia, and Yalta), 12h. (near Tananarive), 15h. (Andijan and near Samarkand), 16h. (Rocca di Papa and Rome), 17h. (Lick), 18h. (Besançon, Paris, Strasbourg, Uccle, Zurich, Neuchatel, and Wellington), 19h. (La Paz and near Andijan), 20h. (Melbourne, Adelaide, Riverview, Suva, Wellington, Baku, Ekaterinburg, Irkutsk, Berkeley, Victoria, Tucson, and Chicago), 21h. (De Bilt, Uccle, Paris, Kew, Strasbourg, Granada, Kucino, Tashkent, and Lick (2)), 22h. (Ann Arbor and Lick), 23h. (Andijan and near Almata).

Nov. 12d. 6h. 7m. 3s. Epicentre 44°5N. 11°5E. (as on 1928 June 9d.). X.

A = +.699, B = +.142, C = +.701; D = +.199, E = -.980;

G = +.687, H = +.139, K = -.713.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	0.7	194	0 10	0	—	—	—	0.7
Padova	0.9	16	0 11	-2	0 26	+3	—	—
Treviso	1.2	22	e 0 18	+1	e 0 45	S _g	—	—
Piacenza	1.4	293	e 0 27	P*	—	—	—	—
Chur	2.7	330	e 0 38	-1	—	—	—	—
Rome	2.7	164	—	—	e 1 8	-1	—	—
Rocca di Papa	2.8	161	e 1 3	S	(e 1 3)	-9	—	2.2
Zagreb	3.4	66	e 1 7	P _g	e 1 37	S*	—	—
Zurich	3.5	325	e 0 59	+9	—	—	—	—
Neuchatel	N. 4.0	310	e 0 54	-3	e 1 39	-3	—	—
Hohenheim	4.5	341	—	—	e 1 50	-5	e 2.4	—
Stuttgart	4.5	340	—	—	e 2 28	S _g	—	—
Strasbourg	4.8	329	e 0.57?	-11	—	—	—	—

Additional readings:—

Zurich e = +2m.57s.

Neuchatel eP_g = +1m.8s.

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Nov. 12d. 19h. 10m. 16s. Epicentre 50°·7N. 168°·8W. N.2.

A = -·621, B = -·123, C = +·774; D = -·194, E = +·981;
G = -·759, H = -·150, K = -·633.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	20·5	59	i 8 13	S	(18 13)	- 3	e 11·2	—
Victoria	29·1	77	10 52	S	(10 52)	+ 2	12·4	16·1
Honolulu T.H.	30·7	160	—	—	i 13 44	?	i 16·0	—
Berkeley	N. 35·0	93	e 6 57	+ 8	e 12 32	+11	—	—
Lick	E. 35·7	93	e 7 3	+ 8	—	—	—	—
Tucson	45·8	90	e 8 48	+29	e 15 8	+ 6	e 18·8	—
Irkutsk	50·7	310	e 8 57	0	e 16 22	+11	25·7	32·3
Florissant	54·2	70	i 9 23	0	i 16 55	- 3	e 30·4	—
St. Louis	54·5	70	i 9 26	+ 1	i 16 57	- 5	—	—
Ann Arbor	55·9	62	—	—	e 23 44	?	e 36·3	—
Toronto	57·4	59	i 13 53	?	i 17 41	- 1	i 28·2	—
Ottawa	58·2	55	—	—	i 16 44	-68	e 27·7	—
Georgetown	61·8	61	i 10 16	- 1	18 31	- 8	—	—
Fordham	62·3	59	e 10 18	- 2	e 18 39	- 7	e 29·6	—
Hong Kong	64·8	275	—	—	19 18	+ 1	e 35·7	44·4
Ekaterinburg	65·0	333	i 10 39	0	19 23	+ 3	29·7	45·0
Pulkovo	68·4	350	—	—	e 20 2	0	39·7	47·2
Andijan	74·1	318	e 11 47	+12	—	—	—	—
Tashkent	75·0	319	11 38	- 2	21 14	- 6	e 37·7	44·1
De Bilt	77·1	4	—	—	e 21 56	+12	e 38·7	50·2
Samarkand	77·3	319	e 11 56	+ 2	—	—	—	—
Kew	77·4	8	—	—	21 44?	- 3	e 39·7	—
Uccle	78·3	5	—	—	e 21 44?	-13	e 37·7	—
Paris	80·2	6	e 12 10	+ 1	—	—	50·7	52·7
Stuttgart	80·5	2	e 12 6	- 4	e 22 28	+ 7	e 45·7	—
Strasbourg	80·7	2	e 12 4	- 8	—	—	36·7	—
Vienna	Z. 81·0	356	12 12	- 1	—	—	—	—
Baku	82·8	331	i 12 24	+ 2	i 22 55	+10	41·2	53·6
Florence	Z. 85·5	0	e 12 39	+ 3	—	—	—	—
San Fernando	91·5	15	24 24?	S	(24 24?)	+14	(47·7)	—
Bombay	91·9	305	13 8	+ 2	23 56	[+12]	45·8	54·1

Additional readings and note:—

Berkeley eN = +7m.7s., +10m.8s., and +12m.48s.

Lick eN = +7m.9s.

Tucson e = +17m.54s. = SS-12s.

Ann Arbor e f E = +24m.38s., e = +27m.14s., eE = +31m.8s.

Fordham eSS = +23m.21s.

Pulkovo SS = +28m.14s.

San Fernando gives S as P and L as S.

Long waves were also recorded at Charlottesville, Harvard, Phu-Lien, Colombo, Hyderabad, Kucino, Scoresby Sund, and several European stations.

Nov. 12d. Readings also at 1h. (Almata, Andijan, Baku, and Ekaterinburg), 8h. (near Nagoya and near Tyos), 10h. (Ksara and Wellington), 11h. (Ekaterinburg, Irkutsk, Hong Kong, and near Manila), 12h. (Tashkent), 13h. (near Koti, Matuyama, and Sumoto), 14h. (Tyos), 18h. (Almata, Andijan, and Samarkand), 19h. (Andijan (2), Almata (2), Samarkand (2), and Florence), 21h. (near Almeria, Granada (3), San Fernando, and Malaga), 22h. (near Granada).

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Nov. 13d. 23h. 5m. 3s. Epicentre 0°7S. 131°8E. (as on 10d.). X.

A = -0.666, B = +0.745, C = -0.012; D = +0.745, E = +0.667;
G = +0.008, H = -0.009, K = -1.000.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Amboina	4.7	231	i 1 10	+ 3	i 2 14	+14	—	—
Batavia	25.5	257	e 5 28	+ 3	i 10 16	+26	—	—
Hong Kong	28.7	324	e 5 55	+ 2	10 37	- 6	—	—
Medan	33.4	278	i 6 38	+ 3	i 12 5	+ 8	—	—
Perth	34.7	205	10 57	S	(10 57)	-80	—	—
Adelaide	34.8	169	—	—	i 14 6	SS	19.3	20.2
Riverview	37.8	152	—	—	e 11 58	?	e 23.6	24.3
Melbourne	39.0	164	—	—	i 13 26	+ 5	21.4	25.4
Calcutta	48.2	303	e 14 51	S	(e 14 51)	-45	29.5	—
Wellington	55.8	141	10 28	+54	—	—	30.0	36.0
Irkutsk	57.8	340	e 9 40	- 9	—	—	26.0	—
Bombay	61.0	294	e 12 57	PP	—	—	—	—
Andijan	67.8	317	e 11 53	+56	—	—	—	—
Tashkent	70.2	316	i 11 3	- 9	e 20 21	- 3	e 27.0	36.4
Ekaterinburg	80.4	330	—	—	e 22 4	-16	33.0	42.4
Baku	84.3	311	—	—	e 22 55	- 6	39.0	—
La Paz	153.9	132	19 56	[+ 9]	—	—	—	—

Additional readings:—

Riverview eZ = +15m.4s., iE = +15m.26s. = SS-4s., and +17m.4s., iN = +20m.17s.

Melbourne S = +16m.7s.

Calcutta S = +21m.36s.

Irkutsk ePP = +11m.52s., iPS = +17m.40s.

Long waves were also recorded at De Bilt.

Nov. 13d. Readings also at 0h. (Samarkand), 1h. (Nagoya, Tyosi, Granada, and Lick), 4h. (La Paz and near Samarkand), 6h. (Granada and near Trenta), 14h. (Tucson), 16h. (Granada and Ksara), 17h. (St. Louis), 20h. (near Sumoto), 21h. (Lick).

Nov. 14d. Readings at 2h. (Bagnères), 3h. (Alicante), 4h. and 6h. (Granada), 10h. (Wellington, Andijan, and near Samarkand), 12h. (Granada), 14h. (Tananarive and near Granada), 15h. (Alicante), 18h. (Lick (2)), 19h. (Wellington), 21h. (Lick), 22h. (La Paz and near Mizusawa), 23h. (Ekaterinburg).

Nov. 15d. 0h. 52m. 52s. Epicentre 19°5N. 146°5E. N.3.

A = -0.786, B = +0.520, C = +0.334; D = +0.552, E = +0.834;
G = -0.278, H = +0.184, K = -0.943.

	Δ	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Kakioka	17.6	343	4 2	0	7 4	-11
Kumagaya	17.8	341	4 4	0	7 20	0
Nagoya	17.8	334	4 8	+ 4	7 30	+10
Sumoto	18.0	328	e 6 40	?	—	—
Oiwake	18.2	339	4 8	- 1	7 27	- 2
Kobe	18.2	329	e 5 53	+104	—	—
Nagano	18.6	339	4 14	0	7 36	- 2
Hukusima	19.0	345	4 19	0	7 54	+ 8
Mizusawa	E. 20.2	348	4 33	+ 1	8 6	- 4
	N. 20.2	348	4 26	- 6	8 14	+ 4
La Paz	147.0	91	e 19 37	[0]	—	—

No additional readings.

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Nov. 15d. Readings also at 0h. (Baku, Lick, near Mizusawa, and Tyosi), 1h. (Lick, Samarkand, and Wellington), 2h. (near Wellington), 3h. and 5h. (near Granada), 6h. (near Medan), 7h. (Andijan, Samarkand, Tashkent, Granada, Nagoya, near Sumoto, and near Medan), 8h. (Ekaterinburg), 9h. (Padova and Port au Prince), 10h. (near Sumoto), 13h. (Samarkand, Tashkent, and near Andijan), 15h. (Granada), 17h. (Baku and Tashkent), 18h. (near Sumoto), 19h. (Zagreb, near Medan, and near Malabar), 22h. (Granada), 23h. (near Nagoya (4) and Sumoto).

Nov. 16d. 20h. 46m. 30s. Epicentre 34°·1N. 32°·2E. (as on 1930 July 25d.). R.3.

$$A = +.701, B = +.441, C = +.561; \quad D = +.533, E = -.846; \\ G = +.474, H = +.299, K = -.828.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ksara	3.1	95	0 42	- 2	1 14	- 6	—	—
Helwan	4.3	190	1 12	+11	i 2 5	S*	—	2.4
Simferopol	10.9	7	e 2 28	- 5	—	—	—	—
Baku	15.4	61	e 3 36	+ 2	6 26	+ 2	7.6	9.6
Zagreb	17.0	318	i 3 57	+ 3	e 7 5	+ 3	—	—
Chur	21.3	313	e 4 42	- 1	e 8 32	0	—	—
Zurich	22.1	314	i 4 49	- 3	—	—	—	—
Neuchatel	23.0	312	e 4 55	- 6	—	—	—	—
Strasbourg	23.2	316	e 4 30?	-33	i 9 11	+ 3	10.5	—
Pulkovo	25.7	358	e 5 13	-13	—	—	15.5	—

Additional readings:—

Ksara $P_1E = +45s.$, $PP = +51s.$, $iSS = +1m.17s.$; $T_0 = 20h.46m.38s.$

Pulkovo $e = +5m.53s. = PP - 6s.$

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

Nov. 16d. Readings also at 0h. and 1h. (Nagoya), 3h. (Irkutsk, Andijan, Tashkent, Phu-Lien, Hong Kong, Bombay, Medan, and Calcutta), 4h. (near Tyosi), 6h. (Nagoya), 7h. (Wellington), 8h. (Granada and Samarkand), 11h. (Almeria, Granada (2), Medan, and Wellington), 12h. (Florissant), 13h. (Berkeley and near Wellington), 14h. (Lick and Sumoto), 15h. (Neuchatel, Zurich, Strasbourg, De Bilt, Uccle, and near Paris), 16h. (Bombay, Hyderabad, Ekaterinburg, Tashkent, and Granada), 17h. (near Amboina), 18h. (Rocca di Papa), 20h. (Ekaterinburg and near Lick), 21h. (near Tyosi).

Nov. 17d. 12h. 3m. 33s. Epicentre 2°·0S. 152°·3E. N.3.

$$A = -.885, B = +.465, C = -.035; \quad D = +.465, E = +.885; \\ G = +.031, H = -.016, K = -.999.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Suva	30.2	124	e 6 57	PP	—	—	13.4	—
Riverview	31.9	182	e 6 21	- 1	—	—	e 14.0	18.2
Sydney	31.9	182	e 9 27	+185	i 14 3	+149	15.8	16.8
Manila	35.2	300	i 6 53	+ 2	i 10 8	?	11.8	—
Adelaide	35.3	200	—	- 2	i 11 22	-64	i 15.7	18.8
Melbourne	36.4	192	—	—	e 11 12	-90	14.4	18.2
Nagasaki	40.7	331	e 5 30	?	—	—	—	—
Wellington	44.2	155	e 7 54	-12	13 22	-77	17.1	23.0
Hong Kong	44.4	306	8 7	- 1	14 48	+ 7	—	23.5
Perth	45.5	225	e 14 22	S	(e 14 22)	-35	e 20.4	—
Phu-Lien	50.2	300	8 27?	-26	—	—	—	—
Honolulu T.H.	54.1	60	—	—	i 16 50	- 7	e 25.3	—
Irkutsk	67.6	330	e 10 59	+ 3	e 20 6	+14	31.4	36.4
Bombay	80.7	290	e 15 20	PP	23 58	+95	38.1	44.6
Andijan	83.7	312	e 12 25	- 2	e 22 46	- 8	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tashkent	86.1	312	i 12 35	- 4	i 22 57	[-10]	—	78.0
Victoria	87.8	40	—	—	25 20	?	42.0	45.7
Ekaterinburg	92.5	327	e 13 50	+41	23 39	[- 8]	36.4	113.4
Baku	100.7	311	e 16 17	?	e 27 13	PS	43.4	57.8
Kucino	105.1	329	—	—	e 34 15	?	e 39.4	62.6
Pulkovo	107.3	334	—	—	e 26 45	?	52.4	64.2
Helsingfors	109.4	335	—	—	e 34 43	SS	e 56.4	—
Scoresby Sund	111.4	358	—	—	29 15	PS	56.4	—
Copenhagen	117.4	336	—	—	41 27?	?	56.4	—
De Bilt	122.9	336	—	—	e 32 27?	?	e 61.4	71.0
Uccle	124.2	336	—	—	e 38 27?	?	e 56.4	—
Kew	125.4	340	—	—	e 38 27?	?	e 58.4	73.2
Neuchatel	125.9	332	e 18 52	[- 7]	—	—	—	—
Rocca di Papa	126.2	323	e 21 39	?	—	—	? 60.6	60.8
La Paz	136.0	116	e 19 10	[- 6]	—	—	64.1	76.2

Additional readings:—

Riverview e = +10m.9s. and +10m.27s.

Manila i = +6m.55s., +7m.3s., and +7m.41s.

Perth e = +17m.12s.

Honolulu T.H. e = +23m.51s.

Ekaterinburg PP = +17m.3s., PPS = +25m.55s., SS = +30m.51s.

Pulkovo e = +34m.14s. and +38m.51s.

La Paz PPE = +22m.43s.

Long waves were also recorded at Tucson, Hyderabad, and other European stations.

Nov. 17d. 15h. 15m. 46s. Epicentre 35°-0N. 132°-5E. (as on 1926 Dec. 1d.). R.3.

A = -.554, B = +.604, C = +.574; D = +.737, E = +.676;

G = -.388, H = +.423, K = -.819.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Matuyama	1.2	173	i 0 14	- 3	0 31	0	—	0.5
Koti	1.7	150	e 0 23	- 1	i 0 43	- 1	—	0.7
Toyooka	2.0	74	i 0 28	- 1	i 0 49	- 2	—	0.9
Sumoto	2.1	108	0 2?	-28	0 29?	-25	—	0.5
Kobe	2.2	98	i 0 30	- 1	0 53	- 4	—	1.0
Hukuoka	2.2	230	0 38	+ 7	1 12	+15	—	1.4
Osaka	2.4	98	0 39	+ 5	(1 10)	+ 8	1.2	1.8
Nagasaki	3.2	226	e 1 1	P _r	1 40	S*	—	—
Nagoya	3.6	87	0 57	+ 6	1 42	S*	—	—

Additional readings:—

Koti iS°E = +46s.

Kobe iE = +37s. = P*.

Hukuoka P*? = +40s., P_r = +42s.

Nov. 17d. Readings also at 4h. (La Paz), 6h. (near Sumoto), 9h. (Calcutta), 13h. (Tananarive (2)), 14h. (La Paz and Sumoto), 15h. (La Paz), 17h. (Riverview, Wellington (2)), and near Christchurch), 19h. (Andijan and Samarkand), 22h. (Granada and near La Paz).

Nov. 18d. Readings at 1h. (Tokyo, Tukuba, near Tyosi, and near La Paz), 4h. (Granada), 8h. (near Mizusawa and Tyosi), 10h. (Tyosi (2), near Mizusawa, Ekaterinburg, Samarkand, near Almata, Andijan, and Tashkent), 11h. (Irkutsk), 13h. (Nagoya, Tyosi, near Mizusawa, and near Ksara), 14h. (La Paz, near Mizusawa, and Tyosi), 15h. (Medan), 18h. (Ekaterinburg, Pulkovo, Irkutsk, near Andijan, Almata, Samarkand, and Tashkent), 20h. (near Mostar), 22h. (near Granada, near Manila, and near Tyosi).

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Nov. 19d. 1h. 9m. 35s. Epicentre 36°·5N. 140°·5E. (as on 1930 Sept. 30d.). X.

A = -·620, B = +·511, C = +·595.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	0·9	160	0 16	+ 3	—	—	0·6	0·7
Mizusawa	2·6	10	0 37	0	1 2	- 5	—	—
Nagoya	3·2	245	e 0 44	- 2	1 52	S _g	—	—
Osaka	4·5	248	1 31	P _g	—	—	2·8	3·0

Mizusawa gives also PN = +43s.

Nov. 19d. Readings also at 1h. (Andijan, Samarkand, and Granada), 2h. (near Amboina and near Santiago), 7h. (near Amboina), 10h. (Vienna), 11h. (Almata (2) and Samarkand), 12h. (Lick and near La Paz), 14h. (near Andijan and near La Paz), 15h. (Andijan, and Samarkand), 17h. (near Tyosi), 18h. (near Andijan), 20h. (near Treviso).

Nov. 20d. 6h. 56m. 11s. Epicentre 43°·6N. 13°·5E. (as on 2d.). R.3.

A = +·704, B = +·169, C = +·690; D = +·233, E = -·972;
G = +·671, H = +·161, K = -·724.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	1·6	276	0 24	+ 1	—	—	—	0·8
Rome	1·9	204	e 0 27	- 1	e 0 39	- 10	i 1·2	1·3
Rocca di Papa	2·0	198	e 0 36	P*	i 0 41	- 10	i 1·1	1·4
Venice	2·0	338	e 0 48	+ 19	i 1 34	+ 43	—	—
Padova	2·1	327	e 0 38	P*	—	—	—	—
Treviso	2·3	336	0 29	- 4	i 0 58	- 1	—	—
Zagreb	2·8	37	0 49?	+ 9	—	—	—	1·5
Placenza	3·1	298	—	—	e 1 21	+ 1	—	2·0
Graz	3·7	21	e 0 58	+ 5	—	—	—	2·2
Chur	4·2	318	e 1 0	0	—	—	—	—
Vienna	5·0	22	1 36	P*	—	—	—	2·8
Zurich	5·1	319	e 1 9	- 4	—	—	—	—
Neuchatel	5·7	308	e 1 17	- 4	e 2 15	- 10	—	—
Strasbourg	6·4	324	e 2 11	P _g	—	—	—	—

No additional readings.

Nov. 20d. Readings also at 1h. (Rocca di Papa), 2h. (Ekaterinburg, Tashkent, Ksara, Harvard (2), Padova, Rome, Zagreb, and Treviso), 3h. (Adelaide), 4h. (Harvard, near Theodosia, and Yalta), 6h. (Catania), 8h. (near Sumoto), 9h. (La Paz), 10h. (near Nagoya), 11h. (near Nagoya (3), Osaka, and Tyosi), 12h. (2) and 13h. (Granada), 14h. (near Taihoku), 17h. (2) and 18h. (Granada), 19h. (Wellington), 20h. (Andijan, Samarkand, near Florissant, and St. Louis), 21h. (La Paz).

Nov. 21d. 2h. 0m. 30s. Epicentre 40°·0N. 19°·5E. N.1.
(as given by De Bilt).

Probable error of epicentre $\pm 0^{\circ}25$.

A = +·722, B = +·256, C = +·643; D = +·334, E = -·943;
G = +·606, H = +·215, K = -·766.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taranto	1·8	286	0 25	- 1	0 48	+ 2	—	1·0
Bari	2·3	300	0 30	- 3	1 6	+ 7	1·5	—
Trenta	2·6	254	i 0 30	- 7	1 45	+ 38	—	—
Messina	3·6	239	0 57	+ 6	1 50	S*	—	—
Benevento	4·1	288	i 0 53	- 5	—	—	—	2·2

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Naples	E. 4-1	283	e 1 20	+22	e 2 8	+23	—	4-8
Catania	4-2	235	1 1	+1	1 52	+4	3-1	3-6
Casamicciola	4-3	282	0 51	-10	1 39	-11	2-6	3-4
Mineo	4-7	235	1 10	+3	—	—	—	—
Belgrade	4-8	8	e 1 4	-4	e 2 18	+15	—	3-1
Rocca di Papa	5-3	291	i 1 16	+1	i 2 27	+12	i 3-4	6-7
Rome	5-6	293	i 1 21	+1	(i 2 17)	+14	i 2-3	6-0
Zagreb	6-4	337	e 1 25	-6	i 2 42	-1	i 3-4	3-9
Labach	7-0	330	e 1 48	+9	e 3 6	+7	—	4-4
Florence	7-2	304	1 41	-1	—	—	—	3-9
Budapest	7-4	358	1 48	+3	—	—	4-0	8-5
Graz	7-6	339	e 1 37	-11	i 3 17	+3	—	4-2
Venice	7-6	318	e 1 46	-2	i 4 1	+47	—	7-2
Livorno	7-7	301	e 2 31	+42	e 4 53	+97	—	—
Padova	7-8	317	e 1 52	+1	e 4 35	+76	—	—
Treviso	7-8	319	i 1 46	-5	3 10	-9	—	—
Vienna	8-5	346	1 57	-3	3 24	-12	i 4-1	5-3
Piacenza	8-8	308	2 12	+7	4 16	+32	5-7	8-3
Innsbruck	9-4	323	e 2 6	-7	3 45	-14	i 5-1	7-8
Chur	9-9	316	e 2 17	-2	—	—	—	—
Lemberg	E. 10-3	17	e 2 26	+1	e 4 31	+10	—	6-7
	N. 10-3	17	e 2 28	+3	e 4 52	+31	—	6-8
Ravensburg	10-6	321	e 2 25	-4	e 4 16	-12	i 5-7	—
Prague	10-7	342	e 2 27	-4	e 4 25	-6	e 5-7	7-5
Zurich	10-8	317	e 2 30	-2	e 4 44	+11	—	—
Marselles	11-0	292	e 2 42	+7	—	—	6-0	—
Cheb	11-2	336	e 2 34	-3	e 3 17	?	e 5-5	6-7
Stuttgart	11-4	326	e 2 35	-5	e 4 36	-12	e 5-7	—
Neuchatel	11-5	312	e 2 36	-6	e 4 37	-13	—	—
Yalta	11-7	63	e 2 53	+9	—	—	e 5-8	—
Simferopol	11-8	61	e 2 50	+4	—	—	—	—
Karlsruhe	12-0	323	2 53	+5	5 22	+19	7-5	7-9
Strasbourg	12-0	320	2 46	-2	e 5 4	+1	6-5	8-0
Besançon	12-1	311	e 3 3	+13	i 5 5	0	6-5	—
Jena	12-2	336	e 2 54	+3	e 6 9	+61	e 6-5	7-2
Theodosia	12-7	62	e 2 58	0	e 5 32	+12	6-2	7-4
Feldberg	12-8	326	i 2 57	-2	15 18	-4	e 7-0	9-2
Potsdam	13-1	343	i 3 1	-2	—	—	e 6-7	7-5
Barcelona	13-2	282	e 3 3	-2	—	—	e 6-0	7-0
Algiers	13-3	261	3 5	-1	5 45	+11	7-0	8-0
Göttingen	13-3	336	i 3 11	+5	e 5 48	+14	e 6-9	7-8
Helwan	14-0	132	3 11	-4	5 41	-10	—	14-3
Ksara	14-4	110	3 23	+2	6 11	+10	7-3	—
Tortosa	14-5	280	3 21	-1	5 58	-5	7-8	13-0
Königsberg	E. 14-8	2	—	—	e 6 29	+19	e 9-1	11-8
Hamburg	15-0	338	e 3 30	+2	e 6 42	+27	e 8-0	10-6
Paris	15-0	312	e 3 29	+1	e 6 33	+18	9-5	10-5
Uccle	15-1	321	3 35	+5	6 34	+17	7-5	9-3
De Blit	15-6	325	3 42	+6	e 6 48	+19	e 7-5	9-3
Alicante	15-6	270	i 3 31	-5	i 6 49	+20	e 8-2	10-0
Lund	16-2	347	3 46	+2	6 59	+16	8-5	—
Copenhagen	16-4	346	3 41	-5	6 56	+8	8-5	—
Almeria	17-4	267	1 4 4	+5	17 30	+19	9-2	10-1
Kew	E. 17-8	317	e 4 7	+3	17 41	+21	10-4	13-6
Toledo	18-0	277	1 4 11	+4	7 31	+6	e 9-1	14-4
Granada	18-2	268	1 4 13	+4	17 37	+8	9-3	12-0
Oxford	18-6	316	1 4 2	-12	17 41	+3	e 9-8	12-8
Malaga	19-0	268	4 23	+4	7 57	+11	8-7	—
Upsala	19-9	357	1 4 24	-5	e 8 6	+2	e 10-5	11-9
Kucino	19-9	32	4 24	-5	8 0	-4	9-2	12-5

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Stonyhurst	20.3	321	4 35	+ 2	8 39	+27	11.5	13.9
Helsingfors	20.4	8	e 4 31	- 3	e 8 7	- 7	e 10.5	-
San Fernando	20.5	267	4 25	-10	7 30	-46	11.0	14.0
Pulkovo	20.9	15	4 36	- 3	8 18	- 6	10.0	13.1
Edinburgh	21.8	325	—	—	i 8 54	+12	—	—
Dyce	22.2	328	e 6 4	PP	i 8 59	+ 9	e 11.7	13.5
Bergen	22.2	342	4 50	- 3	8 58	+ 8	11.3	15.5
Baku	23.1	79	i 5 4	+ 2	19 15	+ 8	13.0	16.2
Samarkand	36.0	74	e 6 58	0	—	—	—	—
Scoresby Sund	37.1	339	—	—	12 57	+ 4	20.5	—
Andijan	39.7	70	e 7 29	0	—	—	—	—
Bombay	50.1	99	10 54	PP	16 2	0	—	33.0
Hyderabad	55.3	96	11 49	+138	19 19	+126	29.9	37.3
Irkutsk	56.6	47	e 9 41	+ 1	e 17 25	- 6	29.5	35.8
Calcutta	59.9	85	19 51	ScS	(19 51)	(0)	33.4	—
Hong Kong	79.2	70	—	—	i 22 7	0	e 47.5	91.0

Additional readings:—

Belgrade e = +1m.25s., +1m.28s., +1m.34s., +1m.47s., +1m.49s., and +1m.58s., eS = +2m.25s.

Rome gives S as eL and S = +1m.37s. = P*.

Zagreb iNW = +1m.43s., e = +1m.48s., i = +2m.2s. and +2m.5s., iNW = +2m.12s. and +2m.17s., i = +2m.46s., iNW = +2m.56s. and +3m.8s., i = +3m.15s.

Laibach ePP = +2m.14s., ePPS = +2m.52s., e = +3m.18s., ePS = +3m.31s.

Graz i = +2m.19s.

Vienna P* = +2m.16s., P_g = +2m.33s.

Ravensburg e = +3m.20s. = P*.

Cheb eSS = +4m.58s.

Stuttgart e = +2m.55s.

Neuchatel e = +5m.8s.

Jena ePZ = +3m.0s.

Feldberg eN = +4m.12s., e = +6m.6s.

Potsdam eEN = +3m.6s., iZ = +3m.12s., iNZ = +3m.37s., iN = +3m.46s., iE = +4m.19s., iN = +4m.27s., iE = +5m.1s., and +5m.49s., iN = +5m.57s., eE = +6m.6s., iEN = +6m.36s.

Königsberg eE = +6m.47s., iE = +8m.39s.

Granada PP = +4m.46s., i = +6m.16s., SS = +8m.51s.

Helsingfors iS = +8m.21s.

Long waves were also recorded at Bidston, La Paz, and Rio de Janeiro.

Nov. 21d. 4h. 1m. 24s. Epicentre 40° 0N. 19° 5E. (as at 2h.).

X.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°		m. s.	s.	m. s.	s.	m.	m.
Trenta	2.6	254	e 1 56	+79	—	—	—	—
Messina	3.6	239	1 0	+ 9	—	—	—	—
Benevento	4.1	288	1 16	P*	—	—	—	—
Naples	E. 4.1	283	e 0 46	-12	e 1 36	- 9	—	—
Catania	4.2	235	2 9	S	(2 9)	S*	—	3.9
Belgrade	4.8	8	e 2 0	S	(e 2 0)	- 3	—	—
Rocca di Papa	5.3	291	e 2 6	S	(e 2 6)	- 9	i 3.3	4.0
Rome	5.6	293	e 1 49	S*	1 3 26	S _g	—	4.0
Zagreb	6.4	337	e 2 20	+49	e 3 22	+39	e 3.4	3.8
Florence	7.2	304	1 50	+ 8	—	—	—	5.6
Vienna	8.5	346	3 13	P _g	—	—	—	6.6
Piacenza	8.8	308	—	—	e 3 56	+12	—	7.4
Chur	9.9	316	e 2 36	+17	e 4 36	+25	—	—

Rocca di Papa gives also i = +2m.38s.

Long waves were also recorded at other European stations.

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Nov. 21d. 9h. 49m. 58s. (I) }
 10h. 16m. 56s. (II) }
 12h. 17m. 33s. (III) }
 12h. 55m. 50s. (IV) }
 Epicentre 35°·1N. 139°·0E.
 (anticipations of the great Idu. shock
 of Nov. 25d.).

X.
X.
X.
X.

A = -·617, B = +·537, C = +·575.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
I Nagoya	1·7	272	e 0 32	P*	0 52	S*	—	—
II	1·7	272	0 20	- 4	0 46	+ 2	—	—
III	1·7	272	0 22	- 2	0 43	- 1	—	0·7
IV	1·7	272	e 0 26	+ 2	0 49	+ 5	—	—
I Tyosi	1·7	67	e 0 23	- 1	—	—	e 0·8	—
II	1·7	67	e 0 23	- 1	—	—	e 0·9	—
III	1·7	67	e 0 24	0	—	—	e 0·8	—
IV	N. 1·7	67	e 0 24	0	—	—	—	—
I Osaka	2·8	261	0 32	- 8	(1 14)	+ 2	1·2	1·7
II	2·8	261	0 40	0	(1 22)	+10	1·4	1·8
III	2·8	261	0 41	+ 1	(1 21)	+ 9	1·4	1·7
IV	2·8	261	0 33	- 7	(1 14)	+ 2	1·2	1·7
I Kobe	3·2	263	e 1 19	∅	(e 1 19)	- 3	(e 1·5)	1·6
II	3·2	263	1 15	∅	(1 15)	- 7	(1·5)	1·6
III Sumoto	3·4	257	e 1 23	∅	(e 1 23)	- 4	(e 1·8)	2·0
III	3·4	257	e 1 25	∅	(e 1 25)	- 2	(e 1·9)	2·0
I Toyooka	3·4	280	0 49	0	1 35	+ 8	—	1·8
II	3·4	280	e 0 58	P*	1 39	S*	—	—
III	3·4	280	0 55	+ 6	1 40	S*	—	1·8
IV	E. 3·4	280	—	—	e 1 27	0	—	—

Additional readings and notes :—

Kobe and Sumoto gives S as P and L as S.
 Toyooka I ePE = +52s., IV eSN = +1m.30s.

Nov. 21d. Readings also at 0h. (Granada), 1h. (Wellington, La Paz, and near Balboa Heights), 3h. (Melbourne, Adelaide, Perth, Riverview, Sydney, Wellington, Bombay, and Victoria), 4h. (near Medan), 5h. (Almata and Andijan), 9h. (near La Paz), 11h. (Nagoya (4) and Tyosi), 12h. (near Nagoya), 13h. (Tyosi), 15h. (Andijan), 20h. (near Nagoya), 23h. (near La Paz).

Nov. 22d. 0h. 25m. 50s. Epicentre 40°·0N. 19°·5E. (as on 21d.).

X.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Taranto	1·8	286	0 28	+ 2	0 56	S*	—	1·1
Trenta	2·6	254	e 0 30	- 7	1 10	+ 3	—	—
Naples	E. 4·1	283	1 40	S	(1 40)	- 5	—	—
Belgrade	4·8	8	—	—	e 2 26	S*	—	—
Rocca di Papa	5·3	291	e 0 58	-17	e 2 22	+ 7	i 3·0	3·3
Rome	5·6	293	—	—	e 3 0	S _r	—	4·6
Zagreb	6·4	337	e 2 34	S	(e 2 34)	- 9	—	—

Additional readings :—

Belgrade e = +2m.44s. and +3m.5s.
 Zagreb e = +3m.22s., eE = +3m.35s.

Nov. 22d. 13h. 56m. 52s. Epicentre 27°·5S. 176°·8W. (as on 1928 Dec. 12d.). X.

A = -·886, B = -·050, C = -·462; D = -·056, E = +·998;
 G = +·461, H = +·026, K = -·887.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Wellington	15·4	204	5 33	+119	7 24	+60	9·8	—
Christchurch	18·2	205	—	—	i 8 13	?	—	11·9
Riverview	28·2	249	e 5 50	+ 1	e 10 24	-11	e 12·4	15·4
Sydney	28·2	249	15 44	- 5	1 10 38	+ 3	13·6	16·0
Melbourne	33·6	241	e 6 33	- 4	e 12 11	+11	15·8	17·3

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Adelaide	38.6	249	e 7 44	+24	e 13 19	+ 4	17.0	21.9
Perth	57.8	249	e 22 58	?	—	—	e 29.1	—
Manila	73.6	296	i 11 36	+ 4	—	—	—	—
Berkeley	82.9	40	—	—	e 23 4	+18	e 44.2	53.9
Hong Kong	85.0	300	12 30	- 3	21 12	?	31.4	47.2
Medan	86.9	276	e 14 8?	?	—	—	e 36.1	—
La Paz	98.1	113	e 13 35	0	i 24 16	[-0]	46.1	66.4
Calcutta	104.3	287	23 27	S	(23 27)	[-79]	55.8	—
Colombo	105.0	269	24 56	S	(24 56)	[+ 6]	—	62.4
Irkutsk	105.1	321	—	—	e 24 52	[+ 2]	55.1	69.0
Hyderabad	110.7	279	28 43	PS	37 31	?	55.5	65.9
Bombay	116.2	278	24 14	?	34 51	?	56.4	74.2
Ekaterinburg	130.4	322	e 19 20	[+12]	—	—	57.1	75.3
Baku	139.7	300	e 23 18	PKS	—	—	64.1	92.7
Pulkovo	142.8	337	e 19 36	[+10]	e 28 17	?	81.1	—
Helsingfors	144.2	340	—	—	e 28 22	?	e 83.1	—
Theodosia	149.1	313	—	—	e 28 37	PPPP	—	—
Simferopol	149.9	314	—	—	e 28 38	PPPP	—	—
Yalta	150.0	313	—	—	e 28 37	PPPP	—	—
Ksara	n. 151.3	292	e 19 57	[+14]	28 42	PPPP	—	—
Granada	168.7	29	—	—	i 32 26	?	e 89.1	99.1

Additional readings:—

Riverview i = +11m.13s.
 Melbourne i = +8m.5s., e = +14m.26s.
 Berkeley eE = +23m.13s. = PS -12s., eN = +31m.51s., eE = +39m.15s.
 La Paz i = +33m.2s.
 Calcutta eS = +35m.37s.
 Irkutsk e = +29m.8s. ? and +32m.52s.
 Ekaterinburg i = +22m.39s. = PKS -4s., e = +31m.24s. = SKSP +8s.
 Baku e = +34m.19s. and +42m.25s.
 Helsingfors eN = +41m.40s. = SS +8s.
 Granada i = +38m.27s.

Long waves were also recorded at Ann Arbor, Ottawa, Tucson, Victoria, Kodaikanal, Tananarive, Rio de Janeiro, Kucino, and other European stations.

Nov. 22d. Readings also at 2h. (La Paz and Tyosi (2)), 5h. (near Tyosi), 7h. (Nagoya and near Tyosi), 13h. (Hong Kong, Phu-Lien, Zi-ka-wei, and near Taihoku), 14h. (Scoresby Sund), 15h. (Feldberg and Piacenza), 16h. (Potsdam), 17h. (Tyosi), 21h. (Granada, Riverview, Wellington, near Matuyama, and Kotl), 22h. (Melbourne and near Sumoto), 23h. (near Sumoto and Tyosi).

Nov. 23d. 15h. 53m. 36s. Epicentre 14°58. 64°0E. N.3.

A = +.424, B = +.870, C = -.250; D = +.899, E = -.438;
 G = -.110, H = -.225, K = -.968.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Tananarive	16.4	252	3 47	+ 1	i 6 43	- 5	i 7.5	9.9
Colombo	26.5	37	5 13	-21	—	—	—	—
Bombay	34.5	15	6 51	+ 6	12 25	+11	17.4	22.0
Cape Town	45.4	236	—	—	e 17 22	?	—	—
Tashkent	56.0	5	e 9 34	- 2	16 24	-59	e 23.4	31.3
Baku	56.4	348	e 10 35	(- 5)	i 17 57	+29	26.4	31.2
Ekaterinburg	71.3	358	e 11 18	- 1	—	—	29.4	35.3

Additional readings and notes:—

Tananarive S = +5m.56s.
 Ekaterinburg gives ePS = +20m.49s.
 Long waves were also recorded at Hyderabad, Paris, and Granada.

Nov. 23d. Readings also at 0h. (La Paz), 1h. (Melbourne, Adelaide, Riverview, Wellington, and Ekaterinburg), 2h. (Tashkent, Kodaikanal, Sumoto, and near Taihoku), 3h. (Hong Kong, Zi-ka-wei), 5h. (Sumoto and near Granada), 11h. (near Tyosi), 12h. (Baku, Ekaterinburg, Samarkand, Tashkent, and Ksara), 15h. (near Tacubaya (2)), 18h. (Ann Arbor and near Sitka), 20h. (near Kotl and Sumoto).

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Nov. 24d. 6h. 6m. 48s. Epicentre 2°-0S. 74°-5W. N.3.

A = +.267, B = -.963, C = -.035; D = -.964, E = -.267;
G = -.009, H = +.034, K = -.999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	15.8	157	i 3 39	+ 1	i 6 44	+10	8.4	10.6
La Plata	36.3	158	6 52	- 8	12 24	-17	16.2	—
Georgetown	41.0	358	8 40	+60	13 54	+ 3	—	—
St. Louis	43.1	344	e 7 54	- 4	i 14 11	-11	—	—
Florissant	43.4	344	i 7 54	- 6	i 14 15	-12	—	—
Harvard	E. 44.5	5	e 8 9	0	i 14 48	+ 5	—	—
Ottawa	47.4	0	e 8 12?	-20	i 15 27	+ 3	e 19.2	—
Victoria	E. 65.8	329	19 19	S	(19 19)	-11	38.3	39.2
Granada	76.1	51	i 11 55	+ 8	i 22 16	PS	—	—
Scoresby Sund	80.2	16	—	—	22 12	- 6	28.2	—
Barcelona	81.4	48	—	—	20 12?	?	—	—
Paris	83.0	41	—	—	(e 22 12?)	-35	e 22.2	23.2
Uccle	84.6	40	—	—	e 22 48	[- 8]	—	—
De Bilt	85.3	38	—	—	e 23 2	- 9	e 42.2	—
Strasbourg	86.4	42	—	—	e 20 12?	?	—	—
Copenhagen	89.8	35	—	—	24 12?	+18	—	—
Pulkovo	99.1	30	e 13 42	+ 3	e 24 12?	[- 9]	27.2?	—
Ekaterinburg	114.6	26	e 19 34	PP	e 26 14	[-25]	54.2	—
Baku	116.9	44	—	—	e 26 24	[-31]	e 44.2	—
Samarkand	128.7	37	e 19 0	[- 4]	—	—	—	—
Tashkent	129.0	35	i 19 2	[- 3]	i 22 28	PP	—	72.4
Andijan	131.1	33	e 19 5	[- 4]	—	—	—	—
Bombay	143.8	59	16 43	?	19 32	PKP	20.9	—

Additional readings:—

St. Louis eN = +9m.56s. = P_cP + 4s., eE = +17m.46s. = S_cS - 15s.
Florissant eN = +17m.43s., eE = +18m.38s.
Harvard e = +13m.48s., eN = +18m.42s.
Ekaterinburg e = +26m.56s. = SKKS + 17s.

Nov. 24d. 6h. 45m. 44s. Epicentre 34°-0N. 135°-5E. (as on 1930 Oct. 26d.). X.

A = -.591, B = +.581, C = +.559.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sumoto	0.6	304	i 0 5	- 4	0 11	- 4	—	0.2
Osaka	0.7	355	0 10	0	(0 18)	0	0.3	0.7
Kobe	0.7	339	i 0 10	0	i 0 18	0	—	0.4
Toyooka	1.7	340	—	—	i 0 40	- 4	—	0.7
Koti	1.7	255	0 26	+ 2	0 44	0	—	—
Nagoya	1.7	45	0 30	P*	0 56	S*	—	—
Matuyama	2.3	266	i 0 36	+ 3	1 3	S*	—	1.1

Nov. 24d. 19h. 43m. 13s. Epicentre 47°-0N. 13°-2E. (as on 1927 Jan. 18d.). X.

A = +.664, B = +.156, C = +.731; D = +.228, E = -.974;
G = +.712, H = +.167, K = -.682.

	Δ	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Treviso	1.5	208	(0 22)	+ 1	0 22	P
Padova	1.8	210	e 0 26	0	—	—
Zagreb	2.2	122	—	—	i 1 6	S*
Chur	2.5	267	e 0 37	+ 1	e 1 6	+ 2
Zurich	3.2	277	e 0 44	- 2	e 1 31	S*
Neuchatel	4.3	272	e 0 59	- 2	e 1 44	- 6

Treviso eP! = 19h.43m.12s.

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Nov. 24d. Readings also at 1h. (Berkeley, Ekaterinburg, Melbourne (2), Sydney, and Wellington), 2h. (Baku, Tashkent, Harvard, Melbourne (2), Riverview, Adelaide, Suva, and Wellington), 3h. (Baku, Ekaterinburg, Irkutsk, Pulkovo, Tashkent, Bombay, Colombo, Scoresby Sund, Harvard, Berkeley, Victoria, and La Paz), 4h. (Granada, Kew, Strasbourg, Paris, Uccle, De Bilt, Copenhagen, and near Nagoya), 5h. (Rocca di Papa), 6h. (Zagreb), 7h. (Barcelona, near Almeria, Alicante, Granada, and Toledo), 10h. (Andijan, and near Almata), 11h. (Granada), 12h. (near Amboina), 14h. (Amboina, Melbourne, and Wellington), 15h. (Samarkand and Tyosi), 16h. (near Amboina), 17h. (Innsbruck), 19h. (near Manila), 20h. (Ekaterinburg, Tashkent, and Tyosi), 21h. (Trenta and near Taranto), 22h. (Berkeley, Rocca di Papa, Zagreb (2), La Plata, Trenta, and near Taranto), 23h. (Zagreb).

Nov. 25d. 19h. 2m. 55s. Epicentre 35°1N. 139°0E. N.1.
(as on 21d.).

Probable error of epicentre $\pm 0^{\circ}.37$.

(given in Tokyo Geophy. Mag., Vol. IV, Nos. 1 and 3, also Vol. VI, page 223).

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	o	o	m. s.	s.	m. s.	s.	m.	m.
Misima	0-0	—	-0 7	- 7	-0 4	- 4	—	—
Numadu	0-1	270	-0 7	- 3	-0 3	- 6	—	—
Yokohama	0-6	58	0 6	- 3	0 17	+ 2	—	—
Tokyo	0-8	47	0 10	- 1	—	—	—	—
Mera	0-8	105	0 6	- 5	0 16	- 5	—	—
Kumagaya	1-1	18	0 14	- 2	0 30	+ 2	—	—
Hamamatu	1-1	250	0 20	+ 4	0 36	+ 8	—	—
Kakioka	1-5	40	0 19	- 2	0 43	+ 4	—	—
Tukubasan	1-5	39	0 18	- 3	0 41	+ 2	—	—
Nagano	1-7	337	0 24	0	0 48	+ 4	—	—
Nagoya	1-7	272	0 23	- 1	0 43	- 1	—	1-3
Tyosi	1-7	67	0 19	- 5	—	—	0-8	0-8
Gihu	1-8	279	0 25	- 1	0 50	+ 4	—	—
Hatidyozima	2-1	161	0 29	- 1	0 59	+ 5	—	—
Hikone	2-2	274	0 32	+ 1	1 8	S*	—	—
Kyoto	2-6	268	0 38	+ 1	1 22	S*	—	—
Osaka	2-8	261	0 39	- 1	—	—	1-4	1-9
Wazima	2-8	323	0 40	0	—	—	—	—
Hukusima	2-9	23	0 39	- 2	1 19	+ 5	—	—
Siomisaki	3-1	238	0 43	- 1	1 27	+ 7	—	—
Kobe	3-2	263	0 42	- 4	1 24	+ 2	—	2-5
Wakayama	3-3	256	0 44	- 3	1 39	S*	—	—
Sumoto	3-4	257	i 0 45	- 4	1 39	S*	—	1-9
Toyoooka	3-4	280	i 0 47	- 2	1 38	S*	—	2-1
Sendai	3-5	24	0 52	+ 2	1 43	S*	—	—
Mizusawa	4-4	22	1 2	- 1	2 6	S*	—	—
Akita	4-7	10	1 8	+ 1	2 36	S*	—	—
Koti	4-7	253	e 1 4	- 3	2 10	+10	—	2-7
Morioka	4-9	20	1 9	- 1	2 16	+11	—	—
Matuyama	5-3	258	i 1 11	- 4	i 2 0	-15	i 2-7	3-0
Simidu	5-5	247	1 15	- 3	2 38	+18	—	—
Hamada	5-6	270	1 18	- 2	2 24	+ 1	—	—
Miyazaki	7-0	245	1 39	0	3 25	S*	—	—
Hukuoka	7-2	260	1 42	0	e 3 23	+19	3-7	5-6
Kumamoto	7-2	254	1 40	- 2	3 22	+18	—	—
Nagasaki	7-9	255	e 1 49	- 3	3 32	+11	4-1	4-6
Sapporo	8-2	13	1 59	+ 3	3 53	S*	—	—
Taiyu	8-4	278	1 57	- 2	4 0	S*	—	—
Nemuro	9-7	30	2 12	- 5	4 1	S*	—	—
Zinsen	10-2	287	2 30	+ 6	5 4	S*	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ootomari	11-9	14	2 48	+ 1	(5 10)	+10	5-2	8-7
Naha	13-1	231	3 1	- 2	6 7	L	(6.1)	—
Zi-ka-wei	15-2	260	3 25	- 6	6 39	+19	8-2	8-5
Isigakizima	16-7	234	3 51	+ 1	7 17	SS	—	—
Taihoku (Omori)	18-1	241	e 4 9	+ 1	7 42	+15	9-1	13-6
(Wiechert)	18-1	241	e 4 17	+ 9	7 42	+15	9-2	13-6
Chiufeng	18-7	292	4 17	+ 2	17 42	+ 2	8-9	14-0
Hong Kong	25-1	246	15 16	- 5	19 38	- 5	12-6	16-6
Manila	26-1	223	15 31	+ 1	19 55	- 5	i 12-5	—
Irkutsk	29-9	316	e 6 4	0	11 10	+ 7	15-1	20-4
Phu-Lien	31-8	252	e 6 22	+ 1	11 31	- 1	15-1	17-8
Ambona	40-1	198	8 13	+40	—	—	13-4	17-0
Calcutta	E. 45-5	270	9 14	+57	(16 14)	+77	(24-8)	(27-0)
N. 45-5	270	9 14	+57	(16 4)	+67	(24-7)	(27-1)	—
Almata	47-6	300	e 8 36	+ 3	15 36	+ 9	25-1	—
Medan	48-8	239	8 52	+10	1 16 0	+16	26-9	27-8
Dehra Dun	50-7	283	—	—	16 25	+14	23-7	29-1
Batavia	51-2	224	8 51	- 9	i 16 22	+ 4	25-2	36-9
Andijan	51-5	298	e 9 7	+ 4	16 32	+10	26-9	—
Agra	E. 51-9	280	8 43	-23	16 13	-14	27-1	28-7
N. 51-9	280	8 23	-43	1 16 3	-24	i 16-1	33-0	—
Tashkent	53-6	300	9 19	+ 1	i 16 51	+ 1	24-1	27-6
Ekaterinburg	55-1	320	e 9 25	- 5	i 17 5	- 6	26-1	—
Samarkand	55-8	299	e 9 37	+ 3	17 25	+ 5	27-6	—
Hyderabad	56-2	270	10 12	+35	17 57	+32	27-5	31-4
Honolulu T.H.	56-5	86	—	—	17 35	+ 5	24-4	—
Sitka	58-9	38	—	—	i 18 11	+10	e 28-7	—
Bombay	60-0	274	10 7	+ 3	18 19	+ 3	31-2	35-3
Colombo	60-9	259	9 25	-46	18 25	- 3	31-9	34-1
Kodaikanal	60-9	264	e 13 53	?	—	—	e 28-1	44-4
Suva	65-0	139	e 9 23	-76	19 17	- 3	31-1	37-1
Kucino	67-2	323	10 49	- 4	19 49	+ 2	32-0	42-6
Baku	67-5	306	e 10 56	+ 1	i 19 56	+ 5	32-1	—
Fulkovo	68-6	330	e 11 0	- 2	i 20 2	- 2	32-1	42-7
Victoria	E. 69-1	44	11 6	+ 1	20 6	- 4	32-3	33-3
N. 69-1	44	11 6	+ 1	20 18	+ 8	32-2	32-8	—
Riverview	69-9	169	e 11 2	- 8	i 20 14	- 6	e 30-7	37-7
Sydney	69-9	169	e 20 41	S	(e 20 41)	+21	38-4	40-5
Adelaide	70-1	180	i 11 11	0	i 20 15	- 7	i 22-3	40-0
Helsingfors	70-5	331	e 11 15	+ 1	e 20 28	+ 1	e 34-6	—
Perth	70-5	200	—	—	20 25	- 2	33-2	—
Melbourne	73-1	175	e 13 52	PP	20 50	- 8	32-1	39-9
Scoresby Sund	73-5	354	e 11 46	+14	21 5	+ 2	33-1	—
Upsala	73-5	333	e 11 29	- 3	i 20 59	- 4	e 36-1	42-2
Theodosia	74-2	315	e 11 40	+ 4	e 21 13	+ 2	39-1	—
Simferopol	75-0	315	e 11 43	+ 3	—	—	—	—
Berkeley	75-2	53	e 21 23	S	(e 21 23)	+ 1	e 38-3	—
Yalta	75-3	315	e 11 46	+ 4	e 21 22	- 2	39-1	—
Sebastopol	75-6	315	e 11 54	+10	—	—	—	—
Königsberg	75-8	329	i 11 59	+14	i 21 27	- 2	36-1	46-1
Bergen	77-2	339	—	—	e 21 47	+ 2	37-1	—
Lemberg	77-4	323	e 21 3	S	(e 21 3)	-44	e 40-8	46-1
Lund	78-2	332	11 59	+ 1	i 21 50	- 6	39-1	—
Copenhagen	78-4	332	11 59	0	21 57	- 1	39-1	—
Ksara	80-4	306	—	—	e 22 28	+ 8	44-1	—
Potsdam	80-6	330	i 12 16	+ 5	i 22 31	+ 9	e 39-1	50-6
Hamburg	81-0	332	e 12 16	+ 3	i 22 24	- 2	e 40-1	49-0
Budapest	81-5	324	12 18	+ 2	22 25	- 7	42-1	52-1
Prague	81-8	327	e 12 25	+ 8	e 22 32	- 3	e 38-5	46-1
Dyce	82-0	340	12 5	-13	22 25	-12	43-9	47-3
Vienna	82-2	325	12 23	+ 4	22 42	+ 3	i 34-6	54-1
Jena	82-3	330	e 12 17	- 3	e 22 33	- 7	e 40-1	49-3

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	\circ	\circ	m. s.	s.	m. s.	s.	m.	m.
Göttingen	82.5	331	e 12 21	0	e 22 38	- 4	e 39.1	50.8
Belgrade	82.6	321	e 12 22	+ 1	e 22 43	0	e 43.6	55.7
Cheb	82.6	328	e 12 28	+ 7	e 22 44	+ 1	e 39.1	51.1
Wellington	83.2	153	12 31	+ 7	22 43	- 6	39.1	43.1
Edinburgh	83.4	340	e 12 25	0	22 51	0	39.1	48.1
Graz	83.4	325	i 12 35	+10	e 22 53	+ 2	39.1	54.5
De Bilt	84.0	333	12 33	+ 5	22 53	- 5	e 41.1	43.6
Durham	84.0	339	12 52	+24	22 49	- 9	40.7	50.9
Feldberg	N. 84.2	331	i 12 41	+12	i 22 56	- 4	e 40.6	48.5
Zagreb	84.2	324	e 12 33	+ 4	e 22 55	- 5	e 42.1	49.5
Christchurch	84.4	156	18 34	?	29 22	?	42.9	—
Laibach	84.7	325	e 12 26	- 6	e 23 9	+ 4	e 41.4	54.5
Stonyhurst	85.0	338	12 25	- 8	i 23 3	- 5	41.1	46.4
Stuttgart	85.0	330	12 34	+ 1	e 22 59	[0]	e 45.1	52.8
Karlsruhe	85.1	330	12 45	+11	23 13	+ 4	e 49.1	57.9
Innsbruck	85.2	327	12 42	+ 8	24 2	PS	—	55.4
Uccle	85.2	333	e 12 37	+ 3	i 23 3	[+ 2]	41.1	47.8
Bidston	85.6	338	e 12 45	+ 9	i 23 17	+ 3	e 41.1	55.9
Strasbourg	85.8	330	e 12 34	- 3	i 23 13	- 3	37.1	53.5
Helwan	85.9	304	12 46	+ 8	i 23 15	- 2	—	60.4
Treviso	86.0	326	12 45	+ 7	23 18	0	46.1	56.6
Tucson	86.1	52	e 12 41	+ 2	e 23 9	[+ 2]	e 35.4	—
Venice	86.1	325	e 12 40	+ 1	i 23 14	- 4	48.1	49.1
Zurich	86.3	329	e 12 47	+ 7	e 23 13	- 7	—	—
Chur	86.4	329	e 12 38	- 2	e 23 2	[- 7]	—	—
Kew	86.4	336	e 12 45	+ 5	e 23 17	- 4	38.1	50.5
Padova	86.4	325	e 12 46	+ 6	i 23 15	- 6	e 46.1	—
Oxford	E. 86.5	337	—	—	i 23 20	- 2	e 37.3	49.1
Neuchatel	N. 86.5	337	—	—	i 23 14	[+ 4]	e 39.4	55.2
	87.3	330	e 12 43	- 2	i 23 19	[+ 4]	—	—
Taranto	87.3	320	15 35	?	24 21	PS	38.8	60.8
Besançon	87.5	330	—	—	e 23 20	[+ 3]	40.1	48.1
Paris	87.6	333	e 12 50	+ 4	e 23 13	[- 4]	30.1	50.1
Piacenza	87.7	326	13 13	+27	23 33	- 1	43.4	54.0
Florence	87.9	325	12 54	+ 7	23 31	- 5	43.1	51.1
Naples	E. 88.6	321	e 12 40	-11	e 23 5	[- 19]	36.1	47.1
Rocca di Papa	88.7	323	1 12 57	+ 6	e 23 32	[+ 8]	e 44.6	58.7
Trenta	88.7	320	e 16 20	PP	—	—	50.1	—
Rome	88.8	323	e 12 27	-25	23 59	+14	e 47.3	50.3
Messina	89.9	320	13 5	+ 8	23 55	0	—	—
Catania	90.6	319	e 12 53	- 7	—	—	e 47.7	62.3
Marseilles	91.0	329	e 13 8	+ 6	e 24 32	+27	33.1	—
Chicago	92.1	32	e 13 16	+ 9	24 6	-10	42.4	—
Bagnères	93.2	331	—	—	(23 5?)	[-46]	23.1	—
Ann Arbor	93.3	29	14 11	+58	i 24 29	+ 2	45.4	59.1
St. Louis	93.4	36	e 13 6	- 7	i 24 26	- 2	—	—
Ottawa	93.6	23	e 13 17	+ 3	i 24 23	- 6	e 45.7	—
Toronto	93.9	26	e 13 27	+12	i 24 25	- 7	45.1	—
Tortosa	95.0	330	e 13 29	+ 9	25 51	PS	e 43.1	57.1
Algiers	97.3	325	e 17 29	PP	e 24 12	[- 1]	49.1	54.1
Alicante	97.6	329	e 17 46	PP	e 28 2	?	e 41.1	58.9
Toledo	97.7	332	e 13 36	+ 3	e 25 26	+20	e 43.8	64.8
Harvard	97.8	21	—	—	e 25 5?	- 2	e 43.1?	—
Fordham	98.2	24	—	—	e 25 15	+ 4	50.1	—
Georgetown	Z. 98.8	27	13 40	+ 2	i 26 35	PS	e 45.1	—
Charlottesville	99.1	28	e 18 5	PP	e 24 59	[+12]	e 42.1	—
Almeria	99.6	330	e 13 56	+14	25 42	+19	47.8	64.6
Granada	99.8	330	e 14 4	+21	25 41	+16	i 48.1	65.0
Malaga	100.5	330	18 9	PP	28 50	?	37.1	54.7
San Fernando	101.4	332	19 35	PPP	29 35	?	49.3	61.1
Tananarive	101.9	256	e 17 31	PP	24 37	[+ 2]	48.4	54.1
Cape Town	131.7	253	e 22 41	PKS	—	—	70.1	75.0
La Paz	149.5	60	i 19 46	[+ 5]	27 4	?	70.9	75.5
Sucre	153.2	60	19 59	[+13]	—	—	—	—
La Plata	166.2	94	25 11	PP	—	—	69.1	—
Rio de Janeiro	167.7	9	e 19 46	[-17]	e 32 25	[+25]	e 57.6	—

For Notes see next page.

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NOTES TO NOV. 25d. 19h. 2m. 55s.

Additional readings :-

Nagoya S = +54s.
 Tyosi P₂ = +23s., e = +29s. = P*.
 Kobe i = +46s., iZ = +1m.17s., S₂? = +1m.31s. = S*.
 Sumoto SN = +1m.34s.
 Toyooka iP₂E = +1m.0s., iP₂N = +1m.3s., SZ = +1m.43s., S₂E = +1m.48s.
 Koti PE = +1m.7s., PZ = +1m.14s., eE = +2m.2s., SZ = +2m.14s., iS₂N = +2m.30s.
 Nagasaki PP = +1m.53s.
 Zi-ka-wei PPE = +3m.39s., PPPE = +3m.43s., PPPPE = +3m.47s., SSN = +7m.9s.
 Taihoku (Omori) iPE = +4m.15s., PPE = +6m.29s., SSE = +8m.17s. (Weichert)
 ePE = +4m.23s., iZ = +4m.52s., iPE = +4m.54s., PPE = +5m.33s., eSE = +7m.48s.
 Chiufeng SSE? = +8m.7s.
 Amboina i = +9m.10s. = PP + 10s.
 Batavia iPZ = +8m.55s., P = +9m.0s.
 Honolulu T. H. SSS = +22m.45s.
 Sitka eSSS = +24m.45s. = SSSS + 12s.
 Suva PP = +13m.11s.
 Riverview ePN = +11m.7s.
 Sydney eS = +29m.35s., SS = +33m.23s.
 Adelaide i = +20m.45s.
 Helsingfors eE = +13m.51s. = PP + 8s., ePPE = +14m.16s., ePPE = +15m.46s.
 ePPN = +15m.57s., iSE = +20m.24s., iSN = +20m.30s., ePPSE = +21m.39s., ePPSN = +21m.42s., eE = +24m.39s. = SS - 11s., eN = +25m.10s. and +27m.24s. = SSS - 18s.
 Perth PP = +16m.5s., SS = +26m.0s., SSS = +28m.25s.
 Upsala iSN = +21m.4s.
 Berkeley eN = +21m.34s., eE = +21m.37s., eN = +23m.33s., eE = +24m.5s., iN = +32m.58s., eE = +33m.0s.
 Königsberg eEN = +14m.7s., ePPE = +14m.57s., eN = +15m.7s., and +22m.57s., iSSN = +26m.24s.
 Bergen e = +27m.5s. ?
 Lund +15m.3s.
 Copenhagen PP = +14m.59s., no phase +15m.6s. = PP + 16s., +27m.5s. = SS + 16s.
 Ksara eN = +32m.40s. = SSSS + 5s.
 Potsdam iPEN = +12m.23s., iPPEN = +15m.18s., iPPZ = +15m.24s., iEN = +15m.58s., iE = +16m.48s., and +22m.17s., iN = +22m.26s., i = +22m.58s., iE = +23m.36s., eEN = +24m.41s., eE = +24m.59s., eSSZ = +26m.59s., iSSE = +27m.29s.
 Hamburg eP = +15m.26s., ePPN = +17m.11s., iSN = +22m.31s., eSSE = +27m.32s., eSSSN = +31m.17s., eSSSSE = +33m.27s.
 Prague ePP = +15m.30s.
 Dyce SS = +28m.12s.
 Vienna iPZ = +12m.26s., PP = +15m.39s., PPP = +17m.29s., PS = +23m.51s., PSS = +27m.17s.
 Jena ePNZ = +12m.21s., eE = +12m.35s., eSN = +22m.35s.
 Göttingen ePE = +12m.27s., ePPEZ = +16m.37s., eSZ = +22m.46s.
 Belgrade eP = +12m.27s., e = +13m.19s. and +24m.4s.
 Cheb ePP = +15m.46s., ePPP = +18m.19s., ePS = +23m.22s., e = +25m.15s., and +26m.50s.
 Wellington PP = +15m.40s., SS = +28m.19s.
 Graz PKP = +15m.58s. = PP + 23s., PKP₂ = +17m.51s., eSS = +28m.49s.
 De Bilt eN = +22m.58s.
 Feldberg iN = +16m.18s., eN = +18m.37s., iN = +19m.27s., eN = +21m.5s., +24m.32s. and +27m.17s., iN = +28m.18s., eN = +30m.5s., iN = +32m.13s.
 Zagreb e = +12m.55s. and +13m.27s., i = +15m.26s. = PP - 13s., ePS = +23m.39s., i = +24m.56s., eNW = +26m.39s., e = +27m.40s., +28m.49s., and +33m.59s.
 Stuttgart iPZ = +12m.39s., ePPEZ = +15m.55s., e = +19m.29s., iSN = +23m.13s., ePSSEZ = +23m.49s., eSSEN = +28m.44s., eSSSEN = +32m.15s.
 Innsbruck PP = +16m.7s.
 Uccle iP = +12m.40s., i = +13m.23s., SS = +28m.25s.
 Bidston PP = +16m.40s.
 Strasbourg iPP = +16m.7s., iPS = +24m.6s., SS = +28m.58s.
 Tucson e = +16m.11s. = PP + 17s. and +32m.30s. = SSS + 20s.
 Kew eSZ = +23m.20s., eE = +28m.57s. = SS + 9s. and +34m.3s. = SSSS - 36s., eEZ = +36m.9s.
 Neuchatel ePP = +16m.9s.
 Florence PP = +16m.25s., PPP = +18m.15s., PPPP = +20m.35s., iPS = +24m.5s., i = +25m.35s., and +27m.35s., SS = +29m.35s., SSS = +33m.35s., i = +36m.35s.

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Rocca di Papa $i = +16m.30s.$ = PP + 15s., $iS = +23m.44s. + 0s.$
 Rome $e_i = +12m.5s.$
 Marseilles ePP = +16m.34s.
 Chicago ePP = +17m.32s., SKS = +23m.36s., ePS = +25m.13s., SS = +30m.20s.
 Ann Arbor ePP = +17m.5s., eE = +23m.47s. = SKS - 5s., ePS = +25m.35s.,
 $iSS = +30m.59s.$; $T_0 = 19h.2m.24s.$
 St. Louis eSKS = +23m.46s.
 Ottawa PP = +17m.15s., eN = +31m.5s. ?; $T_0 = 19h.3m.0s.$
 Toronto PPN = +17m.13s., iN = +22m.25s.; $T_0 = 19h.3m.17s.$
 Tortosa ePN = +13m.41s.
 Algiers iPP = +17m.40s.
 Fordham ePP = +17m.42s., PS = +26m.37s.
 Georgetown PP = +17m.43s.; $T_0 = 19h.2m.48s.$
 Charlottesville e = +31m.5s. = SS - 44s., and +39m.43s.
 Almeria PP = +17m.54s., SS = +27m.23s.
 Granada PP = +17m.59s., i = +24m.41s. = SKS + 16s., PPS = +27m.55s., SS = +32m.58s., G = +37m.14s., +37m.44s.
 Tananarive PP = +18m.12s., EN = +25m.33s. = SKKS + 2s., PSN = +26m.45s.,
 PPSN = +27m.43s., PPSE = +27m.45s., SSEN = +32m.40s., SSSN = +37m.39s., E = +46m.5s.
 La Paz PP = +23m.26s., SKKS = +30m.4s., SKSP = +33m.38s., PPE = +36m.46s., SSN = +43m.12s., SSZ = +43m.28s., SSSN = +48m.4s.
 Long waves were also recorded at Barcelona and Dakar.

Nov. 25d. Further shocks from the epicentre $35^\circ 1'N. 139^\circ 0'E.$ Classified as X.

		6h. 26m. 37s. (I)										
		7h. 5m. 57s. (II)										
		7h. 50m. 18s. (III)										
		9h. 34m. 22s. (IV)										
		12h. 13m. 30s. (V)										
		14h. 23m. 21s. (VI)										
		19h. 29m. 13s. (VII)										
		19h. 46m. 20s. (VIII)										
		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.			
		m. s.	m. s.	m. s.	s.	m. s.	s.	m.	m.			
I	Nagoya	1.7	272	0 21	- 3	0 43	- 1	—	0.7			
II		1.7	272	10 27	+ 3	0 48	+ 4	—	0.8			
III		1.7	272	0 14	-10	0 39	- 5	—	0.7			
IV		1.7	272	0 21	- 3	0 46	+ 2	—	—			
V		1.7	272	e 0 15	- 9	0 43	- 1	—	—			
VI		1.7	272	0 21	- 3	0 43	- 1	—	0.7			
I	Tyosoi	1.7	67	e 0 26	+ 2	—	—	e 0.9	—			
II		1.7	67	e 0 22	- 2	0 45	+ 1	—	—			
III		1.7	67	e 0 15	- 9	e 0 37	- 7	e 0.8	—			
IV		1.7	67	e 0 25	+ 1	—	—	—	—			
V		1.7	67	e 0 40	S	(e 0 40)	- 4	—	—			
VI		1.7	67	e 0 25	+ 1	—	—	e 0.9	—			
VII		1.7	67	e 0 25	+ 1	(e 0 46)	+ 2	e 0.8	—			
VIII		1.7	67	e 0 20	- 4	0 33	-11	—	—			
I	Osaka	2.8	261	0 35	- 5	(1 18)	+ 6	1.3	1.8			
II		2.8	261	0 40	0	—	—	1.4	1.9			
III		2.8	261	0 42	+ 2	—	—	1.4	1.6			
IV		2.8	261	e 0 43	+ 3	—	—	1.4	1.7			
V		2.8	261	0 46	+ 6	—	—	1.5	2.2			
VI		2.8	261	0 38	- 2	—	—	1.4	1.8			
VII		2.8	261	e 0 39	- 1	(1 16)	+ 4	1.3	1.7			
VIII		2.8	261	0 44	+ 4	—	—	1.4	2.1			
I	Kobe	3.2	263	e 0 44	- 2	1 16	- 6	—	1.4			
II		3.2	263	0 44	- 2	1 30	+ 8	—	1.6			
III		3.2	263	0 57	P*	1 23	+ 6	—	—			
VI		3.2	263	—	—	e 1 18	- 4	(1.6)	1.6			
I	Sumoto	3.4	257	e 1 9	P ₁	1 49	L	(1.8)	1.8			
II		3.4	257	e 0 50	+ 1	1 40	+13	—	1.9			
III		3.4	257	e 1 16	+27	1 50	+23	—	1.9			
VI		3.4	257	e 1 16	+27	1 55	S ₁	—	1.9			

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Toyooka	3.4	280	i 0 56	+ 7	1 36	+ 9	—	—
II	3.4	280	0 48	- 1	1 39	+12	—	1.8
III	3.4	280	e 0 51	+ 2	1 34	+ 7	—	1.6
VI	3.4	280	0 55	+ 6	e 1 35	+ 8	—	1.7
VII	N.	3.4	280	e 1 12	P ₂	—	—	—
VIII	E.	3.4	280	e 0 57	+ 8	—	—	—
II Mizusawa	4.4	22	1 3	0	1 56	+ 3	—	—
II Koti	4.7	253	e 2 1	S	(e 2 1)	+ 1	(2.6)	—

Additional readings and notes:—

Tyosi II P₂ = +29s., III eP₂ = +23s.

Kobe VI gives S as e and L as S.

Toyooka II PE = +51s., PN = +57s., SZ = +1m.44s.; the phases entered PZ

and SN are the earliest recorded. VII PE = +1m.17s.

Koti gives S as P and L as S.

Long waves were recorded for shock VI at Koti.

Nov. 25d. Readings also at 1h. (near Granada), 2h. (Baku, Ekaterinburg, Ksara, and La Paz), 6h. (near Nagoya (7)), 7h. (near Malaga and near Nagoya (2)), 8h. (Harvard, Ottawa, St. Louis, Tucson, Tacubaya, Merida, La Paz, and Nagoya (4)), 9h. (Berkeley, Victoria, Strasbourg, Baku, Ekaterinburg, Tyosi, and near Nagoya), 10h. (Andijan, Samarkand, Trenta, and Nagoya), 11h. (near Nagoya (2)), 12h. (Andijan, Samarkand (2), and near Nagoya), 13h. (near Tyosi), 14h. (2), 16h., and 18h. (Nagoya), 19h. and 20h. (2) (Tucson), 21h. (Tucson and Tyosi (3)), 22h. (Barcelona and Tyosi), 23h. (Tyosi and near Nagoya).

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.	
	°	°	m. s.	s.	m. s.	s.	m.	m.	
Nov. 26d.	1h. 6m. 36s. (I)							X.	
	4h. 52m. 17s. (II)							X.	
	8h. 42m. 36s. (III)							X.	
	12h. 41m. 48s. (IV)							X.	
			Epicentre 35° 1N. 139° 0E.						
			(as on 25d.).						
I Nagoya	1.7	272	0 21	- 3	0 44	0	—	—	
II	1.7	272	e 0 20	- 4	0 43	- 1	—	—	
III	1.7	272	e 0 19	- 5	0 43	- 1	—	—	
IV	1.7	272	e 0 22	- 2	0 44	0	—	—	
I Tyosi	1.7	67	e 0 21	- 3	e 0 42	- 2	e 0.9	—	
II	1.7	67	e 0 24	0	e 0 51	+ 7	—	—	
III	1.7	67	e 0 23	- 1	e 0 41	- 3	—	—	
IV	1.7	67	e 0 22	- 2	e 0 53	+ 9	—	—	
I Osaka	2.8	261	0 44	+ 4	—	—	1.4	2.2	
II	2.8	261	0 43	+ 3	—	—	1.4	1.7	
III	2.8	261	0 43	+ 3	—	—	1.4	1.8	
IV	2.8	261	e 0 46	+ 6	—	—	1.4	1.9	
I Kobe	3.2	263	i 1 21	S	(1 21)	- 1	—	2.6	
II	3.2	263	e 0 43	- 3	e 1 26	+ 4	—	1.5	
III	3.2	263	e 1 1	P*	1 32	S*	—	1.8	
I Sumoto	3.4	257	e 1 6	+17	(1 25)	- 2	—	2.1	
II	3.4	257	e 1 16	P ₂	e 1 58	S ₂	—	2.1	
III	3.4	257	e 1 17	P ₂	e 1 49	S ₂	—	2.0	
I Toyooka	3.4	280	e 0 52	+ 3	1 42	S*	—	1.8	
II	3.4	280	0 53	+ 4	1 40	+13	—	—	
III	3.4	280	—	—	e 1 33	+ 6	—	—	
II Mizusawa	E.	4.4	22	1 19	P*	2 13	S*	—	

Sumoto readings are given as ePN and PE respectively.

Toyooka gives also for shock I PE = +56s.

Long waves for shock I were recorded at Koti.

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Nov. 26d. 15h. 9m. 54s. Epicentre 11°-0N. 135°-0E. N.3.

A = -·694, B = +·694, C = +·191; D = +·707, E = +·707;
G = -·135, H = +·135, K = -·982.

The readings from nearly all the stations would be better accounted for by a determination with T₀ = 9m.33s., epicentre 11°N. 140°E. However, the Manila readings cannot be made to fit this assumption and a compromise solution is adopted.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	14·1	286	3 14	- 3	i 6 10	+17	—	—
Hong Kong	22·9	302	5 14	+14	—	—	—	15·1
Irkutsk	48·1	335	e 8 29	- 8	e 15 36	+ 2	e 25·1	29·4
Andijan	62·2	311	e 10 30	+10	—	—	—	—
Tashkent	64·6	311	e 10 59	+23	19 29	+14	e 34·1	41·9
Samarkand	66·1	309	e 10 44	- 2	—	—	—	—
Ekaterinburg	72·2	327	e 11 15	- 9	e 20 47	0	37·1	44·9

Additional readings :-

Manila iE = +4m.43s.

Ekaterinburg i = +11m.20s.

Long waves were also recorded at Koti, Baku, and the European stations.

Nov. 26d. Readings also at 0h. (near Nagoya (2) and Tyosi (2)), 1h. (Baku, Ekaterinburg, and Wellington), 3h. (Nagoya and Almata), 4h. (Nagoya and near Sumoto), 5h. (Baku, Ekaterinburg, Irkutsk, Adelaide, Melbourne, Riverview, Perth, and near Nagoya (2)), 8h. (Granada), 9h. (Kobe, Nagoya, and near Toyooka), 12h. (Granada), 15h. (Nagoya), 18h. (Samarkand), 19h. (Almata, near Andijan, Samarkand, and Tashkent), 20h. (La Paz), 22h. (near Mizusawa), 23h. (Sumoto (2)).

Nov. 27d. Readings at 1h. (near Mizusawa), 4h. (near Manila), 12h. (near Tacubaya), 13h. (Nagoya, near Mizusawa, and near Tacubaya), 14h. (Nagoya), 17h. (near Almeria and near La Paz), 19h. (near Tyosi), 21h. (near Koti and Sumoto).

Nov. 28d. 7h. 32m. 57s. Epicentre 18°-5N. 107°-0W. N.2.

A = -·277, B = -·907, C = +·317; D = -·956, E = +·292;
G = -·093, H = -·303, K = -·948.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manzanillo	2·6	78	(0 39)	+ 2	—	—	(1·0)	(1·9)
Guadalajara	3·9	56	(0 39)	-17	—	—	(1·2)	(2·1)
Tacubaya	7·4	82	1 42	- 3	3 8	- 1	3·4	4·9
Oaxaca	9·8	97	2 0	-18	3 57	-11	4·5†	8·0
Chihuahua	10·2	4	(2 9)	-15	(4 6)	-12	(4·6)	(6·2)
Vera Cruz	10·3	84	2 59	+34	5 5	+44	5·3	7·2
Tucson	14·2	346	13 16	- 2	e 6 10	+14	7·0	—
Lick	22·8	329	e 5 1	+ 2	—	—	—	—
Berkeley	23·6	328	15 7	+ 1	i 9 31	+15	e 10·8	13·9
Florissant	24·9	32	e 5 13	- 6	e 9 38	- 1	e 11·6	—
St. Louis	24·9	32	e 5 15	- 4	e 9 39	0	e 12·6	13·8
Chicago	28·5	31	e 5 58	+ 6	10 36	- 4	i 14·4	—
Ann Arbor	30·9	36	e 5 21	-52	e 11 21	+ 3	i 16·2	17·4
Charlottesville	31·6	47	e 6 19	0	e 11 23	- 6	15·0	—
Victoria	E. 32·7	340	6 27	- 2	11 57	+11	16·0	21·5
	N. 32·7	340	6 27	- 2	11 47	+ 1	16·3	19·7
Georgetown	33·0	47	6 28	- 4	11 38	-13	e 16·0	—
Toronto	34·2	37	e 6 37	- 5	11 57	-12	e 16·0	—
Fordham	36·1	45	16 58	- 1	i 12 38	0	i 17·5	—
Ottawa	37·3	38	e 8 33	PP	i 12 55	- 1	e 17·0	—
Harvard	38·6	44	e 7 21	+ 1	i 13 15	0	e 17·0	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka	44.0	339	—	—	i 14 43	+ 7	e 22.6	—
La Paz	51.8	131	9 4	- 1	i 16 27	+ 2	23.0	29.3
Sucre	55.5	131	e 9 37	+ 5	—	—	—	—
Scoresby Sund	71.0	20	—	—	20 27	- 6	33.0	—
Dyce	82.3	32	—	—	i 22 38	- 2	e 40.2	45.2
Stonyhurst	83.4	37	—	—	e 22 43	- 8	42.0	46.0
Kew	85.5	38	e 13 3?	+27	e 23 13	0	e 32.0	43.3
Uccle	88.0	37	—	—	e 23 36	- 1	e 38.0	—
De Bilt	88.2	35	—	—	e 23 35	- 4	e 41.0	44.5
Paris	88.3	40	e 13 3?	+14	e 23 36	- 4	33.0	54.0
Granada	89.3	51	—	—	i 28 9	?	e 43.6	49.6
Upsala	89.8	25	—	—	e 24 3?	+ 9	e 41.0	—
Copenhagen	90.0	30	15 57	PP	23 33	[0]	45.0	—
Lund	90.4	30	21 3?	?	—	—	—	51.0
Stuttgart	92.1	37	e 24 18	S	(e 24 18)	+ 2	e 45.0	—
Helsingfors	92.3	23	—	—	e 23 39	[- 7]	e 44.0	—
Wellington	93.7	229	—	—	24 28	- 2	43.0	48.0
Piacenza	94.4	40	—	—	e 26 29	?	—	59.0
Pulkovo	94.4	20	e 16 51	PP	—	—	44.0	49.4
Florence	96.0	41	e 21 3	?	e 23 53	[- 13]	—	45.0
Rocca di Papa	98.0	41	—	—	e 25 53	+44	—	58.2
Kucino	100.0	20	e 21 51	PPPP	e 24 25	[- 1]	43.2	58.6
Ekaterinburg	104.0	8	—	—	24 36	[- 9]	45.0	65.0

Additional readings and notes :—

Manzanillo readings have been *increased* by 2m.

Guadalajara readings have been *increased* by 7m.

Chihuahua readings have been *increased* by 2m.

Tucson e = +5m.53s.

Lick eEN = +5m.7s., eN = +5m.24s. and +5m.36s.

Berkeley 1E = +5m.45s., eZ = +5m.50s., 1N = +5m.53s., iSN = +9m.43s.,

eSZ = +9m.48s.

Florissant iPZ = +5m.18s., 1Z = +5m.44s., iSE = +9m.44s.

St. Louis iP = +5m.20s., iSN = +9m.43s., iN = +9m.49s.

Chicago ePP = +6m.35s., SS = +12m.25s.

Ann Arbor ePP? = +6m.15s., ePPP?E = +6m.45s., eSS = +13m.45s.

Charlottesville SS = +13m.53s.

Toronto PP = +7m.40s.; T₀ = 7h.32m.35s.

Fordham iPP = +8m.13s.

Ottawa e = +15m.47s.

Sitka iSS = +18m.13s.

La Paz iPPN = +11m.14s.

Dyce i = +21m.34s., and +31m.49s.

Stonyhurst SSS? = +33m.15s.

Uccle e = +29m.21s. = SS + 10s.

De Bilt eEN = +29m.24s. = SS + 10s.

Granada i = +30m.26s.

Stuttgart eSS = +30m.19s., e = +36m.33s.

Helsingfors eSSE = +30m.6s.

Pulkovo ePS = +25m.39s., SS = +30m.39s.

Rocca di Papa e = +27m.21s.

Kucino e = +31m.0s. and +35m.53s. = SSS + 6s.

Ekaterinburg iPP = +18m.15s., PS = +27m.30s., SS = +32m.39s.

Long waves were also recorded at Honolulu T.H., Adelaide, Riverview, Melbourne, Azores, Baku, Irkutsk, and other European stations.

Nov. 28d. Readings also at 0h. (Samarkand and near La Paz), 3h. (Almata, Andijan, Samarkand, Tashkent, Ekaterinburg, Irkutsk, Pulkovo, Bombay, near Calcutta, Rocca di Papa, and Trenta), 6h. (Alicante), 7h. (Hong Kong, Phu-Lien, Bombay, near Calcutta, Tyosi, and near Nagoya), 8h. (Bombay, Hong Kong, and Sydney), 11h. (near Mizusawa), 14h. (Tucson), 15h. (near Sumoto), 18h. (Tyosi), 19h. (near Sumoto), 21h. (Baku, Ekaterinburg, Ksara, and near Sumoto).

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Nov. 29d. Readings at 3h. and 4h. (near Granada), 5h. (Tyosi), 7h. (Tyosi and near Mizusawa), 8h. (Lick), 10h. (near Tananarive), 14h. (near Hukuoka and Matuyama), 16h. (near La Paz), 20h. (near Tacubaya), 22h. (Andijan and Samarkand), 23h. (Almata, Andijan, Samarkand, Tashkent, and Ekaterinburg).

Nov. 30d. 0h. 35m. 0s. Epicentre 36°-0N. 86°-0E. (given by De Bilt). N.3.

A = +.056, B = +.807, C = +.588; D = +.998, E = -.070;
G = +.041, H = +.586, K = -.809.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Almata	10.1	319	e 2 28	+ 6	e 4 36	+20	4.9	5.0
Andijan	11.7	298	e 2 35	- 9	—	—	—	—
Calcutta	13.6	170	e 8 13	?	—	—	9.2	—
Tashkent	14.1	297	e 3 18	- 1	i 5 45	- 8	6.0	8.5
Samarkand	15.4	290	e 3 24	-10	—	—	—	—
Bombay	20.7	217	—	8 43	S (8 43)	+23	12.9	14.8
Irkutsk	20.8	33	e 4 44	+ 6	e 8 26	+ 4	11.0	—
Ekaterinburg	26.9	329	e 5 26	-11	10 4	-10	12.0	17.9
Baku	28.5	290	—	—	e 10 50	+10	e 15.2	—
Pulkovo	42.5	322	—	—	e 14 13	0	21.0	26.1

Additional readings :-

Bombay S = +11m.35s.

Ekaterinburg e = +11m.38s.

Long waves were also recorded at Kucino, Copenhagen, Hamburg, and De Bilt.

Nov. 30d. 21h. 30m. 46s. Epicentre 18°-5N. 107°-0W. (as on 28d.). R.2.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manzanillo	2.6	87	(0 49)	P*	(1 13)	+ 6	(1.2)	(1.6)
Guadalajara	3.9	56	(1 0)	+ 4	(1 48)	+ 8	(1.3)	(2.8)
Tacubaya	7.4	82	1 40	- 5	3 13	+ 4	3.3	5.2
Chihuahua	10.2	4	(1 55)	-29	(3 54)	-24	(4.4)	(6.5)
Vera Cruz	10.3	84	(2 20)	- 5	(4 27)	+ 6	(4.8)	(6.6)
Tucson	14.2	346	i 3 22	+ 4	e 5 58	+ 2	e 6.9	—
Denver	21.3	4	e 4 49	+ 6	e 8 36	+ 4	—	11.9
Berkeley	23.6	328	e 5 7	+ 1	e 9 30	+14	e 11.6	14.5
Florisant	24.9	32	e 5 17	- 2	i 9 45	+ 6	e 12.2	—
St. Louis	24.9	32	e 5 15	- 4	e 9 40	+ 1	e 13.0	—
Chicago	28.5	31	—	—	e 10 55	+15	e 14.6	—
Ann Arbor	30.9	36	—	—	i 11 20	+ 2	e 16.2	17.2
Charlottesville	31.6	47	—	—	e 11 30	+ 1	e 16.8	—
Victoria	E. 32.7	340	7 1	+32	11 51	+ 5	15.9	19.3
	N. 32.7	340	6 31	+ 2	11 51	+ 5	16.4	22.2
Georgetown	33.0	47	6 32	0	11 47	- 4	e 14.2	—
Toronto	34.2	37	e 6 30	-12	e 11 52	-17	e 16.2	—
Fordham	36.1	45	e 6 59	0	i 12 37	- 1	e 17.2	—
Ottawa	37.3	38	e 8 39	PP	e 12 54	- 2	e 19.8	—
La Paz	51.8	131	e 9 1	- 4	16 13	-12	23.0	26.4
Suore	55.5	131	e 9 41	+ 9	—	—	—	—
Kew	85.5	38	—	—	e 23 13	0	e 38.2	—
Uccle	88.0	37	—	—	e 23 14?	[- 6]	e 38.2	—
De Bilt	88.2	35	—	—	e 23 44	+ 5	e 41.2	51.0
Granada	89.3	51	i 14 0	+86	i 24 0	+11	e 45.4	54.4
Copenhagen	90.0	30	—	—	29 14?	?	41.2	—
Pulkovo	94.4	20	e 16 33	?	—	—	41.2	55.6
Florence	96.0	41	e 23 14	?	—	—	40.2	42.2
Rocca di Papa	98.0	41	—	—	e 35 47	?	e 47.4	65.4

For Notes see next page.

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NOTES TO Nov. 30d. 21h. 30m. 46s.

Additional readings and notes:—

Manzanillo readings have been *increased* by 2m.

Guadalajara and Chihuahua readings have been *increased* by 1m.

Vera Cruz readings have been *increased* by 2m.

Berkeley eSN = +9m.37s.

St. Louis eSN = +9m.45s.

Chicago eSS = +12m.42s.

Ann Arbor ePP?E = +6m.38s., eSS = +13m.44s.

Charlottesville eSS = +12m.54s.

Georgetown PP = +7m.28s.; T₀ = 21h.30m.34s.

Toronto eSE = +11m.58s.; T₀ = 21h.30m.15s.

Fordham ePP = +8m.6s.

Ottawa I = +13m.0s.

La Paz PPN = +10m.55s.

De Bilt eEN = +29m.35s. -SS + 21s.

Rocca di Papa e = +37m.4s.

Long waves were also recorded at Riverview, Honolulu T.H., Harvard, Sitka, Scoresby Sund, and other European and Russian stations.

Nov. 30d. Readings also at 0h. (Alicante), 1h. (near Andijan), 3h. (near Algiers), 7h. (near Nagoya), 8h. (near Granada (2)), 11h. (near Amboina), 14h. (Almata, Andijan, and near Sumoto), 15h. (Nagoya and Yalta), 16h. (Nagoya), 18h. (Wellington), 21h. (Baku, Ekaterinburg, Irkutsk, Tashkent, Manila, Adelaide, Riverview, Melbourne, and Wellington (2)).

Dec. 1d. Readings at 0h. (Baku, Ekaterinburg, Irkutsk, Phu-Lien, Bombay, Almata, Andijan, Samarkand, Lick, and near La Paz), 2h. (Baku, Ekaterinburg, Irkutsk, Calcutta, and near Manila), 8h. (Andijan, Samarkand, and Granada), 9h. (Sucre, near La Paz, near Tyosi, and near Vienna), 10h. (Manila), 11h. (Ekaterinburg and Irkutsk), 15h. (Christchurch), 16h. (Samarkand, near Andijan, and near Granada), 18h. (near Manila), 21h. (Almata).

Dec. 2d. 4h. 21m. 38s. Epicentre 41°-9N. 143°-7E. N.3.

(given by K. Wadati in Geophys. Mag., Tokyo, Vol. IV, No. 4).

A = -·600, B = +·441, C = +·668; D = +·592, E = +·806;

G = -·538, H = +·395, K = -·744.

	Δ	Az.	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Urakawa	0·7	290	0 19	+ 9	0 34	+16	—
Kusiro	1·2	25	0 34	+17	0 53	+27	—
Nemuro	2·0	44	0 59	S	(0 59)	+ 8	(1·3)
Sapporo	2·1	304	0 20	-10	0 35	-19	—
Aomori	2·5	244	0 32	- 4	0 55	- 9	—
Mizusawa	3·4	216	0 46	- 3	1 29	+ 2	—
Akita	3·5	232	0 49	- 1	1 25	- 5	—
Hukusima	4·9	213	1 11	+ 1	2 2	- 3	—
Kakioka	6·3	207	1 30	0	2 36	- 5	—
Tyosi	6·5	201	e 2 44	S	(e 2 44)	- 2	—

Nemuro gives S as P and L as S. Mizusawa gives also PN = +52s.

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Dec. 2d. 7h. 1m. 26s. Epicentre 25°·5N. 98°·5E. (as on 1930 Oct. 10d.). R.2.

A = -·133, B = +·893, C = +·431; D = +·989, E = +·148;
G = -·064, H = +·426, K = -·903.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		o.	o.	m. s.	s.	m. s.	s.	m.	m.
Phu-Lien		8·9	120	e 2 12	+ 6	4 4	+18	4·6	5·0
Calcutta		9·7	254	2 18	+ 1	4 8	+ 2	4·7	—
Hong Kong		14·7	99	3 28	+ 3	6 34	+26	7·7	8·4
Agra	E.	18·4	280	2 39	-92	6 9	-84	10·4	10·7
	N.	18·4	280	1 39	-152	6 12	-81	9·1	9·9
Dehra Dun		18·7	290	3 24	-51	7 4	-36	9·7	10·6
Hyderabad		20·3	251	4 38	+ 5	8 31	+19	11·1	15·2
Chiufeng		20·7	41	4 36	—	8 42	+22	11·2	12·9
Taihoku		20·9	86	4 5	-34	e 7 55	-29	10·9	12·3
Zi-ka-wei	N.	21·0	69	e 4 46	+ 6	8 38	+12	—	12·4
Medan		21·9	179	5 50	+60	e 11 53	L (e 11 9)	—	—
Isigakizima		23·3	87	5 26	+22	9 45	+35	—	—
Manila		23·7	113	i 5 14	+ 7	i 9 42	+24	i 12·6	—
Bombay		24·6	260	5 21	+ 5	9 48	+14	13·0	14·5
Almata		24·9	321	5 23	+ 4	9 55	+16	—	—
Kodaikanal		25·1	236	10 4	S	(10 4)	+21	15·6	22·3
Colombo		25·8	227	5 24	- 3	10 9	+14	21·0	25·2
Andijan		26·5	312	e 5 38	+ 4	e 10 24	+17	e 14·9	—
Irkutsk		27·1	8	5 40	+ 1	10 26	+ 9	i 14·7	15·7
Nagasaki		28·2	68	e 10 55	S	(e 10 55)	+20	(e 15·3)	—
Hukuoka		28·8	66	e 5 44	-10	e 11 7	+22	e 16·7	18·2
Tashkent		28·8	311	i 5 53	-1	i 10 49	+ 4	14·6	16·8
Miyazaki		29·5	70	6 6	+ 5	11 23	+27	—	—
Samarkand		29·8	306	6 5	+ 2	—	—	16·6	—
Batavia		32·8	165	6 33	+ 3	—	—	i 15·9	—
Kobe		32·8	64	6 36	+ 6	—	—	e 17·1	20·2
Osaka		33·2	64	12 22	S	(12 22)	+28	15·4	19·2
Mizusawa		38·1	58	(7 19)	+ 3	7 19	P	19·6	—
Ekaterinburg		41·4	330	i 7 43	-1	i 13 56	- 1	18·6	23·2
Baku		42·8	304	e 7 56	+ 1	14 22	+ 4	22·6	29·5
Ksara	E.	54·2	295	e 9 30	+ 7	16 59	+ 1	—	—
Simferopol		54·5	310	—	—	e 17 4	+ 2	—	—
Yalta		54·5	310	—	—	e 17 4	+ 2	—	—
Pulkovo		57·3	327	9 44	-1	17 44	+ 4	28·6	33·7
Helwan		58·8	291	9 56	0	18 2	+ 2	—	38·1
Helsingfors	E.	59·9	328	e 10 19	+15	e 18 16	+ 1	e 32·6	—
Vienna		66·2	315	e 11 51	(+33)	—	—	e 35·6	—
Zagreb		67·0	312	e 11 1	+ 7	e 19 45	0	—	—
Copenhagen		67·0	323	10 58	+ 6	19 52	+ 7	e 34·6	—
Innsbruck		69·7	316	11 34	(+ 2)	—	—	—	—
Rocca di Papa		70·4	308	e 11 34	(0)	i 20 23	- 3	e 39·9	45·6
Rome		70·5	308	e 11 15	+ 1	—	—	—	—
Stuttgart		70·7	318	—	—	e 28 39	?	e 40·6	—
Feldberg	N.	70·7	318	—	—	e 20 34	+ 4	e 35·8	39·6
Florence		70·8	310	—	—	e 20 25	- 6	—	42·6
Adelaide		71·4	145	—	—	e 24 39	SS	e 37·8	43·5
De Bilt		72·1	320	—	—	e 20 54	+ 8	e 35·6	40·4
Uccle		73·0	319	—	—	e 20 52	- 5	e 36·6	40·6
Kew		75·4	320	—	—	e 21 34	+ 9	e 36·6	42·1
Melbourne		76·9	144	—	—	e 21 41	- 1	e 35·2	—
Riverview		77·6	137	—	—	e 21 58	+ 9	e 41·6	50·6
Granada		83·7	310	i 18 24	?	e 22 52	- 2	i 45·5	48·7
Florissant		115·1	7	—	—	e 24 47	—	e 58·6	—
La Paz		164·6	301	i 20 6	[+ 7]	—	—	80·6	93·7

Additional readings and note:—

Chiufeng iZ = +4m.41s. = PP-11s., PPZ = +5m.8s.

Zi-ka-wei iE = +4m.56s. = PP+0s.

Medan i = +9m.6s. = SS-8s. and +14m.34s.

Nagasaki gives S as P and L as S.

Continued on next page.

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Mizusawa SN = +7m.23s.
 Zagreb e = +13m.26s. = PP + 14s., eNW = +18m.4s., e = +20m.1s. = PS + 3s., eNW = +25m.58s.
 Rocca di Papa i = +12m.32s.
 Feldberg eN = +25m.3s. = SS + 10s. and +28m.47s. = SSSS - 22s.
 Ucle e = +25m.34s. ? = SS + 6s. and +29m.34s. ?
 Florissant eZ = +27m.4s. = SKKS + 21s.
 Long waves were also recorded at Ootomari, Koti, Sumoto, Tyosi, Perth, Wellington, Scoresby Sund, and other American and European stations.

Dec. 2d. 13h. 28m. 51s. Epicentre 40°·0N. 19°·5E. (as on Nov. 22d.).

R.3.

A = +·722, B = +·256, C = +·643; D = +·334, E = -·943;
 G = +·606, H = +·215, K = -·766.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taranto	1·8	286	0 27	+ 1	0 54	+ 8	—	1·2
Trenta	2·6	254	i 0 39	+ 2	1 24	S _f	—	—
Messina	3·6	239	1 2	+11	—	—	—	—
Benevento	4·1	288	e 0 45	-13	—	—	—	2·0
Naples	E. 4·1	283	e 0 51	- 7	e 2 6	S*	2·2	—
Catania	4·2	235	e 1 31	P _f	2 9	S*	—	2·8
Casamicciola	4·3	282	0 2	-59	0 58	-52	—	1·9
Mineo	4·7	235	-0 5	-72	—	—	—	—
Belgrade	4·8	8	1 21	P*	e 2 27	S*	—	—
Rocca di Papa	5·3	291	e 1 14	- 1	—	—	e 2·8	3·6
Rome	5·6	293	e 1 21	+ 1	1 45	P*	e 3·2	3·5
Zagreb	6·4	337	e 1 27	- 4	—	—	—	4·0
Laibach	7·0	330	e 1 51	+12	e 3 22	S*	—	—
Florence	7·2	304	e 2 9	P*	3 19	+15	—	6·0
Budapest	7·4	358	e 3 39	S*	—	—	—	—
Venice	7·6	318	i 3 9	S	(i 3 9)	- 5	(i 4·2)	—
Padova	7·8	317	e 2 28	P _f	4 34	S _f	—	—
Treviso	7·8	319	e 2 9?	+18	3 29	+10	—	—
Vienna	8·5	346	e 2 19	+19	i 4 26	S _f	i 4·9	6·2
Placenza	8·8	308	—	—	e 3 9	-35	—	9·6
Innsbruck	9·3	323	e 2 9	- 2	e 4 3	+ 7	e 4·4	—
Ohur	9·9	316	e 2 17	- 2	—	—	—	—
Ravensburg	10·6	321	e 3 9?	+40	—	—	—	—
Zurich	10·8	317	e 2 49	+17	—	—	—	—
Stuttgart	11·4	324	e 3 9?	+29	e 4 32	-16	—	—
Neuchatel	11·5	312	i 2 36	- 6	e 4 34	-16	—	—
Strasbourg	12·0	320	e 4 30	+102	5 38	+35	—	—
Besançon	12·1	311	—	—	e 4 55	-10	—	—
Potsdam	E. 13·1	343	—	—	e 5 9?	-20	e 7·2	8·8
Ksara	E. 14·4	110	e 3 30	+ 9	—	—	—	—

Additional readings and note:—

Belgrade eP = +1m.24s., e = +1m.28s. = P*, +1m.37s. = P_f, +1m.54s., +1m.59s. and +2m.19s.

Rocca di Papa i = +1m.27s.

Rome e i = +1m.18s.

Zagreb eNW = +1m.57s. = P*, e = +2m.25s., iNE = +2m.33s., eNW = +2m.59s.

Laibach ePP = +2m.24s., ePPS = +3m.0s.

Venice gives S as P and L as S.

Strasbourg i = +5m.49s. and +7m.33s.

Long waves were also recorded at Cheb and Karlsruhe.

Dec. 2d. Readings also at 0h. (La Paz and Tashkent), 4h. (Alicante), 5h. (Granada), 8h. (Tyosi), 12h. (Samarkand, near Almata, and Andijan), 16h. (Almata and Samarkand), 17h. (Azores P.D.), 18h. (La Paz), 19h. (Ksara, Simferopol, Yalta, and Wellington), 20h. (Medan, near Batavia, and near Nagoya), 21h. (Ekaterinburg, Irkutsk, Victoria, Riverview, and Wellington), 22h. (near Nagoya), 23h. (Nagoya and Tyosi).

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Dec. 3d. 15h. 42m. 14s. Epicentre 15°·0N. 97°·0E. N.3.

A = -·118, B = +·959, C = +·259; D = +·993, E = +·122;
G = -·032, H = +·257, K = -·966.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N.	11·1	314	4 5	S	(4 5)	-36	7·3	—
Medan		11·5	171	2 50	+ 8	4 57	+ 7	—	—
Hong Kong		17·8	63	4 6	+ 2	7 32	+12	9·1	9·7
Hyderabad		18·0	281	7 21	S	(7 21)	- 4	12·7	14·4
Bombay		23·4	283	5 5	0	9 9	- 3	11·9	17·4
Tashkent		35·6	323	e 6 49	- 5	13 46	+76	e 17·8	24·4

Additional readings:—

Medan i = +3m.24s.

Long waves were also recorded at Phu-Lien, Batavia, Irkutsk, Baku, and Ekaterinburg.

Dec. 3d. 16h. 36m. 20s. Epicentre 17°·3N. 96°·5E. (as on 1930 May 5d.). X.

A = -·108, B = +·949, C = +·297; D = +·994, E = +·113;
G = -·034, H = +·295, K = -·955.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	N.	9·3	306	3 7	P _r	—	—	6·4	—
Medan		13·8	170	e 3 40	+27	i 8 22	?	—	—
Hyderabad		17·2	274	3 16	-41	7 16	+10	12·6	14·6
Hong Kong		17·4	70	4 0	+ 1	7 20	+ 9	8·5	10·4
Colombo		19·3	239	7 43	S	(7 43)	- 9	—	14·8
Agra	E.	19·7	304	2 49	-97	6 28	-92	e 9·1	—
Bombay		22·5	278	5 0	+ 4	9 8	+13	11·8	17·0
Irkutsk		35·5	8	e 6 51	- 2	e 12 19	-10	17·7	19·1
Baku		46·2	311	—	—	e 18 39	(+19)	e 25·2	—
Ekaterinburg		47·8	335	e 8 33	- 2	e 15 21	- 9	22·7	26·9

Additional readings:—

Hong Kong e = +8m.0s.

Long waves were also recorded at Phu-Lien, Kodaikanal, Batavia, Zi-ka-wei, Koti, De Bilt, and Uccle.

Dec. 3d. 18h. 51m. 51s. Epicentre 18°·2N. 96°·4E. N.1.

Probable error of epicentre ±0°·4.

A = -·106, B = +·944, C = +·312; D = +·994, E = +·111;
G = -·035, H = +·310, K = -·950.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	E.	8·7	301	2 10	+ 7	—	—	e 3·2	—
	N.	8·7	301	1 50	-13	—	—	e 2·9	—
Phu-Lien		9·9	73	e 2 16	- 3	i 4 9	- 2	—	—
Medan		14·7	171	e 3 18	- 7	16 45	+37	—	—
Hyderabad		17·1	270	3 55	0	7 4	0	—	11·6
Hong Kong		17·2	73	3 48	- 9	7 17	+11	8·3	9·6
Agra	E.	19·1	302	i 2 41	-99	16 21	-87	i 8·3	—
Colombo		19·7	237	4 20	- 6	8 0	0	—	—
Kodaikanal		20·0	249	i 4 33	+ 3	—	—	8·1	17·3
Hokoto		22·2	72	(4 50)	- 3	(8 41)	- 9	—	—
Bombay		22·3	276	4 50	- 4	8 57	+ 5	11·6	20·4
Manila		23·8	95	i 5 9	+ 1	19 34	+15	i 12·4	—
Taihoku		24·3	68	e 5 17	+ 4	10 17	SS	11·9	15·2
Zi-ka-wei		26·1	65	e 5 31	+ 1	10 3	+ 3	13·4	19·5
Batavia		26·5	156	5 21	-13	i 10 15	+ 8	i 14·0	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Isigakizima	26.6	72	5 41	+ 6	10 38	+29	—	—
Chufeng	27.7	34	5 37	- 7	10 20	- 7	13.9	17.0
Malabar	27.7	155	—	—	e 10 39	+12	i 14.6	—
Almata	30.0	331	6 4	- 1	11 0	- 4	—	—
Andijan	30.6	323	e 6 9	- 1	e 11 38	+24	17.7	—
Tashkent	32.7	321	1 5 26	-63	i 10 36	-70	—	—
Nagasaki	33.3	58	e 6 31	- 3	e 12 2	+ 7	e 16.0	18.9
Hukuoka	34.0	56	6 24	-16	12 17	+11	18.4	24.0
Miyazaki	34.4	59	6 42	- 2	12 15	+ 3	—	—
Irkutsk	34.6	8	e 6 40	- 6	12 14	- 1	17.1	—
Matuyama	36.0	57	i 12 36	S	(i 12 36)	0	i 19.9	22.1
Kotl	36.5	58	7 8	+ 6	e 12 40	- 4	e 16.6	20.2
Sumoto	37.8	57	7 20	+ 7	13 14	+11	e 19.3	21.2
Toyooka	38.1	55	1 7 16	+ 0	13 18	+10	17.0	21.4
Kobe	38.1	56	e 7 3	-13	13 4	- 4	e 17.1	21.6
Amboina	38.2	121	7 15	- 2	i 13 11	+ 2	24.1	—
Osaka	38.4	56	7 28	+10	13 24	+12	18.1	22.9
Gihu	39.6	56	7 28	- 1	13 26	- 4	—	—
Nagoya	39.6	56	(7 40)	+11	(13 48)	+18	(20.1)	(24.9)
Tyosf	N. 42.9	55	e 14 16	S	(e 14 16)	- 3	21.6	23.6
Sendai	43.4	53	8 10	+10	14 32	+ 4	—	—
Mizusawa	E. 43.9	51	8 3	- 1	14 38	+ 5	22.2	—
Baku	N. 43.9	51	8 9	+ 5	14 34	0	21.5	—
Ekaterinburg	45.6	310	i 8 16	- 2	—	—	—	—
	46.9	334	e 8 21	- 7	i 15 9	- 8	—	—
Ootomari	47.4	42	15 38	S	(15 38)	+14	26.1	31.1
Perth	53.5	160	e 7 29	+ 4	i 16 39	-10	i 30.1	—
Ksara	55.8	299	9 38	+ 4	17 21	+ 1	27.2	—
Theodosia	56.9	313	e 9 44	+ 2	17 34	- 1	30.1	36.2
Yalta	57.7	313	9 50	+ 2	17 37	- 9	—	—
Simferopol	57.8	313	e 9 53	+ 4	e 17 49	+ 2	—	—
Sebastopol	58.1	313	e 9 51	0	e 17 46	- 5	—	—
Helwan	59.8	295	i 10 7	+ 4	i 18 9	- 4	—	41.5
Tananarive	60.7	235	e 10 16	+ 7	18 24	- 1	28.5	33.4
Pulkovo	62.4	330	i 10 22	+ 1	18 42	- 5	29.1	38.9
Lemberg	E. 64.9	318	e 10 38	0	e 19 16	- 3	e 25.0	38.8
	N. 64.9	318	e 10 48	+10	e 19 12	- 7	e 27.8	38.0
Helsingfors	65.1	330	e 10 44	+ 5	i 19 23	+ 2	e 32.1	—
Adelaide	66.5	143	e 10 46	- 3	i 19 39	0	i 29.8	39.3
Königsberg	67.1	323	i 10 52	0	i 19 49	+ 3	e 27.9	38.6
Belgrade	67.4	313	e 10 48	- 6	e 19 46	- 4	e 26.5	40.8
Budapest	68.2	316	10 53	- 6	19 53	- 6	e 32.6	40.6
Upsala	68.8	329	e 10 58	- 5	i 19 58	- 9	e 33.1	44.2
Vienna	70.0	317	e 11 7	- 4	20 22	+ 1	—	42.2
Taranto	70.2	309	11 15	+ 3	20 30	+ 6	40.4	52.1
Bari	70.4	310	11 20	+ 7	20 30	+ 4	36.1	—
Zagreb	70.5	314	e 11 6	- 8	e 20 17	-10	e 36.7	44.0
Graz	70.7	316	e 11 13	- 2	i 20 23	- 7	e 35.1	43.3
Trenta	71.1	307	i 11 9	- 8	20 39	+ 5	33.1	48.1
Prague	71.1	319	e 11 17	0	e 20 29	- 5	e 33.1	41.1
Lund	71.2	325	11 21	+ 3	20 33	- 2	—	—
Copenhagen	71.7	325	11 21	0	20 39	- 2	—	—
Potsdam	71.7	320	e 11 15	- 6	e 20 27	-14	e 34.1	44.1
Messina	71.8	307	11 17	- 5	20 42	- 1	—	—
Melbourne	72.2	142	11 21	- 3	20 37	-10	30.6	45.7
Catania	72.3	305	11 19	- 6	20 39	- 9	34.4	45.2
Naples	E. 72.4	309	e 11 41	+16	e 20 41	- 9	35.1	44.1
Cheb	72.4	319	e 11 11	-14	e 20 50	0	e 38.1	43.0
Casamicciola	72.7	309	11 15	-12	19 23	-90	28.0	—
Jena	72.8	320	e 11 27	- 1	e 20 48	- 6	e 37.7	46.6
Venice	73.0	314	e 11 34	+ 5	i 20 49	- 8	—	44.3
Treviso	73.2	314	i 11 27	- 3	20 58	- 1	39.6	45.1
Padova	73.4	314	e 11 34	+ 3	i 21 4	+ 3	—	—
Innsbruck	73.4	316	e 11 30	- 1	21 16	+15	e 30.0	43.6
Rocca di Papa	73.4	310	e 11 27	- 4	e 20 59	- 2	e 35.9	53.9

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Florence	112-1	317	16 30	?	26 47	{+26}	—	34-3
De Bilt	112-1	328	i 19 19	PP	e 29 55	?	e 52-3	71-6
Zurich	112-3	321	e 18 48	{+23}	e 28 47	PS	—	—
Strasbourg	112-3	323	e 14 18?	-25	e 28 2	PS	41-3	70-6
Piacenza	112-6	320	19 16	PP	26 42	{+17}	34-9	76-5
Livorno	112-8	317	17 58	[-28]	—	—	—	—
Uccle	113-2	327	—	—	e 26 18?	{-11}	e 45-3	71-6
Tucson	113-3	53	—	—	e 25 15	[-12]	35-3	—
Neuchatel	113-6	322	e 18 32	{+ 3}	e 26 50	{+18}	—	—
Edinburgh	114-0	334	—	—	i 30 18	?	46-3	72-5
Besançon	114-0	322	e 19 34	PP	e 30 12	?	58-3	—
Durham	114-0	332	22 55	?	33 43	?	e 44-3	59-3
Stonyhurst	114-9	331	19 40	PP	—	—	54-3	60-3
Paris	115-2	325	e 19 43	PP	e 30 31	?	52-3	56-3
Kew	115-3	330	e 19 39	PP	e 28 34	PS	46-5	57-0
Bidston	115-5	331	—	—	e 30 18	?	—	—
Oxford	115-6	330	i 19 49	PP	i 29 34	PS	e 50-6	61-6
Bagnères	119-5	320	(e 20 18?)	PP	—	—	e 20-3	—
Algiers	120-5	313	20 18	PP	—	—	47-3	65-3
Tortosa	120-5	319	20 23	PP	36 46	SS	e 51-3	69-6
Alicante	122-4	316	e 20 25	PP	e 29 10	?	e 37-0	—
Toledo	123-9	320	20 39	PP	33 40	?	e 55-9	85-8
Almeria	124-4	315	e 18 52	[- 4]	i 30 34	PS	e 63-2	87-3
Granada	125-1	316	19 2	{+ 5}	31 13	PS	e 57-7	87-4
Florissant	125-8	39	e 18 18	[-41]	i 25 53	[-14]	—	173-3
Chicago	125-8	35	e 20 58	PP	e 25 38	[-29]	e 47-1	—
Malaga	125-9	316	e 18 53	[- 6]	27 17	{+69}	29-2	73-6
St. Louis	N. 126-0	39	e 21 48	?	e 38 18	SS	—	—
San Fernando	127-2	316	18 48	[-13]	25 48	[-23]	36-3	88-3
Ann Arbor	127-6	31	e 22 6	?	e 32 48	?	61-5	88-1
Toronto	N. 128-9	29	e 21 1	PP	e 26 6	[-10]	—	—
Ottawa	129-2	23	e 21 8	PP	38 48	SS	e 54-3	—
Charlottesville	133-4	31	e 22 38	PKS	e 45 54	?	60-3	—
Harvard	133-5	22	e 22 43	PKS	e 39 43	SS	e 65-3	—
Georgetown	133-6	30	e 15 54	?	31 29	SKSP	—	—
Fordham	133-6	26	e 21 34	PP	—	—	e 58-3	—
La Plata	143-3	168	19 27	[- 1]	—	—	69-0	—
Port au Prince	150-4	52	e 19 18?	[-24]	—	—	—	—
La Paz	153-9	132	i 19 48	{+ 1}	27 10	?	70-3	86-6
Sucre	154-2	140	19 40	[- 7]	—	—	—	—
Rio de Janeiro	155-9	191	—	—	e 23 58	PKS	e 43-7	78-9

Additional readings and notes :—

Malabar i = +5m.43s. = PP - 7s. and +6m.34s.

Batavia iP = +5m.30s., iPZ = +5m.33s., i = +6m.26s., iZ = +10m.40s.

Hong Kong iPP = +6m.48s.

Zi-ka-wei iN = +6m.56s.

Median readings have been diminished by 5m.

Perth ePP = +7m.58s., ePPP = +8m.39s., SS = +14m.58s., SSS = +15m.38s.

Adelaide i = +8m.1s. = PP + 3s., +12m.44s., +13m.53s., and +15m.1s.

Sumoto eSN = +16m.23s.

Kobe iNE = +9m.4s. = P_cP - 23s.

Toyooka PE = +7m.12s., ePZ = +7m.52s.

Riverview iN = +7m.14s., PPN = +8m.58s., PPPN = +9m.13s., PSN =

+13m.7s., iEN = +15m.19s. = SS - 11s., iE = +18m.1s.; T₁ = 19h.8m.12s.

Melbourne iPPP = +9m.4s.

Wellington SS = +21m.18s. ?

Christchurch PP = +12m.14s., PPP = +13m.23s., SS = +22m.34s.

Tananarive P_cP = +12m.47s., eN = +15m.14s., PPE = +16m.5s., PPPE =

+18m.12s., SKSN = +23m.8s., iS₀S = +23m.32s., iPS = +24m.8s., EN =

+25m.23s., E = +26m.20s., SPSE = +28m.26s., SSN = +28m.54s.,

SSSSN = +34m.56s.

Pulkovo SKS = +24m.8s.

Helingsfors ePPE = +17m.38s., eSKSE = +24m.15s., eE = +29m.34s., eSS =

+31m.59s., eN = +33m.54s., eE = +37m.25s., ePPPZ = +39m.1s.

Upsala e = +32m.38s. = SS + 2s., eN = +42m.29s.

Berkeley iE = +23m.32s., eZ = +24m.1s., eZ = +25m.43s. = S - 9s., iN =

+28m.14s. and +29m.23s., iE = +31m.55s., eN = +45m.2s. and +47m.25s.

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NOTES TO DEC. 3d. 18h. 51m. 51s.

Additional readings and notes :—

Medan iP = +3m.25s.
Hokoto readings have been *diminished* by 3m.
Taihoku iP = +5m.27s., PP = +7m.36s.
Zi-ka-wei iE = +10m.19s. and +11m.49s., iN = +12m.7s., +12m.27s., and +12m.39s., iE = +13m.21s.
Batavia iP = +5m.29s.
Chiufeng PPZ = +6m.12s., PPPZ? = +6m.52s., iZ = +9m.17s., =P_cP +14s., iE = +10m.52s., SSE = +11m.40s., SSSSE = +12m.27s., SSSSE? = +13m.10s.
Nagasaki eSS = +14m.30s.
Hukuoka PP? = +8m.5s.
Koti eE = +7m.12s., iSE = +12m.50s.
Sumoto SN = +13m.10s.
Toyooka SN = +13m.13s.
Kobe ePE = +7m.20s.
Nagoya readings have been *increased* by 3m.
Tyosí ePE = +13m.5s.
Baku i = +8m.26s. and +10m.19s. = P_cP +18s.
Perth PP = +12m.24s., SS = +24m.29s.
Tananarive PPE = +12m.40s., PPPE = +13m.55s., PPPPE = +14m.29s., PS = +18m.43s., EN = +18m.52s., E = +19m.57s. = S_cS +0s., S_cSE = +20m.31s., SSN = +22m.55s., E = +25m.10s., iSSSN = +25m.23s., P_cSS_cPN = +25m.55s.
Helsingfors ePZ = +10m.51s., ePPPE = +14m.46s., eZ = +15m.27s., iPSEZ = +19m.49s., eSSE = +24m.10s., iSSSE = +27m.3s.
Adelaide i = +24m.19s. and +27m.3s.
Königsberg iE = +19m.41s., +19m.52s. = PS -6s., and +20m.58s. = S_cS +15s., eN = +21m.6s. and +23m.16s., iSSE = +24m.33s., eSSSN = +26m.43s.
Belgrade eP = +10m.50s., eS = +19m.52s.
Uppsala iPE = +11m.2s., PPE = +13m.6s., PPPPE = +15m.6s., SSN = +24m.23s., SSE = +24m.35s., SSSN = +27m.45s., SSSSE = +27m.55s.
Vienna iPZ = +11m.11s., P_cP = +11m.54s., PP = +14m.5s., PPP = +15m.49s., PS = +20m.57s., S_cS = +21m.19s., PSS = +25m.11s., SSS = +28m.10s., PKKP? = +30m.15s.
Zagreb i = +11m.26s., ePP = +16m.22s. = ePPPP +14s., e = +20m.22s. and +20m.30s., ePS = +20m.53s., e = +21m.42s., eNW = +22m.22s., +23m.36s., and +24m.59s. = SS +9s., e = +25m.37s., +26m.40s., +27m.50s. = SSS +8s., and +29m.50s., eNW = +30m.29s., e = +33m.49s.
Graz iP = +11m.19s., iPSS = +25m.44s., iSSS = +28m.43s.
Copenhagen PP = +14m.1s., PPP = +15m.59s., SS = +24m.33s.
Potsdam iZ = +11m.19s., i = +11m.24s., iEZ = +11m.46s., i = +14m.23s., iE = +14m.57s., iEZ = +15m.49s., iZ = +16m.28s., and +17m.5s., iSE = +20m.37s. and +20m.46s., iPE = +21m.2s., iE = +24m.43s., iSSE = +25m.3s.
Melbourne PP = +13m.59s., PPP = +15m.41s., PS = +21m.17s.
Cheb ePP = +15m.49s., ePPP = +17m.51s., ePS = +25m.19s., eSS = +29m.23s.
Jena eE = +14m.9s. = PP +7s., eNE = +15m.57s., eE = +27m.51s., eN = +28m.9s.
Innsbruck SS = +25m.45s.
Rocca di Papa iP = +11m.32s.
Hamburg iPPZ = +14m.13s., SS = +26m.50s.
Riverview ePE = +11m.26s., iZ = +11m.31s., iPPP = +15m.53s., i = +21m.3s., SS? = +26m.21s., SSS? = +30m.32s.; T₁ = 18h.51m.35s.
Göttingen iPPZ = +14m.4s., iPE = +14m.8s., ePPPE = +15m.59s., eSKSE = +21m.44s., iSSE = +26m.42s., eSSSE = +29m.13s.
Florence PP = +14m.29s., PPP = +16m.39s., PS = +21m.42s., i = +28m.29s. = SSS -18s.
Stuttgart iPEZ = +11m.44s., ePE = +14m.14s., iPS = +21m.49s., eSSN = +25m.57s., eSSSN = +29m.39s.
Bergen PS = +29m.17s.
Feldberg iN = +19m.37s.
Strasbourg iPP = +15m.10s., iPPP = +16m.48s., ePPPP = +17m.51s., iPS = +21m.55s., iSS = +27m.6s., eSSS = +30m.15s.
Uccle i = +12m.33s., PP = +14m.51s., PPP = +16m.45s., i = +22m.35s., iSS = +26m.41s.
Durham SSSS = +33m.52s.
Kew ePPZ = +15m.13s., iSZ = +22m.16s., PSNZ = +22m.51s., iSSNZ = +27m.2s., iSSSN = +28m.33s.
Edinburgh i = +18m.29s. and +22m.31s. = PS -20s., SS = +27m.57s., SSS = +31m.9s., i = +31m.39s. and +32m.10s.
Oxford i = +15m.21s. = PP +14s., iSN = +21m.59s., e = +29m.17s.
Bidston SS = +27m.19s., SSS = +30m.59s.
Scoresby Sund +15m.33s. = PP +14s., and +27m.27s. = SS -12s.
Reykjavík eE = +23m.27s., +25m.44s., and +28m.41s. = SS +11s., eN = +29m.0s.
Almeria PP = +15m.40s., m = +23m.48s. = PS -7s.
Granada PP = +16m.6s., PPP = +18m.12s., SKS = +23m.7s.

Continued on next page.

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Christchurch PPP = +19m.35s.
 Sitka ePS = +26m.1s., eSS = +30m.59s., i = +37m.51s.
 Wellington PP = +16m.55s., SS = +31m.4s.
 Honolulu T.H. ePS = +26m.23s.
 Victoria PN = +18m.19s. = PP + 2s.
 Berkeley eN = +33m.51s., iE = +34m.33s. = SS - 29s., iN = +35m.37s., iE = +35m.49s.
 Ottawa e = +36m.3s. = SS + 23s., and +47s.9s.
 Toronto iSN = +27m.47s., iN = +29m.54s. = SKSP + 14s. and +35m.51s. = SS - 16s., iE = +36m.9s.?
 Denver eE = +20m.20s. = PP + 20s.
 Ann Arbor iPS?N + 32m.21s., eSSSN = +43m.27s., i = +47m.15s., iE = +52m.15s., SKS is given as ePPP?N.
 Chicago iPS = +30m.0s., ePPS = +31m.39s., SS = +36m.32s., eSSS = +39m.49s.
 Fordham iPPS = +32m.32s., iSS = +36m.54s.
 Georgetown iSKR = +22m.39s., SS = +37m.17s.; T₀ = 18h.51m.36s.
 Florissant iPPZ = +20m.33s., iZ = +22m.28s. = PPP - 30s. and +29m.54s., iE = +31m.21s. and +32m.5s., iEZ = +37m.16s., iE = +40m.13s. and +42m.10s.
 St. Louis iN = +30m.26s., +31m.51s., and +34m.0s.
 Tucson ePS = +30m.40s., e = +32m.53s., eSS = +37m.27s.
 Charlottesville eS = +28m.37s., ePS = +30m.31s., eSS = +36m.53s.
 La Paz iPKPZ = +20m.8s., PPEZ = +24m.29s., SKSE = +27m.29s., SKSZ = +27m.35s., SKSN = +27m.45s., PPPN = +28m.55s., iSKSP = +35m.34s., PPSN = +39m.17s., SSN = +44m.17s., SSSN = +50m.33s.
 Long waves were also recorded at Port au Prince.

Dec. 3d. Readings also at 1h. (La Paz), 3h. (Nagoya, near Mizusawa, and Tyosi), 4h. (Tyosi), 5h. (Tucson and near Lick), 6h. (Nagoya and near Sumoto), 7h. (Tucson), 9h. (near Malabar and near Tyosi), 11h. (near La Paz and near Tacubaya), 13h. (Simferopol and near Theodosia), 15h. (Feldberg), 17h. (Nagasaki), 19h. (Berkeley), 20h. (near Nagasaki).

Dec. 4d. 4h. 16m. 51s. Epicentre 35°·0N. 135°·5E. (as on 1930 July 16d.). R.3.

A = -·584, B = +·574, C = +·574.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Osaka	0·4	173	0 4	- 2	(0 9)	- 1	0·1	0·2
Kobe	0·5	219	10 4	- 3	0 10	- 3	—	0·2
Toyooka	0·8	314	10 12	+ 1	0 23	+ 2	—	0·4
Sumoto	0·9	212	0 13	0	0 24	+ 1	—	0·4
Nagoya	1·2	82	0 19	+ 2	0 34	+ 3	—	—

Dec. 4d. 6h. 18m. 39s. Epicentre 23°·0N. 97°·0E. (as on 1926 Nov. 21d.). X.

A = -·112, B = +·914, C = +·391; D = +·993, E = +·122;
 G = -·048, H = +·388, K = -·921.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hyderabad	18·2	256	4 7	- 2	7 33	+ 4	8·8	12·2
Medan	19·5	175	e 4 43	+ 19	7 33	- 23	i 13·6	—
Bombay	23·0	264	5 1	0	9 9	+ 4	11·8	13·9
Andijan	27·2	317	e 2 43	?	—	—	—	—
Tashkent	29·5	315	e 3 45	?	i 10 38	- 18	e 13·4	16·0
Irkutsk	29·8	9	e 5 50	- 13	e 11 6	+ 5	15·4	16·6
Samarkand	30·3	310	e 6 8	0	—	—	—	—
Ekaterinburg	42·9	332	e 9 39	PP	e 19 32	?	22·4	—

Additional readings:—

Tashkent e = +12m.21s. = SS + 3s.

Long waves were also recorded at Phu-Lien, Batavia, Baku, and De Bilt.

Dec. 4d. Readings also at 1h. (Tashkent and near Almata), 2h. (Almata, De Bilt, Ekaterinburg, La Paz, Trenta, near Taranto, Samarkand, and near Andijan), 3h. (near Tacubaya), 5h. and 6h. (near La Paz), 10h. (Messina (2)), 13h. (Ekaterinburg, Irkutsk, Hong Kong, and Strasburg), 14h. (De Bilt, Paris, Uccle, and Baku), 16h. (near Manila and near Tyosi), 19h. (Nagoya and Florissant), 21h. (Andijan and Samarkand).

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Dec. 5d. 5h. 56m. 48s. Epicentre 33°·5N. 46°·5E. (as on 1927 Nov. 12d.). X.

A = +·574, B = +·605, C = +·552; D = +·725, E = -·688;
G = +·380, H = +·401, K = -·834.

	Δ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Baku	7·4	20	i 1 38	- 7	—	—	2·0	—
Samarkand	17·5	64	e 3 57	- 3	e 7 37	+24	—	8·4
Tashkent	19·6	60	e 4 39	+14	1 7 54	- 4	9·2	11·0
Andijan	21·8	63	e 4 53	+ 4	e 8 44	+ 2	—	—
Almata	25·6	58	e 6 15	+50	—	—	—	—
Pulkovo	28·3	343	i 6 0	+10	i 9 51	-46	—	—

Additional readings:—

Baku i = +1m.41s.

Tashkent i = +4m.50s. and +8m.8s. =SS-9s.

Long waves were also recorded at Irkutsk.

Dec. 5d. 19h. 6m. 54s. Epicentre 41°·7N. 141°·6E. N.2.

(given by K. Wadati in Tokyo Geophys. Mag., Vol. IV, No. 4).

A = -·585, B = +·464, C = +·665; D = +·621, E = +·784;
G = -·521, H = +·413, K = -·747.

	Δ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Hakodate	0·7	277	0 12	+ 2	0 24	+ 6	—	—
Urakawa	1·0	63	0 15	+ 1	0 32	+ 6	—	—
Sapporo	1·4	352	0 26	+ 6	0 41	+ 5	—	—
Akita	2·3	209	0 35	+ 2	1 3	+ 4	—	—
Kusiro	2·5	58	0 28	- 8	0 54	-10	—	—
Mizusawa	2·6	188	0 38	+ 1	1 4	- 3	—	—
Hukusima	4·0	193	0 56	- 1	1 44	+ 2	—	—
Kakioka	5·6	193	1 14	- 6	2 36	+13	—	—
Tyosai	6·0	186	e 1 22	- 3	e 2 37	+ 4	—	—
Yokohama	6·4	194	1 30	- 1	2 45	+ 2	—	—

No additional readings.

Dec. 5d. 20h. 31m. 51s. Epicentre 34°·4N. 134°·8E. N.2.

(given by K. Wadati in Tokyo Geophys. Mag., Vol. IV, No. 4).

A = -·581, B = +·585, C = +·565; D = +·710, E = +·705;
G = -·398, H = +·401, K = -·825.

	Δ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Sumoto	0·1	128	i 0 0	- 1	0 3	0	—	0·1
Wakayama	0·3	119	0 5	+ 1	0 10	+ 2	—	—
Kobe	0·4	48	i 0 5	- 1	i 0 10	0	—	0·3
Osaka	0·7	68	0 9	- 1	(0 18)	0	0·3	0·5
Kyoto	1·0	51	0 14	0	0 26	0	—	—
Toyooka	1·2	1	0 16	- 1	i 0 31	0	—	0·5
Siomisaki	1·3	140	0 20	+ 2	0 35	+ 2	—	—
Koti	1·4	231	e 0 20	0	i 0 37	+ 1	—	0·7
Matuyama	1·8	252	i 0 40	S	(i 0 40)	- 6	i 1·1	1·2
Gihu	1·9	58	0 26	- 2	0 50	+ 1	—	—
Nagoya	1·9	67	0 32	P*	0 59	S*	—	1·0
Simidu	2·2	223	0 39	P*	1 6	S*	—	—
Misima	3·5	78	0 59	P*	1 58	S*	—	—
Nagano	3·5	49	1 6	P*	1 58	S*	—	—
Hukuoka	3·7	258	1 4	P*	1 59	S*	—	2·0
Miyazaki	3·7	229	1 8	P*	1 53	S*	—	—
Kakioka	4·7	66	1 22	P*	2 28	S*	—	—

Matuyama gives also iS = +52s. =S*.

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Dec. 5d. Readings also at 2h. (Trenta and near Taranto), 4h. (Samarkand), 5h. (Tucson), 7h. (Samarkand), 8h. (Königsberg and Samarkand), 9h. (Samarkand and near Andijan), 11h. (Feldberg), 12h. (Baku, Ekaterinburg, Almata, Samarkand, Chufeng, near Irkutsk, and near La Paz), 13h. (Andijan and near Almata), 17h. (Ksara and Neuchatel), 18h. (Ksara and Tyosi).

Dec. 6d. 7h. 3m. 21s. Epicentre 51°-2N, 172°-0W. (as on 1929 July 11d.). R.2.

A = -.621, B = -.087, C = +.779; D = -.139, E = +.990;
G = -.772, H = -.108, K = -.627.

		Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Sitka		22-0	60	8 42	S	(8 42)	- 4	e 13-0	—
Victoria	E.	31-0	76	—	—	11 11	- 9	13-4	15-3
	N.	31-0	76	—	—	11 27	+ 7	13-0	13-5
Honolulu T.H.		31-9	155	—	—	(e 13 9)	SS	e 13-2	—
Berkeley		37-0	90	e 8 52	PP	i 12 51	0	e 17-3	—
Lick	N.	37-8	90	e 7 13	0	—	—	—	—
Tucson		47-8	88	e 8 49	+14	e 15 29	- 1	e 20-8	—
Irkutsk		48-8	308	8 43	+ 1	e 15 34	-10	23-6	34-0
Chicago		55-6	65	—	—	e 17 12	- 5	26-9	—
St. Louis		56-2	70	e 9 33	- 4	e 17 11	-14	e 25-6	30-6
Scoresby Sund		56-5	12	—	—	17 57	+27	26-6	—
Ann Arbor		57-4	61	—	—	e 17 27	-15	e 30-8	—
Toronto	E.	58-9	59	—	—	e 17 50	-11	e 31-2	—
Ottawa		59-2	54	—	—	e 17 57	- 8	e 29-6	—
Hong Kong		62-8	275	10 29	+ 5	18 49	- 3	e 27-2	34-1
Charlottesville		63-2	61	—	—	e 18 51	- 6	e 31-0	—
Georgetown		63-4	60	e 10 27	- 1	i 20 14	(- 3)	e 29-6	—
Ekaterinburg		63-6	332	e 10 28	- 1	i 18 58	- 4	28-6	37-6
Fordham		63-7	58	e 10 32	+ 2	i 18 52	-12	e 30-6	—
Harvard		64-1	54	e 10 33	0	i 18 56	-13	e 31-6	—
Pulkovo		67-6	349	e 10 55	- 1	e 19 55	+ 3	33-6	41-7
Helsingfors	E.	67-8	351	—	—	e 20 11	PS	e 33-6	—
Kuacno		70-2	344	—	—	e 28 33	?	e 40-2	45-6
Andijan		72-3	314	e 11 27	+ 2	—	—	—	—
Copenhagen		73-0	357	—	—	20 57	0	32-6	—
Tashkent		73-3	318	i 11 28	- 3	i 20 51	- 9	e 36-6	41-0
Samarkand		75-6	319	e 11 43	- 1	—	—	—	—
De Bilt		76-9	1	—	—	e 21 34	- 8	e 38-6	51-2
Uccle		78-1	2	—	—	e 21 39?	-16	e 29-6	—
Feldberg	N.	78-6	0	—	—	e 21 39	-21	e 31-6	52-6
Stuttgart	N.	80-1	0	—	—	e 22 9	- 8	e 32-2	—
Strasbourg		80-3	0	—	—	(e 21 39?)	-40	e 21-6	—
Theodosia		80-9	341	e 12 14	+ 1	—	—	—	—
Simeropol		81-3	341	e 12 11	- 4	—	—	—	—
Baku		81-5	330	12 14	- 2	e 22 21	-11	40-2	53-2
Yalta		81-7	341	e 12 15	- 2	—	—	—	—
Florence		85-0	358	12 37	+ 4	22 44	-24	35-6	46-6
Rocca di Papa		87-0	357	e 12 59	+16	(e 23 3)	-24	e 23-0	56-4
Hyderabad		88-0	298	12 50	+ 2	23 14	-23	44-2	54-2
Bombay		90-0	302	12 58	+ 1	23 23	-33	44-5	56-6
La Paz		111-4	92	(19 22)	PP	i 28 38	PS	53-6	63-9

Additional readings :-

Berkeley eN = +15m.41s.

Lick eE = +7m.25s., eN = +7m.30s.

Tucson e = +10m.17s., +11m.1s., and +19m.4s.

Chicago e = +19m.5s. = S₀S - 16s., and +20m.49s. = SS - 8s.

St. Louis iN = +19m.16s. = S₀S - 9s.

Ann Arbor e?E = +17m.39s., e?N = +19m.27s. = S₀S - 7s., eN = +26m.39s.,

eE = +28m.15s.

Toronto eE = +28m.0s.

Ottawa i = +19m.45s.

Georgetown i = +11m.32s. and +19m.49s.

Fordham iPS = +19m.12s.

Feldberg eN = +22m.39s. = PS + 8s. and +27m.20s.

Long waves were also recorded at Phu-Lien, Wellington, and other European

stations.

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Dec. 6d. Readings also at 7h. (Mizusawa and near Medan), 9h. (Bombay, Andijan, Samarkand, Tashkent, Baku, and Ekaterinburg), 10h. (Rocca di Papa, Rome, Taranto, Trenta, and Zagreb), 11h. (Andijan and Samarkand), 17h. (Andijan, Samarkand, Mizusawa, and near Irkutsk), 19h. (Mizusawa, near Tyosil (2), and near Irkutsk), 20h. (Almata, Andijan (2), and near Samarkand (3)).

Dec. 7d.	4h.	2m.	0s.	(I)	Epicentre 35°·1N. 139°·0E. (as on Nov. 26d.).	X.
	5h.	50m.	28s.	(II)		
	7h.	12m.	40s.	(III)		
	13h.	35m.	21s.	(IV)		
	15h.	34m.	24s.	(V)		

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

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m.	s.	m. s.	s.	m. s.	s.	m.	m.
I Nagoya	1·7	272	0 19	- 5	0 41	- 3	—	—
II	1·7	272	e 0 17	- 7	0 40	- 4	—	—
III	1·7	272	e 0 17	- 7	—	—	—	—
IV	1·7	272	0 16	- 8	0 33	- 11	—	—
V	1·7	272	0 18	- 6	0 42	- 2	—	—
I Tyosil	1·7	67	e 0 32	P _g	—	—	—	—
II	1·7	67	e 0 23	- 1	e 0 44	0	e 0·8	—
III	1·7	67	e 0 23	- 1	—	—	—	—
IV	1·7	67	—	—	e 0 55	S _g	—	—
V	1·7	67	e 0 26	+ 2	e 0 36	- 8	—	—
I Osaka	2·8	261	0 37	- 3	—	—	1·4	1·8
II	2·8	261	0 36	- 4	(1 19)	+ 7	1·3	1·8
III	2·8	261	0 49	P*	—	—	1·5	1·8
IV	2·8	261	0 48	P*	(1 33)	S _g	1·5	1·7
V	2·8	261	0 44	+ 4	—	—	1·5	1·8
II Kobe	E.	3·2	263	—	e 1 14	- 8	—	1·5
II Sumoto		3·4	257	e 1 23	+34 (e 1 23)	- 4	(e 1·7)	—
II Toyooka		3·4	280	0 54	+ 5	1 37	+10	1·7

Additional readings and notes:—

Kobe II eN = +1m.2s.

Sumoto II gives S as P and L as S.

Toyooka I records long waves only.

Dec. 7d. 6h. 5m. 50s. Epicentre 36°·5N. 141°·5E. (as on 1930 Aug. 18d.). X.

Tokyo gives epicentre 36°33'N. 141°41'E.

A = -·629, B = +·500, C = +·595.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	m.	s.	m. s.	s.	m. s.	s.	m.	m.
Tyosil	0·9	214	e 0 12	- 1	0 24	+ 1	—	0·5
Tukuba	1·1	252	0 11	- 5	—	—	—	—
Tokyo	1·7	240	1 39	+75	—	—	—	—
Mizusawa	2·6	354	0 34	- 3	1 8	+ 1	—	—
Nagoya	4·0	252	e 0 59	+ 2	1 44	+ 2	—	—
Osaka	5·3	252	1 25	P _g	—	—	2·5	3·0
Kobe	5·5	253	—	—	e 2 16	- 4	—	2·7

Tyosil gives also e = +18s.

Dec. 7d. Readings also at 0h. (Andijan and Samarkand), 2h. (near Amboina), 3h. (Nagoya (2)), 4h. (Nagoya (4) and Tyosil), 5h. (Nagoya (3)), 6h. (Andijan), 7h. (Messina and near Tacubaya), 12h. (La Paz and Messina), 14h. (Besançon and Strasbourg), 15h. (Messina), 16h. (Calcutta and Phu-Lien), 18h. (near Tyosil), 19h. (near Tacubaya), 20h. and 21h. (Lick), 22h. (Bombay, Ekaterinburg, and Tashkent), 23h. (Nagoya, Baku, Ekaterinburg, Tashkent, Irkutsk, Andijan, Hong Kong, Phu-Lien, Bombay, and Calcutta).

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Dec. 8d. 6h. 20m. 4s. Epicentre 23°·2N. 120°·6E. (as on 1930 Aug. 7d.). R.1.

Probable error of epicentre ±0°·31.

Tokyo gives 23°·4N. 120°·5E. close to the adopted epicentre.

A = -·468, B = +·791, C = +·394; D = +·861, E = +·509;
G = -·201, H = +·339, K = -·919.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tainan	0·4	240	0 6	0	0 13	+ 3	—	—
Hokoto	1·0	289	0 4	-10	0 15	-11	—	—
Taityu	1·0	5	0 11	-3	0 30	+ 4	—	—
Kosyu	1·2	174	0 18	+ 1	0 42	S _r	—	—
Karenko	1·2	49	0 10	- 7	0 30	- 1	—	—
Taihoku	2·0	25	10 25	- 4	1 0	S*	—	1·2
Isigakizima	3·5	70	0 48	- 2	1 27	- 3	—	—
Hong Kong	6·0	262	—	—	1 47	P*	2·3	3·3
Zi-ka-wei	8·0	5	e 2 14	+21	4 0	S*	—	5·6
Manila	8·6	178	e 2 5	+ 3	i 3 48	+ 9	—	—
Nagasaki	12·5	39	2 55	0	5 20	+ 5	—	—
Miyazaki	13·0	46	3 16	+14	5 44	+17	—	—
Phu-Lien	13·2	262	e 3 4	- 1	e 5 48	+16	6·9	—
Hukuoka	13·5	38	e 3 21	+12	—	—	e 7·5	10·2
Sumoto	16·7	45	(e 3 53)	+ 3	(e 6 55)	0	(e 7·9)	(8·9)
Osaka	17·3	45	4 16	+18	—	—	7·6	11·0
Chiufeng	N. 17·3	349	3 48	-10	7 12	+ 3	9·0	—
Toyooka	E. 17·5	42	6 41	S	(6 41)	-32	12·7	—
Nagoya	18·6	46	4 26	+12	7 51	+13	—	—
Medan	28·9	231	—	—	e 10 56?	+ 9	—	—
Calcutta	30·3	276	11 53	S	(11 53)	+44	(17·9)	—
Irkutsk	31·6	342	e 6 12	- 7	e 11 17	-12	15·9	19·8
Andijan	44·1	306	e 6 10	?	—	—	—	—
Bombay	44·6	275	—	—	e 14 36	- 8	—	28·1
Tashkent	46·3	308	e 8 18	- 5	i 15 6	- 3	23·9	31·0
Samarkand	47·8	305	e 8 35	0	—	—	—	—
Ekaterinburg	54·4	326	i 9 19	- 5	17 0	- 1	24·9	29·6
Baku	60·9	307	e 10 6	- 5	e 18 29	+ 1	e 29·9	41·8
Pulkovo	70·3	329	—	—	e 19 2	-83	36·9	42·2
Helsingfors	E. 72·7	330	—	—	e 20 46	- 7	e 44·9	—
Straasbourg	86·6	322	—	—	e 38 56?	?	47·9	—
Paris	89·4	324	—	—	e 40 56?	?	52·9	—
La Paz	169·4	52	e 20 3	[0]	—	—	—	—

Additional readings and notes :-

Taihoku P_r = +35s., S_r = +1m.9s.

Zi-ka-wei iN = +4m.22s., iE = +4m.36s., iN = +5m.2s., iE = +5m.9s.

Manila iE = +2m.33s. and iZ = +3m.25s.; epicentre 22°·5N. 120°E.

Sumoto readings have been diminished by 4m.

Medan i = +20m.35s.

Calcutta gives S as P and L as S.

Pulkovo e = +27m.45s.

Long waves were also recorded at Koti, Kobe, Kucino, and many other European stations.

Dec. 8d. 8h. 1m. 5s. Epicentre 23°·2N. 120°·6E. (as at 6h.). R.1.

Probable error of epicentre ±0°·30.

A = -·468, B = +·791, C = +·394; D = +·861, E = +·509;
G = -·201, H = +·339, K = -·919.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tainan	0·4	240	0 9	+ 3	0 14	+ 4	—	—
Taito	0·7	132	0 14	+ 4	0 23	+ 5	—	—
Hokoto	1·0	289	0 10	- 4	0 21	- 5	—	—
Taityu	1·0	5	0 9	- 5	0 28	+ 2	—	—
Karenko	1·2	49	0 18	+ 1	0 38	+ 7	—	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taihoku	2-0	25	0 29	0	—	—	—	—
Isigakizima	3-5	70	0 50	0	1 32	+ 2	—	—
Hong Kong	6-0	262	1 15	-10	2 17	-16	2-9	3-9
Naha	7-1	63	1 49	+ 8	2 42	-19	—	—
Zi-ka-wei	8-0	5	e 1 53	0	e 3 49	+25	i 4-3	4-6
Manila	8-6	178	i 2 3	+ 1	i 3 46	+ 7	—	—
Nagasaki	12-5	39	2 56	+ 1	5 27	+12	7-5	8-0
Miyazaki	13-0	46	3 9	+ 7	5 37	+10	—	—
Phu-Lien	13-2	262	e 3 3	- 2	i 6 3	+31	6-9	8-3
Hukuoka	13-5	38	3 15	+ 6	e 6 22	+43	7-8	10-2
Koti	15-4	45	3 58	+24	7 5	+41	10-0	12-0
Sumoto	16-7	45	e 4 12	+22	e 8 11	+16	e 12-2	13-2
Siomisaki	16-8	49	4 2	+10	7 28	+31	—	—
Kobe	17-1	45	e 4 2	+ 7	7 36	+32	e 11-8	12-8
Osaka	17-3	45	4 16	+18	(7 45)	+36	7-7	12-0
Chiufeng	N. 17-3	349	3 54	- 4	7 14	+ 5	8-9	—
Toyooka	17-5	42	e 4 18	+18	—	—	12-7	14-9
Nagoya	18-6	46	4 22	+ 8	8 59	+81	—	—
Gihu	18-6	46	4 18	+ 4	7 58	+20	—	—
Misima	19-9	49	4 31	+ 2	8 21	+17	—	—
Nagano	20-3	45	4 40	+ 7	8 27	+15	—	—
Tokyo	20-7	49	4 57	+20	9 35	L	(9-6)	—
Palau	20-7	138	4 49	+12	—	—	—	—
Hukusima	22-3	45	4 59	+ 5	—	—	—	—
Mizusawa	E. 23-6	43	5 2	- 4	9 21	+ 5	16-1	—
Medan	28-9	231	e 6 16	+21	—	—	—	—
Calcutta	30-3	276	10 14	?	—	—	18-0	—
Irkutsk	31-6	342	e 6 17	- 2	e 11 14	-15	15-9	19-8
Dehra Dun	38-4	292	13 45	?	18 5	?	21-7	24-9
Agra	E. 38-5	286	e 7 8	-11	—	—	—	—
Hyderabad	39-8	272	7 0	-30	12 55	-38	19-8	24-1
Almata	41-0	310	e 7 57	+17	—	—	—	—
Colombo	42-4	255	14 13	S	(14 13)	+ 2	—	29-6
Andijan	44-1	306	e 8 4	- 2	—	—	—	—
Bombay	44-6	275	8 5	- 5	14 55	+11	23-2	28-2
Tashkent	46-3	308	e 8 19	- 4	i 15 4	- 5	e 22-9	30-4
Samarkand	47-8	305	e 8 34	- 1	—	—	—	—
Ekaterinburg	54-4	326	i 9 22	- 2	i 17 2	+ 1	23-9	33-5
Baku	60-9	307	e 10 9	- 2	e 18 26	- 2	29-9	41-8
Kucino	67-0	324	e 10 35	-17	e 19 41	- 4	35-1	40-6
Pulkovo	70-3	329	11 7	- 6	20 18	- 7	35-9	40-4
Theodosia	70-6	313	e 11 11	- 3	—	—	—	—
Simferopol	71-4	312	e 11 15	- 4	—	—	—	—
Sebastopol	71-9	312	e 13 43	PP	—	—	—	—
Helsingfors	E. 72-7	330	—	—	e 20 49	- 4	e 38-9	—
Copenhagen	80-6	328	12 7	- 4	22 14	- 8	40-9	—
Vienna	81-8	320	12 15	- 2	—	—	—	45-9
Zagreb	83-1	317	e 12 11	-13	e 22 13	-35	e 45-7	56-0
Stuttgart	85-8	323	e 12 40	+ 3	e 22 40	[-25]	e 45-9	47-8
Strasbourg	86-6	322	e 10 55?	?	e 20 55?	?	e 45-9	—
Florence	87-0	316	12 28	-15	22 58	[-15]	51-9	52-9
Paris	89-4	324	—	—	e 21 55?	?	48-9	49-9
Granada	100-0	318	e 18 29	PP	—	—	52-6	66-0
La Paz	z. 169-4	52	i 20 5	[+ 2]	—	—	85-9	99-8

Additional readings :-

Manila iZ = +2m.25s., iE = +2m.38s., iZ = +2m.51s., iE = +3m.20s.

Toyooka PE = +4m.26s., eE = +10m.0s., iN = +10m.3s.

Kobe eZ = +4m.17s.

Sumoto eSN = +7m.49s.

Medan i = +17m.52s., +20m.58s., and +22m.8s.

Irkutsk e = +12m.15s., SS = +13m.25s.

Agra eN = +7m.48s.

Kucino e = +23m.31s.

Helsingfors ePSE = +21m.28s., ePPSE = +21m.49s.

Long waves were also recorded at Kodalkanal, Ottawa, Scoresby Sund, and many other European stations.

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Dec. 8d. 17h. 21m. 20s. Epicentre 29° 0S. 174° 0W. (as on 1928 Nov. 29d.). X.

A = -870, B = -091, C = -485; D = -105, E = +995;
G = +482, H = +051, K = -875.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Wellington	15.3	214	4 35	+63	7 25	+63	8.2	9.7
Christchurch	18.0	213	(4 3)	-4	4 3	P	8.8	19.0
Riverview	30.0	251	1 5 2	-63	10 40	-24	e 13.7	16.7
Sydney	30.0	251	e 5 28	-37	1 9 40	-84	14.3	16.4
Melbourne	35.1	242	1 6 47	-3	1 12 3	-20	16.3	23.8
Adelaide	40.2	250	e 8 1	+27	1 13 21	-18	16.0	22.7
Perth	59.4	249	23 40	?	—	—	—	—
Manila	76.4	295	1 11 54	+ 6	1 16 25	PPP	i 19.4	22.4
Berkeley	82.6	39	e 12 13	- 8	1 23 28	PS	e 42.4	54.2
Hong Kong	86.1	299	12 49	+10	23 10	- 8	—	47.3
Victoria	89.7	30	24 5	S	(24 5)	+12	45.1	48.2
La Paz	95.2	112	e 13 54	+33	1 24 32	-12	47.9	53.4
Florissant	103.2	53	e 17 46	PP	e 25 3	{-14}	—	58.7
St. Louis	103.2	53	—	—	e 24 37	[-4]	e 55.7	—
Calcutta	106.9	286	19 47	?	—	—	60.9	—
Colombo	107.4	267	24 13	S	(24 13)	?	68.6	—
Irkutsk	107.8	320	e 14 30	?	e 25 13	[+10]	58.7	63.6
Ottawa	115.7	49	e 20 52	?	e 28 16	?	e 54.7	—
Bombay	118.8	277	e 20 7	PP	31 9	?	54.0	70.5
Tashkent	128.0	301	19 18	[+15]	1 26 30	[+16]	—	90.9
Ekaterinburg	133.0	322	e 20 0	[+48]	26 34	[+ 6]	59.7	79.1
Baku	142.5	300	e 19 42	[+16]	29 43	[+ 4]	74.7	95.6
Kucino	144.9	329	e 20 46	PP	—	—	e 81.3	91.1
Pulkovo	145.1	337	19 49	[+15]	e 30 7	{+13}	75.7	90.3
Helsingfors	146.3	341	e 19 59	[+23]	—	—	e 84.7	—
Theodosia	151.8	313	e 20 16	[+32]	—	—	—	—
Simferopol	152.7	313	e 20 8	[+23]	—	—	—	—
Copenhagen	152.9	352	20 10	[+24]	43 40	SS	80.7	—
Potsdam	z. 156.1	349	e 20 10	[+21]	—	—	e 80.7	98.7
De Bilt	156.9	1	e 20 43	[+53]	e 44 25	SS	e 84.7	100.3
Kew	157.1	10	e 20 48	[+58]	—	—	84.7	—
Uccle	158.2	3	e 25 40?	?	e 31 40?	{+32}	—	94.7
Feldberg	158.7	356	—	—	e 34 46	SKSP	e 85.1	97.1
Paris	160.0	7	—	—	e 26 40?	?	88.7	91.7
Stuttgart	160.1	354	e 24 40?	PP	e 35 0	SKSP.	e 93.2	—
Strasbourg	160.4	357	e 19 40?	[-14]	e 24 40?	?	e 84.7	—
Piacenza	163.7	351	e 20 56	{- 5}	—	—	—	110.2
Florence	164.6	346	20 19	[+20]	32 40	{- 3}	—	78.7
San Fernando	167.4	51	31 40	SKKS	(31 40)	{-18}	89.7	100.2
Granada	168.6	42	i 20 30	[+27]	—	—	e 84.3	103.2
Alicante	169.0	28	—	—	e 46 49	SS	e 100.9	—

Additional readings:—

Christchurch SSS = +6m.51s.
Riverview 1E = +6m.44s., +7m.1s., +7m.20s., and +7m.58s., S1N = +10m.47s.
Melbourne e = 17h.23m.8s.
Manila 1E = +12m.32s. and +14m.12s. = PP - 21s.
Berkeley eN = +12m.41s., eZ = +12m.48s., and +13m.19s., eSE = +23m.33s.,
ISZ = +23m.37s.
Victoria PE = +24m.15s.
La Paz PSN = +26m.38s., SSSN = +36m.28s.
Florissant 1E = +25m.53s., eE = +35m.40s.
St. Louis e = +33m.40s., eN = +47m.7s.
Irkutsk ePP = +18m.50s., ePS = +25m.40s.?
Ottawa e = +42m.40s.?
Tashkent 1PP = +21m.7s., ePKS = +22m.31s., SKKS = +23m.11s.
Ekaterinburg PP = +21m.51s., PKS = +22m.58s.
Baku 1PKS = +23m.30s.
Potsdam eZ = +23m.40s.? = PKS + 7s. and +34m.40s.? = SKSP + 21s.
Stuttgart e = +44m.53s.
Florence 1P = +25m.2s.
Granada 1 = +25m.21s. = PP + 21s. and +29m.40s.
Long waves were also recorded at Honolulu T.H., Samarkand, Kodalkanal, and other American and European stations.

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Dec. 8d. Readings also at 1h. (Andijan, Berkeley, and Lick), 3h. (Almata, and Andijan), 7h. (Messina), 9h. (near Mizusawa), 10h. (Messina (3)), 11h. (Almata and Samarkand), 13h. (Baku, Ekaterinburg, and Messina (2)), 14h. (Messina, Andijan (2), and Samarkand (2)), 15h. (La Paz, La Plata, and Messina), 16h. (Scoresby Sund), 19h. (Andijan, Samarkand, and near Tacubaya), 21h. (Baku, Ekaterinburg, and Tashkent), 23h. (Sucre, near La Paz, near Mizusawa, Nagoya, Osaka, and Tyosi).

Dec. 9d. 0h. 27m. 30s. Epicentre 25°·0N. 100°·5E. (as on 1930 May 14d.). X.

A = -·165, B = +·891, C = +·423; D = +·983, E = +·182;
G = -·077, H = +·416, K = -·906.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Calcutta	11·4	260	4 49	S	(4 49)	+ 1	6·0	—
Bombay	26·3	260	10 2	S	(10 2)	- 1	15·2	15·7
Irkutsk	27·4	5	—	—	e 10 30	+ 8	14·5	15·0
Tashkent	30·5	311	—	—	e 10 50	-22	e 16·5	19·1
Ekaterinburg	42·7	330	1 7 55	+ 1	e 14 20	+ 4	18·5	—

Additional readings:—

Bombay SEN = +14m.0s.

Tashkent e = +12m.24s. = SS - 18s.

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

Dec. 9d. 19h. 16m. 6s. Epicentre 19°·5N. 104°·5W. N.3.

A = -·238, B = -·912, C = +·334; D = -·968, E = +·250;
G = -·084, H = -·323, K = -·943.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manzanillo	0·5	161	0 18	+11	—	—	1·0	1·5
Guadalajara	1·5	28	0 59	+38	—	—	1·7	2·2
Mazatlan	4·1	334	(1 1)	+ 3	—	—	(1·2)	(1·4)
Tacubaya	5·0	90	2 9	S	(2 9)	+ 1	3·8	4·9
Vera Cruz	8·0	90	1 38	-15	3 26	+ 2	—	4·7
Chihuahua	9·2	351	(2 4)	- 6	(3 19)	-35	(3·4)	(3·7)
Tucson	14·0	337	e 3 16	+ 1	(15 39)	-12	15·6	—
Denver	20·2	359	4 41	+ 9	—	—	—	—
St. Louis	22·7	30	1 4 56	- 2	1 8 53	- 6	e 11·4	—
Florissant	22·8	29	e 4 59	0	i 9 2	+ 1	—	11·5
Berkeley	24·0	324	e 5 10	0	e 9 13	-10	e 10·4	14·1
Chicago	26·5	29	—	—	e 10 8	+ 1	i 13·0	—
Georgetown	30·6	45	9 29	(+17)	—	—	i 16·4	—

Additional readings and notes:—

Mazatlan readings have been increased by 3m.

Chihuahua readings have been increased by 4m.

Tucson e = +4m.3s., +4m.32s., and +5m.10s.

Denver iSE = +9m.36s.

St. Louis iS = +9m.0s.

Berkeley eE = +9m.4s.

Chicago e = 19h.16m.19s.

Georgetown i = +14m.26s.

Long waves were also recorded at Baku, Irkutsk, Tashkent, Copenhagen, Scoresby Sund, and other American stations.

Dec. 9d. Readings also at 0h. (Christchurch, Adelaide, Wellington, Riverview, Andijan, and Samarkand), 1h. (near Almata), 7h. (La Paz and Messina (3)), 8h. (Messina), 10h. (Messina and near Nagoya), 11h. (Tyosi and near Mizusawa), 12h. (Messina), 13h. (Catania, Messina (2), Mineo, Rocca di Papa, Naples, Zagreb, near Taranto, and Trenta (3)), 14h. (Messina, Tyosi, Tashkent, Andijan, and near Samarkand), 15h. (Messina (2)), 18h. (Toledo), 19h. (Ekaterinburg, Tashkent, Almata, near Andijan, Samarkand, and near Nagoya), 20h. (Batavia, near Nagoya (2)), 21h. (Berkeley and near Nagoya), 23h. (Nagoya).

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Dec. 10d. 10h. 31m. 30s. Epicentre 39°·5N. 39°·4E. N.1.

Probable error of epicentre $\pm 0^{\circ}24$.

A = +·596, B = +·490, C = +·636; D = +·635, E = -·773;
G = +·492, H = +·404, K = -·772.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Ksara	6·3	207	e 1 35	+ 5	3 26	S _z	3·7	—
Theodosia	6·3	333	e 1 20	-10	—	—	2·5	2·7
Yalta	6·3	325	e 1 26	- 4	2 24	-17	2·5	2·7
Simferopol	6·7	326	e 1 28	- 7	—	—	—	—
Sebastopol	6·8	322	e 1 30	- 7	—	—	2·8	—
Baku	8·0	80	e 2 0	+ 7	i 3 40	+16	4·7	6·5
Helwan	11·7	217	e 2 40	- 4	5 6	+11	—	13·2
Belgrade	15·0	297	3 4	-24	e 6 26	+11	—	8·9
Kucino	16·3	357	e 3 42	- 3	e 6 36	- 9	e 9·0	11·0
Budapest	16·7	305	3 50	0	7 1	+ 6	10·0	15·0
Taranto	16·9	280	3 51	- 2	10 36	L	13·2	—
Trenta	17·8	278	e 3 40	-24	6 50	-30	—	11·0
Zagreb	18·3	298	e 4 8	- 2	e 7 56	+25	e 10·0	11·2
Messina	18·6	274	4 8	- 6	7 43	+ 5	—	—
Vienna	18·7	306	4 12	- 3	7 45	+ 5	—	12·5
Catania	19·1	272	e 4 19	- 1	7 54	+ 6	11·7	13·1
Naples	19·2	282	e 7 30	S	(e 7 30)	-20	(e 11·5)	—
Laibach	19·3	298	e 4 30	+ 8	e 8 8	+16	e 11·6	—
Mineo	19·5	271	5 54	?	—	—	—	—
Königsberg	N. 19·9	327	—	—	e 8 1	- 3	e 10·7	—
Rocca di Papa	20·3	285	i 4 34	+ 1	i 8 20	+ 8	e 10·3	14·3
Prague	20·5	310	e 4 36	+ 1	e 8 20	+ 4	e 11·5	14·5
Rome	20·5	286	e 4 14	-21	—	—	—	5·5
Venice	20·7	296	4 30?	- 7	—	—	—	—
Treviso	20·9	296	1 45	?	8 35	+11	39·5	—
Padova	21·1	295	e 4 39	- 2	i 8 40	+12	—	—
Pulkovo	21·1	347	4 36	- 5	e 8 19	- 9	11·0	14·1
Florence	21·4	291	4 43	- 1	8 44	+10	—	12·5
Cheb	21·7	308	e 4 52	+ 4	e 8 51	+11	e 11·5	16·0
Innsbruck	21·7	301	e 4 49	+ 1	8 49	+ 9	—	12·5
Ekaterinburg	22·2	32	e 4 51	- 2	i 8 50	0	10·5	15·7
Potsdam	22·2	314	i 4 50	- 3	i 8 53	+ 3	e 11·5	14·5
Helsingfors	22·5	341	e 4 54	- 2	19 0	+ 5	e 11·5	—
Jena	22·5	310	e 4 55	- 1	e 8 57	+ 2	e 12·5	14·0
Piacenza	22·6	294	e 4 57	0	i 9 10	+13	12·7	16·5
Tashkent	22·7	76	i 5 3	+ 5	i 9 15	+16	—	—
Chur	22·8	299	e 4 57	- 2	e 9 8	+ 7	—	—
Stuttgart	23·4	304	e 5 3	- 2	i 9 13	+ 1	e 13·0	13·8
Göttingen	23·6	311	e 5 6	0	e 9 19	+ 3	e 12·1	15·0
Zurich	23·6	300	e 5 0	- 6	e 9 16	0	—	—
Feldberg	N. 24·2	306	—	—	i 8 29	P _z P	—	14·7
Karlsruhe	24·2	304	6 0	?	—	—	—	—
Strasbourg	24·3	302	e 4 55	-18	i 9 33	+ 5	12·5	16·0
Copenhagen	24·4	321	5 12	- 2	9 28	- 2	13·5	—
Hamburg	24·4	315	e 5 30?	+16	i 9 51	+21	e 15·0	22·5
Upsala	24·5	333	e 5 21	+ 6	e 9 36	+ 4	14·5	18·1
Neuchatel	24·6	298	e 5 13	- 3	e 9 36	+ 2	—	—
Besançon	25·3	299	e 5 35	+12	9 57	+11	—	—
De Blit	26·7	310	—	—	10 20	+10	e 12·5	16·7
Uocle	26·9	307	—	—	e 10 15	+ 1	12·5	—
Paris	27·8	302	e 6 30?	PP	—	—	11·5	16·5
Barcelona	28·3	286	(e 6 20)	PP	—	—	e 6·3	16·0
Algiers	28·5	276	5 49	- 3	e 9 44	-56	12·5	17·0
Bergen	29·7	326	e 6 39?	+28	9 38	-81	—	15·5
Alicante	30·8	281	e 5 52	-20	e 11 20	+ 3	e 18·7	—

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Stonyhurst	31.5	311	—	—	e 12 30?	+62	18.5	24.5
Almeria	32.6	279	i 1 51	?	—	—	10.1	14.3
Toledo	33.1	284	e 6 30	- 3	e 11 6	-46	e 12.7	22.1
Granada	33.5	280	i 6 57	+21	—	—	e 10.1	20.4
Agra	34.3	100	10 25	?	e 15 5	?	18.6	19.3
Malaga	34.3	280	e 6 54	+11	e 12 12	+ 1	—	—
Bombay	35.4	116	6 58	+ 5	12 40	+13	18.0	23.1
Hyderabad	40.3	111	7 16	-19	13 51	+10	19.8	24.0
Scoresby Sund	43.7	335	—	—	14 30?	- 1	22.5	—
Irkutsk	45.3	51	e 8 10	- 5	e 14 56	+ 1	22.5	—
Columbo	48.7	121	19 50	S _e S	(19 50)	(+14)	—	32.0
Manila	74.3	84	i 16 6	?	i 21 19	+ 7	—	—

Additional readings and note :—

Belgrade eS = +7m.16s., e = +8m.6s.

Zagreb eNE = +4m.59s., eNW = +7m.16s.

Vienna PPP = +4m.57s., i = +5m.26s., P_cS = +11m.46s.

Naples gives S as P and L as S.

Konigsberg iE = +8m.3s., eN = +8m.11s.

Rome i = +4m.36s. = P + i s.

Potsdam iPN = +4m.54s., iE = +5m.24s., and +5m.35s., eN = +6m.6s., eZ =

+8m.48s., iSEN = +8m.57s., iSE = +8m.59s., eZ = +10m.30s.

Helsingfors ePZ = +5m.0s.

Jena eSE = +9m.0s., eN = +9m.57s.

Stuttgart eSS = +10m.20s.

Strasbourg iSS = +10m.50s., iSSS = +11m.31s.

Upsala SSN = +10m.33s.

Granada i = 10h.29m.29s. and +7m.57s.

Manila iN = +17m.37s. and +18m.49s.

Long waves were also recorded at Bidston, Edinburgh, Kew, Oxford, Tortosa,

Ottawa, Victoria, Kodaikanal, Phu-Lien, Hong Kong, and La Paz.

Dec. 10d. Readings also at 0h. (Nagoya and near Lick), 1h. and 2h. (near Manila), 3h. (near Nagoya), 4h. (Harvard, Ottawa, Tucson, Victoria, near Guadalajara, Oaxaca, Puebla, Tacubaya, and Vera Cruz), 5h. (Baku, Irkutsk, and near Lick), 6h. (near Nagoya), 13h. (Baku, Ekaterinburg, near Ksara, and near Osaka), 16h. (Kotl), 17h. (Ksara and Nagoya), 20h. (Ksara), 23h. (Granada).

Dec. 11d. 7h. 51m. 40s. Epicentre 41°-0N. 16°-0E. (as on 1928 Oct. 17d.).

X.

A = +.725, B = +.208, C = +.656; D = +.276, E = -.961;

G = +.631, H = +.181, K = -.755.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taranto	1.1	118	0 16	0	0 57	+29	—	1.0
Naples	1.3	263	i 0 20	+ 2	e 0 32	- 1	—	—
Benevento	1.3	276	(i 0 22)	+ 4	—	—	—	(0.5)
Casamicciolo	1.6	261	0 15	- 8	0 43	+ 2	—	1.3
Trenta	1.8	172	e 0 25	- 1	1 15	+29	—	—
Rocca di Papa	2.6	287	e 0 38	+ 1	i 1 16	S*	—	1.7
Rome	2.8	289	0 32	- 8	—	—	e 1.4	2.2
Florence	4.5	311	1 20	P*	2 25	S _r	—	2.8
Zagreb	4.8	0	e 0 56	-12	e 2 12	+ 9	2.3	—

Additional readings and notes :—

Benevento readings have been increased by 1m.

Zagreb eNE = +1m.30s., eNW = +1m.36s.

Long waves were also recorded at Vienna.

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Dec. 11d. Readings also at 3h. (near Granada and near Kobe), 8h. (near Taihoku, near Berkeley and Lick), 9h. (Victoria, Scoresby Sund, Copenhagen, Tucson, Ottawa, Baku, and Ekaterinburg), 11h. (Tyosi), 12h. (Berkeley and Lick), 15h. (La Paz), 17h. (near Koti, Matuyama, and Sumoto), 20h. (La Paz), 21h. (Samarkand, near La Paz, and near Manila), 22h. (near Almata).

Dec. 12d. 2h. 53m. 12s. Epicentre 25°·0N. 100°·5E. (as on 9d.). R.3.

A = -·165, B = +·891, C = +·423; D = +·983, E = +·182;
G = -·077, H = +·416, K = -·906.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
Phu-Lien	7·0	126	1 48†	+ 9	—	—	5·8	—
Calcutta	11·4	260	4 38	S	(4 38)	-10	7·2	—
Medan	21·5	185	e 5 11	+26	—	—	i 12·4	—
Manila	21·9	115	i 5 24	+34	i 9 59	+75	—	—
Hyderabad	21·9	254	4 50	0	8 43	- 1	10·7	13·9
Bombay	26·3	260	5 32	0	10 4	+ 1	13·5	18·3
Almata	26·5	319	e 5 40	+ 6	—	—	—	—
Irkutsk	27·4	5	—	—	e 10 30	+ 8	14·6	14·9
Andijan	28·2	311	e 5 51	+ 2	—	—	—	—
Samarkand	31·6	306	e 6 18	- 1	—	—	—	—
Ekaterinburg	42·7	330	e 7 55	+ 1	i 14 9	- 7	17·8	—
Baku	44·6	305	e 10 29	PP	e 14 35	- 9	e 24·8	—
Pulkovo	58·7	327	—	—	e 17 51	- 8	31·8	—

Baku gives also e = +17m.43s. =SS+0s.

Long waves were also recorded at Hong Kong, Koti, Copenhagen, and De Bilt.

Dec. 12d. 13h. 54m. 28s. (I) } Epicentre 32·9N. 130°·8E. X.
16h. 2m. 0s. (II) } (as on 1929 Feb. 9d.). X.
19h. 43m. 0s. (III) } X.

A = -·549, B = +·636, C = +·543; D = +·757, E = +·653;
G = -·355, H = +·411, K = -·840.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	m. s.	m. s.	s.	m. s.	s.	m.	m.
I Hukuoka	0·8	335	10 11	0	10 21	0	—	0·4
II	0·8	335	10 12	+ 1	10 22	+ 1	—	0·4
III	0·8	335	10 8	- 3	10 18	- 3	—	0·3
I Nagasaki	0·8	258	0 11	0	0 22	+ 1	—	—
II	0·8	258	10 12	+ 1	0 23	+ 2	—	—
III	0·8	258	10 13	+ 2	0 24	+ 3	—	—
I Matuyama N.	1·9	60	10 25	- 3	10 48	- 1	—	0·8
II N.	1·9	60	10 26	- 2	10 48	- 1	—	0·8
III	1·9	60	e 0 29	+ 1	10 48	- 1	—	0·8
II Koti	2·4	74	0 37	+ 3	1 6	+ 4	1·3	1·3
III	2·4	74	e 0 42	P*	1 4	+ 2	e 1·3	1·3
II Sumoto	3·7	65	e 1 51	S*	e 1 57	?	—	2·0
III	3·7	65	e 1 53	S*	e 2 3	S*	—	—
II Kobe	4·1	62	e 1 59	S*	12 14	S*	—	—

Koti gives M only for shock I and for shock II P = +43s.

Dec. 12d. Readings also at 2h. (near Manila), 3h. (Tokyo and Tukuba), 5h. (near Lick), 6h. (Bombay and Phu-Lien), 7h. (Ekaterinburg and Irkutsk), 9h. (Riverview, Sydney, Wellington, Adelaide, Baku, Victoria, Ottawa, Tucson, Ekaterinburg, near Berkeley, and Lick), 11h. (Granada and near Bombay), 12h. (Tyosi and near Mizusawa), 13h. (Hong Kong (2), Tashkent, Nagoya, Tyosi, and Kobe), 14h. (Ekaterinburg and near Nagoya), 17h. (Tyosi), 18h. (Rocca di Papa, Trenta, near Taranto, and near Nagoya), 19h. (Nagoya, Rocca di Papa, Rome, Zagreb, near Taranto, and Trenta), 20h. (Riverview, Sydney, Adelaide, Wellington, near Berkeley, and Lick), 21h. (Baku, Ekaterinburg, Irkutsk, and Tyosi),

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Dec. 13d. 2h. 35m. 27s. Epicentre 61°08. 148°0E. N.3.

A = -·411, B = +·257, C = -·875; D = +·530, E = +·848;
G = +·742, H = -·463, K = -·485.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Christchurch	22·8	51	—	—	i 9 6	+ 5	—	12·6
Melbourne	23·3	354	e 4 38	-26	9 8	- 2	12·6	15·2
Wellington	25·5	52	e 5 21	- 4	9 48	- 2	12·9	—
Adelaide	26·7	343	e 5 41	+ 6	i 10 12	+ 2	i 12·1	15·2
Riverview	27·3	6	i 5 41	0	i 10 15	- 5	e 12·2	17·7
Sydney	27·3	6	e 4 51	-50	—	—	e 12·0	13·8
Perth	35·8	309	12 33	S	(12 33)	0	—	—
La Paz	97·2	145	e 18 36	?	i 31 37	SS	47·6	51·4

Additional readings :-

Adelaide iPP = +6m.17s.

Riverview iPP = +6m.14s.

Long waves were also recorded at Bombay, Ekaterinburg, Tashkent, Baku, and Granada.

Dec. 13d. 14h. 22m. 53s. Epicentre 42°3N. 142°4E. R.2.

(given by Wadati "Shallow and Deep Earthquakes" in Geophy. Mag. Tokyo, Vol. IV, No. 4) (as on Oct. 2d.).

A = -·586, B = +·451, C = +·673; D = +·610, E = +·792;
G = -·533, H = +·410, K = -·740.

A depth of focus +0·020 is assumed.

	Corr. for. Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Urakawa	+0·6	0·3	118	0 14	+ 1	0 24	+ 1	—	—
Obihiro	+0·6	0·8	44	0 11	- 9	0 19	-17	—	—
Muroran	+0·5	1·1	272	0 17	- 6	0 31	-10	—	—
Kusiro	+0·5	1·6	65	0 22	- 8	0 41	-13	—	—
Aomori	+0·4	1·9	219	0 33	0	1 0	+ 1	—	—
Nemuro	+0·3	2·5	66	0 32	- 8	0 59	-13	—	—
Akita	+0·2	3·1	214	0 50	+ 3	1 31	+ 6	—	—
Mizusawa	+0·2	3·3	198	0 52	+ 2	1 33	+ 3	—	—
Sendai	+0·1	4·2	198	1 3	+ 2	1 54	+ 4	—	—
Otomari	+0·1	4·4	2	i 0 56	- 8	(1 40)	-15	1·7	1·8
Nagano	0·0	6·5	211	1 37	+ 5	3 0	+14	—	—
Tyosi	0·0	6·6	191	e 1 37	+ 3	e 2 48	0	—	3·7
Tokyo	0·0	6·9	199	e 1 44	+ 6	3 4	+ 8	—	—
Misima	-0·1	7·7	202	1 51	+ 3	3 36	+22	—	—
Nagoya	-0·1	8·3	213	i 2 0	+ 4	4 34	L	(4·6)	5·2
Hamamatu	-0·1	8·4	208	2 3	+ 5	4 20	L	(4·3)	—
Toyooka	-0·2	9·0	224	2 8	+ 3	e 3 51	+ 7	—	3·9
Osaka	-0·2	9·3	218	2 3	- 6	(4 4)	+13	4·1	6·5
Kobe	-0·2	9·5	219	i 2 13	+ 2	i 4 0	+ 4	5·5	6·2
Sumoto	-0·2	9·9	219	2 18	+ 1	e 4 45	L	(e 4·7)	6·6
Koti	z. -0·3	11·2	222	2 32	- 1	—	—	—	—
Miyazaki	-0·4	13·5	224	3 2	- 1	6 1	+32	—	—
Nagasaki	-0·4	13·8	230	e 3 26	+19	5 53	+16	—	—
Tizima	-0·5	15·2	181	2 38	-47	5 20	-48	—	—
Chiufeng	z. -0·8	19·8	272	4 16	- 3	—	—	—	—
Zi-la-wai	z. -0·8	20·1	243	e 4 21	- 1	8 9	+17	—	—
Irkutsk	-1·2	27·3	305	i 5 28	- 2	9 59	- 1	13·1	14·1
Hong Kong	-1·4	30·9	239	—	—	11 3	+ 7	—	16·5
Manila	-1·5	33·3	222	i 6 13	- 8	i 9 41	P ₆ P	i 11·4	—
Phu-Lien	-1·6	36·9	245	6 7?	-45	—	—	—	—

Continued on next page.

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	Corr. for Focus	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Almata	-2.0	46.7	295	e 8 15	+ 5	—	—	—	—
Ekaterinburg	-2.2	51.6	318	i 8 49	+ 2	i 15 59	+ 7	24.1	34.6
Tashkent	-2.2	52.8	297	i 9 13	+17	e 18 1	?	e 21.1	29.9
Bombay	-2.4	62.4	273	e 8 7?	?	—	—	—	—
Pulkovo	-2.5	63.8	330	e 10 12	- 2	18 35	+ 2	29.1	—
Helsingfors	-2.5	65.5	331	—	—	e 18 56	+ 1	e 32.1	—
Baku	-2.5	65.7	305	i 10 29	+ 2	e 19 6	+ 9	e 32.5	—
Vienna	-2.7	77.7	327	i 11 39	- 1	—	—	—	—
Innsbruck	-2.7	81.1	329	i 11 55	- 4	—	—	—	—
Neuchatel	-2.7	82.3	332	e 12 7	+ 1	—	—	—	—
Rocca di Papa	-2.7	84.5	325	i 12 15	- 2	i 22 28	- 7	e 48.7	—
Rome	-2.7	84.5	325	e 12 8	- 9	—	—	—	—
Florissant	-2.7	85.8	39	e 12 22	- 2	e 22 35	-13	—	—
La Paz	z.	143.3	55	e 19 20	[- 8]	—	—	—	—

Additional readings :—

Ootomari P = +1m.0s.

Zi-ka-wei eE = +4m.47s.

Hong Kong e = +7m.56s.

Medan ($\Delta = 54^\circ.9$) gives e = 14h.17m.30s., i = +14h.20m.42s.

Helsingfors eE = +20m.50s.

Vienna i = +12m.14s.

Rocca di Papa e = +11m.50s.

Rome i = +12m.22s.

Florissant iN = +22m.45s., eN = +28m.7s.

Long waves were also recorded at other European stations.

Dec. 13d. 16h. 28m. 27s. Epicentre $8^\circ.0N, 94^\circ.0E$. (as on 1930 July 17d.). R.3.

A = -069, B = +988, C = +139; D = +998, E = +070;

G = -010, H = +139, K = -990.

	Δ	Az.	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Medan	6.4	132	(i 1 57)	+26	(i 5 9)	?	—	—
Colombo	14.1	266	2 37	-40	—	—	7.0	7.6
Calcutta	15.5	340	5 32	?	—	—	11.3	—
Phu-Lien	17.7	42	e 4 0	- 3	e 7 22	+ 5	8.8	10.8
Hyderabad	17.9	303	4 6	+ 1	7 20	- 2	9.4	14.6
Batavia	19.1	138	e 4 39	+19	—	—	—	—
Bombay	23.3	300	5 7	+ 3	9 19	+ 9	12.1	14.8
Hong Kong	24.1	51	4 53?	-18	9 32	+ 7	11.4	15.5
Manila	27.2	74	5 48	+ 8	9 26	-52	11.0	13.1
Andijan	38.0	332	e 7 18	+ 3	—	—	—	—
Almata	38.3	340	e 7 19	+ 1	—	—	—	—
Tashkent	39.9	331	8 3	+32	i 14 9	+34	e 19.6	23.6
Irkutsk	45.1	9	e 8 9	- 5	14 40	-12	e 24.6	28.6
Baku	50.4	319	9 16	+22	—	—	24.2	36.0
Ekaterinburg	55.3	340	9 28	- 3	17 10	- 3	23.6	33.8
Vienna	z.	75.8	320	e 11 50	+ 5	—	—	—

Notes :—

Medan readings have been diminished by 4m.

Long waves were also recorded at Kodalkanal.

Dec. 13d. Readings also at 1h. (near Mostar), 2h. (Manila), 5h. (near Almata), 8h. (Tyosi, Baku (3), Ekaterinburg (3), and Ksara (3)), 10h. (Tyosi), 16h. (Chiufeng), 21h. (near Trenta).

Dec. 14d. Readings at 1h. (Baku, Ekaterinburg, Berkeley, Lick, and La Paz), 2h. (La Paz, Granada, La Plata, Sucre), 3h. (La Paz), 6h. (Almata and Andijan), 7h. (near Tacubaya), 8h. (Tyosi and near Nagoya), 9h. (Ekaterinburg, Almata, Andijan, near Hukuoka, and Nagasaki), 10h. (Baku), 11h. (near Almata and near La Paz), 13h. (Wellington), 14h. (Rocca di Papa, Rome, and near Zagreb), 15h. (near Nagoya), 16h. (near Taihoku), 17h. (Calcutta, Tashkent, Phu-Lien, Riverview, Sydney, Wellington, and Suva), 18h. (Baku, Ekaterinburg (2), Tashkent, La Paz, Almata, near Andijan and Samarkand), 19h. (near Taranto), 21h. (Baku, Ekaterinburg, Tashkent, and Mizusawa), 22h. (near Granada).

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Dec. 15d. 5h. 22m. 12s. Epicentre 35°·6N. 140°·8E. (as on 1930 Aug. 19d.). X.

A = -·630, B = +·514, C = +·582; D = +·632, E = +·775;
G = -·451, H = +·368, K = -·813.

	Δ	Az.	P.	O-C.	S.	O-C.	M.
	°	°	m. s.	s.	m. s.	s.	m.
Tyosi	0·2	17	0 4	+ 1	0 8	+ 3	0·2
Tukuba	0·8	316	0 11	0	—	—	—
Tokyo	0·9	276	0 12	- 1	—	—	—
Nagoya	3·2	262	e 0 49	+ 3	1 45	S _g	—
Mizusawa	3·5	4	1 0	P*	1 46	S*	—

No additional readings.

Dec. 15d. 15h. 59m. 34s. Epicentre 23°·2N. 120°·6E. (as on 8d.). R.3.

A = -·468, B = +·791, C = +·394; D = +·861, E = +·509;
G = -·201, H = +·339, K = -·919.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hokoto	1·0	289	0 4	-10	0 15	-11	—	—
Taihoku	2·0	25	i 0 28	- 1	0 54	+ 3	—	1·1
Hong Kong	6·0	262	1 24	- 1	2 45	+12	3·3	3·8
Zi-ka-wei	E. 8·0	5	e 1 58	+ 5	4 10	L	(4·2)	—
Manila	8·6	178	i 2 14	+12	i 4 17	S*	e 5·4	—
Phu-Lien	13·2	262	e 3 1	- 4	—	—	—	8·4
Irkutsk	31·6	342	—	—	e 11 26?	- 3	16·4	19·9
Bombay	44·6	275	14 20	S	(14 20)	-24	—	—
Tashkent	46·3	308	—	—	e 15 10	+ 1	e 23·4	31·2
Ekaterinburg	54·4	326	i 9 20	- 4	e 16 59	- 2	24·4	32·7
Pulkovo	70·3	329	—	—	e 25 41	SS	41·4	44·1

Readings also at:—

Taihoku P_g = +34s., S_g = +1m.1s.

Zi-ka-wei iE = +4m.30s. = S* and +5m.2s.

Tashkent e = +19m.9s. = SSS -6s.

Long waves were also recorded at Medan, Calcutta, Baku, and several European stations.

Dec. 15d. Readings also at 3h. (Andijan, Samarkand, and near La Paz), 6h. (Andijan), 8h. (near Lick), 9h. (La Paz, Paris, and Wellington), 11h. (La Paz, Sucre, and Balboa Heights), 12h. (Sumoto), 15h. (Koti), 18h. (near Ksara), 19h. (near La Paz), 20h. (Lick).

Dec. 16d. 8h. 19m. 25s. Epicentre 36°·0N. 71°·0E. N.3.

A = +·263, B = +·765, C = +·588; D = +·946, E = -·326;
G = +·191, H = +·556, K = -·809.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Samarkand	4·8	320	1 16	P _g	(12 3)	0	12·0	3·1
Andijan	4·9	13	1 16	P _g	(12 7)	+ 2	12·1	2·3
Tashkent	5·4	347	1 20	+ 3	(12 14)	- 4	13·2	2·5
Almata	8·6	31	2 6	+ 4	3 36	- 3	—	—
Agra	N. 10·7	143	—	—	4 3	-28	5·6	—
Baku	17·1	291	e 5 1	+66	(16 59)	- 5	17·0	—
Bombay	17·2	174	3 59	+ 2	7 23	+17	9·4	—
Hyderabad	19·7	158	4 25	- 1	7 55	- 5	10·4	12·6
Calcutta	20·2	127	7 59	S	(7 59)	-11	9·0	—
Ekaterinburg	21·9	345	1 4 38	-12	1 8 22	-22	—	—
Pulkovo	35·3	325	1 6 35	-17	—	—	—	—

Agra gives also eN = +1m.13s., SE = +3m.18s. = P*.

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Dec. 16d. 19h. 50m. 1s. Epicentre $35^{\circ}1N$. $139^{\circ}0E$. (as on 7d.). X.

$$A = -\cdot 617, B = +\cdot 537, C = +\cdot 575; \quad D = +\cdot 656, E = +\cdot 755; \\ G = -\cdot 434, H = +\cdot 377, K = -\cdot 818.$$

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	.	.	m. s.	s.	m. s.	s.	m.	m.
Nagoya	1.7	272	e 0 20	- 4	0 40	- 4	—	1.0
Tyosi	1.7	67	e 0 25	+ 1	—	—	e 0.9	—
Osaka	2.8	261	0 40	0	(1 22)	+10	1.4	1.8
Kobe	3.2	263	0 50	+ 4	1 32	+10	—	1.6
Sumoto	3.4	257	1 21	S	(1 21)	- 6	(e 2.1)	2.3
Toyooka	3.4	280	e 0 53	+ 4	1 36	+ 9	—	1.7

Additional readings and notes:—

Tyosi eP_g = +35s.

Sumoto gives S as P and L as S.

Toyooka P = +56s., eSN = +1m.40s., eSZ = +1m.44s. -S*.

Dec. 16d. Readings also at 0h. (Zagreb), 1h. (near Granada (2)), 5h. (near Wellington), 6h. (near Medan), 7h. (La Paz), 8h. (near Tortosa), 10h. (Adelaide, Riverview, Sydney, Suva, Wellington, and Lick), 11h. (Baku, Ekaterinburg, Kucino, Uccle, Granada, and La Paz), 15h. (near Andijan and Tashkent), 16h. (Ekaterinburg and near Calcutta), 18h. (Chiufeng, near Samarkand, near Neuchatel and Zurich), 19h. (De Bilt, Uccle, Helsingfors, Copenhagen, Ekaterinburg, Baku, Pulkovo, Tashkent, Hong Kong, Phu-Lien, near Calcutta, near Manila, and near Irkutsk), 20h. (Toledo), 22h. (Andijan, and near Tortosa), 23h. (La Paz).

Dec. 17d. Readings at 0h. (Granada (2)), 1h. (Samarkand), 2h. (near Ksara), 7h. (near Malabar), 9h. (near Tacubaya), 10h. (Feldberg), 11h. (Baku, Ekaterinburg, Melbourne, Riverview, near Christchurch, and Wellington), 15h. (near Santiago and near Tyosi), 16h. (La Paz and La Plata), 17h. (near Wellington), 18h. (near Amboina and near Wellington), 20h. (La Paz and Samarkand), 21h. (Andijan and Wellington), 22h. (Tyosi).

Dec. 18d. Readings at 0h. (near La Paz), 2h. (Samarkand), 4h. (Baku, Irkutsk, Pulkovo, and near Ksara), 6h. (Andijan, Samarkand, near Almata, and near Manila), 7h. (Batavia), 9h. (Ekaterinburg, Irkutsk, Tashkent, Samarkand, near Almata, and near Andijan), 10h. (La Paz, Koti, Kobe, near Osaka, Sumoto, Nagasaki, Hukuoka, and near Bari), 12h. (Feldberg), 14h. (near Nagoya and Osaka), 15h. (near Tacubaya), 20h. (Almata (2)).

Dec. 19d. Readings at 0h. (near Wellington), 2h. (Nagoya), 5h. (near Wellington), 10h. (near Mizusawa), 11h. (Ekaterinburg and Irkutsk), 12h. (Tucson and Tyosi), 13h. (near Ksara), 18h. (Yalta).

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Dec. 20d. 14h. 2m. 32s. Epicentre 34°·8N. 132°·9E. N.1.

Probable error of epicentre $\pm 0^{\circ}\cdot 18$.

Epicentre given by K. Wadati in "Shallow and Deep Earthquakes," Geophys. Mag., Tokyo, Vol. IV, No. 4.

A = -·559, B = +·602, C = +·571; D = +·733, E = +·681;
G = -·389, H = +·418, K = -·821.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hiroshima	0·5	221	0 6	- 1	0 15	+ 2	—	—
Sakai	0·8	20	0 5	- 6	0 14	- 7	—	—
Okayama	0·9	99	0 10	- 3	0 23	0	—	—
Matuyama	1·0	187	i 0 11	- 3	i 0 27	+ 1	—	0·5
Koti	1·3	158	i 0 20	+ 2	i 0 39	+ 6	—	0·7
Sumoto	1·7	105	i 0 23	- 1	i 0 46	+ 2	—	0·8
Toyooka	1·8	65	10 22	- 4	0 47	+ 1	—	0·9
Kobe	1·9	94	10 25	- 3	10 51	+ 2	—	0·9
Osaka	2·2	94	0 31	0	—	—	1·1	1·6
Hukuoka	2·4	239	0 35	+ 1	1 7	+ 5	—	1·3
Hikone	2·8	80	0 40	0	1 21	+ 9	—	—
Siomisaki	2·8	120	0 42	+ 2	1 21	+ 9	—	—
Miyazaki	3·1	203	0 49	+ 5	1 33	S*	—	—
Nagasaki	3·3	233	e 0 46?	- 1	i 1 35	S*	—	1·9
Nagoya	3·3	83	10 48	+ 1	1 37	S*	—	1·8
Wazima	4·1	51	1 0	+ 2	2 10	S*	—	—
Misima	5·0	85	1 11	0	2 26	S*	—	—
Tokyo	5·6	79	1 30	+10	2 52	S*	—	—
Tyosii	6·6	80	2 5	P*	—	—	e 3·3	3·5
Hukushima	6·7	62	1 39	+ 4	3 2	+11	—	—
Akita	7·5	47	2 1	+15	3 54	S*	—	—
Mizusawa	7·9	54	1 28	-24	3 29	+ 8	—	—
Zi-ka-wel	N. 10·3	253	—	—	e 4 34	+13	i 5·7	—
Chiufeng	E. 14·3	297	3 18	- 1	—	—	—	—
Hong Kong	20·6	238	—	—	8 32	+14	10·6	11·9
Manila	22·9	211	i 5 51	+51	i 9 14	+11	i 10·9	—
Irkutsk	26·8	320	e 5 30	- 6	e 10 8	- 4	12·5	17·0
Calcutta	40·6	267	16 59	SSS	—	—	23·5	—
Ekaterinburg	52·1	318	e 10 3	+56	e 16 44	+14	22·5	30·9

Additional readings:—

Nagasaki $iP_s = +53s$.

Hong Kong $e = +10m.5s$.

Long waves were also recorded at Phu-Lien, Bombay, Baku, Pulkovo, and other European stations.

Dec. 20d. 14h. 23m. 9s. Epicentre 34°·8N. 132°·9E. (as at 14h. 2m.). X.

	Δ	Az.	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Matuyama	1·0	187	—	—	10 26	0	0·5
Koti	1·3	158	—	—	10 48	—	—
Sumoto	1·7	105	e 0 30	P*	0 52	S*	0·9
Toyooka	1·8	65	e 0 27	+ 1	0 48	0	0·9
Kobe	1·9	94	0 28	0	0 54	+ 5	0·9
Hukuoka	2·4	239	—	—	1 8	+ 6	—

Toyooka $ePEN = +30^s$

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Dec. 20d. 14h. 43m. 11s. Epicentre 34°-8N. 132°-9E. (as at 14h. 23m.). R.2.

A = -·559, B = +·602, C = +·571; D = +·733, E = +·681;
G = -·389, H = +·418, K = -·821.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hiroshima	0·5	221	0 4	- 3	0 12	- 1	—	—
Okayama	0·9	99	0 11	- 2	0 22	- 1	—	—
Matuyama	1·0	187	1 0 10	- 4	1 0 25	- 1	—	0·4
Koti	1·3	158	0 19	+ 1	1 0 38	+ 5	—	0·7
Sumoto	1·7	105	0 23	- 1	0 47	+ 3	—	0·8
Toyooka	1·8	65	1 0 21	- 5	1 0 43	- 3	—	0·8
Kobe	1·9	94	0 25	- 3	0 51	+ 2	—	0·9
Simidu	2·0	178	0 30	+ 1	0 59	S*	—	—
Osaka	2·2	94	0 31	0	(1 1)	+ 4	1·0	1·1
Hukuoka	2·4	239	0 34	0	1 5	+ 3	—	1·3
Kyoto	2·4	85	0 39	+ 5	1 11	S*	—	—
Siomisaki	2·8	120	0 41	+ 1	1 18	+ 6	—	—
Miyazaki	3·1	203	0 51	+ 7	1 35	S*	—	—
Gihu	3·3	79	0 45	- 2	1 33	+ 8	—	—
Nagasaki	3·3	233	0 50	+ 3	1 32	+ 7	—	—
Nagoya	3·3	83	0 46	- 1	1 38	S*	—	—
Hamamatu	4·0	90	1 2	+ 5	1 59	S*	—	—
Nagano	4·7	65	1 23	P*	2 22	S*	—	—

No additional readings.

Dec. 20d. 23h. 26m. 49s. Epicentre 34°-8N. 132°-9E. (as at 14h.). R.2.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Matuyama	1·0	187	1 0 11	- 3	1 0 26	0	—	0·5
Koti	1·3	158	1 0 19	+ 1	1 0 38	+ 5	—	0·7
Sumoto	1·7	105	0 23	- 1	0 46	+ 2	—	0·8
Toyooka	1·8	65	1 0 23	- 3	1 0 46	0	—	0·9
Kobe	1·9	94	1 0 25	- 3	0 51	+ 2	—	0·9
Osaka	2·2	94	0 32	+ 1	(1 2)	+ 5	1·0	1·1
Hukuoka	2·4	239	0 35	+ 1	1 4	+ 2	—	1·3
Nagasaki	3·3	233	0 52	+ 5	1 34	+ 9	—	—
Nagoya	3·3	83	e 0 48	+ 1	1 41	+16	—	—

Additional readings:—

Kobe P_rN = +28s.

Long waves were also recorded at Irkutsk and Ekaterinburg.

Dec. 20d. Readings also at 2h. (near Nagoya and Osaka), 6h. (Samarkand), 14h. (Matuyama), 15h. (Sumoto, Toyooka, Koti, and near Matuyama (2)), 17h. (Toyooka), 18h. (Almata, Sumoto, Koti, and Matuyama), 20h. (Almata, Sumoto, Koti, Matuyama, and Toyooka), 21h. (Koti and Matuyama), 23h. (Phu-Lien).

Dec. 21d. 12h. 14m. 33s. (I) { Epicentre 34°-8N. 132°-9E. R.2.
12h. 18m. 0s. (II) { (as on 20d.). R.3.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Hiroshima	0·5	221	0 7	0	0 15	S*	—	—
II	0·5	221	0 7	0	0 16	S*	—	—
I Sakai	0·8	20	0 6	- 5	0 16	- 5	—	—
I Matuyama	1·0	187	1 0 12	- 2	1 0 29	S*	—	0·5
II	1·0	187	1 0 12	- 2	1 0 26	0	—	0·5
I Koti	1·3	158	1 0 20	+ 2	1 0 39	S*	—	0·8
II	1·3	158	1 0 20	+ 2	1 0 39	S*	—	0·7
I Sumoto	1·7	105	0 25	+ 1	0 49	S*	—	1·0
I Toyooka	1·8	65	1 0 23	- 3	1 0 47	+ 1	—	0·8
II	1·8	65	0 22	- 4	0 47	+ 1	—	0·8

Continued on next page

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Wakayama	1.9	107	0 28	0	0 32	-17	—	—
I Kobe	1.9	94	10 27	-1	0 52	+3	—	1.0
II	1.9	94	10 23	-5	10 50	+1	—	0.9
I Osaka	2.2	94	0 30	-1	1 1	+4	1.0	1.4
I Hukuoka	2.4	239	10 34	0	1 8	+6	—	1.3
I Kyoto	2.4	85	0 32	-2	1 5	+3	—	—
II	2.4	85	e 0 38	+4	1 9	+7	—	1.2
I Kumamoto	2.7	223	0 40	+1	1 19	+10	—	—
I Miyazaki	3.1	203	0 49	+5	1 30	S*	—	—
II	3.1	203	0 55	P*	1 38	S _r	—	—
I Nagasaki	3.3	233	0 46	-1	1 35	S*	—	2.0
II	3.3	233	1 4	P _r	1 46	S _r	—	—
I Nagoya	3.3	83	e 0 49	+2	e 1 47	S _r	—	2.4
II	3.3	83	e 1 30?	S	(e 1 30?)	+5	—	—
I Nagano	4.7	65	1 10	+3	2 25	S*	—	—
I Misima	5.0	85	1 13	+2	2 31	S*	—	—
II	5.0	85	1 17	+6	2 20	+12	—	—
I Tokyo	5.6	79	1 31	P*	2 54	S*	—	—
I Tyosai	6.6	80	e 1 47	+13	—	—	3.4	—
I Hukusima	6.7	62	1 39	+4	3 20	S*	—	—
I Akita	7.5	47	1 53	+7	3 48	S*	—	—
I Mizusawa	7.9	54	1 55	+3	3 30	+9	—	—
I Chiufeng	14.3	297	3 16	-3	—	—	—	—
I Hong Kong	20.6	238	8 35	S	(8 35)	SS	10.6	12.0
I Manila	22.9	211	4 4	-56	19 23	+20	14.0	16.4
I Irkutsk	26.8	320	e 5.40?	+4	e 10 17?	+5	13.4	17.2
I Ekaterinburg	52.1	318	e 9 7	0	16 31	+1	22.4	32.2
I Baku	63.5	304	—	—	e 23 34	SS	31.0	37.4
I Pulkovo	66.3	328	—	—	e 25 42	?	36.4	43.6
I Florence	85.2	322	(20 27)	?	—	—	20.4	45.4

Additional readings :-

Kobe I $P_r = +30s.$

Nagasaki I $P_r = +53s.$

Hong Kong I $S = +10m.7s.$

Long waves to shock I were recorded at Phu-Lien, Bombay, Tashkent, and several other European stations.

Dec.	21d.	13h.	9m.	30s.	(I)	} Epicentre 34°-8N, 132°-9E. (as at 12h.).	X. X. X. X. X.	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.		
		13h.	17m.	2s.	(II)												
		14h.	9m.	43s.	(III)												
		16h.	30m.	31s.	(IV)												
		17h.	38m.	19s.	(V)												
		20h.	48m.	8s.	(VI)												
I	Matuyama	1.0	187	10 10	-4	10 25	-1	—	—	—	—	—	—	—	—		
II		1.0	187	10 14	0	10 29	+3	—	—	—	—	—	—	—	0.5		
III		1.0	187	10 10	-4	10 24	-2	—	—	—	—	—	—	—	0.4		
IV		1.0	187	10 13	-1	10 28	+2	—	—	—	—	—	—	—	0.5		
V		1.0	187	10 12	-2	10 27	+1	—	—	—	—	—	—	—	0.5		
VI		1.0	187	e 0 9	-5	10 24	-2	—	—	—	—	—	—	—	0.4		
I	Koti	1.3	158	—	—	10 36	+3	—	—	—	—	—	—	—	—		
II		1.3	158	—	—	0 41	S*	—	—	—	—	—	—	—	—		
III		1.3	158	—	—	10 34	+1	—	—	—	—	—	—	—	—		
IV		1.3	158	0 20	+2	10 40	S*	—	—	—	—	—	—	—	0.7		
V		1.3	158	0 20	+2	10 39	S*	—	—	—	—	—	—	—	0.7		
VI		1.3	158	0 17	-1	10 35	+2	—	—	—	—	—	—	—	0.6		
I	Sumoto	1.7	105	e 0 30	+6	0 50	+6	—	—	—	—	—	—	—	—		
II		1.7	105	e 0 45	S	(e 0 45)	+1	—	—	—	—	—	—	—	—		
III		1.7	105	—	—	e 0 45	+1	—	—	—	—	—	—	—	—		
IV		1.7	105	0 24	0	0 48	+4	—	—	—	—	—	—	—	0.8		
V		1.7	105	0 14	-10	—	—	—	—	—	—	—	—	—	—		
VI		1.7	105	e 0 19	-5	0 43	-1	—	—	—	—	—	—	—	0.8		

Continued on next page.

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Toyooka	1-8	65	i 0 42	S	(i 0 42)	- 4	—	0-8
II	1-8	65	0 48	S	(0 48)	+ 2	—	—
III	1-8	65	—	—	i 0 42	- 4	—	—
IV	1-8	65	0 22	- 4	0 45	- 1	—	0-8
V	1-8	65	i 0 24	- 2	i 0 45	- 1	—	0-8
VI	1-8	65	i 0 19	- 7	0 42	- 4	—	0-7
I Kobe	1-9	94	e 0 30	+ 2	e 0 53	+ 4	—	—
II	1-9	94	e 0 38	P*	e 0 54	+ 5	—	—
IV	1-9	94	0 26	- 2	0 52	+ 3	—	0-9
V	1-9	94	0 26	- 2	0 51	+ 2	—	0-9
VI	1-9	94	0 23	- 5	0 47	- 2	—	0-9
I Osaka	2-2	94	e 0 29	- 2	(0 58)	+ 1	1-0	—
II	2-2	94	0 32	+ 1	(1 2)	+ 5	1-0	1-4
IV	2-2	94	0 33	+ 2	(1 4)	+ 7	1-1	1-2
V	2-2	94	0 34	+ 3	(1 1)	+ 4	1-0	1-4
VI	2-2	94	0 29	- 2	(0 58)	+ 1	1-0	1-4
I Hukuoka	2-4	239	e 0 39	+ 5	e 1 10	+ 8	—	—
II	2-4	239	e 0 40	+ 6	e 1 10	+ 8	—	—
III	2-4	239	e 0 39	+ 5	e 1 6	+ 4	—	—
IV	2-4	239	0 35	+ 1	1 9	+ 7	—	1-2
V	2-4	239	0 38	+ 4	1 8	+ 6	—	1-2
VI	2-4	239	e 0 36	+ 2	1 6	+ 4	—	1-2
I Nagoya	3-3	83	—	—	e 1 19	- 6	—	—
II	3-3	83	—	—	e 1 56	S ₂	—	—
IV	3-3	83	e 1 37	S	(e 1 37)	+ 12	—	—
V	3-3	83	e 0 56	+ 9	—	—	—	—

Kobe IV P₂ = +28s., S₂N = +55s.; v P₂N = +29s.

Dec. 21d. 14h. 51m. 32s. Epicentre 20°4N. 122°2'E. N.1.

(Epicentre given by Manila).

A = -499, B = +793, C = +349; D = +846, E = +533;

G = -186, H = +295, K = -937.

Correction for focal depth 0.025 has been applied.

	Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
		°	°	m. s.	s.	m. s.	s.	m.	m.
Taito	+0.4	2.5	337	0 55	+14	1 9	- 5	—	—
Isigakizima	+0.1	4.3	25	1 6	+3	1 50	- 3	—	—
Taihoku	0-0	4.6	351	1 9	+3	1 42	-16	—	—
Manila	-0.1	6.0	191	i 1 25	+1	i 2 34	+ 3	—	—
Hong Kong	-0.2	7.7	286	1 49	+3	3 15 ^a	+ 4	3-5	5-9
Naha	-0.2	7.7	40	1 49	+3	3 13	+ 2	—	—
Zi-ka-wei	-0.3	10.8	356	e 2 28	0	4 23	- 3	i 5.2	—
Nagasaki	-0.6	14.1	27	3 12	+3	5 48	+ 9	—	—
Kumamoto	-0.6	14.5	30	3 17	+3	6 4	+15	—	—
Phu-Lien	-0.6	14.6	274	e 3 19	+4	e 6 8	+17	7-5	7-8
Hukuoka	-0.7	15.0	27	i 3 24	+5	i 6 14	+16	—	6-4
Koti	-0.7	16.6	35	3 40	0	5 54	-42	—	—
Siomasaki	-0.8	17.7	40	3 53	0	7 7	+ 8	—	—
Sumoto	-0.8	17.9	36	3 56	+1	7 16	+12	—	7-4
Kobe	-0.9	18.3	36	i 4 1	+2	e 7 25	+14	—	—
Osaka	-0.9	18.5	37	4 3	+1	(7 32)	+17	7-5	8-0
Toyooka	-0.9	18.7	34	i 4 4	0	7 33	+13	—	—
Tizima	-1.0	19.4	66	4 13	+2	7 25	- 8	—	—
Nagoya	-1.0	19.6	38	i 4 14	0	—	—	—	—
Chiufoeng	n. -1.0	20.3	347	i 4 20	-2	i 8 0	+ 8	—	—

Continued on next page.

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	Corr. for Focus	Δ	Az.	P. m. s.	O-C.	S. m. s.	O-C.	L. m.	M. m.
Misima	-1.0	20.8	42	4 28	+ 1	—	—	—	—
Tokyo	-1.1	21.7	41	4 34	- 2	5 52	?	—	—
Tyosi	-1.2	22.4	43	e 4 39	- 3	—	—	e 9.4	—
Hukusima	-1.3	23.4	38	4 51	- 1	9 0	+12	—	—
Akita	-1.3	24.6	35	5 4	0	10 19	+69	—	—
Amboina	-1.3	24.8	166	4 58	- 7	9 1	-13	—	—
Mizusawa	E. -1.3	24.8	37	5 3	- 2	9 22	+ 8	10.2	—
	N. -1.3	24.8	37	5 4	- 1	9 10	- 4	10.4	—
Medan	-1.6	28.4	237	i 8 46	?	i 9 58	-14	i 16.2	—
Batavia	-1.7	30.6	213	i 5 35	-20	9 24	-83	—	—
Calcutta	-1.8	31.4	281	6 59	+58	—	—	13.5	—
Irkutsk	-1.9	34.7	340	i 6 32	+ 2	11 45	- 3	14.5	16.6
Agra	E. -2.1	40.7	290	e 6 18	-62	12 13	-62	19.2	—
Hyderabad	-2.2	41.4	275	7 32	+ 7	13 26	2	20.2	25.5
Colombo	-2.3	43.1	260	9 8	+89	13 53	5	22.1	27.8
Almata	-2.3	44.0	314	7 51	+ 5	(i 14 13)	+11	i 14.2	—
Kodaikanal	-2.3	44.2	265	e 9 28	PP	(i 13 40)	-25	i 13.7	15.3
Bombay	-2.4	46.3	278	8 10	+ 6	14 40	+ 6	22.4	27.8
Andijan	-2.4	46.7	309	8 13	+ 6	14 48	+ 8	20.5	—
Tashkent	-2.6	49.1	309	i 8 28	+ 3	i 15 13	+ 1	—	23.9
Samarkand	-2.6	50.6	307	8 42	+ 6	15 42	+ 9	—	22.5
Perth	-2.7	52.7	187	e 16 18	S	(e 16 18)	+17	—	—
Ekaterinburg	-2.9	57.5	326	i 9 30	+ 4	i 17 13	+ 9	24.5	37.2
Adelaide	-2.9	57.5	165	e 9 26	0	i 17 2	- 2	25.0	31.3
Riverview	-3.0	60.9	152	e 9 49	- 1	i 17 51	+ 3	e 29.5	31.5
Sydney	-3.0	60.9	152	e 17 46	S	(e 17 46)	- 2	29.5	30.7
Melbourne	-3.0	62.0	160	3	—	i 18 3	0	29.9	—
Baku	-3.1	63.7	308	i 10 15	+ 6	i 18 34	+10	31.0	—
Pulkovo	-3.2	73.4	330	i 11 11	- 1	i 20 22	- 2	35.5	43.3
Theodosia	-3.2	73.5	315	i 11 13	0	i 20 28	+ 3	—	—
Simferopol	-3.2	74.4	315	i 11 17	- 1	i 20 34	- 1	—	—
Yalta	-3.2	74.4	315	i 11 18	0	i 20 36	+ 1	—	—
Sebastopol	-3.2	74.8	315	i 11 20	0	i 20 40	+ 0	—	—
Helsingfors	-3.3	75.8	330	i 11 23	- 3	i 20 50	- 1	e 37.0	—
Ksara	N. -3.3	75.8	303	i 11 31	+ 5	i 20 54	+ 3	—	—
Wellington	-3.3	78.6	143	11 35	- 7	21 13	-11	34.5	—
Upsala	-3.3	79.4	330	i 11 44	- 3	i 21 26	- 7	e 32.5	51.8
Königsberg	-3.3	79.8	326	—	—	i 21 33	- 4	e 26.5	—
Helwan	-3.4	80.7	300	i 11 53	- 1	i 21 43	- 3	—	—
Lund	-3.4	83.3	329	i 12 5	- 2	22 8	- 7	—	—
Budapest	-3.4	83.5	320	11 33	-35	22 3	-14	34.0	—
Belgrade	-3.4	83.6	317	e 12 1	- 8	e 22 11	- 7	—	—
Copenhagen	-3.4	83.7	329	e 12 4	- 5	22 12	- 7	—	—
Vienna	-3.4	84.8	321	i 12 12	- 3	22 21	-10	—	47.5
Potsdam	-3.4	84.9	325	e 12 8	- 8	i 22 19	-13	e 34.2	43.5
Scoresby Sund	-3.4	85.7	350	—	—	22 40	0	—	—
Hamburg	-3.4	85.9	327	i 12 18	- 3	e 22 28	-14	e 35.8	46.0
Zagreb	-3.4	86.1	319	e 12 20	- 2	e 22 34	-10	—	—
Cheb	-3.4	86.3	323	—	—	e 22 28?	-18	—	58.5
Jena	-3.4	86.4	325	i 12 19	- 4	e 22 37	-10	e 32.5	47.0
Göttingen	-3.4	87.0	326	i 12 22	- 4	i 22 45	- 8	e 34.6	—
Innsbruck	-3.5	88.2	321	e 12 30	- 2	e 22 56	- 9	—	—
Venice	-3.5	88.4	320	i 12 31	- 2	i 23 3	- 4	—	—
Feldberg	N. -3.5	88.5	325	—	—	i 23 0	- 8	e 43.7	50.8
Treviso	-3.5	88.5	319	12 31	- 2	22 58	-10	58.5	—
Trenta	-3.5	88.7	313	e 12 33	- 1	i 23 8	- 2	—	—
Stuttgart	-3.5	88.8	324	i 12 32	- 3	e 22 58	-13	e 41.5	56.6
De Bilt	-3.5	89.2	327	i 12 33	- 4	e 23 6	- 9	e 42.5	48.4
Naples	E. -3.5	89.4	314	e 16 8	?	e 22 53	-24	—	—
Chur	-3.5	89.5	322	i 12 35	- 3	i 23 8	-10	—	—
Dyce	-3.5	89.6	334	—	—	23 13	- 5	—	—
Strasbourg	-3.5	89.7	324	i 12 34	- 5	i 23 8	-11	35.5	—
Victoria	-3.5	89.8	38	12 34	- 6	(22 50)	-30	22.8	24.7
Zurich	-3.5	89.9	322	i 12 36	- 4	i 23 12	- 9	—	—
Florence	-3.5	90.0	318	12 31	-10	i 23 1	-21	36.5	—

Continued on next page.

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	Corr. for Focus	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	°	m. s.	s.	m. s.	s.	m.	m.
Rocca di Papa	-3.5	90.1	316	i 12 36	- 5	i 23 12	-11	—	29.6
Rome	-3.5	90.1	316	i 12 37	- 4	e 22 33	-50	—	—
Catania	-3.5	90.3	311	e 22 48	S	(e 22 48)	-37	—	—
Piacenza	-3.5	90.4	320	i 12 47	+ 4	22 49	-37	—	60.8
Uccle	-3.5	90.4	327	i 12 38	- 5	23 14	-12	e 43.5	—
Neuchatel	-3.5	91.0	323	i 12 41	- 4	e 23 20	-12	—	—
Stonyhurst	-3.5	91.8	330	—	—	e 23 28?	-12	—	53.1
Kew	-3.5	92.3	329	i 12 48	- 4	—	—	43.5	—
Paris	-3.5	92.5	326	i 12 49	- 4	i 16 33	PP	35.5	61.5
Berkeley	-3.6	96.0	45	e 13 6	- 3	i 23 26	[-40]	—	—
Ivigtut	-3.6	98.0	356	17 4	PP	—	—	—	—
Algiers	-3.6	99.0	316	16 25	PP	e 22 45	?	42.5	—
Alicante	-3.7	100.4	319	e 18 15	PP	—	—	e 31.8	—
Toledo	-3.7	101.6	321	e 17 40	PP	—	—	e 43.7	—
Almeria	-3.7	102.5	319	i 17 43	PP	—	—	—	57.6
Granada	-3.7	103.1	321	i 18 25	PP	—	—	e 37.5	58.4
San Fernando	-3.7	105.1	321	17 50	PP	e 26 20	?	42.0	71.0
Ottawa	—	112.2	13	i 19 4	PP	e 28 28	PS	—	—
Florissant	—	113.4	28	e 17 57	[-31]	i 24 39	[-49]	—	—
St. Louis	—	113.6	28	e 18 53	[+24]	e 24 37	[-51]	—	—
Harvard	—	116.0	11	—	—	e 29 13	PS	e 61.2	—
Georgetown	—	118.0	16	i 18 15	[-26]	—	—	—	—
Balboa Heights	—	143.6	39	e 19 28	[1]	—	—	—	—
La Paz	—	169.4	70	i 19 45	[-18]	26 49	?	77.5	—

Additional readings:—

Nagasaki SS? = +6m.11s.
 Kobe 1E = +4m.29s. and +5m.48s.
 Amboina 1 = +9m.24s.
 Agra SN = +12m.38s.
 Adelaide 1 = +18m.16s.
 Riverview 1N = +19m.5s.
 Melbourne 1 = +19m.18s., e = +24m.50s.
 Helsingfors P₀PE = +12m.3s., eE = +12m.24s., +14m.8s., and +17m.5s.,
 ePSE = +21m.18s., ePPS = +22m.1s., eSSSE = +29m.17s.
 Wellington PP = +15m.23s.; T₀ = 14h.51m.22s.
 Königsberg eE = +22m.15s.
 Copenhagen 1P = +12m.7s., other phases +15m.22s. = PP + 12s. and +23m.28s.
 Vienna PP = +15m.33s., PPP = +17m.48s., PS? = +23m.38s.
 Potsdam 1PZ = +12m.12s., 1PE = +12m.15s., 1Z = +12m.59s., eZ = +14m.58s. =
 PP - 19s., and +16m.16s., eE = +17m.28s. and +22m.0s., 1N = +22m.22s.,
 eEZ = +22m.52s., 1EN = +23m.38s. = PS - 12s., 1E = +24m.8s., 1N =
 +28m.10s., eZ = +31m.28s.?, eN = +31m.58s.
 Hamburg 1PPPN = +17m.24s.
 Zagreb ePPNE = +15m.46s., ePSNE = +23m.37s.
 Jena eSE = +22m.28s.
 Göttingen eEN = +22m.30s., 1PSE = +23m.45s.
 Feldberg 1N = +24m.25s. = PS - 9s., and +29m.2s., eN = +35m.49s.
 Stuttgart eEZ = +13m.14s., ePPEN = +15m.38s., eEN = +17m.0s., ePS =
 +24m.8s., eEN = +25m.18s., eSSEN = +28m.58s.
 Dyce e = +29m.18s.
 Strasbourg 1PP = +16m.12s., 1PS = +24m.8s., SS = +28m.52s.
 Victoria SE = +17m.42s. = PPP + 0s.
 Rome 1S = +22m.51s.
 Uccle PP = +16m.16s., SS = +29m.22s.
 Neuchatel 1PP = +16m.20s.
 Kew 1PPZ = +16m.33s.
 Berkeley eZ = +16m.39s. = PP - 6s., eEZ = +17m.1s., eN = +17m.57s., 1Z =
 +18m.42s., eE = +24m.47s., eN = +24m.57s., eE = +25m.26s., eN =
 +26m.18s.
 Toledo PP = +17m.43s.
 Granada 1 = +20m.35s. and +22m.15s.
 Florissant ePZ = +18m.51s., 1PZ = +19m.7s., 1Z = +20m.13s., +21m.27s.,
 and +29m.42s.
 St. Louis 1PEN = +19m.7s.
 Georgetown 1 = +19m.40s., +30m.10s., and +31m.35s.
 La Paz 1E = +24m.45s., +31m.19s., and +32m.45s., PPSE = +38m.8s.
 Long waves were also recorded at Durham and Edinburgh.

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Dec. 21d. 23h. 51m. 53s. Epicentre 23°·5N. 120°·9E. (given by Manila). N.2.

A = -·471, B = +·787, C = +·399; D = +·858, E = +·514;
G = -·204, H = +·342, K = -·917.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Taiyu	0·7	343	0 11	+ 1	0 22	+ 4	—	—
Tainan	0·8	232	0 10	- 1	0 15	- 6	—	—
Hokoto	1·2	272	0 9	- 8	0 21	- 10	—	—
Kosyun	1·5	185	0 21	0	0 43	+ 4	—	—
Taihoku	1·6	20	1 0 31	P*	1 4	S _r	—	—
Isigakizima	3·1	74	0 51	+ 7	1 32	S*	—	—
Hong Kong	6·3	261	1 27	- 3	2 49	+ 8	3·2	4·0
Zi-ka-wel	n. 7·7	3	e 1 48	- 1	4 0	S*	i 4·6	—
Manila	8·9	178	1 2 7	+ 1	1 3 52	+ 6	4·3	10·6
Miyazaki	12·6	46	3 9	+13	5 37	+20	—	—
Phu-Lien	13·5	261	e 3 10	+ 1	e 6 0	+21	7·1	8·4
Sumoto	16·3	45	(e 4 3)	+18	(1 6 40)	- 5	—	(7·0)
Osaka	17·0	45	e 3 42	- 12	(7 5)	+ 3	7·1	17·5
Chiufeng	n. 17·1	347	3 29	-26	—	—	—	—
Calcutta	29·9	275	10 11	S	(10 11)	+ 8	—	—
Hyderabad	40·1	271	13 22	S	(13 22)	-16	31·2	42·5
Almata	41·0	311	8 13	+33	—	—	—	—
Colombo	42·3	256	14 12	S	(14 12)	+ 2	—	—
Andijan	43·9	308	8 7	+ 3	—	—	—	—
Bombay	n. 44·8	275	14 29	S	(14 29)	-18	(23·4)	49·0
Tashkent	46·3	308	e 10 12	(+ 9)	e 18 19	(- 2)	e 23·1	27·2
Samarkand	47·9	306	8 39	+ 4	—	—	—	—
Ekaterinburg	54·3	325	1 9 22	- 1	17 2	+ 3	25·1	31·5
Kucino	66·9	323	—	—	e 19 42	- 1	33·4	56·3
Pulkovo	70·2	328	1 11 0	-12	e 20 22	- 2	38·1	42·3
Cheb	83·1	322	—	—	e 23 7†	+19	—	68·1
Florence	86·9	318	—	—	e 23 7	-19	41·1	48·1
Piacenza	87·3	319	—	—	e 23 7	-23	—	72·6
La Paz	n. 169·0	52	e 20 7	[+ 4]	—	—	—	—

Additional readings and notes :-

Sumoto S = (+6m.16s.); all readings have been *diminished* by 6m.

Hyderabad S = +23m.13s.

Bombay gives S as P and L as S.

Kucino e = +24m.27s. and +27m.12s.

Long waves were also recorded at Kobe, Koti, Nagasaki, Kodalkanal, Scoresby Sund, and other European stations.

Dec. 21d. Readings also at 1h. (La Paz), 2h. (near Amboina), 3h. (Baku, Ekaterinburg, Irkutsk, Phu-Lien, Bombay, Medan, and Sumoto), 4h. (Baku and Ekaterinburg), 5h. (Andijan and near Samarkand), 7h. (Florissant and St. Louis), 9h. (Baku, Ekaterinburg, Irkutsk, Almata, near Samarkand, and near Lick), 10h. (Almata), 13h. (Koti (3) and Malaga), 15h. (La Plata, near Santiago and near Malabar), 16h. (Koti (2) and Matuyama (2)), 20h. (Florissant and near Tyosi), 23h. (Almata and Medan).

Dec. 22d. 0h. 8m. 21s. Epicentre 23°·6N. 120°·2E. (given by Manila). N.2.

A = -·461, B = +·792, C = +·400; D = +·864, E = +·503;
G = -·201, H = +·346, K = -·916.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tainan	0·6	179	0 5	- 4	0 13	- 2	—	—
Hokoto	0·8	264	0 8	- 1	0 20	+ 5	—	—
Taiyu	0·7	39	0 10	0	0 22	+ 4	—	—
Taihoku	1·9	40	1 0 26	- 2	0 55	+ 6	—	—
Isigakizima	3·7	78	0 49	- 4	1 30	- 5	—	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hong Kong	5.7	259	1 22	+ 1	2 28	+ 3	2.8	3.8
Naha	7.3	67	1 48	+ 4	—	—	—	—
Zi-ka-wei	N. 7.7	8	e 1 54	+ 5	3 48	S _z	(3.8)	—
Manila	Z. 9.0	176	i 2 14	+ 7	14 0	+11	4.6	—
Nagasaki	12.5	41	3 1	+ 6	7 44	L	(7.7)	—
Phu-Lien	12.9	261	e 3 1	0	e 5 48	+23	6.6	8.4
Miyazaki	13.0	48	3 3	+ 1	5 52	+25	—	—
Hukuoka	13.4	40	e 3 19	+12	e 6 19	+42	e 6.9	9.7
Sumoto	16.7	47	(e 3 59)	+ 9	(7 1)	+ 6	—	(9.2)
Chiufeng	N. 16.8	349	3 53	+ 1	—	—	—	—
Osaka	17.4	47	e 3 47	-12	(7 10)	- 1	7.2	11.5
Kumagaya	20.8	48	4 44	+ 6	8 50	SS	—	—
Ekaterinburg	53.9	325	i 9 21	0	—	—	24.6	32.8
Baku	60.3	307	e 9 39?	-28	—	—	29.6	40.8
Riverview	64.5	151	—	—	19 9	- 5	e 36.0	39.6
Sydney	64.5	151	e 15 21	?	—	—	39.0	40.6
Pulkovo	69.7	329	11 6	- 3	20 21	+ 3	36.6	42.2
Vienna	Z. 81.2	319	12 13	- 1	—	—	—	—
Potsdam	81.3	324	12 12	- 3	—	—	e 41.6	44.6
Innsbruck	84.6	320	12 33	+ 2	—	—	—	—
Feldberg	N. 84.8	324	e 19 21	-11	e 23 5	- 1	e 43.1	48.0
Stuttgart	85.2	323	e 12 33	- 1	e 22 59	-11	e 45.6	55.9
Strasbourg	86.1	323	12 36	- 3	—	—	—	—
Paris	88.8	325	—	—	e 23 39?	- 6	38.6	55.6
La Paz	169.4	50	e 19 57	[- 6]	—	—	83.6	—

Additional readings and notes:—

Sumoto SZ = (+6m.28s.); readings have been *diminished* by 4m.

Feldberg eN = +27m.15s. and +30m.21s.

Long waves were also recorded at Kobe, Koti, Tashkent, Bombay, Calcutta, Colombo, Irkutsk, Victoria, Harvard, Ottawa, Wellington, and other European stations.

Dec. 22d. 3h. 23m. 27s. Epicentre 35°-0N. 132°-5E. (as on Nov. 17d.). R.3.

A = - .554, B = + .604, C = + .574; D = + .737, E = + .676;

G = - .388, H = + .423, K = - .819.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Matuyama	1.2	173	10 17	0	i 0 31	0	—	0.6
Koti	1.7	150	0 24	0	i 0 43	- 1	—	0.8
Toyouka	2.0	74	i 0 27	- 2	0 50	- 1	—	0.9
Sumoto	2.1	108	0 31	+ 1	0 53	- 1	—	0.9
Kobe	2.2	98	0 30	- 1	0 57	0	—	1.0
Hukuoka	2.2	230	e 0 44	P _r	1 14	S _z	—	—
Osaka	2.4	98	e 0 38	+ 4	(1 7)	+ 5	1.1	1.2
Nagoya	3.6	87	e 0 59	+ 8	1 43	+11	—	—

Long waves were also recorded at Irkutsk, Tashkent, and Ekaterinburg.

Dec. 22d. 4h. 19m. 50s. Epicentre 23°-2N. 120°-6E. (as on 15d.). R.2.

A = - .468, B = + .791, C = + .394; D = + .861, E = + .509;

G = - .201, H = + .339, K = - .919.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tainan	0.4	240	0 8	+ 2	0 13	+ 3	—	—
Taiyu	1.0	5	0 11	- 3	0 23	- 3	—	—
Hokoto	1.0	289	0 12	- 2	0 25	- 1	—	—
Karenko	1.2	49	0 13	- 4	0 30	- 1	—	—
Taihoku	2.0	25	i 0 27	- 2	0 56	+ 5	—	1.1
Isgakizima	3.5	70	0 52	+ 2	1 31	+ 1	—	—
Hong Kong	6.0	262	1 21	- 4	2 46	+13	—	3.8
Naha	7.1	63	2 5	P*	3 41	S*	—	—
Zi-ka-wei	8.0	5	e 2 12	+19	4 0	—	14.6	6.0
Manila	8.6	178	e 1 59	- 3	e 3 34	- 5	4.7	—

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	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Miyazaki	13-0	46	3 10	+ 8	5 44	+17	—	—
Phu-Lien	13-2	262	e 3 8	+ 3	e 5 52	+20	7-1	8-3
Koti	15-4	45	—	—	6 57	+33	—	11-1
Chiufeng	17-3	349	3 56	- 2	9 4	+115	—	—
Calcutta	30-3	276	11 9	S	(11 9)	0	17-4	—
Irkutsk	31-6	342	6 17	- 2	e 11 22	- 7	14-1	19-9
Almata	41-0	310	e 9 5	PP	—	—	—	—
Andijan	44-1	306	e 8 21	+15	—	—	—	—
Bombay	44-6	275	8 14	+ 4	14 52	+ 8	23-0	28-2
Tashkent	46-3	308	i 8 23	0	i 15 12	+ 3	e 24-1	31-3
Samarkand	47-8	305	e 8 46	+11	—	—	—	—
Pulkovo	70-3	329	11 11	- 2	e 20 27	+ 2	37-1	42-3

Long waves were also recorded at Nagasaki, Hukuoka, Kobe, Sumoto, Medan, Baku, Harvard, Ottawa, and other European stations.

Dec. 22d. 23h. 7m. 8s. Epicentre 35°-0N. 132°-5E. (as at 3h.). R.3.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Matuyama	1-2	173	e 0 17	0	i 0 32	+ 1	0-6	0-6
Koti	1-7	150	0 24	0	0 44	0	0-8	0-8
Toyooka	2-0	74	0 29	0	0 50	- 1	0-9	0-9
Kobe	2-2	98	0 30	- 1	0 56	- 1	1-0	1-0
Hukuoka	2-2	230	e 0 43	P _r	1 14	S _r	—	—

No additional readings.

Dec. 22d. Readings also at 0h. (Phu-Lien and near Hokoto), 1h. (Königsberg and Samarkand), 3h. (Calcutta, Medan, Phu-Lien, and Tyosi), 5h. (Hokoto, Phu-Lien, Samarkand, and near Andijan), 6h. (Phu-Lien, near Hokoto, and near Almata), 7h. (Phu-Lien and near Hokoto), 8h. (Hong Kong, Phu-Lien and near Hokoto), 9h. (Ekaterinburg, Irkutsk, and La Paz), 11h. (near Almata, near Medan, and near Sumoto), 17h. (Koti and Matuyama (2)), 19h. (near Neuchatel), 20h. (near Andijan), 23h. (near Sumoto).

Dec. 23d. 2h. 9m. 21s. (I) } Epicentre 35°-0N. 132°-5E. R.3.
 4h. 6m. 42s. (II) } (as on 22d.). R.3.
 10h. 46m. 42s. (III) } R.3.

A = - .554, B = + .604, C = + .574 ; D = + .737, E = + .676 ;
 G = - .388, H = + .423, K = - .819.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
I Matuyama	1-2	173	e 0 16	- 1	i 0 31	0	—	0-5
II	1-2	173	e 0 16	- 1	i 0 31	0	—	0-5
III	1-2	173	e 0 17	0	i 0 33	+ 2	—	0-6
I Koti	1-7	150	0 24	0	i 0 43	- 1	—	0-7
II	1-7	150	—	—	i 0 43	- 1	—	0-7
III	1-7	150	0 24	0	i 0 44	0	—	0-8
I Toyooka	2-0	74	0 28	- 1	0 47	- 4	—	0-8
II	2-0	74	0 28	- 1	0 50	- 1	—	0-8
III	2-0	74	0 29	0	0 51	0	—	0-9
I Sumoto	2-1	108	e 0 29	- 1	0 52	- 2	—	0-9
II	2-1	108	e 0 30	0	0 52	- 2	—	0-9
III	2-1	108	e 0 29	- 1	0 52	- 2	—	0-9
I Kobe	2-2	98	0 33	+ 2	0 57	0	—	1-0
II	2-2	98	e 0 33	+ 2	e 0 58	+ 1	—	1-0
III	2-2	98	0 31	0	0 57	0	—	1-0
I Hukuoka	2-2	230	0 42	P _r	1 13	S _r	—	—
II	2-2	230	e 0 43	P _r	1 13	S _r	—	1-3
III	2-2	230	0 43	P _r	1 14	S _r	—	1-3
III Osaka	2-4	98	0 36	+ 2	(1 7)	+ 5	1-1	1-2
III Nagoya	3-6	87	e 1 0	+ 9	—	—	—	—

Toyooka gives also SZ for shock I = + 49s, and for II SZ = + 55s.

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Dec. 23d. 5h. 20m. 31s. Epicentre 23°·6N. 120°·2E. (as on 22d.). X.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Hokoto	0·6	264	0 7	- 2	0 19	+ 4	—	—
Taihoku	1·9	40	i 0 20	- 8	0 40	- 9	—	1·0
Hong Kong	5·7	259	1 39	P*	—	—	e 3·0	3·6
Zi-ka-wei	7·7	8	—	—	e 3 16	0	i 4·4	—
Manila	9·0	176	i 3 58	S	(i 3 58)	+ 9	i 4·3	—
Irkutsk	31·2	341	—	—	e 11 29?	+ 6	16·5	19·7
Tashkent	45·7	305	—	—	e 15 11	+11	e 23·5	31·5
Ekaterinburg	53·9	325	e 9 7	-14	—	—	26·5	—

Additional readings:—

Irkutsk e = +14m.29s.?

Long waves were also recorded at Phu-Lien, Calcutta, Copenhagen, Feldberg, Pulkovo, and De Bilt.

Dec. 23d. 7h. 32m. 21s. Epicentre 28°·5N. 140°·5E. (as on 1929 April 10d.). X.

A = -·678, B = +·559, C = +·477; D = +·636, E = +·772;

G = -·368, H = +·304, K = -·879.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Tyosi	7·2	3	e 1 40	- 2	e 2 40	-24	—	—
Mizusawa	10·6	3	2 31	+ 2	3 59	-29	—	—
Manila	22·8	236	1 5 9	+10	i 9 45	+44	12·3	—
Irkutsk	35·8	322	e 6 51	- 5	e 12 35	+ 2	18·6	22·6
Ekaterinburg	61·0	323	10 5	- 6	18 31	+ 2	30·6	—

Additional readings:—

Manila iE = +6m.1s., iN = +6m.14s.

Long waves were also recorded at Koti, Tashkent, Baku, and De Bilt.

Dec. 23d. 21h. 35m. 36s. Epicentre 1°·3S. 143°·4E. (as on 1927 May 13d.). R.3.

A = -·803, B = +·596, C = -·023; D = +·596, E = +·803;

G = +·018, H = -·014, K = -1·000.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Palau	12·4	314	3 1	+ 7	5 43	+30	—	—
Manila	27·3	308	i 5 41	0	i 9 58	-22	—	—
Riverview	33·3	168	e 7 33	PP	—	—	e 18·4	21·2
Sydney	33·3	168	e 7 24	PP	—	—	16·4	19·1
Adelaide	33·9	187	e 6 33?	- 6	i 12 3	- 1	16·1	21·9
Miyazaki	35·1	343	6 48	- 2	11 27	-56	—	—
Melbourne	36·5	178	—	—	e 12 28	-16	19·5	23·4
Batavia	36·8	261	8 27	PP	—	—	—	—
Kobe	36·8	348	7 1	- 4	—	—	e 17·0	21·3
Hong Kong	37·0	312	e 7 4	- 2	12 57	+ 6	15·6	18·2
Mizusawa	40·5	358	6 38	-58	7 58	?	—	—
Phu-Lien	42·3	305	6 24?	?	—	—	—	—
Medan	45·0	276	e 10 6	(+ 8)	i 13 6	?	—	—
Wellington	49·0	150	9 40	PP	17 3	?	—	—
Calcutta	58·6	299	e 19 31	S ₀ S	(e 19 31)	(-11)	32·5	—
Irkutsk	62·9	335	10 21	- 4	18 53	- 1	e 32·4	36·2
Bombay	72·1	291	11 27	+ 4	20 51	+ 5	37·9	—
Almata	74·0	317	e 11 43	+ 8	—	—	—	—
Andijan	76·6	314	e 11 46	- 3	—	—	—	—
Tashkent	79·1	314	i 12 3	0	i 22 1	- 5	44·4	—
Samarkand	80·5	312	e 12 11	+ 1	—	—	—	—
Ekaterinburg	87·2	328	e 12 42	- 2	i 23 24	- 5	36·4	43·9
Baku	93·5	312	—	—	24 25	- 3	44·1	62·4
Pulkovo	102·6	333	—	—	e 26 48	+59	51·4	57·2
Scoresby Sund	110·1	356	—	—	36 24?	?	—	—
Uccle	119·6	332	—	—	e 45 24?	?	e 59·4	—
Granada	133·0	323	e 16 9	-23	—	—	e 67·2	84·4
La Paz	144·1	122	19 35	[+ 4]	—	—	—	—

For Notes see next page.

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NOTES TO DEC. 23d. 21h. 35m. 36s.

Additional readings :—

Riverview eE = +14m.51s., iN = +15m.23s.
 Melbourne S? = +15m.29s.
 Batavia i = +9m.58s. = PcP + 27s. and +15m.46s.
 Kobe eE = +9m.8s., eN = +9m.30s. = PcP - 1s.
 Hong Kong ePP = +8m.33s.
 Baku PP = +17m.18s., PS = +25m.40s.
 Long waves were also recorded at Victoria and other European stations.

Dec. 23d. 23h. 55m. 8s. Epicentre 43° 1N. 143° 4E. (as 1929 March 11d.). R.3.

A = -·586, B = +·435, C = +·683; D = +·596, E = +·803;
 G = -·549, H = +·407, K = -·730.

A depth of focus 0·015 has been assumed.

	Corr. for Focus	Δ	Az.	P.		O-C.		S.		O-C.		L.	M.		
				m.	s.	s.	s.	m.	s.	m.	s.				
Kusiro	+0·4	0·7	99	0	12	-	4	0	28	0	—	—			
Asahigawa	+0·3	1·0	312	0	24	+	6	0	45	+12	—	—			
Sapporo	+0·3	1·5	269	0	30	+	4	0	48	+2	—	—			
Nemuro	+0·3	1·6	82	0	20	-	8	0	38	-11	—	—			
Aomori	+0·2	3·0	221	0	46		0	1	23	+1	—	—			
Otomari	+0·1	3·6	353	i	59	+	6	(1	39)	+4	1·6	1·7			
Alkita	0·0	4·2	218	1	1	+	1	1	52	+4	—	—			
Mizusawa	0·0	4·3	204	1	1		0	1	49	-1	—	—			
Sendai	0·0	5·2	203	1	15	+	1	2	13	0	—	—			
Hukusima	0·0	5·8	205	1	21	-	1	2	25	-3	—	—			
Wazima	-0·1	7·6	223	1	48	+	2	3	13	+2	—	—			
Tyosi	-0·1	7·6	195	1	43	-	3	3	5	-6	—	3·2			
Tokyo	-0·1	8·0	202	1	39	-	13	3	14	-7	—	—			
Nagoya	-0·2	9·4	214	e	2	11	+	e	4	11	+17	—			
Osaka	-0·2	10·4	218	2	44	+	20	(4	41)	+23	4·7	6·0			
Kobe	-0·2	10·6	219	2	29	+	3	4	54	+31	—	6·4			
Sumoto	-0·2	11·0	220	2	41	+	9	5	17	+44	—	5·4			
Koti	-0·3	12·3	222	2	48		0	5	26	+23	—	—			
Chiufeng	-0·6	20·5	271	4	22	-	7	8	10	+6	—	—			
Irkutsk	-0·9	27·5	303	i	5	31	-	4	10	5	-4	13·9	16·8		
Almata	-1·4	47·1	295	e	8	26	+	8	—	—	—	—	—		
Calcutta	-1·5	49·6	266	16	1		S	(16	1)	+27	—	—	—		
Andijan	-1·5	51·2	295	e	8	49		0	16	14	+17	e	28·1		
Ekaterinburg	-1·6	51·5	318	i	8	49	-	2	i	16	1	+2	24·9	32·1	
Tashkent	-1·6	53·1	298	e	9	11	+	8	i	16	16	-6	e	26·7	30·0
Samarkand	-1·7	55·4	297	e	9	20	+	1	—	—	—	—	—	—	—
Pulkovo	-1·9	63·5	330	i	10	12	-	4	i	19	49	+72	34·9	—	—
Baku	-1·9	65·9	305	—	—	—	—	—	e	19	11	+4	26·5	—	—
Vienna	-2·0	77·4	329	12	38	+	55	—	—	—	—	—	—	—	—
Granada	-2·2	94·4	335	i	16	49	PP	(34	13)	SSS	34·2	—	—	—	—

Additional readings :—

Koti SN = +5m.31s.
 Tashkent e = +17m.1s., i = +18m.35s.
 Long waves were also recorded at Copenhagen, De Bilt, and Cheb.

Dec. 23d. Readings also at 0h. (near Amboina), 1h. and 8h. (near Sumoto), 8h. (near Hokoto), 10h. (Tyosi), 12h. (Koti and near Matuyama), 14h. (Tyosi, near Florissant, and St. Louis), 16h. (Andijan), 17h. (Bergen and Samarkand), 21h. (near Amboina), 23h. (Adelaide).

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Dec. 24d. 6h. 2m. 50s. Epicentre 25°08. 66°0W. N.3.

A = +.369, B = -.828, C = -.423; D = -.914, E = -.407;
G = -.172, H = +.386, K = -.906.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
La Paz	8.7	346	i 2 7	+ 4	i 3 49	+ 8	4.5	6.3
Santiago	9.4	205	2 12	- 1	4 0	+ 1	5.1	—
La Plata	12.1	146	2 47	- 3	4 53	-12	5.7	—
Río de Janeiro	21.0	89	i 5 39	+59	i 9 38	+72	i 11.5	17.8
Charlottesville	64.2	350	—	—	e 18 54	-16	e 29.2	—
St. Louis	67.5	340	e 11 6	+11	e 19 15	-36	e 36.2	—
Harvard	67.6	358	—	—	e 19 40	-12	e 33.4	—
Florissant	67.8	340	e 10 40	-17	e 19 35	-19	—	36.2
Toronto	69.8	350	—	—	e 19 57	-22	e 30.2	—
Granada	85.5	45	—	—	i 26 56	?	e 40.5	53.1
Paris	95.7	38	—	—	e 35 10?	?	49.2	61.2
De Bilt	98.8	38	—	—	e 24 10?	[-10]	e 45.2	56.9
Cheb	102.0	40	—	—	e 24 10?	[-25]	—	—
Copenhagen	104.3	35	—	—	33 10?	SS	45.2	—
Pulkovo	114.5	32	—	—	e 28 54	PS	50.2	65.0
Baku	125.1	55	—	—	e 29 33	?	e 53.2	78.8
Ekaterinburg	130.5	35	e 19 3	[- 5]	—	—	53.2	66.3
Tashkent	139.7	52	—	—	e 33 34	PS	e 58.2	86.9
Almata	144.7	49	e 19 40	[+ 7]	—	—	—	—
Irkutsk	151.8	13	e 19 40	[- 4]	e 30 10?	{-23}	e 66.2	88.8

Additional readings and notes:—

Toronto eN = +27m.54s.

Baku e = +32m.18s.

Ekaterinburg e = +21m.10s. = PP - 11s., i = +22m.43s. = PKS + 7s.

Tashkent e = +39m.34s.

The readings for North American stations with the exception of Florissant are given without phase.

Long waves were also recorded at Chicago, Victoria, Perth, Wellington, Scoresby Sund, Kucino, Dakar, and other European stations.

Dec. 24d. 14h. 27m. 43s. Epicentre 34°5N. 4°0W. (as on 1927 Sept. 12d.). X.

A = +.822, B = -.057, C = +.566; D = -.070, E = -.998;
G = +.565, H = -.040, K = -.824.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Malaga	2.3	352	e 0 34	+ 1	0 56	- 3	—	—
Granada	2.7	5	i 0 41	+ 2	1 14	+ 5	—	1.4
Almeria	2.7	28	0 35	- 4	i 0 59	-10	—	—
San Fernando	2.7	318	1 13	S	(1 13)	+ 4	1.8	1.8
Alicante	4.8	35	e 2 11	S	(e 2 11)	+ 8	—	—
Toledo	5.4	0	e 1 18	+ 1	e 2 41	S*	—	—

Additional readings:—

Granada P = +45s., PP = +47s. and +50s., PS = +1m.4s., SS = +1m.19s.

Almeria PP = +39s., PPPP = +43s., PS = +55s., SS = +1m.11s., PSSS = +1m.19s., SS = +1m.25s., PSSSS = +1m.33s.

Toledo i = +2m.49s. and +2m.54s.

Long waves were also recorded at Central European stations.

Dec. 24d. Readings also at 3h. (Almata, Samarkand, and near Andijan), 5h. (Messina (2) and Wellington), 7h. (near Mizusawa, Nagoya, and Tyosi), 9h. (Berkeley), 10h. (near Toyooka), 12h. (Wellington), 15h. (Koti), 16h. (Toledo), 17h. (near Malabar), 19h. (near Andijan and Samarkand), 20h. (Ottawa and near Manila), 23h. (Nagoya and near Tyosi).

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Dec. 25d. 12h. A local European shock was recorded which does not admit of a definite determination. The following are the earliest phases recorded at the observing stations:—

Messina	34m. 35s.	Catania	35m. 38s.
Rocca di Papa	34m. 35s.	Florence	36m. 46s.
Mineo	34m. 56s.	Piacenza	37m. 0s.
Rome	35m. 13s.	Stuttgart	40m.
Naples	35m. 21s.	Copenhagen	45m.

Catania S - P = 23s.

Dec. 25d. 13h. 7m. 24s. Epicentre 33° 0S. 11° 0W. N.3.

A = +.823, B = -.160, C = -.545; D = -.191, E = -.982;
G = -.535, H = +.104, K = -.839.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Rio de Janeiro	30.0	281	e 6 3	- 2	e 10 4	-60	i 12.2	—
La Plata	38.6	256	e 7 31	+11	13 29	+14	18.4	—
La Paz	53.8	275	e 9 13	- 7	i 16 49	- 4	25.3	27.2
Tananarive	53.8	90	—	—	e 17 45	+52	27.6	32.7
Granada	70.6	7	(e 13 36?)	PP	—	—	e 13.6	37.0
Rocca di Papa	77.9	20	i 11 48	- 9	—	—	—	—
Rome	78.0	20	12 17	+20	—	—	—	—
Florence	79.5	17	12 8	+ 3	18 7	?	—	40.6
Zagreb	82.5	20	e 12 14	- 7	e 22 14?	-28	e 41.6	44.9
Paris	82.8	10	e 12 30	+ 8	—	—	39.6	—
Strasbourg	83.3	14	e 12 37	+12	e 16 1	?	31.6	—
Stuttgart	83.7	14	e 12 28	+ 1	e 15 36	PP	e 39.6	—
Uccle	84.9	10	e 15 36?	PP	e 22 36?	[-22]	e 33.6	—
Kew	85.0	7	e 12 36	+ 3	—	—	41.6	—
De Bilt	86.3	11	e 12 38	- 2	—	—	e 41.6	47.8
Potsdam	88.0	15	e 12 36?	-12	e 21 36?	?	—	46.6
Copenhagen	91.0	14	12 36?	-26	—	—	46.6	—
Baku	92.4	42	e 13 54	+45	e 24 19	+ 1	41.8	54.5
Colombo	94.5	85	24 39	S	(24 39)	+ 1	—	51.9
Bombay	95.2	70	16 49	PP	26 41	?	45.7	54.0
Pulkovo	98.8	20	e 13 54	+16	e 24 58	-18	48.6	57.2
Hyderabad	99.0	75	—	—	26 55	PS	49.8	53.8
Florissant	102.8	310	e 4 6	?	e 24 6	[-33]	—	48.6
Tashkent	104.6	50	—	—	e 25 0	[+12]	e 52.6	66.3
Wellington	105.5	185	20 36?	PPP	—	—	—	—
Melbourne	105.7	161	i 19 54	?	—	—	—	—
Ekaterinburg	108.4	35	e 18 10	[- 3]	—	—	52.6	66.8
Riverview	111.0	165	e 18 6	[-15]	(e 23 36?)	PPPP	e 23.6	—

Additional readings:—

La Paz IPN = +9m.35s.

Tananarive eE = +13m.6s.

Rocca di Papa i = +12m.0s. and +12m.12s.

Zagreb e = +13m.11s.?, ePSNW = +22m.52s.

Strasbourg e = +2m.48s.

Potsdam eNZ = +16m.36s. ? = PP + 27s.

Tashkent e = +27m.24s. = PS - 10s., i = +33m.48s.

Ekaterinburg i = +19m.1s. = PP + 16s., e = +33m.53s. = SS - 4s.

Long waves were also recorded at Piacenza, Cheb, Helsingfors, Irkutsk, Hong

Hong, Phu-Lien, and Harvard.

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Dec. 25d. 13h. 49m. 16s. Epicentre $42^{\circ}1'N$. $69^{\circ}3'E$. N.3.
(given by the Central Asia stations).

$$A = +.262, B = +.694, C = +.670.$$

	Δ °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.	M. m.
Tashkent	0.8	i 0 11	0	(i 0 19)	- 2	i 0.3	0.7
Andijan	2.7	e 0 48	P*	—	—	1.4	—
Samarkand	3.0	e 0 43	0	(i 1 30)	S*	i 1.5	—

Long waves were also recorded at Almata.

Dec. 25d. 23h. A local European shock distinct from that at 12h. and attributed to the epicentre of Nov. 21d. 2h. The readings cannot be made to fit this hypothesis within reasonable limits and are recorded below as given by the stations.

Rocca di Papa e? = 45m.6s., e = 45m.32s., i = 49m.13s.

Trenta eP = 45m.40s., S = + 46m.50s.

Mineo P = 45m.55s.

Taranto P = 46m.30s., S = 47m.32s.

Messina P = 46m.47s.

Piacenza e = 47m.0s.

Naples eP = 47m.20s., eS = 58m.20s.

Rome e = 48m.35s.

Pulkovo 1P = 49m.17s., eS = 53m.36s., L = 56m.30s.

Ekaterinburg 1P = 50m.33s., e = 57m.10s., L = 60m.

Stuttgart e = 53m.30s. and 54m.30s.

Readings to the nearest minute were also given by Cheb, De Bilt, Neuchatel, and Venice.

Dec. 25d. Readings also at 3h. (near Amboina), 4h. (near Toyooka), 6h. (Ottawa), 8h. (Messina), 9h. (Harvard), 13h. (Christchurch, Wellington, Riverview, Sydney, Melbourne, near Kodaikanal, and near Mizusawa), 14h. (Feldberg and Perth), 15h. (De Bilt, Uccle, and Paris), 16h. (Almata), 21h. (Zagreb), 22h. (Zagreb, Florissant, Harvard, Ottawa, and Toronto).

Dec. 26d. Readings at 3h. (near Ksara and near La Paz), 6h. (near Tyosi), 7h. (Tyosi and Mizusawa), 8h. (La Paz), 9h. (near Matuyama), 10h. (Feldberg), 11h. (near Amboina), 13h. (Ekaterinburg, Irkutsk, Sitka, and near Tyosi), 14h. (Nagoya), 20h. (Berkeley).

Dec. 27d. Readings at 5h. (Berkeley), 7h. (Samarkand), 8h. (De Bilt and La Plata), 11h. (Cheb, Florence, Belgrade, Zagreb, Feldberg, Königsberg, Baku, Ekaterinburg, Kucino, Theodosia, Simferopol, Yalta, and near Ksara), 16h. (Manila), 18h. (near Tyosi), 20h. (Baku and Ekaterinburg).

Dec. 28d. Readings at 7h. (Tyosi (2)), 10h. (near Lick and near Manila), 11h. (Hong Kong), 14h. (Hong Kong, Phu-Lien, near Bombay (2), and Calcutta (2)), 18h. (Samarkand), 20h. (Yalta and Ksara).

Dec. 29d. 20h. 57m. 4s. Epicentre $35^{\circ}5'N$. $140^{\circ}0'E$. (as on 1930 Oct. 5d.). X.

$$A = -.624, B = +.523, C = +.581.$$

	Δ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	L. m.
Tokyo	0.3	312	0 6	+ 2	—	—	—
Tyosi	0.7	72	0 8	- 2	0 18	0	0.3
Tukuba	0.7	11	0 8	- 2	—	—	—
Nagoya	2.5	262	0 52	P ₂	1 16	S*	—
Mizusawa	E. 3.7	14	0 56	+ 3	1 35	0	—

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Dec. 29d. Readings also at 3h. (La Paz, La Plata, and near Santiago), 4h. (near Tyosi), 6h. (Tucson, Victoria, near Tyosi, and near Ksara), 7h. (Sebastopol, Simferopol, and Yalta), 9h. (Tucson and Victoria), 10h. (near Tacubaya), 20h. (near Tyosi (2)), 22h. (near Sumoto).

Dec. 30d. Readings at 1h. (Tyosi), 2h. (Florissant, Guadalajara, near Manzanillo, Puebla, Vera Cruz, and Tacubaya), 3h. (Tucson, Berkeley, and near Lick), 6h. (near Andijan and near Sumoto), 7h. (near Samarkand), 8h. (Hong Kong, Phu-Lien, Medan, Bombay, Almata, Andijan (2), and Ekaterinburg), 9h. (Baku and Irkutsk), 14h. (Tyosi, Rocca di Papa, Rome, near Naples, Taranto, and Trenta), 19h. (De Bilt, Feldberg, Kew, Copenhagen, Strasbourg, Wellington), 23h. (near Andijan).

Dec. 31d. 20h. 15m. 3s. Epicentre 3° 0S. 143° 5E. (as on 1929 March 31d.). X.

A = -803, B = +594, C = -052; D = +595, E = +804;
G = +042, H = -031, K = -999.

	Δ	Az.	P.	O-C.	S.	O-C.	L.	M.
	°	°	m. s.	s.	m. s.	s.	m.	m.
Manila	28.4	309	6 1	+10	i 10 47	+ 9	14.0	—
Riverview	31.7	168	10 4	?	e 14 41	?	e 18.4	22.0
Sydney	31.7	168	e 10 57	S	(e 10 57)	-34	18.5	20.0
Adelaide	32.3	188	e 6 21	-4	i 11 37	-3	i 16.5	22.6
Melbourne	34.8	178	—	—	e 11 32	-46	19.1	20.0
Hong Kong	38.2	314	7 25	+ 8	(13 10)	+ 1	13.2	18.5
Irkutsk	64.4	335	e 10 7	-28	e 19 16	+ 4	30.0	—
Bombay	72.8	291	—	—	e 20 57?	+ 3	—	—
Almata	75.3	317	e 11 57	+15	—	—	—	—
Andijan	77.8	313	e 13 2	+65	—	—	—	—
Tashkent	80.3	313	i 12 6	- 3	i 22 19	0	e 33.0	41.4
Samarkand	81.6	311	e 12 17	+ 1	—	—	—	—
Ekaterinburg	88.6	328	—	—	i 23 42	- 1	38.0	—

Additional readings:—

Riverview e = +13m.3s.

Sydney eS = +14m.57s.

Adelaide i = +13m.15s. =SS-9s.

Melbourne i = +12m.11s. =S-7s., e = +15m.24s., S? = +15m.45s.

Long waves were also recorded at Feldberg.

Dec. 31d. Readings also at 1h. (Almata), 4h. (Bombay, Hong Kong, Phu-Lien, Irkutsk, and Tashkent), 6h. (Wellington), 8h. (Andijan), 11h. (Kobe, Osaka, Tyosi, Mizusawa, and near Malaga), 17h. (Ksara), 18h. (Tyosi), 19h. (Cheb).