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The International Seismological Summary.

1939 April, May, June.

FORMERLY THE BULLETIN OF THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.

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

This second quarter for 1939 contains 118 determinations of epicentre, 54 being repetitions from origins determined since the introduction of the use of geocentric co-ordinates.

Cases of abnormal focal depth are noticed as below :—

April	5d.	16h. 42m. 39s.	19·9°S.	169·0°E.	Suggested Deep.
	21d.	4h. 29m. 6s.	47·6N.	140·0E.	0·080
	25d.	12h. 53m. 36s.	12·2S.	75·3W.	0·005
May	13d.	0h. 43m. 33s.	23·7S.	65·7W.	0·030
	19d.	18h. 25m. 30s.	19·0S.	69·0W.	0·010
	21d.	20h. 21m. 43s.	21·5S.	180·0	0·060
	27d.	3h. 45m. 37s.	24·3N.	94·1E.	Suggested Deep.
June	2d.	3h. 33m. 23s.	5·0N.	126·8E.	0·010
	4d.	0h. 23m. 56s.	8·7S.	123·0E.	Suggested Deep.
	8d.	20h. 46m. 56s.	15·6S.	173·6W.	0·010
	13d.	20h. 39m. 54s.	0·2N.	125·2E.	0·010
	17d.	12h. 2m. 35s.	15·6S.	173·6W.	0·010

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

KEW OBSERVATORY,
RICHMOND,
SURREY,

August, 1950.

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1939 APRIL, MAY, JUNE.

April 1d. 2h. Undetermined 'quake.

Apia e = 2m.3s. and 5m.0s.
Wellington eP? = 7m.54s., i = 12m.20s., S? = 13m.45s., L_q = 14m.10s., L = 15·7m.
Riverview eE = 10m.30s. and 14m.17s., eLN = 17·4m.
Vladivostok eP = 11m.47s., eS = 21m.9s., eL = 32·9m.
Christchurch eSN? = 13m.6s., eL_q = 15m.45s., eEN = 18m.20s.
Brisbane iE = 13m.24s., eE = 15m.36s.
Sydney e = 14m.1s. and 17m.0s.
La Jolla iPZ = 14m.4s.
Batavia PZ = 14m.5s., iN = 23m.37s.
Mount Wilson iP = 14m.5s.
Pasadena eP = 14m.5s.
Riverside iPZ = 14m.7s.
Haiwee ePE = 14m.12s.
Tinemaha ePEN = 14m.15s.
Tucson iP = 14m.30s., i = 14m.37s., 15m.32s., and 38m.56s.
Melbourne e = 15m.43s., i = 18m.59s. and 20m.39s., L = 24·7m.
Adelaide e = 17m.52s., i = 18m.52s.
Tiflis eZ = 21m.54s., eE = 25m.24s., eLZ = 74·0m.
Uccle ePKP = 22m.0s., eL = 71·0m.
Ksara PKP = 22m.5s., i = 22m.38s., ePP = 25m.27s., PPS = 38m.24s., L = 78·0m.
Stuttgart eZ = 22m.5s., 22m.12s., eL = 89·0m.
Strasbourg ePKPZ = 22m.6s., eE = 27m.35s., eLE = 81·0m.
Rome ePKPZ = 22m.19s., eZ = 23m.37s., ePPZ = 26m.9s., ePPPN = 28m.39s., eZ = 31m.54s., eSSE = 45m.25s., eL = 67·4m.
Helwan iZ = 22m.20s.
Huancayo e = 28m.6s.
Sverdlovsk S = 39m.11s., L = 48·0m.
Long waves were also recorded at Moscow, Pulkovo, Paris, Edinburgh, Tashkent, Harvard, and De Bilt.

April 1d. 21h. 4m. 55s. Epicentre 37·3N. 20°·6E. (as on 1938 December 26d.).

A = +·7465, B = +·2806, C = +·6034; δ = +9; h = −1;
D = +·352, E = −·936; G = +565, H = +·212, K = −·797.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		5·8	21	e 1 25	− 4	—	—	—	—	i 3·3
Belgrade		7·5	359	e 1 46a	− 7	i 4 10	S_g	e 2 17	P*	—
Istanbul		7·6	57	3 35	S	(3 35)	+12	4 59	L	(5·0)
Rome		7·8	308	e 2 10	P*	e 3 43	+15	4 26	S_g	i 4·8
Bucharest		8·2	28	e 3 33	S	(e 3 33)	− 5	4 21	S_g	i 5·1
Szeged		8·9	358	e 2 32	P*	e 4 15	* S*	—	—	e 5·4
Kecskemet	z.	9·6	356	e 2 32	PP	e 4 1	−11	—	—	e 5·5
Triest		9·8	331	e 2 33	+ 9	e 4 28	+11	i 5 29	S_g	—
Budapest		10·2	354	—	—	e 3 53	−34	e 6 9	?	—
Helwan		11·6	127	2 47	− 3	e 5 14	+13	—	—	e 9·0
Chur		12·6	323	e 3 1	− 2	e 5 12	−14	—	—	—
Ksara		12·9	101	e 3 19	PP	—	—	—	—	6·3
Zurich		13·4	322	e 3 19	+ 5	e 5 37	− 8	—	—	—
Basle		14·0	321	e 3 27	+ 5	e 6 13	SS	—	—	—
Neuchatel		14·0	318	e 3 26	+ 4	—	—	—	—	—
Stuttgart		14·1	328	e 6 15	S	(e 6 15)	SS	—	—	e 8·4
Strasbourg		14·6	325	e 3 45	PP	6 48	SSS	—	—	—
Hamburg		17·8	338	—	—	e 6 5?	?	—	—	—
Tiflis		19·2	69	e 4 30	+ 2	e 8 5	+ 6	e 8 23	SS	e 11·2
Moscow		21·7	28	4 46	− 9	e 8 51	0	—	—	e 10·6
Pulkovo		23·3	13	5 5	− 5	e 9 18	− 2	—	—	e 10·9

Additional readings :—
Belgrade eSS = +2m.27s.
Rome iN = +4m.42s.
Szeged e = +3m.0s.
Kecskemet eZ = +2m.53s.
Triest e = +2m.41s., +4m.5s., and +5m.59s.
Strasbourg e = +4m.14s., +4m.26s., and +4m.51s.
Tiflis eN = +8m.10s.
Long waves were also recorded at Moncalieri and Sverdlovsk.

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April 1d. Readings also at 0h. (Collmberg (2)), 2h. (Mount Wilson, Pasadena, Riverside, and Tucson), 4h. (La Paz, College (2), and near Tananarive), 5h. (Riverview, Samarkand, and Almata), 7h. (near Balboa Heights), 8h. (near Algiers), 11h. (Vera Cruz, Tacubaya, Almata, Tucson, Riverside, and Mount Wilson), 12h. (Ksara, Tucson, Riverside, Mount Wilson, Pasadena, Collmberg, and Apia), 13h. (Riverside, Mount Wilson, and Tucson), 17h. (Balboa Heights), 18h. (Fordham), 19h. (Moncalieri, Tinemaha, Riverside, Mount Wilson, and Pasadena), 20h. (Sotchi), 21h. (near Triest, Riverside, Mount Wilson, Pasadena, Tucson, and Apia), 22h. (Fordham).

April 2d. Readings at 0h. (Sofia and Tucson), 1h. (near Wellington), 2h. (Tucson, Riverside, Mount Wilson, La Paz, and Pasadena), 3h. (Almata, Tchimkent, Semipalatinsk, and Andijan), 4h. (Ksara, Tucson, Riverside, Mount Wilson, and Vladivostok), 5h. (Tucson, Berkeley, Fresno, Lick, near Branner, Balboa Heights, La Paz, and Fort de France), 6h. (Wellington, New Plymouth, and Christchurch), 7h. (Mizusawa), 10h. (La Paz), 11h. (Tucson, Mount Wilson, Riverside, and Pasadena), 13h. (Collmberg), 14h. (Grozny, Agra, Bombay, Almata (2), Tchimkent (2), Semipalatinsk, Andijan (2), Sverdlovsk, Frunse (2), Samarkand (2), and Tiflis), 16h. (Samarkand, Andijan, Tchimkent, and Tucson), 18h. (near Tananarive), 19h. (Tashkent, Baku, Pulkovo, Tchimkent, Andijan, Samarkand, Tiflis, Frunse, Sverdlovsk, Semipalatinsk, and Almata), 20h. (Samarkand, Fort de France, Vladivostok, and Harvard), 21h. (College).

April 3d. 11h. Local Japanese shock.

Tokyo Imp. Univ. gives epicentre as 35°·38N. 140°·42E.

Komaba P = 18m.41s., S = 18m.51s.
Tokyo Imp. Univ. P = 18m.41s., S = 18m.50s.
Kamakura P = 18m.44s.
Kiyosumi P = 18m.44s., S = 18m.49s.
Koyama P = 18m.44s., S = 19m.5s.
Okiziku P = 18m.44s., S = 18m.53s.
Mitaka P = 18m.44s., S = 18m.55s.
Titibu P = 18m.44s., S = 19m.1s.
Tukubasan P = 18m.44s., S = 18m.56s.
Susaki P = 18m.46s., S = 19m.5s.
Mizusawa ePE = 19m.55s., eSE = 20m.26s.

April 3d. 15h. 46m. 6s. Epicentre 19°·9S. 169°·0E. (as on 1938 May 30d.).

A = −·9232, B = +·1795, C = −·3397; δ = −9; h = +5;
D = +·191, E = +·982; G = +·333, H = −·065, K = −·941.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	16·4	240	i 3 54	+ 1	i 7 6	+10	—	—	—
Riverview		21·0	224	i 4 44k	− 3	e 8 33	− 4	—	—	e 10·2
Sydney		21·0	224	e 3 24	?	e 8 12	−25	—	—	—
Wellington		21·8	169	4 38	−18	e 8 44	− 8	—	—	e 9·9
Christchurch		23·7	174	—	—	e 9 6	−21	e 10 5	SS	e 12·1
Melbourne		27·4	224	—	—	e 10 34	+ 6	—	—	14·2
Adelaide		30·7	234	—	—	e 11 41	+20	e 12 32	SS	15·8
Pasadena		87·7	53	e 12 57	+ 5	—	—	—	—	e 41·9
Riverside	Z.	88·2	53	e 12 59	+ 5	—	—	—	—	—
Haiwee	E.	88·7	51	e 13 1	+ 4	—	—	—	—	—
Tucson		92·5	56	13 19k	+ 5	—	—	—	—	43·5
St. Louis		110·4	54	—	—	e 46 40	?	—	—	e 55·9
Ottawa		121·6	47	e 18 59	[+ 3]	—	—	—	—	59·9
Ksara		136·3	298	e 20 37	?	—	—	—	—	—
Collmberg	Z.	143·5	334	e 19 44	[+ 7]	—	—	—	—	—

Additional readings :—
Riverview eE = +8m.40s.
Melbourne i = +10m.46s.
Pasadena iZ = +13m.12s.
Riverside iZ = +13m.15s.
Tucson P = +13m.35s.
Ottawa iZ = +19m.16s.
Ksara e = +23m.20s. and +33m.14s.
Collmberg iZ = +19m.51s., +19m.59s., and +20m.4s., eZ = +20m.12s.

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April 3d. Readings also at 1h. (near Mizusawa, Frunse, and Andijan), 2h. (near Rome, Triest, and near Tucson), 5h. (near Fort de France), 7h. (La Paz and near Fresno), 8h. (Samarkand, Tchimkent, Tacubaya, Andijan, Sverdlovsk, Manila, and Batavia), 9h. (Batavia and Malabar), 12h. (Collmberg, Ksara, Haiwee, Riverside, Pasadena, Tinemaha, Mount Wilson, Triest, and Tucson), 16h. (Andijan), 17h. (Tiflis, San Juan, and Balboa Heights), 20h. (Fordham), 21h. (Vladivostok, Manila, Sverdlovsk, La Paz, and Melbourne), 23h. (Riverview and Melbourne).

April 4d. 10h. 10m. 56s. Epicentre 19°·9S. 169°·0E. (as on 1939, April 3d.).

$A = -\cdot 9232$, $B = +\cdot 1795$, $C = -\cdot 3397$; $\delta = -9$; $h = +5$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	16·4	240	i 4 4	PP	i 7 16	SS	—	—	i 8·1
Arapuni		19·0	164	—	—	9 28	?	—	—	12·1
Riverview		21·0	224	i 5 4a	+17	i 9 6	SS	5 27	PP	e 10·8
Sydney		21·0	224	e 5 10	PP	e 9 10	SS	—	—	e 11·1
Wellington		21·8	169	e 4 36a	−20	10 7	?	—	—	13·1
Christchurch		23·7	174	e 4 40	−34	e 10 10	SS	11 56	L_q	e 14·4
Melbourne		27·4	224	i 5 14	−35	i 10 43	+15	—	—	13·2
Adelaide		30·7	234	—	—	i 12 54	SS	—	—	17·0
Honolulu		52·3	41	e 9 29	+14	—	—	e 12 32	PPP	e 23·4
Manila		58·4	303	e 9 46	−14	17 35	−27	—	—	27·4
Batavia		61·8	275	e 10 18	− 5	18 30	−16	—	—	—
Hong Kong		68·1	306	19 39	S	(19 39)	−24	—	—	—
Medan		72·8	281	e 11 40	+ 8	e 21 21	+23	—	—	—
Santa Clara		86·4	49	e 12 41	− 4	—	—	—	—	e 46·7
Ukiah		86·4	47	—	—	e 23 7	[− 3]	—	—	e 35·1
Pasadena		87·7	53	e 12 51	− 1	—	—	—	—	e 39·1
Mount Wilson	Z.	87·8	53	e 12 58	+ 6	—	—	—	—	—
Riverside	Z.	88·2	53	e 12 54	0	—	—	—	—	—
Tinemaha	Z.	88·9	50	e 12 58	0	—	—	—	—	—
Victoria		90·7	38	e 7 4	?	e 25 4?	PS	—	—	37·1
Colombo	E.	91·5	277	—	—	23 54	[+12]	—	—	—
Tucson		92·5	56	13 16a	+ 2	—	—	—	—	i 41·7
Kodaikanal	E.	94·9	280	i 23 56	S	(i 23 56)	[− 5]	—	—	—
Bombay		101·8	286	—	—	e 24 28	[− 8]	—	—	e 57·1
Huancayo		109·2	111	—	—	e 34 32	SS	e 35 14	PSPS	52·7
Tashkent		110·1	308	18 50	[+17]	e 28 22	PS	e 33 58	SS	—
St. Louis	E.	110·4	54	e 19 24	PP	e 28 33	PS	e 33 32	?	e 49·1
Chicago		112·9	51	e 19 20	PP	e 28 47	PS	—	—	e 48·1
Sverdlovsk		116·5	325	e 14 21	P	e 29 24	PS	e 35 21	SS	45·6
Ottawa		121·6	47	e 18 54	[− 2]	—	—	—	—	56·1
Philadelphia		122·2	54	—	—	e 30 16	PS	e 37 37	PSPS	e 60·2
San Juan		128·1	81	e 22 29	PKS	e 32 56	PPS	—	—	e 58·6
Tiflis		128·6	308	e 19 31	[+22]	—	—	e 20 52	PP	e 62·1
Ksara		136·3	298	e 19 24	[0]	35 55	PPS	e 22 54	PP	—
Helwan	E.	140·6	294	e 22 36	PP	e 28 28	{−56}	—	—	—
Stuttgart		147·0	336	e 19 38	[− 5]	—	—	—	—	e 87·1
Kew		147·5	347	e 19 39	[− 4]	—	—	—	—	e 79·1
Strasbourg		147·7	337	i 19 35	[− 9]	—	—	e 23 1	PP	e 77·1
Basle		148·6	336	e 19 43	[− 2]	—	—	—	—	—
Paris		149·2	342	e 19 44	[− 2]	—	—	—	—	81·1
Rome		150·5	321	e 19 36a	[−12]	—	—	i 23 15	PP	e 66·1

Additional readings :—
Arapuni i = +10m.34s.
Riverview PPPN = +5m.38s., iSE = +9m.9s., SSEN = +9m.42s.
Christchurch e = +5m.58s.
Batavia iE = +18m.16s.
Medan iE = +20m.42s.
Tucson P = +13m.20s.
Sverdlovsk e = +27m.16s.
Rome iPKP$_2$Z = +19m.50s., i = +19m.59s., iEN = +20m.13s., iN = +20m.39s. and +21m.9s., iZ = +21m.31s., iE = +21m.57s. and +22m.24s., iZ = +22m.58s., iE = +24m.14s. and +26m.0s.
Long waves were also recorded at Tananarive, Berkeley, La Paz, Pulkovo, Moscow, Baku, De Bilt, Bidston, Vermont, Butte, East Machias, Harvard, College, Sitka, and San Fernando.

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April 4d. Readings also at 2h. (Grozny and Tiflis), 3h. (Collmberg, Sverdlovsk, Sotchi, near Mizusawa, Haiwee, Tinemaha, Mount Wilson, and Tucson), 4h. (Tashkent), 6h. (Mizusawa), 7h. (La Paz and near Mizusawa), 9h. (Tacubaya and Puebla), 10h. (Tucson, Mount Wilson, Haiwee, Tinemaha, Tashkent, Williamstown, Guadalajara, and Riverside), 11h. (Tiflis, Tucson, Adelaide, Riverview, Melbourne, near Manila, and Brisbane), 12h. (Medan), 13h. (Triest, Collmberg, San Juan, near Fort de France, Tucson, Rome, and Sofia), 14h. (near Granada, Almeria, and Toledo), 16h. (Batavia, Colombo, Granada, Almeria, Toledo, Tiflis, Tucson, Manila, Vladivostok, Tashkent, Sverdlovsk, Grozny, Ksara, and Samarkand), 17h. (Grozny), 18h. (Grozny, Ottawa, Semipalatinsk, Tchimkent, Andijan, Frunse, Almata, Samarkand, Sverdlovsk, and Tashkent), 19h. (near Toledo, Almeria, and Granada), 20h. (Pulkovo, Ksara, Stuttgart, Copenhagen, Cernauti, Moscow, Istanbul, Grozny, Bucharest, Tashkent, Sverdlovsk, Baku, Tiflis, Rome, Sofia, and Sotchi), 21h. (Manila), 23h. (Manila).

April 5d. 16h. 42m. 39s. Epicentre 19°·9S. 169°·0E. (as on 1939 April 4d.).

Pasadena suggests depth 70kms.

$A = -\cdot9232$, $B = +\cdot1795$, $C = -\cdot3397$; $\delta = -9$; $h = +5$;
$D = +\cdot191$, $E = +\cdot982$; $G = +\cdot333$, $H = -\cdot065$, $K = -\cdot941$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	16·4	240	i 3 51	− 2	i 7 3	+ 7	—	—	—
Arapuni		19·0	164	4 27	+ 1	8 3	+ 8	i 8 21	SS	—
Apia		19·4	76	e 4 32	+ 2	i 8 40	SSS	i 4 43	pP	—
Riverview		21·0	224	i 4 50a	+ 3	i 8 46	+ 9	5 8	PP	e 10·4
Sydney		21·0	224	i 4 51	+ 4	i 8 51	+14	e 5 20	PPP	10·4
Wellington		21·8	169	5 0a	+ 4	9 20	SS	5 35	PPP	11·0
Christchurch		23·7	174	i 5 17a	+ 3	i 9 33	+ 6	i 8 49	P_cP	11·9
Melbourne		27·4	224	5 45	− 4	10 24	− 4	—	—	13·0
Adelaide		30·7	234	e 8 20	?	i 11 18	− 3	i 13 19	SSS	i 15·8
Palau		43·5	306	8 7	0	14 11	−25	—	—	—
Perth		48·1	245	9 11	+28	i 15 54	+13	i 10 18	PP	25·0
Honolulu		52·3	41	e 9 19	+ 4	e 16 36	− 4	e 11 28	PP	21·9
Manila		58·4	303	i 9 55k	− 5	18 7	+ 5	—	—	28·4
Batavia		61·8	275	i 10 20k	− 3	18 42	− 4	—	—	e 25·4
Numadu		61·8	333	10 29	+ 6	18 47	+ 1	—	—	—
Tokyo Cen. Met. Ob.		61·9	335	10 24	0	18 44	− 3	—	—	—
Yakusima		62·3	324	10 20	− 6	18 45	− 7	—	—	—
Nagoya		62·7	333	10 30	+ 1	18 55	− 2	—	—	—
Kobe		63·2	330	10 29	− 3	18 58	− 5	—	—	—
Sendai		63·7	337	10 37	+ 1	19 5	− 5	—	—	—
Toyooka		64·0	329	10 40	+ 2	19 18	+ 5	—	—	—
Mizusawa		64·3	338	e 10 38	− 1	e 19 12	− 5	—	—	e 26·4
Taihoku		64·3	313	e 10 47	+ 8	19 18	+ 1	—	—	—
Nagasaki		64·4	326	10 38	− 2	19 16	− 2	—	—	—
Wazima		64·6	333	10 38	− 3	19 14	− 7	—	—	—
Hukuoka		64·8	327	e 10 43	0	19 12	−11	—	—	26·7
Akita		65·2	338	10 44	− 1	19 14	−14	—	—	—
Mori		67·1	339	10 59	+ 2	19 58	+ 7	—	—	—
Hong Kong		68·1	306	11 2a	− 2	20 7	+ 4	20 29	PS	32·0
Zi-ka-wei	Z.	68·4	318	i 11 1a	− 5	19 53	−14	14 11	PP	32·6
Vladivostok		71·5	334	i 11 22	− 2	i 20 43	0	—	—	e 34·8
Medan		72·8	281	11 32	0	i 20 55	− 3	—	—	38·4
Phu-Lien		73·3	300	e 11 33	− 2	21 5	+ 1	—	—	—
Branner		86·3	49	e 12 46	+ 1	e 23 15	− 5	e 24 15	PS	e 36·8
Berkeley		86·4	49	i 12 43k	− 2	e 22 56	[−14]	e 24 12	PS	e 40·6
Ukiah		86·4	47	e 12 45	0	23 17	− 4	e 16 12	PP	e 35·0
Lick	E.	86·6	49	e 12 48	+ 2	e 23 13	[+ 1]	—	—	e 40·2
Santa Barbara		86·7	53	i 12 49	+ 2	—	—	—	—	—
Fresno	N.	87·7	50	e 12 53	+ 1	e 23 29	− 4	—	—	—
Pasadena		87·7	53	i 12 51k	− 1	i 23 35	+ 2	i 24 45	PS	i 36·4

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		87·8	54	i 12 51	− 1	—	—	—	—	—
Mount Wilson		87·8	53	i 12 51k	− 1	—	—	e 38 49	P′P′	—
Riverside		88·2	53	i 12 53k	− 1	e 23 17	[− 4]	e 38 51	P′P′	—
Sitka		89·7	27	e 12 49	−12	23 28	[− 3]	i 13 18	pP	—
Calcutta	N.	89·8	294	i 13 11a	+ 9	e 23 30	[− 2]	e 16 42	PP	40·6
Victoria		90·7	38	i 13 1	− 5	23 31	[− 6]	16 45	PP	41·4
College		90·8	16	e 13 5	− 1	e 23 32	[− 6]	e 25 21	PS	e 36·0
Seattle		91·1	39	e 13 4	− 4	e 23 30	[− 9]	e 17 17	PP	—
Colombo	E.	91·5	277	13 21?	+11	23 21?	[−21]	30 21?	SSP	47·9
Tucson		92·5	56	i 13 14k	0	24 10	−7	i 13 37	pP	i 41·5
Kodaikanal	E.	94·9	280	i 13 25k	0	i 24 1	[+ 1]	i 17 16	PP	—
Salt Lake City		95·0	48	—	—	e 24 10	[+ 9]	26 17	PS	—
Hyderabad		96·3	287	13 37	+ 5	24 7	[− 1]	17 25	PP	42·2
Butte		96·4	43	e 13 47	+15	e 23 57	[−12]	26 14	PS	e 40·4
Bozeman		97·3	44	e 17 26	PP	e 24 20	[+ 7]	e 26 29	PS	e 40·4
Agra		99·7	296	i 13 44k	− 3	24 22	[− 3]	17 44	PP	47·5
Dehra Dun	N.	100·6	299	—	—	e 24 18	[−12]	—	—	e 52·4
Bombay		101·8	286	i 13 57	+ 1	i 24 36	[0]	e 18 7	PP	49·8
Saskatoon		102·2	38	—	—	e 24 33	[− 5]	e 28 21?	PPS	47·4
Semipalatinsk		104·4	319	e 18 13	PP	—	—	—	—	—
Almata		104·9	312	e 17 38	?	—	—	—	—	—
Frunse		106·5	311	e 17 44	?	e 25 8	[+11]	—	—	—
Andijan		107·3	308	e 19 10	PP	—	—	—	—	47·4
Little Rock		108·0	59	e 19 3	PP	i 25 6	[+ 2]	i 28 16	PS	50·4
Huancayo		109·2	111	e 19 3	PP	e 25 1	[− 8]	28 19	PS	—
La Plata		109·5	140	19 9	PP	28 27	PS	34 51	SS	45·4
Tchimkent		110·0	310	e 18 21	[−12]	e 25 11	[− 1]	—	—	—
Tashkent		110·1	308	18 15	[−18]	i 25 8	[− 4]	e 19 3	PP	e 57·4
Florissant		110·3	54	e 14 32	P	i 26 14	{+ 7}	i 19 8	PP	50·4
St. Louis		110·4	54	e 14 30	P	i 25 7	[− 6]	i 19 3	PP	e 42·4
Cape Girardeau		110·7	55	e 19 3	PP	—	—	—	—	e 62·4
Tananarive		110·8	241	e 19 16	PP	25 17	[+ 2]	28 42	PS	e 47·8
Samarkand		111·5	306	e 18 32	[− 4]	—	—	—	—	—
Chicago		112·9	51	e 18 40	[+ 2]	e 25 26	[+ 3]	e 19 14	pP	e 45·6
La Paz	Z.	113·2	119	e 15 23	P	i 25 39	[+15]	i 19 39	PP	52·4
Sverdlovsk		116·5	325	14 57	P	i 25 30	[− 7]	i 29 29	PS	48·4
Columbia		117·1	60	—	—	e 25 39	[0]	e 29 46	PS	—
Toronto		119·0	50	18 57	[+ 6]	25 39	[− 8]	20 9	PP	53·4
Cape Town		119·5	208	e 19 20	PP	25 48	[0]	30 20	PS	54·4
Georgetown		120·7	55	e 18 57	[+ 3]	e 25 49	[− 3]	e 20 13	PP	57·4
Ottawa		121·6	47	i 18 54	[− 2]	25 59	[+ 4]	i 20 17	PP	51·4
Philadelphia		122·2	54	—	—	e 28 7	{+39}	e 30 11	PS	e 50·5
Fordham		123·1	53	i 18 58	[− 1]	i 26 4	[+ 4]	i 20 36	PP	—
Vermont		123·5	50	e 20 41	PP	e 25 57	[− 4]	e 30 31	PS	e 51·5
Shawinigan Falls		123·6	46	e 19 3	[+ 3]	—	—	—	—	55·4
Williamstown		123·6	51	e 18 58	[+ 2]	—	—	i 20 37	PP	e 66·8
Baku		124·7	306	e 19 5	[+ 4]	e 26 19	[+14]	i 20 55	PP	57·4
Seven Falls		124·8	45	19 6	[+ 4]	26 6	[+ 1]	20 42	PP	59·4
Harvard		124·8	51	19 1a	[− 1]	i 32 29	PPS	e 20 47	PP	e 62·4
Rio de Janeiro		127·1	142	e 21 3	PP	i 32 43	PPS	e 39 20	SS	e 52·7
Grozny		127·5	310	e 19 8	[+ 1]	—	—	24 12	PPP	46·4
East Machias		127·6	48	e 21 11	PP	e 26 19	[+ 6]	e 31 13	PS	—
San Juan		128·1	81	e 19 10	[+ 2]	i 28 8	{+ 1}	e 21 11	PP	e 52·8
Tiflis		128·6	308	i 19 9	[0]	e 26 19	[+ 3]	i 21 13	PP	e 47·4
Erevan		128·8	306	e 19 21	[+12]	—	—	—	—	—
Scoresby Sund		129·1	5	19 10a	[0]	25 33	[−43]	39 21	SSP	—
Moscow		129·2	327	e 15 53	P	26 11	[− 6]	21 13	PP	61·9
Halifax		130·2	47	e 18 45	[−27]	e 39 21?	SSP	e 22 35	?	48·4
Pulkovo		130·6	334	e 19 13	[0]	e 31 23	PS	e 21 23	PP	e 56·0
Ivigtut		131·3	23	19 13	[− 1]	33 33	PPS	21 28	PP	53·4

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Sotchi		131·8	312	e 19 14	[− 1]	—	—	— —	—
Fort de France		132·0	88	e 19 14	[− 2]	i 22 40	?	— —	e 24·3
Upsala		135·2	341	e 21 53	PP	e 28 49	{− 3}	e 40 21? SSP	e 59·4
Ksara		136·3	298	i 19 25k	[+ 2]	—	—	i 19 43 pPKP	—
Bergen		138·0	349	e 19 26	[− 1]	—	—	e 23 2 PP	e 63·4
Cernauti		138·2	323	e 19 40	[+13]	—	—	— —	67·4
Istanbul		140·0	312	18 53	[−38]	29 23	{+ 2}	22 33 PP	—
Copenhagen		140·6	340	e 19 24a	[− 7]	29 27	{+ 3}	i 22 27 PP	59·4
Helwan		140·6	294	i 19 26k	[− 5]	26 23	[− 7]	22 27 PP	—
Bucharest		140·8	318	i 19 21	[−10]	i 29 36	{+10}	i 22 41 PP	66·4
Aberdeen	N.	142·3	352	i 19 31	[− 3]	i 29 33	{− 2}	i 22 49 PP	60·4
Hamburg		142·8	340	e 19 29	[− 6]	e 41 27	SS	e 22 58 PP	e 62·9
Heligoland		142·8	343	e 19 40	[+ 5]	e 29 37	{− 1}	e 22 43 PP	e 61·9
Budapest	E.	143·3	326	19 34	[− 2]	29 38	{− 2}	— —	79·4
	N.	143·3	326	19 30	[− 6]	29 49	{+ 9}	35 9 PPS	79·4
Kecskemet	Z.	143·3	325	i 19 33	[− 3]	e 30 39	{+59}	e 23 25 PKS	e 67·4
Sofia		143·3	316	19 34	[− 2]	27 39	[+55]	41 33 SS	47·4
Collmberg		143·5	334	e 19 32a	[− 4]	e 26 59	[+15]	i 22 11 PP	e 67·8
Szeged		143·5	324	e 19 32	[− 4]	e 26 31	[−13]	e 23 38 PKS	e 67·9
Edinburgh		143·6	353	e 20 21?	[+45]	i 33 5	PS	i 41 40 SS	e 59·4
Prague		143·8	332	e 19 45?	[+ 9]	e 42 21	SSP	e 23 45 PKS	e 63·4
Belgrade		144·1	321	i 19 34a	[− 3]	i 26 57	[+11]	i 23 30 PP	56·1
Jena		144·4	334	i 19 32	[− 5]	e 33 3	PS	e 22 50 PP	e 61·4
Göttingen		144·5	338	i 19 35	[− 3]	—	—	— —	e 64·4
Durham		144·5	351	i 19 36	[− 2]	i 29 46	{− 1}	i 23 33 PKS	—
Cheb		144·7	334	e 19 38	[0]	e 29 48	{ 0}	e 22 57 PP	e 68·4
De Bilt		145·5	343	i 19 38k	[− 2]	—	—	i 23 19 PP	70·7
Bidston		146·1	352	i 19 43	[+ 2]	i 42 27	SS	i 23 6 PP	e 61·4
Rathfarnham Castle		146·5	355	i 19 47	[+ 5]	i 33 11	PS	i 23 18 PP	e 64·6
Laibach	N.E.	146·6	327	e 19 45	[+ 3]	—	—	— —	e 74·8
Uccle		146·9	343	e 19 42k	[0]	e 26 33	[−16]	i 23 13 PP	e 62·4
Stuttgart		147·0	336	i 19 42k	[− 1]	e 30 8	{+ 6}	e 23 0 PP	e 73·4
Triest		147·3	328	e 19 42k	[− 1]	30 3	{ 0}	20 35 pPKP	e 64·4
Oxford		147·4	348	i 19 50	[+ 7]	e 42 11	SS	— —	e 51·9
Kew		147·5	347	i 19 41k	[− 2]	i 33 28	PS	i 23 32 PP	e 60·4
Strasbourg		147·7	337	i 19 38	[− 5]	i 26 28	[−23]	i 20 15 pPKP	e 65·9
Chur		148·4	334	e 19 43	[− 1]	—	—	— —	—
Zurich		148·4	335	e 19 45k	[+ 1]	—	—	— —	—
Basle		148·6	336	e 19 45	[0]	—	—	— —	—
Paris		149·2	342	e 19 46	[0]	—	—	23 24 PP	69·4
Neuchatel		149·3	335	e 19 45	[− 1]	—	—	— —	—
Jersey		150·0	350	e 20 3	[+16]	e 43 0	SS	e 23 54 PP	e 72·4
Rome		150·5	321	i 19 47k	[− 1]	26 31	[−23]	i 23 38 PP	i 48·9
Moncalieri		150·6	334	20 10	[+22]	33 43	PS	— —	48·6
Clermont Ferrand		151·0	338	e 19 56	[+ 7]	e 42 51	SS	— —	—
Bagnères		155·1	340	19 58	[+ 4]	e 26 45	[−15]	e 21 25 pPKP	e 74·4
Algiers		159·2	326	e 19 50	[−10]	31 8	{ 0}	23 50 PP	e 61·4
Toledo		159·3	345	e 20 1	[+ 1]	e 44 29	SS	e 24 19 PP	—
Almeria		161·5	338	e 20 18	[+16]	—	—	e 24 36 PP	e 83·3
Granada		161·7	341	i 20 1	[− 1]	44 55	SS	20 53 pPKP	70·7
San Fernando		163·0	347	e 20 12	[+ 8]	i 45 17	SS	e 24 58 PP	82·4

Additional readings :—
Apia PP = +5m.10s.
Riverview iEN = +4m.59s., N = +9m.37s.
Wellington i = +5m.43s., iZ = +6m.28s., i = +6m.58s. and +7m.47s., PcP = +9m.1s., i = +9m.33s. and +9m.56s.
Melbourne i = +5m.56s.
Adelaide i = +9m.29s., +13m.53s., and +15m.14s.
Perth PP? = +11m.11s., PPP? = +11m.51s., i = +13m.28s., +14m.21s., +14m.34s., +16m.21s., +17m.24s., +18m.38s., +20m.4s., +20m.26s., and +20m.48s.
Honolulu eSP = +12m.6s., isS = +17m.24s.
Batavia iPEN = +10m.24s., iSE = +18m.48s.
Hong Kong PcP = +11m.17s., PP = +13m.28s., ScS = +21m.4s., SS = +24m.27s.
Zi-ka-wei iZ = +11m.15s., +11m.35s., +12m.3s., and +12m.23s., PPPZ = +15m.27s., PPPPZ = +16m.33s., iN = +20m.7s., iZ = +20m.15s. and +21m.15s., SSZ = +24m.41s., SSSZ = +27m.21s., SSSSZ = +29m.15s.
Medan iEN = +11m.40s.

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Berkeley eP = +12m.47s., eZ = +23m.30s.
Ukiah esPP = +16m.52s., SS = +28m.59s.
Pasadena eN = +23m.15s., iE = +23m.22s., and +25m.35s., eSSN = +29m.58s., ePKP, PKPZ = +38m.59s.
Riverside e = +23m.27s.
Sitka P = +12m.54s., pPP = +17m.1s., SKS = +22m.35s., ipS = +23m.55s., isS = +24m.1s., iPS = +25m.10s., isPS = +25m.14s.
Calcutta N. ePPP = +18m.44s., iS = +24m.6s., iPS = +25m.4s., iPPS = +25m.33s., eSS = +30m.18s., eSSS = +33m.54s.
Victoria PS = +25m.15s., SS = +30m.33s., SSS = +33m.45s., e = +36m.21s. ?
Tucson isP = +13m.50s., i = +14m.1s., +14m.6s., +14m.28s., +14m.54s., +15m.6s., +15m.12s., +15m.16s., +16m.10s., and +16m.22s., i = +17m.0s., iPP = +17m.6s., ipPP = +17m.25s., isPP = +17m.47s., i = +18m.2s., +18m.38s., and +19m.3s., iPPP = +19m.7s., i = +20m.45s., and +23m.43s., iSKKS = +23m.51s., i = +23m.55s., i = +24m.23s. and +24m.27s., iPS = +24m.47s., iSP = +25m.15s., i = +25m.28s., iPS = +25m.46s., i = +26m.17s., iSS = +33m.47s., isSS = +34m.36s. i = +37m.54s., iPKP,PKP = +38m.47s.
Kodaikanal E. iPPP = +19m.21s., iSKKS = +24m.34s., iS = +24m.49s., PS = +25m.56s., PPS = +26m.24s., iSS = +31m.11s., iSSS = +35m.11s.
Salt Lake City i = +22m.24s., eSSS = +33m.39s.
Hyderabad PSE = +25m.1s.
Butte eS = +24m.48s., eSS = +32m.0s.
Bozeman eSS = +31m.45s.
Agra eN = +17m.54s., SE = +25m.21s., PS = +26m.44s., SS = +32m.14s., SSS = +35m.44s.
Dehra Dun eN = +42m.24s.
Bombay ePN = +14m.0s., eEN = +14m.34s., eE = +16m.59s., iSKSEN = +24m.40s., iEN = +25m.8s. and +25m.44s., iPSN = +27m.17s., iE = +27m.27s., iEN = +28m.16s. and +32m.43s., iSSEN = +32m.56s., eSSSEN = +37m.1s., L_qN = +43m.7s.
Saskatoon SE ? = +27m.15s., eE = +33m.21s. ?
Little Rock i = +26m.6s., eS = +26m.42s., SS = +34m.21s.
Huancayo i = +23m.53s., i = +28m.12s., and +33m.34s., SS = +34m.6s., isSS = +35m.18s.
Tashkent PS = +28m.41s., SS = +34m.27s., SSS = +39m.51s.
Florissant iZ = +24m.39s., iSN = +26m.51s., ePSE = +28m.39s., iSSE = +35m.4s.
St. Louis eE = +14m.43s., iE = +19m.13s., iSKKSE = +26m.49s., eSN = +28m.41s.
Cape Girardeau eE = +40m.8s., iE = +40m.17s., eE = +41m.13s. and +42m.43s.
Tananarive SKKS = +26m.7s., SS = +34m.43s., SSS = +39m.1s.
Chicago eS = +27m.18s., eSP = +28m.56s., ePS = +29m.17s., eSS = +35m.11s., ePKP,PKP = +38m.58s.
La Paz iZ = +21m.21s., PS = +29m.5s., PPS ? = +30m.21s., iZ = +30m.51s., iSSZ = +36m.1s.
Sverdlovsk iPKP = +18m.39s., iPP = +19m.47s., iPPP = +22m.22s., iSKKS = +26m.46s., iPPS = +30m.55s., SS = +35m.57s.
Columbia eSS = +35m.53s.
Toronto SKKSE = +27m.6s., SN = +28m.0s., PSE = +29m.52s., PPSE = +31m.21s., SS = +36m.21s. ?, SSS = +40m.21s. ?
Cape Town eSKPE = +20m.35s., PPPE = +21m.30s., PPPN = +21m.36s., N = +24m.0s., SKKSN = +26m.2s., SN = +26m.52s., SE = +27m.10s., PSN = +28m.10s., PSE = +28m.28s., SSE = +34m.37s., N = +37m.58s., SSSE = +38m.54s.
Georgetown e = +19m.59s., eSKKS = +27m.14s., ePS = +30m.16s., ePPS = +31m.42s.
Ottawa SKKS = +27m.27s., SN = +28m.35s., PS = +30m.17s., SS = +37m.21s. ?
Philadelphia ePPS = +32m.57s., eSS = +37m.11s., eSSS = +41m.21s.
Fordham iZ = +20m.0s., iSKKSE = +27m.40s., eS = +28m.45s., iE = +30m.37s., iPPSE = +32m.15s., iSS = +37m.46s.
Vermont eSKSP = +30m.1s., ePPS = +32m.11s., eSS = +37m.31s., eSSS = +40m.57s.
Willimstown i = +22m.30s.
Baku iPKS = +22m.1s., iPPP = +23m.45s., eS = +28m.40s.
Seven Falls SKP = +22m.3s., SKKS = +27m.37s., PS = +30m.37s., PPS = +32m.23s., SS = +37m.48s., SSS = +41m.15s.
Harvard eSSE = +38m.21s.
Rio de Janeiro iSN = +32m.47s., eSSSN = +42m.43s.
East Machias i = +22m.29s., ePPS = +32m.59s., eSS = +38m.17s., eSSS = +44m.14s.
San Juan i = +22m.27s. and +31m.31s., epPS = +31m.36s., iSSS = +39m.13s.
Tiflis ePKPN = +19m.14s., iPPE = +21m.19s., iPKSZ = +22m.27s., iPKSE = +22m.32s., PPPZ = +23m.57s., ePPPN = +24m.9s., epPPPN = +24m.30s., iSKKSE = +28m.9s., eSPE = +31m.1s., eSPNZ = +31m.6s., eN = +33m.19s., eEZ = +33m.29s., eSSN = +38m.6s., SSZ = +38m.12s., esSSE = +38m.55s., SSSE = +42m.27s., eSSSN = +42m.31s.
Scoresby Sund +21m.12s., +22m.32s., and +31m.15s.
Moscow PKP = +19m.7s., PPP = +23m.38s., SKKS = +28m.8s., PS = +31m.12s., PPS = +32m.41s., SS = +38m.45s.
Pulkovo ePKS = +22m.35s., ePPS = +32m.57s., eSS = +38m.51s., eSSS = +43m.33s.
Ivigtut +22m.34s. and +39m.51s.
Fort de France PPP = +19m.36s., SS = +22m.50s., SSS = +22m.58s.

Continued on next page.

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Upsala iE = +22m.49s., i = +23m.6s., eE = +28m.54s., +38m.21s. ?, and +45m.21s. ?
Ksara PP = +21m.59s., ipPP = +22m.12s.
Istanbul PP = +23m.15s., PS = +32m.49s.
Copenhagen i = +19m.29s. and +23m.5s., iPKSEN = +23m.11s., eN = +24m.21s., PPP = +25m.27s., eEN = +31m.3s., SKSPN = +32m.33s., PPS = +34m.43s., SS = +40m.51s., eN = +45m.15s.
Helwan SKPZ = +23m.0s., eE = +29m.21s., PSKSE = +32m.45s., PPSE = +35m.1s., SSE = +40m.59s.
Bucharest ePKPN = +19m.43s., iE = +23m.11s., eN = +23m.27s., iE = +24m.25s., PPPE = +25m.27s., eN = +26m.25s., iE = +26m.33s., iSKSE = +27m.41s., SE? = +30m.47s., SSEN = +41m.1s., iE = +46m.50s.
Aberdeen iN = +19m.39s., +19m.51s., and +21m.36s., iPSKSN = +32m.59s., iPPSN = +35m.19s., iN = +38m.44s., iSSEN = +41m.21s., iSSSN = +47m.16s., iN = +54m.45s.
Hamburg eE = +51m.21s. ?
Heligoland eN = +23m.23s., eE = +46m.39s.
Budapest PPE = +22m.21s., PPN = +22m.26s.
Kecskemet ePKP$_2$Z = +19m.57s., eZ = +20m.59s., iZ = +22m.5s., eZ = +22m.15s., ePKSZ = +23m.9s., eZ = +26m.52s., ePSKSZ = +33m.7s.
Sofia SKKSEN = +29m.45s., PPSE = +35m.21s. ?, eE. +41m.41s.
Collmberg iZ = +19m.37s., i = +19m.44s., +19m.49s., +20m.19s., +20m.46s., and +22m.52s., iSKPZ = +23m.12s., iZ = +23m.21s., +23m.28s., +23m.39s., and +23m.57s., e = +24m.13s., +24m.25s., +25m.41s., and +28m.26s., eSKKS = +28m.44s., eSKSP = +32m.21s., ePS = +33m.9s., e = +35m.21s. and +41m.39s.
Szeged ePKP$_2$ = +19m.57s., eE = +20m.31s., eE = +26m.37s., eSKKSE = +30m.0s., ePSKSE = +33m.1s., ePSKSN = +33m.5s.
Edinburgh i = +34m.57s., +43m.17s., and +47m.40s.
Prague e = +20m.36s., +36m.15s., and +47m.33s.
Belgrade iZ = +20m.54s. and +22m.36s., iNW = +37m.56s., eNW = +41m.35s.
Jena iPN = +19m.35s., iPE = +19m.40s., eE = +22m.56s., eN = +23m.0s., eN = +32m.52s.
Durham iN = +19m.59s., +23m.13s., and +43m.29s.
Cheb e = +33m.5s. and +35m.33s.
Bidston i = +19m.50s., +20m.3s., +21m.5s., and +21m.30s., iPP = +23m.21s., iPSKS = +33m.33s., iPPS = +36m.29s., iSSS = +47m.48s.
Rathfarnham Castle i = +27m.40s., e = +48m.14s.
Laibach iNE = +20m.3s.
Uccle i = +20m.0s., +20m.52s., and +22m.6s., SKSP = +33m.30s., PPSN = +36m.0s., eSSE = +41m.58s., iSSSE = +47m.35s.
Stuttgart iPKP = +19m.45s. and +20m.1s., e = +20m.25s. and +20m.45s., ePPP = +26m.49s., eSKSP = +33m.38s., eSKKS$_2$ = +35m.47s., ePPS = +36m.46s., eSS = +42m.14s., eL$_g$ = +66·4m.
Triest iPKP$_2$ = +19m.46s., i = +22m.3s., iSKP = +23m.24s., PSKS = +33m.32s., iSS = +42m.17s., SSS = +47m.21s.
Kew iN = +19m.48s., iNZ = +20m.2s., iZ = +20m.27s., iNZ = +21m.1s. and +21m.26s., eE = +31m.32s., iPPSN = +36m.22s., iZ = +37m.31s., iE = +42m.12s., iSSEN = +42m.28s., esSSZ = +43m.32s., iSSSEN = +47m.52s., iZ = +53m.32s.
Strasbourg iZ = +20m.9s., iN = +22m.33s., iPPZ = +23m.33s., ipPPZ = +24m.8s., iZ = +24m.15s., iPSKS = +33m.11s., iSS = +42m.21s., isSS = +43m.36s.
Paris i = +19m.53s.
Jersey e = +24m.50s.
Rome iPKP$_2$Z = +19m.56s., iZ = +20m.59s., iSKPZ = +23m.30s., iZ = +24m.49s., iPPPZ = +26m.52s., iSKKSE = +30m.23s., i = +31m.19s., iPSKSE = +33m.55s., iE = +35m.9s., iZ = +36m.0s., i = +36m.21s., iEN = +38m.51s. and +39m.53s., iSSEN = +42m.57s., iE = +43m.51s., iN = +48m.21s., iSSSE = +48m.30s.
Bagnères ePKP$_2$N = +20m.37s., esPKPE = +21m.12s., ePPN = +23m.54s., epPPN = +24m.28s., isPPN = +25m.8s., PPPE = +27m.14s., epSKSN = +27m.55s., esSKSN = +28m.19s., ePSKS = +35m.19s., ePPSE = +37m.12s., eSSN = +43m.21s., eSSSE = +49m.27s.
Algiers PP = +21m.30s., PPS = +34m.34s., e = +50m.21s.
Toledo SKP = +23m.33s.
Granada iPP = +24m.23s., pPP = +25m.7s., SKS = +25m.49s., SKSP = +31m.13s., PPS = +39m.5s., SSS = +50m.43s.

April 5d. Readings also at 0h. (Rome and Helwan), 1h. (near Mizusawa and Samarkand), 2h. (Colombo, near Balboa Heights, Almata, Frunse, and Andijan), 4h. (Sverdlovsk, Tashkent, Vladivostok, Bombay, Agra, Calcutta, Phu-Lien, Medan, and Baku), 6h. (Adelaide, near Berkeley, San Franciso, and Riverview), 9h. (Tucson and near Manila), 12h. (near Tananarive and Melbourne), 13h. (near Fort de France, Tiflis, Riverview, and Grozny), 15h. (Bagnères), 17h. (Grozny and Tucson (3)), 18h. (near Branner, Almata, Frunse, Andijan (2), Tucson, and Mount Wilson), 19h. (Tucson), 20h. (Tucson and Pasadena), 23h. (Haiwee, Collmberg, Riverside (2), Sverdlovsk, Pasadena (2), Tucson (2), and Mount Wilson (2)).

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April 6d. 4h. 8m. 2s. Epicentre 35°·0N. 54°·5E.

$A = +\cdot4768$, $B = +\cdot6684$, $C = +\cdot5710$; $\delta = +14$; $h = 0$;
$D = +\cdot814$, $E = -\cdot581$; $G = +\cdot332$, $H = +\cdot465$, $K = -\cdot821$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		6·4	327	e 1 39	+ 1	—	—	—	—	i 3·4
Erevan		9·5	307	e 2 33	PPP	e 4 33	SSS	—	—	e 5·1
Tiflis		10·1	315	e 2 28	0	e 4 56	SSS	e 2 42	PP	6·0
Grozny		10·7	324	2 38	0	e 4 31	− 8	—	—	—
Samarkand		10·9	61	e 2 44	+ 4	5 16	SSS	—	—	—
Tashkent		13·2	57	e 3 7	− 4	i 6 1	SS	—	—	i 6·8
Tchimkent		13·8	54	i 3 18	− 1	e 5 58	+ 4	—	—	—
Sotchi		14·2	311	e 3 32	+ 8	—	—	—	—	—
Andijan		15·2	63	e 3 39	+ 1	e 9 17	L	—	—	(e 9·3)
Ksara		15·4	271	e 3 44	+ 4	e 6 40	+ 8	—	—	8·5
Frunse		17·4	57	e 4 2 •	− 4	—	—	—	—	—
Almata		19·2	57	e 4 31	+ 3	—	—	—	—	—
Helwan		20·2	262	i 4 38k	− 1	8 34	+13	5 13	PPP	e 11·9
Istanbul		20·9	296	8 41	S	(8 41)	+ 6	11 50	L	(11·8)
Agra	E.	21·6	104	e 4 55	+ 1	8 55	+ 6	—	—	—
Sverdlovsk		22·2	10	i 4 56	− 4	9 6	+ 6	11 34	L_q	14·2
Bombay		22·8	130	e 5 16	+11	i 9 26	+15	—	—	—
Moscow		23·8	337	e 5 11	− 4	e 9 27	− 1	—	—	17·5
Pulkovo		29·4	330	e 6 6	− 1	e 11 2	+ 1	—	—	e 13·7
Calcutta	N.	32·0	103	—	—	e 14 5	SSS	—	—	—
Kodaikanal	E.	32·3	133	—	—	e 11 58?	+12	—	—	—
Rome		33·3	295	5 51	−50	i 12 4	+ 2	—	—	e 17·3
Collmberg		33·9	311	i 6 44a	− 3	—	—	e 7 58	PP	—
Cheb		34·0	310	—	—	e 14 18	SS	—	—	e 21·0
Copenhagen		35·3	319	e 6 57	− 2	12 33	0	—	—	—
Hamburg	E.	36·1	316	—	—	e 12 46	+ 1	—	—	—
Colombo	E.	36·4	133	—	—	e 11 58?	−52	—	—	—
Vladivostok		58·7	55	e 9 39	−23	e 17 52	−14	—	—	e 19·5

Additional readings:—
Tiflis SZ = +5m.8s.
Helwan iZ = +4m.43s. and +5m.22s.
Collmberg iZ = +6m.48s., e = +8m.15s.
Copenhagen +12m.36s.
Long waves were also recorded at Strasbourg, De Bilt, Stuttgart, and Cape Town.

April 6d. Readings also at 0h. (Wellington, Tucson, Baku, De Bilt, Tiflis, Mount Wilson, Pasadena, Haiwee, and Riverside), 1h. (La Jolla, Rome, Tucson (2), Riverside, Haiwee, Pasadena (2), Mount Wilson, Baku, Collmberg (2), and La Paz), 2h. (Mizusawa, Collmberg, and Sverdlovsk), 3h. (Mizusawa, Baku, Sverdlovsk, and Collmberg), 4h. (Tiflis, Tashkent, Vladivostok, near La Paz, Mount Wilson, Tucson (2), Huancayo, Balboa Heights, San Juan, La Plata, and Bucharest), 5h. (Tucson (2), Mount Wilson, near Mizusawa, Collmberg, Pasadena, Harvard, Florissant, and Williamstown), 8h. (Collmberg, Mizusawa, and Tucson (2)), 9h. (Pasadena, Huancayo, La Paz, Riverside, St. Louis, and Tucson (2)), 10h. (Collmberg), 11h. (Jena), 14h. (Balboa Heights), 15h. (Fort de France), 17h. (Kew and Uccle), 18h. (Medan, Edinburgh, Jersey, Bidston, Stonyhurst, Paris, Grozny, Strasbourg, Stuttgart, Rathfarnham Castle, Tucson, Tashkent, Tiflis, Sverdlovsk, Baku, De Bilt, and Ksara), 20h. (Sverdlovsk), 21h. (near Manila, Hong Kong, Phu-Lien, Calcutta, Agra, near Berkeley, Lick, near San Francisco, Branner, Santa Clara, Ksara, De Bilt, Baku, Tiflis, Tashkent, Vladivostok, and Kew), 22h. (Triest).

April 7d. Readings at 0h. (Tucson), 2h. (Balboa Heights), 3h. (Balboa Heights), 5h. (Frunse, Andijan, Tchimkent, Samarkand, and Almata), 6h. (Fort de France, Mizusawa, Tashkent, and Sverdlovsk), 9h. (La Jolla, St. Louis, Tashkent, Sverdlovsk, Tiflis, Pasadena, Mount Wilson, and Riverside), 11h. (Wellington, Christchurch, and New Plymouth), 13h. (Lick, Fresno, Tashkent, Sverdlovsk, Tiflis, Pasadena, Mount Wilson, Riverside, and near Branner), 14h. (Tacubaya), 16h. (Tucson, Ksara, Baku, Vladivostok, Collmberg, Fordham, Osaka, Riverside, Mount Wilson, Pasadena, Tiflis, Sverdlovsk, Tashkent, and Mizusawa), 22h. (near Branner).

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April 8d. Readings at 5h. (Medan), 6h. (Tucson), 8h. (near Wellington), 9h. (Tucson, Medan, Batavia, Andijan, and Samarkand), 10h. (Collmberg, Chur, Zurich, Basle, Santa Barbara, Tucson, Haiwee, Melbourne, Rathfarnham Castle, Strasbourg, Ksara, Stuttgart, Uccle, Batavia, Mount Wilson, Pasadena, La Jolla, and Riverside), 12h. (Mizusawa and Tucson (2)), 13h. (Fordham, New Plymouth, and near Wellington), 14h. (Tucson, Grozny (2), Mount Wilson, Pasadena, La Jolla, and Riverside), 15h. (near Manila and Sverdlovsk), 17h. (Tashkent, Sverdlovsk, Samarkand, Andijan, Tchimkent, and Frunse), 19h. (Tucson, Bombay, and near Calcutta), 20h. (Andijan, Tchimkent, Frunse, and Almata), 21h. (Almata and Grozny), 22h. (Tucson), 23h. (near Fort de France, Grozny, and Balboa Heights).

April 9d. Readings at 1h. (near Balboa Heights and near Istanbul), 2h. (Andijan, Frunse, and Samarkand), 3h. (Strasbourg), 8h. (Mizusawa), 9h. (near Taihoku), 10h. (Tucson), 13h. (Balboa Heights), 15h. (Mizusawa (2)), 19h. (La Paz), 22h. (Manila).

April 10d. 13h. 21m. 57s. Epicentre 18°·0N. 120°·0E. (as on 1938 May 23d.).

N. Luzon. Intensity III at Baguio, Vigan, and Laoag. Felt slightly at Piddig, Bargui, Tuao, Gattaran, and Claveria.

W. C. Repetti.

Seismological Bulletin for 1939, Manila Central Observatory, Manila, 1940, p. 16.

$A = -\cdot4758$, $B = +\cdot8242$, $C = +\cdot3071$; $\delta = 0$; $h = +5$;
$D = +\cdot866$, $E = +\cdot500$; $G = -\cdot154$, $H = +\cdot266$, $K = -\cdot952$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Manila		3·5	165	i 1 4k	P*	i 1 58	S_g	—
Kosyun		4·0	10	0 57	− 7	2 17	S_g	—
Karenko		6·1	13	1 28	− 6	—	—	—
Hong Kong		6·9	309	1 48a	+ 3	2 55	−10	3·5
Phu-Lien		13·0	285	e 3 3	− 6	—	—	—
Kumamoto		17·6	31	4 4	− 4	—	—	—
Osaka		21·5	37	4 47	− 5	8 0	−47	—
Nagoya		22·8	39	5 8	+ 3	—	—	—
Nagano		24·6	38	5 31	+ 8	10 3	+21	—
Calcutta	N.	30·0	284	—	—	e 10 43	−27	—
Agra	E.	39·7	291	1 9 10	PP	—	—	—
Bombay		44·7	279	—	—	e 17 3?	SS	—
Sverdlovsk		58·5	327	10 56	+56	e 19 0	+57	28·1
Ksara		75·4	300	e 12 14	+27	e 22 34	PPS	—
Collmberg		86·3	323	e 12 41	− 4	—	—	—

Additional readings :—
Hong Kong ? = +1m.53s.
Svrdlovsk e = +19m.10s.
Collmberg e = +12m.52s.
Long waves were also recorded at De Bilt, Paris, Strasbourg, Pulkovo, Baku, Tiflis, Stuttgart, and Kew.

April 10d. Readings also at 5h. (near Zurich, Chur, Bucharest, Rome, near Belgrade, Basle, Strasbourg, Sofia, and Triest), 8h. (Tacubaya), 9h. (Almata), 10h. (Tucson), 11h. (Tucson, Strasbourg, Mizusawa, Collmberg, and Copenhagen), 12h. (Mizusawa), 13h. (Tucson and Tashkent), 14h. (Triest and Sofia), 16h. (Almeria), 17h. (Manila), 18h. (Baku, Sverdlovsk, Agra, Andijan, Frunse, Samarkand, Tashkent, and Almata), 19h. (Mizusawa), 21h. (Erevan), 22h. (near Tananarive).

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April 11d. 15h. 30m. 59s. Epicentre 42°·8N. 66°·9E.
(As given by stations of Central Asia).

$A = +\cdot2888$, $B = +\cdot6770$, $C = +\cdot6770$; $\delta = +6$; $h = -3$;
$D = +\cdot920$, $E = -\cdot392$; $G = +\cdot266$, $H = +\cdot623$, $K = -\cdot736$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tashkent	2·3	130	i 0 36	− 4	i 1 13	+ 4	—	—	i 1·3
Samarkand	3·1	179	0 54	+ 3	1 28	− 1	i 1 4	P_g	—
Andijan	4·6	116	1 13	+ 1	2 7	0	e 1 33	P_g	—
Frunse	5·6	87	e 1 27	0	e 2 35	+ 2	1 39	P*	—
Almata	7·4	83	2 19	P_g	e 3 50	S*	—	—	—
Sverdlovsk	14·6	346	e 4 27	+57	e 6 52	SSS	8 37	L_q	9·7
Grozny	15·5	279	e 3 29	−13	6 50	SS	—	—	—
Moscow	22·9	315	e 5 1	− 5	e 9 17	+ 4	e 10 23	SSS	e 13·5
Pulkovo	28·0	320	e 8 38	?	—	—	—	—	—

Additional readings :—
Samarkand i = +1m.12s., iS* = +1m.34s., i = +1m.45s., S_g = +1m.48s.
Andijan e = +1m.38s., i = +2m.27s., S_g = +2m.34s., e = +2m.43s.
Frunse e = +2m.3s. and +2m.23s., S* = +2m.49s., S_g = +3m.7s.
Moscow e = +7m.8s.
Long waves were also recorded at Baku and Tiflis.

April 11d. Readings also at 4h. (Samarkand, Andijan, Tashkent, Sverdlovsk, Baku, Tucson, Ksara, Colombo, Calcutta, Phu-Lien, Medan, Agra, Batavia, Bombay, and Kodaikanal), 5h. (Tucson), 8h. (Andijan), 10h. (Tucson, Ksara, Baku, Sverdlovsk, Tashkent, and Tiflis), 13h. (Almata, Frunse, and Andijan (2)), 16h. (Grozny (2), Sotchi, Erevan, Tiflis (2), and Ksara (2)), 17h. (Tucson, Riverside, Mount Wilson, Christchurch, Riverview, and Pasadena), 18h. (Tucson, Sverdlovsk, and Vladivostok), 19h. (La Paz (2) and near Triest), 20h. (near Triest and Port au Prince), 21h. (Osaka, Vladivostok, near Mizusawa, Tucson, Riverside, Mount Wilson, Christchurch, and Ksara), 22h. (near Mizusawa and Sverdlovsk), 23h. (Almeria).

April 12d. 13h. 45m. 41s. Epicentre 55°·6N. 157°·7W. (as on 1938 Nov. 21d.).

$A = -\cdot5251$, $B = -\cdot2154$, $C = +\cdot8233$; $\delta = -5$; $h = -7$;
$D = -\cdot379$, $E = +\cdot925$; $G = -\cdot762$, $H = -\cdot312$, $K = -\cdot568$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		10·5	24	e 2 35	0	e 5 9	SSS	—	—	e 6·0
Sitka		12·5	74	e 3 1	− 1	e 5 42	SS	—	—	—
Victoria		22·2	94	5 19?	+19	—	—	—	—	9·3
Tinemaha		32·3	109	e 6 38	+ 5	—	—	—	—	—
Haiwee		33·2	109	e 6 47	+ 7	—	—	—	—	—
Mount Wilson	z.	34·6	111	i 6 50	− 3	—	—	—	—	—
Pasadena		34·6	111	i 6 49	− 4	—	—	—	—	e 15·3
Riverside	z.	35·1	111	i 6 54	− 3	—	—	—	—	—
Tucson		40·0	105	i 7 35	− 3	—	—	i 9 26	P_cP	e 17·2
St. Louis	E.	47·0	82	—	—	e 15 4	−22	—	—	—
East Machias		54·9	61	e 10 48	P_cP	e 17 9	− 7	e 11 57	PP	e 22·6
Sverdlovsk		63·7	339	i 11 47	+71	20 24	?	—	—	32·3
Collmberg		73·2	7	i 11 41	+ 6	—	—	—	—	—
Andijan		75·0	324	e 12 13	+28	—	—	—	—	47·3
Strasbourg		75·5	324	e 14 25	PP	—	—	i 15 59	PPP	—
Samarkand		77·8	328	e 12 33	+32	—	—	—	—	—
Agra	E.	84·9	312	—	—	e 23 16	+10	—	—	—
Ksara		90·2	349	—	—	e 23 47	− 9	—	—	—

For Notes see next page.

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NOTES TO APRIL 12d. 13h. 45m. 41s.

Additional readings :—
College eP = +2m.39s.
Mount Wilson iZ = +6m.57s.
Pasadena iPZ = +6m.58s.
Riverside i = +7m.1s.
Tucson iP = +7m.42s. and +8m.10s.
East Machias ePPP = +13m.24s.
Collmberg i = +11m.51s., e = +12m.0s.
Strasbourg e = +15m.2s.
Ksara e = +34m.9s.
Long waves were also recorded at Baku, Paris, De Bilt, Edinburgh, Bidston, Tiflis, Fordham, Butte, Philadelphia, Kodaikanal, Malabar, Kew, and Pulkovo.

April 12d. Readings also at 0h. (Columbia), 1h. (Wellington, New Plymouth, Tucson, and Balboa Heights), 7h. (near Fort de France, Pasadena, Tinemaha, Riverside, Tucson, and Mount Wilson), 10h. (La Paz, Tucson, Mount Wilson, Riverside, Andijan, and Samarkand), 11h. (Frunse and Andijan), 12h. (Copenhagen, Vladivostok, and Tashkent), 13h. (Frunse, Andijan, and Samarkand), 16h. (Ottawa, Lick, San Francisco, Berkeley, near Branner, and Strasbourg), 17h. (near Mizusawa and Balboa Heights), 19h. (Ottawa), 23h. (Mizusawa).

April 13d. Readings at 1h. (Williamstown, Harvard, and near Fordham), 2h. (Ksara), 3h. (Batavia), 8h. (Mizusawa, Christchurch, New Plymouth, and Wellington), 9h. (near Triest), 12h. (near Granada, Almeria, Grozny (3), and Bagnères), 13h. (Bagnères), 14h. (New Plymouth and Wellington), 15h. (Mizusawa), 17h. (Tucson), 18h. (Grozny), 19h. (Rathfarnham Castle, Ottawa, Fort de France, and near Manila), 22h. (Williamstown and near Fordham).

April 14d. Readings also at 1h. (Triest, Strasbourg, near Balboa Heights, and Rome), 2h. (Triest and Collmberg), 3h. (near Mizusawa, Collmberg, Strasbourg, Jena, Baku, Moscow, Sverdlovsk, Grozny, Tiflis, Ksara, Tucson, Osaka, and near Fort de France), 4h. (Malabar), 7h. (near Mizusawa), 8h. (Frunse), 12h. (Samarkand), 15h. (near Hukuoka and Manila), 17h. (near Mizusawa), 18h. (Williamstown), 19h. (near Manila), 21h. (near Tananarive), 22h. (Frunse and Andijan).

April 15d. 9h. 4m. 7s. Epicentre 29°·0N. 142°·0E. (as on 1939 Feb. 7d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Mizusawa		10·1	357	e 2 52	?	e 3 57	?	—
Vladivostok		16·3	333	e 3 51	− 1	e 7 7	SS	e 7·8
Zi-ka-wei	z.	17·9	284	e 4 17	+ 5	—	—	—
Manila		24·2	238	i 5 26	+ 7	10 22	SS	—
Tashkent		59·1	303	i 10 3	− 1	i 18 15	+ 4	e 30·9
Sverdlovsk		61·6	323	10 20	− 2	18 40	− 3	31·9
Tiflis	z.	76·3	311	e 11 53	+ 1	—	—	—
Pasadena	z.	81·6	56	e 12 20	− 1	—	—	—
Mount Wilson	z.	81·7	56	e 12 20	− 2	—	—	—
Riverside	z.	82·3	56	i 12 23	− 2	—	—	—
Ksara		86·3	306	e 12 47	+ 2	e 24 22	PS	—
Tucson		87·9	54	e 12 51	− 2	—	—	—
Rome		95·5	325	e 31 24	SSP	—	—	—

Mizusawa readings may be unconnected with this.

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

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April 15d. 20h. 3m. 35s. Epicentre 61°·4S. 150°·7E.

$A = -\cdot4196$, $B = +\cdot2355$, $C = -\cdot8767$; $\delta = +13$; $h = -9$;
$D = +\cdot489$, $E = +\cdot872$; $G = +\cdot765$, $H = -\cdot429$, $K = -\cdot481$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		22·1	45	i 5 0a	+ 1	i 9 2	+ 4	10 16	L_q	i 10·6
Melbourne		23·9	350	i 5 16	0	9 17	−13	i 9 58	SS	—
Wellington		24·9	46	5 29	+ 3	9 56	+ 9	5 45	PP	12·4
Adelaide		27·6	338	e 7 45	?	i 13 12	?	—	—	—
Riverview		27·6	1	e 4 34	?	—	—	—	—	e 11·0
Batavia		64·0	311	10 38	0	19 16	+ 3	—	—	e 30·4
Manila		79·3	331	e 12 9	0	22 5	− 4	—	—	37·4
Colombo	E.	87·0	290	—	—	e 23 25?	− 2	—	—	—
Kodaikanal	E.	91·0	289	—	—	e 23 25	[−14]	—	—	—
Rio de Janeiro	E.	95·3	168	e 24 58	S	(e 24 58)	+17	—	—	e 39·6
Hyderabad	N.	97·0	294	23 46	S	(23 46)	[−26]	—	—	—
Calcutta	N.	97·3	305	—	—	e 23 49	[−24]	—	—	—
Huancayo		98·2	135	(e 13 32)	− 8	—	—	—	—	(i 52·1)
Bombay		100·8	290	e 20 23	PPP	e 29 24	?	—	—	—
Agra	E.	105·7	299	—	—	e 33 33	SS	—	—	—
Tashkent		121·5	299	e 21 9	PP	e 27 23	{ 0}	e 30 0	PS	e 53·1
Victoria		129·1	59	—	—	e 39 25?	SSP	—	—	59·4
Baku		129·4	284	e 24 19	PPP	e 26 26	[+ 8]	39 1	SS	61·4
San Juan		129·9	132	e 22 54	?	—	—	—	—	—
Ksara		130·8	266	e 19 38	[+25]	e 30 34	PS	—	—	63·1
Tiflis		132·8	281	e 19 39	[+22]	e 39 47	SS	e 21 35	PP	e 63·4
St. Louis		136·7	92	—	—	e 40 31	SSP	—	—	e 55·4
Sverdlovsk		137·1	306	e 19 37	[+12]	—	—	i 25 27	PPP	54·4
Moscow		146·1	291	e 19 51	[+10]	—	—	—	—	e 76·9
Williamstown		148·0	107	e 20 0	[+16]	—	—	—	—	e 72·6
Rome		148·3	252	e 19 47k	[+ 3]	e 42 40	SS	e 23 33	PP	e 69·8
Harvard	Z.	148·6	108	e 20 25	[+40]	—	—	—	—	e 74·4
Triest		150·2	258	e 20 25	[+38]	—	—	—	—	—
Pulkovo		151·6	294	e 20 8	[+19]	—	—	—	—	—
Cheb		154·4	263	—	—	e 58 25?	?	—	—	e 90·4
Collmberg	Z.	154·9	264	e 20 19	[+25]	—	—	—	—	—
Stuttgart		155·0	258	e 20 16	[+22]	e 43 55	SS	e 37 31	PPS	e 86·4
Strasbourg		155·6	256	e 20 17	[+22]	—	—	—	—	e 80·9
Paris		158·2	249	e 21 6	?	—	—	—	—	85·4
De Bilt		159·2	259	e 20 25?	[+25]	—	—	—	—	91·4

Additional readings :—
Christchurch i = +9m.9s.
Melbourne e = +11m.8s.
Wellington iZ = +6m.15s., +7m.0s., and +10m.25s., i = +10m.40s. and +11m.5s., L_q = +11m.33s.
Adelaide i = +8m.35s.
Batavia iE = +11m.10s., iN = +11m.31s.
Rio de Janeiro ePN = +25m.1s., eSE = +32m.1s.
Huancayo 10 minutes have been added to the readings.
Tashkent e = +23m.6s., +31m.59s., +35m.11s., +36m.41s., +40m.11s., +41m.53s., and +45m.49s.
Baku e = +33m.33s.
Ksara e = +22m.30s. and +34m.38s.
Tiflis eE = +22m.56s. and +22m.59s.
Moscow e = +20m.38s.
Rome eEN = +19m.52s., eNZ = +21m.5s., eEZ = +22m.26s., ePPPEZ = +26m.58s., eZ = +28m.48s., eEN = +62m.17s.
Triest e = +20m.46s. and +56m.30s.
Long waves were also recorded at Edinburgh, Chicago, College, Butte, Sitka, Ukiah, San Fernando, Philadelphia, Berkeley, Sydney, Toledo, Pasadena, Kew, Almeria, Cape Town, Aberdeen, Upsala, Bidston, Hamburg, Bergen, and La Paz.

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April 15d. Readings also at 1h. (Tucson), 3h. (Tucson, Mount Wilson, Pasadena, and Collmberg), 6h. (near La Paz and Tucson), 7h. (Tucson (2), Harvard, St. Louis, Merida, Mount Wilson (3), Pasadena (2), Florissant, Ksara, and Riverside (3)), 8h. (Rome, Moscow, Pulkovo, Stuttgart, Strasbourg, Frunse, Andijan, Samarkand. (2), Almata, Riverview, Sverdlovsk, Tashkent, and Vladivostok), 11h. (near Mizusawa, Triest, and Riverview), 14h. (Riverview, Riverside, Pasadena, Mount Wilson, Haiwee, Tinemaha, and Butte), 15h. (Tacubaya, Butte, Tinemaha, Haiwee, Mount Wilson, Pasadena, Riverside, Florissant, Tucson (2), St. Louis, Santa Barbara, and La Jolla), 16h. (Tashkent and Sverdlovsk), 17h. (St. Louis, near Florissant, Wellington, and Christchurch), 18h. (Florissant, Wellington, and Christchurch), 19h. (La Plata and Medan), 20h. (Batavia and Malabar), 21h. (Sverdlovsk, Vladivostok, and College), 23h. (Medan).

April 16d. Readings at 0h. (Grozny), 1h. (near Tananarive), 3h. (Andijan (3), Frunse (3), and Samarkand (2)), 5h. (La Paz), 7h. (Ksara, Grozny, Tiflis, near Tananarive, New Plymouth, Wellington, Baku, and Sverdlovsk), 8h. (Fort de France), 10h. (Mount Wilson, Pasadena, Tinemaha, and Riverside), 11h. (Tucson), 14h. (Tananarive), 16h. (Mizusawa), 18h. (Tananarive, Ksara, Christchurch, and Melbourne), 22h. (Tucson, Lick, and Branner).

April 17d. 19h. 15m. 31s. Epicentre 40°·5N. 77°·1E.
(as given by stations of Central Asia).

$A = +\cdot1703$, $B = +\cdot7433$, $C = +\cdot6469$; $\delta = -2$; $h = -2$;
$D = +\cdot975$, $E = -\cdot223$; $G = +\cdot144$, $H = +\cdot631$, $K = -\cdot763$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		2·8	358	i 0 46	− 1	i 1 32	S_g	i 0 57	P_g	—
Frunse		3·0	322	0 50	0	—	—	i 0 56	P_g	—
Andijan		3·6	275	0 51	− 7	1 55	S_g	1 3	P_g	—
Tashkent		6·0	282	e 1 40	+ 8	i 3 10	S_g	—	—	i 3·3
Samarkand		7·8	268	e 1 45	−13	—	—	—	—	—
Dehra Dun	N.	10·2	175	e 3 53	S	(e 3 53)	−34	—	—	e 6·0
Agra	E.	13·4	177	—	—	e 5 13	−32	—	—	i 7·1
Sverdlovsk		19·5	333	4 31	0	8 16	+10	9 59	L_q	11·7
Calcutta	N.	20·3	148	—	—	e 8 18	− 5	—	—	—
Baku		20·7	279	e 4 44	0	e 8 41	+10	—	—	e 12·7
Bombay		21·8	190	—	—	e 8 30	−22	—	—	—
Grozny		23·4	288	e 5 12	+ 1	e 14 10	L	—	—	(e 14·2)
Tiflis		24·3	283	e 5 8	−12	e 9 43	+ 6	e 10 19	SS	e 23·5
Moscow		30·0	314	—	—	e 12 56	SS	—	—	e 18·4
Kodaikanal	E.	30·2	180	—	—	e 11 29?	+16	—	—	—
Pulkovo		34·7	320	e 8 52	PPP	e 13 43	+79	—	—	e 16·4

Additional readings :—
Almata $i = +51s.$ and $+1m.9s.$
Frunse $iP_g = +1m.0s.$
Andijan $e = +1m.11s.$ and $+1m.15s.$
Tiflis $eE = +5m.25s.$, $eZ = +16m.1s.$
Moscow $e = +16m.8s.$
Long waves were also recorded at Ksara, Rome, Strasbourg, Vladivostok, and Fordham.

April 17d. Readings also at 2h. (Santa Barbara, Tinemaha, Riverside, Berkeley, La Jolla, Pasadena, Collmberg, Mount Wilson, Haiwee, Ksara, La Paz, and Tucson), 3h. (near Tucson), 8h. (New Plymouth, Wellington, and La Paz), 10h. (Manila and Ksara), 12h. (Fort de France, Port au Prince, Harvard, and San Juan), 13h. (Fort de France and La Paz), 14h. (Tucson), 15h. (La Paz, Medan, Batavia, Vladivostok, Kodaikanal, Sverdlovsk, and Tashkent), 17h. (near Denver), 21h. (Almata).

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April 18d. 6h. 22m. 37s. Epicentre 27°·0S. 70°·6W.

Felt in the Provinces of Coquimbo and Atacama; damage at Copiapo and Caldera.

Epicentre 27°·0S. 70°·0W. (Strasbourg).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome IV, 2e partie, 1939, p. 23.

$A = +\cdot2964$, $B = -\cdot8415$, $C = -\cdot4516$; $\delta = -8$; $h = +3$;
$D = -\cdot943$, $E = -\cdot332$; $G = -\cdot150$, $H = +\cdot426$, $K = -\cdot892$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		10·7	13	i 2 42a	+ 4	i 4 58	SS	—	—	6·0
La Plata		13·4	129	3 14	0	5 41	− 4	—	—	6·8
Huancayo		15·5	341	i 3 46	+ 4	i 6 37	+ 2	—	—	i 7·0
Rio de Janeiro		25·1	86	i 5 27	− 1	i 10 5	+14	—	—	i 13·3
Balboa Heights		36·3	347	e 7 13	+ 2	i 12 57	+ 1	e 8 36	PP	18·8
Fort de France		42·5	16	i 7 48	−11	i 17 28	SS	10 40	PPP	e 32·3
Port au Prince		45·3	358	i 8 22	+ 1	i 14 57	− 5	9 57	PP	—
San Juan		45·3	8	8 21	0	i 14 53	− 9	e 10 14	PP	i 18·2
Merida	Z.	51·1	338	i 9 20	+14	—	—	—	—	—
Vera Cruz	N.	52·2	330	i 9 11	− 4	—	—	—	—	—
Tacubaya	N.	53·8	327	i 9 31	+ 5	—	—	—	—	—
Guadalajara	N.	57·0	324	e 9 53	+ 3	—	—	—	—	—
Bermuda		59·2	8	i 10 3	− 2	i 18 16	+ 4	—	—	i 24·4
Columbia		61·5	352	e 10 20	− 1	18 36	− 6	i 10 45	pP	i 29·8
Little Rock		64·8	341	i 10 41	− 2	i 19 18	− 5	11 4	pP	27·0
Georgetown		65·8	356	i 10 50	+ 1	—	—	i 13 26	PP	—
Cincinnati		67·1	350	i 10 55	− 2	i 19 44	− 7	i 13 26	PP	31·4
Fordham		67·5	358	i 11 1	+ 1	i 19 56	0	i 11 30	pP	—
St. Louis		67·8	343	e 11 1	− 1	i 19 54	− 6	i 11 20	pP	—
Florissant		68·0	343	i 11 1	− 2	i 19 52	−10	i 11 25	pP	i 27·8
Harvard		69·2	0	i 11 10	0	e 20 4	−12	—	—	e 34·9
Williamstown		69·4	359	i 11 12	0	i 20 25	+ 7	i 11 33	pP	i 33·9
Chicago		70·3	347	11 15	− 2	i 20 21	− 8	e 14 6	PP	e 28·7
Chicago (Loyola)		70·3	347	e 11 17	0	i 20 23	− 6	e 13 59	PP	—
Tucson		70·3	326	i 11 16a	− 1	i 20 23	− 6	i 11 41	pP	i 30·8
Toronto		70·8	354	i 11 30	+10	i 20 41	+ 6	15 53	PPP	32·4
Vermont		71·2	358	i 11 27a	+ 4	i 20 45	+ 5	e 14 8	PP	e 28·8
East Machias		71·5	2	i 11 26	+ 2	i 20 43	0	11 51	pP	29·6
Halifax		71·6	7	i 11 26	+ 1	i 20 45	+ 1	14 47	PP	34·4
Ottawa		72·2	357	e 11 28a	− 1	20 50	− 1	21 23?	PS	31·4
Shawinigan Falls		73·2	359	11 31	− 4	20 58	− 4	—	—	35·4
Denver		73·7	334	e 11 37	− 1	e 21 5	− 3	i 12 0	pP	—
Seven Falls		73·8	0	11 38	0	21 6	− 3	—	—	31·4
La Jolla		74·3	321	i 11 41a	0	e 21 14	− 1	—	—	—
Cape Town		74·7	121	i 11 45	+ 2	i 21 20	+ 1	16 39	PPP	36·4
Riverside		75·1	321	e 11 48	+ 2	e 21 24	0	—	—	—
Mount Wilson		75·7	321	i 11 48a	− 1	e 21 29	− 1	i 39 37	P'P'	—
Pasadena		75·7	321	i 11 48a	− 1	i 21 31	+ 1	e 15 1	PP	i 32·3
Santa Barbara	Z.	76·8	320	i 11 53	− 2	—	—	—	—	—
Haiwee		77·1	323	i 11 56	− 1	e 21 46	0	e 39 14	P'P'	—
Salt Lake City		77·5	329	e 12 24	pP	i 21 47	− 3	26 54	SS	i 34·7
Tinemaha		77·9	323	i 11 52	− 9	e 21 49	− 5	e 39 9	P'P'	—
Fresno	N.	78·5	323	e 12 5	+ 1	e 21 56	− 5	—	—	—
Lick		80·0	322	e 12 13	0	e 22 13	− 4	—	—	e 40·0
Santa Clara		80·1	322	i 12 40	+27	i 22 46	+28	—	—	e 34·5
Branner		80·3	322	e 12 17	+ 3	e 22 22	+ 2	—	—	e 39·1
San Francisco		80·5	322	e 12 18	+ 3	e 22 21	− 1	—	—	e 38·6
Berkeley		80·7	322	i 12 16a	0	e 22 33	+ 9	i 15 38	PP	e 38·4
Bozeman		81·1	333	e 12 19	+ 1	i 22 30	+ 2	e 12 48	pP	e 35·0
Butte		82·0	333	e 12 24	+ 1	i 22 38	+ 1	e 17 42	PPP	39·4
Ukiah		82·1	322	12 23	− 1	i 22 39	+ 1	i 12 52	PP	34·1
Ferndale		83·7	323	e 12 35	+ 3	e 22 59	+ 5	40 23	L_q	e 46·7
Saskatoon		84·9	339	e 12 43	+ 5	e 23 1	− 5	—	—	35·4
Johannesburg	E.	85·7	117	i 12 44	+ 2	i 23 20	+ 6	i 16 25	PP	—

Continued on next page.

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Fernando	87·5	47	e 12 51	0	i 24 0	PS	29 56	SS	44·4
Seattle	87·6	329	e 12 42	− 9	e 23 8	[− 9]	e 16 21	PP	—
Victoria	88·7	329	12 47	−10	23 14	[−11]	16 29	PP	37·4
Christchurch	89·0	320	i 12 56a	− 2	i 23 13	[−14]	16 28	PP	40·9
Wellington	89·1	223	12 58	0	23 22	[− 5]	16 42	PP	41·5
Granada	89·6	47	i 13 9k	+ 8	i 24 9	+18	i 16 43	PP	42·3
Almeria	90·2	48	e 13 3	− 1	e 23 29	[− 5]	—	—	e 34·8
Arapuni	90·4	226	12 53	−11	23 35	[0]	29 52	SS	41·4
Toledo	90·9	45	i 13 8a	+ 1	i 23 51	−12	e 16 34	PP	—
Apia	93·5	253	e 13 10	− 9	e 24 0	[+ 7]	e 30 41	SS	—
Algiers	93·9	51	13 23	+ 2	e 23 57	[+ 2]	—	—	i 40·9
Bagnères	95·3	44	e 13 31	+ 4	e 24 4	[+ 2]	e 18 18	PP	e 41·9
Honolulu	97·0	291	e 14 13	pP	e 24 7	[− 5]	17 43	PP	e 41·2
Jersey	97·3	36	e 13 51	+15	e 24 12	[− 1]	e 17 50	PP	e 41·8
Rathfarnham Castle	97·4	33	i 12 45	−52	i 23 28	[−46]	i 17 5	PP	42·7
Clermont Ferrand	98·5	43	e 13 57	+15	i 24 23	[+ 3]	—	—	—
Marseilles	98·7	46	e 13 42	0	e 24 13	[− 7]	e 26 25	PS	e 44·4
Bidston	99·1	34	i 14 10	+26	e 25 20	+ 7	i 18 12	PP	e 41·4
Kew	99·4	36	i 13 45	− 1	i 24 21	[− 3]	i 17 53	PP	e 48·4
Paris	99·6	40	i 13 48a	+ 2	24 34	[+ 9]	18 13	PP	43·4
Stonyhurst	99·6	33	i 13 48	+ 2	i 24 23	[− 2]	17 27	PKP	44·7
Grenoble E.	99·8	44	e 14 28	+41	e 24 52	−27	e 27 10	PS	44·4
Sitka	99·8	330	e 13 50	+ 3	i 24 23	[− 3]	e 17 59	PP	43·7
Edinburgh	100·1	31	e 13 53	+ 4	i 25 29	+ 8	i 17 56	PP	41·4
Durham	100·5	33	i 13 58	+ 7	i 24 31	[+ 2]	i 17 51	PP	—
Lille N.	100·8	38	e 19 57	PPP	e 27 6	PS	—	—	—
Moncalieri	100·9	43	14 1	+ 9	27 18	PS	—	—	39·5
Neuchatel	101·4	43	e 13 56	+ 1	e 24 34	[0]	e 18 18	PP	—
Aberdeen	101·6	30	i 13 58	+ 2	i 25 18	−16	27 23	PS	42·6
Uccle	101·7	38	e 13 54	− 2	24 34	[− 1]	e 18 7	PP	43·4
Basle	102·0	42	e 13 59	+ 2	e 24 54	[+17]	e 18 18	PP	—
Strasbourg	102·6	41	i 14 1	+ 1	i 24 57	[+18]	i 18 7	PP	e 42·4
Zurich	102·6	43	e 14 1	+ 1	e 24 37	[− 2]	e 18 13	PP	—
De Bilt	102·7	37	14 0a	0	i 27 40	PS	i 18 16	PP	52·0
Rome	102·7	50	i 14 3a	+ 3	i 24 41	[+ 1]	i 18 7	PP	e 50·1
Chur	102·9	44	e 14 3	+ 2	e 24 51	[+11]	e 18 16	PP	—
Scoresby Sund	103·1	15	18 35	PP	24 29	[−12]	27 35	PS	—
Stuttgart	103·5	42	i 14 6a	+ 2	e 24 49	[+ 6]	e 17 55	PP	e 43·4
Tananarive	104·7	120	e 15 23	?	24 43	[− 6]	17 49	PP	49·4
Heligoland	105·1	36	e 18 29	PP	e 24 52	[+ 1]	e 28 3	PS	e 41·4
Triest	105·1	46	e 14 32	P	i 25 42	−21	18 29	PP	e 46·1
Göttingen	105·2	38	e 14 12	P	—	—	e 17 52	?	51·4
Jena	105·8	41	e 13 51	P	e 27 51	PS	—	—	e 48·4
Cheb	106·0	41	e 14 20	P	e 25 7	[+12]	e 18 18	PP	e 52·4
Hamburg	106·0	37	e 14 16	P	e 25 2	[+ 7]	e 18 33	PP	e 42·4
Bergen	106·5	29	e 18 43	PP	e 26 18	+ 3	e 33 53	SS	e 44·4
Collmberg	106·8	41	e 14 20	P	e 24 53	[− 5]	i 18 29	PP	e 54·4
Prague	107·2	42	e 14 29	P	e 25 2	[+ 2]	e 18 47	PP	e 45·4
Melbourne	107·4	210	i 13 46	?	i 26 19	S	i 18 43	PP	44·9
Sydney	107·6	216	e 18 41	PP	e 25 2	[0]	e 34 13	SSP	e 44·9
Riverview	107·7	216	e 18 47	PP	i 25 0	[− 2]	e 33 41	SS	e 45·0
Copenhagen	108·1	36	e 14 26	P	24 57	[− 7]	18 39	PP	—
College	108·9	334	e 14 29	P	i 25 4	[− 3]	e 18 57	PP	e 44·3
Belgrade	109·2	49	e 18 10k	PKP	e 26 11	{+12}	i 18 57	PP	55·7
Budapest	109·2	46	e 18 43	PKP	e 28 31	PPS	e 18 59	PP	e 46·4
Kecskemet Z.	109·4	46	e 17 43	?	e 28 29	PS	e 21 22	PPP	e 54·4
Sofia	110·5	52	e 18 23?	[−10]	25 23?	[+ 9]	e 19 11	PP	—
Brisbane E.	111·5	223	i 19 29	PP	i 26 17	{+ 2}	i 28 41	PS	—
Upsala	112·1	33	e 18 2	[−35]	i 25 23	[+ 3]	e 28 56	PS	e 46·4
Adelaide	112·5	206	i 21 7?	PPP	e 29 0	PS	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Helwan		112·6	67	i 14 47k	P	26 40	{+17}	19 29 PP	—
Bucharest		112·9	50	e 19 29	PP	i 25 31	[+ 8]	26 25 SKKS	54·4
Cernauti		113·8	46	e 13 43	P	25 41	[+14]	— —	49·4
Istanbul		114·1	54	14 48	P	29 20	PS	19 32 PP	e 62·4
Ksara		117·5	65	e 15 10a	P	30 1	PS	i 19 59 PP	—
Pulkovo		118·4	34	e 15 11	P	25 46	[+ 2]	i 20 7 PP	e 49·9
Perth		121·1	187	i 20 23	PP	i 30 23	PS	— —	i 60·0
Moscow		122·0	39	e 15 33	P	26 2	[+ 5]	20 31 PP	60·4
Piatigorsk		124·8	53	e 19 21	[+20]	—	—	— —	—
Erevan		125·5	58	e 19 10	[+ 7]	—	—	— —	—
Tiflis		125·9	56	e 15 47	P	e 28 11	{+18}	20 56 PP	—
Baku		129·6	58	19 15	[+ 4]	31 38	PS	21 25 PP	58·4
Sverdlovsk		134·5	34	i 19 22	[+ 2]	31 59	PS	i 21 54 PP	—
Samarkand		142·7	59	19 1	[−34]	e 32 23	PS	— —	—
Bombay		145·5	95	i 19 41k	[+ 1]	i 26 50	[+ 3]	i 22 59 PP	66·7
Colombo	E.	145·5	120	i 19 42	[+ 2]	—	—	— —	72·7
Kodaikanal	E.	145·6	115	i 19 39a	[− 1]	29 40	{−13}	i 43 4 SSP	68·0
Malabar		145·9	177	i 19 43	[+ 3]	—	—	— —	—
Andijan		146·6	56	e 19 45	[+ 3]	—	—	— —	53·4
Batavia		146·9	176	i 19 43a	[+ 1]	—	—	— —	e 66·4
Frunse		147·6	51	e 20 1	[+18]	e 30 49	{+44}	— —	—
Almata		149·1	48	e 19 51	[+ 5]	—	—	— —	—
Hyderabad		149·8	102	19 55	[+ 9]	30 31	{+14}	23 37 PP	—
Mizusawa		150·9	303	19 58	[+ 9]	31 43	?	— —	—
Sendai		151·3	302	19 56	[+ 7]	—	—	— —	—
Akita		151·6	304	19 58	[+ 9]	—	—	— —	—
Agra		152·1	82	19 52	[+ 2]	30 35	{+ 6}	23 25 PP	66·7
Dehra Dun	N.	152·3	75	20 8	[+18]	—	—	— —	e 77·7
Yokohama		152·9	295	19 54	[+ 3]	—	—	— —	—
Numadu		153·6	295	20 1	[+ 9]	—	—	— —	—
Nagano		153·8	299	20 2	[+10]	—	—	— —	—
Medan	E.	154·5	155	e 19 57	[+ 3]	i 32 36	PS	— —	e 72·4
Vladivostok		155·7	317	i 19 56	[+ 1]	27 3	[+ 3]	i 23 37 PP	e 51·5
Osaka		156·3	296	19 56	[0]	—	—	— —	—
Kotl		158·2	294	20 2	[+ 4]	—	—	— —	—
Calcutta	E.	159·3	97	e 20 12	[+12]	—	—	— —	—
Kumamoto		160·7	294	20 25	[+24]	—	—	— —	—
Manila		163·6	223	i 20 8a	[+ 4]	30 40	?	— —	78·4
Kosyun		168·5	246	20 2	[− 6]	—	—	— —	—
Zi-ka-wei		168·7	294	i 20 7k	[− 1]	—	—	— —	78·1
Phu-Lien		173·3	158	e 20 23	[+12]	e 31 53	{−26}	e 25 28 PP	—
Hong Kong		173·6	224	20 15	[+ 4]	32 54	{+34}	25 53 PP	72·2

Additional readings :—
Balboa Heights eSSE = +15m.28s., eSSN = +15m.34s.
Fort de France PPP = +15m.5s., SS = +22m.37s., SSS = +25m.0s.
Port au Prince PPP = +10m.33s., i = +12m.20s. and +12m.47s.
Columbia i = +20m.37s., iSS = +22m.50s.
Little Rock isP = +19m.36s., isS = +20m.2s., sSP = +20m.32s., SS = +23m.10s.
Fordham iPP = +13m.29s., iN = +20m.35s., isSN = +20m.45s., iE = +20m.58s., iEN = +21m.12s., iN = +21m.18s., iPKP,PKP = +39m.23s., iL_g = +34m.23s.
St. Louis iP_cPE = +11m.41s., iS_cSE = +20m.58s., iSSN = +24m.17s., eSSSE = +27m.43s.
Florissant iPZ = +13m.33s., ipPPZ = +13m.53s., iSPE = +20m.29s., isSE = +20m.39s., isSPE = +21m.11s., iSSE = +24m.22s.
Harvard iEN = +20m.16s.
Williamstown isP = +11m.43s., ipP_cP? = +12m.0s., i = +12m.30s., iPP = +13m.51s., ePPP = +15m.19s., ePS = +20m.57s., eSS = +24m.48s., eSSS = +27m.31s.
Chicago i = +17m.11s., esSS = +25m.31s., i = +26m.10s., eSSS = +28m.5s., i = +28m.32s.
Tucson iP = +11m.25s., i = +11m.50s., isP = +11m.55s., i = +12m.4s., i = +12m.57s., +13m.3s., +13m.38s., +13m.43s., and +13m.48s., iPP = +13m.59s., ipPP = +14m.16s., isPP = +14m.47s., i = +15m.16s., and +15m.30s., iPPP = +15m.41s., ipPPP = +15m.48s., i = +16m.3s., +16m.16s., +16m.32s., +18m.40s., +20m.31s., +21m.40s., +21m.53s., and +23m.31s., iSS = +25m.6s. iSSS = +28m.37s., i = +28m.50s., iPKP,PKP = +39m.18s. and +39m.48s.
Toronto PSE = +21m.23s., SSN = +25m.23s., SSS = +28m.53s.

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Vermont ePPP = +15m.51s., ipS = +20m.51s., esS = +21m.3s., ePS = +21m.11s., eSSS = +28m.27s.
East Machias i = +12m.57s. and +13m.4s., ePP = +14m.18s., esPP = +14m.51s., eSS = +25m.11s., eSSS = +28m.11s.
Halifax PSN = +21m.23s., SSS = +28m.17s.
Ottawa SS = +25m.53s.
Denver iPE = +11m.41s., iPN = +11m.45s., eSN = +21m.8s., eN = +21m.45s., esSE = +22m.1s., esSN = +22m.4s., eSSN = +25m.59s., eSSE = +26m.13s.
Cape Town PPN = +14m.10s., PPE = +14m.45s., iSE = +21m.27s., PSE = +22m.13s., iSSE = +26m.15s., SSSE = +29m.29s.
Pasadena iSSN = +26m.13s., iPKP,PKPZ = +39m.11s.
Salt Lake City iS_cS = +22m.6s., i = +27m.9s.
Lick eSN = +22m.16s., eN = +37m.23s. ?
Bozeman ePP = +15m.29s., eSS = +27m.26s., eSSS = +30m.29s.
Butte eP_cP = +14m.32s., esS = +23m.4s., eSSS = +32m.47s.
Ukiah PP = +15m.46s., ipS = +22m.54s., ePS = +23m.44s., SS = +28m.13s., eSSS = +31m.43s.
Johannesburg iSE = +23m.32s., ePSE = +24m.26s., e?E = +33m.2s.
Seattle epPP = +16m.39s., esS = +23m.56s., eSS = +29m.29s.
Victoria eE = +26m.53s., SS = +29m.23s., SSSN = +32m.43s.
Christchurch iS = +23m.43s., SS = +29m.39s., SSS = +33m.5s., L_q = +36m.43s.
Wellington iZ = +13m.11s. and +13m.32s., S = +23m.44s., PS = +24m.31s., i = +25m.12s., +25m.40s., and +27m.22s., SS = +29m.27s. SSS = +32m.58s., L_q = +36m.6s.
Granada ScS = +23m.46s., PS = +25m.27s., SS = + 30m.16s., SSS = +34m.26s.
Arapuni i= +34m.11s.
Toledo ePS = +24m.55s., e = +25m.27s., eSS = +29m.39s.
Apia iS = +24m.31s.
Algiers S = +24m.46s.
Bagnères iSKKSE = +24m.28s., SE = +24m.45s., PSE = +25m.45s., PPS = +26m.26s., eSSE = +31m.17s., eSSSN = +34m.45s.
Honolulu ePPP = +20m.9s., iSKS = +24m.12s., iSP = +26m.24s., ePS = +26m.50s.
Jersey ePPP = +19m.59s., i = +26m.32s., e = +30m.55s.
Rathfarnham Castle iS = +24m.16s., iPS = +25m.2s., i = +27m.18s., +31m.37s., and +37m.25s.
Marseilles ePSE = +26m.31s.
Bidston i = +17m.46s. and +24m.36s., eS = +25m.39s., iPS = +26m.59s., iPPS = +27m.52s.
Kew iPKPZ = +17m.33s., iZ = +21m.55s., iE = +23m.13s., iEN = +24m.31s., iSKKSE = +25m.6s., iN = +25m.14s., iEN = +25m.21s., eSEN = +25m.41s., iZ = +26m.49s., iPS = +27m.7s., iEZ = +27m.55s., iPPSEN = +28m.1s., iSSE = +32m.17s., eL_q = +41·4m.
Paris PS = +26m.55s.
Stonyhurst iS = +25m.41s., i = +27m.19s.
Sitka iS = +25m.18s., PS = +26m.44s., ipPS = +26m.54s., iSS = +31m.48s., sSS = +32m.7s.
Edinburgh i = +18m.12s., +24m.30s., +24m.47s., +27m.13s., +27m.35s., +27m.55s., +28m.4s., +32m.21s., and +33m.26s.
Durham iN = +18m.8s., iE = +18m.23s., iSN = +25m.44s., iEN = +28m.12s.
Lille eN = +20m.16s.
Aberdeen iE = +18m.8s., iEN = +24m.33s., iN = +25m.23s., iE = +28m.10s., iSSN = +32m.43s., iE = +36m.42s. and +39m.53s.
Uccle SKSE = +24m.37s., iSN = +25m.41s., iPSE = +27m.31s.
Basle eS = +27m.22s.
Strasbourg ePPP = +20m.20s., iS = +25m.51s., ePS = +27m.23s., iSS = +32m.53s., iSSS = +37m.3s.
Zurich ePKP = +17m.42s., ePS = +27m.23s.
De Bilt iZ = +14m.5s., iPKPE = +18m.31s., iZ = +20m.42s.
Rome i = +14m.25s., iPPZ = +18m.12s., i = +18m.27s., iPPPEN = +20m.20s., iPPPZ = +20m.43s., iE = +23m.43s. and +24m.48s., iSKKSE = +25m.9s. and +25m.22s., iE = +25m.31s., iSE? = +25m.56s., iE = +26m.11s., iPSZ = +27m.27s., iPSE = +27m.34s., iPPS = +28m.32s., i = +33m.55s., iL_q = +42m.39s.
Scoresby Sund +31m.53s. and +33m.11s.
Stuttgart e = +14m.30s. and +19m.39s., eSKKS = +25m.39s., ePS = +27m.34s., eSS = +33m.11s.
Tananarive E = +18m.23s., N = 18m.31s., E = +19m.8s., N = +24m.49s., SKKSE = +25m.40s., PSN = +27m.46s., e = +27m.49s. and +28m.10s., N = +28m.36s., SSN = +33m.41s., E = +34m.1s. and +42m.6s.
Heligoland eN = +19m.42s.
Triest PPP = +20m.39s., SKP = +25m.0s., iS = +26m.19s., PS = +27m.32s., i = +27m.49s., PPS = +28m.51s., SS = +33m.38s., SSS = +38m.7s.
Jena ePN = +14m.23s., eN = +24m.53s. and +27m.23s.
Cheb e = +27m.59s.
Hamburg ePPE = +18m.41s., ePSZ = +27m.56s., iE = +28m.13s.
Collmberg e = +18m.5s., i = +18m.39s., e = +18m.43s., e = +19m.32s., ePPP = +20m.21s., e = +21m.48s., eS = +26m.1s., iPPS = +28m.7s., eZ = +29m.41s., e = +30m.8s. and +30m.40s., eSS = +32m.29s., NW = +33m.17s., eSSS = +37m.23s. ?, eL_q = +48m.23s.

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Prague eSKKS = +26m.29s., ePS = +28m.11s., e = +39m.23s. ? and +44m.23s. ?
Melbourne i = +18m.53s., +19m.31s., +28m.1s., +29m.23s., +33m.53s., and +34m.37s.
Riverview eEN = +30m.2s.
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Brisbane iE = +35m.17s., eE = +47m.23s.
Upsala eE = +19m.23s., eN = +26m.23s.?, iPS = +29m.14s., eSSN = +34m.47s., eSSSN = +38m.53s.
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Baku PPP = +24m.17s., SSS = +43m.47s.
Sverdlovsk eP = +16m.27s., iPKS = +22m.54s., iPPP = +24m.45s., iPPS = +34m.3s.
Bombay iN = +22m.48s., iEN = +23m.16s., iE = +26m.33s., iN = +29m.47s., iSKKSE = +30m.2s., iSKSPE = +33m.37s., iPPSEN = +36m.12s., SSEN = +42m.16s., iE = +47m.49s., L$_q$NE = +62m.17s.
Batavia iP = +19m.48s.
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Mizusawa SN = +31m.53s.
Agra eN = +19m.55s., PKP$_2$E = +20m.7s., PSKS = +33m.58s., PPS = +36m.39s., SSN = +42m.50s., SSE = +43m.57s., SSS = +48m.57s.
Dehra Dun eN = +39m.29s., +52m.13s., and +69m.22s.
Medan iE = +20m.26s., iN = +20m.51s.
Vladivostok iPS = +34m.23s., iPPS = +36m.57s., SS = +43m.11s., SSS = +50m.17s.
Kodaikanal PPE = +25m.6s., iSKPE = +26m.8s., iSKKSE = +31m.53s., iSE = +33m.25s., iPPSE = +37m.23s., SSS = +48m.10s.
Zi-ka-wei iZ = +20m.23s. and +21m.41s.
Hong Kong PPP = +29m.32s., SKS = +31m.16s., SS = +46m.52s., SSS = +53m.48s.
Long waves were also recorded at Grozny and Laibach.

April 18d. Readings also at 0h. (Haiwee, Santa Barbara, Mount Wilson, La Jolla, Apia, Tinemaha, Pasadena, and Tucson), 1h. (Ksara and Collmberg), 2h. (Rome and Tucson), 3h. (Triest and near Mizusawa), 6h. (Almeria, near Granada, and Ksara), 8h. (La Paz), 11h. (Harvard and Tucson), 12h. (La Paz and Christchurch), 13h. (Tucson, Pasadena, Tinemaha, and Mount Wilson), 15h. (Tucson, Mount Wilson, Puebla, Tacubaya (2), and Vera Cruz), 16h. (Almata, Ksara, and Helwan), 17h. (Ksara, Helwan, La Paz, La Plata, Baku, Tashkent, Sverdlovsk, and Tiflis), 18h. (La Plata, La Paz, Mount Wilson, Tucson, Pasadena, Tinemaha, Apia, Riverside, and Huancayo), 19h. (Huancayo (2), Riverside. Tinemaha, Mount Wilson, La Paz (2), La Plata (2), Rio de Janeiro, Tucson, and San Juan), 20h. (Rome), 21h. (Grozny, La Plata, Huancayo, and Tiflis), 22h. (Tiflis (2)), 23h. (La Plata).

April 19d. Readings at 1h. (La Paz and La Plata), 2h. (Malabar), 3h. (Tacubaya), 5h. (Tucson), 7h. (La Jolla, Haiwee, Hyderabad, near Tucson, Pasadena, Tinemaha, and Riverside), 8h. (Medan), 12h. (Budapest, Riverview, Wellington (2), and Melbourne), 13h. (Bombay, Ksara, Sverdlovsk, Baku, and Rome), 14h. (Paris, Stuttgart, Kew, and Strasbourg), 15h. (Williamstown, Mount Wilson, Riverside, Tinemaha, Pasadena, Tucson, and La Paz), 16h. (San Juan, Rio de Janeiro, La Paz (2), Tucson (2), Pasadena (2), Mount Wilson (2), Rome, Riverside (2), La Plata (2), and Huancayo), 17h. (Paris, Tashkent, Huancayo, Sverdlovsk, and Baku), 19h. (Tucson), 20h. (Andijan).

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April 20d. 22h. 6m. 31s. Epicentre 46°·4S. 166°·4E.

Felt Queenstown IV-V and at Invercagill; epicentre in vicinity of Sounds.

See Dominion Observatory Seismological Report E85, April, 1939, p. 7.

Epicentre 46°·5S. 167°·5E. (Gutenberg).

$A = -\cdot6727$, $B = +\cdot1627$, $C = -\cdot7218$; $\delta = -1$; $h = -4$;
$D = +\cdot235$, $E = +\cdot972$; $G = +\cdot702$, $H = -\cdot170$, $K = -\cdot692$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Monowai		1·0	54	1 29	+68	—	—	—	—	—
Christchurch		5·2	58	1 26	+ 5	—	—	1 30	P*	—
Wellington		7·9	52	e 1 59	0	3 16	−14	—	—	—
New Plymouth		9·2	41	2 21	+ 5	3 56	− 7	—	—	—
Sydney		17·0	312	i 3 53	− 8	—	—	—	—	e 7·3
Riverview		17·1	312	i 4 3k	+ 1	—	—	—	—	e 7·8
Melbourne		18·0	292	4 21	+ 8	7 47	+15	—	—	8·8
Brisbane	N.	21·6	327	i 4 47	− 7	i 8 53	+ 4	—	—	—
Adelaide		23·9	289	e 7 25	?	i 11 51	L	—	—	(i 11·9)
Batavia		64·8	289	10 51a	+ 8	—	—	—	—	—
Manila		73·2	314	i 11 40	+ 5	i 21 8	+ 6	—	—	35·3
Medan		77·5	289	e 12 8	+ 9	21 56	+ 6	—	—	—
Zi-ka-wei	Z.	87·3	323	e 12 59	+ 9	i 24 40	PS	—	—	—
Colombo	E.	92·6	277	—	—	23 56	[+ 8]	—	—	—
Vladivostok		94·3	335	—	—	e 24 47	+15	31 19	SSP	e 32·4
Kodaikanal	E.	96·6	278	e 17 29?	PP	—	—	—	—	—
Calcutta	N.	98·2	294	e 21 36	?	i 24 26	[+ 8]	—	—	—
Hyderabad	N.	101·0	283	24 43	S	(24 43)	[+11]	—	—	—
Bombay		105·8	280	e 17 46	PKP	e 26 6	− 3	e 18 50	PP	—
Ukiah		105·8	49	—	—	e 32 9	?	—	—	—
Tucson		108·0	62	i 13 40k	P	—	—	—	—	i 53·2
Agra	E.	108·1	291	e 18 59	PP	i 25 12	[+ 8]	—	—	—
Tashkent		122·6	297	i 19 4	[+ 6]	26 5	[+ 7]	i 20 34	PP	e 53·5
Chicago		128·5	65	—	—	e 44 8	?	—	—	—
Baku		134·6	286	e 19 48	[+28]	e 31 45	PS	e 23 7	PKS	e 66·5
Sverdlovsk		134·9	312	e 20 29	[+69]	—	—	e 22 59	PKS	66·5
Philadelphia		135·6	76	e 23 1	PKS	—	—	—	—	—
Tiflis		138·6	286	e 19 39	[+11]	i 29 24	{+11}	e 22 21	PP	—
Bermuda		138·7	91	e 22 38	PP	—	—	—	—	—
Grozny		138·7	288	e 19 36	[+ 8]	—	—	e 23 10	PKS	—
Helwan		141·6	261	i 19 47k	[+14]	e 29 47	{+17}	e 22 56	PP	—
Moscow		147·2	306	i 19 57	[+14]	—	—	e 23 21	PP	—
Istanbul		149·0	277	19 11	[−35]	—	—	—	—	—
Pulkovo		151·0	313	e 20 11	[+22]	—	—	—	—	—
Rome		160·8	267	20 14	[+13]	i 31 28	{+11}	i 24 51	PP	—
Collmberg		161·6	293	e 20 11	[+ 9]	—	—	e 24 41	PP	—
Cheb		162·3	292	e 28 34	PPP	e 31 34	{+10}	—	—	—
Hamburg		163·3	304	e 21 7	[+63]	e 31 35	{+ 6}	e 24 57	PP	—
Stuttgart		164·5	287	e 20 15	[+10]	e 30 38	{−57}	e 25 2	PP	e 103·5
Strasbourg		165·4	286	e 20 23k	[+17]	—	—	e 25 4	PP	e 97·5
De Bilt		166·5	301	i 21 23	?	—	—	i 25 10	PP	e 91·5
Uccle		167·4	297	e 20 29	[+22]	e 31 39	{−11}	e 25 13	PP	—
San Fernando		168·6	212	—	—	e 48 27	?	—	—	—
Paris		168·9	288	e 20 27	[+19]	—	—	—	—	100·5
Kew		169·9	305	e 21 1	[+52]	e 32 10	{+ 8}	i 25 27	PP	e 96·5
Toledo		170·5	231	e 20 9	[0]	—	—	—	—	—

Additional readings:—
Monowai +1m.37s. and +1m.43s.
Christchurch +1m.42s.
New Plymouth S? = +3m.35s. and +3m.50s.
Batavia ePE = +10m.55s.
Medan iE = +12m.35s.
Zi-ka-wei iZ = +13m.14s.
Vladivostok e = +25m.8s. and +26m.25s.

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Tucson i = +13m.48s., +30m.11s., and +50m.3s.
Tashkent SKKS = +27m.39s., PS = +30m.28s., eSS = +37m.23s.
Baku +29m.44s. and +41m.39s.
Tiflis iZ = +23m.13s., eZ = +31m.37s., eN = +31m.51s., eE = +37m.4s.
Moscow e = +21m.37s., +22m.26s., and +24m.24s.
Rome iPKP$_2$E = +21m.9s., iZ = +24m.36s., iPPPE = +28m.38s., iPSKSE = +35m.3s., iSSE = +44m.55s., iE = +46m.10s. and +47m.8s.?
Collmberg e = +20m.58s.
Cheb e = +35m.4s.
Stuttgart ePKP$_2$EZ = +21m.13s., ePSEZ = +35m.51s., ePPS = +37m.53s., eSPS = +45m.35s.
Strasbourg ePKP$_2$Z = +21m.18s., eSKPZ = +23m.51s., e = +35m.59s.
Uccle ePKP$_2$Z = +21m.26s., eSKSPE = +35m.33s.
San Fernando ePPSN = +55m.59s.
Paris PP = +21m.37s.
Kew eZ = +35m.53s.
Toledo e = +21m.42s.
Long waves were also recorded at Huancayo, Cape Town, Stonyhurst, Edinburgh, Berkeley, and Pasadena.

April 20d. Readings also at 0h. (La Paz), 1h. (La Paz (2), Fort de France, Andijan, and Frunse), 3h. (Tucson (2)), 4h. (Rathfarnham Castle), 7h. (Tiflis), 8h. (Tiflis and near Mizusawa), 9h. (near Fort de France), 12h. (Apia), 13h. (Tucson and Collmberg), 14h. (Andijan, Frunse, and near Tananarive), 16h. (Fordham), 17h. (Balboa Heights, San Juan, Riverside, Pasadena, Mount Wilson, Collmberg, Tucson, near Fort de France, Tiflis, and La Paz), 18h. (Huancayo), 20h. (Ottawa and near Fordham), 21h. (La Paz, Tucson (2), near Tananarive, and La Plata), 23h. (near Fort de France, Cheb, and Tiflis).

April 21d. 1h. Undetermined shock :
Sitka eP = 40m.3s., eS = 41m.44s.
College eS = 42m.0s., eL = 43·2m.
Tinemaha iPEZ = 43m.27s.
Hawiee ePEN = 43m.38s.
Mount Wilson iPZ = 43m.46s.
Riverside iPZ = 43m.49s.
Tucson iP = 44m.33s.a and +44m.39s.
Sverdlovsk iP = 47m.39s., S = 56m.34s., L = 73·0m.
Toledo iP = 49m.23s.
Tiflis eP = 49m.24s., eSE = 59m.7s., eL = 90·0m.
Tashkent eS = 58m.42s., e = 67m.23s. and 79m.42s., eL = 84·4m.
Philadelphia e = 65m.45s.
Long waves were also recorded at St. Louis.

April 21d. 4h. 29m. 6s. Epicentre 47°·6N. 140°·0E.

Intensity II at Miyako ; I at Hakodate, Urakawa, Aomori, Hatinohe, Morioka, Onahama, and Sendai. Epicentre 47°·6N. 140°·0E. Very deep. Focal depth 500kms. See the Seismological Bulletin of the Central Met. Obs., Japan, for the year 1939, Tokyo, 1949, pp. 11-12.

H. Honda and H. Ito.

The deep seated earthquake of April 21, 1939, that originated in the northern part of the Japan Sea ; S_0S and the rigidity of the earth's core, 3rd paper, " Kensin Ziho," Vol. II, Tokyo, 1940.

$$A = -\cdot5184,\ B = +\cdot4350,\ C = +\cdot7362\ ;\quad \delta = -5\ ;\quad h = -4\ ;$$
$$D = +\cdot643,\ E = +\cdot766\ ;\quad G = -\cdot564,\ H = +\cdot473,\ K = -\cdot677.$$

Tables for a focal depth 0·080 have been used.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sapporo	4·6	169	1 27k	+ 1	2 25	−10	—	—	—
Mori	5·5	176	1 34	0	2 48	− 1	—	—	—
Nemuro	5·8	135	1 37k	0	2 56	+ 2	—	—	—
Aomori	6·8	175	1 46k	0	3 10	− 1	—	—	—
Hatinohe	7·1	170	1 49k	0	3 18	+ 2	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		7·2	235	e 1 50	0	—	—	—	—	—
Miyako		8·1	169	1 57k	− 2	3 31	− 3	—	—	—
Mizusawa		8·5	174	i 2 3	0	i 3 40	− 2	—	—	—
Sendai		9·4	175	2 12k	0	3 59	+ 1	—	—	—
Hukusima		9·9	178	2 16a	− 2	4 8	0	—	—	—
Wazima		10·5	194	2 23a	− 1	4 14	− 5	—	—	—
Onahama		10·7	176	2 28k	+ 2	4 23	+ 1	—	—	—
Nagano		11·0	188	2 28	− 1	4 31	+ 3	—	—	—
Utunomiya		11·0	180	2 28	− 1	4 28	0	—	—	—
Toyama		11·1	192	2 30	0	4 30	0	—	—	—
Maebasi		11·2	184	2 32	+ 1	4 34	+ 2	—	—	—
Mito		11·2	177	2 29a	− 2	4 29	− 3	—	—	—
Kakioka		11·4	179	2 30	− 3	4 34	− 2	—	—	—
Tukubasan		11·4	178	2 31	− 2	4 31	− 5	—	—	—
Kumagaya		11·5	183	2 34	0	4 39	+ 1	—	—	—
Tokyo Cen. Met. Ob.		11·9	181	2 39	+ 1	4 48	+ 3	—	—	—
Hunatu		12·1	185	2 40	0	4 49	0	—	—	—
Yokohama		12·2	183	2 40a	− 1	4 51	+ 1	—	—	—
Gihu		12·4	193	2 43a	0	4 57	+ 3	—	—	—
Misima		12·5	183	2 43	− 1	4 57	+ 1	—	—	—
Hikone		12·6	194	2 47a	+ 2	4 58	0	—	—	—
Nagoya		12·6	191	2 47	+ 2	5 1	+ 3	—	—	—
Toyooka		12·6	200	2 47a	+ 2	5 3	+ 5	—	—	—
Mera		12·7	181	2 43	− 3	5 0	0	—	—	—
Osima		12·8	181	2 48	+ 1	5 2	0	—	—	—
Kameyama		13·0	193	2 50a	+ 1	5 8	+ 3	—	—	—
Kyoto		13·0	196	2 49a	0	5 6	+ 1	—	—	—
Omaesaki		13·1	187	2 54	+ 4	5 8	+ 1	—	—	—
Heizyo		13·4	237	2 53k	0	5 14	+ 1	—	—	—
Kobe		13·4	197	2 53a	0	5 14	+ 1	—	—	—
Osaka		13·4	196	i 2 53a	0	5 14	+ 1	—	—	—
Hamada		14·0	208	3 1a	+ 2	5 29	+ 5	—	—	—
Zinsen		14·1	229	3 2	+ 2	5 30	+ 5	—	—	—
Hirosima		14·4	207	3 3a	0	5 33	+ 2	—	—	—
Siomisaki		14·5	198	3 5a	+ 1	5 34	+ 1	—	—	—
Taikyu		14·5	220	3 7	+ 3	5 37	+ 4	—	—	—
Matuyama		14·8	204	3 7a	0	5 36	− 2	—	—	—
Koti		14·9	200	3 9a	+ 1	5 43	+ 3	—	—	—
Muroto		15·0	200	3 11a	+ 2	5 47	+ 5	—	—	—
Izuka		15·6	211	3 18a	+ 3	5 59	+ 6	—	—	—
Simidu		15·7	202	3 37	+21	6 19	+25	—	—	—
Hukuoka		15·8	211	3 17	0	(6 1)	+ 5	—	—	6·0
Dairen		15·9	242	3 19	+ 1	6 2	+ 4	—	—	—
Kumamoto		16·4	209	3 23a	0	6 11	+ 4	—	—	—
Nagasaki		16·7	211	3 29a	+ 3	6 20	+ 8	—	—	—
Yakusima		18·6	207	3 46a	+ 2	6 46	+ 1	—	—	—
Titizima		20·6	174	4 3a	0	7 21	+ 3	—	—	—
Zi-ka-wei		21·7	228	i 4 14k	+ 1	i 7 40	+ 4	9 12	SS	—
Miyakozima		25·6	213	4 45	− 3	8 24	−14	—	—	—
Tainan		29·2	219	5 10	− 9	9 24	−11	—	—	—
Hong Kong		32·7	229	5 48k	− 1	10 25	− 4	(13 23)	SS	13·4
Manila		36·5	212	i 6 22a	+ 1	i 11 25	− 1	—	—	15·3
Phu-Lien		37·9	237	e 6 33	+ 1	i 11 44	− 2	—	—	—
College		41·1	37	e 8 53	pP	12 33	0	15 27	sS	e 17·9
Almata		43·4	290	7 17	+ 1	—	—	—	—	—
Frunse		45·1	290	7 29	0	13 28	− 1	—	—	—
Sverdlovsk		46·9	313	i 7 41	− 2	i 13 51	− 3	i 9 21	pP	—
Andijan		47·6	288	7 48	0	14 3	− 1	—	—	—
Calcutta	N.	48·0	257	i 7 53	+ 1	i 14 13	+ 3	10 9	sP	—
Tashkent		49·3	298	i 7 57	− 4	i 14 25	− 2	9 13	pP	e 20·4
Sitka		49·4	46	e 8 5	+ 3	i 14 34	+ 5	e 10 44	sP	e 20·5
Samarkand		51·6	290	e 8 10	− 8	e 14 52	− 6	—	—	—
Agra	E.	51·9	270	8 15	− 5	i 14 56	− 6	9 58	pP	—
Honolulu		55·9	95	i 8 54	+ 6	i 16 4	+ 9	e 18 56	sS	e 22·2
Medan		56·4	233	8 54	+ 2	i 16 2	+ 1	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hyderabad		58·2	261	9 0	− 4	16 20	− 4	23 44	SSS	—
Moscow		58·4	319	i 9 2	− 4	i 16 23	− 4	i 10 48	pP	—
Pulkovo		58·7	327	i 9 8	0	i 16 28	− 3	i 10 52	pP	e 23·4
Victoria		60·2	49	i 9 10	− 7	i 16 47	− 3	e 17 18	sS	22·9
Batavia		61·0	218	i 9 21a	− 2	i 16 59	0	—	—	—
Bombay		61·0	267	i 9 21a	− 2	i 16 58	− 1	i 11 6	pP	—
Scoresby Sund		61·5	354	9 27a	+ 1	i 17 9	+ 3	11 14	pP	—
Baku		61·7	301	i 9 27	0	i 17 9	+ 1	i 11 14	pP	—
Grozny		62·2	305	e 9 31	+ 1	e 17 13	− 1	—	—	—
Upsala		63·1	332	i 9 35	− 1	e 17 19	− 6	i 11 57	PP	—
Piatigorsk		63·2	307	9 37	0	—	—	—	—	—
Tiflis		63·8	304	i 9 39	− 2	i 17 32	− 2	i 11 27	pP	—
Kodaikanal	E.	64·1	257	i 9 43k	0	i 17 36	− 1	i 18 44	S_cS	—
Erevan		64·9	303	9 49	+ 1	17 48	+ 1	—	—	—
Colombo	E.	65·0	252	11 54?	pP	17 54?	+ 6	—	—	—
Bergen		65·6	338	i 9 54	+ 2	e 18 2	+ 7	—	—	—
Ukiah		66·4	57	e 10 6	+ 9	i 18 12	+ 7	e 14 16	pPP	e 28·4
Butte		67·3	45	e 11 56	pP	e 18 20	+ 5	e 19 7	S_cS	e 31·8
Berkeley		67·8	58	i 10 7a	+ 1	i 18 27	+ 6	i 11 59	pP	—
San Francisco	N.	67·8	58	i 10 9	+ 3	—	—	—	—	—
Copenhagen		68·1	332	i 10 7k	0	i 18 23	− 1	e 11 52	pP	—
Branner		68·2	58	e 10 10	+ 2	e 18 33	+ 7	—	—	—
Santa Clara		68·3	58	e 10 48	+39	i 19 6	+39	i 22 29	sS	—
Bozeman		68·3	45	e 12 31	pP	i 18 31	+ 4	—	—	—
Lick		68·5	58	e 10 12	+ 2	e 18 33	+ 4	—	—	—
Fresno		70·0	57	e 10 22	+ 3	e 18 52	+ 6	—	—	—
Tinemaha		70·6	56	10 25a	+ 3	—	—	i 12 15	pP	—
Hamburg		70·7	332	i 10 22k	− 1	i 18 52	− 2	i 12 12	pP	e 40·9
Aberdeen		70·9	340	i 10 25	+ 1	i 18 54	− 2	i 19 25	PS	—
Ivigtut		71·4	5	i 10 27k	0	19 4	+ 2	i 12 18	pP	—
Bucharest		71·5	317	e 10 28	0	i 19 3	0	i 12 20	pP	—
Collmberg		71·5	328	i 10 26k	− 2	i 19 0	− 3	i 12 16	pP	—
Haiwee		71·5	56	i 10 29	+ 1	e 19 9	+ 6	—	—	—
Prague		71·7	327	i 10 32k	+ 3	i 19 8	+ 3	19 43	PS	—
Budapest		72·2	322	i 10 31	− 1	i 19 12	+ 1	10 47	P_cP	—
Göttingen		72·3	332	i 10 32	0	e 19 11	− 1	e 11 23	pP	—
Edinburgh		72·3	340	e 13 13	PP	i 19 12	0	—	—	—
Jena		72·3	329	e 10 30	− 2	i 19 8	− 4	i 12 22	pP	e 26·9
Kecskemet	Z.	72·4	322	i 10 34	+ 1	—	—	e 12 28	pP	e 16·9
Istanbul		72·6	313	10 27	− 7	19 8	− 7	22 19	PS	—
Cheb		72·7	329	e 10 32	− 2	e 19 13	− 3	e 12 25	pP	—
Mount Wilson		72·7	58	i 10 37a	+ 3	i 19 23	+ 7	i 12 30	pP	—
Pasadena		72·9	58	i 10 37a	+ 1	i 19 22	+ 4	i 12 29	pP	—
Durham		73·0	338	i 10 39	+ 3	i 19 17	− 3	i 12 28	pP	—
Szeged		73·0	322	e 10 37	+ 1	e 19 57	+37	e 12 7	pP	—
Riverside		73·3	58	i 10 39	+ 1	i 19 27	+ 4	i 12 33	pP	—
De Bilt		73·4	333	i 10 39	+ 1	i 19 26	+ 2	i 12 31	pP	—
Belgrade		73·8	320	i 10 39a	− 2	i 19 26	− 2	i 12 31	pP	47·3
Stonyhurst		74·0	338	—	—	i 19 32	+ 2	i 24 31	SS	—
La Jolla		74·2	59	i 10 45	+ 2	e 19 38	+ 5	i 12 40	pP	—
Ksara		74·3	303	i 10 44k	+ 1	i 19 36	+ 2	i 12 36	pP	—
Bidston		74·5	339	i 10 46	+ 2	i 19 36	0	i 12 39	pP	—
Uccle		74·8	333	i 10 46k	0	i 19 36	− 3	12 36	pP	e 27·9
Stuttgart		75·0	329	e 10 47k	0	e 19 37	− 4	e 12 30	pP	e 28·9
Kew		75·6	337	i 10 50	− 1	i 19 46	− 2	i 12 42	pP	—
Strasbourg		75·6	330	i 10 51k	0	i 19 48	0	i 12 44	pP	—
Oxford		75·8	338	i 10 48	− 4	i 19 42	− 8	i 12 45	pP	—
Triest		75·9	325	i 10 51k	− 1	i 19 47	− 4	i 12 45	pP	—
Zurich		76·4	329	e 10 54	− 1	e 19 55	− 1	i 12 48	pP	—
Chur		76·5	329	e 10 55k	− 1	—	—	e 12 49	pP	—
Basle		76·6	330	e 10 56	0	e 20 6	+ 8	—	—	—
Paris		77·1	333	i 11 0	+ 1	19 56	− 8	12 53	pP	23·9
Neuchatel		77·3	330	e 10 59	− 1	e 20 3	− 3	e 12 53	pP	—
Jersey		78·2	337	e 11 0	− 5	i 20 8	− 7	e 12 56	pP	e 31·7
Tucson		78·3	55	i 11 8a	+ 3	20 23	+ 7	i 13 3	pP	i 32·1

Continued on next page.

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lincoln	78·6	41	e 13 5	pP	20 21	+ 2	e 14 52	PP	32·4
Moncalieri	78·7	329	i 11 8	+ 1	20 22	+ 2	—	—	—
Rome	79·5	323	i 11 11k	− 1	i 20 26	− 3	i 13 5	pP	e 28·5
Clermont Ferrand	79·7	331	i 11 14	+ 1	e 20 8	−23	i 13 8	pP	—
Helwan	79·8	303	i 11 13a	0	20 30	− 2	13 6	pP	—
Chicago	81·4	35	—	—	i 20 49	+ 1	24 15	sS	e 38·6
Riverview	81·7	171	i 11 25a	+ 2	e 20 52	+ 1	i 12 28	pP	—
Seven Falls	81·7	21	11 22	− 1	20 48	− 3	25 30	SS	—
Shawinigan Falls	81·9	22	11 27	+ 3	20 54	+ 1	13 23	pP	—
Adelaide	82·2	182	i 13 27	pP	e 22 49	PS	e 26 6	SS	—
Ottawa	82·2	24	i 11 26	+ 1	i 20 56	0	i 13 23	pP	—
Toronto	82·7	28	i 13 25	pP	i 20 58	− 2	i 24 28	sS	—
Florissant	83·0	37	e 11 29	0	i 20 58	− 5	e 13 23	pP	—
St. Louis	83·2	37	i 11 30	0	e 20 58	− 7	e 13 25	pP	—
East Machias	84·9	19	—	—	i 21 14	− 8	e 24 57	sS	e 34·2
Cincinnati	85·0	33	i 11 42	+ 3	i 21 24	+ 1	i 13 38	pP	—
Melbourne	85·2	177	e 15 4	sP	i 21 31	+ 6	e 24 49	sS	—
Williamstown	85·4	23	i 11 44	+ 3	i 21 32	+ 6	i 13 39	pP	—
Little Rock	85·5	41	i 11 41	− 1	i 21 17	−10	i 13 40	pP	—
Halifax	85·8	16	—	—	e 21 17	−13	e 25 12	sS	—
Harvard	86·0	22	i 11 45	+ 1	i 21 20	−12	i 13 44	pP	—
Fordham	86·9	25	i 11 50k	+ 2	i 21 26	−14	i 13 48	pP	—
Toledo	87·2	334	i 11 51k	+ 1	i 21 26	−17	i 13 48	pP	—
Philadelphia	87·4	27	e 13 46	pP	i 21 45	0	e 25 12	sS	e 43·7
Algiers	87·6	327	i 13 31	pP	21 45	− 2	i 15 16	sP	—
Georgetown	87·8	28	e 11 52	0	i 21 49	+ 1	i 13 52	pP	—
Almeria	89·5	331	i 13 42	pP	e 20 2	?	—	—	e 35·7
Granada	89·5	332	i 12 4a	+ 4	22 26	+22	13 56	pP	30·9
San Fernando	90·7	334	i 14 8	pP	i 21 49	−25	25 54	sS	—
Wellington	93·7	155	e 17 54?	?	—	—	—	—	—
Christchurch	95·2	157	e 12 4	−22	22 9	−44	i 25 44	sS	39·4
Bermuda	97·4	21	e 14 44	pP	e 22 22	SKS	e 26 46	sS	—
San Juan	110·3	26	—	—	25 1	sS	e 28 5	SS	e 35·3
Cape Town	134·7	266	i 22 3	PP	—	—	—	—	—
La Paz z.	141·3	46	i 18 31	[+ 1]	—	—	i 21 29	PP	—

Additional readings :—
Zi-ka-wei S?Z = +6m.22s., iZ = +6m.36s., +7m.52s., +8m.0s., +9m.58s., and +10m.32s.
Hong Kong +9m.17s., SS = +11m.23s.
College esPP = +11m.5s.
Sverdlovsk PP = +9m.38s., isS = +16m.30s., iSS = +16m.52s.
Calcutta eN = +8m.25s., iN = +15m.16s.
Tashkent isS = +16m.52s.
Sitka S_eS = +17m.1s., isS = +17m.40s.
Honolulu eP_eP = +9m.56s., ePP = +11m.26s., i = +14m.59s., esS = +18m.56s.
Agra eE = +9m.21s., PP = +10m.21s., e = +12m.55s., iS_eSE = +17m.6s., isS = +17m.54s., SS = +18m.37s., sSS = +20m.38s.
Moscow iPP = +11m.19s., isP = +11m.49s., ipPP = +12m.54s., isS = +19m.24s.
Pulkovo ePP = +11m.22s., isS = +19m.36s.
Victoria e = +18m.6s. and +19m.48s.
Batavia iPEN = +9m.24s.
Bombay iE = +10m.40s., isPN = +11m.44s., iS_eSEN = +18m.14s., eN = +20m.13s.
Scoresby Sund +18m.24s., +24m.0s., and +24m.50s.
Baku PP = +11m.48s., sS = +20m.9s.
Upsala ePSN = +17m.38s., iN = +18m.31s., eSSE = +21m.14s., eSSSE = +23m.24s.
Tiflis iN = +9m.42s., iE = +9m.49s., iN = +10m.11s., iE = +10m.18s., iN = +10m.23s., +10m.31s., and +10m.41s., isPZ = +12m.5s., isPE = +12m.11s., eZ = +13m.11s., ePPPEZ = +13m.47s., sSZ = +20m.29s., sSN = +20m.42s., SSZ = +22m.5s., SSSN = +24m.58s., SSSZ = +25m.22s.
Kodaikanal iSSE = +21m.42s. and +23m.13s.
Ukiah sS = +21m.29s.
Copenhagen i = +10m.46s., eZ = +12m.38s., isP = +12m.47s., ePP = +14m.28s., eZ = +18m.18s., i = +19m.12s., e = +21m.30s., eE = +22m.12s., e = +22m.54s.
Lick eSE = +18m.36s.
Hamburg eE = +13m.1s.
Aberdeen iN = +19m.35s., iE = +23m.40s., iN = +26m.54s.
Ivigtut +19m.37s. and +22m.0s.
Bucharest isPE = +13m.5s., iSPNE = +19m.26s., iSPN = +19m.29s., iSSE = +22m.21s.

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Collmberg $iP_cP = +10m.44s.$, $i = +12m.18s.$, $ipP_cP = +12m.42s.$, $i = +12m.59s.$, $isP = +13m.13s.$, $iPP = +13m.23s.$, $isP_cP = +13m.36s.$, $i = +13m.52s.$, $ipPP = +14m.57s.$, $iPPP = +15m.7s.$, $isPP = +15m.52s.$, $i = +16m.28s.$ and $+17m.29s.$, $eZ = +19m.12s.$, $iS_cS = +19m.24s.$, $iSP = +19m.40s.$, $eZ = +19m.50s.$, $i = +20m.26s.$, $eSSS = +27m.6s.$, $iPKP,PKPZ = +38m.8s.$, $iPKP_2PKP_2 = +38m.15s.$, $i = +38m.20s.$
Budapest $sPN = +12m.22s.$, $sPE = +12m.39s.$, $e = +19m.47s.$, $eE = +20m.26s.$
Edinburgh $i = +24m.1s.$
Jena $iN = +12m.43s.$, $eN = +19m.38s.$, and $+19m.42s.$, $eE = +19m.48s.$
Kecskemet $eZ = +12m.47s.$
Istanbul $PKS = +13m.2s.$, $SS = +27m.14s.$
Mount Wilson $ePKP,PKPZ = +37m.37s.$, $iZ = +40m.56s.$
Pasadena $isSEN = +22m.36s.$, $eE = +26m.58s.$, $ePKP,PKPZ = +37m.51s.$
Durham $iN = +13m.26s.$, $iE = +23m.0s.$ and $+24m.10s.$
Szeged $eP_cPEN = +10m.59s.$, $ePPE = +13m.5s.$, $ePSE = +20m.21s.$, $eS_cSN = +20m.54s.$, $eSSE = +24m.41s.$
Riverside $ePKP,PKPZ = +37m.23s.$, $eZ = +40m.47s.$
De Bilt $iPP = +13m.28s.$, $iS? = +19m.58s.$
Belgrade $iPPZ = +13m.34s.$
Stonyhurst $i = +24m.31s.$
Ksara $sP = +13m.36s.$, $iPP = +13m.48s.$, $pPP = +15m.24s.$, $SP = +20m.20s.$, $sS = +22m.41s.$
Bidston $iPP = +13m.35s.$, $epPP = +15m.14s.$, $ePPP = +15m.39s.$, $e = +19m.57s.$, $iS_cS = +20m.4s.$, $iSP = +20m.22s.$, $iSS = +23m.0s.$, $i = +23m.38s.$, $iSSS = +27m.28s.$
Uccle $sPN = +13m.36s.$, $iPPN = +13m.49s.$, $pPPN = +15m.22s.$, $iZ = +19m.55s.$, $iN = +20m.9s.$
Stuttgart $ipP = +12m.41s.$, $esP = +13m.34s.$, $ePP = +15m.23s.$, $e = +18m.0s.$, $eSP = +20m.4s.$, $eEN = +27m.24s.$ and $+27m.54s.$
Kew $iZ = +10m.53s.$, $iP_cPN = +11m.8s.$, $iZ = +12m.46s.$, $i_gPZ = +13m.38s.$, $i_gP_cPZ = +13m.44s.$, $iPPZN = +13m.50s.$, $epPPNZ = +15m.24s.$, $ePPPN = +15m.38s.$, $eEZ = +19m.16s.$, $eNZ = +19m.58s.$, $iS_cSNZ = +20m.4s.$, $iSPZN = +20m.24s.$, $isSN = +23m.2s.$, $isSN = +23m.2s.$, $isSPZ = +23m.40s.$, $iN = +23m.49s.$, $iSSE = +24m.54s.$, $isSSEN = +27m.38s.$, $eSSSZ = +28m.37s.$, $eE = +30m.44s.$, $iZ = +31m.4s.$
Strasbourg $isPZ = +13m.42s.$, $iPPZ = +13m.53s.$, $pPPZ = +15m.20s.$, $pPPPZ = +17m.4s.$, $iSPZ = +20m.21s.$, $isS = +23m.14s.$, $eSSZ = +25m.10s.$, $i = +31m.26s.$
Oxford $i = +20m.6s.$
Triest $i = +11m.1s.$, $+20m.10s.$, and $+20m.25s.$, $isS = +23m.8s.$, $e = +23m.20s.$, $+31m.10s.$, and $+38m.8s.$
Paris $PP = +14m.7s.$
Jersey $eSS = +23m.34s.$
Tucson $iP_cP = +11m.19s.$, $i = +11m.36s.$, $+11m.47s.$, $+12m.3s.$, $+12m.12s.$, $+12m.28s.$, $+12m.36s.$, $+12m.47s.$, $+13m.33s.$, and $+13m.52s.$, $i_gP = +14m.7s.$, $iPP = +14m.18s.$, $i = +14m.53s.$ and $+15m.43s.$, $ipPP = +15m.52s.$, $PPP = +16m.30s.$, $i = +19m.4s.$ and $+19m.48s.$, $iS_cS = +20m.32s.$, $i = +20m.41s.$ and $+20m.52s.$, $iSP = +21m.9s.$, $i = +23m.14s.$, $isS = +23m.49s.$, $PKKS = +27m.56s.$, $isSS = +28m.41s.$, $i = +31m.51s.$
Lincoln $i = +15m.59s.$, $sS = +23m.45s.$, $ePKKP = +28m.33s.$
Rome $eZ = +14m.4s.$, $iZ = +14m.23s.$, $iS = +20m.37s.$, $iE = +23m.42s.$, $iN = +23m.50s.$
Helwan $iZ = +11m.27s.$ and $+14m.2s.$, $PPZ = +14m.21s.$, $eE = +21m.27s.$, $sSE = +23m.54s.$, $SSSE = +29m.19s.$
Chicago $eSP = +22m.37s.$, $eSSS = +31m.45s.$
Seven Falls $e = +24m.18s.$
Ottawa $i = +24m.26s.$
Florissant $ePPPZ = +16m.23s.$, $epPPPZ = +18m.17s.$, $esSE = +24m.27s.$
St. Louis $ipPEN = +13m.28s.$, $eSKSE = +21m.1s.$, $isSE = +24m.31s.$
East Machias $iSKKS = +21m.24s.$, $eSS = +27m.8s.$, $esSS = +30m.8s.$, $eSSS = +31m.15s.$
Cincinnati $e = +15m.40s.$, $i = +16m.24s.$ and $+18m.36s.$, $iSKS = +21m.13s.$, $isS = +24m.31s.$
Williamstown $e = +20m.48s.$, $iS = +22m.24s.$
Little Rock $iS = +21m.29s.$, $isS = +24m.59s.$
Halifax $e = +21m.32s.$
Harvard $iSEN = +21m.34s.$, $isSEN = +25m.6s.$
Fordham $iZ = +11m.55s.$, $iE = +21m.30s.$, $iSE = +21m.43s.$, $iNZ = +21m.46s.$, $isSN = +25m.16s.$, $isSE = +25m.19s.$, $iSSSZ = +29m.38s.$
Toledo $i = +15m.24s.$ and $+21m.46s.$
Philadelphia $i = +21m.26s.$, $e_sP = +22m.50s.$
Algiers $sS? = +21m.25s.$
Georgetown $i = +11m.55s.$, $iSKS = +21m.28s.$, $i = +22m.52s.$, $isS = +25m.14s.$
Granada $P_cP = +12m.22s.$, $PP = +16m.5s.$, $SKS = +21m.37s.$, $PS = +23m.21s.$, $sS = +25m.56s.$
Christchurch $iZ = +18m.6s.$, $e = +19m.6s.$, $i = +26m.45s.$, $eEN = +27m.30s.$ and $+30m.4s.$
Bermuda $eSKKS = +23m.12s.$, $esSS = +33m.13s.$, $eSSS = +39m.54s.?$
San Juan $iSSS = +33m.0s.$
Long waves were also recorded at Huancayo.

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April 21d. Readings also at 1h. (near Mizusawa, Wellington, and New Plymouth), 3h. (near Mizusawa), 4h. (Tucson), 5h. (Tiflis), 6h. (Tucson and Granada), 10h. (Balboa Heights), 13h. (near Tananarive), 15h. (Tucson), 16h. (Tashkent), 17h. (Sverdlovsk, Ksara, and near Mizusawa), 19h. (Fordham).

April 22d. 11h. 24m. 11s. Epicentre 2°·2N. 126°·9E. (as on 1938 Oct. 11d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		13·6	335	i 3 20k	+ 3	6 14	SSS	—	—	7·3
Kosyun		20·6	344	4 43	0	8 23	− 6	—	—	—
Batavia		21·7	248	e 4 52	− 3	8 51	0	—	—	—
Miyakozima		22·5	358	4 56	− 6	9 3	− 2	—	—	—
Medan		28·2	274	5 49?	− 7	i 10 56	+15	—	—	—
Gihu		34·3	15	6 51	+ 1	—	—	—	—	—
Nagano		35·8	15	7 5	+ 2	—	—	—	—	—
Sendai		38·1	19	7 28	+ 6	—	—	—	—	—
Mizusawa	E.	39·0	19	(e 7 33)	+ 3	e 7 33	P	—	—	—
Mori		41·6	15	8 0	+ 9	—	—	—	—	—
Kodaikanal	E.	49·7	282	e 10 49?	PP	—	—	—	—	—
Agra	E.	52·9	303	e 9 16	− 4	16 36	−12	20 7	SS	—
Frunse		61·6	318	e 10 28	+ 6	—	—	—	—	—
Samarkand		65·7	313	e 10 40	− 8	—	—	—	—	—
Sverdlovsk		75·3	329	i 11 46	− 1	21 18	− 8	—	—	34·8
Grozny		82·0	313	e 12 26	+ 3	—	—	—	—	—
Tiflis	Z.	82·6	311	12 26	0	—	—	—	—	—
Moscow		87·8	326	12 50	− 2	23 29	− 5	—	—	—
Ksara		89·6	304	i 13 2	+ 1	i 23 58	+ 7	e 16 33	PP	—
Tinemaha	Z.	108·2	50	e 18 50	PP	—	—	—	—	—
Pasadena	Z.	109·1	53	i 18 32	[+ 1]	—	—	e 19 17	PP	—
Riverside	Z.	109·8	53	e 18 34	[+ 1]	—	—	e 19 5	PP	—
Tucson		115·6	52	18 47k	[+ 3]	i 29 17	PS	i 19 42	PP	—
La Paz	Z.	159·5	135	e 20 6	[+ 6]	—	—	—	—	—

Additional readings:—
Medan iN = +11m.0s., iE = +11m.4s.
Grozny e = +13m.5s.
Tiflis eZ = +13m.16s.
Moscow eS = +23m.35s.
Ksara ePS = +24m.51s.
Tucson i = +19m.55s., +19m.59s., and +21m.16s.
Long waves were also recorded at Strasbourg, Stuttgart, and La Plata.

April 22d. Readings also at 0h. (near Ferndale), 1h. (Tananarive), 10h. (Mizusawa), 11h. (Tacubaya and Collmberg), 12h. (La Paz, near Mizusawa, and Tucson), 13h. (Riverside, Tucson, Collmberg, and Kodaikanal), 15h. (Stuttgart, near Strasbourg, Neuchatel, Zurich, Basle, Collmberg (2), and Tucson), 20h. (Andijan, Medan, and Kodaikanal), 23h. (Tucson).

April 23d. 16h. 23m. 4s. Epicentre 0°·5N. 17°·0W.

$A = +\cdot9563$, $B = -\cdot2924$, $C = +\cdot0087$; $\delta = +8$; $h = +7$;
$D = -\cdot292$, $E = -\cdot956$; $G = +\cdot008$, $H = -\cdot003$, $K = -1\cdot000$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rio de Janeiro	34·5	226	i 6 51	− 1	i 12 14	− 6	—	—	i 15·9
San Fernando	37·2	14	e 7 20	+ 5	i 13 7	+ 5	e 15 15	SS	18·9
Granada	38·5	17	i 7 25a	− 1	i 12 23	−59	8 33	PP	19·7
Almeria	38·6	19	e 7 24	− 2	e 13 30	+ 7	9 3	PP	e 19·6
Algiers	40·6	26	e 7 44	+ 1	13 56	+ 2	i 9 17	PP	20·8

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo		40·9	16	e 7 47	+ 1	14 5	+ 7	e 9 20	PP	—
Bagnères		45·1	18	e 8 23	+ 3	e 15 5	+ 6	e 18 14	SS	e 21·8
Fort de France		45·9	289	e 8 25	− 1	e 15 3	− 8	—	—	—
Cape Town	E.	47·8	139	e 8 53	+12	15 51	+13	10 34	PP	22·7
Rome		49·0	30	i 8 54	+ 4	i 16 4	+ 9	i 10 44	PP	e 22·9
Moncalieri		49·4	22	e 9 48	+55	i 16 10	+10	—	—	25·8
Jersey		50·2	12	—	—	e 16 17	+ 6	—	—	e 18·9
Neuchatel		50·8	21	e 9 6	+ 2	e 16 24	+ 4	—	—	—
Paris		51·0	16	i 9 7	+ 1	i 16 28	+ 6	11 4	PP	24·9
San Juan		51·4	293	i 9 6	− 3	e 16 27	− 1	e 12 13	PP	e 21·9
Basle		51·5	21	e 9 10	+ 1	e 16 35	+ 6	—	—	—
Chur		51·7	22	e 9 12	+ 1	e 16 35	+ 3	—	—	—
Zurich		51·7	21	e 9 12a	+ 1	16 34	+ 2	—	—	—
La Plata		52·0	224	9 13	0	16 31	− 5	18 56	ScS	22·3
Strasbourg		52·5	20	i 9 19	+ 2	i 16 51	+ 8	i 11 12	PP	e 22·1
Triest		52·5	27	i 9 16a	− 1	i 16 45	+ 2	11 12	PP	—
Kew		52·7	13	i 9 20a	+ 2	i 16 51	+ 5	i 11 15	PP	25·6
Oxford		52·8	12	e 9 19	0	i 16 55	+ 8	—	—	—
Stuttgart		53·1	21	i 9 22a	+ 1	i 16 58	+ 7	e 11 19	PP	e 26·4
La Paz		53·2	249	9 17	− 5	i 16 53	+ 1	e 20 33	SS	24·6
Uccle		53·3	16	e 9 24	+ 1	i 16 59	+ 5	e 11 19	PP	e 22·9
Bidston		54·0	9	—	—	i 17 6	+ 3	—	—	26·8
Helwan		54·4	53	i 9 32k	+ 1	17 14	+ 5	11 32	PP	—
Stonyhurst		54·5	10	—	—	i 17 17	+ 7	i 19 26	ScS	27·9
De Bilt		54·7	16	9 32k	− 1	i 17 21	+ 8	—	—	23·8
Bermnda		55·0	310	e 9 40	+ 5	e 17 18	+ 1	e 19 18	ScS	e 22·9
Belgrade		55·2	32	i 9 36k	− 1	i 17 24	+ 4	i 11 39	PP	29·2
Cheb		55·4	22	e 9 42	+ 4	e 17 30	+ 8	e 12 59	PPP	e 26·9
Sofia		55·4	35	e 9 41	+ 3	e 17 30	+ 8	e 12 58	PPP	29·9
Durham		55·6	10	e 9 40	0	i 17 28	+ 3	i 19 36	ScS	—
Göttingen		55·7	18	e 9 43	+ 3	e 17 33	+ 7	e 11 47	PP	e 28·9
Jena		55·8	22	e 9 40	− 1	e 17 32	+ 4	e 21 16	SS	e 26·9
Kecskemet	Z.	56·2	30	e 9 46	+ 2	—	—	e 11 50	PP	e 18·7
Prague		56·2	23	i 9 45a	+ 1	17 37	+ 4	e 12 45	PPP	e 24·9
Budapest		56·3	29	9 47	+ 2	e 17 41	+ 7	19 41	ScS	e 27·9
Edinburgh		56·4	9	e 13 36	PPP	i 17 37	+ 1	i 19 43	ScS	23·9
Collmberg		56·6	22	e 9 47k	0	e 17 37	− 1	i 11 50	PP	e 31·4
Hamburg		57·4	18	e 9 53a	0	i 17 55	+ 6	e 13 6	PPP	e 27·1
Aberdeen		57·7	9	i 9 43	−12	i 17 56	+ 3	i 19 51	ScS	25·4
Bucharest		58·0	35	e 9 59	+ 2	i 18 4	+ 7	12 4	PP	27·9
Istanbul		58·0	39	10 0k	+ 3	17 59	+ 2	13 19	PPP	—
Huancayo		59·2	256	10 3	− 2	e 18 11	− 1	13 39	PPP	e 24·0
Ksara		59·5	50	i 10 10a	+ 3	e 18 28	+12	—	—	—
Copenhagen		60·0	18	i 10 12	+ 1	i 18 30	+ 7	12 27	PP	25·9
Halifax		60·2	324	10 20	+ 8	18 32	+ 7	—	—	25·9
Cernauti		60·3	32	e 10 15	+ 2	—	—	—	—	31·9
Bergen		62·2	12	e 10 17	− 9	e 18 56	+ 5	—	—	e 31·9
East Machias		62·6	322	e 10 29	+ 1	e 18 48	− 8	e 20 19	ScS	e 25·6
Harvard		64·2	319	i 10 38	− 1	i 19 20	+ 4	e 26 26	SSS	e 28·4
Ivigtut		65·0	343	10 49	+ 5	19 33	+ 7	—	—	25·9
Upsala		65·0	18	e 10 40	− 4	i 19 29	+ 3	e 23 36	SS	e 32·9
Fordham		65·2	316	i 10 43k	− 2	i 18 59	−29	e 39 35	P'P'	—
Williamstown		65·4	319	i 10 46	− 1	i 19 40	+10	i 13 3	PP	—
Philadelphia		65·7	314	e 10 56	+ 8	e 19 47	+13	—	—	e 27·2
Seven Falls		65·8	323	10 47	− 2	19 35	0	—	—	27·9
Tananarive	E.	66·2	110	e 10 56	+ 4	e 19 50	+10	—	—	e 33·4
Georgetown		66·8	313	i 10 56	0	i 19 49	+ 1	—	—	29·9
Shawinigan Falls		66·8	322	10 56	0	19 48	0	—	—	—
Ottawa		68·2	320	i 11 5	+ 1	20 8	+ 4	e 15 56	PPP	31·9
Tiflis		68·9	44	e 11 8	− 1	i 20 18	+ 5	13 24	PP	e 32·9
Pulkovo		69·5	23	e 11 16	+ 4	e 20 23	+ 3	—	—	e 33·8
Scoresby Sund		69·9	358	—	—	i 20 34	+10	i 21 31	PPS	27·9
Toronto		70·0	317	11 14	− 1	20 29	+ 3	21 14	PS	33·9
Grozny		70·1	43	e 11 18	+ 2	e 20 41	+14	—	—	—
Moscow		70·4	29	11 19	+ 1	20 33	+ 3	—	—	36·9

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cincinnati		72·4	311	e 11 31	+ 1	e 20 46	− 7	—	—	e 31·5
Chicago		75·3	313	e 11 45	− 2	i 21 25	− 1	e 29 42	SSS	e 34·9
St. Louis		76·6	309	i 11 50	− 4	e 21 38	− 2	—	—	—
Florissant		76·8	309	e 11 52	− 3	e 21 38	− 4	i 14 46	PP	—
Little Rock		77·7	305	i 12 3	+ 3	e 21 56	+ 4	—	—	—
Sverdlovsk		82·8	32	i 12 29	+ 2	i 22 49	+ 4	i 23 30	PS	38·9
Samarkand		85·0	51	12 43	+ 5	—	—	—	—	—
Tashkent		86·9	49	i 12 47	− 1	i 23 15	[+ 2]	—	—	e 42·9
Andijan		89·2	50	13 8	+ 9	e 23 53	+ 6	—	—	—
Bombay		89·7	71	13 2	+ 1	i 23 35	[+ 4]	i 16 38	PP	e 43·6
Frunse		90·8	47	e 13 11	+ 5	—	—	—	—	—
Tucson		93·0	302	i 13 16	− 1	23 38	[−12]	i 17 3	PP	37·7
Butte		93·5	316	—	—	e 23 58	[+ 5]	e 30 41	SS	—
Agra	E.	94·2	62	e 13 31	+ 9	23 56	[− 1]	17 6	PP	—
Kodaikanal	E.	94·3	79	e 13 29	+ 6	i 23 59	[+ 2]	16 42	PP	41·1
Hyderabad	E.	95·1	73	—	—	24 9	[+ 8]	—	—	—
Colombo	E.	96·8	83	—	—	24 16	[+ 5]	—	—	48·3
Pasadena		99·0	304	e 17 45	PP	e 24 24	[+ 2]	e 26 38	PS	e 47·9
Victoria		100·4	319	—	—	e 24 26	[− 3]	—	—	43·9
Berkeley		101·7	308	—	—	i 24 43	[+ 8]	—	—	e 50·7
Ukiah		102·2	310	e 18 7	PP	e 24 41	[+ 3]	e 27 12	PS	e 41·2
Calcutta	N.	104·0	66	e 21 46	PPP	e 27 12	PS	i 33 26	SS	e 50·9
Manila		135·8	68	e 21 56	PP	—	—	—	—	—

Additional readings :—
Granada SS = +15m.23s.
Algiers iP = +7m.48s., i = +9m.22s., PPP = +9m.56s., SS = +16m.49s.
Toledo ePPP = +9m.50s., SS = +16m.57s.
Cape Town PPPE = +11m.18s., SSE = +18m.52s., SSSE = +20m.29s.
Rome iEN = +10m.4s., iN = +11m.43s. and +11m.52s., iPSN = +16m.36s., iE = +17m.29s., iSSN = +19m.17s., iEN = +19m.45s.
Strasbourg iPPEN = +11m.18s., iSSE = +20m.24s.
Triest PS = +17m.18s.
Kew ePPPZ = +12m.32s., iP_cSZ = +14m.30s., iSPZ = +16m.54s., i = +17m.1s., iS_cSE = +19m.6s., SSE = +20m.44s., SSSE = +22m.34s.
Stuttgart ePPP = +12m.24s., e = +13m.21s., e = +17m.26s., eSS = +20m.29s., eSSS = +22m.32s., e = +23m.14s.
Helwan PPPZ = +12m.31s., eE = +18m.56s. and +21m.6s.
Belgrade iZ = +9m.50s., iNW = +19m.19s.
Sofia eN = +19m.34s.
Durham eN = +17m.11s.
Göttingen e = +19m.35s.
Kecskemet eZ = +12m.49s.
Budapest e = +18m.5s., SSN = +21m.37s., SSE = +21m.41s.
Edinburgh i = +17m.42s.
Collmberg i = +9m.51s., iP_cP = +10m.46s., i = +11m.53s. and +12m.4s., e = +20m.14s. +22m.32s., eL_g = +25m.56s.
Hamburg iSSE = +21m.44s., iSSSE = +23m.38s.
Aberdeen iSSSE = +23m.12s.
Bucharest iEN = +10m.2s., P_cPNE = +10m.46s., PPPE = +13m.33s., S_cSE = +19m.36s., S_cSN = +19m.40s., iN = +19m.56s.
Istanbul PP = +24m.52s.
Huancayo eS = +17m.42s.
Copenhagen i = +10m.17s., eN = +10m.41s., PPPN = +13m.56s., eN = +19m.29s., eEN = +20m.16s., SS = +22m.23s.
Halifax e = +20m.8s.
East Machias S = +19m.0s.
Upsala iN = +10m.46s., eSSSN = +26m.51s.
Tananarive E = +31m.20s., EN = +32m.20s.
Ottawa PS = +20m.44s., SSS = +27m.56s.
Tiflis PPZ = +13m.38s., PPE = +13m.42s., PPPEZ = +15m.26s., ePSE = +20m.57s., iE = +21m.18s., eN = +22m.2s., SSEZ = +24m.45s., eSSN = +24m.52s., SSSE = +27m.57s., eSSSZ = +28m.6s., eSSSN = +28m.28s.
Toronto SSSN = +28m.26s.
Cincinnati eS = +20m.55s.
Florissant ePSN = +22m.8s.
Sverdlovsk i = +12m.40s.
Tashkent S = +23m.21s.
Bombay eSEN = +23m.56s., iPSN = +25m.0s., iSSN = +29m.35s.
Tucson +13m.27s., iPP = +17m.18s., PPP = +19m.1s., iSKS = +23m.53s., iS = +24m.7s. and +24m.26s., PS = +25m.23s., iPPS = +26m.11s., SS = +30m.25s.
Agra SKKSE = +24m.31s., PSE = +25m.36s., SSE = +31m.1s.
Kodaikanal PSE = +24m.37s., SSE = +29m.22s.
Ukiah SS = +32m.58s., eSSS = +37m.24s.
Calcutta eN = +38m.31s.
Long waves were also recorded at Lincoln, College, Bozeman, and Santa Clara.

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April 23d. Readings also at 1h. (near Manila), 2h. (Medan, near Batavia, and Malabar), 3h. (Jena, Collmberg, Ksara, and Tucson), 4h. (Bombay, Agra, and Calcutta), 6h. (La Paz, Pasadena, Tinemaha, Riverside, Mount Wilson, and Tucson), 9h. (Mizusawa (2)), 17h. (Tiflis, Mizusawa, Tucson, Andijan, Samarkand, Fort de France (3), near Port au Prince, Little Rock, San Juan, Williamstown, Fordham, and Harvard), 18h. (Ksara), 19h. (Tiflis), 21h. (Mizusawa).

April 24d. Readings at 1h. (Guadalajara and Tucson), 3h. (Andijan, Frunse, and Samarkand), 6h. (Tiflis), 8h. (Mizusawa), 9h. (Mizusawa), 10h. (near Mizusawa), 12h. (Colombo, near Mizusawa, Riverview, Brisbane, Melbourne, Tinemaha, Mount Wilson, and Pasadena), 13h. (near Mizusawa, Pasadena, Mount Wilson, Tinemaha, Tiflis, Tucson (2), Grozny, and Sverdlovsk), 15h. (Zi-ka-wei, Fordham, Sverdlovsk, and Tashkent), 16h. (Triest, Stuttgart, and Strasbourg), 17h. (Tucson), 18h. (Fort de France), 19h. (near Tananarive, Grozny, and Tiflis), 20h. (Tiflis, Tashkent, Ksara, Cernauti, Bucharest, and Helwan), 21h. (Christchurch (2), Wellington (2), Adelaide, Tiflis, New Plymouth, Huancayo, Ksara, near Tucson (2), Sverdlovsk, Melbourne, Riverview, Brisbane, and Tucson (2)), 22h. (Harvard, Tucson, Sverdlovsk, Tashkent, and Rome), 23h. (near Mizusawa, Moscow, Rome, and Sverdlovsk).

April 25d. 12h. 53m. 36s. Epicentre 12°·2S. 75°·3W. (as suggested by Pasadena).

Pasadena suggests depth 150km.

$A = +\cdot2481$, $B = -\cdot9457$, $C = -\cdot2100$; $\delta = 0$; $h = +6$;
$D = -\cdot967$, $E = -\cdot254$; $G = -\cdot053$, $H = +\cdot203$, $K = -\cdot978$.

Tables for depth of focus 0·005 have been used.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		0·2	346	e 0 25	+14	—	—	—	—	—
La Paz		8·1	123	2 8	PP	i 4 11	+43	—	—	4·8
Fort de France		30·2	29	e 6 7	+ 1	—	—	—	—	—
San Juan		31·7	16	e 6 28	+ 8	11 38	+15	i 12 14	sS	—
Rio de Janeiro		32·3	112	e 11 40	S	(11 40)	+ 7	—	—	e 17·5
Bermuda		45·4	12	(e 10 8)	PP	e 10 8	P	—	—	e 15·0
Little Rock		49·4	342	e 8 44	− 1	e 16 19	+33	—	—	—
Philadelphia		51·9	0	i 9 4	0	e 16 18	− 3	e 9 57	sP	e 21·1
St. Louis		52·5	346	i 9 6	− 3	i 16 23	− 6	e 9 34	pP	—
Florissant		52·7	346	i 9 8	− 2	i 16 27	− 4	e 9 45	pP	—
Fordham		52·8	2	i 9 11	0	i 16 38	+ 5	i 9 52	pP	—
Harvard		54·5	4	i 9 24	+ 1	e 16 47	− 9	i 10 4	pP	—
Williamstown		54·7	3	i 9 25	0	e 17 0	+ 2	i 10 5	pP	—
Chicago		55·0	349	e 9 23	− 4	e 16 52	−10	e 19 3	S_cS	e 23·1
Tucson		55·8	324	i 9 30k	− 3	i 17 11	− 2	i 10 16	pP	23·9
East Machias		57·2	7	e 9 44	+ 1	17 34	+ 2	e 21 12	SS	e 23·6
Ottawa		57·3	0	i 9 43	− 1	i 17 34	+ 1	—	—	—
La Jolla		60·1	320	e 10 5	+ 2	—	—	e 10 36	pP	—
Riverside		60·9	321	e 10 5	− 3	e 18 17	− 3	—	—	—
Mount Wilson		61·5	321	i 10 10k	− 2	e 18 25	− 2	i 10 34	pP	—
Pasadena		61·5	321	i 10 10k	− 2	e 18 25	− 2	i 10 34	pP	—
Haiwee		62·7	323	i 10 19	− 1	—	—	i 10 56	pP	—
Tinemaha		63·5	323	i 10 24	− 2	—	—	—	—	—
Victoria		73·8	330	e 15 54	PPP	e 20 48	− 6	—	—	33·4
Toledo		83·8	47	e 12 57	+33	e 22 50	+10	e 23 30	sS	—
Rome		96·4	48	e 17 42	PP	i 23 55	[+ 2]	—	—	—
Moscow		112·6	34	e 19 25	PP	e 28 55	PS	e 29 34	PPS	—
Ksara		114·2	59	e 20 3	PP	e 29 51	PS	22 35	PPP	—
Tiflis	z.	120·4	49	e 20 39	PP	—	—	—	—	e 68·4

For Notes see next page.

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NOTES TO APRIL 25d. 12h. 53m. 36s.

Additional readings :—
St. Louis isSE = +16m.56s,, eE = +17m.13s., iE = +18m.44s.
Florissant iPPZ = +11m.13s., esSE = +17m.13s.
Fordham isSE = +17m.28s., esSSN = +21m.24s.
Harvard eN = +21m.48s.
Tucson i = +9m.35s., +9m.59s., +10m.6s., and +10m.20s., isP = +10m.25s., i = +10m.45s., +10m.55s., +11m.9s., +11m.18s., and +11m.34s., iPP = +11m.42s., i = +12m.6s., sPP = +12m.37s., iPPP = +13m.14s., i = +16m.49s., iS_cS = +17m.28s., i = +19m.9s.
Mount Wilson iEZ = +10m.45s.
Pasadena iNZ = +10m.48s., iSEN = +18m.28s.
Rome e = +26m.29s.
Moscow e = +19m.50s.
Ksara SS = +37m.22s.
Long waves were also recorded at Sverdlovsk and La Plata.

April 25d. 18h. 24m. 59s. Epicentre 46°·4N. 12°·9E. (as on 1938 July 14d.).

Intensity VI at Moggio, Vezzone, and Bordano (Frioul).
Epicentre—Macroseismic 46°20′N. 13°05′E.
Microseismic 46°·3N. 12°·8E. (Strasbourg).

P. Caloi.

Attivita sismica in Italia nel dec. 1930-1939, Comm. ital. di studio per i problemi del soccorso alle popolazino, Vol. XI, Firenze, 1942, p.85, plate p. 73.

$A = +·6746$, $B = +·1545$, $C = +·7218$; $\delta = -5$; $h = -4$;
$D = +·223$, $E = -·975$; $G = +·704$, $H = +·161$, $K = -·692$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	1·0	142	0 18	− 3	—	—	—	—	—
Laibach	1·2	107	e 0 25	+ 1	i 0 38	− 3	—	—	—
Chur	2·4	281	e 0 44	+ 3	—	—	—	—	—
Zurich	3·1	288	e 0 53	+ 2	e 1 45	S_g	e 1 1	P_g	—
Stuttgart	3·4	316	e 0 57	+ 2	e 1 36	− 1	i 1 9	P_g	—
Basle	3·8	290	e 1 1	0	e 2 7	S_g	—	—	—
Moncalieri	3·9	251	e 0 51	−11	—	—	i 1 24	P_g	—
Neuchatel	4·1	281	e 1 7	+ 2	e 2 20	S_g	e 1 19	P_g	—
Strasbourg	4·1	305	e 1 1	− 4	1 58	+ 3	e 1 19	P_g	—
Rome	4·5	184	e 1 36	P_g	i 2 38	S_g	—	—	—
Jena	4·6	349	e 1 13	+ 1	e 2 5	− 2	—	—	e 2·4
Collmberg	4·9	0	i 1 14	− 3	—	—	—	—	i 2·7
Göttingen	5·5	340	e 1 47	P_g	e 2 57	S_g	—	—	—

Additional readings :—
Triest PsP = +24s., e = +28s.
Laibach i = +28s. and +31s.
Stuttgart e = +1m.17s. and +1m.53s., iS_g = +1m.57s.
Strasbourg iS_g = +2m.17s.
Rome i = +3m.5s.
Long waves were also recorded at Huancayo.

April 25d. Readings also at 3h. (Riverside, Mount Wilson, and Pasadena), 4h. (Mount Wilson and Mizusawa), 5h. (Tucson, Tashkent, Sverdlovsk, Rome, Ksara (2), and Collmberg), 7h. (Tucson, near Lick, Branner, and Berkeley), 9h. (near Tiflis), 11h. (Huancayo, Harvard, Tucson, Pasadena, Mount Wilson, La Paz, Haiwee, and Tinemaha), 12h. (Balboa Heights), 13h. (near Balboa Heights, Tinemaha, Haiwee, Mount Wilson, Pasadena, Collmberg, Riverside, Tucson (2), Fort de France, and Apia), 14h. (Fort de France, Tashkent, and near Manila), 15h. (near Manila, Andijan, and Vladivostok), 16h. (Triest, Tashkent, Tucson, Pasadena, Mount Wilson, Haiwee, Tinemaha, and Sverdlovsk), 17h. (Tucson), 18h. (Tucson (2), Ottawa, and La Paz), 19h. (Erevan and Rome), 20h. (La Paz), 21h. (Ottawa), 22h. (Tucson and Ottawa), 23h. (Chicago),

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April 26d. 1h. Local Japanese shock. Tokyo Imperial University gives Epicentre 35°·0N. 140°·4E.
Komaba P =42m.0s., S =42m.15s.
Kamakura P =42m.2s., S =42m.15s.
Kiyosumi P =42m.2s., S =42m.13s.
Koyama P =42m.2s., S =42m.20s.
Mitaka P =42m.2s., S =42m.17s.
Titibu P =42m.2s., S =42m.21s.
Tokyo Imp. Univ. P =42m.2s., S =42m.17s.
Tukubasan P =42m.2s., S =42m.17s.
Yosiwara P =42m.2s., S =42m.22s.
Susaki P =42m.6s., S =42m.22s.

April 26d. 11h. 16m. 26s. Epicentre 19°·6N. 120°·6E. (as on 1938 April 1d.).

Batan Islands and N. Luzon. Centre in Balingtan Channel. Felt Intensity III at Basco, Calayan, and Laoag. Two aftershocks at Calayan. Felt slightly throughout Northern Luzon.

W. C. Repetti.

Seismological Bulletin for 1939. Manila Central Observatory, Manila, 1940, p. 16.

$A = -\cdot4799$, $B = +\cdot8115$, $C = +\cdot3334$; $\delta = -1$; $h = +5$;
$D = +\cdot861$, $E = +\cdot509$; $G = -\cdot170$, $H = +\cdot287$, $K = -\cdot943$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		5·0	176	i 1 21a	+ 3	i 2 25	+ 7	—	—	—
Taihoku		5·6	11	e 1 27	0	i 2 30	− 3	e 1 58	P_g	—
Hong Kong		6·6	295	1 59a	P*	3 31	S_g	—	—	3·9
Zi-ka-wei		11·6	5	e 2 46	− 4	i 5 12	+11	i 5 48	SSS	—
Phu-Lien		13·2	278	e 3 31	+20	e 6 22	?	—	—	—
Mizusawa	E.	26·3	38	e 5 15	−24	6 23	?	—	—	—
Medan		26·7	238	5 49	+ 6	10 24	+ 7	—	—	14·6
Batavia		29·0	210	e 5 53	−11	i 11 10	+16	i 7 18	PPP	—
Calcutta	N.	30·2	283	e 8 55	?	e 13 30	SSS	—	—	e 16·2
Agra	E.	39·7	291	e 8 14	+38	—	—	—	—	—
Colombo	E.	41·5	259	e 7 34?	−16	—	—	—	—	—
Kodaikanal	E.	42·6	265	i 8 4k	+ 5	—	—	—	—	—
Bombay	E.	45·0	278	i 8 22	+ 3	—	—	—	—	—
Frunse		45·0	312	8 20	+ 1	e 19 10	SSS	—	—	—
Tashkent		48·5	309	8 43	− 3	i 16 48	+60	—	—	—
Samarkand		49·9	306	e 8 54	− 3	—	—	—	—	—
Sverdlovsk		57·5	327	i 9 46	− 7	e 17 30	−20	23 58	SSS	26·6
Grozny		65·9	310	e 11 39	+49	—	—	—	—	—
Tiflis		66·8	309	10 50	− 6	e 19 34	−14	e 20 15	PS	e 27·6
Moscow		70·1	324	e 11 4	−12	i 21 16	PPS	—	—	34·1
Pulkovo		73·4	329	e 11 19	−17	e 21 52	PS	—	—	—
Ksara		75·1	301	i 11 42	− 4	e 22 19	PPS	—	—	—
Helwan		79·9	298	i 12 4a	− 8	e 22 1	−15	e 23 11	PS	—
Bergen		84·9	334	—	—	e 23 34?	+28	—	—	—
Collmberg		85·4	323	e 12 28	−12	—	—	—	—	—
Triest		87·4	319	e 16 42	PP	24 22	PS	—	—	—
Stuttgart		88·7	323	e 17 14	?	e 24 19	+36	—	—	e 47·6
Strasbourg		89·6	323	e 17 22	?	e 24 28	+37	—	—	e 46·6
Rome		89·8	315	e 13 30	+28	e 24 42	PS	e 16 55	PP	—
Paris		92·5	324	—	—	e 24 34	?+17	—	—	51·6
Tucson		108·7	45	18 15	PP	—	—	—	—	—
Fort de France		145·8	2	e 19 27	[−13]	—	—	—	—	—

Additional readings :—
Taihoku i = +1m.31s. and +1m.48s., eEN = +2m.15s.
Zi-ka-wei iZ = +3m.34s. and +4m.46s., iE = +7m.14s., iN = +7m.28s., iE = +8m.10s. iZ = +8m.38s., +10m.30s., and +11m.2s.
Medan iE = +8m.27s., iN = +10m.10s., iEN = +13m.3s.
Batavia iN = +11m.51s.
Calcutta iN = +14m.39s.
Sverdlovsk e = +10m.40s. and +20m.26s.
Tiflis ePSN = +20m.45s., ePSZ = +20m.49s.

Continued on next page.

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Ksara i = +12m.20s.
Collmberg iZ = +12m.31s. and +13m.10s., i = +13m.28s.
Rome e = +17m.38s. and +39m.46s.
Tucson PP = +19m.55s.
Long waves were also recorded at Edinburgh, De Bilt, Kew, Bidston, Uccle, and Jersey.

April 26d. Readings also at 1h. (near Tananarive, near Mizusawa, and Tucson), 4h. (Tucson (2)), 5h. (Fort de France), 6h. (Tucson), 7h. (La Paz), 11h. (Istanbul and Tucson), 12h. (Tucson, Collmberg, and Mount Wilson), 13h. (Samarkand and Andijan), 14h. (Andijan (3) and Frunse), 15h. (Denver, Frunse, and Andijan), 17h. (Andijan), 18h. (Tinemaha, Mizusawa, Vladivostok, Tiflis, Grozny, Sverdlovsk, Andijan, Tucson, Collmberg, Mount Wilson, and Pasadena), 19h. (near Manila), 21h. (Riverside, La Jolla, Chicago, Pasadena, Mount Wilson, and Tucson), 22h. (Harvard and East Machias), 23h. (Honolulu, Andijan, and Frunse).

April 27d. Readings at 0h. (Bermuda), 1h. (Samarkand, Andijan, and Frunse (2)), 4h. (Tucson), 5h. (Tucson, Mount Wilson, Tinemaha, Pasadena, and Huancayo), 6h. (La Plata, La Paz, Andijan, and Frunse), 10h. (Tucson), 13h. (Tucson, Cape Town, near Johannesburg, Mount Wilson, Ksara, and Tiflis), 15h. (Harvard and Fordham), 16h. (Andijan and Frunse), 17h. (College), 20h. (near Fort de France), 21h. (Tucson), 22h. (Ksara and Tiflis), 23h. (Apia).

April 28d. 0h. 32m. 55s. Epicentre 43°·6N. 29°·2W.

A = +·6342, B = −·3544, C = +·6872; δ = +5; h = −3;
D = −·488, E = −·873; G = +·600, H = −·335, K = −·726.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo	19·1	92	i 4 27	0	e 8 10	+13	—	—	9·3
Jersey	19·4	63	e 4 31	+ 1	—	—	—	—	e 9·6
Bidston	19·8	51	e 4 42	+ 7	i 8 19	+ 6	—	—	e 10·1
Stonyhurst	20·3	50	—	—	e 8 26	+ 3	—	—	10·1
Oxford	20·4	57	e 4 46	+ 5	i 8 26	+ 1	—	—	e 9·8
Granada	20·5	100	i 4 39	− 3	i 8 55	SS	5 6	PP	11·6
Edinburgh	20·7	45	e 4 49	+ 5	i 8 34	+ 3	—	—	—
Kew	20·9	58	e 4 45	− 1	i 8 35	0	i 8 49	P_cP	e 10·1
Almeria	21·4	99	e 4 55	+ 4	—	—	—	—	e 11·1
Aberdeen	21·8	43	i 4 57	+ 1	i 8 58	+ 6	—	—	10·6
Paris	22·4	66	e 5 2	0	e 9 18	+14	—	—	11·1
Uccle	23·8	60	e 5 14a	− 1	e 9 26	− 2	—	—	11·1
De Bilt	24·4	57	5 21a	0	e 9 33	− 6	—	—	12·1
Strasbourg	25·9	65	e 5 30	− 5	e 10 3	− 1	e 11 12	SS	e 12·1
Stuttgart	26·9	65	e 5 43	− 2	e 9 18	−62	e 10 11	SS	e 13·1
East Machias	27·2	286	e 6 19	+32	e 10 44	+19	—	—	e 12·4
Hamburg	27·4	54	e 5 42	− 7	e 11 15	+47	—	—	e 14·8
Copenhagen	29·1	50	i 6 3	− 1	—	—	—	—	—
Prague	30·2	62	—	—	e 11 16	+ 3	—	—	e 14·6
Rome	30·4	79	e 6 15	− 1	11 9	− 7	—	—	—
Triest	30·4	71	e 6 13	− 3	e 11 18	+ 2	6 55	PP	e 15·9
Pulkovo	38·8	43	e 7 28	0	e 13 27	+ 1	—	—	e 19·8
Bucharest	39·1	69	—	—	e 13 29	− 2	—	—	21·1
Moscow	43·2	49	e 8 5	+ 1	e 14 33	+ 1	—	—	23·6
Ksara	50·5	79	i 9 5	+ 3	i 16 24	+ 8	e 10 58	PP	—
Tiflis	52·7	65	e 9 21	+ 3	e 16 50	+ 4	e 12 24	PPP	e 25·1
Sverdlovsk	54·9	42	i 9 34	− 1	17 15	− 1	—	—	30·1
Tucson	63·0	290	i 10 39	+ 8	—	—	—	—	33·0

Additional readings:—
Stonyhurst i = +8m.41s.
Granada SS = +9m.45s.
Edinburgh i = +8m.45s.
Strasbourg eZ = +5m.52s., eE = +9m.20s.
East Machias eS = +10m.51s.
Triest eSS = +12m.55s.
Tiflis eE = +9m.31s.
Tucson iP = +10m.42s.
Long waves were also recorded at Cheb, San Fernando, and Tashkent.

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April 28d. Readings also at 0h. (near Manila and near Tananarive), 2h. (Columbia, Christchurch, near New Plymouth, and Wellington), 4h. (Stuttgart), 5h. (Sofia), 7h. (Sverdlovsk and Tashkent), 9h. (Tucson), 13h. (Columbia, Edinburgh, Bidston, Kew, Stuttgart, near Moncalieri, Andijan, Frunse, and Samarkand), 14h. (Frunse, Samarkand, Copenhagen, Lick, and near Malabar), 18h. (near Berkeley), 20h. (near Branner), 22h. (near Berkeley (2), Tucson, San Francisco (2), Branner (2), Haiwee, Mount Wilson, Pasadena, near Fresno, Tinemaha, near Ferndale, and near Lick).

April 29d. Readings at 0h. (Bagnères), 4h. (Bombay and near Calcutta), 5h. (Bombay, near Calcutta, Agra, and Andijan), 7h. (near Mizusawa, Andijan, and Bagnères), 8h. (Frunse and Almata), 13h. (Riverside, Pasadena, Mount Wilson, and Tucson), 16h. (near Mizusawa), 17h. (La Paz), 19h. (Tucson), 23h. (Tucson).

April 30d. 2h. 55m. 25s. Epicentre 9°·2S. 159°·5E. (as on 1939 March 7d.).

Nature. London, 27 May, 1939.

Number of buildings wrecked on the Island of Guadalcanal; tidal wave swamped a number of villages; houses were damaged on Ysabel Island and in the Cape Marsh district of the Russell Islands; surface faults visible on Savo Island. No loss of life.

Epicentre 9°·9S. 158°·0E. (Strasbourg).

$A = -\cdot9248$, $B = +\cdot3458$, $C = -\cdot1589$; $\delta = +8$; $h = +7$;
$D = +\cdot350$, $E = +\cdot937$; $G = +\cdot149$, $H = -\cdot056$, $K = -\cdot987$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		25·7	196	e 5 5?	−28	i 9 35?	−26	i 5 40?	PP	—
Sydney		25·7	196	i 5 35	+ 2	i 9 55	− 6	—	—	12·6
Apia		28·5	103	i 6 5	+ 6	10 43	− 3	i 11 35	SS	13·9
Palau		29·9	304	6 7	− 5	11 17	+ 8	—	—	—
Melbourne		31·4	203	6 20	− 5	(13 5)	SS	—	—	13·1
Adelaide	E.	32·0	214	e 8 35	?	i 13 47	SSS	—	—	—
Wellington		34·7	160	e 6 44	−10	12 17	− 7	7 55	PP	17·2
Christchurch		36·1	164	e 7 0a	− 5	i 13 16	+31	—	—	19·6
Titizima		39·8	338	7 41	+ 5	—	—	—	—	—
Manila		44·9	302	e 8 12	− 6	i 14 57	+ 1	—	—	—
Perth		46·3	235	8 39	+10	i 15 35	+19	9 3	PcP	—
Siomisaki		48·0	335	8 36	− 7	15 47	+ 6	—	—	—
Tokyo Cen. Met. Ob.		48·5	340	8 52	+ 6	16 22	+34	—	—	—
Nagoya		49·0	338	8 54	+ 4	16 7	+12	—	—	—
Osaka		49·2	336	8 55	+ 3	16 2	+ 4	11 17	PP	—
Nagano		49·8	340	9 0	+ 4	16 35	+29	—	—	—
Kumamoto		50·0	329	8 56	− 2	16 14	+ 5	—	—	—
Taihoku		50·3	316	e 9 8	+ 8	16 1	−12	—	—	21·7
Hukuoka		50·8	330	e 9 10	+ 6	16 4	−16	—	—	22·9
Mizusawa		51·0	343	e 9 11	+ 5	16 42	+20	—	—	21·9
Malabar		51·4	269	9 14	+ 5	i 16 38	+10	e 11 41	PP	21·6
Honolulu		51·7	54	i 9 23	+12	—	—	i 10 58	PP	e 22·6
Akita		51·9	343	9 18	+ 6	17 0	PS	—	—	—
Batavia		52·2	270	9 4	−11	i 16 49	+10	i 17 7	PS	24·6
Mori		53·9	345	9 29	+ 2	17 34	+32	—	—	—
Hong Kong		54·3	307	9 27a	− 3	17 26	+19	9 58	PcP	26·4
Zi-ka-wei		54·3	320	e 9 33	+ 3	16 35	−32	11 29	PP	25·2
Zinsen		55·7	330	9 37	− 3	17 38	+12	—	—	—
Ootomari		57·6	348	10 3	+ 9	—	—	—	—	—
Vladivostok		57·8	338	e 9 52	− 3	i 17 38	−16	i 13 55	PPP	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Phu-Lien		59·9	301	e 10 7	− 3	i 18 33	+12	—	—	29·1
Medan		61·9	281	10 21	− 3	18 39	− 8	i 19 12	PS	—
Calcutta	N.	76·5	297	i 12 1k	+ 7	i 22 16	PS	i 15 10	PP	i 38·9
Colombo	E.	80·9	278	e 12 12	− 5	22 29	+ 3	—	—	39·6
College		83·6	21	i 12 36	+ 4	i 22 29	−24	e 17 47	PPP	—
Kodaikanal	E.	83·9	282	e 10 15a	?	i 20 45	?	i 15 5	PP	37·0
Hyderabad		84·3	290	e 13 7	+32	23 7	+ 7	—	—	35·1
Sitka		84·6	30	i 12 39	+ 3	e 22 57	− 6	i 13 11	pP	i 35·1
Ferndale		85·6	48	e 12 51	+10	e 23 39	+26	e 28 35	SS	—
San Francisco		86·0	52	e 13 4	+21	e 23 25	+ 8	—	—	e 37·4
Ukiah		86·0	50	e 12 46	+ 3	i 23 33	+16	i 24 15	PS	i 35·9
Berkeley		86·4	52	e 12 45	0	e 23 24	+ 3	e 36 29	L_q	e 37·6
Branner		86·4	52	e 12 41	− 4	e 23 22	+ 1	e 36 11	L_q	e 39·7
Santa Clara		86·5	52	i 12 55	+ 9	—	—	—	—	e 40·1
Agra		86·7	300	e 12 42	− 5	23 20	− 4	13 12	pP	—
Lick		86·8	52	e 12 55	+ 8	e 23 19	[+ 6]	e 36 47	L_q	e 38·3
Dehra Dun	N.	87·3	303	e 13 5	+15	e 22 48	[−27]	i 27 19	?	e 36·0
Santa Barbara		87·6	55	e 12 52	+ 1	e 23 37	+ 5	—	—	—
Fresno	N.	88·1	53	e 13 13	+19	e 23 59	+22	e 36 34	L_q	e 38·8
Victoria		88·4	42	12 57	+ 2	23 53	+13	18 17	PPP	40·6
Pasadena		88·8	56	e 12 54	− 3	i 23 34	[+ 9]	i 25 33	PPS	e 40·7
Mount Wilson		88·9	56	i 12 55	− 3	e 23 52	+ 8	—	—	—
Seattle		88·9	43	e 12 53	− 5	e 23 46	+ 2	e 33 58	SSS	—
La Jolla		89·3	57	i 13 3	+ 4	e 24 2	+14	—	—	—
Tinemaha		89·4	53	e 12 57	− 3	e 23 37	[+ 8]	i 19 10	PPP	—
Haiwee		89·4	54	e 13 1	+ 1	e 23 38	[+ 9]	—	—	—
Riverside		89·4	56	i 12 57	− 3	e 23 36	[+ 7]	—	—	—
Bombay		89·8	291	e 12 58a	− 4	i 23 26	[− 6]	i 16 0	PP	i 42·9
Semipalatinsk		90·3	322	e 13 6	+ 2	—	—	—	—	—
Almata		90·9	315	e 13 11	+ 4	—	—	—	—	—
Frunse		92·5	313	e 13 20	+ 6	—	—	—	—	37·6
Andijan		93·8	310	13 25	+ 5	—	—	—	—	40·6
Tucson		94·6	58	13 21	− 3	i 23 15	[−44]	i 13 53	pP	i 39·0
Salt Lake City		94·9	50	i 14 14	sP	24 21	− 9	e 18 6	PP	39·5
Butte		95·1	44	e 13 50	+24	e 23 39	[−22]	i 31 53	SSP	36·6
Bozeman		96·1	45	14 9	sP	23 47	[−20]	e 17 41	PP	e 38·6
Tashkent		96·2	311	13 33	+ 2	27 17	PPS	e 17 13	PP	—
Samarkand		97·7	309	e 13 38	0	—	—	—	—	30·8
Manzanillo	N.	98·7	70	e 17 55	PP	—	—	—	—	—
Saskatoon		99·6	38	e 13 35	−11	e 24 59	−18	17 5	PP	46·6
Guadalajara	N.	99·8	71	—	—	e 26 50	PS	—	—	—
Denver		100·1	52	—	—	e 24 28	[+ 1]	i 27 22	PS	e 46·7
Sverdlovsk		102·5	326	i 14 1	+ 1	24 33	[− 6]	18 22	PP	43·0
Tacubaya	N.	103·6	73	i 18 7	PKP	—	—	—	—	—
Lincoln		106·4	50	e 14 22	P	i 25 4	[+ 7]	e 14 51	pP	44·3
Vera Cruz	N.	106·5	73	e 18 12	PKP	—	—	—	—	—
Tananarive		107·6	248	e 18 28	PKP	24 48	[−14]	e 18 54	PP	44·4
Little Rock		110·1	57	e 18 42	[+ 9]	i 27 0	{+54}	i 29 11	PPS	—
Florissant		111·3	52	e 14 45	P	i 25 48	[+31]	i 28 59	PS	44·4
St. Louis		111·5	52	e 14 46	P	e 25 39	[+21]	i 19 23	PP	—
Chicago		113·2	48	e 14 57	P	e 25 8	[−17]	e 15 10	pP	i 46·9
Grozny		113·5	314	e 15 11	P	—	—	e 18 51	PKP	—
Tiflis		114·4	312	14 54	P	i 25 58	[+29]	e 19 56	PP	—
Erevan		114·9	311	e 18 48	[+ 5]	—	—	—	—	—
Moscow		115·2	329	e 15 1	P	26 54	{+13}	19 47	PP	60·1
Pulkovo		116·9	335	e 15 15	P	e 25 40	[+ 1]	e 20 3	PP	—
Sotchi		117·8	316	e 19 19	[+31]	—	—	—	—	—
Toronto		118·7	45	20 5	PP	25 41	[− 4]	23 5	PPP	50·6
Scoresby Sund		118·8	2	15 47	P	26 12	[+26]	29 46	PS	—
Columbia		119·5	56	e 15 47	pP	e 30 7	PS	e 20 27	PP	e 50·5

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa		120·6	42	e 18 52	[− 2]	30 17	PS	20 25	PP	56·6
Johannesburg		121·2	232	e 20 51	PP	e 26 19	[+26]	e 30 47	PS	57·6
Huancayo		121·6	110	e 15 32	P	e 26 17	[+22]	e 15 55	pP	i 51·5
Balboa Heights		121·7	85	e 20 35?	PP	—	—	—	—	—
Upsala		122·0	339	i 19 10	[+13]	i 27 50	{+23}	e 20 55	PP	e 50·6
Shawinigan Falls		122·1	40	19 14	[+17]	29 5	?	20 53	PP	64·6
Vermont		122·6	43	e 15 58	pP	i 26 33	{−58}	i 20 39	PP	i 51·9
Philadelphia		122·7	48	e 16 5	pP	i 30 40	PS	i 20 38	PP	e 50·7
Ksara		122·9	304	e 15 37	P	30 50	PS	19 46	PP	—
Seven Falls		123·1	38	19 9	[+10]	27 51	{+17}	20 48	PP	56·6
Williamstown		123·3	44	e 19 6	[+ 7]	i 25 58	[− 3]	i 20 45	PP	e 44·4
Cape Town		123·4	219	20 52	PP	26 37	[+36]	30 58	PS	59·1
Fordham		123·4	46	e 19 6	[+ 7]	i 26 39	[+38]	i 19 21	pPKP	—
La Plata		123·6	143	20 41	PP	28 11	{+33}	—	—	49·6
Ivigtut		124·2	17	19 17	[+16]	26 59	[+56]	21 17	PP	52·4
Harvard		124·5	44	e 19 7	[+ 6]	e 38 29	SS	e 20 55	PP	—
Bergen		125·4	346	e 18 59	[− 4]	e 38 35	SS	i 21 20	PP	e 50·6
Istanbul		126·0	316	15 59	P	26 18	[+ 9]	21 5	PP	—
East Machias		126·4	41	e 18 59	[− 5]	26 49	[+39]	21 9	PP	53·2
La Paz		126·4	118	19 7	[+ 3]	26 7	[− 3]	21 26	PP	59·6
Bucharest		126·7	320	e 19 35	[+30]	26 47	[+36]	21 19	PP	59·6
Copenhagen		126·8	338	e 19 5	[0]	e 26 17	[+ 6]	21 9	PP	52·6
Helwan		127·5	302	19 11	[+ 4]	30 53	PS	39 29	SSP	—
Port au Prince		129·0	74	19 45	[+35]	—	—	i 21 55	PP	63·5
Sofia	N.	129·2	320	e 19 17	[+ 7]	e 33 2	PPS	e 21 53	PP	53·1
Budapest		129·3	327	19 21	[+11]	i 28 35	{+20}	i 21 49	PP	e 59·6
Kecskemet	Z.	129·3	325	e 19 17	[+ 7]	e 29 11	{+56}	e 21 46	PP	e 68·0
Hamburg		129·4	338	e 19 13	[+ 3]	—	—	i 21 48	PP	e 54·6
Szeged		129·4	325	e 19 27	[+17]	e 28 27	{+12}	e 21 15	PP	e 63·0
Prague		129·5	332	e 19 5	[− 6]	e 39 5	SS	e 33 23	PPS	e 52·6
Heligoland		129·7	340	e 19 32	[+21]	e 38 59	SS	e 21 49	PP	e 52·6
Collmberg		129·8	333	i 19 12	[+ 1]	(i 26 17)	[− 2]	i 23 59	PPP	e 52·6
Belgrade		130·0	323	e 19 26	[+14]	i 39 32	SS	e 21 17	PP	e 54·3
Aberdeen		130·1	348	i 19 20	[+ 8]	i 31 55	PS	e 21 50	PP	53·0
Jena		130·7	334	e 19 11	[− 2]	—	—	e 21 27	PP	e 51·6
Cheb		131·0	334	e 19 28	[+14]	32 53	PPS	e 21 27	PP	e 64·6
Göttingen		131·0	337	e 19 13	[− 1]	—	—	—	—	51·6
Hof		131·0	334	e 21 35	PP	—	—	e 23 35	PPP	e 51·6
Edinburgh		131·4	347	e 19 54	[+40]	i 39 25	SS	i 22 3	PP	53·6
Durham		132·1	346	i 19 53	[+37]	i 39 26	SS	i 22 5	PP	—
De Bilt		132·4	340	i 19 23	[+ 7]	—	—	i 22 29	PP	71·0
Laibach		132·6	328	e 19 39a	[+22]	—	—	i 22 56	PP	68·7
Bermuda		133·0	53	e 19 59	PKP	e 39 57	SS	e 23 24	PKS	—
Stonyhurst		133·2	346	e 19 27	[+ 9]	i 40 24	SSP	i 21 49	PP	54·6
Triest		133·2	328	e 19 23	[+ 5]	29 48	{+69}	e 19 33	pPKP	60·5
Stuttgart		133·4	333	e 19 23a	[+ 5]	e 26 33	[+ 6]	e 21 45	PP	e 54·6
Bidston		133·7	347	i 19 32	[+13]	e 26 45	[+17]	i 21 55	PP	e 56·6
Uccle		133·7	340	e 19 24	[+ 5]	i 25 36	[−52]	e 21 54	PP	e 55·6
Strasbourg		134·1	335	e 19 26	[+ 6]	i 26 11	[−18]	i 19 54	pPKP	e 55·6
Lille		134·4	339	e 22 5	PP	e 25 35	[−54]	e 25 5	PPP	e 54·6
Chur		134·6	333	e 19 17	[− 3]	—	—	—	—	—
Rathfarnham Castle		134·6	349	i 19 26	[+ 6]	i 26 39	[+ 9]	i 22 20	PP	63·6
Kew		134·7	343	i 19 24	[+ 4]	i 26 31	[+ 1]	i 22 5	PP	e 64·6
Oxford		134·7	344	e 19 28	[+ 8]	—	—	i 22 8	PP	—
Zurich		134·7	333	e 19 16	[− 4]	—	—	e 22 3	PP	—
San Juan		134·9	73	e 19 20	[0]	i 40 46	SSP	i 21 57	PP	i 53·9
Basle		135·0	334	e 19 21	[0]	—	—	e 22 26	PP	—
Neuchatel		135·7	334	e 19 20	[− 2]	—	—	—	—	—
Paris		136·1	339	e 19 43	[+20]	—	—	22 10	PP	54·6
Rome		136·4	324	i 19 23a	[0]	i 32 37	PS	i 22 21	PP	57·4

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Moncalieri	136·8	332	i 20 4	[+40]	33 35?	PPS	—	—	49·5
Jersey	137·3	345	e 19 53	[+28]	e 28 36	{−29}	e 22 44	PP	e 57·6
Grenoble	137·6	334	e 19 33	[+ 7]	e 26 59	{+24}	e 22 46	PP	64·6
Clermont Ferrand	138·4	337	e 19 31	[+ 4]	—	—	e 23 35	?	—
Marseilles	139·2	331	e 19 11	[−18]	e 27 31	[+53]	e 22 5	PP	57·6
Fort de France	139·9	79	e 19 32	[+ 2]	—	—	22 52	PP	e 24·4
Tunis	141·0	319	e 19 20	[−12]	—	—	i 22 35	PP	e 54·6
Rio de Janeiro	141·1	146	i 19 25	[− 8]	i 22 30	PKS	—	—	i 40·3
Bagnères	141·7	336	e 19 32	[− 1]	e 28 28	{−63}	20 19	pPKP	e 59·3
Algiers	145·2	326	19 35	[− 4]	i 25 52	[−55]	i 20 15	pPKP	e 60·6
Toledo	146·1	338	e 19 38	[− 3]	i 30 39	{+42}	i 22 57	PP	—
Almeria	148·0	333	e 19 42	[− 2]	e 26 50	[− 1]	—	—	e 62·2
Granada	148·2	335	e 19 41	[− 3]	30 27	{+19}	21 11	pPKP	64·4
San Fernando	149·9	336	i 19 50	[+ 3]	37 13	?	—	—	63·6

Additional readings :—
Riverview iP = +5m.15s.?, P_cPN = +9m.0s. ?, P_cPE = +9m.4s. ?, iZ = +9m.30s. ?, iE = +9m.49s. ?, SSE = +10m.17s. ?, iE = +11m.11s. ? and +12m.12s. ?
Sydney i = +5m.44s. and +10m.22s.
Wellington eZ = +6m.49s., i = +6m.58s., iZ = +7m.12s., i = +7m.40s., iZ = +8m.23s., PPP = +8m.50s., P_cP = +9m.11s., i = +9m.35s., iZ = +11m.40s., P_cS = +13m.6s., iE = +13m.24s., i = +13m.37s., +13m.58s., and +14m.12s., SS = +14m.55s., L_q = +15m.8s.
Christchurch ePE = +7m.4s., iP = +7m.8s., eP? = +14m.23s., L_q = +16m.21s.
Perth i = +10m.13s., +10m.55s., +11m.30s., +12m.53s., +13m.15s., +15m.48s., and +22m.5s.
Osaka SS = +21m.31s., SSS = +23m.7s.
Taihoku P = +9m.23s.
Malabar iE = +9m.22s., iEN = +16m.21s.
Mizusawa SE = +16m.56s.
Honolulu ePPP = +12m.50s., i = +14m.33s.
Batavia iP = +9m.22s., iS?N = +17m.13s.
Hong Kong SS = +21m.37s., SSS = +23m.24s.
Zi-ka-wei iN = +10m.7s., +10m.17s., and +16m.43s., PPPE = +12m.17s., iN = +13m.13s., iE = +18m.3s., and +19m.45s., SSN? = +20m.5s., SSSN? = +21m.23s.
Vladivostok i = +9m.58s., +12m.39s., +15m.18s., +19m.29s., +20m.41s., and +21m.51s.
Medan iE = +10m.32s., iN = +10m.44s., iE = +16m.4s.
Calcutta N iPPP = +16m.59s., iSS = +27m.46s., iSSS = +32m.6s.
College ipS = +23m.21s., i = +26m.44s.
Kodaikanal iPE = +10m.23s., iE = +21m.25s., +26m.11s., and +29m.23s.
Sitka i = +13m.5s., ipPPP = +18m.23s., ipS = +23m.39s., isS = +23m.43s.
Ferndale ePN = +12m.55s.
San Francisco eN = +27m.25s. and +35m.59s.
Ukiah i = +12m.53s. and +13m.56s., ipS = +23m.47s., eSSS = +32m.51s.
Berkeley ePZ = +12m.50s.
Branner eSN = +23m.41s.
Agra iPE = +12m.54s., eN = +13m.1s., PPE = +16m.20s., iEN = +28m.20s., iN = +35m.36s., iE = +39m.29s.
Lick iN = +13m.47s.
Victoria PPSN = +25m.39s., SS = +30m.17s., SSS = +33m.35s.
Pasadena iE = +23m.43s., iNZ = +24m.10s., iN = +24m.21s.
Seattle esP = +14m.10s., esPP = +18m.18s.
Haiwee eN = +23m.54s.
Bombay ePN = +13m.3s., iE = +13m.7s., iN = +13m.10s., iEN = +13m.14s. and +15m.2s., iE = +15m.54s. and +16m.44s., iEN = +16m.49s., eN = +17m.9s., iEN = +18m.8s., iN = +20m.21s., +21m.37s. and +23m.31s., iSEN = +23m.37s., iEN = +23m.58s., iPSEN = +24m.5s., iEN = +24m.50s., iSSN = +28m.46s., iSSE = +29m.1s., iSSSEN = +32m.56s., iL_q = +36m.38s.
Tucson i = +13m.32s., i = +14m.4s., isP = +14m.22s., i = +14m.55s., +15m.3s., +15m.7s., +15m.44s., +16m.0s., +16m.5s., +17m.0s. +17m.19s., +17m.29s., and +17m.41s., ipPP = +17m.47s., i = +18m.1s., isPP = +18m.27s., i = +18m.49s., +19m.8s., and +19m.15s., iPPP = +19m.19s., i = +19m.26s., ipPPP = +19m.47s., i = +20m.20s., +20m.56s., +21m.9s., +21m.19s., and +22m.11s., iSKS = +23m.44s., iSKKS = +23m.57s., i = +24m.17s., iS = +24m.21s., i = +24m.41s., +24m.46s., +24m.51s., and +24m.58s., ipS = +25m.16s., i = +25m.23s., isS = +25m.30s., iSP = +25m.41s., iPS = +26m.14s., ipPS = +26m.30s., isPS = +26m.37s. i = +26m.53s., +27m.8s., +27m.11s., and +27m.46s., isS = +30m.46s., i = +31m.20s. and +31m.32s., isSS = +31m.58s., iSSS = +35m.29s., i = +37m.30s.
Butte iSKKS = +24m.19s.
Bozeman pPP = +17m.52s., ePPP = +19m.25s., eSKKS = +24m.2s., iS = +24m.21s., ipS = +25m.16s., iSP = +25m.49s., iSS = +31m.10s., SSS = +35m.34s.
Tashkent PPP = +19m.49s.
Saskatoon eE = +17m.59s., PSN = +25m.53s., SS = +31m.47s.

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Denver iE = +24m.41s., iSKKSE = +24m.54s., iSE = +26m.6s., eE = +26m.16s., iE = +26m.21s., eN = +32m.22s., eSSE = +33m.2s., iSSE = +33m.6s., iSSN = +33m.18s.
Sverdlovsk PPP = +20m.59s., iS = +25m.41s., PPS = +28m.28s., iSS = +33m.5s., iSSS = +37m.59s.
Lincoln i = +17m.26s., PP = +18m.48s., iSP = +28m.2s., sPS = +28m.39s., i = +30m.2s., isSS = +34m.42s., iSSS = +38m.36s.
Tananarive pPPE = +19m.12s., sPPEN = +19m.24s., eE = +20m.27s., E = +24m.59s., SKKSE = +25m.30s., N = +25m.33s., SPE = +27m.48s., PSE = +28m.12s., N = +28m.21s., eE = +28m.38s., +29m.16s., and +33m.29s., SSE = +33m.53s., sSSE = +34m.33s., N = +34m.40s., E = +35m.0s.
Little Rock i = +27m.22s. and +27m.54s.
Florissant iE = +27m.1s., iN = +27m.31s.
St. Louis eE = +18m.14s., iPPPE = +21m.57s., eSN = +27m.24s., ePSEN = +29m.0s., iSSEN = +35m.19s., iSSSE = +39m.52s., eSSSSE = +43m.28s.
Chicago esP = +15m.30s., PP = +19m.27s., i = +25m.23s., ipS = +27m.43s., iPS = +29m.13s., iSPP = +29m.42s., isSS = +35m.51s., iSSS = +39m.43s., i = +40m.38s.
Tiflis eN = +15m.23s., PKPZ = +18m.22s., ePKPE = +18m.35s., eE = +19m.4s., iE = +20m.2s., iNZ = +20m.8s., iEN = +20m.11s., e = +20m.14s., iZ = +20m.50s., iPPPZ = +21m.41s., iPPPE = +22m.8s., iE = +22m.40s., iN = +23m.48s., iE = +24m.23s., iN = +24m.38s., iZ = +24m.50s., eSKKSN = +26m.55s., eSE = +27m.35s., iPSE = +29m.23s., iPS = +29m.29s.
Moscow PPP = +22m.21s.
Pulkovo eSKKS = +26m.56s., ePS = +29m.59s., ePPS = +31m.40s., eSS = +36m.47s.
Toronto SN = +28m.5s., PS = +29m.59s., SS = +36m.35s.
Scoresby Sund +18m.56s., +20m.30s., +26m.53s., +27m.53s., +30m.9s., +31m.1s., +32m.29s., SS = +36m.59s.
Columbia epPKP = +19m.27s., pPP = +20m.45s., ipPS = +30m.37s., i = +34m.7s., SS = +37m.2s., sSS = +37m.27s.
Ottawa PPSE = +31m.35s., SS = +37m.59s.
Johannesburg eSKKSEN = +27m.59s., ePPSEN = +31m.55s., eSSEN = +37m.19s., eSSSEN = +40m.39s., eSSSSEN = +45m.8s.
Huancayo sP = +16m.6s., epPKP = +19m.26s., i = +19m.43s., iPP = +20m.38s., pPP = +20m.55s., i = +25m.4s., i = +26m.25s., iPS = +30m.10s., ipSKS = +30m.35s., isSS = +37m.43s., i = +37m.52s. and +49m.13s.
Upsala eN = +20m.1s., eE = +30m.34s., eN = +37m.5s., eE = +37m.35s., iE = +40m.15s., iN = +40m.57s.
Shawinigan Falls SS = +37m.59s.
Vermont epPKP = +19m.38s., i = +20m.45s. and +22m.47s., eS = +28m.20s., ipPS = +31m.18s., i = +33m.21s., iSS = +37m.41s., i = +38m.1s., iSSS = +42m.23s., i = +45m.26s. and +46m.35s.
Philadelphia i = +28m.13s., +18m.55s. and +37m.41s., iPKP,PKP = +38m.47s., i = +39m.1s., iSSS = +42m.15s.
Ksara PKP = +19m.4s.
Seven Falls S = +29m.29s., PS = +31m.38s., SS = +38m.30s.
Williamstown eP = +15m.45s., i = +19m.28s., iPPP = +23m.18s., iS_cSP? = +29m.57s., ePS = +31m.0s., iPPS = +31m.56s., i = +32m.40s., iSS = +37m.38s.
Cape Town N = +21m.9s., E = +21m.16s., PPPN = +23m.9s., PPPE = +23m.17s., SKKSN = +28m.14s., SE = +29m.11s., SN = +29m.15s., PSE = +31m.5s., PPSN = +32m.28s., SSN = +38m.5s.
Fordham ePZ = +15m.47s., iZ = +19m.31s., iPPZ = +20m.49s., iSE = +27m.55s., iEN = +30m.53s., iSSEN = +37m.47s.
La Plata PP = +22m.23s., PPP = +26m.5s., PS = +33m.23s.
Ivigtut +23m.17s., +31m.17s., +33m.11s., +35m.5s., and +37m.23s.
Harvard ePZ = +15m.49s.
East Machias eP = +16m.1s., i = +22m.55s. and +23m.4s., ePPP = +24m.24s., i = +34m.22s., iSS = +38m.45s., isSS = +39m.27s., i = +49m.19s.
La Paz SKPN = +22m.28s., iN = +27m.33s., PSN = +28m.53s., iSSN = +38m.55s., iSSSN = +42m.56s., L_qN = +52m.35s.
Bucharest SKPEN = +22m.43s., eE = +25m.39s., SKSE = +26m.55s., SKKSEN = +28m.35s., iSE = +29m.35s., PSEN = +31m.35s., PPSE = +32m.40s., PPSN = +32m.54s., iN = +33m.15s., iE = +34m.16s., SSE = +38m.19s.
Copenhagen eP = +16m.29s., eZ = +19m.12s. and +19m.33s., e = +21m.30s., eEN = +22m.17s., eZ = +22m.40s., eE = +23m.47s., eZ = +23m.59s., e = +24m.41s. and +24m.59s., eZ = +28m.29s., e = +28m.37s., PS = +31m.29s., PPS = +32m.47s., eE = +35m.5s., eZ = +35m.59s., eE = +36m.35s., SS = +38m.29s.
Helwan iZ = +21m.11s., SE = +31m.35s., PPSE = +34m.23s.
Port au Prince i = +24m.45s.
Sofia eN = +30m.17s.
Budapest PKSN = +22m.33s., PKSE = +22m.39s., iN = +24m.21s., iE = +24m.26s., e = +25m.1s., eN = +27m.57s., iSKKSN = +29m.1s., iN = +30m.41s. and +35m.1s., SSN = +41m.29s.
Kecskemet ePKPZ = +22m.23s., ePPZ = +24m.42s., e = +30m.43s. and +32m.29s., ePS = +34m.47s., eZ = +36m.12s.
Hamburg iZ = +19m.44s., eE = +22m.48s., iZ = +22m.56s., iEN = +36m.11s., iN = +41m.44s.

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Szeged eE = +21m.15s., ePKP$_2$ = +22m.21s., ePPN = +24m.32s., eSKSE = +29m.25s., eN = +30m.10s., eSKKSN = +31m.41s., ePSKSE = +34m.19s., ePSE = +35m.3s., ePSN = +35m.19s., eSSN = +40m.21s., eSSE = +40m.35s.
Prague e = +22m.26s., +24m.5s., and +24m.47s.
Heligoland eEN = +22m.41s., eN = +25m.17s., eE = +25m.20s.
Collmberg iPKP = +22m.41s., iSKS = +29m.47s., iS = +32m.1s., iPS = +33m.23s., iPPS = +34m.45s., eSS = +38m.41s.; SKS is given as PPP.
Belgrade iZ = +19m.44s. and +20m.0s., eNE = +21m.13s., iNE = +23m.21s., +25m.2s., and +32m.41s., iNW = +46m.15s.
Aberdeen iEN = +21m.30s. and +24m.15s., iN = +25m.40s. and +37m.55s., iE = +39m.7s.
Jena ePZ = +19m.27s., ePE = +19m.35s., ePZ = +19m.44s., ePN = +19m.47s., e = +21m.35s., eZ = +23m.3s.
Cheb eE = +16m.29s., +19m.53s., and +22m.15s., e = +22m.43s., +30m.29s., +34m.23s., and +41m.59s.
Hof eNE = +22m.50s., eNW = +22m.53s.
Edinburgh i = +22m.54s., +23m.18s., and +42m.0s.
Durham eN = +16m.25s., iE = +20m.12s., iN = +25m.7s., iE = +25m.17s., iEN = +25m.31s.
De Bilt ePZ = +16m.52s.
Laibach iNE = +23m.51s. and +36m.3s.
Bermuda e = +17m.1s.
Stonyhurst i = +19m.57s., +22m.12s., +23m.23s., and +23m.32s.
Triest eP = +16m.28s., e = +22m.15s., iSKP = +22m.54s., i = +23m.26s., PPP = +24m.58s., e = +27m.20s. and +31m.35s., PS = +31m.54s., PPS = +34m.34s., e = +41m.45s. and +55m.31s.
Stuttgart ePZ = +16m.23s., ePKP$_2$ = +19m.35s., e = +20m.35s. and +22m.36s., ePKS = +22m.57s., e = +23m.25s. and +23m.55s., ePPP = +25m.24s., ePPS = +32m.9s., e = +36m.20s. and +42m.7s.
Bidston i = +22m.17s., +22m.47s., +23m.20s., +30m.17s., +31m.57s., +34m.47s., +41m.25s., and +45m.57s.
Uccle ePNZ = +16m.47s., iZ = +19m.57s. and +22m.15s., iSKPN = +22m.56s., iEZ = +23m.16s., iE = +29m.7s., iSSE = +39m.37s.
Strasbourg ePZ = +16m.25s., epPZ = +16m.46s., iPPZ = +21m.59s., iSKPN = +22m.29s., iSKS = +23m.3s., isSKPZ = +23m.32s., iZ = +23m.52s.
Lille eN = +23m.52s., eSSSE = +41m.35s.
Chur i = +19m.53s.
Rathfarnham Castle i = +20m.57s., iPP = +25m.26s., i = +28m.24s. and +28m.50s., iS = +30m.11s., i = +32m.35s. and +37m.35s.
Kew eZ = +16m.27s. and +16m.51s., iZ = +19m.59s., iE = +20m.7s., i = +22m.23s., iZ = +22m.43s., iEN = +23m.1s., iZ = +23m.11s., i = +23m.29s., iZ = +24m.42s., and +25m.19s., iN = +25m.41s. and +26m.53s., iZ = +27m.31s., ZEe = +29m.13s., iN = +29m.24s., iEN = +31m.21s., iNZ = +32m.21s., iEZ = +33m.18s., iNZ = +34m.47s., iZ = +37m.35s., iE = +40m.20s., iN = +41m.51s., iE = +44m.55s., iZ = +45m.23s., iEN = +45m.57s., eL$_q$EN = +56·6m.
Oxford i = +20m.12s.
Zurich e = +23m.7s. and +24m.3s.
San Juan isPP = +22m.37s.
Basle e = +23m.32s.
Paris eP = +16m.54s. and +25m.32s.
Rome PKPZ = +16m.31s.a, i = +19m.46s., iSKP = +19m.54s., iPPPE = +21m.58s., i = +22m.55s., iSKS = +23m.22s., i = +24m.22s., +24m.29s., +30m.7s., and +33m.30s.
Jersey ePP = +25m.59s., i = +41m.14s.
Grenoble iE = +20m.41s., pPP = +23m.39s., esPP = +24m.3s., iE = +24m.52s., iPPPE = +26m.11s., isSKSE = +28m.23s., eSKKS = +28m.53s., iE = +32m.2s., ePSE = +33m.35s., eSPP? = +34m.33s., eE = +39m.5s., eSS = +40m.35s., e = +52m.20s., +53m.9s., +54m.35s.?, +63m.10s., and +64m.8s.
Marseilles ePKPN = +19m.40s., epPPE = +22m.40s., sPPE = +23m.12s., eN = +23m.51s., ePPP = +25m.5s., epSKSE = +28m.15s., ePSKSE = +32m.18s., ePPSE = +34m.22s., eE = +34m.53s. and +36m.29s., eSSE = +40m.12s., eSSN = +40m.19s., eSSSE = +44m.9s.
Fort de France PP = +19m.50s., PPP = +19m.53s.
Tunis ipPP = +23m.17s., isPP = +23m.35s., ipSKP = +23m.53s., i = +24m.35s.?
Bagnères esPKPE = +20m.44s., iE = +21m.57s., ePPN = +22m.37s., SKP = +22m.52s., epPPN = +23m.19s., esPPN = +23m.52s., ipPKSE = +23m.55s., iE = +24m.33s., e = +25m.7s., eSKKPE = +31m.30s., ePSKSE = +32m.39s., ePS = +33m.19s., eSSN = +41m.25s., eSSSE = +46m.23s.
Algiers i = +21m.33s., iPP = +22m.20s., SKP = +23m.12s., PPP = +25m.23s., SKKS = +29m.35s., PPS = +35m.35s., SS = +41m.35s., eSSS = +47m.52s.
Toledo i = +19m.48s. and +31m.41s., iSS = +41m.55s.
Granada iPKP$_3$ = +19m.50s., PP = +23m.28s., PKS = +23m.37s., SS = +43m.2s., SSS = +49m.8s., L$_q$ = +56m.58s.
San Fernando iEN = +20m.33s., SSSNE = +40m.29s.
Long waves were also recorded at Cernauti.

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April 30d. 14h. 2m. 34s. Epicentre 5°·6S. 163°·8E.

$A = -\cdot 9558$, $B = +\cdot 2777$, $C = -\cdot 0969$; $\delta = +6$; $h = +7$;
$D = +\cdot 279$, $E = +\cdot 960$: $G = +\cdot 093$, $H = -\cdot 027$, $K = -\cdot 995$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		30·4	201	e 5 26?	−50	—	—	—	—	e 14·2
Sydney		30·4	201	e 5 38	−38	e 10 14	−62	—	—	12·9
Melbourne		36·4	205	—	—	e 11 30	?	i 14 24	SS	16·0
Wellington		36·9	166	7 6	− 6	12 44	−14	8 24	PP	17·5
Christchurch		38·6	169	e 7 26	0	13 9	−14	e 15 38	L_g	17·7
Manila		46·9	296	8 31	− 3	15 10	−15	—	—	20·9
Tokyo Cen. Met. Ob.		46·9	333	9 3	+29	—	—	—	—	—
Kobe		48·3	329	8 37	− 8	16 7	+22	—	—	—
Nagano		48·4	333	9 13	+27	—	—	—	—	—
Perth		51·9	233	—	—	e 15 36	−59	i 21 56	SSS	—
Vladivostok		56·5	333	e 12 45	PPP	—	—	22 20	SSS	e 24·2
Batavia		56·6	267	9 53	+ 6	17 50	+12	—	—	—
Medan	E.	65·7	277	10 50	+ 2	19 32	− 2	—	—	—
Pasadena	Z.	83·3	55	e 12 33	+ 3	—	—	—	—	—
Mount Wilson	Z.	83·4	55	i 12 33	+ 3	—	—	—	—	—
Haiwee	Z.	83·8	53	e 13 19	+47	—	—	—	—	—
La Jolla	Z.	83·8	56	e 12 49	+17	—	—	—	—	—
Tinemaha	Z.	83·8	52	e 12 36	+ 4	—	—	—	—	—
Riverside	Z.	83·9	55	i 12 35	+ 2	—	—	—	—	—
Colombo	E.	84·7	277	e 12 26?	−11	—	—	—	—	—
Kodaikanal	E.	87·4	280	e 12 48	− 2	—	—	—	—	—
Agra	E.	88·8	298	e 12 53	− 4	i 23 28	[+ 3]	—	—	—
Tucson		89·0	57	13 43	+45	—	—	16 54	PP	—
Bombay		92·7	289	e 16 51	PP	e 23 23	[−25]	—	—	—
Sverdlovsk		101·9	327	e 18 42	PP	25 52	+16	—	—	41·4
Tiflis	E.	115·2	314	e 20 47	?	e 29 42	PS	e 35 44	SS	e 60·4
Pulkovo		115·5	337	—	—	e 39 12	SSS	—	—	—
Ksara		124·3	308	e 20 52	PP	e 30 54	PS	—	—	—
Uccle		131·8	344	e 23 14	PKS	—	—	—	—	e 67·4
Stuttgart		131·9	338	e 23 6	PKS	—	—	—	—	e 82·4
Strasbourg		132·6	338	e 22 30	PKS	—	—	—	—	72·4

Additional readings :—
Melbourne i = +12m.3s.
Wellington P_cP = +9m.41s., P_cS = +13m.46s., SS = +15m.15s.
Perth i = +24m.8s.
Vladivostok e = +14m.45s. and +19m.27s.
Medan iE = +20m.12s.
Pasadena i = +13m.16s., iZ = +13m.28s.
Mount Wilson i = +13m.17s.
La Jolla eZ = +13m.20s.
Tinemaha e = +13m.19s.
Riverside iZ = +13m.18s.
Tucson PPP = +18m.26s.
Bombay iEN = +24m.7s.
Tiflis eN = +21m.2s.
Long waves were also recorded at De Bilt, Tashkent, and Sitka.

April 30d. Readings also at 0h. (La Paz), 3h. (La Paz, Toledo (2), Andijan, Santa Barbara (2), Wellington (2), Christchurch, Mount Wilson (2), Haiwee, La Jolla (2), Tinemaha (2), Riverside (2), New Plymouth, Tucson (2), and Pasadena (2)), 5h. (Manila), 7h. (Pasadena, Riverside, Tinemaha, La Jolla, Haiwee, Mount Wilson, and Riverview), 9h. (Melbourne, Wellington, Riverview, Christchurch, Mount Wilson (2), Haiwee, La Jolla, Tinemaha (2), Riverside (2), and Pasadena (2)), 12h. (Pasadena (2), Riverside (2), Tinemaha, Mount Wilson (2), and Tucson (2)), 14h. (New Plymouth, Pasadena, Riverside, Tucson, near Fort de France, Christchurch, and Wellington), 15h. (Tucson and near Medan), 20h. (Tucson), 23h. (Pasadena, Riverside, Tinemaha, and Mount Wilson).

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May 1d. 4h. 27m. 54s. Epicentre 9°·2S. 159°·5E. (as on 1939 April 30d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview	N.	25·7	196	e 6 48	PPP	—	—	—	—	e 10·0
Sydney		25·7	196	—	—	e 10 0	− 1	—	—	e 12·9
Melbourne		31·4	203	—	—	e 14 15	SSS	—	—	16·1
Wellington		34·7	160	e 6 41	−13	12 19	− 5	14 46	L_q	16·1
Christchurch		36·1	164	e 7 3	− 2	e 12 36	− 9	15 17	L_q	e 17·9
Manila		44·9	302	8 25	+ 7	12 47	?	—	—	15·4
Pasadena	Z.	88·8	56	i 12 58	+ 1	—	—	—	—	—
Mount Wilson		88·9	56	i 12 58	0	—	—	—	—	—
La Jolla	Z.	89·3	57	e 13 1	+ 2	—	—	—	—	—
Haiwee		89·4	54	e 13 0	0	—	—	—	—	—
Riverside		89·4	56	i 13 0	0	—	—	—	—	—
Tinemaha		89·4	53	e 13 0	0	—	—	—	—	—
Tucson		94·6	58	13 29	+ 5	—	—	i 17 18	PP	—
Ksara		122·9	304	e 19 5	[+ 7]	e 30 28	PS	e 20 43	PP	—

Additional readings:—
Melbourne i = +14m.58s.
Tucson i = +13m.40s. and +17m.31s.
Long waves were also recorded at St. Louis and Adelaide.

May 1d. 5h. 58m. 26s. Epicentre 39°·9N. 139°·8E.

Oga peninsula, Akita prefecture. Felt throughout Tohoku district and Akita, southern half of Hokkaido, and some part of Tyuku district. Severe in the epicentral region and strong in Akita prefecture. A small tunami of 27cm. double amplitude was experienced in Tutizaki harbour.

Epicentre 39°·57′N. 139°49′E. (Central Met. Obs.).

Intensity V at Akita; IV at Mizusawa; III at Sendai, Morioka, Aomori, Hatinohe, Miyako, Hakodate, Niigata, Mori, and Aikawa; II at Yamagata, Wazima, Hukusima; I at Onahama, Utunomiya, Takada, Tokyo, and Sirakawa. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1939, Tokyo 1949, pp. 13-14.

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

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The Ogasima earthquake of May 1st, 1939. Bulletin of the Earthquake Research Institute, Tokyo, vol. XVII, pp. 627-637, 21 fig., Tokyo 1939.

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The deformation of the earth's surface that accompanied the Ogasima earthquake of May 1st, 1939. Bulletin of the Earthquake Research Institute, Tokyo, vol. XVII, pp. 638-649, 9 fig., Tokyo 1939.

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On the earthquake fissures that occurred on May 1st, 1939, in the Ogasima Region. Bulletin of the Earthquake Research Institute, Tokyo, vol. XVII, pp. 650-660, and 9 fig., Tokyo 1939.

F. Kishirouye and K. Ida.
The tunami that accompanied the Ogasima earthquake of May 1st, 1939. Bulletin of the Earthquake Research Institute, Tokyo, vol. XVII, pp. 733-740, 2 fig., Tokyo 1939.

N. H. Heck.
Japanese Earthquakes, Introduction. Bulletin of the Seismological Society of America, vol. 34, No. 3, Berkeley 1944, 2 tables, pp. 119-136, 8 figures.

A = −·5877, B = +·4965, C = +·6389; δ = +10; h = −2;
D = +·645, E = +·764; G = −·488, H = +·412, K = −·769.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Akita	0·3	129	0 8k	− 3	0 14	− 4	—	—	—
Aomori	1·2	39	0 23a	− 1	0 39	− 2	—	—	—
Mizusawa	1·3	127	i 0 25	0	—	—	—	—	—
Hatinohe	1·5	64	0 28k	0	0 50	+ 1	—	—	—
Miyako	1·7	99	0 30k	− 1	0 56	+ 2	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukusima		2·1	166	0 38a	+ 1	1 16	+12	—	—	—
Mori		2·3	15	0 39a	− 1	1 15	+ 6	—	—	—
Utunomiya		3·3	179	0 55	+ 2	1 48	S_g	—	—	—
Wazima		3·4	223	0 54	− 1	1 46	S*	—	—	—
Maebasi		3·5	190	1 0a	+ 3	1 55	S_g	—	—	—
Mito		3·5	172	0 48a	− 9	1 36	− 4	—	—	—
Tukubasan		3·7	177	0 57a	− 3	1 57	S*	—	—	—
Kumagaya		3·8	186	1 1a	0	2 6	S_g	—	—	—
Toyama		3·8	213	1 0	− 1	2 15	+29	—	—	—
Titibu		4·0	189	1 11	P*	2 6	S*	—	—	—
Komaba		4·2	182	1 11	+ 4	2 12	S*	—	—	—
Tokyo, Cen. Met. Ob.		4·2	181	1 8a	+ 1	2 12	S*	—	—	—
Tokyo, Imp. Univ.		4·2	181	1 7k	0	2 6	+ 9	—	—	—
Hunatu		4·5	191	1 12a	+ 1	2 18	S*	—	—	—
Yokohama		4·5	182	1 2	− 9	2 17	S*	—	—	—
Koyama		4·6	188	1 11	− 1	2 20	S*	—	—	—
Kiyosumi		4·7	177	1 11a	− 3	2 18	+ 8	—	—	—
Misima		4·8	189	1 15a	0	2 44	S_g	—	—	—
Yosiwara		4·8	192	1 11	− 4	2 23	S*	—	—	—
Mera		5·0	182	1 21k	+ 3	2 49	S_g	—	—	—
Gihu		5·1	209	1 18a	− 2	2 40	S*	—	—	—
Osima		5·1	184	1 21a	+ 1	2 35	S*	—	—	—
Nagoya		5·2	207	1 23a	+ 2	2 40	S*	—	—	—
Susaki		5·3	188	1 22a	0	2 37	S*	—	—	—
Omaesaki		5·4	194	1 27a	+ 3	2 58	S_g	—	—	—
Nemuro		5·5	50	1 27	+ 2	2 29	− 1	—	—	—
Kameyama		5·7	209	1 29k	+ 1	3 4	S_g	—	—	—
Kyoto		5·8	215	1 32a	+ 3	3 3	S_g	—	—	—
Toyooka		5·9	224	1 32k	+ 1	2 59	S*	—	—	—
Osaka		6·2	215	i 1 37k	+ 2	2 59	+11	—	—	—
Kobe		6·4	217	1 38a	0	2 56	+ 3	—	—	—
Sumoto		6·8	217	1 43a	− 1	3 34	S*	—	—	—
Hamada		7·9	233	2 0	+ 1	4 11	S_g	—	—	—
Muroto		8·0	216	2 0a	0	3 44	+11	—	—	—
Koti		8·1	220	1 59	− 3	3 26	− 9	—	—	—
Izuka		9·6	232	2 23	+ 2	4 58	S_g	—	—	—
Taikyu		9·7	249	2 24	+ 2	4 8	− 7	—	—	—
Hukuoka		9·8	233	e 2 26	+ 2	4 11	− 6	—	—	5·4
Husan		9·8	244	2 28a	+ 4	4 20	+ 3	—	—	—
Miyazaki		10·5	223	2 38	+ 3	4 23	−12	—	—	—
Nagasaki		10·7	231	2 41	+ 3	4 24	−15	—	—	—
Heizyo		10·9	270	2 41	+ 1	4 29	−15	—	—	—
Yakusima		12·1	222	2 58k	+ 1	5 40	SSS	—	—	—
Titizima		12·9	171	2 58	− 9	—	—	—	—	—
Dairen		14·1	271	3 23	0	7 6	+64	—	—	—
Nake		14·3	220	3 28k	+ 2	6 25	+19	—	—	—
Naha		17·0	220	3 59	− 2	7 43	SS	—	—	—
Zi-ka-wei		17·3	245	e 4 6	+ 2	7 18	+ 2	—	—	10·3
Miyakozima		19·4	223	4 35	+ 5	7 49	−15	—	—	—
Taihoku		21·3	231	e 5 5	+15	e 9 13	SS	—	—	11·5
Taityu		22·5	231	5 5	+ 3	9 49	SS	—	—	—
Irkutsk		27·3	309	5 48	0	e 10 23	− 4	—	—	14·6
Hong Kong		27·9	238	5 55	+ 1	10 35	− 2	6 47	PPP	15·7
Manila		30·1	217	i 6 11a	− 2	11 23	+11	—	—	14·9
Palau		32·8	189	6 36	− 1	13 45	SS	—	—	—
Semipalatinsk		42·2	305	7 53	− 3	14 17	0	—	—	—
Almata		46·2	296	e 8 11	−17	—	—	—	—	25·3
Calcutta	N.	46·6	263	i 8 41a	+ 9	i 15 35	+14	e 18 42	SS	e 22·8
College		47·4	32	e 8 40	+ 2	e 15 33	+ 1	—	—	e 19·4
Frunse		47·9	296	8 39	− 3	15 39	0	—	—	—
Andijan		50·2	293	9 0	0	16 16	+ 5	—	—	26·6
Dehra Dun	N.	50·5	279	—	—	16 45	PPS	—	—	e 26·2
Medan		51·8	236	e 9 5	− 7	16 40	+ 7	i 19 46	SS	28·6
Agra		52·1	275	e 9 11	− 3	e 16 31	− 7	20 6	SS	—
Sverdlovsk		52·2	317	i 9 11	− 4	16 36	− 3	—	—	24·3

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Samarkand		54·4	295	e 9 33	+ 2	17 2	− 7	—	—	—
Batavia		55·0	220	9 33	− 2	17 24	+ 7	—	—	e 27·6
Sitka		55·1	40	e 9 38	+ 2	e 17 17	− 1	i 21 8	SS	25·0
Honolulu		55·7	88	e 9 29	−11	e 17 18	− 8	20 57	SS	i 25·1
Hyderabad		57·2	265	9 51	0	17 42	− 4	21 27	SS	27·9
Bombay		60·6	271	e 10 13	− 2	i 18 29	− 1	i 12 36	PP	e 29·1
Kodaikanal	E.	62·3	260	i 10 25a	− 1	18 51	− 1	—	—	36·5
Colombo	E.	62·7	254	10 29	0	18 56	− 1	—	—	37·1
Moscow		64·2	322	10 35	− 4	19 8	− 8	—	—	32·1
Pulkovo		65·1	328	e 10 50	+ 5	i 19 29	+ 2	—	—	e 31·1
Victoria		65·5	45	10 46	− 1	19 34	+ 2	—	—	—
Baku		65·6	303	e 10 47	− 1	i 19 40	+ 7	—	—	31·6
Grozny		66·1	307	10 51	0	e 19 47	+ 8	—	—	27·6
Erevan		69·1	305	e 11 15	+ 5	—	—	—	—	—
Scoresby Sund		69·1	353	11 10	0	20 19	+ 4	24 37	SS	—
Upsala		69·8	333	—	—	e 20 26	+ 3	e 24 52	SS	e 35·7
Sotchi		70·1	310	e 11 11	− 5	—	—	—	—	—
Ukiah		70·2	53	—	—	e 20 33	+ 5	24 32	SS	—
Saskatoon		71·7	36	e 11 34?	+ 8	e 20 52	+ 7	—	—	35·6
Berkeley		72·2	54	e 11 36	+ 7	—	—	—	—	—
Branner		72·5	54	e 12 21	+51	—	—	—	—	—
Santa Clara		72·7	54	i 11 40	+ 8	i 21 14	PS	—	—	e 31·8
Butte		72·8	42	e 11 39	+ 7	e 21 1	+ 3	e 16 2	PPP	e 29·4
Lick		72·9	54	e 11 35	+ 2	e 21 7	+ 8	—	—	—
Bergen		73·3	338	i 11 40	+ 5	e 21 6	+ 2	—	—	e 34·3
Bozeman		73·8	42	e 11 41	+ 3	21 17	+ 8	—	—	e 30·1
Riverview		74·1	169	e 11 45	+ 5	i 21 24	+12	—	—	e 35·3
Sydney		74·1	169	—	—	e 21 9	− 3	—	—	32·1
Fresno	N.	74·4	54	e 11 46	+ 4	e 21 27	+11	—	—	—
Cernauti		74·5	321	e 11 41	− 1	21 13	− 4	—	—	38·1
Copenhagen		74·8	332	i 11 42	− 2	21 22	+ 2	e 21 40	PS	—
Tinemaha		75·1	53	e 11 46	0	e 21 30	+ 6	22 7	PS	—
Halwee		75·9	54	i 11 50	0	—	—	—	—	—
Santa Barbara		75·9	56	i 11 51	+ 1	—	—	—	—	—
Salt Lake City		76·6	47	e 12 4	+10	e 21 44	+ 4	—	—	—
Bucharest		77·0	317	e 12 1	+ 5	21 49	+ 4	15 14	PP	—
Mount Wilson		77·1	55	i 11 56	− 1	e 21 50	+ 4	—	—	—
Pasadena		77·1	55	i 11 55	− 2	e 21 47	+ 1	—	—	—
Hamburg		77·4	332	e 11 55	− 3	e 21 53	+ 4	i 30 36	SSS	e 36·6
Melbourne		77·5	174	—	—	27 0	SS	i 29 42	SSS	36·1
Heligoland	E.	77·6	334	e 12 33	+33	e 21 54	+ 3	—	—	e 38·2
Riverside		77·7	55	i 11 58	− 2	—	—	—	—	—
Collmberg		78·0	329	e 12 28	+26	e 21 56	+ 1	e 26 52	SS	i 42·5
Aberdeen		78·1	339	e 12 9	+ 7	i 22 24	PS	i 26 42	SS	38·0
Budapest		78·3	322	12 6	+ 3	22 0	+ 1	15 24	PP	e 39·6
Kecskemet	Z.	78·4	322	e 12 0	− 4	e 21 42	−18	e 14 50	PP	e 43·1
Prague		78·4	327	e 12 4	0	e 21 59	− 1	—	—	e 38·6
Ksara		78·5	304	i 12 5	+ 1	e 22 4	+ 3	i 15 2	PP	—
La Jolla	Z.	78·5	56	i 12 5	+ 1	—	—	—	—	—
Szeged	N.	78·7	321	e 12 0	− 6	e 22 22	+19	e 15 15	PP	e 43·1
Jena		78·8	329	e 12 6	0	e 22 4	0	—	—	e 36·6
Göttingen		79·0	331	e 12 7	0	—	—	—	—	e 41·6
Cheb		79·2	329	e 12 24	+16	e 22 13	+ 5	—	—	e 42·6
Belgrade		79·5	319	e 12 12a	+ 2	i 22 19	+ 8	—	—	e 40·6
Edinburgh		79·5	339	—	—	i 27 21	SS	—	—	32·6
Sofia		79·7	316	e 12 14	+ 3	e 22 21	+ 8	—	—	41·6
Durham		80·1	338	—	—	i 22 20	+ 2	i 27 43	SS	—
De Bilt		80·2	333	12 16k	+ 2	22 22	+ 3	—	—	38·6
Stonyhurst		81·1	338	e 13 21	+63	—	—	—	—	41·6
Stuttgart		81·5	328	e 12 20	− 1	e 22 19	−13	e 15 50	PP	e 41·6

Continued on next page.

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Uccle	81·6	333	e 12 21	0	i 22 33	0	e 27 48	SS	e 37·6
Bidston	81·7	338	i 12 26	+ 4	i 22 31	− 3	i 27 44	SS	e 37·6
Triest	82·1	325	e 12 24	0	22 42	+ 4	28 5	SS	e 40·0
Strasbourg z.	82·2	330	e 12 23	− 1	—	—	—	—	—
Kew	82·6	336	e 12 26	0	i 22 46	+ 3	e 27 54	SS	e 42·2
Rathfarnham Castle	82·7	340	e 12 56	+29	i 23 46	PS	e 16 1	PP	—
Chur	82·9	327	e 12 27	− 1	—	—	—	—	—
Oxford	82·9	336	—	—	i 22 43	− 3	—	—	—
Tucson	82·9	52	i 12 27a	− 1	i 22 54	+ 8	i 15 32	PP	34 4
Zurich	82·9	328	e 12 26	− 2	e 22 40	− 6	—	—	—
Basle	83·1	329	e 12 27	− 2	e 22 40	− 8	—	—	—
Neuchatel	83·8	329	e 12 31	− 1	—	—	—	—	—
Paris	83·9	332	i 12 37	+ 4	22 59	+ 3	—	—	41·6
Helwan	84·0	303	i 12 31k	− 2	22 59	+ 2	i 15 54	PP	49·5
Lincoln	84·6	38	e 12 43	+ 7	e 23 1	− 2	—	—	34·7
Jersey	85·1	336	e 12 36	− 3	e 23 7	− 1	e 16 22	PP	—
Moncalieri	85·2	328	e 13 2	+23	23 11	+ 2	—	—	31·6
Clermont Ferrand	86·3	331	e 13 10	+25	e 23 24	+ 4	—	—	e 45·6
Wellington	86·8	153	i 12 56	+ 9	i 24 21	PS	—	—	e 29·6
Marseilles	87·5	328	e 12 56	+ 5	e 23 15	[− 2]	e 16 29	PP	e 37·6
Chicago	87·9	33	e 12 52	− 1	e 23 20	[0]	25 18	PPS	e 36·3
Christchurch	88·2	156	12 55a	+ 1	i 23 47	+ 9	i 29 51	SS	e 43·0
Shawinigan Falls	89·2	20	13 4	+ 5	24 4	+17	—	—	—
Florissant	89·2	36	i 12 58	− 1	i 23 41	− 6	—	—	—
Seven Falls	89·2	19	12 52	− 7	23 35	[+ 7]	—	—	43·6
Ottawa	89·3	23	i 12 59	0	23 50	+ 2	—	—	48·6
St. Louis	89·4	36	e 13 0	0	i 23 49	0	—	—	—
Toronto	89·6	27	—	—	e 23 34	[+ 4]	33 28	SSS	e 41·6
Bagnères	89·7	332	e 13 43	+42	i 23 59	+ 7	i 25 52	PPS	e 44·6
Vermont	90·9	23	—	—	e 23 46	[+ 8]	e 30 37	SSP	e 44·1
Cincinnati	91·5	33	e 13 7	− 3	i 24 7	− 1	16 44	PP	—
Little Rock	91·5	41	e 13 13	+ 3	e 24 9	+ 1	—	—	—
East Machias	92·2	19	e 17 31	PP	23 56	[+11]	30 34	SS	e 37·5
Williamstown	92·5	22	i 13 14	0	—	—	e 16 54	PP	—
Harvard	93·2	22	i 13 17	0	i 23 57	[+ 6]	e 42 34	L_q	e 49·6
Halifax	93·3	16	—	—	e 23 34?	[−18]	—	—	41·6
Fordham	94·0	24	—	—	i 24 1	[+ 5]	26 17	PPS	e 48·3
Toledo	94·0	333	e 13 30	+ 9	24 0	[+ 4]	—	—	e 43·0
Philadelphia	94·3	25	—	—	e 23 50	[− 7]	e 30 45	SS	e 38·3
Almeria	96·1	330	e 14 31	+60	—	—	—	—	47·8
Granada	96·2	331	17 49	PP	—	—	—	—	47·1
Columbia	97·4	33	e 18 2	PP	e 24 12	[− 2]	e 31 47	SS	e 42·6
San Fernando N.	97·8	333	e 19 38	PPP	—	—	—	—	52·4
Tananarive	103·6	257	—	—	31 59	SS	—	—	54·1
San Juan	117·2	27	e 20 11	PP	e 26 22	{−33}	e 21 50	PPP	e 48·1
Cape Town	133·5	259	24 29	PPP	29 38	{+57}	—	—	64·1
La Paz	146·3	53	i 19 43k	[+ 2]	29 43	{−15}	23 13	PP	70·6
Rio de Janeiro	162·9	9	—	—	e 31 45	{+17}	e 25 4	PP	e 47·7
La Plata	165·1	77	21 4	[+58]	—	—	—	—	68·6

Additional readings :—
Zi-ka-wei iE = +4m.12s., +5m.6s., and +6m.18s.
Hong Kong +10m.46s. and +12m.43s.
Manila iPEN = +6m.14s.
Calcutta iSSSN = +19m.54s.
Medan iE = +17m.50s.
Agra P = +9m.14s., pPE = +9m.27s., sS = +16m.56s., $iS_cS?N$ = +18m.20s., sSS = +20m.39s., iEN = +22m.23s.
Bombay iPEN = +10m.17s., iP_cPEN = +10m.57s., iPPEN = +12m.7s., iE = +15m.57s. eE = +18m.13s., eSN = +18m.35s., iN = +18m.57s., iSSEN = +22m.8s., eEN = +23m.39s. and +25m.23s.
Kodaikanal iE = +25m.58s.
Victoria eE = +11m.34s., SSS = +27m.34s.?
Grozny e = +11m.51s.
Ukiah eSSS = +28m.1s.
Riverview eE = +20m.55s., eL_qE = +33m.22s.
Copenhagen e = +11m.52s.

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Haiwee e = +13m.39s.
Bucharest ePE = +12m.4s., eN = +16m.4s., SSE = +27m.44s.
Hamburg eSKSE = +22m.11s.
Collmberg ePPP = +16m.31s., eSKS = +19m.46s., eSS = +29m.54s., e = +30m.10s. and +31m.10s., eSSS = +33m.52s., eL$_q$ = +41m.34s.
Aberdeen iEN = +22m.2s., iN = +24m.30s., iE = +27m.2s., iN = +30m.41s.
Budapest iN = +13m.4s., i = +14m.26s., SN = +22m.4s., SS = +27m.0s.
Kecskemet eP$_c$PZ = +12m.8s., eSKSZ = +22m.22s., eSSZ = +26m.48s.
Szeged eP$_c$PN = +12m.42s., eN = +18m.24s., ePSN = +22m.42s., eS$_c$SN = +22m.50s. eN = +26m.42s., eSS = +27m.7s.
Jena ePN = +12m.10s., eN = +22m.10s.
Stuttgart eP = +12m.35s., iS = +22m.38s., e = +23m.7s.
Uccle PPN = +15m.38s., iPSN = +23m.33s., eN = +31m.43s.
Bidston i = +19m.9s. and +22m.41s., eS = +29m.32s.
Kew eZ = +20m.24s., ePSE = +24m.6s., eN = +29m.18s., eZ = +31m.22s., eSSSZ = +32m.38s., eZ = +33m.32s., eL$_q$N = +37m.34s.
Tucson iP = +12m.33s., i = +12m.56s., +14m.27s., +14m.45s., +15m.14s., +16m.7s., and +16m.21s., iPPP = +17m.22s., iPPS = +23m.54s., SSS = +31m.40s.
Helwan iZ = +12m.54s., PPZ = +16m.49s., PPPZ = +19m.13s., SKKSE = +23m.55s., SEN = +24m.34s., PSE = +26m.1s., L$_q$E = +46m.20s.
Wellington eZ = +12m.3s., iZ = +12m.16s., e = +20m.6s., i = +20m.46s.
Marseilles eSE = +23m.31s., iSN = +23m.36s., eSSE = +29m.51s.
Christchurch iEZ = +23m.6s., eEN = +23m.21s., S? = +29m.3s., iSSSE = +33m.19s., L$_q$E = +36m.55s.
Florissant eE = +23m.34s., iSE = +23m.52s., iE = +24m.11s.
Ottawa eN = +20m.10s.
St. Louis iSE = +23m.52s.
Bagnères e = +24m.18s., eS = +24m.33s., iPS = +25m.22s., eSS = +30m.41s., eSSS = +33m.59s.
East Machias eS = +24m.24s.
Philadelphia iS = +24m.41s., eSSS = +34m.1s.
Almeria PS = +27m.8s., PPS = +27m.56s.
Columbia ePPP = +19m.27s., eSS = +31m.47s.
San Fernando ePPSN = +30m.2s.
San Juan SS = +35m.54s.
Cape Town PPPE = +24m.37s.
La Paz PSKS = +33m.16s.
La Plata SKKSP = +35m.58s.
Long waves were also recorded at Tashkent, Grenoble, Laibach, and Lille.

May 1d. 6h. 0m. 11s. Epicentre 39°·9N. 139°·8E. (as at 5h.).

A = −·5877, B = +·4965, C = +·6389; δ = +10; h = −2

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Morioka		1·1	101	0 17	− 5	0 35	− 4	—	—	—
Hatinohe		1·5	64	0 27	− 1	0 49	0	—	—	—
Yamagata		1·7	166	0 43	+12	—	—	—	—	—
Sendai		1·8	152	0 51	S	(0 51)	− 5	1 19	?	—
Tukubasan		3·7	177	1 52	− 8	—	—	—	—	—
Koti		8·1	220	3 57	S*	—	—	—	—	—
Simidu		9·0	220	6 17	?	8 40	?	—	—	—
Zi-ka-wei		17·3	245	4 7	+ 3	7 34	+18	—	—	—
Taihoku		21·3	231	e 5 12	PP	—	—	—	—	—
Hong Kong		27·9	238	5 53	− 1	10 21	−16	—	—	—
Calcutta	N.	46·6	263	8 37	+ 5	—	—	—	—	—
College		47·4	32	e 8 41	+ 3	—	—	—	—	—
Dehra Dun	N.	50·5	279	e 9 7	+ 5	e 20 21	SS	—	—	—
Agra		52·1	275	9 13	− 1	16 55	+17	20 16	SS	—
Sverdlovsk		52·2	317	i 9 12	− 3	16 35	− 4	—	—	24·6
Sitka		55·1	40	11 42	PP	—	—	—	—	—
Honolulu		55·7	88	—	—	17 37	PS	—	—	—
Hyderabad	E.	57·2	265	9 45	− 6	17 35	−11	—	—	—
Bombay		60·6	271	e 10 14	− 1	i 18 28	− 2	i 12 15	PP	—
Kodaikanal	E.	62·3	260	i 10 23	− 3	i 18 50	− 2	—	—	—
Moscow		64·2	322	i 10 38	− 1	19 15	− 1	—	—	—
Pulkovo		65·1	328	10 43	− 2	19 23	− 4	—	—	—
Victoria		65·5	45	e 10 43	− 4	e 19 25	− 7	—	—	—
Baku		65·6	303	i 10 51	+ 3	—	—	—	—	—
Grozny		66·1	307	10 57	+ 6	—	—	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		69·1	305	—	—	e 20 35	PS	—	—	—
Scoresby Sund		69·1	353	i 11 10a	0	—	—	13 49	PP	—
Upsala	N.	69·8	333	—	—	i 20 21	− 2	i 21 8	PPS	—
Sotchi		70·1	310	i 11 10	− 6	—	—	—	—	—
Saskatoon		71·7	36	i 11 29	+ 3	e 20 49	+ 4	—	—	—
Berkeley		72·2	54	i 11 28	− 1	—	—	—	—	—
Santa Clara	Z.	72·7	54	i 11 35	+ 3	—	—	—	—	—
Butte		72·8	42	e 14 17	PP	—	—	—	—	—
Bergen	Z.	73·3	338	i 11 34	− 1	—	—	—	—	—
Riverview		74·1	169	e 11 44	+ 4	21 28	+16	—	—	—
Sydney		74·1	169	—	—	e 21 19	+ 7	—	—	—
Adelaide		74·5	181	i 12 0	+18	i 21 32	+15	25 26	SS	34·3
Copenhagen		74·8	332	i 11 40a	− 4	21 23	+ 3	i 14 26	PP	—
Tinemaha		75·1	53	i 11 49	+ 3	—	—	e 39 12	P′P′	—
Haiwee		75·9	54	i 11 49	− 1	—	—	—	—	—
Santa Barbara		75·9	56	i 11 52	+ 2	—	—	—	—	—
Bucharest		77·0	317	e 11 59	+ 3	21 48	+ 3	e 14 53	PP	—
Mount Wilson		77·1	55	i 11 54	− 3	—	—	—	—	—
Pasadena		77·1	55	i 11 54	− 3	e 21 42	− 4	e 39 3	P′P′	—
Hamburg		77·4	332	i 11 57	− 1	e 21 51	+ 2	—	—	—
Melbourne		77·5	174	e 16 31	PPP	i 21 22	−28	—	—	—
Heligoland	E.	77·6	334	e 12 2	+ 2	e 21 51	0	—	—	—
Riverside		77·7	55	i 11 57	− 3	—	—	—	—	—
Collmberg		78·0	329	e 12 2	0	i 21 57	+ 2	—	—	—
Aberdeen		78·1	339	i 12 3	+ 1	i 21 55	− 1	—	—	—
Budapest		78·3	322	i 12 3	0	22 3	+ 4	e 22 59	PS	—
Prague		78·4	327	11 59	− 5	22 1	+ 1	—	—	—
Ksara		78·5	304	i 12 4	0	e 22 3	+ 2	—	—	—
La Jolla		78·5	56	i 12 6	+ 2	—	—	—	—	—
Jena		78·8	329	i 12 5	− 1	e 22 3	− 1	—	—	—
Göttingen		79·0	331	i 12 6	− 1	—	—	—	—	—
Ivigtut		79·0	4	12 8	+ 1	22 7	+ 1	—	—	—
Cheb		79·2	329	12 13	+ 5	e 22 11	+ 3	—	—	—
Hof		79·2	329	e 12 12	+ 4	e 22 5	− 3	—	—	e 34·8
Belgrade		79·5	319	i 12 14k	+ 4	—	—	i 15 13	PP	—
Edinburgh		79·5	339	e 12 13	+ 3	i 22 33	+22	—	—	—
Sofia		79·7	316	e 12 13	+ 2	i 22 17	+ 4	—	—	—
Durham		80·1	338	e 12 1	−12	i 22 10	− 8	—	—	—
De Bilt		80·2	333	12 11a	− 3	22 14	− 5	—	—	—
Stonyhurst		81·1	338	i 12 21	+ 3	i 22 21	− 7	—	—	—
Stuttgart		81·5	328	e 12 22	+ 1	e 22 35	+ 3	e 15 25	PP	—
Uccle		81·6	333	i 12 21	0	i 22 34	+ 1	i 15 35	PP	—
Bidston		81·7	338	i 12 17	− 5	i 22 37	+ 3	e 27 28	SS	—
Triest		82·1	325	12 25	+ 1	i 22 41	+ 3	—	—	—
Strasbourg		82·2	330	i 12 25	+ 1	e 23 39	PS	i 15 32	PP	—
Kew		82·6	336	i 12 21	− 5	i 22 45	+ 2	e 23 47	PS	—
Rathfarnham Castle		82·7	340	i 12 34	+ 7	i 22 40	− 4	i 15 38	PP	—
Oxford		82·9	336	i 12 28	0	—	—	—	—	—
Tucson		82·9	52	i 12 29	+ 1	i 23 44	PS	i 26 24	SS	—
Zurich		82·9	328	e 12 28	0	e 22 41	− 5	—	—	—
Basle		83·1	329	e 12 28	− 1	—	—	—	—	—
Paris		83·9	332	i 12 29	− 4	22 59	+ 3	15 54	PP	—
Besançon		84·0	330	—	—	e 22 55	− 2	—	—	—
Helwan		84·0	303	i 12 34k	+ 1	22 54	− 3	15 46	PP	—
Lincoln		84·6	38	—	—	31 13	SSS	—	—	—
Jersey		85·1	336	e 12 40	+ 1	e 23 1	[0]	e 15 31	PP	e 34·8
Wellington		86·8	153	12 47	0	i 24 26	PS	—	—	i 29·4
Christchurch		88·2	156	12 41	−13	23 40	+ 2	i 16 26	PP	42·0
Shawinigan Falls		89·1	20	e 13 2	+ 3	23 49	+ 3	—	—	—
Florissant		89·2	36	i 13 2	+ 3	i 23 51	+ 4	i 16 35	PP	—

Continued on next page.

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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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seven Falls		89·2	19	e 12 55	− 4	e 23 19	[− 9]	—	—	—
Ottawa		89·3	23	e 12 56	− 3	23 47	− 1	16 13	PP	—
St. Louis		89·4	36	e 12 58	− 2	i 23 51	+ 2	e 16 30	PP	—
Toronto		89·6	27	e 12 49?	−12	—	—	—	—	—
Bagnères		89·7	332	—	—	i 23 37	[+ 6]	e 24 27	S	—
Vermont		90·9	23	—	—	e 24 12	+ 9	—	—	—
Cincinnati		91·5	33	i 13 9	− 1	i 24 12	+ 4	i 16 44	PP	—
Little Rock		91·5	41	e 13 9	− 1	e 24 13	+ 5	—	—	—
East Machias		92·2	19	—	—	—	—	e 33 36	SSS	—
Williamstown		92·5	22	i 13 16	+ 2	i 23 47	[0]	i 16 30	PP	e 40·3
Harvard		93·2	22	i 13 14	− 3	i 24 23	0	i 17 9	PP	—
Halifax	N.	93·3	16	—	—	25 19	PS	—	—	—
Algiers		93·9	326	13 49?	+28	e 19 49?	PPP	—	—	e 39·8
Fordham		94·0	24	13 21	0	i 24 1	[+ 5]	17 9	PP	—
Toledo		94·0	333	i 13 23	+ 2	e 24 2	[+ 6]	i 17 7	PP	—
Georgetown		94·6	27	e 13 25	+ 1	—	—	e 17 27	PP	—
Almeria		96·1	330	19 9	PPP	24 26	[+19]	31 10	SS	50·8
Granada		96·2	331	—	—	24 31	−17	—	—	—
San Fernando	N.	97·8	333	—	—	i 24 14	[− 2]	e 28 17	PPS	—
Fort de France		122·3	24	20 24	PP	—	—	—	—	—
Cape Town		133·5	259	21 3	PP	28 23	{−18}	—	—	—
La Paz		146·3	53	i 19 42k	[+ 1]	—	—	—	—	—
Rio de Janeiro		162·9	9	e 20 10	[+ 6]	—	—	—	—	—
La Plata		165·1	77	24 43	PP	27 19	[+10]	—	—	—

Additional readings :—
Adelaide i = +13m.43s., +15m.15s., +22m.49s., +26m.48s., and +29m.47s.
Haiwee e = +11m.54s.
Copenhagen i = +11m.45s.
Santa Barbara i = +11m.56s.
Bucharest ePN = +12m.3s.
Budapest iN = +22m.47s., PPPE = +15m.1s., eE = +22m.59s., SSE = +25m.15s.
Edinburgh i = +12m.27s.
Durham eN = +12m.12s., iE = +20m.57s., iN = +22m.24s.
Stuttgart eP = +12m.13s., ePPP = +17m.16s., e = +26m.1s.
Strasbourg iSN = +20m.59s., eSSN = +28m.21s.
Helwan P_cPZ = +13m.14s., PSE = +23m.42s., SSE = +28m.31s., SSSE = +31m.42s.
Jersey ePPP = +17m.39s., e = +25m.49s.? and +30m.24s.
Bagnères eSKS = +23m.57s., ePS = +25m.28s.
Williamstown iPS = +25m.25s.
Georgetown e = +19m.11s.

May 1d. 7h. 28m. 15s. Epicentre 39°·9N. 139°·8E. (as at 6h.).

Intensity II at Akita, Aomori, and Mizusawa ; I at Morioka, Hakodate, Niigata, and Hatinohe.

Epicentre 40°·0N. 139°·6E. Shallow.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1939, Tokyo 1949, pp. 15.

A = −·5877, B = +·4965, C = +·6389 ; δ = +10 ; h = −2.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Akita	0·3	129	0 11k	0	—	—	—	—	—
Aomori	1·2	39	0 24	0	0 41	0	—	—	—
Mizusawa	1·3	127	i 0 25	0	0 46	+ 2	—	—	—
Hatinohe	1·5	64	0 28k	0	0 48	− 1	—	—	—
Sendai	1·8	152	0 34	+ 2	0 59	+ 3	—	—	—
Hukusima	2·1	166	0 39	+ 2	1 13	S_g	—	—	—
Mori	2·3	15	0 37a	− 3	1 9	0	—	—	—
Utunomiya	3·3	179	0 58	P*	1 52	S_g	—	—	—
Wazima	3·4	223	0 53a	− 2	1 46	S*	—	—	—
Sapporo	3·4	19	0 54	− 1	1 46	S*	—	—	—
Maebasi	3·5	190	1 2	+ 5	1 58	S_g	—	—	—
Mito	3·5	172	1 0a	+ 3	1 53	S_g	—	—	—
Nagano	3·5	202	0 55a	− 2	1 39	− 1	—	—	—
Tukubasan	3·7	177	0 59	− 1	1 53	S*	—	—	—
Toyama	3·8	213	1 0	− 1	1 57	S*	—	—	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kohu		4·4	193	1 9	− 1	2 13	S_g	—	—	—
Hunatu		4·5	191	1 13	+ 2	2 25	S_g	—	—	—
Hukui		4·7	217	1 9	− 5	2 21	+11	—	—	—
Mera		5·0	182	1 25	P*	2 42	S_g	—	—	—
Gihu		5·1	209	1 18	− 2	2 32	S*	—	—	—
Nagoya		5·2	207	1 21	0	2 35	S*	—	—	—
Hikone		5·4	213	1 26	+ 2	2 44	S*	—	—	—
Omaesaki		5·4	194	1 29	+ 5	2 53	S_g	—	—	—
Nemuro		5·5	50	1 37	P*	—	—	—	—	—
Kameyama		5·7	209	1 28	0	—	—	—	—	—
Kyoto		5·8	215	1 33	+ 4	—	—	—	—	—
Toyooka		5·9	224	1 31	0	3 8	S_g	—	—	—
Osaka		6·2	215	1 30	− 5	2 53	+ 5	—	—	—
Sumoto		6·8	217	1 34	−10	3 23	S*	—	—	—
Muroto		8·0	216	2 0	0	3 44	+11	—	—	—
Matuyama		8·3	225	2 3	− 1	4 18	S*	—	—	—
Sikka		9·6	13	3 19	+58	—	—	—	—	—
Husan		9·8	244	2 28	+ 4	3 59	−18	—	—	—
Hukuoka		9·8	233	2 27	+ 3	—	—	—	—	—
Kumamoto		10·2	229	2 29	− 2	—	—	—	—	—
Zinsen		10·6	261	2 33	− 3	4 39	+ 2	—	—	—
Sverdlovsk		52·2	317	i 9 11	− 4	16 34	− 5	—	—	29·8
Moscow		64·2	322	10 34	− 5	19 12	− 4	—	—	—
Grozny		66·1	307	e 10 48	− 3	—	—	—	—	—
Tinemaha		75·1	53	e 11 45a	− 1	—	—	—	—	—
Haiwee		75·9	54	e 11 50	0	—	—	—	—	—
Santa Barbara	z.	75·9	56	i 11 50	0	—	—	—	—	—
Mount Wilson		77·1	55	i 11 55a	− 2	—	—	—	—	—
Pasadena		77·1	55	i 11 55a	− 2	—	—	—	—	—
Riverside		77·7	55	i 11 58a	− 2	—	—	—	—	—
Collmberg		78·0	329	i 11 57	− 5	—	—	e 14 54	PP	—
Ksara		78·5	304	i 12 3k	− 1	e 22 1	0	e 15 2	PP	—
Tucson		82·9	52	i 12 27a	− 1	—	—	—	—	—
Basle		83·1	329	e 12 26	− 3	—	—	—	—	—
Helwan	z.	84·0	303	i 12 30a	− 3	—	—	—	—	—
La Paz	z.	146·3	53	19 43	[+ 2]	—	—	—	—	—

Additional readings:—
Collmberg iZ = +12m.1s.
Tucson iP = +12m.30s.
Long waves were recorded at Stuttgart.

May 1d. 11h. 50m. 30s. Epicentre 39°·9N. 139°·8E. (as at 7h.).

A = −·5877, B = +·4965, C = +·6389; δ = +10; h = −2.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		1·3	127	0 28	+ 3	0 49	+ 5	—	—	—
Osaka		6·2	215	1 52	P*	3 18	S_g	—	—	—
Hukuoka		9·8	233	e 2 30	+ 6	—	—	—	—	—
Irkutsk		27·3	309	e 5 46	− 2	e 10 24	− 3	—	—	14·5
Manila		30·1	217	e 6 12	− 1	11 11	− 1	—	—	15·2
Phu-Lien		34·1	246	—	—	e 11 37	−37	—	—	—
Agra	E.	52·1	275	—	—	e 16 33	− 5	i 20 38	SSS	—
Sverdlovsk		52·2	317	i 9 14	− 1	16 38	− 1	—	—	23·5
Tashkent		52·2	296	e 9 12	− 3	e 16 30	− 9	—	—	e 28·0
Bombay		60·6	271	—	—	e 17 30?	−60	—	—	—
Moscow		64·2	322	10 35	− 4	—	—	—	—	33·0
Baku		65·6	303	e 10 49	+ 1	e 19 34	+ 1	—	—	32·8
Grozny		66·1	307	e 10 55	+ 4	—	—	—	—	—
Tinemaha		75·1	53	e 11 47	+ 1	—	—	—	—	—
Haiwee		75·9	54	e 11 49	− 1	—	—	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara	z.	75·9	56	i 11 52	+ 2	—	—	—	—	—
Mount Wilson	z.	77·1	55	e 11 56	− 1	—	—	—	—	—
Pasadena		77·1	55	e 11 57	0	—	—	—	—	—
Riverside	z.	77·7	55	e 11 59	− 1	—	—	—	—	—
Istanbul		77·8	314	—	—	e 20 30?	?	—	—	—
Collmberg	z.	78·0	329	e 12 0	− 2	—	—	—	—	—
Ksara		78·5	304	i 12 5	+ 1	e 22 8	+ 7	e 15 4	PP	—
Stuttgart		81·5	328	e 12 21	0	e 22 31	− 1	e 43 30	L_q	e 45·5
Uccle		81·6	333	e 12 22	+ 1	e 22 34	+ 1	—	—	e 43·5
Triest		82·1	325	e 13 16	+52	e 23 24	PS	—	—	—
Strasbourg		82·2	330	12 26	+ 2	e 22 47	+ 8	—	—	e 46·3
Tucson		82·9	52	e 12 29a	+ 1	—	—	—	—	—
Helwan	z.	84·0	303	i 12 32	− 1	—	—	—	—	—
Rome		85·0	322	e 12 39	+ 1	e 24 8	PS	e 16 1	PP	e 45·6

Additional readings :—
Stuttgart e = +35m.30s.
Tucson iP = +12m.32s.
Long waves were also recorded at Prague, Budapest, Bergen, Upsala, Kodaikanal, Medan, San Fernando, Toledo, Göttingen, Edinburgh, Paris, Kew, Bidston, De Bilt, Cheb, Jena, Hamburg, and Pulkovo.

May 1d. 16h. 5m. 47s. Epicentre 39°·9N. 139°·8E. (as at 7h.).

Intensity IV at Akita ; III Morioka, Mizusawa, Sendai, Akawa ; II Aomori, Hatinohe, Miyako, Niigata ; I Hukusima, Wazima, and Onahama.

Epicentre 39°·8N. 139°·9E.

See Seismological Bulletin of Central Met. Obs., Japan, for the year 1939, Tokyo 1949, pp. 16-17.

A = −·5877, B = +·4965, C = +·6389 ; δ = +10 ; h = −2.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Akita	0·3	129	0 10	− 1	0 15	− 3	—	—	—
Aomori	1·2	39	0 25	+ 1	0 41	0	—	—	—
Mizusawa	1·3	127	0 27	+ 2	0 44	0	—	—	—
Hatinohe	1·5	64	0 29k	+ 1	0 49	0	—	—	—
Miyako	1·7	99	0 34k	+ 3	1 0	+ 6	—	—	—
Sendai	1·8	152	0 34a	+ 2	0 58	+ 2	—	—	—
Hukusima	2·1	166	0 39a	+ 2	1 15	+11	—	—	—
Mori	2·3	15	0 42a	+ 2	1 17	S_g	—	—	—
Onahama	3·1	164	0 56a	+ 5	1 46	S_g	—	—	—
Utunomiya	3·3	179	0 55a	+ 2	1 49	S_g	—	—	—
Sapporo	3·4	19	0 57a	+ 2	1 49	S*	—	—	—
Wazima	3·4	223	0 55a	0	1 47	S*	—	—	—
Maebasi	3·5	190	1 8a	P_g	2 4	S_g	—	—	—
Nagano	3·5	202	0 57	0	1 44	S*	—	—	—
Tukubasan	3·7	177	1 0a	0	1 58	S*	—	—	—
Kumagaya	3·8	186	1 2a	+ 1	2 5	S_g	—	—	—
Toyama	3·8	213	1 1	0	2 14	S_g	—	—	—
Tokyo, Cen. Met. Ob.	4·2	181	1 14	P*	2 14	S*	—	—	—
Hunatu	4·5	191	1 13a	+ 2	2 18	S*	—	—	—
Yokohama	4·5	182	1 13a	+ 2	2 16	S*	—	—	—
Misima	4·8	189	1 18	+ 3	2 50	S_g	—	—	—
Mera	5·0	182	1 20	+ 2	2 51	S_g	—	—	—
Gihu	5·1	209	1 19a	− 1	2 42	S*	—	—	—
Osima	5·1	184	1 21a	+ 1	2 31	S*	—	—	—
Nagoya	5·2	207	1 23	+ 2	2 48	S_g	—	—	—
Hikone	5·4	213	1 30k	+ 6	2 58	S_g	—	—	—
Omaesaki	5·4	194	1 26a	+ 2	2 52	S_g	—	—	—
Nemuro	5·5	50	1 28	+ 3	2 32	+ 2	—	—	—
Kameyama	5·7	209	1 29k	+ 1	3 6	S_g	—	—	—
Kyoto	5·8	215	1 33	+ 4	3 16	S_g	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toyooka		5·9	224	1 31	0	3 8	S_g	—	—	—
Osaka		6·2	215	i 1 39k	+ 4	3 6	S*	—	—	—
Hamada		7·9	233	2 0	+ 1	3 35	+ 5	—	—	—
Hirosima		8·1	229	2 0	− 2	3 56	S*	—	—	—
Matuyama		8·3	225	2 4	0	4 21	S*	—	—	—
Simidu		9·0	220	2 42k	+29	5 12	S_g	—	—	—
Izuka		9·6	232	2 24	+ 3	5 16	+ 4	—	—	—
Hukuoka		9·8	233	2 28	+ 4	4 9	− 8	—	—	—
Husan		9·8	244	2 28	+ 4	4 22	+ 5	—	—	—
Kumamoto		10·2	229	2 29	− 2	4 22	− 5	—	—	—
Miyazaki		10·5	223	3 37	+62	5 47	+72	—	—	—
Zinsen		10·6	261	2 35	− 1	—	—	—	—	—
Nagasaki		10·7	231	2 43	+ 5	—	—	—	—	—
Yakusima		12·1	222	2 58	+ 1	5 23	+ 9	—	—	—
Dairen		14·1	271	6 6	S	(6 6)	+ 4	8 18	?	—
Zi-ka-wei	N.	17·3	245	e 4 7	+ 3	7 25	+ 9	i 4 13	PP	9·3
Miyakozima		19·4	223	4 38	+ 8	8 18	+14	—	—	—
Taihoku		21·3	231	e 5 24	+34	e 8 58	+15	—	—	e 12·2
Taito		23·3	228	5 8k	− 2	9 25	+ 5	—	—	—
Irkutsk		27·3	309	e 5 44	− 4	10 23	− 4	—	—	14·2
Hong Kong		27·9	238	5 55	+ 1	10 38	+ 1	—	—	14·4
Manila		30·1	217	i 6 14k	+ 1	i 11 10	− 2	—	—	14·6
Phu-Lien		34·1	246	e 6 52	+ 4	12 13	− 1	—	—	—
Semipalatinsk		42·2	305	7 58	+ 2	14 16	− 1	—	—	—
Almata		46·2	296	8 28	0	—	—	—	—	—
Calcutta	N.	46·6	263	8 51	+19	e 15 45	+24	e 11 16	PPP	e 23·0
College		47·4	32	e 8 43	+ 5	e 15 36	+ 4	e 19 8	SS	e 20·5
Frunse		47·9	296	e 8 39	− 3	15 41	+ 2	—	—	—
Andijan		50·2	293	e 8 56	− 4	e 16 19	+ 8	—	—	28·2
Dehra Dun	N.	50·5	279	—	—	e 16 34	+18	—	—	e 27·2
Medan		51·8	236	9 17	+ 5	16 33	0	—	—	27·2
Agra		52·1	275	e 9 11	− 3	16 31	− 7	11 8	PP	—
Sverdlovsk		52·2	317	i 9 13	− 2	i 16 37	− 2	—	—	27·4
Tashkent		52·2	296	i 9 11	− 4	e 16 33	− 6	—	—	e 26·6
Samarkand		54·4	295	e 9 18	−13	17 3	− 6	—	—	—
Batavia		55·0	220	e 9 39	+ 4	17 13	− 4	—	—	—
Honolulu		55·7	88	—	—	21 33	SS	—	—	e 25·0
Hyderabad		57·2	265	9 52	+ 1	17 40	− 6	11 47	PP	26·8
Bombay		60·6	271	i 10 20	+ 5	i 18 31	+ 1	e 22 16	SS	e 29·3
Kodaikanal	E.	62·3	260	i 10 28a	+ 2	i 18 54	+ 2	i 19 24	PS	—
Colombo	E.	62·7	254	—	—	e 19 13?	PS	—	—	—
Moscow		64·2	322	10 37	− 2	19 13	− 3	—	—	34·7
Pulkovo		65·1	328	e 10 43	− 2	e 19 23	− 4	—	—	e 31·4
Baku		65·6	303	10 51	+ 3	19 34	+ 1	—	—	32·2
Grozny		66·1	307	e 10 53	+ 2	e 19 50	+11	—	—	e 27·2
Tiflis		68·1	307	11 2	− 2	20 9	+ 6	e 13 41	PP	e 33·2
Scoresby Sund		69·1	353	11 13k	+ 3	20 25	+10	—	—	—
Upsala		69·8	333	e 10 50	−24	i 20 22	− 1	—	—	—
Sotchi		70·1	310	e 11 14	− 2	—	—	—	—	—
Ukiah		70·2	53	e 11 43	+26	e 20 43	+15	e 25 23	SS	e 29·8
Bergen		73·3	338	—	—	e 21 13?	+ 9	—	—	—
Bozeman		73·8	42	e 11 41	+ 3	e 21 7	− 2	—	—	e 32·4
Riverview		74·1	169	—	—	e 31 25	?	—	—	e 33·8
Cernauti		74·5	321	e 11 42	0	—	—	—	—	39·2
Copenhagen		74·8	332	i 11 42	− 2	21 19	− 1	—	—	37·2
Tinemaha		75·1	53	i 11 46	0	—	—	—	—	—
Haiwee		75·9	54	e 11 47	− 3	—	—	—	—	—
Santa Barbara	Z.	75·9	56	i 11 55	+ 5	—	—	—	—	—
Bucharest	N.	77·0	317	e 11 51	− 5	21 48	+ 3	14 34	PP	37·7
Mount Wilson		77·1	55	e 11 59	+ 2	—	—	—	—	—
Pasadena		77·1	55	e 11 56	− 1	—	—	—	—	e 31·7
Hamburg		77·4	332	e 12 3	+ 5	e 21 47	− 2	—	—	e 35·2
Riverside		77·7	55	e 11 51	− 9	—	—	—	—	—
Istanbul		77·8	314	12 7	+ 6	22 4	+11	—	—	40·8
Collmberg		78·0	329	i 11 54k	− 8	e 21 55	0	e 15 13	PP	e 44·7

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Aberdeen	N.	78·1	339	i 13 11	+69	i 22 5	+ 9	i 26 54	SS	38·7
Budapest		78·3	322	12 9	+ 6	—	—	—	—	42·2
Prague		78·4	327	e 11 37?	−27	e 21 57	− 3	e 31 13	SSS	e 40·2
Ksara		78·5	304	i 12 8	+ 4	e 22 6	+ 5	e 15 7	PP	—
La Jolla	Z.	78·5	56	e 11 53	−11	—	—	—	—	—
Szeged	E.	78·7	321	e 12 7	+ 1	e 22 5	+ 2	e 25 13	SS	e 43·7
Jena		78·8	329	e 12 5	− 1	e 22 5	+ 1	—	—	e 37·2
Göttingen		79·0	331	e 12 7	0	—	—	—	—	e 41·2
Cheb		79·2	329	—	—	e 24 13?	?	—	—	e 44·2
Edinburgh		79·5	339	—	—	e 21 42	−29	—	—	e 38·2
Belgrade		79·5	319	e 12 8a	− 2	e 22 9	− 2	—	—	40·5
Sofia		79·7	316	e 12 13	+ 2	e 22 7	− 6	—	—	—
De Bilt		80·2	333	i 22 18	S	(i 22 18)	− 1	—	—	e 32·2
Stuttgart		81·5	328	e 12 19	− 2	e 22 31	− 1	e 15 33	PP	e 41·2
Uccle		81·6	333	e 12 22	+ 1	e 22 29	− 4	—	—	e 40·2
Bidston		81·7	338	—	—	e 22 39	+ 5	—	—	e 38·0
Triest		82·1	325	e 12 23	− 1	i 22 33	− 5	e 15 28	PP	—
Strasbourg		82·2	330	e 12 24	0	e 22 39	0	—	—	—
Kew		82·6	336	e 12 27	+ 1	e 22 43	0	e 15 45	PP	e 43·3
Rathfarnham Castle		82·7	340	e 12 44	+17	i 22 49	+ 5	e 28 0	SS	e 44·8
Tucson		82·9	52	i 12 29	+ 1	i 22 49	+ 3	i 15 28	PP	34·5
Chur		82·9	327	e 12 27	− 1	—	—	—	—	—
Oxford		82·9	336	—	—	i 22 50	+ 4	—	—	e 38·2
Zurich		82·9	328	e 12 25	− 3	e 22 45	− 1	e 15 32	PP	—
Basle		83·1	329	e 12 28	− 1	e 22 43	− 5	—	—	—
Neuchatel		83·8	329	e 12 32	0	—	—	—	—	—
Paris		83·9	332	i 12 37	+ 4	e 22 58	+ 2	15 53	PP	44·2
Helwan		84·0	303	i 12 33k	0	22 55	− 2	15 49	PP	—
Lincoln		84·6	38	—	—	e 28 41	SS	—	—	e 41·6
Rome		85·0	322	i 12 44k	+ 6	23 6	− 1	16 4	PP	e 39·3
Wellington		86·8	153	e 12 43	− 4	e 23 13?	[0]	—	—	e 36·2
Chicago		87·9	33	—	—	e 29 31	SS	e 32 15	SSS	e 41·5
Christchurch		88·2	156	i 13 0a	+ 6	e 23 49	+11	36 51	L_q	e 43·2
Florissant	E.	89·2	36	i 13 3	+ 4	e 23 30	[+ 2]	—	—	40·0
Ottawa		89·3	23	e 12 59	0	e 23 25	[− 4]	—	—	e 41·2
St. Louis		89·4	36	—	—	e 23 32	[+ 3]	—	—	e 42·2
Toronto		89·6	27	—	—	e 23 37	[+ 7]	—	—	40·2
Bagnères		89·7	332	e 13 28	+27	23 29	[− 2]	—	—	e 47·2
Vermont		90·9	23	—	—	e 23 42	[+ 4]	—	—	e 41·1
East Machias		92·2	19	—	—	e 23 55	[+10]	e 30 18	SS	e 37·6
Williamstown		92·5	22	e 13 16	+ 2	—	—	—	—	—
Harvard		93·2	22	i 13 18	+ 1	e 23 55	[+ 4]	e 44 13	L_q	e 52·2
Fordham		94·0	24	e 13 34	+13	i 24 2	[+ 6]	—	—	—
Toledo		94·0	333	e 16 59	PP	—	—	—	—	—
San Fernando		97·8	333	—	—	e 21 14	?	—	—	48·2
Bermuda		104·6	20	—	—	e 35 13?	SSS	—	—	—
Balboa Heights		119·3	45	—	—	e 28 13?	{+64}	—	—	—
La Paz	Z.	146·3	53	i 19 43a	[+ 2]	—	—	—	—	72·2
Rio de Janeiro		162·9	9	—	—	e 44 13	SS	—	—	—

Additional readings :—
Zi-ka-wei iN = +4m.17s.
Hong Kong S = +10m.48s.
Calcutta eSSN = +18m.52s., eSSSN = +20m.4s.
Agra eN = +9m.17s. and +16m.39s., sSE = +16m.55s., SSE = +20m.4s., sSSE = +20m.38s.
Hyderabad S_0SE = +19m.59s., SSN = +21m.38s.
Kodaikanal iSSE = +23m.5s.
Tiflis PE = +11m.7s., eZ = +19m.53s., ePSE = +20m.49s., ePSN = +21m.8s., eN = +21m.39s., eZ = +21m.48s., eE = +21m.55s., eSSE = +24m.34s., eSSN = +24m.54s., SSSN = +27m.39s., eSSSE = +27m.53s., eZ = +29m.45s.
Upsala eSN = +20m.32s.
Copenhagen +11m.45s.
Bucharest ePN = +12m.1s.
Istanbul PPS = +36m.49s.
Collmberg i = +12m.11s., e = +12m.22s., i = +12m.46s., e = +13m.32s., +14m.25s., and +14m.28s., ePPP = +16m.39s., eSS = +26m.55s., eSSS = +30m.25s., e = +40m.25s., eL_q = +41m.13s.

Continued on next page.

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Aberdeen iN = +32m.4s., iE = +33m.6s.
Budapest PE = +12m.27s.
Prague e = +12m.42s.
Szeged eE = +14m.45s.
Jena eSN = +22m.13s.
Belgrade eZ = +12m.23s.
Stuttgart eP = +12m.22s., ePPP = +17m.15s., e = +26m.49s.
Uccle eSN = +22m.34s.
Triest SS = +28m.8s., SSS = +31m.15s.
Strasbourg e = +22m.42s.
Kew eL$_q$EN = +38m.21s.
Tucson i = +12m.42s. and +12m.48s., iPPP = +17m.22s., iPS = +23m.20s., iPPS = +23m.58s., eSSS = +31m.58s.
Paris pPP = +16m.26s.
Helwan iZ = +13m.6s., eE = +23m.58s.
Rome i = +23m.37s., iPS = +23m.54s., eE = +28m.36s., eN = +28m.51s., iN = +30m.8s., iE = +34m.53s.
Bagnères eSE = +23m.57s. and +24m.1s.
East Machias eS = +24m.48s., eSSS = +33m.58s.
San Fernando ePSN = +24m.16s.
La Paz iZ = +20m.51s.
Long waves were also recorded at Almeria, Stonyhurst, Moncalieri, Clermont Ferrand, Huancayo, Algiers, and Granada.

May 1d. 23h. 53m. 0s. Epicentre 31°·5N. 117°·5W.

Intensity VI at Pine Valley, felt in the district of San Diego.

Epicentre 32°·0N. 117°·5W.

Macroseismic area 1400 square miles.

R. Bodle.
United States Earthquakes, 1939, Washington 1941, p.14, chart p. 63.

$A = -\cdot3944$, $B = -\cdot7577$, $C = +\cdot5199$; $\delta = -4$; $h = +1$;
$D = -\cdot887$, $E = +\cdot462$; $G = -\cdot240$, $H = -\cdot461$, $K = -\cdot854$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		1·4	9	i 0 26	− 1	i 0 38	− 8	—	—	—
Riverside		2·5	2	i 0 42	− 1	i 1 12	− 2	—	—	—
Pasadena		2·7	348	i 0 45	0	i 1 22	+ 3	—	—	—
Mount Wilson		2·8	350	i 0 46	− 1	i 1 23	+ 1	—	—	—
Haiwee		4·6	356	i 1 14	+ 2	i 2 20	S*	—	—	—
Fresno	N.	5·5	343	e 1 29	+ 4	i 3 13	S_g	—	—	—
Tinemaha		5·6	355	i 1 28	+ 1	i 2 53	S*	—	—	—
Tucson		5·7	84	i 1 30$_a$	+ 2	i 2 40	+ 5	i 1 38	P*	i 3·4
Lick		6·8	331	e 1 52	+ 8	—	—	1 55	P*	—
Santa Clara	E.	6·9	329	e 2 46	+61	e 3 51	S_g	—	—	—
Branner		7·1	328	e 1 50	+ 2	—	—	—	—	—
Berkeley		7·5	330	—	—	e 3 30	+10	i 5 10	?	—
San Francisco		7·5	329	—	—	e 3 48	S*	—	—	—
Ukiah		8·9	330	—	—	e 4 24	S*	—	—	—
Salt Lake City		10·5	26	e 2 15	−20	e 5 18	S*	—	—	—
Denver	E.	13·1	48	—	—	e 5 56	SS	—	—	—
Bozeman		15·0	18	e 3 43	+ 8	e 7 45	L	—	—	(e 7·7)
Lincoln		19·2	55	e 4 39	+11	e 8 7	+ 8	—	—	e 9·9
Florissant		23·3	65	—	—	e 9 35	+15	—	—	e 12·2
St. Louis		23·4	65	e 5 15	+ 4	e 9 29	+ 8	—	—	e 11·5
Chicago		26·0	58	—	—	10 34	+28	—	—	e 13·3
Sitka		28·4	341	e 7 39	PPP	e 11 8	+23	—	—	13·5
Sverdlovsk		92·0	3	—	—	e 34 51	SSS	—	—	47·0
Ksara		110·4	23	e 18 56	PP	e 30 44	?	—	—	—

Additional readings :—
Tucson iP = +1m.35s., i = +1m.49s., P_g = +1m.56s., i = +2m.4s., iS = +2m.44s., i = +2m.46s., +2m.58s., and +3m.12s.
Branner eN = +1m.53s.
Salt Lake City iS = +5m.35s., i = +5m.50s.
Long waves were also recorded at Strasbourg, Stuttgart, Uccle, Cheb, Rome, Tiflis, Baku, Philadelphia, Butte, East Machias, College, Harvard, Ottawa, and Columbia.

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May 1d. Repetitions from an origin near the Epicentre 39°·9N. 139°·9E. of 5h. 58m.

The earliest phase recorded at Mizusawa is entered for each.

	h.	m.	s.		h.	m.	s.		h.	m.	s.		h.	m.	s.
SE	6	19	25	eSE	9	7	13	ePE	13	53	24	ePE	18	16	20
SE	6	26	7	PE	9	15	21	ePE	14	14	22	ePE	18	19	15
PN	6	28	43	ePE	9	22	59	eSE	14	39	13	ePE	18	24	59
SE	6	38	32	PE	9	53	44	ePE	15	43	27	ePE	18	39	1
ePE	6	43	28	PE	10	4	9	ePE	15	55	1	ePE	18	55	41
ePE	6	49	27	eSE	10	32	19	ePE	16	2	53	ePE	19	2	40
ePE	6	55	49	ePE	10	33	4	ePN	16	18	43	ePE	19	13	21
ePN	7	3	17	eSE	10	37	44	ePE	16	29	22	eSE	19	17	1
iPN	7	9	15	ePE	10	52	55	ePE	16	37	50	eSE	19	38	32
eP	7	16	4	iPE	11	43	45	iPE	17	5	37	ePE	19	41	2
ePN	7	23	59	ePN	11	49	45	ePE	17	15	29	ePE	19	45	47
eSE	7	45	58	ePE	12	6	23	ePE	17	25	28	ePE	20	3	53
SE	7	52	40	PE	12	12	16	iPE	17	28	6	ePE	20	41	27
SE	7	55	40	PE	12	18	23	ePE	17	32	41	ePE	21	28	9
SE	8	0	37	ePE	12	23	30	ePE	17	36	59	ePE	22	12	24
eSE	8	3	44	SE	12	27	29	ePE	17	49	43	eSE	23	8	42
eSE	8	13	2	eSE	12	39	43	eSE	18	7	20	eSE	23	36	43
ePE	8	29	58	eSE	12	54	28	ePE	18	8	34	ePE	23	45	57
eSN	8	31	11	ePN	13	0	57	eSE	18	12	47	ePE	23	55	35
eSE	8	44	56	PE	13	18	55	ePE	18	13	36	iSE	23	59	39
iPN	8	56	22	iPE	13	43	25								

May 1d. Readings also at 3h. (Tashkent, Samarkand, Andijan, and Frunse), 5h. (Mizusawa (2), Pasadena, Mount Wilson, and Riverside), 6h. (Hikone, Copenhagen, Strasbourg, Stuttgart, Uccle, and Kew), 7h. (Pasadena, Mount Wilson, Riverside, Riverview, Tinemaha, Tucson, Ksara, and Huancayo), 8h. (near Lick, Berkeley, and Branner), 10h. (Christchurch, Pasadena, Mount Wilson, Riverside, and Tinemaha), 11h. (Wellington, New Plymouth, and Tucson), 12h. (Tucson), 13h. (Guadalajara, Manzanillo, Almata, Sverdlovsk, Irkutsk, Samarkand, Andijan, and Frunse), 14h. (Tacubaya, Tucson, near Hukuoka, Osaka, Moscow, Baku, Stuttgart, Uccle, Tiflis, and Tashkent), 15h. (La Plata, Tucson, Pasadena, Mount Wilson, Riverside, Tinemaha, Haiwee, and La Paz), 16h. (Huancayo and Tucson), 17h. (Huancayo, Balboa Heights and La Paz), 18h. (Williamstown), 19h. (Adelaide and Riverview), 20h. (Fort de France, Tucson, Samarkand, Andijan, and Frunse), 21h. (near Ferndale, Tucson, near San Francisco, Lick, Ukiah, Haiwee, Tinemaha, Pasadena, and near Branner), 22h. (Mizusawa (2)), 23h. (Tucson).

May 2d. 13h. 14m. 46s. Epicentre 29°·0N. 114°·0W.

Felt at Point Loma, San Diego (Mission Hills), and Newport Beach.

Epicentre near 29°·5N. 113°·8W. (U.S.C.G.S.).

R. R. Bodle.
United States Earthquakes, 1939, Washington, 1941, p. 14.

$A = -\cdot3563$, $B = -\cdot8003$, $C = +\cdot4823$; $\delta = +4$; $h = +2$;
$D = -\cdot914$, $E = +\cdot407$; $G = -\cdot196$, $A = -\cdot441$, $K = -\cdot876$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		4·2	40	i 1 0k	− 7	i 1 50	− 7	i 1 10	P*	—
La Jolla		4·8	325	i 1 15	0	—	—	—	—	—
Riverside	z.	5·7	332	e 1 26	− 2	—	—	—	—	—
Pasadena		6·2	327	i 1 36	+ 1	i 2 45	− 3	—	—	i 2·9
Mount Wilson		6·3	327	e 1 37	+ 1	—	—	—	—	—
Chihuahua	z.	6·9	91	i 1 41	− 4	—	—	—	—	—
Santa Barbara	z.	7·3	320	e 1 55	+ 5	—	—	—	—	—
Haiwee		7·8	336	e 1 59	+ 1	—	—	—	—	—
Tinemaha		8·8	337	e 2 12	+ 1	—	—	—	—	—
Mazatlan	N.	9·0	128	e 2 16	+ 3	—	—	—	—	—
Fresno	N.	9·1	329	e 2 20	+ 6	—	—	—	—	e 5·1
Lick		10·5	325	e 2 39	+ 4	e 4 52	SS	—	—	e 5·4
Santa Clara		10·6	323	i 2 44	+ 8	i 4 44	+ 7	—	—	e 5·2
Branner		10·8	323	e 2 45	+ 6	e 4 56	SS	—	—	e 5·7
Berkeley		11·2	324	e 2 44	0	e 4 56	+ 4	—	—	e 5·6

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Francisco	E.	11·2	323	e 2 49	+ 5	e 4 56	+ 4	—	—	e 5·8
Salt Lake City		11·9	8	i 2 55	+ 1	e 5 12	+ 3	i 3 13	PPP	i 6·1
Ukiah		12·6	326	e 2 57	− 6	5 24	− 2	—	—	6·1
Guadalajara	N.	12·7	128	i 3 9	+ 4	—	—	—	—	—
Denver		13·0	33	e 3 18	PP	i 5 41	+ 6	(e 5 57)	SS	e 6·7
Manzanillo	N.	13·2	136	e 3 18	+ 7	—	—	—	—	—
Ferndale		14·3	327	e 3 34	+ 8	e 6 26	SS	6 50	SSS	e 8·2
Tacubaya	N.	16·5	122	e 3 55	+ 1	—	—	—	—	—
Bozeman		16·8	7	i 3 59	+ 1	e 6 50	−15	—	—	e 8·4
Butte		17·0	4	4 1	0	5 19	?	7 10	SS	i 10·1
Puebla	E.	17·5	121	e 4 7?	0	—	—	—	—	—
Lincoln		18·4	45	e 4 13	− 5	e 7 26	−15	—	—	i 8·7
Vera Cruz	N.	19·0	116	i 4 22	− 4	—	—	—	—	—
Little Rock		19·2	67	i 4 22	− 6	i 8 17	+18	i 5 7	PPP	9·9
Seattle		19·7	344	e 3 57	−37	e 7 50	−20	e 4 32	PP	e 9·4
Victoria		20·7	343	4 36	− 8	8 32	+ 1	e 5 44	PPP	10·2
Florissant		21·9	57	i 4 49	− 8	e 8 48	− 6	9 1	SS	11·6
St. Louis		21·9	57	i 4 52	− 5	i 8 49	− 5	—	—	—
Saskatoon		23·8	11	5 17	+ 2	9 38	+10	11 2	SSS	12·6
Chicago		24·9	51	e 5 23	− 3	9 48	+ 1	e 6 11	PPP	i 11·5
Chicago (Loyola)		24·9	51	e 5 25	− 1	i 9 51	+ 4	i 5 55	PP	—
Columbia		28·5	59	e 5 56	− 3	10 46	0	—	—	12·3
Toronto		31·2	52	6 22	− 1	11 29	0	7 8	PP	—
Sitka		31·8	339	e 6 31	+ 3	e 11 44	+ 6	7 45	PPP	13·3
Georgetown		32·0	61	i 6 30	0	—	—	—	—	—
Philadelphia		33·6	60	e 6 37	− 7	i 12 0	− 6	e 7 50	PP	i 13·7
Ottawa		34·2	50	6 47	− 2	12 14	− 2	8 14	PP	16·2
Fordham		34·7	58	i 6 50	− 4	i 12 20	− 4	i 8 15	PP	i 16·5
Williamstown		35·4	55	i 6 58	− 2	i 12 47	+13	i 8 8	PP	i 17·0
Vermont		35·8	53	i 7 9	+ 6	i 12 42	+ 1	e 8 16	PP	i 18·9
Shawinigan Falls		36·5	49	7 14	+ 5	12 56	+ 5	8 38	PPP	18·2
Harvard		36·6	56	i 7 5k	− 5	i 12 49	− 4	i 8 25	PP	e 17·2
Seven Falls		37·9	48	7 16	− 4	13 9	− 4	8 44	PP	19·2
Balboa Heights		38·0	113	e 8 14?	+53	e 13 14?	0	—	—	—
East Machias		39·9	53	e 8 3	+26	e 13 59	+16	e 9 39	PPP	i 16·8
Honolulu		40·2	270	e 7 27	−13	13 58	+10	e 9 22	PP	e 16·4
College		41·7	340	e 7 48	− 4	14 16	+ 6	—	—	e 17·1
Bermuda		42·1	72	e 7 54	− 1	e 14 26	+10	e 9 37	PP	e 17·3
Halifax		42·6	54	8 2	+ 3	14 32	+ 9	17 32	SS	20·2
San Juan		44·8	91	8 18	+ 1	i 14 56	+ 1	e 10 11	PP	i 18·1
Fort de France		50·7	94	e 8 53	−10	e 14 3	?	—	—	—
Ivigtut		53·4	34	9 23	− 1	16 54	− 1	20 8	SS	27·2
Huancayo		55·3	131	e 9 33	− 5	17 15	− 6	e 11 25	PP	23·1
La Paz	Z.	63·3	129	10 34	+ 1	19 9	+ 5	—	—	28·2
Scoresby Sund		63·7	22	10 40	+ 4	19 8	− 2	23 2	SS	—
Apia		70·2	240	—	—	e 20 46	PS	—	—	e 34·4
Aberdeen		76·9	32	e 11 45	−11	i 21 31	−12	i 26 29	SS	31·8
Rathfarnham Caslte		77·0	36	e 14 21	PP	i 21 36	− 9	i 26 16	SS	—
Edinburgh		77·1	33	e 14 20	PP	i 22 2	PS	i 26 44	SS	32·2
Bergen		78·1	25	—	—	e 22 3	+ 7	—	—	e 34·2
Bidston		78·5	36	—	—	i 22 3	+ 2	i 26 54	SS	e 32·5
Durham		78·5	34	e 13 8	+64	i 22 4	+ 3	i 26 58	SS	—
Stonyhurst		78·6	35	e 20 1	?	i 23 6	PPS	i 26 36	SS	e 35·2
Oxford		80·4	36	—	—	i 22 14	− 7	i 27 30	SS	e 32·2
Kew		81·0	36	e 12 26	+ 8	i 22 29	+ 2	i 15 28	PP	e 36·9
Jersey		81·4	37	e 12 17	− 3	e 22 41	+10	e 15 20	PP	e 33·2
La Plata		82·7	136	12 32	+ 5	22 50	+ 6	—	—	34·2
Upsala		83·0	23	e 12 45	+17	e 22 47	0	e 28 29	SS	e 38·2
Heligoland		83·2	29	e 12 33	+ 4	e 22 55	+ 6	—	—	e 36·1
De Bilt		83·3	32	i 12 36k	+ 6	i 22 58	+ 8	—	—	35·2

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Uccle		83·8	34	12 36	+ 4	i 22 53	− 2	i 28 14 SS	34·2
Copenhagen		84·1	27	e 12 38	+ 4	e 23 2	+ 4	e 15 46 PP	34·2
Paris		84·1	36	e 12 36	+ 2	e 23 0	+ 2	— —	32·2
Hamburg		84·5	30	e 12 41	+ 5	e 23 6	+ 4	— —	e 35·7
Rio de Janeiro		85·4	118	e 12 44	+ 4	i 23 14	+ 3	— —	e 36·9
Toledo		85·5	47	e 12 43	+ 2	i 23 19	+ 7	e 15 56 PP	e 34·3
Göttingen		85·9	31	—	—	e 23 27	+11	e 26 30 ?	e 37·2
Nagano		85·9	310	13 2	+19	—	—	— —	—
San Fernando		86·0	50	e 13 4	+21	i 23 29	+12	e 16 12 PP	39·2
Bagnères		86·2	42	e 12 54	+10	e 23 22	+ 3	e 16 14 PP	e 41·2
Pulkovo		86·8	17	e 12 49	+ 2	e 23 22	− 3	e 29 44 SS	e 39·7
Besançon		86·9	36	—	—	e 23 32	+ 6	— —	38·2
Strasbourg		86·9	34	e 12 56	+ 8	i 23 22	− 4	e 16 17 PP	e 35·8
Jena		87·1	31	e 12 44	− 5	e 23 29	+ 1	— —	e 34·2
Granada		87·3	48	e 18 26	PPP	i 24 56	PS	— —	36·1
Basle		87·5	35	e 12 49	− 2	e 24 48	PS	— —	—
Collmberg		87·5	31	e 12 54k	+ 3	e 23 40	+ 9	e 16 20 PP	e 41·1
Neuchatel		87·5	35	e 12 54	+ 3	—	—	— —	—
Stuttgart		87·5	33	e 12 59	+ 8	e 23 26	− 5	e 24 39 PS	e 43·2
Hof		87·6	31	—	—	e 26 49	?	— —	e 35·2
Cheb		88·0	31	e 23 40	S	(e 23 40)	+ 4	e 29 8 SS	e 36·2
Zurich		88·1	35	e 12 56	+ 2	—	—	e 16 30 PP	—
Almeria		88·3	48	e 13 1	+ 6	23 31	− 8	16 22 PP	42·3
Chur		88·9	35	e 12 58	0	—	—	e 16 8 PP	—
Prague		89·0	30	—	—	e 23 52	+ 7	— —	e 36·2
Koti		90·8	309	24 9	S	(24 9)	+ 7	— —	—
Algiers		91·8	45	e 15 14?	?	24 14	+ 3	18 0 PPP	37·2
Triest		91·9	33	e 13 35	+24	e 23 51	[+ 7]	i 25 42 PS	e 41·2
Moscow		92·2	14	e 13 18	+ 5	23 53	[+ 8]	24 27 S	e 45·7
Irkutsk		92·4	337	e 13 4	−10	23 48	[+ 2]	e 16 45 PP	—
Budapest		92·9	29	—	—	e 24 30	+10	e 27 40 ?	37·7
Rome		93·9	36	e 14 9	+48	e 24 29	0	— —	e 40·6
Sverdlovsk		94·4	2	e 13 26	+ 3	24 4	[+ 6]	17 14 PP	48·0
Szeged	E.	94·4	29	e 15 0	?	e 23 49	[− 9]	e 19 16 PPP	e 52·7
Cernauti		95·1	24	e 17 40	PP	24 54	+15	— —	45·2
Belgrade		95·6	30	—	—	e 24 12	[+ 8]	e 26 32 PPS	46·3
Wellington		96·0	225	17 34	PP	25 2	+15	31 34 SSP	44·8
Bucharest		98·4	27	20 14?	PPP	28 14?	PPS	— —	42·2
Christchurch		98·6	224	e 14 35a	+53	25 28	+19	31 50 SS	44·7
Sofia		98·6	30	e 17 8	PP	e 24 26	[+ 6]	— —	41·6
Semipalatinsk		99·9	350	18 2	PP	—	—	— —	—
Istanbul		102·4	27	18 19	PP	25 50	+10	32 56 SS	e 52·2
Grozny		105·7	14	e 17 21	PKP	—	—	i 18 35 PP	e 44·2
Tiflis		107·0	16	e 18 43	PP	e 26 9	−10	e 27 59 PS	e 47·2
Frunse		108·0	352	e 19 4	PP	—	—	— —	—
Riverview		109·2	241	—	—	e 26 57	{+58}	e 34 51 SS	e 50·0
Sydney		109·2	241	—	—	e 25 14	[+ 5]	e 34 50 SS	—
Baku		109·4	13	e 18 52	[+20]	26 50	{+49}	e 29 48 PPS	—
Tashkent		110·0	356	e 18 52	[+19]	25 11	[− 1]	e 21 19 PPP	e 49·5
Andijan		110·4	354	e 19 35	PP	—	—	— —	58·2
Ksara		110·7	26	e 14 47	P	e 29 6	PS	i 19 25 PP	53·7
Hong Kong		111·0	312	—	—	27 7	{+55}	34 49 SS	57·2
Manila		111·5	301	e 18 20	[−16]	29 6	PS	— —	51·2
Helwan		112·8	31	e 18 59	[+20]	25 44	[+21]	19 38 PP	—
Adelaide		119·4	244	—	—	e 24 26	?	e 32 21 ?	e 61·8
Dehra Dun	N.	119·9	348	—	—	e 25 15	[−35]	— —	e 73·6
Agra	E.	123·0	346	e 22 24	PPP	e 26 2	[+ 2]	i 38 4 SSP	58·9
Calcutta	N.	124·4	334	i 23 53	PPP	e 25 23	[−41]	i 30 48 PS	e 63·1
Bombay		131·9	352	e 21 43	PP	i 26 1	[−24]	e 43 13 SSS	61·2
Hyderabad	N.	132·3	344	22 54	SKP	e 35 1	?	— —	58·5
Medan		134·9	311	23 0	SKP	—	—	i 24 19 PPP	e 66·2
Cape Town		139·4	108	23 23	SKP	40 24	SS	25 16 PPP	65·0
Kodaikanal	E.	139·5	343	e 23 30	SKP	—	—	— —	—
Colombo	E.	141·9	337	e 22 48	PP	—	—	— —	63·4
Tananarive		160·4	63	—	—	e 38 9	PPS	44 48 SS	71·7

For Notes see next page.

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NOTES TO MAY 2d. 13h. 14m. 46s.

Additional readings :—
Tucson iP = +1m.5s., i = +1m.18s., +1m.22s., and +1m.41s.
Berkeley ePNZ = +2m.47s.
Salt Lake City i = +3m.38s., iS = +5m.31s.
Denver ePPN = +3m.25s., eE = +3m.38s., eN = +4m.18s., +4m.23s., and +5m.18s., iSSN = +6m.18s., iN = +6m.34s. ; SS is given as S.
Lincoln iS = +7m.50s.
Little Rock iPPP = +5m.11s., i = +7m.35s., iP_cP = +8m.27s., SS = +9m.9s., SSS = +9m.19s.
Victoria i = +7m.52s., SS = +9m.14s.
Florissant iE = +8m.9s., eN = +8m.56s., iE = +11m.20s.
St. Louis iN = +4m.55s., iE = +8m.9s., iN = +8m.52s.
Chicago iS = +9m.55s.
Chicago (Loyola) iP = +5m.32s.
Toronto SS = +13m.2s.
Sitka P = +6m.37s., i = +9m.42s., iS = +11m.48s.
Ottawa e = +9m.56s., SS = +14m.0s., i = +15m.30s.
Fordham iZ = +10m.2s. and +11m.7s., iSSN = +14m.33s.
Williamstown i = +10m.10s., eSS = +15m.8s.
Shawinigan Falls PP = +8m.56s., SS = +15m.14s.
Harvard iZ = +10m.29s., eN = +15m.26s.
Seven Falls SSS = +16m.2s.
East Machias iS = +14m.4s.
Honolulu ePPP = +10m.10s., iS = +14m.1s.
San Juan SS = +17m.26s.
Ivigtut +9m.34s.
Huancayo PPP = +12m.53s., iS = +17m.26s., SS = +20m.33s.
La Paz iPZ = +10m.40s., is?Z = +18m.20s.
Scoresby Sund +22m.18s. and +25m.26s.
Aberdeen iE = +21m.44s., iN = +24m.22s., iSSSN = +29m.34s., iE = +30m.20s.
Rathfarnham Castle iS = +24m.57s.
Edinburgh i = +24m.57s., +25m.13s., and +30m.50s.
Bergen eN = +25m.6s.
Bidston iSKS = +22m.32s., i = +22m.44s. and +25m.10s., e = +30m.38s.
Durham iN = +25m.14s., +30m.9s., and +31m.10s.
Stonyhurst i = +27m.16s.
Oxford i = +25m.33s.
Kew iZ = +13m.19s., iSKSN = +22m.42s., iEN = +25m.38s., iSSEN = +27m.38s., eN = +30m.54s., eSSSE = +31m.12s., eL_q = +32m.52s.
Jersey ePPP = +18m.23s., e = +25m.14s.?, eSS = +28m.54s.
Upsala eN = +24m.9s. and +25m.59s.
Heligoland eE = +12m.52s., eN = +26m.2s.
De Bilt iZ = +13m.33s., i = +26m.5s.
Uccle iZ = +12m.47s., iN = +26m.14s.
Copenhagen i = +12m.48s., eZ = +13m.40s. and +14m.31s., eN = +23m.5s., iE = +23m.11s., e = +24m.14s., eN = +26m.10s., eE = +26m.20s., e = +28m.20s. and +31m.14s.
Paris i = +25m.17s.
Hamburg eEN = +26m.14s.
Toledo i = +26m.28s.
San Fernando ePPN = +16m.20s., SN = +24m.24s., PPSN = +25m.20s.
Bagnères ePPP = +18m.1s., ePS = +24m.13s., eN = +26m.36s., eSSE = +29m.8s., eE = +32m.9s., eSSSE = +32m.39s.
Pulkovo ePPS = +24m.40s., eSSS = +32m.56s.
Besançon i = +26m.44s.
Strasbourg iSZ = +23m.34s., SS = +29m.14s.
Jena ePN = +12m.58s., eSEN = +23m.34s., eN = +26m.40s.
Collmberg i = +13m.16s., ePS = +24m.52s., eSS = +29m.2s.
Stuttgart e = +13m.50s., ePP = +17m.30s., ePPP = +19m.28s., iSKS = +23m.39s., eS = +24m.19s., ePPS = +26m.44s., e = +27m.34s., +28m.45s. and +29m.8s., eSS = +31m.50s., eSSS = +35m.54s., eL_q = +40·2m.
Almeria P_cP = +13m.29s., S = +23m.52s., PS = +24m.22s.
Prague e = +21m.44s. and +26m.58s.
Algiers e? = +23m.14s. ?, SS = +30m.14s. ?
Triest e = +15m.29s., i = +24m.22s. and +27m.30s.
Irkutsk PS = +25m.24s., SS = +30m.38s.
Rome iSN = +24m.33s.
Sverdlovsk iS = +24m.43s., PS = +25m.46s., SS = +31m.14s., L_q = +41m.8s.
Szeged eE = +29m.10s.
Wellington eZ = +18m.44s., S = +25m.44s., e = +27m.42s., i = +28m.54s., L_q = +40m.9s.
Christchurch eE = +24m.54s., iN = +25m.34s., SSSE = +35m.22s., eE = +39m.2s., L_qE = +40m.16s.
Sofia eE = +17m.50s.
Grozny e = +23m.39s.

Continued on next page.

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Tiflis ePP = +18m.52s., ePPPN = +20m.50s., ePPPE = +21m.2s., eZ = +21m.12s. +21m.59s., eSKKSN = +25m.55s., eSE = +26m.38s., eS = +26m.42s., ePSN = +28m.10s., eSSZ = +34m.0s., eE = +36m.42s., eSSSZ = +37m.41s., eSSSE = +38m.2s.
Tashkent PS = +28m.21s., PPS = +29m.31s., eSS = +34m.20s., eSSS = +38m.50s.
Ksara eSS = +35m.28s.
Helwan iZ = +21m.5s. and +21m.44s., PPPZ = +22m.8s., iZ = +22m.49s., SE = +27m.20s., iEZ = +30m.30s., eE = +32m.24s., SSE = +35m.14s., iE = +36m.39s., iE = +37m.26s., SSSE = +39m.14s.
Adelaide e = +34m.43s., +38m.55s., and +42m.22s.
Agra eE = +26m.42s., +32m.36s., +33m.47s., +35m.39s., +42m.4s., and +46m.27s.
Calcutta N. i = +26m.48s., e = +32m.19s., +35m.23s., +42m.4s., and +46m.42s.
Bombay eEN = +23m.0s., iE = +25m.35s., eN = +28m.51s., +32m.5s., and +34m.42s., SSN = +37m.50s., eN = +59m.48s.
Cape Town PSKSE = +32m.23s., SSN = +41m.1s., SSSN = +45m.55s.
Long waves were also recorded at Lille, Laibach, Moncalieri, Marseilles, Perth, and Mera.

May 2d. Repetitions from an origin near the epicentre 39°·9N. 139°·8E. as on 1d., were were recorded at Mizusawa as below.

	h.	m.	s.		h.	m.	s.		h.	m.	s.		h.	m.	s.
ePE	0	51	43	eSE	4	41	31	eSE	10	26	23	eSE	15	29	14
ePE	1	21	51	PE	6	22	0	eSE	11	3	56	iP	15	37	39
eSE	3	47	9	ePE	6	34	7	SE	11	22	31	ePE	15	46	11
ePE	3	51	23	eSE	7	4	20	ePE	12	18	5	ePE	18	53	39
eSE	4	4	47	ePE	7	46	11	ePE	13	19	10	iPE	21	39	22
ePE	4	7	55	eSE	9	21	26	ePE	14	32	14	ePE	22	58	18

May 2d. Readings also at 1h. (Tucson), 2h. (Tashkent, Tchimkent, Almata, Andijan, Samarkand, Frunse, Riverside, Mount Wilson, and Sverdlovsk), 5h. (Triest and Andijan), 6h. (College, Sitka, Tinemaha, Haiwee, Sverdlovsk, Mount Wilson, Riverside, and Tucson), 7h. (Tiflis and Malabar), 9h. (Mizusawa), 10h. (Christchurch, Mount Wilson, Wellington, Riverside, and Tucson), 11h. (Mount Wilson, Riverside, Tucson, and Pasadena), 13h. (Tucson (3)), 14h. (Tucson (4)), 15h. (Tucson (2), Tiflis, Ottawa, and Sverdlovsk), 16h. (Tucson (2)), 17h. (Tucson), 18h. (Tucson (2), Branner, near Lick, Fresno, and Santa Clara), 20h. (Tucson), 21h. (Ferndale), 23h. (Andijan, Frunse, Samarkand, and Mizusawa).

May 3d. 7h. Undetermined shock.

Brisbane iPE = 10m.6s., iSE = 13m.48s.
Adelaide e = 10m.18s., i = 19m.43s. and 21m.31s.
Manila eP = 13m.17s. SEN = 20m.19s., LE = 28·8m.
Riverview eSE = 15m.45s., eLN = 18·7m.
Sydney e = 15m.48s. and 20m.18s.
Christchurch eP = 16m.9s., eS = 21m.25s., L_q = 23m.25s., L = 25·6m.
Wellington e = 18m.0s., eL = 22·0m.
Irkutsk eP = 18m.5s., eS = 27m.11s., eL = 42·0m.
Pasadena ePZ = 18m.44s.
Mount Wilson iPZ = 18m.45s.
Tinemaha iP = 18m.46s.
Riverside iPZ = 18m.47s.
Sitka eP = 19m.8s., eSKS = 28m.42s., eS = 28m.57s., ePS = 29m.53s., eL = 40m.38s.
Perth i = 24m.22s., 26m.30s., and 28m.10s., L = 29·4m.
Ksara ePP = 26m.10s., eSKP = 27m.28s., ePS = 36m.18s., eSS = 43m.15s.
Bombay eEN = 29m.30s.
Tashkent e = 30m.18s., 33m.13s., and 48m.0s.
Sverdlovsk e = 33m.26s., L = 47·5m.
Long waves were also recorded at Honolulu, Baku, and Stuttgart.

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May 3d. 23h. 58m. 2s. Epicentre 31°·5N. 117°·5W. (as on May 1d.).

$A = -\cdot3944$, $B = -\cdot7577$, $C = +\cdot5199$; $\delta = -4$; $h = +1$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		1·4	9	i 0 25	− 2	—	—	—	—	—
Riverside		2·5	2	i 0 42	− 1	i 1 10	− 4	—	—	—
Pasadena		2·7	348	e 0 46	+ 1	i 1 51	+32	—	—	—
Mount Wilson		2·8	350	i 0 47	0	i 1 22	0	—	—	—
Haiwee		4·6	356	i 1 10	− 2	i 2 15	S*	—	—	—
Fresno	N.	5·5	343	e 1 52	P_g	—	—	—	—	—
Tinemaha		5·6	355	i 1 31	+ 4	e 2 49	S*	—	—	—
Tucson		5·7	84	1 28	0	i 2 40	+ 5	1 39	P*	i 3·3
Lick		6·8	331	—	—	e 2 33	−30	—	—	—
Santa Clara	E.	6·9	329	—	—	e 3 53	S_g	—	—	—
Branner		7·1	328	—	—	e 3 10	0	—	—	—
Salt Lake City		10·5	26	e 2 16	−19	—	—	—	—	i 5·9
Denver		13·1	48	—	—	e 1 58	?	—	—	i 7·0
Bozeman		15·0	18	e 4 0	PPP	—	—	—	—	—
Butte		15·0	15	e 3 47	PP	—	—	—	—	—
Lincoln		19·2	55	e 4 38	+10	—	—	—	—	—
Florissant	E.	23·3	65	—	—	e 9 46	+26	—	—	—
Chicago		26·0	58	—	—	e 10 55	SS	—	—	—
Sitka		28·4	341	e 6 39	PP	—	—	—	—	i 18·1
Tashkent		107·3	354	—	—	e 25 33	[+33]	—	—	—

Additional readings :—
Tucson iP = +1m.47s., iP_g = +1m.53s., i = +2m.15s. and +2m.32s., iS = +2m.53s., i = +2m.57s., +3m.6s., +3m.11s., and +3m.17s.
Denver eEN = +2m.7s., eE = +4m.2s., eEN = +5m.58s., eN = +6m.23s., eE = +6m.27s.
Long waves were also recorded at Berkeley, Little Rock, East Machias, Fordham, Stuttgart, Tiflis, Baku, and Philadelphia.

May 3d. Repetitions from an origin near the epicentre 39°·9N. 139°·8E., were recorded at Mizusawa.

	h.	m.	s.		h.	m.	s.		h.	m.	s.		h.	m.	s.
ePE	0	53	48	eSE	12	29	5	eP	16	26	15	eSE	21	5	52
ePN	4	50	51	ePE	14	25	14	eSE	16	28	43	ePE	23	9	45
ePE	5	17	14	ePE	14	53	6	ePE	20	19	14	iPE	23	56	0
ePE	10	31	51	ePE	16	7	8								

May 3d. Readings also at 0h. (Ukiah and Tucson, near Rome), 1h. (near Algiers and Tucson), 2h. (Tucson (2)), 4h. (Tucson), 7h. (Honolulu and Sitka), 8h. (Medan, Manila, and Tucson), 9h. (near Medan), 10h. (Triest, near Sofia, Laibach, near Bucharest, and Ksara), 13h. (Medan, Tucson (3), and near Almeria), 14h. (Tucson), 15h. (Medan) 16h. (Baku, Sverdlovsk, Tashkent, Medan, Ksara, Manila, Pasadena, Tinemaha, Tucson, Irkutsk, Wellington, Tiflis, Colombo, Christchurch, Riverview, Adelaide, Kodaikanal, and Batavia), 18h. (Tucson), 19h. (Tucson (3), La Jolla and Pasadena), 21h. (Tucson), 22h. (Manila), 23h. (near Samarkand and Andijan).

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May 4d. 20h. 44m. 46s. Epicentre 36°·0N. 114°·8W.

Maximum intensity VI felt in Arizona, California, and Nevada.

Epicentre 36°·0N. 114°·8W. (Pasadena).

R. Bodle.
United States Earthquakes, 1939, Washington 1941, p. 9-10, chart p. 63.

$A = -\cdot3401$, $B = -\cdot7361$, $C = +\cdot5852$; $\delta = -3$; $h = 0$;
$D = -\cdot908$, $E = +\cdot419$; $G = -\cdot245$, $H = -\cdot531$, $K = -\cdot811$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		2·6	273	i 0 49	P*	i 1 23	S*	—	—	—
Riverside		2·9	226	i 0 47	− 1	i 1 35	S_g	—	—	—
Tinemaha		3·0	292	i 0 52	+ 2	i 1 41	S_g	—	—	—
Mount Wilson		3·2	238	i 0 52	0	i 1 45	S_g	—	—	—
Pasadena		3·3	238	i 0 53k	0	e 1 46	S_g	—	—	—
La Jolla		3·7	214	i 0 59	− 1	i 1 56	S*	—	—	—
Fresno	N.	4·1	283	e 1 20	P_g	i 2 12	S_g	—	—	—
Tucson		5·0	138	i 1 16a	− 2	i 2 14	− 4	1 35	P_g	i 3·0
Lick		5·7	286	e 1 47	P*	e 3 1	S*	e 3 4	S_g	—
Santa Clara	Z.	5·9	284	—	—	e 3 31	S_g	—	—	—
Berkeley	N.	6·2	288	—	—	e 3 8	S*	—	—	—

Additional readings :—
Tucson i = +1m.26s., +1m.33s., and +1m.56s., iS = +2m.36s., i = +2m.40s.

May 4d. Readings at 0h. (Sverdlovsk, Mizusawa, and Irkutsk), 3h. (Mizusawa, Tucson, and Rome), 4h. (Mizusawa, Rome, Tucson, Wellington, Ksara, New Plymouth, Copenhagen, Collmberg, Tinemaha, Riverside, Mount Wilson, and Paadena), 5h. (Tucson (2) and La Paz), 6h. (Tucson (2), Collmberg, and near Algiers), 7h. (Brisbane and Adelaide), 9h. (Tucson), 11h. (Tucson), 12h. (Moncalieri, Samarkand, and Mizuzawa), 13h. (Fordham), 15h. (Mizusawa), 16h. (Mizusawa), 17h. (near Medan, Pasadena, and Riverside), 18h. (Tucson), 20h. (La Paz), 21h. (Tucson), 22h. (Triest and Tucson).

May 5d. 12h. 13m. 20s. Epicentre 2°·5S. 122°·0E. (as on 1938 Nov. 25d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		17·0	356	e 4 6	+ 5	8 31	L	—	—	(8·5)
Medan	E.	24·1	285	5 8	−10	10 24	PP	—	—	—
Perth		29·9	190	8 5	?	8 50	?	—	—	9·4
Brisbane	E.	38·7	132	—	—	i 12 16	−69	—	—	—
Melbourne		41·0	151	e 11 50	?	i 13 30	−29	—	—	20·2
Riverview		41·4	142	—	—	e 14 10	+ 5	—	—	—
Nagano		41·8	20	7 51	− 2	14 12	+ 1	—	—	—
Mizusawa	E.	45·0	20	(e 8 33)	+14	e 8 33	P	—	—	—
Irkutsk		56·6	348	e 9 26	−21	e 17 47	+ 9	—	—	e 28·7
Almata		60·9	324	e 10 32	+15	—	—	—	—	—
Frunse		62·1	322	e 10 20	− 5	—	—	—	—	—
Andijan		62·4	319	10 2	−25	e 18 55	+ 2	e 14 54	PP	—
Tashkent		64·7	319	e 10 55	+13	i 19 20	− 2	—	—	e 34·7
Baku		78·1	312	e 11 55	− 7	i 21 45	−11	—	—	42·2
Tiflis		82·1	313	11 48	−36	i 22 21	−17	—	—	e 44·7
Mount Wilson	Z.	115·9	54	e 18 19	[−26]	—	—	—	—	—
Pasadena	Z.	115·9	54	e 18 23	[−22]	—	—	—	—	—
Riverside	Z.	116·6	54	e 18 23	[−23]	—	—	—	—	—
Tucson		122·3	53	17 57a	[−60]	—	—	—	—	—

Additional readings :—
Medan iN = +10m.8s., iE = +10m.36s., iN = +10m.40s. and +11m.31s.
Melbourne i = +13m.1s., +16m.20s., and +17m.10s.
Irkutsk e = +25m.40s. ?
Tashkent e = +11m.40s. and +18m.9s.
Tiflis eZ = +12m.14s., eEN = +22m.5s.
Tucson i = +18m.12s., +18m.26s., +18m.31s., +19m.2s., and +19m.17s.

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May 5d. Readings also at 0h. (La Paz and Port au Prince), 1h. (Tucson), 2h. and 3h. (near Mizusawa), 4h. (Moncalieri and near Tiflis), 5h. (Tucson), 6h. (Andijan, near Algiers, and near Mizusawa), 7h. (La Paz and Tucson), 9h. (Tiflis), 10h. (Ksara), 11h. (Tucson), 13h. (Adelaide and La Paz), 14h. (Hukuoka, near Osaka, and near Mizusawa), 16h. (Tucson), 18h. (Baku, Tashkent, and Bombay), 19h. (Tucson), 20h. (Butte Riverside, Tucson, and near Mizusawa), 22h. (near Malabar).

May 6d. 4h. 10m. 3s. Epicentre 46°·1N. 14°·8E.

Intensity VI at Litija and in the vicinity.

Macroseismic area r = 80km. ?

Epicentre Alpes Juliennes, 15km. east of Laibach—46°04′ ± 5′N.; 14°49′ ± 2′E.

J. Mihailovic.
Annuaire microseismique et macroseismique année XIX, 1939, Beograd 1940, pp. 94-96.

A = + ·6728, B = + ·1778, C = + ·7182; δ = + 8; h = − 4;
D = + ·255, E = − ·967; G = + ·694, H = + ·183, K = − ·696.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Laibach		0·2	255	i 0 8	− 2	i 0 12	− 4	—	—	—
Triest		0·9	238	e 0 19	− 1	e 0 30	− 4	—	—	—
Budapest		3·2	64	1 10	P_g	i 1 33	+ 1	1 50	S_g	—
Kecskemet	z.	3·5	74	e 1 41	S	(e 1 41)	+ 1	e 2 32	?	—
Chur		3·7	284	e 1 4	P*	e 2 3	S_g	—	—	—
Szeged		3·7	86	e 1 43	S	(e 1 43)	− 2	e 1 56	S_g	e 3·1
Belgrade		4·2	104	e 1 35a	P_g	e 1 53	− 4	e 2 36	?	—
Cheb		4·3	341	e 1 25	P_g	e 2 21	S_g	—	—	e 2·7
Zurich		4·5	289	e 1 12	+ 1	e 2 26	S_g	—	—	—
Stuttgart		4·6	308	e 1 12	0	i 2 7	0	e 1 33	P_g	e 2·9
Basle		5·1	289	e 1 20	0	e 2 29	+ 9	e 2 50	S_g	—
Jena		5·2	338	e 1 24	+ 3	e 2 22	0	—	—	e 2·6
Collmberg		5·4	346	i 1 22	− 2	i 2 37	+ 9	1 43	S_g	e 2·8
Neuchatel		5·4	281	e 1 25	+ 1	—	—	—	—	—
Strasbourg		5·4	301	1 41	P*	2 36	+ 8	e 1 49	P_g	—
Göttingen		6·3	332	e 1 43	+ 7	—	—	—	—	—
Hamburg	N.	8·1	339	—	—	e 4 27	S_g	—	—	—

Additional readings:—
Budapest PSN = + 1m.44s., iE = + 1m.58s., S_gN = + 2m.2s.
Szeged eP_gE = + 1m.53s., e = + 2m.9s., ePPSE = + 2m.16s., eS = + 2m.29s., ePSS = + 2m.39s., eS_g = + 2m.48s.
Stuttgart eP* = + 1m.15s., eS* = + 2m.34s., iS_g = + 2m.38s.
Jena e = + 2m.27s.
Collmberg iP* = + 1m.26s., i = + 2m.15s.
Strasbourg i = + 2m.51s. and + 2m.58s.
Long waves were also recorded at Rome.

May 6d. 6h. 0m. 9s. Epicentre 5°·4N. 84°·0W.

A = + ·1041, B = − ·9902, C = + ·0935; δ = + 8; h = + 7;
D = − ·995, E = − ·105; G = + ·010, H = − ·093, K = − ·996.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida	z.	16·4	341	e 3 37	− 16	—	—	—	—	—
Port au Prince		17·3	41	i 4 16	PP	i 7 33	SS	4 30	PP	—
Huancayo		19·3	153	e 4 26	− 3	i 8 1	− 1	—	—	i 9·2
Tacubaya	N.	20·3	316	e 4 42	+ 2	i 8 33	+ 10	—	—	—
San Juan		21·7	51	e 4 56	+ 1	i 8 58	+ 7	—	—	i 11·6
Fort de France		24·3	67	i 5 21	+ 1	i 9 45	+ 8	5 53	PP	e 12·3
La Paz		26·8	144	i 5 41a	− 3	i 10 32	+ 13	i 6 47	PPP	13·9
Columbia		28·6	6	e 6 1	+ 1	e 10 47	− 1	e 7 1	PPP	12·6
Little Rock		30·2	346	e 6 11	− 3	i 11 13	0	12 41	SS	—
Bermuda		32·2	33	i 6 31	− 1	e 11 46	+ 1	e 7 35	PP	e 14·9

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cincinnati		33·6	0	i 6 46	+ 2	e 12 6	0	e 8 14	PPP	—
St. Louis		33·6	352	e 6 42	− 2	i 11 55	−11	6 52	pP	—
Florissant		33·8	352	e 6 43	− 3	e 11 57	−13	i 7 36	PP	—
Georgetown		33·9	11	e 6 44	− 3	e 11 51	−20	—	—	—
Philadelphia		35·3	14	i 6 59	0	i 12 29	− 4	e 8 11	PP	i 15·0
Fordham		36·4	15	i 7 9	+ 1	i 12 52	+ 2	i 15 24	SSS	i 17·4
Chicago		36·5	356	e 7 2	− 7	12 45	− 6	e 8 16	PP	e 16·7
Tucson		36·6	321	i 7 8a	− 2	i 12 59	+ 6	i 8 16	PP	i 15·4
Toronto		38·3	7	7 26	+ 2	13 13	− 6	8 47	PP	18·9
Williamstown		38·4	15	i 7 22	− 3	e 13 24	+ 4	i 8 57	PP	—
Harvard		38·6	16	e 7 24	− 2	e 13 17	− 6	e 9 1	PP	e 21·4
Vermont		40·1	13	e 7 43	+ 4	i 13 47	+ 1	i 9 17	PP	16·7
Ottawa		40·5	9	7 39	− 3	13 45	− 7	9 27	PP	18·4
La Jolla		41·3	316	i 7 50	+ 1	e 14 14	+10	—	—	—
East Machias		41·8	19	e 8 23	+30	e 14 41	+30	i 17 39	SS	i 18·0
Riverside		42·0	318	e 7 54	0	e 14 14	0	—	—	—
Shawinigan Falls		42·1	13	7 53	− 2	14 9	− 7	9 43	PP	19·9
Mount Wilson		42·6	318	i 8 0	+ 1	—	—	i 9 45	PP	—
Pasadena		42·7	318	i 8 0	0	i 14 33	+ 9	i 9 45	PP	e 17·7
Halifax		43·0	23	e 10 51?	PPP	e 14 51?	+22	—	—	17·9
Seven Falls		43·1	14	7 56	− 8	14 27	− 3	17 45	SS	21·9
Salt Lake City		43·2	339	e 8 7	+ 3	e 14 40	+ 8	—	—	17·9
Haiwee		43·7	320	e 8 9	+ 1	e 14 39	0	—	—	—
Tinemaha		44·4	320	e 8 16	+ 2	—	—	—	—	—
La Plata		47·0	150	8 34	− 1	15 23	− 3	—	—	19·3
Santa Clara		47·0	319	i 8 33	− 2	i 15 41	+15	—	—	e 23·1
Butte		47·4	335	e 8 37	− 1	i 15 33	+ 1	e 10 11	PP	e 19·3
Berkeley		47·5	318	e 8 26	−12	i 15 35	+ 1	—	—	e 24·2
Rio de Janeiro		48·8	126	e 8 46	− 3	i 15 49	− 3	i 19 14	SS	i 23·2
Ukiah		48·8	320	e 8 54	+ 5	e 15 53	+ 1	e 10 49	PP	e 19·8
Seattle		53·3	329	e 9 34	+11	e 17 16	PPS	e 11 44	PP	e 21·4
Victoria		54·3	329	9 19	−11	17 3	− 4	12 51	PPP	26·9
Ivigtut		61·8	19	—	—	18 33	−13	—	—	—
Sitka		65·3	333	e 10 39	− 7	e 19 18	−11	e 14 59	PPP	e 26·7
Honolulu		73·0	291	e 13 56	PP	e 21 2	+ 2	e 16 1	PPP	e 29·3
College		74·2	338	e 11 40	0	e 21 4	−10	e 14 31	PP	e 30·2
Scoresby Sund		75·8	17	11 51	+ 1	21 29	− 2	—	—	—
San Fernando		77·0	54	—	—	e 21 51	+ 6	e 26 28	SS	—
Toledo		78·8	51	e 12 7	+ 1	i 22 11	+ 7	e 22 55	PS	—
Granada		79·1	53	e 10 33	?	e 20 20	?	—	—	40·6
Almeria		80·0	53	e 12 25	+12	22 30	+13	—	—	40·0
Bidston		80·3	37	—	—	e 22 26	+ 6	i 31 24	SSS	—
Edinburgh		80·4	34	—	—	i 22 20	− 1	i 27 46	SS	37·9
Stonyhurst		80·7	36	—	—	e 22 22	− 2	i 23 12	PS	45·9
Aberdeen		81·1	33	i 13 18	+60	i 22 20	− 8	i 27 56	SS	34·5
Durham		81·2	35	—	—	i 22 31	+ 2	—	—	—
Oxford		81·3	38	—	—	e 22 25	− 5	—	—	e 34·9
Kew		81·9	38	e 12 28	+ 5	e 22 35	− 1	i 23 36	PS	e 37·9
Paris		83·7	42	e 12 57	+25	e 22 52	− 2	23 50	PS	28·9
Uccle		84·8	39	e 12 42	+ 5	i 23 4	− 1	i 24 6	PS	e 39·9
Bergen		85·0	29	—	—	e 22 51?	[−10]	—	—	—
De Bilt		85·3	38	e 12 39	− 1	23 8	− 2	i 15 28	PP	28·9
Neuchatel		86·7	43	e 12 45	− 2	—	—	—	—	—
Strasbourg		87·2	42	i 12 54	+ 5	e 23 28	0	i 24 41	PS	e 36·4
Hamburg		88·1	36	e 12 56	+ 2	e 23 38	+ 1	e 24 49	PS	e 40·9
Stuttgart		88·1	41	e 12 54	0	e 23 27	[+ 6]	e 24 39	PS	e 41·9
Cheb		90·0	40	e 14 2?	+59	e 23 41	[+ 8]	e 29 54	SS	e 43·9
Collmberg		90·2	39	e 13 2	− 2	e 23 39	[+ 5]	e 16 26	PP	e 38·9
Upsala	E.	91·2	30	—	—	e 23 57	− 8	—	—	—
Prague		91·3	39	—	—	e 22 51	[−49]	e 25 21	PS	e 40·9
Rome		91·3	48	13 13	+ 4	i 23 41	[+ 1]	16 50	PP	i 30·3
Triest		91·6	44	e 12 48	−22	23 45	[+ 2]	—	—	—
Budapest		94·8	41	11 51?	?	—	—	—	—	49·9
Belgrade	N.W.	96·4	44	e 19 30	PPP	e 24 11	[+ 2]	26 30	PS	50·1
Pulkovo		97·3	27	17 41	PP	e 26 29	PS	e 20 10	PPP	e 38·6

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		98·9	46	19 27	PPP	e 25 21	+10	e 26 57	PS	—
Cernauti		99·0	39	e 15 51?	?	—	—	—	—	44·8
Wellington		102·0	229	—	—	e 32 51?	SS	—	—	—
Cape Town		103·3	124	—	—	24 49	[+ 7]	27 21	PS	48·9
Christchurch		103·4	227	e 17 31	PP	27 36	PS	i 33 26	SSP	47·3
Helwan		108·9	57	e 18 45	PP	25 7	[0]	i 28 26	PS	—
Ksara		111·2	52	i 19 17	PP	e 28 49	PS	35 3	SS	52·4
Sverdlovsk		111·6	19	18 29	[− 7]	25 19	[+ 1]	19 19	PP	44·9
Tiflis		113·9	40	19 37	PP	e 29 11	PS	e 35 31	SS	e 48·9
Baku		117·8	39	e 20 5	PP	i 30 1	PS	e 36 3	SS	52·9
Melbourne		125·1	227	—	—	e 38 33	SSP	—	—	58·9
Tashkent		127·5	25	e 19 0	[− 7]	e 25 57	[−16]	e 21 6	PP	e 60·9
Frunse		128·2	20	e 19 20	[+11]	—	—	—	—	—
Andijan		129·2	23	e 19 15	[+ 5]	—	—	—	—	73·9
Tananarive		130·9	111	—	—	e 32 23	PS	39 29	SS	e 66·4
Agra	E.	143·3	27	e 20 13	[+37]	42 36	SS	—	—	—
Bombay		146·8	42	e 19 49	[+ 7]	—	—	—	—	—
Hong Kong		147·2	329	19 55	[+12]	32 57	PS	42 18	SS	—
Manila		148·3	310	e 20 9	[+25]	e 42 21?	SS	47 51	L_q	71·9
Hyderabad	E.	151·5	37	e 20 46	PKP_2	—	—	—	—	—
Kodaikanal	E.	155·9	50	e 15 51?	?	—	—	—	—	—
Colombo	E.	159·8	53	19 56	[− 4]	—	—	—	—	79·7
Batavia	E.	169·2	264	i 20 45	[+36]	—	—	i 26 9	PP	—
Medan		170·7	344	20 15	[+ 5]	i 26 57	[−15]	i 38 0	PPS	—

Additional readings :—
Port au Prince PPP = +4m.34s.
Huancayo iP = +4m.30s., iS = +8m.9s.
San Juan i = +5m.2s.
Fort de France PPP = +6m.6s., SSS = +10m.29s.
La Paz iZ = +10m.47s.
Columbia ePPP = +7m.9s., S = +10m.54s.
Little Rock iP = +6m.14s., i = +11m.51s.
St. Louis iN = +8m.5s., isSE = +12m.5s.
Florissant iPZ = +6m.47s., iSE = +12m.5s., iE = +12m.57s.
Georgetown iP = +6m.48s., iS = +12m.4s.
Philadelphia i = +13m.20s.
Fordham iE = +13m.50s., N = +15m.30s.
Chicago eL_q = +14m.45s.
Tucson i = +7m.40s., +7m.58s., and +8m.45s., iPPP = +8m.50s., iP_cP = +9m.15s., i = +10m.37s.
Toronto SSS = +16m.9s.
Williamstown iPPP = +9m.30s.
Harvard eN = +14m.17s. and +16m.21s., eL_qEN = +20m.3s.
Vermont i = +9m.21s., iS = +13m.53s.
Ottawa SSS = +16m.51s.
Mount Wilson iZ = +9m.27s.
Butte ePPP = +11m.31s.
Berkeley iZ = +8m.37s., iE = +15m.41s.
Ukiah ePPP = +11m.53s., eSS = +19m.18s.
Seattle ePPP = +12m.34s., eSS = +20m.22s.
Victoria SSE = +21m.3s., SSSN = +22m.51s.
Sitka S_cS = +20m.38s., eSS = +23m.18s.
College ePPP = +16m.25s., eSS = +25m.58s.
San Fernando e?N = +23m.58s.
Edinburgh i = +31m.6s.
Stonyhurst eSS = +28m.2s., eSSS = +31m.2s.
Aberdeen iE = +31m.18s.
Kew eE = +26m.55s., iSSE = +28m.23s., eSSSE = +31m.25s., eL_qEN = +34m.29s.
Uccle iSSE = +28m.48s., SSSE = +32m.18s.
De Bilt i = +24m.22s.
Strasbourg iSS = +29m.18s., iSSS = +33m.10s.
Hamburg eE = +33m.5s.
Stuttgart iPZ = +12m.58s., eSS = +29m.30s., eSSS = +33m.27s., e = +36m.23s.
Collmberg eZ = +13m.39s., +14m.3s., and +16m.47s., ePPS = +25m.9s., eSS = +30m.9s., eSSS = +33m.39s.
Prague e = +30m.33s.
Rome iZ = +13m.51s., eZ = +15m.51s., PP? = +16m.23s., i = +18m.51s., iN = +24m.20s., iPSE = +25m.3s., iE = +26m.32s. and +26m.57s., iSSN = +29m.36s.
Triest e = +14m.11s. and +24m.31s.
Belgrade SS = +31m.41s.
Pulkovo e = +21m.27s., ePPS = +27m.7s., e = +28m.1s., +31m.39s., and +33m.11s.

Continued on next page.

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Cape Town SKSE = +24m.57s., S_cPP_cSE = +25m.35s., PPS = +28m.49s., SSE = +33m.17s., SSSE = +36m.37s.
Christchurch SZ = +28m.24s., SSSEN = +36m.58s., eL_qN = +42m.8s.
Helwan eEZ = +19m.27s., PKPZ = +22m.16s., iE = +27m.1s., SKSE = +29m.1s., PSE = +33m.31s., PPSE = +34m.33s.
Ksara PPS = +29m.47s.
Sverdlovsk ePS = +28m.17s., SS = +34m.57s., SSS = +38m.33s.
Tiflis PPN = +19m.43s., ePPSNZ = +29m.16s., eEN = +30m.41s., eSSSE = +39m.18s., eSSSN = +39m.30s.
Tashkent ePPS = +32m.51s., eSS = +38m.45s.
Tananarive SSS = +43m.47s.
Medan iE = +35m.38s.
Long waves were also recorded at Irkutsk.

May 6d. 8h. 38m. 6s. Epicentre 36°·5S. 72°·6W. (as on 1939 Jan. 25d.).

A = +·2410, B = −·7689, C = −·5922; $\delta = -1$; $h = 0$;
D = −·954, E = −·299; G = −·177, H = +·565, K = −·806.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata		12·0	87	2 53	− 2	5 6	− 5	—	—	6·4
La Paz		20·3	13	i 4 40k	0	i 8 36	+13	i 8 42	SS	10·3
Fordham		77·0	0	i 11 54	− 2	—	—	—	—	—
Tucson		77·2	329	i 11 57k	0	—	—	—	—	—
Harvard	z.	78·6	2	i 12 4	− 1	—	—	—	—	—
Riverside	z.	81·6	324	i 12 21	0	—	—	—	—	—
Mount Wilson	z.	82·1	324	i 12 25	+ 1	—	—	—	—	—
Pasadena	z.	82·1	324	e 12 24	0	—	—	—	—	—
Haiwee		83·7	326	i 12 32	0	—	—	—	—	—

Additional readings:—
Fordham i = +12m.9s.
Tucson i = +12m.11s., +12m.37s., and +15m.20s.
Harvard iZ = +12m.19s.
Riverside iZ = +12m.35s.
Mount Wilson iZ = +12m.39s.

May 6d. 17h. 0m. 3s. Epicentre 13°·5N. 121°·2E.

Mindoro and S. Luzon. Centre in the Verde Island Passage. Very strong in towns along the north coast of Mindoro and the south coast of Luzon. Intensity V at Batangas, accompanied by loud noise. Intensity IV at Ambulong, Atimonan, Lucena, Boac, Daet, Santa Cruz, and Manila. Felt up to a distance of 200kms.

Epicentre 13°30′N. 121°15′E. (Manila).

W. C. Repetti.
Seismological Bulletin for 1939. Manila Central Observatory, Manila, 1940, p. 19.

A = −·5039, B = +·8320, C = +·2320; $\delta = -4$; $h = +6$;
D = +·855, E = +·518; G = −·120, H = +·198, K = −·973.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila	1·1	349	i 0 20k	− 2	0 36	− 3	—	—	—
Hong Kong	11·0	324	2 37	− 5	4 48	+ 1	(4 59)	SS	5·7
Taihoku	11·5	1	2 42	− 6	—	—	—	—	—
Palau	14·4	114	3 29	+ 2	—	—	—	—	—
Phu-Lien	15·7	300	e 3 38	− 6	e 6 42	+ 3	—	—	—
Yakusima	18·9	25	4 24	0	7 17	−36	—	—	—
Miyazaki	20·6	26	4 44	+ 1	8 30	+ 1	—	—	—
Hukuoka	21·7	21	5 2	+ 7	—	—	—	—	9·0
Matuyama	22·8	25	5 6	+ 1	9 20	+ 9	—	—	—
Batavia	24·2	216	5 25	+ 6	9 42	+ 7	—	—	i 12·3

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		24·3	250	5 27	+ 7	i 9 59	+22	—	—	i 12·3
Zinsen		24·4	9	5 20	− 1	9 45	+ 6	—	—	—
Kobe		24·6	28	5 24	+ 1	10 2	+20	—	—	—
Osaka		24·7	28	5 24	0	—	—	—	—	—
Nagoya		25·8	31	5 37	+ 3	—	—	—	—	—
Sendai		30·2	31	6 10	− 4	—	—	—	—	—
Akita		31·0	29	6 23	+ 2	—	—	—	—	—
Mizusawa	E.	31·0	30	(e 6 25)	+ 4	e 6 25	P	—	—	—
Calcutta	N.	32·5	291	e 5 17	−77	i 11 46	− 3	—	—	i 15·4
Irkutsk		41·0	343	7 46	0	e 13 30	−29	—	—	20·0
Colombo	E.	41·2	264	e 7 57?	+ 9	—	—	—	—	—
Hyderabad		41·3	281	e 7 54	+ 5	14 3	− 1	—	—	19·9
Agra	E.	42·5	296	7 56	− 3	14 18	− 4	8 16	pP	—
Kodaikanal	E.	42·9	272	e 8 57?	+55	—	—	—	—	—
Bombay		46·7	284	e 8 23	− 9	i 15 14	− 8	i 8 50	pP	—
Almata		48·1	317	e 8 20	−23	—	—	—	—	—
Frunse		49·6	315	9 7	+12	—	—	—	—	29·9
Andijan		50·4	312	e 9 6	+ 5	16 30	+16	—	—	—
Brisbane		51·1	143	—	—	—	—	i 20 21	SS	—
Tashkent		52·8	312	i 9 16	− 3	e 16 34	−13	—	—	e 29·4
Samarkand		54·1	309	e 9 33	+ 4	17 3	− 2	—	—	—
Riverview	N.	55·0	149	—	—	e 18 27	+70	—	—	—
Sydney		55·1	149	—	—	e 16 47	−31	e 23 33	SSS	—
Melbourne		55·7	157	—	—	e 17 57	+31	i 23 59	SSS	28·4
Sverdlovsk		62·8	328	i 10 27	− 3	e 19 55	+57	—	—	30·4
Baku		67·2	309	e 10 58	0	e 19 58	+ 6	e 20 36	PS	34·9
Grozny		70·3	312	e 10 59	−18	—	—	—	—	37·9
Tiflis		71·0	310	e 11 20	− 2	e 20 47	+10	e 14 18	PP	e 36·9
Moscow		75·4	325	e 11 49	+ 2	21 20	− 7	e 14 37	PP	e 44·4
Honolulu		76·9	70	e 11 58	+ 2	e 22 5	+22	e 14 51	PP	e 32·1
Ksara		78·8	301	e 12 6	0	e 22 13	+ 9	e 15 13	PP	—
Pulkovo		78·9	330	—	—	e 21 57	− 8	—	—	e 40·0
Helwan		83·2	299	12 30	+ 1	e 22 57	+ 8	e 24 39	PPS	—
Collmberg		90·6	325	e 13 4	− 1	—	—	e 15 36	PP	e 47·9
Cheb		91·4	323	e 15 57?	PP	—	—	—	—	e 47·9
Hamburg		91·4	326	—	—	e 25 57?	PPS	—	—	e 47·9
Rome		94·5	315	e 19 45	PPP	e 30 57	SS	—	—	e 40·8
Strasbourg		94·8	322	—	—	e 26 3	PS	e 30 27	SS	—
Uccle		95·7	325	—	—	e 24 57?	+13	e 31 15	SS	e 48·9
Berkeley		101·7	45	—	—	e 30 15	?	—	—	—
Tucson		112·6	46	e 14 46	P	27 6	{+43}	19 21	PP	e 51·4
St. Louis	N.	120·4	28	—	—	e 37 1	?	—	—	e 58·3
Philadelphia		124·3	14	—	—	e 36 26	SS	—	—	e 57·1
Huancayo		163·8	84	e 20 29	[+25]	e 45 26	SS	e 25 12	PP	e 68·9

Additional readings :—
Calcutta eN = +14m.31s.
Agra sSE = +15m.2s., S_eS?E = +17m.27s.
Bombay iEN = +19m.56s.
Sverdlovsk e = +24m.11s.
Baku e = +27m.18s.
Tiflis ePEZ = +11m.26s., SN = +20m.55s., SSE = +25m.16s., SSN = +25m.40s.
Honolulu esP = +12m.41s., esPP = +15m.55s., ePPP = +17m.7s., eSS = +27m.4s., eSSS = +29m.46s.
Ksara eSS = +27m.29s.
Helwan eE = +26m.27s.
Collmberg e = +13m.31s.
Tucson PKP = +18m.19s., iPP = +19m.27s., ipPP = +20m.1s., sPP = +20m.10s. PPP = +22m.29s., iS = +27m.13s., PS = +29m.13s.
Long waves were also recorded at Prague, Belgrade, Christchurch, Cape Town, Upsala, De Bilt, Bergen, Paris, Kew, Aberdeen, Stonyhurst, Edinburgh, Bidston, Toledo, San Fernando, Harvard, East Machias, Clermont Ferrand, Jersey, and Rathfarnham Castle.

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May 6d. 20h. 4m. 22s. Epicentre 10°·0S. 161°·1E.

$A = -\cdot 9319$, $B = +\cdot 3191$, $C = -\cdot 1725$; $\delta = +2$; $h = +7$;
$D = +\cdot 324$, $E = +\cdot 946$; $G = +\cdot 163$, $H = -\cdot 056$, $K = -\cdot 985$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	19·0	202	i 4 20	− 6	i 7 56	+ 1	—	—	—
Riverview		25·4	199	e 5 31	0	i 9 56	0	—	—	e 13·0
Sydney		25·4	199	—	—	e 10 2	+ 6	—	—	e 13·3
Melbourne		31·3	204	—	—	i 11 27	− 4	i 13 33	SSS	i 15·5
Adelaide		32·2	215	—	—	e 11 34	−11	i 13 28	SS	18·5
Wellington		33·4	162	e 6 42	0	12 1	− 2	8 15	PPP	16·5
Christchurch		34·9	165	6 55a	0	i 12 31	+ 4	15 12	L_q	17·7
Manila		46·7	301	e 8 27	− 5	15 5	−17	—	—	22·1
Honolulu		50·9	51	e 9 4	− 1	e 16 27	+ 6	e 11 2	PP	e 20·4
Batavia		53·8	270	e 10 11	+45	i 16 38	−23	—	—	—
Hong Kong		56·1	305	—	—	17 17	−15	—	—	—
Medan		63·6	279	i 11 15	+40	i 21 2	?	—	—	—
Calcutta	N.	78·2	296	—	—	i 21 47	−10	—	—	—
Irkutsk		78·7	329	e 12 4	− 2	21 53	−10	—	—	36·6
Colombo	E.	82·6	279	e 12 26	0	22 30	−13	—	—	—
Sitka		84·5	29	—	—	23 6	+ 4	e 28 18	SS	e 35·0
Ukiah		85·4	49	—	—	e 23 15	+ 4	e 28 43	SS	e 34·7
Kodaikanal	E.	85·6	281	e 12 38	− 3	—	—	—	—	—
Berkeley		85·7	50	—	—	e 23 14	0	—	—	e 42·9
Santa Clara	E.	85·8	50	i 13 28	+46	e 23 28	+13	—	—	e 39·1
Santa Barbara	Z.	86·8	54	e 12 50	+ 3	—	—	—	—	—
Agra	E.	87·4	298	12 51	+ 1	23 10	[− 7]	16 17	PP	—
Pasadena		88·0	54	i 12 55k	+ 2	e 23 31	− 5	—	—	e 40·3
Victoria		88·0	40	—	—	e 23 20	[0]	e 29 56	SS	40·6
La Jolla		88·4	56	i 12 57	+ 2	—	—	—	—	—
Haiwee		88·6	52	e 12 58	+ 2	—	—	—	—	—
Riverside		88·6	54	i 12 58k	+ 2	—	—	—	—	—
Tinemaha		88·6	51	i 12 59	+ 3	—	—	—	—	—
Bombay		91·6	289	e 13 11	+ 1	e 23 28	[−15]	i 17 8	PP	—
Tucson		93·6	57	13 21	+ 2	23 56	[+ 2]	17 5	PP	43·0
Tashkent		97·9	311	e 14 41	+62	24 5	[−11]	26 17	PS	45·6
Sverdlovsk		104·0	327	—	—	e 25 41	−13	e 32 56	SS	43·1
Florissant		110·6	52	e 19 14	PP	e 28 50	PS	e 29 54	PPS	52·4
St. Louis	E.	110·7	52	—	—	28 44	PS	e 34 46	SS	e 51·8
Chicago		112·4	48	—	—	e 25 45	[+23]	e 38 40	SSS	e 44·2
Baku		112·5	310	e 19 25	PP	e 28 56	PS	e 35 41	SS	55·6
Tiflis		116·2	312	19 49	PP	29 31	PS	e 35 45	SS	56·6
Huancayo		119·8	110	—	—	e 30 3	PS	—	—	e 49·0
Philadelphia		122·9	49	—	—	e 30 26	PS	—	—	e 56·3
Helwan		129·3	301	e 21 14	PP	e 31 14	PS	24 28	PPP	—
Collmberg	Z.	131·3	335	e 19 8	[− 6]	—	—	e 21 49	PP	—
Cheb		132·4	333	e 22 38?	?	—	—	—	—	e 62·6

Additional readings :—
Wellington $P_cP = +9$m.28s., $S_cP = +12$m.45s., $L_q = +14$m.36s., $S_cS = +17$m.4s.
Adelaide i = +17m.8s.
Honolulu ePPP = +12m.35s.
Medan iN = +17m.5s. and +21m.14s.
Agra iE = +23m.31s. and +24m.32s.
Pasadena iE = +23m.45s.
Tucson iP = +13m.32s., iPP = +17m.14s., PPP = +18m.44s., S = +24m.8s., PS = +24m.40s.
Tashkent e = +16m.54s., e = +23m.57s., i = +24m.51s., e = +35m.45s.
Florissant ePSZ = +28m.54s., eZ = +39m.24s.
Chicago eS = +26m.18s.
Baku e = +39m.38s.
Tiflis ePPN = +19m.59s., PPPE = +22m.9s., eSSN = +35m.25s.
Helwan eE = +23m.20s.
Collmberg eZ = +22m.30s.
Long waves were also recorded at De Bilt, Uccle, Cape Town, Pulkovo, Harvard, Williamstown, Moscow, Strasbourg, Tananarive, Arapuni, East Machias, San Fernando, and Paris.

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May 6d. Readings also at 3h. (Mizusawa, Osaka, and Andijan), 4h. (Tiflis, Tashkent, and Baku), 5h. (Andijan), 7h. (Mizusawa (2)), 9h. (near Tananarive), 10h. (Hukuoka, Osaka, and Mizusawa), 11h. (Agra, Irkutsk, Sverdlovsk, Strasbourg, Tiflis, Stuttgart, Baku, and Tashkent), 12h. (Mizusawa and Agra), 13h. (Mizusawa), 14h. (Tucson), 17h. (Samarkand, near Manila), 18h. (Mizusawa, near Manila, and near La Paz), 19h. (Tucson and Triest), 23h. (Frunse, Samarkand, and Andijan).

May 7d. 0h. 31m. 45s. Epicentre 3°·7N. 128°·5E. (as on 1938 May 22d.).

$A = -\cdot6212$, $B = +\cdot7810$, $C = +\cdot0641$; $\delta = -4$; $h = +7$;
$D = +\cdot782$, $E = +\cdot623$; $G = -\cdot040$, $H = +\cdot050$, $K = -\cdot998$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		13·1	326	e 2 44	−26	7 9	L	—	—	9·9
Hong Kong		23·1	324	5 7	− 1	9 20	+ 4	5 17	PP	—
Medan		29·8	272	i 8 39	?	i 11 13	+ 6	—	—	—
Agra	E.	53·5	301	i 9 22a	− 2	17 0	+ 3	9 32	pP	—
Bombay		56·4	291	e 9 44	− 1	i 17 32	− 4	—	—	—
Frunse		61·6	318	e 10 24	+ 2	—	—	—	—	—
Andijan		62·3	315	e 10 27	+ 1	19 3	+11	—	—	—
Tashkent		64·7	315	i 10 39	− 3	e 19 22	0	—	—	e 32·6
Samarkand		65·9	312	10 54	+ 4	19 36	− 1	—	—	—
Sverdlovsk		74·9	329	i 11 43	− 1	21 17	− 5	—	—	34·7
Baku		78·9	311	e 12 8	+ 1	e 22 14	+ 9	—	—	42·2
Grozny		82·2	313	e 11 5	?	—	—	—	—	—
Tiflis		82·9	311	e 12 28	0	e 22 55	+ 9	e 15 48	PP	e 42·2

Additional readings :—
Hong Kong SS = +10m.33s.
Bombay eEN = +7m.2s.
Long waves were also recorded at Cheb.

May 7d. 7h. 10m. 42s. Epicentre 30°·4N. 141°·8E. (as on 1937 August 21d.).

$A = -\cdot6790$, $B = +\cdot5343$, $C = +\cdot5035$; $\delta = +3$; $h = +2$;
$D = +\cdot618$, $E = +\cdot786$; $G = -\cdot396$, $H = +\cdot311$, $K = -\cdot864$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Mizusawa		8·7	357	e 2 16	+ 6	e 3 57	+ 7	—
Manila		24·8	235	e 5 30	+ 5	11 0	SSS	—
Irkutsk		35·1	320	e 6 59	+ 2	e 12 46	+16	19·3
Tashkent		58·2	303	9 59	+ 1	e 16 0	?	e 32·8
Sverdlovsk		60·4	322	i 10 14	+ 1	18 32	+ 4	30·3
Baku		72·4	307	e 11 32	+ 2	e 20 59	+ 6	e 39·8
Tiflis		75·2	310	e 11 49	+ 3	e 21 31	+ 6	e 42·3
Tinemaha		79·4	54	e 12 9	0	—	—	—
Haiwee		80·1	54	e 12 12	− 1	—	—	—
Mount Wilson	z.	81·0	56	e 12 14	− 4	—	—	—
Pasadena	z.	81·0	56	e 12 14	− 4	—	—	—
Riverside	z.	81·6	56	e 12 17	− 4	—	—	—
Tucson		87·2	55	i 12 47	− 2	23 30	+ 2	—

Additional readings :—
Tucson i = +13m.11s., e = +22m.4s., i = +22m.9s., +22m.13s., +22m.27s., +23m.36s. and +23m.40s.
Long waves were also recorded at Agra and Sitka.

May 7d. Readings also at 2h. (Riverside, Pasadena, Mount Wilson, Haiwee, Tinemaha, Tucson, Frunse, Andijan, and Samarkand), 5h. (Samarkand, Andijan, Frunse, Tashkent, and Sverdlovsk), 6h. (near Manila and Tucson), 7h. (near Taihoku), 10h. (Sitka), 11h. (Almata and Zi-ka-wei), 12h. (near Tucson), 14h. (Mizusawa), 16h. (Bombay, Agra, Baku, Sverdlovsk, and Tashkent), 17h. (Zi-ka-wei), 18h. (Sverdlovsk and near Tashkent, Almata, Frunse, Andijan, and near Samarkand), 19h. (Balboa Heights and Tucson), 20h. (Zi-ka-wei and Perth), 21h. (Balboa Heights), 22h. (Tucson).

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May 8d. 1h. 46m. 48s. Epicentre 37°·0N. 23°·9W.

Felt intensity V-VI on the Island of Santa Maria; IV-V on the Isle of San Miguel and Terceira; III-IV at Faial.

Epicentre 37°·0N. 23°·9W. (Strasbourg).

Almeria, Boletin de las Observaciones Sismicas, Enero-Junio, 1939.

$A = +\cdot7320$, $B = -\cdot3244$, $C = +\cdot5992$; $\delta = +10$; $h = -1$;
$D = -\cdot405$, $E = -\cdot914$; $G = +\cdot548$, $H = -\cdot243$, $K = -\cdot801$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Angra do Heroismo		3·1	302	i 0 47	− 4	i 1 16	−13	—	—	—
Lisbon	E.	11·8	77	2 47	− 6	4 57	− 9	3 0	pP	6·3
	N.	11·8	77	2 52	− 1	4 58	− 8	3 3	pP	—
San Fernando		14·2	87	i 3 31	+ 7	i 6 25	SS	—	—	—
Toledo		15·8	73	e 3 44	− 1	i 6 54	+12	i 3 57	PP	e 7·7
Granada		16·2	83	i 4 2k	PP	i 7 18	SS	4 19	PPP	9·2
Almeria		17·1	84	i 4 2	0	7 27	+15	4 15	PP	9·2
Bagnères		19·4	64	e 4 31	+ 1	e 8 5	+ 1	e 4 37	pP	i 10·0
Jersey		20·0	44	i 4 38	+ 1	i 8 22	+ 5	i 4 56	PP	e 10·3
Rathfarnham Castle		20·4	31	i 4 40	− 1	i 9 27	SSS	—	—	—
Algiers		21·5	83	i 4 57	+ 5	i 8 58	+11	5 2	pP	i 10·6
Oxford		21·8	40	i 4 59	+ 3	i 8 57	+ 5	—	—	—
Bidston		21·9	35	i 4 58	+ 1	i 8 59	+ 5	—	—	—
Clermont Ferrand		22·0	59	i 5 3	+ 5	i 9 15	+19	—	—	—
Kew		22·1	42	i 5 1a	+ 2	i 9 2	+ 4	i 10 46	SSS	11·3
Stonyhurst		22·4	35	i 5 7	+ 5	i 9 14	+10	—	—	—
Paris		22·5	51	i 5 7	+ 5	i 9 15	+10	5 15	pP	11·2
Marseilles		23·2	66	4 57	−12	i 9 12	− 6	e 5 10	pP	i 11·1
Durham		23·4	34	i 5 16	+ 5	i 9 30	+ 9	i 5 37	PP	—
Edinburgh		23·5	31	i 5 14	+ 2	i 9 35	+12	i 9 51	SS	—
Lille		23·6	47	e 5 19	+ 6	e 9 37	+12	e 5 36	pP	13·2
Grenoble		23·7	60	e 5 14	0	9 34	+ 7	i 5 17	pP	e 14·7
Besançon		24·3	56	e 5 29	+ 9	i 9 38	+ 1	—	—	—
Uccle		24·4	45	e 5 23a	+ 2	i 9 46	+ 7	—	—	11·7
Aberdeen		24·8	29	i 5 26	+ 1	i 9 49	+ 3	i 6 0	PP	11·8
Neuchatel		24·9	56	e 5 31	+ 5	e 9 59	+12	—	—	—
Moncalieri		25·0	61	i 5 50	+23	8 52	−57	—	—	—
Basle		25·4	55	e 5 34	+ 3	e 9 58	+ 2	e 11 26	SSS	—
De Bilt		25·4	44	i 5 33a	+ 2	i 9 57	+ 1	—	—	—
Chur		25·7	57	e 5 44	+11	e 10 23	+22	—	—	—
Strasbourg		25·8	53	e 5 37	+ 3	e 10 9	+ 7	—	—	—
Zurich		26·0	56	e 5 41a	+ 5	e 10 15	+ 9	—	—	—
Stuttgart		26·7	54	e 5 43	0	i 10 23	+ 6	i 6 9	PP	e 12·3
Heligoland		27·8	41	e 5 57	+ 4	i 10 42	+ 7	e 11 36	SS	e 14·2
Göttingen		28·0	48	e 5 59	+ 4	e 10 29	− 9	—	—	e 14·2
Rome		28·4	69	i 6 0a	+ 2	i 10 54	+ 9	i 6 10	pP	i 14·6
Ivigtut		28·6	336	5 57	− 3	10 47	− 1	—	—	12·2
Hamburg		28·7	43	e 6 2	+ 1	i 10 49	− 1	e 6 47	PP	e 14·3
Hof	N.E.	28·8	52	e 5 44	−18	e 10 59	+ 8	—	—	e 12·2
	N.W.	28·8	52	e 6 4	+ 2	e 10 54	+ 3	—	—	e 12·7
Jena		28·8	51	e 6 4	+ 2	i 10 53	+ 2	e 6 49	PP	e 12·7
Cheb		29·1	52	e 6 5	+ 1	i 11 0	+ 4	—	—	e 14·2
Triest		29·3	61	e 6 11	+ 5	11 3	+ 4	6 50	PP	—
Collmberg		29·7	51	e 6 11	+ 1	i 11 12	+ 6	i 7 9	PPP	e 15·2
Bergen		29·9	29	i 6 15	+ 3	e 11 9	0	—	—	e 14·2
Laibach	N.E.	29·9	60	e 6 17	+ 5	i 11 17	+ 8	—	—	i 14·9
Prague		30·4	52	6 20a	+ 4	11 21	+ 5	—	—	e 13·2
Copenhagen		30·8	41	e 6 21	+ 1	i 11 26	+ 3	e 7 16	PP	—
Halifax		30·8	298	6 21	+ 1	11 24	+ 1	7 18	PP	14·2
Budapest		33·1	58	6 43	+ 3	12 3	+ 4	i 8 0	PP	i 16·8

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
East Machias		33·4	297	7 11	+29	e 11 54	− 9	—	—	i 13·6
Kecskemet	Z.	33·5	59	e 6 50	+ 7	e 12 8	+ 3	e 7 42	PP	e 20·2
Scoresby Sund		33·6	2	i 6 47	+ 3	12 11	+ 5	7 55	PP	—
Bermuda		33·8	275	i 6 45	− 1	e 12 30	+20	e 7 58	PP	e 14·1
Szeged	N.	33·8	59	e 6 50	+ 4	i 12 18	+ 8	e 7 55	PP	e 15·7
Belgrade		34·1	63	e 6 44a	− 4	i 12 16	+ 2	i 8 7	PP	18·6
Upsala		34·9	36	i 6 58	+ 3	e 12 27	0	e 8 5	PP	e 16·2
Seven Falls		35·8	303	6 54	− 9	12 37	− 4	—	—	17·2
Sofia		36·3	66	e 7 11	+ 4	i 12 57	+ 9	i 8 40	PP	—
Harvard		36·7	295	i 7 6k	− 4	i 12 51	− 3	—	—	e 21·2
Shawinigan Falls		37·1	302	7 12	− 2	13 0	− 1	15 24	SS	17·2
Vermont		37·6	299	e 7 19k	+ 1	i 13 4	− 4	e 8 33	PP	e 15·4
Williamstown		37·8	295	i 7 17	− 3	i 13 15	+ 4	i 8 29	PP	i 17·9
Bucharest		38·1	63	e 7 28k	+ 6	i 13 22	+ 6	8 42	PP	19·2
Fordham		38·6	292	i 7 22	− 4	i 13 23	0	i 9 39	PPP	i 20·2
Ottawa		39·3	300	7 29	− 3	i 13 36	+ 2	9 6	PP	18·2
Fort de France		39·8	246	e 7 36	0	i 13 43	+ 1	9 16	PP	—
Philadelphia		39·8	291	i 7 32k	− 4	i 13 28	−14	e 8 54	PP	i 16·4
Istanbul		40·8	67	8 1	+16	16 12?	SS	—	—	—
Pulkovo		41·1	39	i 7 50	+ 3	i 14 6	+ 5	—	—	e 18·8
San Juan		41·3	256	e 7 51	+ 2	i 14 5	+ 1	13 32	PcS	i 17·3
Georgetown		41·5	290	e 7 39	−11	i 14 5	− 2	i 9 23	PP	—
Toronto		42·1	298	7 58	+ 3	14 14	− 2	9 36	PP	20·2
Moscow		44·7	46	8 18	+ 2	15 2	+ 8	—	—	24·7
Columbia		46·0	285	e 8 28	+ 1	e 15 16	+ 4	e 18 28	SS	e 22·8
Helwan		46·4	82	i 8 30a	0	15 18	0	10 9	PP	—
Cincinnati		47·0	293	i 8 31	− 4	i 15 21	− 5	10 8	PP	i 21·3
Ksara		48·1	76	10 49	PP	15 52	+10	16 30	PS	—
Chicago		48·5	298	e 8 45	− 1	15 43	− 5	e 9 58	PcP	—
Chicago (Loyola)		48·5	298	i 8 45	− 1	e 15 42	− 6	i 19 16	SS	—
Florissant		51·4	294	i 9 7	− 2	i 16 26	− 2	e 9 22	pP	—
St. Louis		51·4	294	i 9 6	− 3	e 16 17	−11	i 9 21	pP	—
Tiflis		52·0	62	9 15	+ 2	i 16 43	+ 7	i 9 33	pP	e 25·2
Grozny		52·2	60	9 1	−14	16 28	−11	—	—	—
Erevan		52·3	65	e 9 20	+ 5	—	—	—	—	—
Little Rock		54·4	290	i 9 25	− 6	16 57	−12	i 9 37	pP	24·2
Lincoln		55·3	299	e 9 34	− 4	i 17 17	− 4	11 40	PP	e 22·7
Baku		56·1	62	e 9 46	+ 3	i 17 41	+ 9	—	—	28·2
Sverdlovsk		57·2	40	i 9 50	− 1	17 46	0	26 54	Lq	30·0
Balboa Heights		57·4	252	e 9 49	− 4	(17 42)	− 7	—	—	17·7
Saskatoon		57·7	315	9 55	0	17 44	− 9	12 0	PP	28·2
Denver		61·5	300	i 10 16	− 5	e 18 36	− 6	i 10 30	pP	—
Rio de Janeiro		62·3	200	i 10 14	−12	i 18 30	−22	i 22 32	SS	i 29·2
Bozeman		62·9	309	e 10 28	− 2	e 18 36	−24	e 14 40	PPP	e 26·0
Butte		63·7	310	e 10 32	− 4	19 20	+10	23 24	SS	e 26·3
Salt Lake City		65·7	305	i 10 50	+ 2	e 19 22	−12	26 12	SSS	e 30·3
Tacubaya	N.	67·1	278	i 10 55	− 2	e 19 55	+ 4	—	—	—
La Paz		67·6	227	i 10 59k	− 2	i 19 56	− 1	i 13 24	PP	31·5
Samarkand		68·2	57	11 3	− 1	16 18	?	—	—	—
Huancayo		68·7	236	e 11 7	0	i 19 49	−21	13 42	PP	27·6
Seattle		68·8	315	e 12 8	+60	20 2	− 9	27 48	SSS	29·4
Tashkent		68·9	54	i 11 8	− 1	i 20 12	− 1	—	—	32·7
Victoria		68·9	316	10 58	−11	20 15	+ 2	13 42	PP	31·2
Tucson		69·2	296	i 11 9	− 1	20 0	−16	i 13 45	PP	i 28·4
College		69·5	339	e 11 10	− 2	e 20 19	− 1	e 15 51	PPP	e 29·9
Sitka		70·0	328	11 16k	+ 1	i 20 17	− 9	20 33	PS	i 28·3
Semipalatinsk		70·4	41	i 11 20	+ 2	—	—	—	—	—
Andijan		71·1	53	e 11 16	− 6	i 20 49	+11	—	—	—
Frunse		71·4	51	11 28	+ 4	—	—	—	—	35·9
Tinemaha		71·9	303	i 11 26	− 1	—	—	e 39 12	P'P'	—
Haiwee		72·2	303	e 11 27	− 2	e 20 51	0	—	—	—
Almata		72·6	48	11 36	+ 5	—	—	—	—	—
Riverside		72·9	301	i 11 30	− 3	—	—	e 39 17	P'P'	—
Fresno	N.	73·1	304	e 11 33	− 1	—	—	—	—	e 34·6
Mount Wilson		73·3	301	i 11 32k	− 3	—	—	e 39 14	P'P'	e 38·9

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena		73·4	301	i 11 34k	− 2	e 21 2	− 3	e 39 14	P′P′	e 31·1
La Jolla		73·5	299	e 11 35	− 1	e 21 6	0	—	—	—
Ferndale		73·8	309	e 12 12	+34	e 21 12	+ 3	—	—	e 37·2
Lick		74·0	306	e 11 40	+ 1	—	—	—	—	e 36·7
Ukiah		74·0	308	e 11 39	0	21 9	− 2	25 51	SS	e 31·3
Berkeley		74·1	306	e 11 39	− 1	—	—	—	—	—
Santa Clara		74·1	306	e 11 51	+11	i 21 28	+16	—	—	e 35·6
Branner		74·3	306	e 11 42	+ 1	—	—	—	—	—
Santa Barbara		74·3	302	e 11 40	− 1	—	—	—	—	—
La Plata		78·2	209	12 2	− 1	21 48	− 9	27 12?	SS	32·5
Johannesburg		79·6	134	i 12 16	+ 6	e 22 19	+ 7	e 15 5	PP	43·2
Irkutsk		80·3	30	12 15	+ 1	22 20	0	—	—	38·2
Cape Town		80·9	146	i 12 20	+ 3	i 22 35	+ 9	15 23	PP	40·2
Dehra Dun	N.	80·9	59	e 12 23	+ 6	e 22 43	+17	e 27 45	SS	e 41·7
Agra	E.	82·8	62	12 28	+ 1	i 22 46	+ 1	12 40	pP	—
Bombay		84·0	71	i 12 36	+ 2	i 23 2	+ 5	15 5	PP	42·0
Tananarive		87·2	116	e 12 54	+ 5	23 17	[+ 2]	17 46	PPP	e 44·7
Hyderabad		89·1	69	12 59	+ 1	23 31	[+ 4]	16 37	PP	44·0
Kodaikanal	E.	92·9	75	i 13 15k	− 1	i 23 57	[+ 7]	i 16 52	PP	—
Calcutta	N.	93·0	59	e 13 3	−14	e 23 17	[−33]	e 13 25	pP	—
Colombo	E.	96·8	76	13 38	+ 4	24 19	[+ 8]	17 36	PP	58·6
Phu-Lien		106·0	47	e 18 41	PP	e 27 59	PS	—	—	—
Honolulu		107·6	316	e 14 31	P	e 26 28	S	e 18 49	PP	e 44·3
Hong Kong		109·0	41	17 20	?	28 30	PS	19 4	PP	—
Medan		113·2	66	18 20	[−19]	i 26 3	{−24}	—	—	e 73·2
Manila		119·0	39	e 15 27	P	29 57	PS	19 57	PP	56·6
Batavia		125·7	67	18 52	[−12]	—	—	i 21 3	PP	—
Arapuni		164·5	260	—	—	35 36	?	45 12	SS	e 68·2
Wellington		164·9	248	20 10	[+ 4]	27 11	[+ 3]	24 52	PP	78·2
Christchurch		165·8	237	i 20 11k	[+ 5]	i 32 2	{+20}	i 24 55	PP	79·8
Brisbane		170·2	16	i 20 24	[+15]	—	—	i 25 24	PP	—
Melbourne		171·1	99	e 20 12?	[+ 2]	i 32 12	{+ 4}	i 25 29	PP	57·2
Riverview		174·9	53	e 20 4	[− 7]	i 32 39	{+12}	e 25 41	PP	e 74·7
Sydney		174·9	53	e 21 13	[+62]	—	—	e 25 30	PP	—

Additional readings :—
Lisbon pPN = +2m.56s., ?EN = +3m.37s.
Toledo i = +3m.47s. and +5m.16s., iSS = +7m.16s.
Granada PPP = +4m.27s., SS = +7m.44s., SSS = +7m.51s.
Almeria PPP = +4m.23s., i = +4m.48s.
Bagnères iPP = +4m.51s., epPPE = +4m.56s., eE = +5m.42s., eN = +7m.43s., iN = +7m.50s., iS = +8m.17s., ipSE = +8m.22s., eSSE = +8m.45s., ePcPN = +8m.53s., and +8m.56s., iSSSN = +9m.11s., iSSS?N = +9m.23s., iE = +9m.38s., iScP = +12m.34s., iScSN = +15m.51s., epScS?E = +16m.5s.
Jersey ePPP = +5m.6s., iSS = +9m.24s.
Rathfarnham Castle i = +7m.12s.
Algiers isP? = +5m.16s., PP = +5m.23s., PPP = +5m.39s., SS? = +9m.43s.
Bidston i = +7m.21s.
Kew iN = +7m.23s.
Stonyhurst i = +6m.32s.
Marseilles iPN = +5m.2s., iSPZ = +5m.20s., ePPN = +5m.26s., iPP = +5m.31s., iE = +6m.22s., iS = +9m.17s., isS?N = +9m.34s., eSSE = +9m.56s.
Edinburgh i = +5m.18s., +5m.24s., +8m.17s., and +8m.44s.
Lille +5m.26s., isP? = +5m.41s., ePP = +5m.49s. and +5m.54s., iS = +9m.42s., i = +9m.53s., eSS = +10m.50s.
Grenoble i = +10m.29s.
Besançon iP = +5m.33s., iS? = +10m.9s.
Uccle i = +5m.26s., +5m.32.s, +5m.51s., +8m.36s., +9m.23s., +9m.28s., and +9m.56s.
Aberdeen iN = +10m.57s.
Basle e = +10m.17s.
Chur e = +5m.47s.
Strasbourg iE = +5m.40s., eE = +10m.1s., iS = +10m.11s.
Stuttgart iPZ = +5m.48s., i = +5m.55s., e = +7m.6s., eN = +7m.34s., eSN = +9m.56s.
Heligoland eN = +7m.30s., iPcSE = +12m.54s., iN = +13m.30s.
Göttingen i = +6m.5s.
Rome iP = +6m.3s., iPPE = +6m.34s., iZ = +8m.16s., iSSE = +12m.10s., i = +12m.57s., iE = +14m.4s., iN = +14m.8s., iE = +14m.16s.
Ivigtut i = +6m.0s.
Hamburg iPE =ePN = +6m.7s., iN = +7m.28s., eE = +9m.42s.

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Jena iP = +6m.13s., iSN = +10m.57s.
Collmberg iZ = +6m.20s., +6m.42s., +8m.21s., +10m.30s., +10m.49s., +11m.17s., and +12m.15s., i = +12m.45s.
Laibach iNE = +6m.26s., +14m.55s., +18m.44s., and +19m.48s.
Copenhagen iZ = +6m.24s., eE = +8m.39s., e = +8m.54s., eE = +10m.54s., eZ = +11m.38s.
Halifax SS = +13m.0s.
Budapest PP = +6m.47s., eN = +8m.23s., P_cPE = +9m.10s., P_cPN = +9m.16s., SSE = +13m.43s., SSN = +13m.47s., eN = +15m.20s., eE = +16m.17s., eS_cSN = +17m.29s.
East Machias isS = +12m.26s.
Kecskemet Z. e = +8m.41s., i = +10m.48s., eP_cS = +13m.32s., iSS = +14m.7s., eS_cS = +17m.8s.
Szeged N. e = +7m.3s., +8m.41s., and +9m.15s., eP_cP = +9m.30s., i = +9m.50s., e = +11m.26s., eP_cS = +13m.12s., eSS = +14m.10s.
Belgrade iZ = +6m.58s., i = +8m.15s., iNE = +9m.0s., iNW = +9m.24s. and +10m.55s., iZ = +12m.21s., iSSSNW = +14m.51s.
Upsala ePPPE = +8m.18s., e = +12m.13s.
Sofia eE = +12m.40s., iE = +13m.23s., iN = +13m.53s.
Vermont iS = +13m.9s.
Williamstown i = +7m.31s., +7m.48s., and +7m.55s., iPPP = +8m.59s., iSS = +15m.47s.
Bucharest PPPN = +9m.17s., iE = +10m.2s. and +10m.12s., iN = +10m.27s., SSE = +15m.50s., SSSN = +16m.16s., SSSE = +16m.26s., S_cSE = +17m.36s.
Fordham eE = +13m.3s., iE = +14m.56s., iN = +16m.10s., iZ = +16m.38s.
Ottawa SSS = +16m.6s., e = +16m.42s.
Philadelphia P = +7m.36s., i = +15m.14s.
San Juan iP = +7m.55s.
Georgetown iP = +7m.48s., i = +9m.27s., iS = +14m.9s.
Toronto SSS = +17m.12s.
Columbia iP = +8m.31s.
Helwan eZ = +9m.44s., iZ = +10m.33s., PPPEN = +10m.52s., iE = +13m.54s., +14m.42s., and +16m.12s., SSE = +18m.30s.
Cincinnati ipPP = +10m.26s., SS = +18m.26s.
Chicago SS = +19m.15s.
Florissant ipPN = +9m.27s., iSSE = +19m.59s.
St. Louis iE = +9m.25s., eN = +16m.2s., iSEN = +16m.25s., esSEN = +16m.51s.
Tiflis iP = +9m.19s., eP_cPE = +10m.25s., eZ = +10m.59s., iPPEZ = +11m.23s., eN = +12m.13s., PPPZ = +12m.29s., iS = +16m.47s., iE = +17m.31s., eS_cSZ = +19m.2s., iS_cSE = +19m.14s., eZ = +19m.38s., iSSE = +20m.29s., eN = +21m.15s., eSSSE = +22m.32s.
Little Rock iP_cP = +10m.28s., i = +14m.32s., iPS = +17m.25s., S_cS = +19m.29s., SS = +20m.39s. and +21m.22s.
Lincoln eP_cP = +10m.42s. and +14m.37s., eSS = +20m.43s.
Balboa Heights eS = +14m.40s.
Saskatoon SS = +21m.48s.
Denver iE = +10m.23s., eN = +10m.33s., i = +10m.36s., eE = +18m.26s., iE = +18m.44s., esSE = +19m.17s.
Rio de Janeiro iSSS = +26m.10s.
Bozeman esS = +19m.26s., eSS = +23m.10s.
Butte iP = +10m.36s., sS = +19m.40s.
La Paz iPPPZ = +14m.4s., iZ = +20m.46s., iSSZ = +24m.20s.
Huancayo sPP = +14m.12s., isS = +20m.10s., iSS = +24m.24s., eSSS = +27m.12s.
Seattle sS = +20m.34s.
Victoria PS = +20m.27s., SS = +24m.30s., SSS = +27m.42s.
Tucson iP = +11m.27s., iP_cP = +11m.31s., ipP = +11m.40s., iSP = +11m.45s., i = +11m.58s., +12m.42s., and +12m.56s., iPPP = +15m.43s., ipPPP = +16m.1s., i = +16m.56s., i = +20m.19s., iS = +20m.24s., i = +20m.54s. and +21m.4s., iSS = +25m.2s., isSS = +25m.12s., SSS = +28m.4s.
College eSS = +24m.45s., eSSS = +27m.34s.
Pasadena eN = +21m.43s.
Ukiah eSSS = +29m.42s.
Berkeley iPN = +11m.42s.
La Plata SSS = +30m.12s.?
Johannesburg eE = +16m.2s. and +42m.7s.
Cape Town PPN = +15m.26s., PPPN = +17m.8s., PS?E = +23m.14s., SSN = +27m.46s., SSE = +27m.49s., SSSE = +31m.3s.
Agra E. sP = +12m.47s., PP = +15m.42s., PPP = +17m.49s., sS = +23m.12s., PS = +23m.34s., SS = +28m.2s., SSS = +32m.27s.
Bombay eN = +23m.14s., iPSN = +23m.59s., iSSN = +28m.38s., SSSEN = +31m.52s., eN = +34m.53s.
Tananarive SE = +23m.23s., SN = +23m.38s., PSE = +24m.39s., SSN = +29m.38s., SSE = +29m.44s.
Hyderabad SEN = +23m.49s., PSN = +25m.3s., SSN = +29m.51s.
Kodaikanal iPPPE = +19m.12s., iSE = +24m.27s., iPSE = +25m.43s., iSSE = +31m.2s.
Calcutta N. ePP = +16m.47s., iS = +23m.56s., isS = +24m.39s., iPS = +25m.15s., iPPS = +26m.2s., iSSN = +30m.58s.
Honolulu epP = +14m.40s., epPP = +19m.35s., ePS = +28m.27s., eSS = +34m.21s.

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Hong Kong PS = +29m.32s., SS = +34m.22s.
Arapuni SSS = +52m.30s., iEN = +57m.18s.
Wellington iZ = +20m.33s., PKP_2 = +21m.7s., iZ = +25m.30s. and +26m.59s., PPP = +28m.38s., iZ = +29m.37s., eZ = +31m.47s., SKKS = +32m.9s., PSKS = +35m.34s., iZ = +40m.39s., SS = +45m.47s., SSS = +52m.17s., i = +54m.7s., +56m.17s., and +57m.22s., e = +63m.27s., L_q = +68·4m.
Christchurch iZ = +20m.35s., $iPKP_2Z$ = +21m.7s., iE = +21m.14s., iZ = +23m.5s. and +24m.49s., iE = +25m.11s., +26m.2s., iPPPE = +28m.51s., iPPPZ = +28m.54s., iNZ = +33m.11s., e = +35m.6s., eZ = +38m.39s., iZ = +38m.44s., iEN = +38m.47s., e = +41m.34s., eZ = +43m.44s., e = +45m.34s., iZ = +46m.8s. and +47m.28s., iEN = +47m.57s., i = +52m.43s., e = +56m.45s.?, iE = +58m.49s. and +59m.2s., eEN = +63m.22s., L_q = +70m.21s.
Melbourne i = +21m.34s. and +22m.2s., e = +25m.14s., i = +29m.20s., e = +36m.44s., +37m.27s., i = +47m.18s. and +53m.5s.
Sydney e = +29m.42s.
Riverview ePKP?E = +20m.25s., iN = +22m.39s., ePPN = +25m.49s., eSSE = +48m.30s., eSSN = +48m.36s., eSSSEN = +54m.30s.

May 8d. 8h. 4m. 40s. Epicentre 35°·5N. 141°·0E. (as on 1938 Oct. 29d.).

Tokyo Imperial University gives Epicentre 35°·52N. 141°·11E.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Kiyosumi		0·7	242	0 20k	+ 3	0 31	+ 3		—
Tokyo Imp. Univ.		1·0	281	0 22	+ 1	0 38	+ 2		—
Tukubasan		1·0	315	0 24	+ 3	0 38	+ 2		—
Komaba		1·1	278	0 22	0	0 39	0		—
Kamakura		1·2	262	0 24	0	0 42	+ 1		—
Mitaka		1·2	278	0 24	0	0 41	0		—
Koyama		1·6	265	0 20	−10	0 42	− 9		—
Titibu		1·6	287	0 20	−10	0 42	− 9		—
Susaki		1·8	243	0 29	− 3	0 53	− 3		—
Yosiwara		1·9	260	0 20	−14	0 45	−14		—
Mizusawa		3·7	4	0 57	− 3	i 1 37	− 8		—
Osaka		4·6	261	1 14	+ 2	2 32	S_g		—
Tashkent		55·0	299	—	—	i 17 9	− 8		e 25·3
Sverdlovsk		56·1	320	9 36	− 7	17 23	− 9		26·3
Tiflis		71·5	308	e 11 18	− 6	—	—		—
Haiwee		77·7	55	e 11 54	− 6	—	—		—
Mount Wilson	z.	78·7	56	e 12 2	− 4	—	—		—
Pasadena	z.	78·7	56	e 11 59	− 7	—	—		—
Riverside	z.	79·3	56	e 12 4	− 5	—	—		—
Tucson		84·8	53	12 34a	− 3	—	—		—

Additional readings:—
Tucson i = +12m.44s., +13m.11s., +13m.34s., +13m.43s., and +14m.22s.
Long waves were recorded at Kew, Rathfarnham Castle, Bidston, Edinburgh, Cheb, Strasbourg, Stuttgart, Stonyhurst.

May 8d. 16h. 15m. 19s. Epicentre 37°·0N. 23°·9W. (as at 1h.).

A = +·7320, B = −·3244, C = +·5992; δ = +10; h = −1.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Fernando	14·2	87	e 3 32	+ 8	e 6 14	+10	i 3 53	PPP	8·2
Toledo	15·8	73	e 3 48	+ 3	—	—	i 3 57	PP	e 8·3
Almeria	17·1	84	4 6	+ 4	e 7 13	+ 1	4 23	PPP	9·0
Jersey	20·0	44	e 4 46	+ 9	e 8 28	+11	—	—	—
Rathfarnham Castle	20·4	31	e 5 31	PPP	e 10 23	L	—	—	(e 10·4)
Bidston	21·9	35	e 4 53	− 4	e 9 3	+ 9	e 5 6	PP	e 10·7
Clermont Ferrand	22·0	59	i 4 59	+ 1	i 9 9	+13	—	—	e 10·3
Kew	22·1	42	e 4 59	0	e 9 9	+11	e 5 25	PP	e 10·7
Stonyhurst	22·4	35	e 5 1	− 1	e 9 19	+15	—	—	e 11·2
Paris	22·5	51	e 5 3	+ 1	9 17	+12	—	—	10·7.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Durham	E.	23·4	34	e 5 11	0	e 9 33	+12	—	—	—
Edinburgh		23·5	31	—	—	e 9 41	+18	—	—	—
Uccle		24·4	45	e 5 22	+ 1	e 9 45	+ 6	—	—	—
Aberdeen	E.	24·8	29	—	—	i 9 53	+ 7	—	—	—
Neuchatel		24·9	56	e 5 26	0	—	—	—	—	—
De Bilt		25·4	44	5 32a	+ 1	e 10 1	+ 5	—	—	e 12·7
Strasbourg		25·8	53	5 38	+ 4	10 27	+25	6 19	PP	15·7
Zurich		26·0	56	e 5 38	+ 2	—	—	—	—	—
Stuttgart		26·7	54	e 5 44	+ 1	e 9 57	−20	e 6 48	PPP	e 13·7
Rome		28·4	69	e 5 58a	0	e 10 46	+ 1	e 7 38	PPP	e 13·7
Hamburg		28·7	43	e 5 41?	−20	—	—	—	—	e 16·2
Cheb		29·1	52	—	—	e 11 1	+ 5	—	—	e 14·7
Triest		29·3	61	e 6 57	− 9	e 10 54	− 5	—	—	e 15·4
Pulkovo		41·1	39	e 7 42	− 5	e 14 4	+ 3	—	—	e 20·5
Moscow		44·7	46	8 17	+ 1	e 15 3	+ 9	—	—	25·2
Ksara		48·1	76	e 8 48	+ 5	e 15 55	+13	e 10 53	PP	—
St. Louis	E.	51·4	294	—	—	e 16 16	−12	—	—	e 24·9
Tiflis		52·0	62	9 14	+ 1	e 16 48	+12	e 12 26	PPP	e 30·7
Grozny		52·2	60	e 8 56	−19	—	—	—	—	—
Sverdlovsk		57·2	40	9 49	− 2	17 48	+ 2	—	—	26·7
Tucson		69·2	296	i 11 7k	− 3	—	—	14 6	PP	e 38·7
Andijan		71·1	53	e 11 41	+19	—	—	—	—	—
Tinemaha		71·9	303	e 11 25	− 2	—	—	—	—	—
Haiwee		72·2	303	e 11 31	+ 2	—	—	—	—	—
Riverside	Z.	72·9	301	e 11 30	− 3	—	—	—	—	—
Mount Wilson	Z.	73·3	301	i 11 31k	− 4	—	—	—	—	—
Pasadena	Z.	73·4	301	e 11 30	− 6	—	—	—	—	—
La Jolla	Z.	73·5	299	e 11 33	− 3	—	—	—	—	—

Additional readings :—
Jersey e = +6m.12s. and +13m.32s.
Rathfarnham Castle ePP = +6m.43s.
Kew eZ = +5m.11s., ePPPZ = +5m.35s., eE = +9m.17s.
Aberdeen iN = +10m.1s.
Strasbourg eSSE = +11m.48s.
Rome eSS = +12m.15s.
Tiflis ePN = +9m.17s., eSSE = +20m.26s.
Tucson iP = +11m.30s.
Long waves were also recorded at La Paz and Tashkent.

May 8d. Readings also at 0h. (Manila), 1h. (Sverdlovsk, Tashkent, Irkutsk, and near Fort de France), 2h. (Lick, Berkeley, Fresno, and Tucson (4)), 3h. (Tucson, Mizusawa, and Adelaide), 4h. (near Sarajevo, Tucson (2), and Triest), 5h. (near Osaka), 6h. (Collmberg), 7h. (Harvard), 8h. (Tucson, Sverdlovsk, and Manila), 10h. (Tucson), 13h. (near Balboa Heights), 14h. (Balboa Heights), 15h. (near Andijan and Frunse), 18h. (Tucson), 19h. (Andijan, Frunse, and Tashkent), 20h. (Sverdlovsk, Mizusawa, and Irkutsk), 21h. (Stuttgart, Strasbourg, Triest, Tucson, Bucharest, Sofia, Batavia, near Malabar, Rome, and Tiflis), 22h. (Tucson), 23h. (Tucson and Manila).

May 9d. 7h. 28m. 24s. Epicentre 56°·2N. 155°·3W.

A = −·5078, B = −·2335, C = +·8292 ; $\delta = -4$; $h = -8$;
D = −·418, E = +·909 ; G = −·753, H = −·346, K = −·559.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		9·4	20	e 2 19	+ 1	e 4 19	+12	—	—	e 5·0
Sitka		11·0	78	e 2 43	+ 1	4 33	−14	—	—	5·1
Victoria		20·9	97	4 36	−10	8 36	+ 1	—	—	10·1
Ukiah		27·2	114	e 5 49	+ 2	e 10 26	+ 1	e 6 38	PP	e 13·0
Butte		28·3	91	e 6 1	+ 4	e 10 42	− 1	—	—	e 12·9
Berkeley		28·6	115	e 5 54	− 6	e 10 36?	−12	—	—	e 13·6
Santa Clara		29·2	115	e 6 20	+15	e 11 10	+12	—	—	e 13·9
Bozeman		29·3	91	e 6 11	+ 5	e 10 54	− 5	—	—	e 12·6
Tinemaha		31·3	111	e 6 23	− 1	—	—	—	—	—
Haiwee	Z.	32·2	112	i 6 29	− 3	—	—	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mount Wilson		33·6	114	i 6 42	− 2	—	—	—	—	—
Pasadena		33·6	114	e 6 41	− 3	i 12 3	− 3	—	—	e 16·1
Riverside	Z.	34·1	114	i 6 45	− 3	—	—	—	—	—
Honolulu		34·9	183	e 8 26	PP	—	—	e 8 48	PPP	e 14·6
Tucson		38·9	108	i 7 28k	− 1	13 26	− 2	8 45	PP	e 16·0
Lincoln		40·5	85	e 7 49	+ 7	e 13 47	− 5	—	—	e 16·9
Chicago		44·7	79	e 9 13	+57	e 14 48	− 6	—	—	e 18·1
Florissant		45·4	84	e 8 21	− 1	e 14 55	− 9	e 18 11	SSS	—
St. Louis		45·6	84	—	—	i 14 58	− 8	e 18 40	SSS	—
Toronto		48·0	71	—	—	e 14 36?	−65	e 18 36	SS	25·6
Ottawa		48·7	67	—	—	e 15 48	− 2	e 18 36	SS	25·6
Scoresby Sund		49·3	19	10 54	PP	15 58	− 1	18 45	SS	23·6
Vermont		50·7	67	—	—	16 10	− 8	e 19 43	SS	e 24·0
Georgetown		52·6	74	—	—	16 33	−11	—	—	—
Philadelphia		52·8	72	—	—	e 16 38	− 9	e 20 17	SS	e 23·5
Fordham		52·9	70	—	—	i 16 43	− 5	—	—	e 27·6
East Machias		53·4	62	e 10 1	+37	e 17 19	PPS	e 12 51	PPP	e 25·0
Irkutsk		53·7	312	e 9 26	0	e 17 12	+13	—	—	31·6
Sverdlovsk		63·6	340	i 10 34	− 1	19 9	+ 1	—	—	34·6
Bermuda		64·1	70	—	—	e 19 6	− 8	—	—	e 26·3
Pulkovo		64·3	358	e 10 37	− 2	e 18 50	−27	—	—	e 32·5
Edinburgh		66·0	16	—	—	e 19 36?	− 2	—	—	e 27·6
Moscow		67·9	352	e 11 1	− 1	e 19 58	− 3	—	—	42·1
Copenhagen		68·0	7	11 3a	0	20 5	+ 3	—	—	—
Hamburg		69·9	9	e 11 13	− 2	e 20 44	PS	—	—	43·6
De Bilt		70·9	12	11 20a	− 1	e 20 17	−19	—	—	e 35·6
Uccle		72·0	14	e 11 27	− 1	e 20 52	+ 3	e 14 8	PP	36·6
Collmberg		72·4	7	e 11 27	− 3	e 21 0	+ 7	e 16 18	PPP	—
Frunse		72·7	325	11 41	+ 9	21 18	+21	—	—	—
Paris		73·7	15	e 11 36	− 2	e 20 36?	−32	—	—	43·6
Stuttgart		74·1	10	e 11 42	+ 2	e 21 18	+ 6	e 17 51	?	e 41·6
San Juan		74·5	80	—	—	21 9	− 8	e 25 43	SS	e 34·9
Strasbourg		74·6	11	i 11 43	0	e 21 20	+ 2	11 59	pP	e 40·8
Andijan		75·3	325	11 49	+ 2	21 31	+ 5	—	—	—
Tashkent		75·8	327	i 11 47	− 3	e 21 27	− 4	—	—	e 42·7
Clermont Ferrand		76·8	16	—	—	e 21 45	+ 3	—	—	e 31·6
Samarkand		78·0	329	e 12 3	+ 1	—	—	—	—	—
Triest		78·1	8	—	—	e 22 2	+ 6	—	—	e 48·5
Grozny		79·3	345	e 11 52	−17	21 51	−18	—	—	—
Tiflis		81·0	346	12 19	+ 1	e 22 30	+ 3	e 26 58	SS	e 43·6
Baku		81·4	342	e 12 22	+ 2	e 22 38	+ 7	—	—	40·6
Rome		81·7	10	e 12 19k	− 3	e 22 48	+14	e 23 45	PS	e 40·0
Agra	E.	85·5	314	—	—	e 23 4	[0]	—	—	—
Ksara		89·8	351	—	—	e 24 10	+17	25 16	PS	49·6
Huancayo		94·4	105	e 13 7	−16	e 23 43	[−15]	e 31 13	SSP	e 36·3

Additional readings :—
Tucson iP = +7m.36s. and +8m.3s., iPP = +8m.52s., iPPP = +9m.48s.
Ottawa e = +23m.18s.
Scoresby Sund SS = +19m.48s.
Vermont eS_cS = +18m.51s.
Philadelphia eS_cS = +19m.1s.
East Machias eS_cS = +19m.39s.
Collmberg i = +12m.4s.
San Juan eSSS = +29m.8s.
Strasbourg ePPZ = +14m.29s., isSE = +21m.37s., e = +21m.51s., eSS = +26m.21s.
Tiflis ePN = +12m.22s.
Long waves were also recorded at La Paz, Kodaikanal, Bombay, Columbia, Rathfarnham Castle, Colombo, Prague, Kew, Upsala, Bidston, and Stonyhurst.

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May 9d. 16h. 27m. 19s. Epicentre 37°·0N. 23°·9W. (as on 1939 May 8d.).

$A = +\cdot7320$, $B = -\cdot3244$, $C = +\cdot5992$; $\delta = +10$; $h = -1$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Bidston	21·9	35	—	—	e 9 4	+10	9·7
Kew	22·1	42	—	—	e 9 14	+16	e 10·7
Paris	22·5	51	e 5 3	+ 1	—	—	11·7
Edinburgh	23·5	31	—	—	e 9 41?	+18	—
Uccle	24·4	45	e 5 21	0	e 9 45	+ 6	e 12·2
De Bilt	25·4	44	e 5 31a	0	—	—	e 13·7
Strasbourg	25·8	53	e 5 40	+ 6	e 10 23	+21	e 14·2
Rome	28·4	69	e 8 13	?	—	—	e 13·7
Sverdlovsk	57·2	40	9 47	− 4	e 17 54	+ 8	24·7
Balboa Heights	57·4	252	e 12 49	PPP	—	—	—
Tucson	69·2	296	i 11 8a	− 2	—	—	—

Rome also gives eZ = 16h.21m.7s.
Long waves were also recorded at Stonyhurst, Tashkent, Clermont Ferrand, and Stuttgart.

May 9d. Readings also at 0h. (Collmberg), 1h. (La Paz and Tucson (2)), 2h. (Tucson and Tiflis), 3h. (Honolulu, Collmberg, and Tucson), 6h. (Tucson (2)), 8h. (near Manila), 11h. (Rome), 12h. (Rome, Tucson, Haiwee, Riverside, Pasadena, Mount Wilson, and Tinemaha), 13h. (Balboa Heights, and Manila), 14h. (Sitka), 15h. (Rome), 17h. (Rome, Bidston, Kew, Edinburgh, Strasbourg, and Stonyhurst), 18h. (Fresno, near Lick, Branner, and Berkeley), 19h. (Mizusawa), 21h. (near Fort de France, Sverdlovsk, and Manila), 22h. (near Wellington), 23h. (near Ksara).

May 10d. 7h. 44m. 16s. Epicentre 51°·7N. 178°·5W.

$A = -\cdot6221$, $B = -\cdot0163$, $C = +\cdot7828$; $\delta = +5$; $h = -6$;
$D = -\cdot026$, $E = +1\cdot000$; $G = -\cdot782$, $H = -\cdot020$, $K = -\cdot622$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		20·6	38	e 4 41	− 2	e 8 28	− 1	—	—	10·6
Sitka		25·3	60	e 5 20	−10	e 9 49	− 5	e 6 7	PP	e 11·1
Nemuro		25·4	266	5 30	− 1	—	—	—	—	—
Sapporo		28·2	270	5 56	0	—	—	—	—	—
Mizusawa	E.	30·6	262	4 39	?	11 19	− 1	—	—	—
Akita		30·9	263	6 9	−11	—	—	—	—	—
Nagano		33·9	263	6 48	+ 1	—	—	—	—	—
Honolulu		34·3	144	e 6 50	0	12 22	+ 5	e 8 11	PP	e 13·6
Victoria		34·9	73	6 44	−11	12 18	− 9	14 50	SS	16·7
Nagoya		35·7	260	7 2	0	—	—	—	—	—
Kyoto		36·5	262	7 11	+ 2	—	—	—	—	—
Koti		38·9	262	7 29	0	—	—	—	—	—
Ukiah		39·8	87	e 7 46	+10	e 13 43	+ 1	e 9 25	PP	16·8
Berkeley		41·2	87	e 7 46a	− 2	e 14 2	0	—	—	e 19·0
San Francisco		41·2	87	e 7 51	+ 3	—	—	—	—	—
Miyazaki		41·3	261	7 49	0	—	—	—	—	—
Branner		41·5	87	e 7 51	+ 1	e 14 4	− 3	e 17 32	SSS	e 19·7
Santa Clara		41·7	87	i 8 17	+ 25	i 14 26	+16	—	—	e 18·7
Lick		41·9	87	e 7 54	0	e 14 12	− 1	—	—	e 22·5
Butte		42·4	70	8 0	+ 2	14 21	+ 1	—	—	17·2
Saskatoon		42·6	60	8 2	+ 3	14 26	+ 3	17 56	SSS	19·2
Bozeman		43·5	70	e 8 6	− 1	e 14 43	+ 7	e 10 22	PP	18·2
Fresno	N.	43·5	86	e 8 9	+ 2	—	—	—	—	—
Tinemaha		44·2	84	i 8 14	+ 2	e 14 50	+ 4	—	—	—
Haiwee		45·0	85	i 8 20	+ 1	e 14 56	− 2	—	—	—
Santa Barbara		45·0	88	e 8 26	+ 7	—	—	—	—	—
Irkutsk		45·4	304	8 23	+ 1	e 15 2	− 2	—	—	22·7
Pasadena		46·1	87	i 8 28	0	i 15 12	− 2	—	—	e 18·3
Mount Wilson		46·2	87	i 8 27	− 1	e 15 11	− 4	—	—	—
Riverside		46·7	87	i 8 32	0	—	—	—	—	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		47·6	88	i 8 39	0	—	—	—	—	—
Tucson		52·0	84	i 9 12	− 1	i 16 36	0	i 11 23	PP	20·8
Scoresby Sund		56·9	9	i 9 50k	+ 1	13 16	PPP	—	—	—
Semipalatinsk		58·4	313	9 57	− 3	—	—	—	—	—
Hong Kong		58·8	268	10 2	0	18 14	+ 7	20 8	S_cS	—
Chicago		59·1	61	e 10 3	− 1	e 18 6	− 5	e 22 27	SS	e 24·1
Florissant		59·7	65	i 10 6	− 3	i 18 15	− 4	i 18 40	PS	27·7
St. Louis		59·9	65	i 10 8	− 2	e 18 12	− 9	i 18 41	PS	—
Manila		60·5	256	e 10 7a	− 7	18 39	+10	—	—	30·2
Little Rock		61·4	69	i 10 15	− 5	i 18 35	− 5	—	—	—
Sverdlovsk		61·4	328	i 10 20	0	i 19 9	PS	—	—	31·7
Toronto		62·1	54	e 10 38	+13	e 18 50	+ 1	—	—	28·7
Ottawa		62·7	50	10 27	− 2	18 49	− 8	23 14	SS	28·7
Shawinigan Falls		63·3	47	e 10 40	+ 7	—	—	—	—	33·7
Seven Falls		63·7	46	—	—	e 19 14	+ 4	—	—	30·7
Vermont		64·6	50	e 10 45	+ 4	e 19 15	− 6	e 14 55	PPP	e 26·4
Apia		65·5	172	—	—	e 19 33	+ 1	—	—	29·7
Williamstown		65·9	51	i 10 48	− 2	—	—	—	—	—
Pulkovo		66·4	345	e 10 51	− 2	e 19 48	+ 5	—	—	e 33·1
Frunse		66·6	310	10 56	+ 2	20 29	PPS	—	—	—
Georgetown		66·8	56	i 10 54	− 2	i 19 42	− 6	—	—	29·7
Harvard		66·9	50	i 10 54	− 2	e 19 44	− 5	e 30 44	L_q	e 33·7
Fordham		67·0	53	i 10 54k	− 3	e 19 47	− 3	i 20 26	PS	36·4
East Machias		67·1	46	e 11 29	+32	e 19 59	+ 8	e 27 51	SSS	e 31·7
Upsala		68·0	352	—	—	e 20 44?	PPS	—	—	—
Bergen		68·2	358	—	—	(i 19 44?)	−20	—	—	19·7
Columbia		68·4	62	e 11 3	− 3	e 20 3	− 4	—	—	e 32·0
Halifax		68·8	43	—	—	e 20 8	− 3	—	—	36·7
Moscow		68·8	339	11 4	− 4	20 6	− 5	—	—	34·2
Andijan		69·3	310	11 15	+ 4	21 0	PPS	—	—	—
Aberdeen	N.	71·5	2	—	—	e 21 29	PPS	i 25 17	SS	33·8
Copenhagen		72·6	355	e 11 31	0	20 56	0	—	—	—
Samarkand		72·6	313	e 11 44	+13	—	—	—	—	—
Edinburgh		72·7	4	e 16 20	PPP	e 21 8	PS	—	—	e 30·7
Durham	N.	73·9	3	e 11 50	+11	e 21 25	+15	—	—	—
Dehra Dun	N.	74·4	299	—	—	20 49	−27	—	—	e 40·1
Calcutta	N.	74·5	287	e 11 37	− 5	e 21 12	− 5	e 14 35	PP	e 36·8
Stonyhurst		74·8	3	e 11 54	+10	e 21 19	− 1	e 25 54	SS	e 31·7
Hamburg		74·9	355	e 11 42	− 2	e 21 34	+12	—	—	e 37·7
Bidston		75·2	4	e 11 55	+ 9	e 21 50	PS	e 25 59	SS	—
Rathfarnham Castle		75·2	6	(e 12 44?)	?	—	—	—	—	e 12·7
De Bilt		76·5	358	i 11 54a	0	i 21 40	+ 1	i 16 58	PPP	27·3
Collmberg		76·9	353	i 11 55a	− 1	e 21 44?	+ 1	e 14 8	PP	e 39·2
Agra	E.	77·0	297	i 11 55a	− 1	21 37	− 8	14 47	PP	39·6
Kew		77·2	2	e 11 57	0	e 21 48	+ 1	e 22 44	PS	e 37·4
Jena		77·4	353	e 11 59	+ 1	—	—	—	—	—
Uccle		77·8	359	i 12 1a	0	e 22 4	+11	i 22 57	PPS	e 36·7
Prague		78·0	352	—	—	e 21 32	−23	22 26	PS	e 31·7
Bermuda		78·2	52	e 12 3	0	e 22 2	+ 5	—	—	e 31·9
Cheb		78·2	353	e 21 49	S	(e 21 49)	− 8	—	—	e 34·7
Baku		79·1	325	e 11 55	−13	i 22 24	+17	e 23 17	PPS	41·7
Sotchi		79·5	334	e 12 8	− 2	—	—	—	—	—
Tiflis		79·6	329	i 12 11	+ 1	22 15	+ 3	15 26	PP	39·7
Stuttgart		79·7	356	e 12 11a	0	e 22 22	+ 9	e 17 17	PPP	e 39·7
Paris		79·9	0	i 12 13	+ 1	22 14	− 2	23 13	PPS	33·7
Strasbourg		79·9	356	i 12 13	+ 1	e 22 12	− 4	e 15 11	PP	e 37·7
Basle		81·0	357	e 12 17	− 1	—	—	—	—	—
Zurich		81·1	356	e 12 23a	+ 5	—	—	—	—	—
Chur		81·6	355	e 12 21	0	—	—	—	—	—
Bucharest		81·9	343	e 12 24a	+ 1	e 22 30	− 6	—	—	39·7

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		82·5	347	i 12 26k	0	e 23 25	PS	—	—	e 46·4
Triest		82·5	352	e 12 24	− 2	23 2	+20	23 54	PS	—
Brisbane		82·7	205	i 12 32	+ 5	i 22 44	0	—	—	e 41·7
Medan	E.	82·8	267	i 12 33	+ 6	i 23 13	+28	—	—	—
Clermont Ferrand		82·9	359	e 12 30	+ 2	—	—	—	—	—
Sofia		84·1	344	e 12 44	+10	e 23 20	+22	—	—	—
Hyderabad		84·3	291	12 37	+ 2	22 57	− 3	24 17	PS	41·2
Istanbul		84·5	340	12 32	− 4	22 50	−12	28 56	SS	e 45·7
Batavia	E.	85·4	255	i 13 40	+60	—	—	—	—	—
Rome		86·3	352	i 12 45a	0	i 23 19	− 1	i 24 17	PS	i 29·1
Bombay	E.	86·4	297	e 12 43	− 2	i 23 14	[+ 4]	i 24 29	PS	—
Toledo		88·7	5	e 13 48	+51	—	—	—	—	28·7
San Juan		88·8	61	e 13 1	+ 4	e 23 27	[+ 2]	—	—	36·6
Riverview		89·2	205	—	—	e 24 0	+13	—	—	e 41·4
Sydney		89·3	205	—	—	e 23 50	+ 2	e 29 14	SS	e 35·5
Ksara		89·7	332	i 13 2a	+ 1	25 12	PS	—	—	45·7
Kodaikanal	E.	90·6	288	—	—	e 23 44?	[+ 8]	—	—	—
Granada		91·4	4	e 13 14	+ 5	e 24 8	+ 1	—	—	40·2
Almeria		91·8	3	e 13 42	+31	e 24 30	+19	e 17 49	PP	46·4
Colombo	E.	91·8	283	e 13 14	+ 3	—	—	—	—	—
Wellington		92·8	185	e 19 51	PPP	i 23 49	[0]	—	—	—
Adelaide		94·1	214	—	—	e 25 54	PS	e 32 51	?	e 40·5
Fort de France		94·5	59	e 13 17	− 6	—	—	—	—	—
Helwan		94·7	333	e 13 24	0	24 19	[+20]	e 17 25	PP	—
Melbourne		94·7	208	—	—	e 24 29	− 7	i 31 31	SSP	39·9
Christchurch		95·2	187	e 20 4	PPP	30 6	SS	39 26	L_Q	44·4
La Paz	Z.	115·4	83	19 48	PP	29 34	PS	36 12	SSS	56·7
La Plata		134·9	92	22 56	PKS	—	—	—	—	65·7
Rio de Janeiro		135·3	67	e 21 44	PP	—	—	—	—	—

Additional readings :—
Sitka S = +9m.56s.
Victoria eN = +12m.50s.
Berkeley iP = +7m.53s.
Branner ePN = +7m.58s.
Bozeman ePPP = +11m.9s., eSS = +17m.27s.
Tucson iP = +9m.42s., i = +11m.28s. and +11m.59s., iPPP = +12m.21s., SS = +20m.5s.
Scoresby Sund +18m.22s.
Hong Kong SN = +18m.19s., SS = +22m.12s.
St. Louis iSN = +18m.15s., iSSN = +22m.29s.
Ottawa e = +20m.14s., SSSN = +25m.44s.?
Vermont eSS = +24m.17s.
Georgetown iS = +19m.58s.
Calcutta N. ePPP = +23m.44s., i = +21m.30s., ePS = +22m.9s., eSS = +26m.41s., eSSS = +29m.47s.
Bidston ePS = +22m.42s.
De Bilt iN = +22m.41s.
Collmberg i = +12m.6s. and +12m.21s., e = +12m.43s., e = +14m.48s. and +27m.14s.
Agra E. P_cP? = +12m.3s., i = +22m.7s., e = +22m.32s., SS = +27m.1s.
Kew eP_cPZ = +12m.10s., eSSEN = +26m.12s., eSSSN = +30m.48s., eL_qEN = +32m.52s.
Jena eNZ = +11m.44s.
Uccle eSSN = +27m.7s.
Baku e = +28m.2s. and +32m.8s.
Tiflis SSEN = +27m.32s.
Stuttgart e = +20m.2s., ePS = +23m.12s., eSS = +28m.8s., e = +33m.50s.
Strasbourg ePPZ = +15m.26s., ePPPNZ = +17m.20s., eSE = +22m.28s., eSN = +22m.31s., ePSN = +23m.24s., iN = +23m.29s., iSSN = +28m.3s., eE = +33m.44s.
Belgrade iZ = +12m.36s.
Brisbane eN = +32m.56s.
Medan PEN = +12m.41s.
Hyderabad N = +23m.13s., SSN = +28m.55s.
Istanbul SKS = +19m.34s.
Rome eNZ = +12m.49s., e = +16m.6s., iSN = +23m.22s., iN = +24m.38s.
Bombay iE = +23m.44s., iSSE? = +29m.47s., eSSS?E = +33m.5s.
Granada i = +13m.44s.
Helwan eE = +22m.9s., SEN = +24m.35s., PPSNE = +26m.9s.
Long waves were also recorded at Cape Town and Göttingen.

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May 10d. Readings also at 0h. (Tucson, Riverside, Pasadena, and Mount Wilson), 2h. (Tucson), 4h. (Mizusawa), 5h. (Mizusawa and Andijan), 7h. (Andijan, Tucson, Tiflis, Balboa Heights, and Jersey (2)), 8h. (near Tananarive), 9h. (Bombay and Strasbourg), 10h. (Stuttgart, Uccle, Tucson, Tiflis, Riverside, and Mount Wilson), 11h. (Tiflis), 13h. (Andijan), 14h. (Tucson (2)), 15h. (Tucson, Riverside, Rome, and La Paz), 16h. (Mizusawa), 19h. (Sverdlovsk, Sitka, Tashkent, College, Andijan, Tucson, Riverside, Pasadena, and Tinemaha), 20h. (Ksara, Baku, Ottawa, Irkutsk, Haiwee, Rome, Tiflis, Andijan, Tucson, Riverside, Pasadena, and Tinemaha), 21h. (Tucson), 22h. (Tiflis).

May 11d. 17h. 30m. 49s. Epicentre 10°·0S. 112°·0E.

$A = -\cdot3690$, $B = +\cdot9133$, $C = -\cdot1725$; $\delta = +3$; $h = +7$;
$D = +\cdot927$, $E = +\cdot375$; $G = +\cdot065$, $H = -\cdot160$, $K = -\cdot985$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Malabar		5·1	302	e 1 34	P*	i 2 40	S*	—	—	—
Batavia		6·4	307	1 47	P*	3 10	S*	—	—	—
Medan		18·9	315	e 4 43	PP	8 7	+14	e 8 28	SSS	—
Manila		26·0	20	i 5 40	+ 4	i 10 6	0	—	—	12·7
Hong Kong		32·2	4	11 48	S	(11 48)	+ 3	—	—	—
Adelaide		34·7	141	—	—	e 15 49	?	—	—	e 19·3
Colombo	E.	36·1	296	—	—	e 13 11?	+26	—	—	—
Calcutta	N.	39·8	325	—	—	i 13 31	−11	—	—	—
Kodaikanal	E.	39·8	300	e 7 41	+ 5	—	—	—	—	—
Riverview		43·0	130	—	—	e 17 41?	SS	—	—	e 25·0
Sydney		43·0	130	—	—	e 19 5	?	—	—	e 23·2
Bombay		48·1	307	e 9 11?	+ 28	—	—	—	—	—
Agra	E.	49·5	320	e 8 54	0	16 5	+ 3	—	—	—
Andijan		62·3	320	e 10 29	+ 3	—	—	—	—	—
Irkutsk		62·4	355	e 10 20	− 7	e 18 51	− 2	—	—	31·2
Frunse		62·7	330	e 10 50	+21	—	—	—	—	—
Tashkent		64·4	326	e 10 41	+ 1	e 19 22	+ 4	—	—	e 34·1
Samarkand		64·7	323	e 10 43	+ 1	—	—	—	—	—
Baku		76·1	317	e 11 53	+ 2	e 21 43	+ 8	—	—	41·2
Sverdlovsk		78·8	335	i 12 6	0	22 5	+ 1	—	—	38·2
Tiflis		80·1	316	12 15	+ 2	e 22 23	+ 5	e 23 9	PS	49·2
Ksara		84·2	305	i 12 37k	+ 3	e 22 56	− 3	e 14 55	PP	—
Helwan		86·9	301	i 12 50k	+ 2	e 23 29	+ 3	—	—	—
Moscow		89·6	327	e 13 0	− 1	e 25 0	PS	e 16 29	PP	—
Pasadena	Z.	128·3	53	i 19 6	[− 3]	—	—	—	—	—
Riverside	Z.	128·9	53	e 19 6	[− 4]	—	—	—	—	—
Florissant		145·0	31	i 19 34	[− 5]	e 26 23	[−24]	e 42 47	SSP	—
St. Louis	E.	145·2	31	—	—	e 28 45	{−66}	—	—	—
Little Rock		146·8	39	e 19 42	[0]	i 44 54	SS	—	—	—
Williamstown		147·1	5	i 19 43	[0]	—	—	—	—	—
Harvard	Z.	147·5	4	i 19 43	[0]	—	—	—	—	—
Fordham		148·8	8	i 19 59	[+14]	—	—	—	—	—
La Paz	Z.	153·7	180	19 56	[+ 4]	—	—	—	—	—

Additional readings :—
Batavia iE = +3m.22s.
Medan iEN = +5m.43s.
Riverview eN = +22m.11s.?
Ksara ePS = +23m.45s.
Pasadena iZ = +19m.19s.
Riverside iZ = +19m.20s.
Florissant eE = +38m.51s. and +42m.54s.
Harvard iZ = +19m.56s.
Long waves were also recorded at Bidston, Brisbane, and Melbourne.

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May 11d. 18h. 4m. 43s. Epicentre 38°·6N. 117°·8W.

Intensity VI in the region of Rawhide (Nevada). Epicentre near Mina (Nevada), 38°35′N. 117°·50′W. (Pasadena). Macroseismic area 38,000 sq. miles.

R. Bodle.
United States Earthquakes, 1939, Washington, 1941, p. 14, chart p. 63.

$A = -·3654$, $B = -·6931$, $C = +·6213$; $\delta = -8$; $h = -1$;
$D = -·885$, $E = +·466$; $G = -·290$, $H = -·550$, $K = -·784$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		1·5	194	i 0 27k	− 1	—	—	—	—	—
Fresno	N.	2·5	220	e 0 40	− 3	—	—	—	—	—
Haiwee		2·5	183	i 0 41	− 2	i 1 13	− 1	—	—	—
Lick		3·3	247	e 0 53	0	i 1 40	+ 5	i 1 1	P*	—
Santa Clara		3·5	251	i 1 27	+30	i 2 10	S_g	—	—	—
Berkeley		3·6	259	i 0 58	0	i 1 48	S*	i 1 52	S_g	—
Branner		3·7	254	e 1 2	+ 2	i 1 45	0	i 1 13	P_g	—
San Francisco		3·8	259	e 1 6	P*	e 1 23	−24	—	—	—
Mount Wilson		4·3	183	e 1 8	0	i 2 14	S*	—	—	—
Ukiah		4·3	280	e 1 20	P*	i 2 16	S*	—	—	—
Santa Barbara		4·4	201	i 1 10	0	i 2 14	S*	—	—	—
Pasadena		4·5	185	i 1 8	− 3	i 2 13	+ 8	—	—	—
Riverside		4·6	176	i 1 10	− 2	i 2 21	S*	—	—	—
Salt Lake City		5·1	62	i 1 49	P_g	e 2 50	S_g	—	—	3·2
Ferndale		5·4	294	e 1 49	P_g	e 2 45	S*	—	—	—
La Jolla		5·7	175	i 1 25	− 3	i 2 25	−10	—	—	—
Butte		8·4	26	e 2 20	PPP	e 3 57	SS	—	—	5·2
Tucson		8·5	136	i 2 6k	− 1	i 3 48	+ 3	4 19	S*	—
Bozeman		8·7	33	e 2 35	+25	e 4 33	S*	—	—	e 5·3
Victoria		10·6	340	e 2 41	+ 5	—	—	—	—	5·3
Sitka		21·8	334	e 4 20	−36	e 8 36	−16	—	—	e 12·7
Chicago		23·2	73	e 5 17	+ 8	e 9 19	+ 1	—	—	e 12·3
Williamstown		33·8	68	i 6 51	+ 5	—	—	—	—	e 17·9
Harvard	z.	35·0	69	i 6 58	+ 2	—	—	—	—	e 18·3
Honolulu		38·4	256	e 7 0	−25	e 12 10	−70	—	—	e 14·8

Additional readings :—
Fresno iN = +43s.
Berkeley iZ = +1m.5s., iN = +1m.8s.
Branner iSN = +1m.55s.
San Francisco iSN = +1m.26s.
Salt Lake City iP = +1m.56s., i = +2m.45s., iS = +2m.56s.
Tucson iP_g = +2m.45s., i = +2m.59s., +3m.11s., and +3m.28s., iS = +4m.7s., i = +4m.24s., +4m.31s., and +4m.39s., iS_g = +4m.51s.
Sitka ePP = +5m.6s.
Long waves were also recorded at Denver, Tacubaya, College, Columbia, East Machias, Philadelphia, Paris, Lincoln, Strasbourg, Baku, Stuttgart, Sverdlovsk, Tashkent, Clermont Ferrand, De Bilt, Rome, Edinburgh, Kew, and Bidston.

May 11d. Readings also at 0h. (near Batavia), 2h. (Rio de Janeiro, Mount Wilson, near Berkeley, Lick, Haiwee, near Manila (2), Honolulu, Tucson (2), Fresno, Tinemaha, Riverside, and Pasadena), 4h. (Mizusawa), 5h. (Almata), 6h. (Semipalatinsk), 7h. (Ferndale and Kodaikanal), 11h. (Piatigorsk), 12h. (Samarkand), 14h. (Tucson, La Jolla, Pasadena, Riverside, Tinemaha, and Collmberg), 15h. (Medan), 17h. (near Grozny), 19h. (near Triest, Rome, near Strasbourg, and Stuttgart), 20h. (Fordham and near Tinemaha), 21h. (Lick, Berkeley, near San Francisco, Branner, near Santa Clara, Tucson, near Fresno, and Honolulu), 23h. (Bozeman and Butte).

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May 12d. 2h. 30m. 45s. Epicentre 0°·0 13°·0W.

A = +·9744, B = −·2250, C = ·0000; δ = +8; h = +7;
D = −·225, E = −·974; G = ·000, H = ·000, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Algiers		39·5	21	e 10 15?	?	e 17 15?	SS	—	—	i 22·0
Toledo		40·5	11	e 10 25	?	—	—	—	—	e 22·6
Rome		47·6	26	e 8 38	− 1	i 15 54	+19	i 18 33	SS	e 24·2
Paris		50·4	13	—	—	e 16 47	+33	—	—	28·2
Triest		50·5	24	e 9 35	+33	e 16 41	+25	e 10 44	PP	—
Helwan	E.	51·6	51	—	—	e 16 39	+ 8	—	—	—
Strasbourg		51·6	17	e 9 7	− 3	e 16 32	+ 1	e 20 15	SS	28·2
Stuttgart		52·2	18	e 9 25	+10	e 16 58	+19	e 12 33	PPP	e 28·7
De Bilt		54·1	13	—	—	e 23 15?	SSS	—	—	33·2
Collmberg		55·6	19	e 9 39	− 1	—	—	e 11 55	PP	—
La Paz	z.	56·7	250	9 45	− 3	17 45	+ 5	—	—	27·7
Ksara		56·8	49	e 9 42	− 6	e 17 58	PS	—	—	27·8
Huancayo		63·0	257	e 7 40	?	—	—	—	—	—
Tiflis		66·5	44	e 10 46	− 8	e 19 52	+ 8	13 9	PP	e 34·2
Baku		69·6	46	e 11 22	+ 9	e 20 31	+10	—	—	35·2
Sverdlovsk		81·1	32	e 12 12	− 6	22 33	+ 5	e 23 19	PS	39·2
Tashkent		84·2	48	—	—	e 22 52	− 7	—	—	e 44·5

Additional readings:—
Toledo e = +10m.41s.
Rome eE? = +19m.53s.
Triest e = +11m.49s.
Strasbourg eSN = +16m.35s.
Stuttgart eSSS = +22m.49s.
Collmberg eZ = +12m.7s. and +14m.23s.
Ksara ePS = +18m.32s.
Tiflis eZ = +12m.10s. and +13m.22s.
Long waves were also recorded at Edinburgh, Bidston, Cheb, Clermont Ferrand, Hamburg, Pulkovo, Kew, and San Fernando.

May 12d. 7h. 37m. 57s. Epicentre 51°·7N. 178°·5W. (as on 1939 May 10d.).

A = −·6221, B = −·0163, C = +·7828; δ = +5; h = −6.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		20·6	38	—	—	e 8 34	+ 5	—	—	—
Sitka		25·3	60	—	—	e 10 5	+11	—	—	—
Tinemaha		44·2	84	i 8 13	+ 1	—	—	—	—	—
Haiwee		45·0	85	e 8 18	− 1	—	—	—	—	—
Irkutsk		45·4	304	e 8 3?	−19	—	—	—	—	24·1
Pasadena		46·1	87	i 8 26	− 2	—	—	i 10 2	PP	e 26·5
Mount Wilson		46·2	87	i 8 26	− 2	—	—	—	—	—
Riverside	z.	46·7	87	i 8 30	− 2	—	—	—	—	—
La Jolla		47·6	88	i 8 38	− 1	—	—	—	—	—
Tucson		52·0	84	i 9 11a	− 2	—	—	i 10 47	PP	—
Sverdlovsk		61·4	328	i 10 20	0	19 6	+26	—	—	31·1
Harvard	z.	66·9	50	i 10 55	− 1	—	—	—	—	—
Fordham	z.	67·0	53	i 11 0k	+ 3	—	—	i 11 17	PP	—
Tashkent		70·3	312	e 11 18	+ 1	e 20 24	− 5	—	—	e 36·5
Collmberg	z.	76·9	353	—	—	i 27 55	?	—	—	—
Grozny		77·9	329	e 11 31	−30	—	—	—	—	—
Baku		79·1	325	e 12 11	+ 3	e 22 25	PS	—	—	e 40·1
Tiflis		79·6	329	12 10	0	—	—	—	—	e 42·1
Ksara		89·7	332	—	—	e 24 2	+10	34 28	SSS	—

Additional readings:—
Tucson i = +9m.25s. and +9m.30s.
Ksara e = +27m.18s.
Long waves were also recorded at Stuttgart and Honolulu.

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May 12d. 9h. 46m. 16s. Epicentre 37°·9N. 71°·2E. (as given by stations of Central Asia).

$A = +\cdot2549$, $B = +\cdot7489$, $C = +\cdot6117$; $\delta = 0$; $h = -1$;
$D = +\cdot947$, $E = -\cdot322$; $G = +\cdot197$, $H = +\cdot579$, $K = -\cdot791$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan	3·0	18	i 0 52	+ 2	1 43	S_g	i 1 0	P_g	—
Samarkand	3·7	299	e 0 59	− 1	2 4	S_g	—	—	—
Tashkent	3·7	339	i 1 0	0	i 1 56	S*	—	—	e 2·0
Tchimkent	4·6	345	1 14	+ 2	e 2 10	+ 3	e 2 16	S*	—
Frunse	5·6	26	i 1 25	− 2	e 2 35	+ 2	e 2 43	S*	—
Almata	6·9	37	i 1 39	− 6	e 3 5	0	—	—	—
Sverdlovsk	20·2	342	i 4 35	− 4	8 22	+ 1	—	—	—

Additional readings:—
Samarkand e = +1m.47s. and +2m.22s.
Frunse e = +1m.33s. and +1m.36s.

May 12d. 14h. Undetermined shock. Pasadena suggests deep focus.

Mizusawa iPE = 5m.54s., iSN = 6m.38s.
Irkutsk eP = 10m.37s., eS = 15m.13s., L = 18·0m.
Sverdlovsk P = 14m.15s., S = 21m.33s., L = 28·2m.
Grozny eP = 15m.26s.
Tiflis ePN = 15m.52s., eL = 47·0m.
Mount Wilson iPZ = 16m.12s., iZ = 16m.36s.
Riverside iPZ = 16m.14s., eZ = 16m.39s.
Pasadena iZ = 16m.36s.
Collmberg iZ = 16m.37s. and 17m.0s.
Tucson iP = 16m.46s.k and 16m.57s.
Tashkent eS = 21m.34s., e = 33m.10s., eL = 35·2m.

May 12d. 19h. 25m. 3s. Epicentre 33°·5N. 116°·6W. (as on 1937, March 25d.).

$A = -\cdot3741$, $B = -\cdot7472$, $C = +\cdot5493$; $\delta = -1$; $h = +1$;
$D = -\cdot894$, $E = +\cdot448$; $G = -\cdot246$, $H = -\cdot491$, $K = -\cdot836$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla	0·8	221	i 0 17	− 1	i 0 28	− 3	—	—	—
Riverside	0·8	307	i 0 17k	− 1	i 0 30	− 1	—	—	—
Mount Wilson	1·4	301	i 0 29	+ 2	i 0 49	+ 3	—	—	—
Pasadena	1·5	296	i 0 29	+ 1	i 0 49	0	—	—	—
Haiwee	2·8	337	i 0 47	0	i 1 34	S_g	—	—	—
Santa Barbara	2·8	290	i 0 54	P_g	—	—	—	—	—
Tucson	5·0	102	1 13	− 5	i 2 37	S*	i 1 39	P_g	i 3·0
Honolulu	38·3	262	e 7 5	−19	e 13 33	+14	e 9 13	PP	e 15·8

Tucson also gives P = +1m.18s., iP = +1m.33s., i = +2m.7s.

May 12d. Readings also at 0h. (Tashkent, Sverdlovsk, La Paz, and near Manila), 1h. (Rome), 3h. (Fort de France), 6h. (Oaxaca, Tacubaya, near Fresno, Lick, Triest, and Tucson), 7h. (near Fresno, Lick, and Tucson), 8h. (Mizusawa and Tiflis), 9h. (Pasadena, Riverside, Mount Wilson, Grozny, Tucson, and Fort de France), 10h. (near Wellington and New Plymouth), 11h. (Sofia, Williamstown, Bucharest, Ksara, near Fort de France, Triest, Rome, and Ottawa), 13h. (Triest), 14h. (near New Plymouth and Wellington), 21h. (Ottawa), 22h. (near Wellington).

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May 13d. 0h. 43m. 33s. Epicentre 23°·7S. 65°·7W. (as on 1938, August 4d.).

$A = +\cdot3772$, $B = -\cdot8355$, $C = -\cdot3996$; $\delta = +2$; $h = +4$;
$D = -\cdot911$, $E = -\cdot412$; $G = -\cdot164$, $H = +\cdot364$, $K = -\cdot917$.

A depth of focus 0·030 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		7·5	341	i 1 48	+ 1	i 3 12	0	—	—	3·8
La Plata		13·0	151	2 58	0	4 51	−27	—	—	5·6
Huancayo		14·8	320	i 3 17a	− 3	e 5 52	− 6	i 6 9	SS	e 6·2
Rio de Janeiro		20·7	92	e 5 27	PPP	—	—	—	—	—
Fort de France		38·4	9	e 7 3	+ 2	—	—	—	—	—
Harvard		66·1	357	i 10 16k	− 9	—	—	—	—	—
Williamstown		66·4	356	i 10 29	+ 2	—	—	—	—	—
Riverside	Z.	75·5	318	i 11 21	0	—	—	e 12 13	pP	—
Mount Wilson		76·1	318	i 11 25k	0	—	—	—	—	—
Pasadena		76·1	318	i 11 25k	0	—	—	e 12 18	pP	—
Haiwee	Z.	77·3	320	i 11 31	0	—	—	—	—	—
Santa Barbara	Z.	77·3	317	i 11 31	0	—	—	—	—	—
Rome		97·2	47	—	—	e 23 32	[+10]	e 24 27?	sS	—
Ksara		112·0	62	e 19 56	PP	e 29 32	PPS	e 21 37	PPP	—

May 13d. 12h. 58m. 58s. Epicentre 3°·0N .97°·0E. (as on 1938, December 2d.).

$A = -\cdot1217$, $B = +\cdot9912$, $C = +\cdot0520$; $\delta = -1$; $h = +7$;
$D = +\cdot993$, $E = +\cdot122$; $G = -\cdot006$, $H = +\cdot052$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Medan		1·8	71	i 0 32	0	i 0 57	+ 1	—	—	—
Batavia		13·4	134	2 47	−27	—	—	—	—	—
Colombo	E.	17·5	283	e 4 32	PPP	—	—	—	—	—
Phu-Lien		20·1	28	e 4 55	PP	e 8 2	−17	—	—	—
Kodaikanal	E.	20·7	293	e 5 2?	PP	—	—	—	—	—
Calcutta	N.	21·2	338	e 3 33	?	i 8 52	+11	i 5 20	PP	—
Manila		26·3	62	e 5 14	−25	11 13	SS	—	—	—
Bombay	N.	28·4	305	—	—	e 9 42	−63	—	—	—
Agra	E.	30·1	326	e 6 16	+ 3	i 11 15	+ 3	—	—	—
Andijan		43·7	332	e 8 9	+ 1	14 39	0	—	—	—
Almata		43·9	340	e 8 12	+ 2	—	—	—	—	—
Frunse		44·4	337	e 8 33	+19	—	—	—	—	—
Tchimkent		46·2	333	e 8 28	0	—	—	—	—	—
Irkutsk		49·5	7	—	—	e 15 47	−15	—	—	e 27·0
Tiflis		60·5	318	e 10 10	− 4	18 26	− 3	—	—	—
Sverdlovsk		61·0	339	e 10 22	+ 4	i 18 36	+ 1	—	—	e 32·3
Ksara		64·5	306	e 10 41	0	e 19 29	+10	—	—	—
Helwan	E.	67·5	302	e 10 12	−48	i 19 52	− 4	e 20 47	PS	—
Moscow		70·7	330	—	—	i 20 23	−11	—	—	48·5
Collmberg	Z.	83·9	322	e 12 28	− 5	—	—	—	—	—
Copenhagen		84·5	326	i 12 30	− 6	—	—	—	—	—
Mount Wilson		130·4	39	i 18 56	[−17]	i 22 7	SKP	i 21 5	PP	—
Pasadena		130·4	39	i 18 56	[−17]	i 22 5	SKP	—	—	—
Riverside	Z.	131·0	39	i 18 55	[−19]	i 22 5	SKP	—	—	—
La Jolla		131·8	40	—	—	i 22 10	SKP	—	—	—
Tucson		136·1	35	e 18 45	[−38]	—	—	21 41	PP	—

Additional readings :—
Batavia iN = +3m.18s.
Bombay eN = +10m.56s.
Agra iE = +11m.18s.
Sverdlovsk i = +11m.46s.
Collmberg iZ = +12m.59s.
Copenhagen i = +13m.2s.
Mount Wilson eZ = +19m.31s.
Pasadena iZ = +19m.31s.
Riverside eZ = +19m.32s.

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May 13d. Readings also at 0h. (Wellington and Tucson), 1h. (Andijan), 2h. (Bozeman, Butte, Wellington, Tucson, Fresno, near Lick, Berkeley, Santa Clara, and near Tinemaha), 3h. (Balboa Heights, Honolulu, Sarmarkand, Almata, Andijan, Frunse, Tchimkent, and Branner), 4h. (Chur, Strasbourg, and Triest), 5h. (Rome, Baku, Erevan, Ksara, Tiflis, Grozny, Collmberg, and Sverdlovsk), 6h. (Tucson), 8h. (Riverside, Pasadena, and Mount Wilson), 10h. (Tucson and Tashkent), 13h. (Tucson), 14h. (Collmberg), 15h. (Lick, San Francisco, Grozny, Branner, near Fresno, Berkeley, and Santa Clara), 19h. (Manila, Osaka, Tashkent, and Mizusawa), 20h. (Mizusawa, Santa Barbara, Haiwee, Tinemaha, Copenhagen, Grozny, Tucson, Riverside, Pasadena, Mount Wilson, and Sverdlovsk), 21h. (Mizusawa), 22h. (Andijan, Frunse, and Tchimkent).

May 14d. 18h. 12m. 20s. Epicentre 36°·5S. 179°·6E.

Felt in East Cape district from Tamanga to Wairoa, and Gisborne; V at Opotiki and Tolaga Bay.

Epicentre: 37°·5S. 180° (Wellington).
36°·5S. 179°·0E. (Gutenberg).

Dominion Observatory, Wellington, Seismological Report E 86, 1939, May, p.7.

$A = -\cdot8058$, $B = +\cdot0056$, $C = -\cdot5922$; $\delta = +5$; $h = 0$;
$D = +\cdot007$, $E = +1\cdot000$; $G = +\cdot592$, $H = -\cdot004$, $K = -\cdot806$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai		3·1	220	0 40?	−11	1 14	−15	—	—	—
Arapuni		3·5	243	e 0 46	−11	i 1 28	−12	—	—	1·8
Hastings		3·8	213	e 1 10?	P*	1 52	+ 5	—	—	—
New Plymouth		5·0	238	1 22	+ 4	2 22	+ 4	1 26	P*	—
Wellington		6·1	217	e 1 31	− 3	2 35	−10	1 43	P*	—
Christchurch		8·8	215	2 13	+ 2	3 37	−16	2 26	PPP	—
Sydney		23·3	268	e 3 40	?	e 9 4	−16	—	—	—
Riverview		23·4	268	i 5 12a	+ 1	—	—	—	—	e 10·9
Brisbane	N.	24·2	284	i 5 22	+ 3	i 9 52	+17	—	—	i 11·9
Adelaide		33·2	260	e 7 10	+30	e 11 52	− 8	e 14 29	SSS	—
Manila		75·0	301	i 11 44a	− 1	i 21 21	− 2	—	—	—
Medan	E.	84·8	278	—	—	e 22 46	[−13]	—	—	—
Santa Barbara	Z.	90·4	46	e 13 7	+ 3	—	—	—	—	—
La Jolla		90·8	49	i 13 8	+ 2	—	—	—	—	—
Berkeley		91·1	43	e 13 13	+ 5	e 23 33	[− 6]	—	—	e 40·7
Pasadena		91·1	48	i 13 9	+ 1	e 24 8	+ 4	i 16 46	PP	e 40·7
Mount Wilson	Z.	91·2	48	i 13 10	+ 2	—	—	—	—	—
Santa Clara		91·3	43	i 13 16	+ 7	i 24 22	+16	—	—	e 42·5
Riverside		91·5	48	i 13 10	0	—	—	e 16 53	PP	—
Ukiah		91·9	41	—	—	e 23 2	[−42]	—	—	e 42·8
Tinemaha		93·1	46	e 13 32	+15	—	—	—	—	—
Tucson		94·4	53	i 13 24k	+ 1	i 24 0	[+ 2]	i 14 23	pP	43·8
Victoria		98·6	35	—	—	e 24 4	[−16]	e 31 52	SS	47·7
Colombo	E.	101·9	270	—	—	e 24 10	[−26]	—	—	—
Irkutsk		110·0	321	e 18 40?	[+ 7]	e 25 4	[− 8]	e 28 22	PS	e 46·7
St. Louis		111·7	57	—	—	e 27 4	{+47}	e 29 59	PPS	e 46·6
Bombay	N.	114·3	277	—	—	e 25 40?	[+11]	—	—	e 56·7
Agra	E.	114·4	287	e 19 29	PP	i 29 23	PS	—	—	—
San Juan		120·0	88	—	—	e 25 50	[0]	e 37 5	SS	e 44·8
Philadelphia		122·8	62	—	—	e 37 13	SS	—	—	e 51·9
Frunse		123·7	302	e 19 7	[+ 7]	—	—	—	—	—
Ottawa		124·3	56	i 19 1	[0]	—	—	—	—	e 37·7
Andijan		124·5	299	e 18 58	[− 3]	—	—	—	—	—
Williamstown		125·4	60	e 19 2	[− 1]	—	—	—	—	—
Harvard		126·2	60	e 19 4	[− 1]	e 41 14	?	—	—	e 57·7
Tashkent		126·9	299	i 19 4	[− 2]	i 31 8	PS	e 20 54	PP	e 63·7
Sverdlovsk		135·2	318	e 19 20	[− 2]	e 31 52	PS	e 21 45	PP	e 56·7
Baku		140·9	293	e 19 53	[+21]	—	—	e 22 36	PP	67·7
Scoresby Sund		144·9	12	19 30	[− 9]	—	—	—	—	—
Tiflis		144·9	294	i 19 35	[− 4]	—	—	22 58	PP	e 70·7

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Moscow		148·0	318	e 19 45	[+ 1]	e 29 55	{−12}	e 23 10	PP	73·2
Pulkovo		149·5	330	e 19 44	[− 3]	e 30 4	{−11}	—	—	—
Ksara		150·3	276	e 19 47	[− 1]	—	—	e 23 19	PP	72·7
Helwan		152·7	266	i 20 0a	[+ 9]	—	—	e 24 0	PP	—
Copenhagen		158·9	341	e 19 59	[0]	—	—	—	—	—
Hamburg		161·5	342	e 20 1	[− 1]	—	—	—	—	e 83·7
Collmberg	z.	162·4	331	e 20 3	[0]	—	—	—	—	—
Cheb		163·6	329	—	—	e 31 40?	{+ 9}	—	—	—
De Bilt		163·9	346	20 2	[− 2]	—	—	i 24 41	PP	e 78·7
Kew		165·0	358	e 20 3	[− 3]	—	—	e 24 55	PP	e 77·7
Uccle		165·3	348	e 20 4	[− 2]	e 31 36	{− 3}	e 24 46	PP	e 79·7
Stuttgart		165·9	333	e 20 5	[− 1]	e 31 40	{− 2}	e 31 40?	L_g	e 82·7
Strasbourg		166·5	335	e 20 4	[− 3]	e 27 6	[− 3]	e 24 53	PP	e 79·7
Paris		167·5	350	i 20 9	[+ 1]	—	—	24 51	PP	83·7
Rome		168·9	300	e 20 10	[+ 2]	e 31 42	{−15}	e 24 56	PP	e 80·6
Clermont Ferrand		170·4	345	e 29 40?	PPP	—	—	—	—	—
San Fernando		175·3	88	—	—	e 33 57	?	—	—	92·7
Toledo		175·6	39	e 20 13	[+ 1]	—	—	e 25 44	PP	e 88·7

Additional readings :—
Tuai +52s.
Hastings +2m.5s.
New Plymouth +1m.37s. and +2m.12s.
Wellington +1m.59s. and +3m.1s., S_cS? = +9m.11s.
Christchurch +3m.22s. and +3m.33s.
Berkeley eNZ = +23m.58s.
Ukiah eS = +24m.22s.
Tucson i = +13m.46s., PP = +17m.12s., iPP = +17m.19s., ipS = +25m.10s., sS = +25m.42s.
Victoria e = +37m.16s.
Irkutsk e = +24m.40s.
San Juan eS = +29m.10s.
Tashkent e = +22m.1s. and +22m.20s.
Sverdlovsk i = +22m.46s.
Tiflis iPKPNZ = +19m.38s., ePPP = +26m.10s.
Moscow e = +20m.19s.
Helwan eE = +20m.25s.
Copenhagen e = +20m.11s.
Collmberg eZ = +20m.20s., iZ = +20m.50s.
De Bilt iZ = +20m.57s.
Kew eZ = +28m.57s.
Uccle iPKP = +21m.3s., eSKSP = +25m.32s.
Stuttgart $iPKP_2Z$ = +21m.6s., eZ = +24m.48s., e = +27m.52s., +32m.5s., +35m.46s., and +51m.40s.
Strasbourg $iPKP_2Z$ = +21m.9s., ePSKS = +35m.51s., SS = +45m.40s.
Rome ePSKS = +35m.56s., eSS = +45m.57s.
Toledo e = +20m.38s., $ePKP_2$ = +21m.50s.
Long waves were also recorded at College, Rio de Janeiro, Bidston, Edinburgh, and Kodaikanal.

May 14d. 23h. 35m. 57s. Epicentre 37°·0N. 23°·9W. (as on 1939 May 9d.).

$A = +·7320$, $B = -·3244$, $C = +·5992$; $\delta = +10$; $h = -1$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Bidston	21·9	35	—	—	e 8 55	+ 1	—
Kew	22·1	42	e 4 58	− 1	e 9 2	+ 4	—
Paris	22·5	51	e 5 4	+ 2	e 9 16	+11	12·1
Edinburgh	23·5	31	—	—	e 9 3?	−20	—
Uccle	24·4	45	e 5 21	0	e 9 41	+ 2	—
De Bilt	25·4	44	e 5 39	+ 8	e 9 57	+ 1	—
Strasbourg	25·8	53	—	—	e 10 14	+12	—
Stuttgart	26·7	54	—	—	e 10 3?	−14	e 16·0
Rome	28·4	69	e 6 3?	+ 5	—	—	—
Sverdlovsk	57·2	40	e 9 49	− 2	e 17 47	+ 1	28·0
Tucson	69·2	296	e 11 5	− 5	i 22 35	?	—

Long waves were also recorded at Stonyhurst.

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May 14d. Readings also at 0h. (Riverside, Mount Wilson, Pasadena, and Santa Barbara), 1h. (Balboa Heights and Tucson), 2h. (Tucson (2) and near Honolulu), 3h. (Almata and Tucson (2)), 4h. (Tucson (2)), 6h. (Triest, Kodaikanal, and Colombo), 7h. (Tucson), 8h. (near Medan, Wellington, Helwan, and Ksara), 9h. (Bombay and Tucson), 10h. (Tucson), 11h. (Tacubaya), 12h. (near Apia, Tucson, Ksara, Erevan, Grozny, Tiflis, and near Baku), 14h. (Moncalieri (2)), 15h. (Tucson), 16h. (Ksara), 17h. (Mizusawa), 18h. (Mizusawa and Tucson), 19h. (Sverdlovsk), 20h. (Tashkent, Ksara, Helwan, and Fort de France), 21h. (Fort de France), 22h. (Stuttgart).

May 15d. Readings at 5h. (near Sofia), 6h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, and near Apia), 7h. (Agra, Bombay, Colombo, Kodaikanal, Medan, and Sverdlovsk), 8h. (Irkutsk, Ksara, Tashkent, and Tucson), 9h. and 14h. (Cernauti), 18h. (Rathfarnham Castle and near Mizusawa), 19h. (near Grozny and Piatigorsk), 20h. (Honolulu, Tchimkent, Ksara, near Grozny, and Piatigorsk), 21h. (Pasadena, Riverside, Tinemaha, Tucson (2), Harvard, Williamstown, Philadelphia, Ottawa (2), Bermuda, San Juan, and La Paz), 22h. (Baku, Sverdlovsk, Grozny, Ksara, De Bilt, Strasbourg, Paris, Bidston, Kew, and near Fort de France).

May 16d. 4h. 5m. 16s. Epicentre 44°·5N. 3°·0E.

Intensity V-VI at Séverac-le-Chateau, V at Saint Laurent-d'Olt. Macroseismic area 5600 sq. kms. Macroseismic centre not very marked, earthquake relatively deep. Epicentre 44°30'N. 3°·0'E. (Strasbourg).

J. P. Rothé.
Les seismes ressenti en France en 1939. Etude geophysique et geologique.

See Annales de Physique du Globe de Strasbourg, Seismologie, t. 4, 1949, pp. 105-106. Carte macroseismique, p. 103.

$A = +\cdot7146$, $B = +\cdot0375$, $C = +\cdot6985$; $\delta = -4$; $h = -3$;
$D = +\cdot052$, $E = -\cdot999$; $G = +\cdot698$, $H = +\cdot037$, $K = -\cdot716$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Clermont-Ferrand	1·3	3	i 0 14	−11	i 0 44	0	i 0 29	P_g	—
Marseilles	2·1	125	e 0 49	P_g	e 1 2	− 2	—	—	—
Bagnères	2·5	235	i 0 33	−10	1 20	S*	i 0 43	P*	—
Neuchatel	3·7	47	e 1 1	+ 1	e 1 51	S*	—	—	—
Paris	4·3	356	—	—	e 2 12	S*	—	—	—
Basle	4·4	44	e 1 14	+ 4	e 2 14	S*	—	—	—
Zurich	4·9	51	e 1 20	+ 3	e 2 22	+ 7	—	—	—
Strasbourg	5·3	37	e 1 33	P*	i 2 23	− 2	i 1 45	P_g	—
Stuttgart	6·0	43	—	—	e 3 2	S*	3 16	S_g	—

Additional readings :—
Clermont Ferrand i = +23s., iS_g = +33s., i = +58s., and +1m.22s., e = +1m.36s.
Marseilles i = +56s., e = +1m.17s.
Bagnères iPP = +1m.2s., i = +1m.5s. and +1m.8s.
Strasbourg eE = +2m.1s., e = +2m.33s., iSS = +2m.44s., iSSS = +2m.57s., i = +3m.7s., e = +3m.25s., i = +3m.53s.
Stuttgart e = +3m.8s. and +3m.12s.

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May 16d. 7h. 20m. 12s. Epicentre 23°·9N. 121°·7E. (as on 1938 Nov. 21d.).

Whole island of Formosa was shaken, no serious damage; felt strongly at Arisan.

See Seismological Notes, Bulletin of the Seismological Society of America. Vol. 29, Berkeley, 1939, p. 516.

$A = -\cdot4809$, $B = +\cdot7787$, $C = +\cdot4029$; $\delta = -3$; $h = +4$;
$D = +\cdot851$, $E = +\cdot525$; $G = -\cdot212$, $H = +\cdot343$, $K = -\cdot915$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arisan		0·9	245	0 20	0	0 29	− 5	—	—	—
Giran		0·9	3	0 12	− 8	0 30	− 4	—	—	—
Taityu		1·0	285	0 24k	+ 3	0 41	+ 5	—	—	—
Taihoku		1·1	352	i 0 28	+ 6	0 48	+ 9	—	—	—
Taito		1·3	204	0 21k	− 4	0 33	−11	—	—	—
Tainan		1·6	237	0 31	+ 1	0 51	0	—	—	—
Kosyun		2·1	205	0 32a	− 5	0 57	− 7	—	—	—
Miyakozima		3·4	75	1 0k	+ 5	1 40	+ 3	—	—	—
Hong Kong		7·1	258	1 47	− 1	3 7	− 3	—	—	3·7
Zi-ka-wei		7·2	358	e 1 56	+ 7	3 30	S*	—	—	—
Nake		8·3	56	2 6	+ 2	3 41	+ 1	—	—	—
Manila		9·3	184	i 2 14k	− 3	i 4 12	+ 7	—	—	—
Yakusima		10·2	49	2 38	+ 7	4 44	+17	—	—	—
Kagosima		11·0	44	2 39	− 3	6 0	SSS	—	—	—
Miyazaki		11·7	45	3 0	PP	5 24	SSS	—	—	—
Hukuoka		12·3	36	3 11	+12	7 48	?	—	—	—
Izuka		12·5	37	3 7	+ 5	6 26	+63	—	—	—
Husan		12·9	28	3 21	PP	7 26	L	—	—	(7·4)
Matuyama		13·9	42	3 21	0	6 9	SS	—	—	—
Hirosima		14·0	40	3 34	PP	6 20	SS	—	—	—
Koti		14·1	44	3 50	PPP	6 30	SSS	—	—	—
Zinsen		14·2	16	3 27	+ 3	6 25	SS	—	—	—
Phu-Lien		14·3	260	e 3 23	− 3	6 37	SSS	—	—	7·3
Osaka		16·1	45	3 52	+ 3	7 14	SS	4 19	PPP	—
Nagoya		17·4	46	4 22	PP	7 56	SSS	—	—	—
Tokyo Cen. Met. Ob.		19·6	48	4 48	+16	—	—	—	—	—
Palau		20·6	142	4 40	− 3	8 25	− 4	—	—	—
Sendai		21·8	44	5 1	+ 5	9 10	+18	—	—	—
Mizusawa		22·4	42	e 5 3	+ 1	9 13	+ 9	—	—	—
Medan		30·0	233	i 6 12	0	11 20	+10	—	—	i 15·2
Calcutta		30·7	275	e 5 27	−52	i 11 21	0	i 13 34	SSS	e 16·4
Batavia		33·2	208	i 6 36	− 4	i 11 54	− 6	—	—	—
Hyderabad		40·9	270	7 44	− 2	13 56	− 2	9 12	PP	19·7
Almata		41·4	310	e 7 52	+ 2	—	—	—	—	—
Semipalatinsk		41·5	321	7 52	+ 2	—	—	—	—	—
Frunse		43·0	309	8 7	+ 4	14 34	+ 5	—	—	—
Colombo	E.	43·5	255	8 5	− 2	14 39	+ 3	—	—	21·1
Kodaikanal	E.	44·2	261	i 8 13a	+ 1	i 15 8	+22	18 23	SSS	22·3
Andijan		44·4	305	e 8 17	+ 3	14 51	+ 2	—	—	—
Bombay		45·6	274	8 24	0	e 15 4	− 2	10 12	PP	22·4
Tchimkent		46·6	307	e 8 33	+ 1	i 15 18	− 3	—	—	—
Samarkand		48·4	303	8 49	+ 3	15 46	0	—	—	—
Sverdlovsk		54·6	324	i 9 33	+ 1	i 17 10	− 1	i 27 54	L_q	i 33·2
Brisbane	N.	59·4	147	—	—	i 18 6	− 9	—	—	i 33·5
Baku		61·4	305	i 10 23	+ 3	i 18 46	+ 6	—	—	32·8
Grozny		64·0	309	10 21	−17	e 18 55	−18	—	—	—
Tiflis		65·0	307	i 10 45	+ 1	19 30	+ 4	e 20 6	PS	e 36·8
Moscow		67·3	323	i 10 57	− 2	19 49	− 5	—	—	e 33·3
College		68·8	27	e 11 1	− 7	e 20 13	+ 2	—	—	e 28·9
Pulkovo		70·3	328	e 11 17	0	e 20 26	− 3	—	—	e 34·5
Ksara		73·8	300	i 11 39a	+ 1	e 21 13	+ 4	e 21 43	PS	—
Upsala		76·4	331	e 12 15	+22	e 21 33	− 5	—	—	—
Sitka		77·0	33	e 11 49	− 7	e 21 45	0	e 27 41	SS	—
Bucharest		77·5	313	e 12 1	+ 2	22 52	PPS	28 6	SS	42·8
Helwan		78·8	298	i 12 5k	− 1	22 0	− 4	15 18	PP	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Copenhagen		80·7	328	i 12 17a	+ 1	22 22	− 2	—	—	39·8
Scoresby Sund		82·4	349	12 26	+ 1	—	—	—	—	—
Collmberg		82·6	324	i 12 26a	0	—	—	e 15 40	PP	e 43·1
Hamburg		83·0	327	e 12 28a	0	e 23 32	PS	—	—	43·8
Jena		83·5	323	e 12 30	− 1	—	—	—	—	e 43·8
Göttingen		83·7	325	e 12 48?	+16	—	—	—	—	e 50·8
Triest		84·9	318	e 13 15	+37	e 23 2	− 4	e 23 44	PS	—
Stuttgart		86·0	323	i 12 43a	0	e 23 14	− 3	e 16 5	PP	e 43·8
De Bilt		86·3	327	—	—	i 29 33	SS	—	—	40·8
Aberdeen	E.	86·5	333	—	—	e 23 18	− 4	—	—	—
Strasbourg		86·9	323	i 12 48a	0	e 23 24	− 2	e 16 8	PP	e 39·8
Uccle		87·4	327	e 12 50a	0	e 23 28	− 2	e 16 13	PP	41·8
Rome		87·5	314	i 12 49a	− 2	i 23 29	− 2	i 16 17	PP	30·3
Victoria		87·5	37	—	—	e 26 6	?	—	—	39·8
Durham		87·8	331	—	—	i 23 32	− 2	—	—	—
Edinburgh		87·8	333	e 13 18	+26	e 23 37	+ 3	—	—	e 42·8
Kew		89·4	328	i 12 58	− 2	e 23 47	− 2	e 16 35	PP	e 42·8
Paris		89·6	325	e 13 1	0	25 20	PPS	16 33	PP	47·8
Rathfarnham Castle		90·9	332	e 12 8	−59	e 22 38	[−60]	e 19 11	PPP	e 42·7
Clermont Ferrand		91·2	322	e 13 8	0	—	—	—	—	—
Tinemaha		97·2	44	e 13 26	−10	—	—	—	—	—
Mount Wilson	Z.	99·0	47	e 13 44	0	—	—	—	—	—
Pasadena		99·0	47	e 13 43	− 1	—	—	e 17 33	PP	e 45·5
Riverside	Z.	99·6	47	e 13 40	− 6	—	—	e 17 39	PP	—
Tucson		104·9	44	e 14 16	+ 6	i 27 38	PS	18 23	PP	e 44·3
Florissant	N.	110·8	26	—	—	e 28 58	PS	—	—	55·8
St. Louis		111·0	26	—	—	e 28 42	PS	—	—	e 49·8
Harvard	N.	112·8	10	—	—	e 29 12	PS	—	—	e 58·8
Philadelphia		114·6	14	—	—	e 28 55	PS	—	—	e 53·4
La Paz	Z.	168·2	53	20 10	[+ 2]	—	—	—	—	—

Additional readings :—
Taihoku i = +35s.
Zi-ka-wei iZ = +2m.46s., iE = +4m.26s., iN = +4m.56s., iE = +5m.24s.
Osaka SS = +7m.57s.
Calcutta eSSSN = +14m.4s.
Batavia iPEN = +6m.39s., iE = +9m.20s.
Hyderabad SSE = +17m.12s.
Bombay PSEN = +15m.22s., SSE = +18m.34s., SSN = +18m.45s., SSSEN = +19m.4s.
Tiflis eSZ = +19m.35s., eSSZ = +24m.1s., eEZ = +27m.13s.
Ksara SS = +26m.3s.
Sitka iS_cS = +22m.8s., eSSS = +29m.42s.
Bucharest ePE = +12m.32s., SE = +23m.12s., PSE = +23m.34s.
Helwan iZ = +13m.23s., SE = +22m.27s., PSE = +23m.8s., SSE = +27m.59s., SSSE = +31m.18s.
Collmberg i = +12m.43s., +12m.59s., and +13m.8s., e = +14m.17s., +14m.28s., +15m.33s., and +17m.15s.
Stuttgart $ePcPZ$ = +13m.7s., e = +17m.18s., ePS = +22m.8s.
Uccle eSSE = +29m.29s.
Rome SS = +29m.18s.
Kew eL_qE = +35m.48s.
Rathfarnham Castle e = +14m.51s.
Mount Wilson eZ = +16m.47s. and +22m.44s.
Pasadena eZ = +16m.46s.
Tucson iPP = +18m.34s., PPP = +20m.10s.
Long waves were also recorded at Berkeley, Bermuda, Prague, Rio de Janeiro, Bidston, Heligoland, Toledo, Williamstown, and Cheb.

May 16d. Readings also at 0h. (near Hukuoka), 2h. (near Rome), 4h. (Balboa Heights, Riverside, Tinemaha, Mount Wilson, Pasadena, Collmberg, and Tucson), 7h. (Zurich, Samarkand, near Belgrade, near Triest, Rome, Collmberg, Christchurch, Andijan, and Tiflis), 8h. (San Francisco, near Andijan, near Fort de France (3), and near Berkeley), 9h. (Grozny), 10h. (near Fort de France (2)), 13h. (La Plata, Tacubaya, Guadalajara, La Paz, and Tucson), 14h. (Tucson, Christchurch, Pasadena, Mount Wilson (2), Tinemaha, Riverside (2), Wellington, Sverdlovsk, Mizusawa, Zi-ka-wei, New Plymouth, Tashkent, and Irkutsk), 15h. (Mizusawa, Berkeley, Butte, East Machias, Chicago, Santa Clara, and Harvard), 19h. (Fordham), 22h. (Brisbane and Mizusawa), 23h. (Stuttgart, Strasbourg, La Jolla, Apia, Ksara, Collmberg, Uccle, Sverdlovsk, Wellington, Riverside, Tinemaha, Mount Wilson, Pasadena, Christchurch, Tucson, Rome, and Tiflis).

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May 17d. 0h. 16m. 2s. Epicentre 11°·2S. 163°·9E. (as on 1939 March 21d.).

$A = -\cdot9427$, $B = +\cdot2721$, $C = -\cdot1930$; $\delta = -3$; $h = +6$;
$D = +\cdot277$, $E = +\cdot961$; $G = +\cdot185$, $H = -\cdot054$, $K = -\cdot981$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		25·4	204	e 6 10	PP	e 11 28	SSS	—	—	e 13·5
Adelaide		33·0	220	e 6 57	+18	e 12 57	+60	—	—	e 16·5
Manila		49·7	300	8 56	+ 8	11 31	PPP	—	—	—
Kohu		52·4	334	9 35	+19	—	—	—	—	—
Osaka		52·9	330	9 23	+ 3	—	—	—	—	—
Miyazaki		53·0	326	9 11	−10	—	—	—	—	—
Nagano		53·4	334	9 23	− 1	17 0	+ 5	—	—	—
Mizusawa	E.	54·4	339	(9 28)	− 3	9 28	P	—	—	—
Irkutsk		81·2	327	e 12 26	+ 7	e 21 58?	−31	—	—	e 33·0
Sitka		84·2	28	e 12 34	0	e 23 5	+ 6	e 33 1	?	e 35·4
Pasadena	Z.	86·4	54	e 12 45	0	—	—	—	—	—
Mount Wilson		86·5	54	i 12 45	− 1	—	—	—	—	—
La Jolla	Z.	86·8	55	e 12 48	+ 1	—	—	—	—	—
Riverside		87·0	54	i 12 49	+ 1	—	—	—	—	—
Haiwee		87·1	52	e 12 54	+ 5	—	—	—	—	—
Tinemaha		87·2	51	e 12 52	+ 3	—	—	—	—	—
Tucson		91·9	57	13 12	+ 1	—	—	16 30	PP	—
Tashkent		100·7	310	e 16 57	PP	i 27 0	PS	—	—	—
Sverdlovsk		106·6	326	e 14 16	P	—	—	e 17 9	?	48·0
Tiflis		119·0	312	e 20 11	PP	e 30 4	PPP	—	—	e 60·6
Ksara		127·6	304	e 19 12	[+ 5]	e 28 16	{+12}	i 21 14	PP	—
Hamburg		132·9	339	e 20 58	PP	—	—	—	—	—
Collmberg	Z.	133·5	334	e 19 20	[+ 1]	—	—	e 21 53	PP	—
De Bilt	Z.	135·7	341	i 22 2	PP	e 34 58?	PPS	—	—	—
Stuttgart		137·0	336	e 19 28	[+ 3]	—	—	e 22 8	PP	e 46·0
Uccle	Z.	137·1	342	e 19 26	[+ 1]	—	—	e 22 9	PP	—
Strasbourg		137·8	337	e 19 29	[+ 3]	—	—	e 22 6	PP	e 42·0
Paris		139·4	342	e 19 33	[+ 4]	—	—	e 22 28	PP	36·0
Rome		140·5	323	e 19 28	[− 3]	e 35 41	?	e 22 2	PP	—

Additional readings:—
Tucson ePPP = +18m.16s.
Tashkent i = +17m.57s.
Tiflis ePPE = +20m.15s.
Collmberg eZ = +22m.51s.
Stuttgart e = +24m.58s.
Rome e = +38m.52s.
Long waves were also recorded at Melbourne.

May 17d. 15h. 10m. 33s. Epicentre 2°·5S. 147°·5E.

$A = -\cdot8426$, $B = +\cdot5368$, $C = -\cdot0433$,; $\delta = 0$; $h = +7$;
$D = +\cdot537$, $E = +\cdot843$; $G = +\cdot037$, $H = -\cdot023$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		31·3	304	e 6 20	− 4	12 6	+35	—	—	—
Riverview		31·4	174	e 7 27	PP	e 12 51	SS	—	—	e 16·5
Adelaide		33·3	193	i 6 42	+ 1	i 11 56	− 6	—	—	e 18·1
Kobe		38·8	345	8 38	PP	12 46	−40	—	—	—
Nagano		39·9	349	7 39	+ 2	13 50	+ 7	—	—	—
Hong Kong		40·8	310	7 45	0	13 56	0	17 0	SS	—
Zi-ka-wei	Z.	41·7	326	e 7 53	+ 1	i 14 27	+17	i 18 53	SSS	20·8
Mizusawa	E.	41·8	354	(7 57)	+ 4	7 57	P	—	—	—
Perth		41·8	222	—	—	i 14 0	−11	i 18 5	SSS	22·1
Arapuni		43·8	148	—	—	14 45	+ 5	—	—	e 18·5
Wellington		45·8	151	—	—	15 7	− 2	18 37	L_q	22·7
Christchurch		46·6	155	8 28	− 4	i 15 18	− 3	19 50	L_q	e 22·6
Medan		49·2	278	i 8 52	0	i 15 58	0	i 10 13	PP	—
Calcutta	N.	62·8	297	—	—	e 20 28	?	—	—	—
Irkutsk		65·6	333	e 10 48	0	e 19 26	− 7	—	—	32·5

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	68·1	278	e 10 57	− 7	—	—	—	—	—
Kodaikanal	E.	70·8	283	e 8 27?	?	—	—	—	—	—
Agra	E.	73·0	300	e 11 29	− 4	e 20 55	− 5	25 44	SS	—
Bombay	N.	76·3	290	e 10 38	?	i 21 42	+ 5	14 19	PP	—
Frunse		79·3	315	e 13 22	+73	—	—	—	—	—
Andijan		80·4	312	e 13 16	+61	—	—	—	—	—
Tchimkent		82·7	314	e 13 22	+55	—	—	—	—	—
Tashkent		82·8	312	e 14 27	?	e 22 39	− 6	—	—	e 38·3
Samarkand		84·3	310	e 12 51	+16	—	—	—	—	—
Sitka		85·1	32	e 12 47	+ 8	23 15	+ 7	—	—	e 35·2
Sverdlovsk		90·4	328	e 13 35	+31	e 24 2	+ 4	30 6	SS	40·5
Ukiah		91·0	51	e 23 38	S	(e 23 38)	[− 1]	e 30 40	SS	e 38·2
Victoria		91·3	42	—	—	e 23 33	[− 8]	—	—	e 42·5
Santa Clara	E.	91·9	52	—	—	e 26 34	PPS	—	—	e 43·6
Pasadena	Z.	95·0	55	e 13 24	− 2	—	—	—	—	e 46·5
Mount Wilson		95·1	55	i 13 25	− 1	—	—	e 17 10	PP	—
Riverside	Z.	95·6	55	e 13 29	+ 1	—	—	e 17 20	PP	—
Baku		97·4	310	e 18 1	PP	e 26 45	PS	—	—	41·5
Tiflis		101·1	312	e 18 2	PP	24 38	[+ 6]	e 19 53	PPP	e 49·5
Moscow		103·2	327	e 18 7	PP	—	—	—	—	55·0
Ksara		109·3	305	e 19 1	PP	e 28 41	PS	e 21 34	PPP	—
Cheb		119·3	330	—	—	e 41 27?	SSS	—	—	e 55·5
Stuttgart		121·7	330	e 20 30	PP	e 43 27	?	—	—	e 67·5
Strasbourg		122·6	331	e 20 41	PP	—	—	—	—	e 65·5
Rome		123·8	321	e 20 47	PP	e 27 5	{−34}	e 37 35	SS	e 63·0
Paris		125·0	332	e 19 48	[+46]	—	—	—	—	72·5

Additional readings :—
Riverview eE = +8m.27s.
Adelaide e = +15m.15s.
Perth i = +15m.30s., +19m.32s., and +21m.32s.
Agra iE = +22m.47s.
Bombay eEN = +17m.59s., iN = +21m.59s.
Ukiah eSSS = +35m.33s.
Tiflis ePPE = +18m.7s., ePPPZ = +19m.56s.
Rome e = +51m.35s. and +57m.25s.
Long waves were also recorded at Berkeley, Florissant, Hamburg, Uccle, and De Bilt.

May 17d. 18h. 30m. 32s. Epicentre 23°·0N. 142°·5E.

A = −·7310, B = +·5609, C = +·3885; $\delta = -10$; $h = +4$;
D = +·609, E = +·793; G = −·308, H = +·237, K = −·921.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatidyozima	10·4	347	2 34	0	5 4	SSS	—	—	—
Siomisaki	12·0	332	3 0	+ 5	5 24	SS	—	—	—
Osima	12·1	348	2 53	− 4	6 15	L	—	—	(6·2)
Tokyo Cen. Met. Ob.	12·9	350	3 5	− 2	5 27	− 6	6 4	SS	—
Nagoya	13·1	339	3 12	+ 2	6 45	L	—	—	(6·7)
Osaka	13·1	334	3 12	+ 2	5 49	+11	3 31	PP	7·5
Miyazaki	13·2	315	3 22	PP	6 1	SS	—	—	—
Nagano	14·1	346	3 23	0	6 32	SSS	—	—	—
Toyooka	14·2	334	3 27	+ 3	6 39	SSS	—	—	—
Kumamoto	14·3	316	3 34	+ 8	6 18	SS	—	—	—
Nagasaki	14·8	314	3 41	+ 9	6 35	SS	—	—	—
Hamada	15·0	325	3 40	+ 5	6 47	SS	—	—	—
Hukuoka	15·0	318	3 48	+13	6 53	SS	—	—	—
Wazima	15·1	343	3 34	− 2	7 6	SSS	—	—	—
Mizusawa	16·1	356	i 3 49	0	i 7 4	SS	—	—	—
Akita	16·8	354	3 59	+ 1	7 22	SS	—	—	—
Hatinohe	17·5	357	4 5	− 2	7 30	+ 9	—	—	—
Taihoku	19·3	281	4 48	PP	—	—	—	—	—
Zinsen	19·9	320	4 39	+ 3	8 19	+ 4	—	—	—
Sapporo	20·0	358	4 37	0	8 31	+14	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		20·4	299	e 4 50	+ 9	8 40	+15	i 5 8	PP	12·6
Manila		22·0	251	i 5 5k	+ 7	9 15	+19	—	—	—
Hong Kong		26·1	275	5 48	+11	9 49	−18	12 24	SSS	—
Phu-Lien		33·3	274	6 50	+ 9	e 12 28	+26	—	—	23·7
Irkutsk		41·3	325	i 7 51	+ 2	i 14 3	− 1	—	—	19·5
Batavia		45·5	234	8 25	+ 2	e 15 9	+ 4	—	—	—
Medan		46·6	253	8 21	−11	i 15 6	−15	—	—	26·5
Calcutta	N.	49·7	281	e 8 58	+ 2	i 16 10	+ 6	i 10 48	PP	i 24·2
Honolulu		55·0	79	e 9 34	− 1	e 17 2	−15	e 12 11	PP	e 22·5
Semipalatinsk		55·0	317	9 37	+ 2	17 16	− 1	—	—	—
Almata		57·1	309	9 53	+ 3	—	—	—	—	—
Riverview		57·1	171	e 9 51	+ 1	i 17 47	+ 2	—	—	e 26·3
Sydney		57·2	171	—	—	e 17 28	−18	e 24 18	SSS	e 29·0
Dehra Dun	N.	57·4	293	e 10 34	+41	i 18 28	PPS	e 24 5	SSS	e 29·0
Adelaide		57·7	184	e 10 3	+ 8	i 18 16	PS	i 13 28	PPP	e 27·7
Apia		57·8	124	e 10 12	+17	e 24 58?	SSS	—	—	—
Agra	E.	58·0	289	e 9 57	0	17 58	+ 1	10 14	pP	—
Frunse		58·8	308	10 9	+ 7	i 18 17	+10	—	—	33·7
Hyderabad		60·0	277	10 25	+14	18 33	+10	12 53	PP	28·9
Perth		60·3	205	—	—	i 18 58	PPS	—	—	i 32·9
Andijan		60·6	305	10 18	+ 3	i 18 40	+10	—	—	—
College		60·8	27	e 10 11	− 5	e 18 21	−12	e 22 23	SS	e 24·5
Colombo		62·2	266	10 32	+ 6	18 53	+ 2	—	—	—
Tchimkent		62·5	307	10 29	+ 1	i 18 59	+ 5	—	—	—
Tashkent		62·8	306	i 10 32	+ 2	i 19 6	+ 8	—	—	29·4
Kodaikanal	E.	63·2	271	e 10 39k	+ 7	i 19 11	+ 8	i 19 36	PS	i 29·9
Bombay		64·7	281	10 48	+ 6	i 19 30	+ 8	e 13 18	PP	35·9
Samarkand		64·8	304	10 42	− 1	19 29	+ 6	—	—	—
Sverdlovsk		66·7	325	i 10 56	+ 1	i 19 46	0	34 16	L_g	37·5
Sitka		66·8	36	e 10 29	−27	e 19 20	−28	e 23 42	SS	e 25·8
Arapuni		68·3	152	—	—	19 58	− 8	24 28	SS	28·5
Wellington		70·6	155	11 19a	0	20 25	− 8	13 42	PP	28·5
Christchurch		71·8	157	i 11 24a	− 2	20 38	− 8	i 25 19	SS	e 33·7
Victoria		75·8	43	i 11 31	−19	i 21 2	−29	21 34	PS	e 31·5
Baku		77·4	309	i 12 3	+ 5	i 21 52	+3	—	—	39·5
Ukiah		79·0	52	e 12 8	+ 1	e 21 59	− 7	e 30 43	SSS	e 39·0
Grozny		79·3	313	11 50	−19	21 50	−19	—	—	31·5
Moscow		79·3	327	e 12 8	− 1	22 5	− 4	—	—	40·0
Berkeley		80·2	53	i 12 8	− 6	i 22 8	−11	e 35 40	L_g	e 36·7
Tiflis		80·5	312	e 12 16	+ 1	i 22 26	+ 4	15 36	PP	e 38·5
Santa Clara		80·6	53	e 12 17	+ 1	i 22 14	− 9	—	—	—
Lick		80·8	53	e 12 12	− 5	e 22 14	−11	—	—	—
Pulkovo		80·8	332	e 12 17	0	22 22	− 3	—	—	e 39·2
Erevan		81·3	310	e 12 27	+ 7	e 22 35	+ 5	—	—	—
Fresno	N.	82·4	53	e 12 23	− 2	e 22 30	−11	—	—	—
Sotchi		83·2	314	e 12 23	− 6	—	—	—	—	—
Santa Barbara		83·4	55	i 12 26	− 4	i 22 43	− 8	—	—	—
Tinemaha		83·4	53	i 12 26	− 4	e 22 42	− 9	—	—	—
Butte		83·5	42	e 12 34	+ 3	e 22 45	− 7	—	—	e 34·5
Haiwee		84·0	53	i 12 29	− 4	e 22 47	−10	—	—	—
Bozeman		84·6	42	e 12 37	+ 1	22 54	− 9	e 28 1	SS	e 33·7
Mount Wilson		84·7	55	i 12 31	− 6	e 22 47	−17	—	—	—
Pasadena		84·7	55	i 12 31	− 6	i 22 52	−12	—	—	e 35·7
Riverside		85·3	55	i 12 34	− 6	e 22 57	[− 6]	—	—	—
Scoresby Sund		85·8	355	i 12 44	+ 2	23 4	[− 2]	16 4	PP	—
La Jolla		85·9	56	e 12 38	− 5	e 22 57	[−10]	—	—	—
Upsala		86·0	336	i 16 4	PP	e 23 10	[+ 2]	—	—	e 43·5
Cernauti		89·2	324	e 12 59	0	23 41	− 6	16 35	PP	46·5
Bergen		89·9	340	i 16 33	PP	—	—	—	—	e 44·5
Ksara		90·2	307	i 13 6	+ 2	i 25 11	PS	i 16 45	PP	—
Copenhagen		90·9	334	i 13 4a	− 3	23 35	[− 3]	i 16 45	PP	45·5
Tucson		91·0	53	i 13 3k	− 4	i 23 37	[− 2]	i 16 38	PP	e 35·9
Bucharest	N.	91·3	320	e 13 14a	+ 5	23 33	[− 8]	—	—	39·5
Istanbul		91·3	316	13 50	+41	26 24	?	17 40	?	—
Budapest		93·4	325	13 16	− 2	e 23 48	[− 4]	i 17 4	PP	e 46·5

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hamburg		93·4	334	e 13 23	+ 5	i 23 49	[− 3]	i 17 4	PP	e 46·5
Kecskemet	Z.	93·4	324	i 13 25	+ 7	—	—	e 17 1	PP	—
Collmberg		93·8	331	i 13 18a	− 2	e 23 50	[− 5]	i 17 5	PP	e 47·0
Heligoland		93·8	335	e 16 59	PP	e 24 3	[+ 8]	e 31 12	SSP	e 46·5
Sofia		93·9	320	e 13 24	+ 3	23 58	[+ 3]	—	—	—
Prague		94·0	329	i 17 9	PP	e 23 52	[− 4]	—	—	e 46·5
Belgrade		94·7	322	e 13 23a	− 1	e 23 53	[− 6]	i 17 15	PP	e 48·3
Jena		94·7	331	e 13 28	+ 4	—	—	e 17 7	PP	e 44·5
Aberdeen		94·8	341	e 13 51	+26	i 23 55	[− 5]	i 17 3	PP	42·5
Cheb		94·9	330	e 13 22	− 3	e 24 28?	− 9	e 17 17	PP	e 48·5
Göttingen		94·9	333	e 13 40	+15	—	—	e 17 17	PP	e 52·5
Helwan		95·5	305	13 28	0	24 3	[− 1]	17 25	PP	—
Ivigtut		95·7	5	—	—	23 52	[−13]	—	—	40·5
Lincoln		96·0	36	e 16 42	?	e 23 55	[−12]	e 18 50	?	38·6
Edinburgh		96·2	341	e 17 34	PP	—	—	—	—	44·5
De Bilt		96·5	335	e 13 35	+ 3	i 24 7	[− 2]	i 17 28	PP	48·7
Durham	E.	96·7	340	e 16 1	?	i 24 25	[+15]	—	—	—
Stuttgart		97·3	331	i 13 35a	− 1	e 24 10	[− 3]	i 17 35	PP	e 49·5
Triest		97·3	326	e 13 42	+ 6	e 24 7	[− 6]	i 17 34	PP	48·5
Stonyhurst		97·7	340	e 17 38	PP	—	—	—	—	e 45·0
Uccle		97·8	331	e 13 37	− 1	e 24 13	[− 3]	i 17 37	PP	e 47·5
Strasbourg		98·1	331	i 13 39a	− 1	e 24 58	− 6	e 17 38	PP	e 49·5
Bidston		98·3	340	e 13 46	+ 6	i 24 38	[+20]	i 18 8	PP	—
Chur		98·5	330	e 13 41	− 1	—	—	e 17 42	PP	—
Zurich		98·6	330	e 13 53	+11	—	—	e 17 35	PP	—
Basle		98·9	331	e 13 42	− 1	—	—	e 17 42	PP	—
Kew		99·0	337	e 13 43	− 1	i 24 17	[− 5]	i 17 47	PP	e 48·5
Rathfarnham Castle		99·4	341	e 11 25	?	—	—	i 18 47	?	e 48·7
Neuchatel		99·6	331	—	—	—	—	e 17 18	PP	—
Paris		100·1	334	e 13 50	+ 1	e 27 52	PPS	i 17 56	PP	51·5
Chicago		100·5	35	—	—	e 24 23	[− 6]	e 31 5	SS	e 42·0
Rome		100·6	324	e 13 50a	− 1	e 24 25	[− 4]	i 17 59	PP	e 48·0
Florissant		101·1	38	e 13 57	+ 1	i 24 24	[− 8]	—	—	—
Jersey		101·5	337	e 18 20	PP	e 28 8	PPS	—	—	49·3
Tananarive		101·6	255	—	—	24 35	[0]	27 19	PS	50·2
Little Rock		102·5	43	e 18 1	PP	e 24 43	[+ 4]	—	—	—
Clermont Ferrand		102·7	332	e 18 2	PP	e 24 28?	[−12]	—	—	e 51·5
Toronto		103·3	29	e 18 10	PP	e 24 40	[− 3]	e 32 46	SS	e 44·5
Ottawa		103·6	25	e 18 52	PP	e 24 52	[+ 8]	e 27 46	PS	41·5
Vermont		105·3	25	e 18 38	PP	e 24 55	[+ 3]	e 33 45	SS	e 43·0
Bagnères		105·7	332	e 18 36	PP	e 24 52	[− 2]	e 21 8	PPP	52·0
Williamstown		106·8	25	e 18 48	PP	—	—	—	—	e 50·0
East Machias		107·2	21	e 15 11	P	e 25 51	SKKS	e 19 19	PP	e 43·2
Harvard	N.	107·4	24	e 19 16	PP	—	—	—	—	—
Fordham		108·0	27	e 18 59	PP	i 26 25	S	i 34 7	SS	64·2
Georgetown		108·1	30	e 17 48	PKP	28 25	PS	33 30	SS	44·5
Philadelphia		108·2	29	e 18 33	PKP	e 24 52	[−13]	e 33 48	SS	—
Columbia		109·8	36	e 14 23	P	e 25 17	[+ 6]	e 33 20	SS	e 44·1
Toledo		110·1	333	e 18 56	[+23]	28 42	PS	—	—	e 42·5
Granada		112·1	331	18 28	[− 9]	—	—	—	—	58·3
San Fernando		113·9	333	e 19 42	PP	e 29 47	PPS	—	—	57·0
Bermuda		119·1	25	e 20 28	PP	e 30 28	PS	e 36 10	SS	e 47·5
Cape Town	E.	130·1	245	22 47	SKP	26 28	[+ 6]	39 1	SS	70·5
San Juan		130·3	35	e 19 16	[+ 4]	e 26 54	[+31]	e 23 6	?	e 52·1
Huancayo		142·4	79	e 19 52	[+17]	e 26 42	[− 1]	e 23 5	PP	59·6
La Paz		150·5	81	i 19 51a	[+ 3]	—	—	i 20 58	pPKP	76·5
Rio de Janeiro		174·8	90	e 25 55	PP	—	—	—	—	i 47·0

Additional readings :—
Osaka SS = +6m.16s.
Mizusawa iSN = +7m.7s.
Zi-ka-wei iE = +8m.52s., iN = +9m.4s., iZ = +9m.30s. and +11m.12s.
Hong Kong S = +10m.44s.
Phu-Lien SS = +21m.18s.
Batavia iSN = +15m.13s.
Medan iPEN = +8m.46s., iS?E = +15m.30s.

Continued on next page.

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Calcutta ePPPN = +11m.37s., ePSN = +16m.45s., eSSN = +19m.32s., eSSSN = +20m.54s.
Honolulu eSS = +21m.56s.
Riverview eE = +10m.2s., eN = +18m.7s.
Adelaide i = +24m.14s.
Agra iP = +10m.2s., PPE = +12m.6s., PPPE = +13m.31s., iN = +18m.3s., sSE = +18m.32s., S_cSE = +19m.40s., SS?E = +22m.17s., iE = +27m.9s.
Hyderabad P_cPN = +11m.23s., S_cSN = +20m.8s.
Kodaikanal iSSE = +23m.24s.
Bombay iEN = +11m.8s. and +11m.34s., eEN = +16m.4s., iEN = +19m.39s., iPPSEN = +20m.26s., iEN = +21m.35s., iSSEN = +23m.34s., iE = +24m.21s., eSSSN = +26m.49s., iN = +27m.34s., L_q?N = +28m.56s.
Sitka iS = +19m.40s.
Wellington P_cP = +11m.38s., eZ = +13m.18s., S_cS = +20m.57s., eEN = +21m.29s., eSS = +24m.56s.
Christchurch iNZ = +11m.32s., i = +11m.42s., iZ = +11m.58s., eZ = +18m.15s., iE = +21m.3s., iEN = +21m.35s., SSSN = +27m.59s., eZ = +29m.27s., L_qE = +29m.43s.
Victoria SSN = +25m.52s., SSSE = +29m.10s.
Berkeley iZ = +13m.18s., eN = +13m.22s.
Tiflis iZ = +12m.25s., iEZ = +12m.34s., PPPZ = +17m.14s., eE = +18m.16s., eZ = +18m.20s., eE = +22m.20s., iZ = +22m.42s., PSN = +23m.1s., ePSZ = +23m.5s., iE = +23m.46s., SSE = +28m.6s., SSSE = +31m.6s.
Tinemaha eN = +22m.56s.
Bozeman ePPS = +24m.3s., eSSS = +31m.53s.
Mount Wilson iZ = +12m.46s.
Pasadena iZ = +12m.47s., iEN = +23m.3s.
Scoresby Sund iS = +23m.18s.
Copenhagen eN = +24m.23s., PS = +25m.6s., PPS = +25m.40s., SS = +30m.16s.
Tucson i = +14m.55s., iPPP = +18m.33s., iS = +23m.59s., i = +24m.8s. and +24m.14s., iPS = +24m.41s., i = +25m.2s., iPPS = +25m.16s., iSS = +29m.58s., iSSS = +33m.40s.
Bucharest ePN? = +13m.25s., SN = +23m.50s.
Budapest ePE = +13m.24s.
Hamburg eN = +24m.6s.
Kecskemet eZ = +18m.36s.
Collmberg iZ = +14m.38s., e = +17m.38s., ePPP = +19m.4s., ePS = +25m.28s., eSS = +30m.28s., e = +30m.58s., eSSS = +34m.28s.
Heligoland ePPE = +17m.28s.
Sofia eE = +23m.10s.
Belgrade iNE = +25m.53s., iNW = +26m.47s.
Jena ePZ = +13m.34s., ePP = +17m.10s.
Aberdeen iEN = +17m.13s. and +17m.53s., iSSN = +31m.8s.
Cheb e = +30m.58s.
Helwan iZ = +14m.40s. and +18m.52s., eE = +21m.18s., iEN = +24m.19s., SKKSEN = +24m.37s., SE = +25m.3s., eEN = +26m.1s., SSE = +31m.52s.
Lincoln eSS = +30m.15s., eSSS = +34m.24s.
Stuttgart e = +18m.3s., +21m.8s., and +22m.51s., eSSEN = +31m.28s., eSSS = +35m.16s., e = +40m.4s.
Stonyhurst e = +21m.33s.
Uccle ePS = +26m.28s., eSS = +31m.51s.
Strasbourg iSSZ = +31m.9s.
Bidston eS = +25m.8s., ePS = +26m.32s., eSS = +32m.3s.
Kew eZ = +19m.53s., ePPPZ = +20m.27s., eSE = +25m.11s., ePSNZ = +26m.27s., ePPSZ = +27m.43s., eSSEN = +31m.59s., eSSSE = +35m.35s., eL_qEN = +40m.28s.
Chicago eSSS = +36m.26s.
Rome ePEN = +13m.54s., ePPPN = +21m.44s., iSN = +25m.56s., e = +26m.1s., ePS = +26m.42s., ePPS = +27m.42s., e = +28m.51s., eSS = +31m.54s., e = +33m.2s.
Florissant iE = +24m.34s., iN = +24m.37s.
Tananarive SS = +33m.16s.
Little Rock i = +18m.17s.
Toronto e = +25m.34s.
Ottawa eN = +28m.28s.?
Vermont ePPS = +28m.40s.
Bagnères eSKKSN = +25m.35s., eSN = +26m.18s., eSSE = +33m.35s.
East Machias ePPS = +28m.40s., eSS = +34m.30s.
Fordham eZ = +29m.35s.
Georgetown SSS = +38m.5s.
Philadelphia eS = +26m.52s.
Columbia eS = +26m.27s., eSSS = +36m.53s.
Toledo i = +19m.12s.
San Fernando e?N = +22m.47s.
Bermuda eSSS = +40m.40s.
Cape Town PPPE = +24m.25s., S_cPP_cSE = +28m.21s., SE = +29m.30s., SSSE = +44m.3s.
San Juan ePPS = +32m.54s.
Huancayo eSS = +40m.17s., eSSS = +46m.36s.
La Paz iPKP,Z = +20m.6s., isPKPZ = +22m.8s., SKPZ = +23m.16s., iZ = +23m.48s.
Rio de Janeiro eN = +26m.28s.
Long waves were also recorded at Algiers, La Plata, Moncalieri, and Ferndale.

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May 17d. Readings also at 0h. (Christchurch, Tashkent, La Paz, Harvard, Berkeley, and Wellington), 1h. (near Fort de France, Helwan, Ksara, Tucson, and Mount Wilson), 2h. (Andijan), 3h. (Mizusawa, near Fresno, near Lick, and Tucson), 4h. (near Almeria), 5h. (Mizusawa), 8h. (Andijan), 10h. (Balboa Heights (2) and Tucson), 12h. (Mizusawa), 13h. (New Plymouth, Mount Wilson, Wellington, and Riverside), 17h. (Sydney), 18h. (San Francisco, Branner, East Machias, Santa Clara, Tucson, near Fresno, Lick, Berkeley, and near Tinemaha), 19h. (Pasadena, Riverside, Mount Wilson, near La Paz, and Rome), 20h. (Collmberg), 21h. (Belgrade, Sofia, Grozny, Triest, Basle, Mizusawa, and Rome), 22h. (Lincoln and Manila).

May 18d. 9h. 31m. 13s. Epicentre 35°·6N. 140°·0E. (as on 1938 April 28d.).

Epicentre given by Earthquake Research Institute, Imperial University, Tokyo.

$A = -\cdot6243$, $B = +\cdot5239$, $C = +\cdot5795$; $\delta = +4$; $h = 0$;
$D = +\cdot643$, $E = +\cdot766$; $G = -\cdot444$, $H = +\cdot373$, $K = -\cdot815$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Komaba	0·2	281	0 15k	+ 5	0 24	+ 8
Tokyo Imp. Univ.	0·2	298	0 13	+ 3	0 21	+ 5
Mitaka	0·4	280	0 15	+ 2	0 25	+ 4
Kamakura	0·5	232	0 15	+ 1	—	—
Kiyosumi	0·5	162	0 13	− 1	0 22	− 1
Tukubasan	0·6	7	0 15	0	0 24	− 2
Titibu	0·8	297	0 13	− 5	0 28	− 3
Koyama	0·9	253	0 13	− 7	0 28	− 6
Susaki	1·2	222	0 22	− 2	0 40	− 1
Yosiwara	1·2	248	0 13	−11	0 29	−12
Mizusawa	3·7	14	e 0 59	− 1	e 1 37	− 8
Osaka	3·8	257	1 21	P_g	2 9	S_g

May 18d. Readings also at 2h. (Basle, Chur, Zurich, and Neuchatel), 4h. (Stuttgart, Strasbourg, Samarkand, and Andijan), 5h. (Riverview, Balboa Heights, and Lincoln), 7h. (Tucson), 8h. (Tiflis), 9h. (Lincoln), 12h. (Tucson), 13h. (Tucson and Balboa Heights), 14h. (La Paz), 15h. (Balboa Heights), 16h. (Honolulu and Balboa Heights), 17h. (Tucson, Sitka, College, Tashkent, Sverdlovsk, Mount Wilson, and Riverside), 18h. (Andijan and Tchimkent), 20h. (Riverside, Mount Wilson, Tiflis, Sverdlovsk, Tashkent, Pasaadena, Christchurch, Rome, and Baku), 21h. (Osaka, Mizusawa, and Bucharest), 22h. (Andijan, Tashkent, Tucson, and Frunse), 23h. (Mizusawa Mount Wilson, and Riverside).

May 19d. 12h. Local Japanese shock. Tokyo Imperial University gives Epicentre 34°·54N. 140°·48E.

Kiyosumi P = 10m.24s., S = 10m.35s.
Koyama P = 10m.24s., S = 10m.43s.
Titibu P = 10m.24s., S = 10m.51s.
Yosiwara P = 10m.24s., S = 10m.46s.
Susaki P = 10m.39s., S = 10m.56s.
Komaba P = 10m.42s., S = 11m.3s.
Tokyo Imp. Univ. P = 10m.42s., S = 11m.3s.
Kamakura P = 10m.43s., S = 11m.3s.
Mitaka P = 10m.43s., S = 11m.6s.
Tukubasan P = 10m.43s., S = 10m.59s.
Osaka P = 11m.14s., S = 12m.8s.
Mizusawa ePE = 11m.30s., eSN = 12m.19s.
Mount Wilson iPZ = 22m.14s.
Pasadena iPZ = 22m.14s.
Riverside iPZ = 22m.17s.
Tucson iP = 22m.46s.a

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May 19d. 18h. 25m. 30s. Epicentre 19°·0S. 69°·0W.

$A = +·3391$, $B = -·8834$, $C = -·3236$; $\delta = +10$; $h = +5$;
$D = -·934$, $E = -·358$; $G = -·116$, $H = +·302$, $K = -·952$.

A depth of focus 0·010 has been assumed.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	N.	2·6	18	i 0 48	+ 7	i 1 22	+10	—	—	1·4
Huancayo		9·2	319	e 2 2	− 9	e 3 32	−22	—	—	e 4·3
La Plata		18·6	150	4 13	+ 1	7 49	+16	—	—	10·3
Rio de Janeiro		24·4	103	i 6 8	PPP	i 9 30	+10	i 10 27	SS	i 14·4
Balboa Heights		29·7	340	e 5 30?	−29	—	—	—	—	—
San Juan		37·3	5	e 7 36	+32	13 16	+32	—	—	16·1
Bermuda		51·2	5	—	—	e 16 0	− 5	—	—	e 21·2
St. Louis		60·7	341	i 10 2	− 1	i 18 6	− 5	i 10 27	pP	—
Florissant		60·9	341	i 10 3	− 2	i 18 8	− 5	e 10 27	pP	—
Harvard		61·2	359	i 10 6k	− 1	e 18 16	− 1	—	—	—
Williamstown		61·5	357	i 10 8	− 1	—	—	i 10 35	pP	—
Ottawa		64·4	355	e 10 27	− 1	e 18 54	− 3	e 20 12	PPS	34·5
Lincoln		64·8	339	e 10 29	− 2	18 55	− 7	21 2	S_cS	e 25·2
Tucson		64·8	322	i 10 30k	− 1	19 38	PS	i 10 47	P_cP	28·3
La Jolla		69·2	318	i 10 58	0	—	—	i 11 21	pP	—
Riverside		70·0	318	i 11 3k	0	—	—	i 11 29	pP	—
Mount Wilson		70·6	319	i 11 6k	− 1	e 20 12	+ 1	i 11 33	pP	—
Pasadena		70·6	319	i 11 7k	0	i 20 14	+ 3	i 11 33	pP	—
Santa Barbara		71·8	318	i 11 13	− 1	—	—	—	—	—
Haiwee		71·8	320	i 11 14	0	—	—	—	—	—
Tinemaha		72·6	320	i 11 19	0	e 20 38	+ 4	i 11 46	pP	—
Santa Clara	E.	75·0	319	e 11 43	+11	e 22 0	sS	—	—	—
San Fernando		81·0	47	—	—	i 22 13	+ 8	i 23 6	sS	65·5
Victoria		82·7	327	12 6	− 8	22 12	−10	23 0	PS	e 38·5
Almeria		83·8	48	12 30	+10	e 21 52	−41	—	—	—
Toledo		84·2	44	e 12 24	+ 2	e 22 40	+ 3	23 32	PS	—
Bidston		91·6	32	—	—	e 23 52	+ 6	—	—	e 60·5
Kew		92·1	35	e 17 22	PP	e 23 24	[+ 3]	e 25 46	PS	—
Paris		92·5	38	e 13 5	+ 4	e 23 58	+ 4	—	—	48·5
Edinburgh		92·8	30	—	—	e 24 2	+ 5	—	—	i 47·6
Durham		93·0	32	—	—	e 23 48	−11	e 24 5	sS	e 47·6
Sitka		93·6	330	e 13 10	+ 4	e 23 34	[+ 6]	e 16 44	PP	e 36·7
Uccle		94·5	36	e 13 42	+32	e 23 39	[+ 6]	—	—	—
Scoresby Sund		95·1	13	—	—	24 19	+ 2	25 9	PS	—
De Bilt		95·5	35	—	—	e 26 24	PS	—	—	e 46·5
Strasbourg		95·6	40	e 13 46	+30	e 23 40	[+ 9]	e 30 50	SS	—
Honolulu		95·7	291	e 13 44	+28	e 24 19	− 3	e 17 50	PP	e 37·5
Rome		96·4	48	e 12 19	−60	i 23 50	[+ 4]	17 15	PP	—
Stuttgart		96·6	40	e 13 48	+28	e 23 47	[0]	e 17 14	PP	—
Triest		98·4	44	e 17 8	PP	e 23 59	[+ 2]	i 24 54	S	—
Hamburg		98·7	36	—	—	e 24 3	[+ 5]	—	—	e 45·5
Collmberg		99·7	39	e 13 35	+ 1	e 17 40	PP	e 14 5	pP	—
Copenhagen		100·8	34	17 48	PP	24 13	[+ 5]	—	—	—
College		102·4	334	—	—	e 24 13	[− 2]	e 27 46	PS	e 47·0
Helwan		107·9	63	e 18 42	PP	e 24 44	[+ 4]	e 28 40	PS	—
Istanbul		108·2	51	i 24 50	SKS	(i 24 50)	[+ 8]	—	—	—
Pulkovo		110·9	31	e 19 2	PP	e 24 55	[+ 3]	e 27 23	PS	—
Ksara		112·4	61	e 19 15	PP	e 29 0	PPS	e 19 46	pPP	—
Moscow		114·8	35	e 19 29	PP	e 25 13	[+ 5]	e 28 54	PS	—
Grozny		120·7	49	e 19 50	PP	—	—	—	—	—
Baku		123·9	53	e 20 38	PP	e 27 30?	?	—	—	—
Tashkent		138·1	48	e 19 19	[+ 5]	e 27 15	SKKS	i 22 8	PP	—
Andijan		140·5	48	e 19 54	[+36]	—	—	—	—	—
Frunse		141·2	44	e 21 34	PP	—	—	—	—	—
Almata		142·5	41	e 20 24	[+62]	—	—	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	146·5	98	e 19 30?	[+ 1]	—	—	—	—	—
Agra	E.	148·7	68	e 19 35	[+ 3]	—	—	e 23 5	PP	—
Mito		148·9	309	19 38	[+ 5]	—	—	—	—	—
Oiwake		150·3	312	19 44	[+10]	—	—	—	—	—
Zi-ka-wei	Z.	164·6	325	e 20 32	[+40]	e 31 44	SKKS	e 24 36	PP	—
Manila		169·5	248	e 20 7	[+11]	29 53	?	—	—	43·5

Additional readings :—
St. Louis ipP$_G$P = +10m.36s., isS = +18m.49s.
Florissant isSEN = +18m.51s., iE = +19m.42s. and +20m.31s.
Williamstown i = +10m.46s.
Ottawa e = +21m.0s.
Tucson i = +11m.9s. and +11m.21s., iPP = +12m.58s., PPP = +14m.49s., iS = +19m.45s., eSS = +24m.6s.
Riverside ePKP,PKPZ = +38m.54s.
Mount Wilson eEN = +20m.58s., iPKP,PKPZ = +38m.54s.
Pasadena isPEZ = +11m.45s., eE = +20m.58s., iPKP,PKPZ = +38m.53s.
Tinemaha eE = +21m.23s.
Toledo i = +12m.57s., e = +36m.53s.
Sitka eS = +24m.7s.
Strasbourg eZ = +17m.13s. and +24m.30s.
Honolulu ePS = +25m.44s., eSS = +29m.58s., eSSS = +34m.59s.
Rome e = +15m.58s. and +24m.30s.
Stuttgart ePS = +24m.43s., eSSS = +31m.54s.
Hamburg eZ = +34m.58s.
Copenhagen +25m.4s.
College eS = +26m.0s.
Helwan eE = +25m.35s.
Pulkovo e = +19m.48s. and +26m.32s.
Moscow e = +20m.7s. and +26m.11s.
Tashkent e = +20m.4s., +20m.15s., and +22m.35s., i = +22m.42s., +23m.3s., +23m.32s., and +23m.42s.
Zi-ka-wei iZ = +36m.44s.
Long waves were also recorded at Fort de France, Bombay, Clermont-Ferrand, Jersey, and Göttingen.

May 19d. 18h. 51m. 31s. Epicentre 52°·4N. 98°·7E.

A = −·0927, B = +·6056, C = +·7903 ; δ = −8 ; h = −6 ;
D = +·988, E = +·151 ; G = −·120, H = +·781, K = −·613.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		3·4	89	0 57	+ 2	1 47	S_g	—	—	—
Semipalatinsk		11·7	266	e 2 51	0	—	—	—	—	—
Almata		17·2	246	4 2	− 1	7 23	+ 9	—	—	—
Frunse		18·8	249	4 23	0	7 54	+ 4	—	—	—
Andijan		21·4	247	4 55	+ 4	8 58	+13	—	—	—
Tchimkent		22·0	255	5 0	+ 2	—	—	—	—	—
Sverdlovsk		22·3	297	i 5 0	− 1	i 9 6	+ 4	—	—	i 12·4
Tashkent		22·8	253	i 5 2	− 3	e 9 1	−10	—	—	e 11·3
Samarkand		25·2	252	5 25	− 4	9 45	− 7	—	—	—
Calcutta	N.	30·9	199	—	—	e 9 56	?	—	—	—
Phu-Lien		32·1	166	e 6 10	−21	—	—	—	—	—
Moscow		35·0	301	6 53	− 3	12 22	− 6	—	—	—
Baku		35·1	270	e 7 1	+ 4	i 14 52	SS	—	—	18·9
Grozny		35·9	277	e 6 42	−22	e 15 19	SSS	e 8 16	PP	—
Pulkovo		37·3	310	7 19	+ 3	13 3	− 1	—	—	—
Bombay		38·9	221	—	—	e 13 20	− 8	e 16 50	SSS	i 21·3
Upsala		43·1	314	e 9 52	PP	e 16 44	SS	—	—	—
Bucharest		47·0	291	10 29?	PP	—	—	—	—	—
Copenhagen		47·6	311	8 37	− 2	e 15 41	+ 6	10 33	PPP	—
Ksara		47·9	273	i 8 40	− 2	e 15 54	PS	i 10 31	PP	—
Bergen		48·1	319	—	—	e 20 29?	SSS	—	—	—
Collmberg		49·9	306	i 8 56	− 1	—	—	e 10 55	PP	e 25·8
Prague		49·9	303	—	—	e 23 5	?	—	—	—
Jena		50·8	305	e 8 59	− 5	—	—	—	—	e 21·5
Triest		53·1	299	e 12 9	PPP	—	—	—	—	e 27·1

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		53·4	273	e 9 19	− 5	e 17 9	+14	—	—	—
Stuttgart		53·4	305	e 9 22	− 2	e 21 17	SSS	e 12 37	PPP	e 29·5
Strasbourg	z.	54·3	306	e 9 29	− 1	e 21 32	SSS	—	—	—
Uccle		54·5	310	9 30	− 2	e 20 59	SS	e 12 47	PPP	—
Stonyhurst		55·5	316	—	—	e 17 39	+15	—	—	e 36·5
Kew		56·2	312	—	—	e 17 51	+18	—	—	e 36·5
Rome		56·2	296	i 9 42	− 2	e 17 7	−26	i 11 52	PP	28·5
Tucson		91·8	25	i 13 11a	0	—	—	i 16 50	PP	—

Additional readings :—
Copenhagen +19m.11s.
Prague eS = +25m.46s.
Triest e = +13m.29s. and +25m.47s.
Stuttgart e = +27m.47s.
Rome i = +12m.29s. and +23m.45s.
Tucson i = +14m.5s.
Long waves were also recorded at Belgrade, Sofia, and Budapest.

May 19d. Readings also at 1h. (College), 3h. (Balboa Heights and Collmberg), 4h. (Oaxaca, Tacubaya, Puebla, Vera Cruz, Mount Wilson, Riverside, and Tucson), 5h. (Tucson), 6h. (Piatigorsk), 7h. (Stuttgart), 8h. (Christchurch, New Plymouth, Huancayo, Wellington, and near Tananarive), 9h. (Tinemaha, near Piatigorsk, Tucson, Mount Wilson (2), Riverside (2), and Pasadena (2)), 11h. (Mizusawa), 12h. (Rome, Pasadena, Riverside, Mount Wilson, and Tucson), 13h. (Balboa Heights and near Tananarive), 18h. (near Williamstown), 19h. (Hukuoka, Pulkovo, and Moscow), 20h. (Balboa Heights), 23h. (Balboa Heights and Collmberg).

May 20d. 9h. 35m. 25s. Epicentre 41°·1N. 19°·3E.

Intensity V in Yugoslavia at Debar; IV at Struga and Ochrida; in Italy, III-IV at Locorotondo (Bari) and Brindisi, III at Lecce and Tarento.

Radius of Macroseismic area 150-200km.

Epicentre at sea, 10km. from the mouth of the Shkumbi 41°·1N. 19°·3E. (Strasbourg).

C. Morelli.
Carta sismica dell' Albania, commissione italiana di studio peri problemi del soccorso alle popolazioni vol. X, Firenze 1942, p. 85-86.

$A = +\cdot7133$, $B = +\cdot2498$, $C = +\cdot6548$; $\delta = -4$; $h = -2$;
$D = +\cdot331$, $E = -\cdot944$; $G = +\cdot618$, $H = +\cdot216$, $K = -\cdot756$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		3·4	61	e 0 59	+ 4	i 1 30	− 7	i 1 1	P*	—
Belgrade		3·9	13	i 1 0k	− 2	i 1 47	− 3	i 1 9	P*	—
Rome		5·2	281	1 25k	+ 4	2 23	+ 1	2 42	S*	—
Szeged		5·2	7	i 1 31	P*	i 2 25	+ 3	i 1 41	S_g	e 3·3
Bucharest		5·8	55	e 1 33k	+ 4	i 2 51	S*	i 1 58	P_g	—
Laibach	N.E.	6·0	328	i 2 6	P_g	2 51	+ 8	—	—	—
Triest		6·1	321	e 1 34	0	2 45	0	e 2 8	P_g	—
Budapest		6·4	0	1 38	0	e 3 18	S*	—	—	3·6
Istanbul		7·4	86	1 36	−16	3 7	−11	—	—	—
Cernauti		8·6	31	e 2 3	− 6	4 0	+12	—	—	4·6
Chur		9·1	313	e 2 18	+ 4	e 4 4	+ 4	—	—	—
Moncalieri		9·4	299	e 2 15	− 3	4 25	S*	—	—	7·1
Prague		9·6	341	2 22	+ 1	e 4 10	− 2	—	—	e 4·6
Zurich		9·9	312	e 2 29	+ 4	e 4 35	+15	—	—	—
Cheb		10·2	334	e 2 35?	+ 4	e 4 24	− 3	—	—	e 5·3

Continued on next page.

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart	10·5	321	e 2 34	− 1	e 4 28	− 7	2 48	PPP	—
Basle	10·6	312	e 2 37	+ 1	e 4 51	SS	—	—	—
Neuchatel	10·7	308	e 2 33	− 5	e 4 33	− 6	—	—	—
Collmberg	11·1	339	e 2 43	0	e 4 59	SS	i 2 53	PP	—
Strasbourg E.	11·1	317	e 2 55	PP	i 5 24	SSS	—	—	i 6·1
Jena	11·2	334	e 2 50	+ 6	e 4 35	−17	—	—	e 5·6
Göttingen	12·3	332	e 3 4	+ 5	—	—	—	—	—
Clermont Ferrand	12·6	297	e 3 27	PP	—	—	—	—	e 7·9
Hamburg	14·0	337	e 3 19	− 3	e 6 56	?	—	—	e 7·1
Paris	14·1	303	e 3 29	+ 6	—	—	—	—	e 8·8
Uccle	14·2	318	—	—	e 6 25	SS	—	—	e 7·4
De Bilt	14·6	324	—	—	i 6 59	SSS	—	—	i 7·8
Helwan	14·9	135	e 3 23	−11	6 38	SS	—	—	—
Ksara	15·0	114	e 3 29	− 6	e 6 28	+ 5	—	—	e 8·0
Heligoland	15·2	334	—	—	e 6 50	SS	—	—	e 7·7
Copenhagen	15·3	345	e 3 38	− 1	6 42	SS	—	—	8·6
Jersey	17·1	306	e 3 56	− 6	e 8 0	SSS	—	—	e 10·4
Almeria	17·4	263	e 4 20	PP	e 7 41	SS	—	—	9·9
Oxford	17·6	314	—	—	i 7 34	+11	—	—	—
Toledo	17·8	275	e 4 24	PP	e 7 43	+15	—	—	—
Granada	18·2	265	3 51	−25	i 7 39	+ 2	4 41	PP	10·2
Moscow	18·9	35	4 18	− 6	7 49	− 4	—	—	11·5
Upsala	18·9	358	i 4 22	− 2	e 8 3	+10	—	—	—
Stonyhurst	19·0	320	—	—	e 8 35?	SSS	—	—	e 15·6
Tiflis	19·1	80	e 4 23	− 4	e 8 1	+ 4	i 4 35	PP	e 9·6
Erevan	19·2	84	e 4 51	PP	—	—	—	—	—
Bidston	19·5	318	—	—	i 8 11	+ 5	—	—	e 11·6
Durham	19·5	323	—	—	e 8 15	+ 9	—	—	i 16·1
Grozny	19·8	74	e 4 12	−23	—	—	—	—	e 11·7
Pulkovo	19·9	17	i 4 31	− 5	e 8 14	− 1	—	—	e 9·6
San Fernando	20·4	265	—	—	e 8 50	SS	—	—	12·1
Edinburgh	20·9	324	—	—	e 8 35?	0	—	—	—
Rathfarnham Castle	21·1	315	—	—	i 8 55	+16	—	—	e 11·2
Bergen	21·2	342	—	—	e 8 35?	− 6	—	—	—
Baku	23·1	81	5 6	− 2	e 9 30	+14	—	—	e 13·6
Tashkent	37·2	72	e 8 37	PP	e 15 48	SS	e 16 17	SSS	e 20·6
Irkutsk	56·1	48	—	—	e 24 35?	?	—	—	30·6
Tucson	93·7	320	13 20k	0	—	—	—	—	e 52·4
Honolulu	117·9	357	e 14 53	P	e 25 36	[− 7]	e 22 51	PPP	e 45·9

Additional readings :—
Sofia iEN = +1m.44s.
Belgrade iNW = +1m.12s., iPS = +1m.59s., iS_gNW = +2m.8s.
Rome iN = +2m.3s., iNZ = +2m.11s., i = +2m.48s., iEN = +2m.59s.
Szeged ePP = +1m.58s., i = +2m.2s., iPPS = +2m.36s., eSE = +2m.50s.
Bucharest iE = +2m.30s., iS_gN = +3m.14s.
Laibach iNE = +3m.9s., +3m.24s., and +3m.38s.
Triest i = +1m.38s., S_g = +3m.30s.
Budapest iN = +2m.30s., eSN = +3m.22s.
Istanbul PS = +4m.31s.
Stuttgart e = +3m.13s. and +3m.54s., e = +4m.18s. and +4m.47s.
Collmberg i = +2m.47s., +3m.6s., +3m.10s., and +3m.18s., i = +3m.57s. and +4m.21s., eZ = +5m.19s., i = +5m.34s., e = +5m.44s., eZ = +5m.58s., iS = +6m.20s., e = +7m.26s.
Strasbourg iPPE = +3m.37s., iSSE = +6m.46s.
Helwan iZ = +5m.14s. and +6m.23s.
Tiflis ePN = +4m.29s., iSE = +8m.7s.
Tashkent i = +8m.42s.
Honolulu eS = +17m.37s., eSS = +35m.7s., eSSS = +40m.48s.

May 20d. Readings also at 1h. (Frunse, Andijan, and Samarkand), 2h. (La Paz, Tchimkent, Andijan, and Samarkand), 3h. (Balboa Heights and Tucson), 7h. (Tiflis), 9h. (Tiflis, Tucson, Bombay, Kodaikanal, Colombo, Medan, Irkutsk, Tashkent, and Collmberg), 10h. (Bermuda, near Apia, and Tucson), 13h. (Chur), 15h. (Andijan), 16h. (Tucson, Andijan, Frunse, and Samarkand), 20h. (near Phu-Lien), 21h. (Mizusawa),

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May 21d. 3h. Undetermined shock. Epicentre probably in the region of Spitzbergen.

Moscow eP = 49m.46s., e = 53m.51s., L = 57·4m.
Collmberg eZ = 49m.46s., iZ = 49m.53s., eZ = 50m.0s., 50m.8s., 50m.28s., and 50m.57s.
Uccle ePZ = 49m.52s., eSE = 54m.2s., eL = 57·0m.
Stuttgart ePEZ = 50m.12s., eS = 54m.48s., eL = 59·0m.
Paris eZ = 50m.12s., L = 104m.
Strasbourg ePZ = 50m.14s., eSN = 55m.0s.
Tacubaya PN = 53m.26s.
Ksara e = 54m.27s. and 61m.39s.
Tucson iP = 55m.44s.a, i = 55m.48s., 62m.47s., 77m.22s., and 78m.35s.
Sitka e = 56m.44s.
College e = 57m.
Long waves were also recorded at Chicago, Sverdlovsk, Tashkent, and Baku.

May 21d. 20h. 21m. 43s. Epicentre 21°·5S. 180° (epicentre as given by Pasadena).

Pasadena suggests depth 600km.

$A = -·9313$, $B = ·0000$, $C = -·3644$; $\delta = +11$; $h = +4$;
$D = ·000$, $E = +1·000$; $G = +·364$, $H = ·000$, $K = -·931$.

A depth of focus 0·060 has been assumed.

		△	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		10·9	47	e 2 40	+11	i 4 38	+10	4 57	SS	—
Wellington		20·2	193	e 4 3	− 3	i 6 43	+19	14 21	S_cS	—
Christchurch		22·8	196	i 7 7a	?	i 7 48	−20	i 9 46	SS	—
Brisbane	N.	25·2	251	—	—	i 8 41	− 6	i 11 47	SSS	—
Riverview		28·2	238	e 5 25	+ 6	i 9 28	− 6	—	—	—
Manila		68·1	297	i 10 22k	+ 4	e 18 41	− 3	—	—	29·3
Mito		68·6	327	10 31	+ 9	—	—	—	—	—
Nagoya		69·6	324	10 34	+ 6	—	—	—	—	—
Mizusawa	E.	70·4	329	11 37	pP	11 37	P	—	—	—
Miyazaki		70·6	318	10 28	− 6	—	—	—	—	—
Batavia		72·1	270	10 42	0	i 19 20	−10	—	—	—
Sapporo		73·4	332	11 15	pP	—	—	—	—	—
Santa Barbara		79·8	48	i 11 26	+ 1	e 20 48	− 4	i 13 34	pP	—
Berkeley		80·2	43	e 11 28	+ 1	—	—	—	—	—
Pasadena		80·7	48	i 11 28	− 2	i 20 53	− 9	e 13 37	pP	—
La Jolla		80·7	49	i 11 31	+ 1	—	—	—	—	—
Mount Wilson		80·9	48	i 11 29	− 2	e 20 58	− 6	13 37	pP	—
Fresno	N.	81·1	45	e 11 34	+ 2	—	—	—	—	—
Riverside		81·2	48	i 11 30	− 2	e 20 57	−10	i 13 37	pP	—
Haiwee		82·0	46	i 11 37	+ 1	e 21 9	− 6	e 13 45	pP	—
Tinemaha		82·3	46	i 11 47	+ 9	e 21 10	− 8	—	—	—
Phu-Lien		83·1	296	e 11 46	+ 4	—	—	—	—	—
Medan		83·2	276	e 11 43	+ 1	i 21 14	−13	i 15 56	PP	—
Tucson		85·0	53	i 11 50	− 1	i 21 39	− 5	i 14 3	pP	—
Sitka		86·7	23	e 12 0	+ 1	21 51	− 9	31 30	SSS	—
Butte		90·7	39	—	—	e 22 30	− 6	e 28 21	SS	—
Huancayo		98·9	106	e 17 41	PP	e 23 44	− 2	e 25 59	sS	—
Colombo	E.	101·9	272	e 17 47	PP	—	—	—	—	—
La Paz	Z.	103·3	113	e 17 37	PP	—	—	i 23 2	?	—
Kodaikanal	E.	105·3	282	e 22 17?	PKS	—	—	—	—	—
Irkutsk		108·4	323	e 15 23	P	e 25 16	S	e 17 9	PKP	—
Agra	E.	109·7	291	i 23 22	PKS	—	—	—	—	—
Bombay		112·2	282	i 20 37	PPP	i 24 45	[+27]	—	—	—
Semipalatinsk		112·4	317	e 23 32	PKS	—	—	—	—	—
Frunse		115·4	308	e 19 15	PP	—	—	—	—	—
Harvard	N.	117·6	51	—	—	e 26 17	SKKS	e 30 12	PPS	—
Tashkent		119·2	306	e 19 25	PP	i 24 1	[−31]	e 28 25	PS	—
Sverdlovsk		123·8	324	e 18 7	[− 3]	i 24 16	[−24]	20 50	PP	38·3
Scoresby Sund		129·3	9	20 46	PP	—	—	—	—	—
Baku		133·9	306	e 21 5	PP	e 24 47	[−10]	e 31 0	PS	50·8

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Moscow		135·9	329	18 31	[− 1]	27 13	SKKS	20 52	PP	—
Pulkovo		136·2	338	18 33	[0]	25 26	[+24]	21 5	PP	—
Grozny		136·3	311	e 18 5	[−29]	—	—	i 20 49	PP	—
Tiflis	z.	137·4	308	e 18 35	[0]	—	—	e 20 55	PP	—
Copenhagen		144·6	348	e 18 46	[− 2]	—	—	e 21 5	PP	—
Ksara		146·1	297	i 18 51	[0]	e 25 9	[− 8]	i 21 9	pPKP	—
Hamburg	z.	147·1	350	e 18 51	[− 2]	—	—	e 21 12	PP	—
Bidston		148·1	4	e 21 13	PP	e 28 21	SKKS	—	—	—
Bucharest		148·6	322	e 19 1	[+ 6]	e 28 27	SKKS	—	—	—
Collmberg		148·6	345	i 18 52	[− 3]	e 25 29	[+ 9]	i 21 41	PP	—
Göttingen		149·0	348	e 18 58	[+ 2]	—	—	—	—	—
De Bilt		149·2	353	—	—	e 33 17?	PS	—	—	—
Jena		149·3	345	e 18 56	[0]	—	—	—	—	—
Cheb		149·9	344	—	—	e 26 17?	sSKS	—	—	—
Kew		150·1	0	i 19 2	[+ 5]	e 28 35	SKKS	i 21 20	pPKP	—
Helwan		150·6	292	18 56	[− 1]	e 28 29	SKKS	—	—	—
Uccle		150·6	355	e 18 54	[− 3]	i 28 40	SKKS	e 21 17	pPKP	—
Stuttgart		151·8	347	e 18 58	[0]	e 28 46	SKKS	i 19 7	pPKP	—
Strasbourg		152·3	348	e 19 5	[+ 6]	i 28 50	SKKS	i 19 22	pPKP	—
Paris		152·7	356	e 21 19	pPKP	—	—	e 24 11	PP	33·3
Zurich		153·3	347	e 18 59	[− 2]	—	—	e 19 27	?	—
Triest		153·4	338	e 19 27	[+26]	e 28 52	SKKS	—	—	e 51·4
Basle		153·5	346	e 18 57	[− 4]	—	—	e 19 27	?	—
Neuchatel		154·0	348	e 19 0	[− 2]	—	—	—	—	—
Rome		157·1	335	e 21 15	pPKP	—	—	e 26 37	PPP	—
Toledo		161·4	9	e 19 11	[0]	e 29 35	SKKS	e 23 49	PP	—
Granada		164·1	11	i 20 30	?	—	—	i 25 0	PP	—

Additional readings :—
Apia iE = +3m.30s., iN = +3m.40s.
Christchurch iNZ = +11m.30s., iE = +11m.55s., iSEN = +14m.31s., i = +18m.47s.
Brisbane iN = +14m.47s.
Riverview eN = +12m.38s., eE = +12m.41s., iEN = +15m.0s.
Pasadena i = +11m.31s., esPZ = +14m.44s.
Mount Wilson esPZ = +14m.43s.
Riverside i = +11m.33s., isPZ = +14m.47s.
Tucson iP$_c$P = +11m.53s., i = +12m.10s., +12m.16s., and +14m.12s., iSP = +14m.58s., iPP = +15m.20s., iSKS = +21m.23s., iSP = +22m.37s., isS = +25m.26s., iSS = +27m.48s.
Sitka eSKS = +21m.33s., esS = +25m.44s., esSS = +31m.8s.
Butte esS = +26m.22s.
Huancayo eSKS = +22m.35s., SKS = +22m.39s., eSKKS = +23m.14s.
Irkutsk e = +22m.35s., +26m.23s., and +29m.3s.
Bombay iEN = +23m.37s., eEN = +25m.33s.
Harvard eN = +34m.50s.
Tashkent i = +25m.30s. and +25m.42s., e = +28m.10s.
Sverdlovsk ePPP = +21m.59s., i = +26m.0s.
Baku e = +21m.46s. and +40m.5s.
Moscow e = +20m.18s., PPP = +23m.32s., SKS = +25m.24s., ePS = +30m.35s., PPS = +32m.44s.
Tiflis iZ = +21m.14s.
Copenhagen iPKP = +18m.49s., i = +21m.33s.
Ksara iPP = +22m.26s.
Hamburg iZ = +18m.55s.
Collmberg i = +18m.57s., +19m.7s., +19m.22s., +19m.28s., +19m.40s., +19m.47s., +19m.54s., +20m.13s., +20m.51s., +21m.13s., +21m.17s., +21m.21s., and +22m.35s., e = +22m.51s., +24m.33s., +26m.5s., and +28m.29s., i = +29m.12s., e = +33m.5s.
Jena ePZ = +18m.59s.
Kew eZ = +19m.11s.
Helwan iZ = +19m.5s., +21m.20s., and +22m.50s., eE = +29m.17s., SPE = +30m.32s., sSPE = +32m.47s.
Uccle iZ = +19m.3s. and +19m.15s.
Stuttgart isP = +19m.20s., ePPZ = +21m.18s., eZ = +21m.37s., e = +22m.36s., +29m.30s., and +32m.59s.
Strasbourg iZ = +19m.8s., eZ = +21m.19s., iZ = +21m.42s., eZ = +22m.55s.
Rome e = +31m.37s., +35m.56s., and +44m.51s.
Toledo i = +20m.1s.

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May 21d. Readings also at 0h. (Ksara, Tucson, Butte, College, and Sitka), 2h. (Upsala, Andijan, Samarkand, Almata, Balboa Heights, Frunse, Agra, Tashkent, and Baku), 3h. (Collmberg, Tucson, and Stuttgart), 4h. (Tucson, Stuttgart, Tashkent, Ksara, and Moscow), 10h. (near Batavia and Malabar and Piatigorsk (2)), 12h. (Lick), 13h. (La Paz, De Bilt, and Rome), 14h. (Irkutsk, Tiflis, Osaka, Aberdeen, Zi-ka-wei, Rome, Sverdlovsk, De Bilt, Moscow, Tashkent, Stuttgart, Baku, and Mizusawa), 15h. (Mizusawa, La Paz, and Tucson), 16h. (La Paz), 19h. (near Fresno), 20h. (Honolulu), 21h. (Tucson (2)), 23h. (near Medan).

May 22d. 1h. 34m. 50s. Epicentre 4°·5S. 140°·5E. (as on 1937 Jan. 4d.).

$A = -\cdot7693$, $B = +\cdot6342$, $C = -\cdot0779$; $\delta = +10$; $h = +7$;
$D = +\cdot636$, $E = +\cdot772$; $G = +\cdot060$, $H = -\cdot050$, $K = -\cdot997$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	25·8	154	e 5 28	− 6	i 10 10	+ 8	—	—	—
Manila		27·1	315	i 5 50	+ 4	10 48	+24	—	—	14·3
Adelaide		30·3	184	e 7 19	PP	i 12 15	SS	i 13 46	SSS	(i 15·5)
Sydney		30·8	163	—	—	e 11 43	+20	—	—	e 16·6
Melbourne		33·4	174	—	—	i 12 23	+20	i 14 49	SSS	16·7
Batavia	Z.	33·6	267	6 46	+ 2	—	—	—	—	—
Perth		35·8	217	12 20	S	(12 20)	−21	i 14 25	SS	17·2
Zi-ka-wei	Z.	39·9	334	e 7 28	− 9	—	—	—	—	—
Medan		42·5	281	7 55	− 4	i 14 9	−13	—	—	—
Wellington		47·8	145	—	—	e 15 42	+ 4	19 40	L_q	23·7
Christchurch		48·1	146	i 8 48a	+ 5	i 15 54	+12	20 40	L_q	e 24·7
Irkutsk		64·3	337	10 32	− 7	19 1	−16	—	—	31·2
Kodaikanal	E.	64·4	284	—	—	e 19 6	−12	—	—	—
Agra		68·0	302	—	—	i 19 42	−20	—	—	—
Bombay		70·5	292	e 11 10	− 8	i 20 14	−18	—	—	—
Frunse		75·7	316	11 56	+ 7	—	—	—	—	—
Andijan		76·6	314	12 0	+ 6	21 32	− 8	—	—	—
Tashkent		79·0	314	i 12 2	− 5	i 21 50	−16	—	—	e 38·2
Tchimkent		79·1	315	e 12 12	+ 4	—	—	—	—	—
College		86·4	24	—	—	e 23 10?	[0]	—	—	—
Sverdlovsk		88·2	328	e 12 51	− 3	i 23 22	[0]	—	—	37·2
Sitka		90·6	33	e 13 0	− 5	i 23 31	[− 6]	e 33 10	SSS	e 35·3
Baku		93·3	310	e 15 23	?	24 21	− 3	—	—	46·7
Tiflis		97·2	311	e 17 27	PP	e 24 22	[+ 9]	e 29 8	SS	e 47·2
Victoria		97·4	42	—	—	e 24 10	[− 4]	—	—	e 44·2
Moscow		101·0	326	e 14 1	+ 8	e 26 53	PS	17 51	PP	55·7
Mount Wilson	Z.	102·0	56	e 13 53	− 4	—	—	—	—	—
Pulkovo		104·0	331	e 18 21	PP	e 25 41	−13	27 26	PS	e 41·1
Ksara		104·6	303	e 18 17	PP	e 27 31	PS	—	—	—
Tucson		108·2	58	e 18 40	PP	i 36 50	SSS	—	—	i 49·9
Cheb		117·1	326	—	—	e 37 10?	SSP	—	—	e 60·2
Stuttgart		119·6	326	e 20 20	PP	—	—	e 62 10?	L_q	e 65·2
De Bilt		119·9	331	—	—	e 36 10?	SS	—	—	58·2
Strasbourg	Z.	120·5	327	e 20 19	PP	—	—	e 22 49	PPP	e 63·2
Rome		120·7	317	—	—	e 29 58	PS	—	—	—
Edinburgh		121·1	338	e 23 30	PPP	—	—	—	—	e 63·2
Uccle		121·1	330	e 20 22	PP	e 30 28	PS	e 36 16	SS	e 55·2
Bidston		122·9	336	—	—	e 30 52	PS	—	—	e 55·2
St. Louis		122·9	47	—	—	e 30 31	PS	—	—	—
Kew		123·0	333	20 31	PP	30 35	PS	—	—	56·7
Paris		123·2	329	e 20 47	PP	—	—	—	—	65·2
Toronto		127·5	36	—	—	e 27 46	{−17}	—	—	e 61·2
Williamstown		131·6	32	e 21 34	PP	—	—	—	—	e 64·2
Philadelphia		132·3	37	e 22 37	PP	e 41 10	?	—	—	e 59·1
Fordham		132·5	35	i 22 44	PP	e 31 58	PS	—	—	—
Harvard	N.	132·6	32	e 22 46	PP	—	—	—	—	e 66·2
East Machias		133·0	27	e 19 22	[+ 4]	e 39 16	SS	e 21 38	PP	e 54·4
Huancayo		140·8	115	e 19 1	[−31]	e 41 23	SS	e 22 23	PP	e 67·0
La Paz		144·8	127	i 19 42	[+ 3]	—	—	i 20 25	pP	77·2

For Notes see next page.

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NOTES TO MAY 22d. 1h. 34m. 50s.

Additional readings :—
Adelaide L is given as S.
Perth S = +15m.20s. and +16m.10s.
Zi-ka-wei iZ = +7m.40s.
Medan iE = +14m.16s., SN = +14m.26s.
Christchurch iPEN = +8m.52s.
Bombay eN = +19m.43s., eE = +20m.11s.
Tiflis eZ = +23m.40s., eSSZ = +31m.14s.
Moscow S_eS = +25m.49s.
Tucson iPP = +18m.50s.
Stuttgart eZ = +21m.22s.
Strasbourg eZ = +21m.29s.
East Machias ePPP = +23m.3s., ePPS = +31m.49s.
Huancayo ePPS = +35m.4s.
Long waves were also recorded at Riverview, Salt Lake City, Chicago, Bermuda, Stonyhurst, Aberdeen, Cape Town, Triest, Hamburg, Rio de Janeiro, Pasadena, and Ukiah.

May 22d. Readings also at 0h. (Tucson), 1h. (Tucson, Tacubaya, and Oaxaca), 2h. (La Paz and Medan), 5h. (Tucson), 6h. (Tucson, La Paz, Tacubaya, Oaxaca, Rio de Janeiro, La Plata, Huancayo, East Machias, Harvard, and Ksara), 7h. (Paris, Stuttgart, and Kew), 10h. (Oaxaca, Tacubaya, Samarkand, Almata, Sverdlovsk, Tchimkent, Frunse, and Irkutsk), 12h. (La Paz), 15h. (Tashkent, Andijan, and near Tchimkent), 17h. (Collmberg).

May 23d. 2h. 49m. 40s. Epicentre 18°·2N. 100°·3W. (as on 1938 June 28d.).

Universidad Nacional de Mexico suggests Epicentre 18°·33′N. 100°33′W.

$A = -\cdot1700$, $B = -\cdot9353$, $C = +\cdot3104$; $\delta = +3$; $h = +7$;
$D = -\cdot984$, $E = +\cdot179$; $G = -\cdot056$, $H = -\cdot305$, $K = -\cdot951$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya	N.	1·6	41	0 40	+10	—	—	—	—	—
Puebla	N.	2·2	67	0 51	+13	—	—	—	—	—
Oaxaca	N.	3·6	108	1 13	P_g	—	—	—	—	—
Guadalajara	N.	3·8	312	1 6	+ 5	—	—	—	—	—
Vera Cruz	N.	4·1	75	1 18?	P_g	—	—	—	—	—
Tucson		16·9	328	i 3 58a	− 1	i 7 9	+ 2	i 4 20	PPP	i 8·3
La Jolla		21·1	318	i 4 46	− 2	—	—	—	—	—
Riverside		21·9	320	i 4 54	− 3	i 8 53	− 1	i 5 12	PP	—
St. Louis		22·2	21	e 5 0	0	i 9 4	+ 4	e 5 18	PP	—
Florissant		22·3	21	i 5 1	0	e 9 5	+ 3	i 5 37	PP	—
Mount Wilson		22·5	320	i 5 1	− 1	i 8 55	−10	i 5 20	PP	—
Pasadena		22·5	320	i 5 0	− 2	e 9 10	+ 5	i 5 20	PP	i 14·2
Lincoln		22·8	8	e 5 34	PP	—	—	—	—	11·9
Haiwee	E.	23·7	324	e 5 17	+ 3	—	—	—	—	—
Salt Lake City		24·6	337	e 5 40	PP	e 9 50	+ 8	—	—	13·3
Tinemaha		24·6	324	i 5 22	− 1	—	—	—	—	e 12·8
Chicago		26·0	20	e 5 32	− 4	e 10 16	+10	—	—	—
Bozeman		28·8	346	e 6 22	PP	e 10 49	− 2	—	—	e 15·1
Fordham		32·0	39	i 6 32k	+ 2	e 12 56	SS	i 7 47	PPP	—
San Juan		32·4	83	e 6 29	− 5	e 11 55	+ 7	—	—	e 13·2
Williamstown		33·5	38	i 6 45	+ 2	—	—	—	—	—
Ottawa		34·0	32	i 6 48	0	—	—	(8 20)	PPP	8·3
Harvard		34·4	39	i 6 51	0	e 12 47	+28	—	—	—
Huancayo		38·9	138	e 7 29	0	e 13 37	+ 9	—	—	e 15·6
La Paz	Z.	46·8	135	8 35	+ 2	—	—	—	—	25·3
Collmberg	Z.	89·7	36	i 13 1	0	—	—	—	—	—
Sverdlovsk		103·6	10	—	—	25 7	[+23]	—	—	51·3

Additional readings :—
Tucson i = +4m.16s., +4m.27s., +4m.40s., +4m.56s., and +5m.26s.
St. Louis iE = +9m.20s.
Florissant iSEN = +9m.9s.
Pasadena eNZ = +5m.39s.
Collmberg e = +13m.22s.
Long waves were also recorded at College and Sitka.

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May 23d. 4h. 18m. 46s. Epicentre 9°·0N. 58°·5E.

$A = +\cdot5162$, $B = +\cdot8423$, $C = +\cdot1554$; $\delta = +8$; $h = +7$;
$D = +\cdot853$, $E = -\cdot522$; $G = +\cdot081$, $H = +\cdot133$, $K = -\cdot988$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		17·0	53	i 4 1k	0	i 7 32	SS	i 4 36	PP	9·2
Kodaikanal	E.	18·7	83	i 4 25a	+ 3	i 8 21	SSS	4 41	PP	10·0
Hyderabad		21·1	64	4 51	+ 3	9 1	+22	9 47	SS	11·1
Colombo	E.	21·2	94	4 52	+ 3	8 54	+13	10 22	SSS	32·0
Agra	E.	25·8	44	5 37	+ 3	10 13	+11	6 15	PP	i 12·5
Tananarive		29·8	202	6 11	0	11 12	+ 5	12 45	SS	15·6
Samarkand		31·5	12	6 31	+ 5	—	—	—	—	—
Calcutta	N.	31·6	61	e 7 36	PP	e 11 43	+ 8	i 12 36	SS	e 13·8
Baku		32·2	347	8 37	?	15 51	?	—	—	20·7
Ksara		32·3	322	e 6 35	+ 2	12 5	+19	7 37	PP	—
Helwan		32·8	313	i 6 36a	− 1	12 4	+10	7 33	PP	—
Erevan		33·5	340	e 6 47	+ 4	—	—	—	—	—
Tashkent		33·6	15	6 47	+ 3	i 12 8	+ 2	—	—	e 16·2
Andijan		33·9	19	e 6 56	+ 9	—	—	—	—	—
Tiflis		34·8	342	i 6 56	+ 2	i 12 29	+ 4	8 9	PP	e 18·7
Grozny		36·0	344	e 6 42	−23	e 12 32	−12	—	—	—
Frunse		36·6	20	e 7 14	+ 4	—	—	—	—	—
Almata		37·8	22	e 7 30	+10	—	—	—	—	—
Medan		40·3	95	7 16	−24	13 57	+ 8	i 8 32	PP	—
Istanbul		41·2	326	7 48	0	17 14	SSS	—	—	—
Semipalatinsk		45·1	20	e 8 28	+ 8	—	—	—	—	—
Sofia		45·5	324	e 8 24	+ 1	e 15 26	+21	—	—	—
Sverdlovsk		47·7	2	i 8 43	+ 3	i 15 41	+ 5	—	—	23·2
Belgrade	N.W.	48·5	324	e 8 45a	− 1	i 15 26	−22	i 10 36	PP	e 32·1
Moscow		49·5	346	8 55	+ 1	16 3	+ 1	—	—	19·7
Batavia	E.	50·5	106	9 12	+10	—	—	—	—	—
Rome		52·0	318	i 9 14a	+ 1	i 16 37	+ 1	e 12 46	PPP	e 25·7
Triest		52·9	323	9 18a	− 2	e 16 50	+ 2	e 11 21	PP	—
Prague		54·8	327	e 9 33	− 1	e 17 9	− 5	—	—	—
Pulkovo		54·9	344	e 9 35	0	i 17 16	0	—	—	e 27·5
Cheb		55·9	327	e 11 14?	PP	e 17 32	+ 3	e 21 20	SSS	e 37·2
Chur		56·1	322	e 9 41	− 2	—	—	—	—	—
Collmberg		56·2	329	e 9 43k	− 1	—	—	e 11 52	PP	—
Moncalieri		56·5	320	i 9 48	+ 2	—	—	—	—	—
Jena		56·8	327	e 9 47	− 1	—	—	—	—	—
Irkutsk		56·9	33	e 9 52	+ 3	—	—	i 13 16	PPP	33·2
Zurich		56·9	322	e 9 43a	− 6	—	—	—	—	—
Stuttgart		57·1	324	e 9 49	− 1	e 19 40	?	e 10 7	pP	e 38·2
Basle		57·6	322	e 9 51	− 3	—	—	—	—	—
Neuchatel		57·7	321	e 9 53	− 2	—	—	—	—	—
Strasbourg		57·9	323	i 9 55k	− 1	e 17 49	− 6	i 11 53	PP	e 34·2
Copenhagen		58·9	332	e 10 2	− 1	—	—	—	—	—
Hamburg		59·0	329	e 10 2	− 2	—	—	—	—	e 27·2
Clermont-Ferrand		59·8	318	i 10 0	− 9	—	—	—	—	—
Uccle		60·8	324	i 10 16	0	18 32	− 1	—	—	e 33·2
De Bilt		60·9	326	i 10 17a	0	i 18 35	+ 1	—	—	e 32·2
Paris		61·2	322	i 10 19	0	18 37	− 1	—	—	33·2
Manila		61·3	78	e 10 14	− 6	15 53	?	—	—	20·2
Almeria		61·5	308	10 18	− 3	18 23	−19	13 7	PP	—
Zi-ka-wei	Z.	62·3	59	e 10 26	0	—	—	—	—	—
Granada		62·4	307	i 9 26	−61	—	—	—	—	—
Toledo		63·3	310	i 10 32	− 1	e 19 6	+ 2	—	—	—
Kew		63·8	324	e 10 35	− 1	e 19 12	+ 1	e 12 49	P	e 47·2
San Fernando		64·4	306	e 10 41	+ 1	e 19 23	+ 5	—	—	—
Durham	E.	65·7	327	e 10 55	+ 7	e 19 31	− 3	—	—	—
Bidston		66·0	326	e 12 50	PP	e 19 6	−32	—	—	e 47·2
Edinburgh		66·9	327	—	—	e 19 50	+ 1	—	—	e 46·2
College		103·8	12	e 14 19	+14	e 26 29	+37	e 19 21	?	e 44·3
San Juan		119·0	297	e 20 14	PP	e 29 57	PS	e 40 27	SSS	e 48·4
Honolulu		133·3	49	e 16 7	P	e 26 14	[−13]	e 22 30	PP	e 53·9
Huancayo		133·8	262	e 19 22	[+ 3]	e 26 14	[−14]	e 22 43	PP	e 63·3
Riverside	Z.	137·1	355	e 19 27	[+ 2]	—	—	—	—	—
Tucson		137·7	347	e 19 5	[−21]	i 26 24	[−11]	i 22 17	PP	e 80·7

For Notes see next page.

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NOTES TO MAY 23d. 4h. 18m. 46s.

Additional readings :—
Bombay iEN = +5m.36s., iSSEN = +8m.7s.
Kodaikanal SSE = +8m.49s.
Agra i = +8m.17s.
Tananarive eN = +13m.38s.
Calcutta eN = +8m.2s.
Ksara SS = +14m.1s.
Helwan iZ = +6m.47s. and +7m.1s.
Tiflis iZ = +7m.16s., PPE = +8m.12s., ePPPZ = +8m.28s., ePPPE = +8m.33s., iE = +13m.17s., eSSEZ = +14m.31s., L_qE = +16m.40s.
Medan PEN = +7m.41s.
Istanbul PP = +11m.17s.
Belgrade iSSNW = +19m.31s.
Rome iSSE = +21m.0s.
Triest ePPP = +12m.24s., ePS = +17m.22s.
Jena ePN = +9m.50s.
Collmberg i = +9m.56s., +10m.16s., and +10m.22s., e = +10m.34s., i = +10m.42s., e = +11m.8s., +12m.14s., +13m.44s., +14m.29s., and +15m.14s.
Irkutsk e = +16m.14s.? and +29m.14s.?
Stuttgart epPP = +13m.31s., ePPP = +15m.2s., e = +17m.19s., ePS = +20m.37s.
Strasbourg iZ = +10m.4s. and +10m.42s.
Uccle SN = +18m.35s.
Granada e = +9m.56s.
Toledo e = +10m.44s.
Kew eEZ = +10m.59s.
College ePPP = +21m.8s., ePS = +27m.37s., eSS = +33m.13s.
San Juan ePPP = +23m.7s.
Honolulu ePKP = +19m.48s., ePS = +32m.17s., eSS = +39m.55s., eSSS = +44m.33s.
Huancayo ePS = +32m.24s., ePPS = +34m.4s., eSSS = +44m.54s.
Tucson iPKP = +19m.29s., iPKS = +23m.55s., PPP = +25m.34s.
Long waves were also recorded at Cape Town, Stonyhurst, Göttingen, and La Paz.

May 23d. Readings also at 1h. (Rome and La Paz), 2h. (Tiflis and Butte), 3h. (Tucson), 5h. (Tucson), 7h. (Andijan), 8h. (Andijan), 9h. (Phu-Lien and Moncalieri), 12h. (Tucson), 15h. (Tucson and Piatigorsk (3)), 17h. (Tchimkent, Samarkand, Frunse, Andijan, and near Tashkent), 18h. (Ksara, Cape Town, Rio de Janeiro, and La Paz), 19h. (Kodaikanal, Colombo, Pulkovo, Irkutsk, Stuttgart, Strasbourg, Kew, Sverdlovsk, Huancayo, Rome, and Tashkent), 22h. (Fort de France, near Tananarive, and Tiflis).

May 24d. Readings at 0h. (De Bilt, Stuttgart, Toledo, and San Juan), 3h. (Balboa Heights), 5h. (near Fort de France), 11h. (De Bilt, Edinburgh, Pulkovo, Paris, San Fernando, Cheb, De Bilt, Uccle, Stuttgart, Strasbourg, Tucson, and East Machias), 12h. (Granada, Baku, Tashkent, Sverdlovsk, and Bozeman), 13h. (Mizusawa), 14h. (Medan and near Batavia), 16h. (near Hukuoka, Neuchatel, near Strasbourg, and Basle), 17h. (Tucson and La Paz (2)), 18h. (Basle, Ksara, Christchurch, Port au Prince, Wellington, and Collmberg), 19h. (Melbourne and La Paz), 20h. (Salt Lake City, Pasadena, La Jolla, Tucson (2), East Machias, Riverside, and Mount Wilson), 23h. (Tucson (2), Honolulu, Tinemaha, Riverside, and Mount Wilson).

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May 25d. 6h. 16m. 6s. Epicentre 12°·5N. 123°·5E. (as on 1937 Sept. 22d.).

S.E. Luzon. Epicentre in the Pacific Ocean. Intensity VII and about 5 seconds duration at Capalonga; vertical motion predominating. Intensity VI and 30 seconds duration at Deat; V at Naga; IV at Libmanan, Legaspi, and Virac. Slight as far west as Ambulong in the Province of Batangas and to the south-east at Gatarman, Samar. The area of perceptiblity has a radius of 250-300kms.

Epicentre 14°30′N. 123°10′E. (Manila).

W. C. Repetti.

Seismological Bulletin for 1939, Manila Central Observatory, Manila, 1940, p. 19.

R. Bodle.

United States Earthquakes 1939, Washington 1941, p. 30.

$A = -\cdot5390$, $B = +\cdot8144$, $C = +\cdot2151$; $\delta = +4$; $h = +6$;
$D = +\cdot883$, $E = +\cdot552$; $G = -\cdot119$, $H = +\cdot179$, $K = -\cdot977$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		3·4	310	i 0 44a	−11	1 17	−20	—	—	—
Kosyun		9·8	345	2 27	+ 3	4 9	− 8	—	—	—
Palau		12·0	115	5 54	S	(5 54)	SSS	—	—	—
Hong Kong		13·2	319	2 57	−14	4 37	−63	—	—	5·5
Phu-Lien		18·1	300	e 4 11	− 3	—	—	—	—	—
Zi-ka-wei	Z.	18·7	356	e 4 8	−14	7 28	−20	—	—	9·5
Miyazaki		20·6	21	4 44	+ 1	8 4	−25	—	—	—
Koti		22·9	22	5 6	0	—	—	—	—	—
Osaka		24·6	25	5 28	+ 5	8 3	?	—	—	—
Batavia		24·9	224	e 5 39	+13	10 14	+27	—	—	—
Zinsen		25·0	5	5 35	+ 8	9 31	−18	—	—	—
Nagoya		25·6	26	5 31	− 1	—	—	—	—	—
Medan	E.	26·1	254	5 49	+12	10 20	+13	i 12 8	SSS	—
Tokyo Cen. Met. Ob.		27·4	30	7 21	?	—	—	—	—	—
Nagano		27·7	26	5 46	− 6	10 46	+13	—	—	—
Irkutsk		42·6	343	e 7 54?	− 5	e 13 54?	−29	e 16 54?	SS	20·9
Colombo	E.	43·3	267	e 9 54?	PP	—	—	—	—	—
Agra	E.	45·0	297	e 8 16	− 3	e 14 35	−23	17 59	SSS	—
Bombay	N.	49·1	285	—	—	e 15 54	− 2	—	—	—
Frunse		51·9	315	9 22	+10	—	—	—	—	—
Andijan		52·7	313	9 23	+ 5	e 16 52	+ 6	—	—	—
Tashkent		55·1	312	e 9 29	− 7	i 17 9	− 9	—	—	e 26·9
Sverdlovsk		64·9	328	10 39	− 4	19 10	−14	—	—	29·9
Baku		69·5	309	e 10 13	−59	e 27 14	SSS	—	—	34·4
Tiflis		73·4	311	e 11 34	− 2	e 20 58	− 7	e 21 16	PS	e 38·9
Ksara		81·2	303	e 12 21	+ 2	e 22 31	+ 2	e 15 29	PP	—
Helwan		85·7	300	e 12 45	+ 3	e 23 6	[0]	e 24 6	PS	—
Collmberg	Z.	92·7	324	e 13 15	0	—	—	—	—	—
Rome		96·8	316	—	—	e 24 9	[− 2]	e 27 32	PPS	e 35·5

Additional readings:—
Zi-ka-wei iZ = +4m.36s.
Ksara ePS = +23m.14s.
Rome eEN = +31m.53s.
Long waves were also recorded at Paris, Pulkovo, De Bilt, Edinburgh, Cheb, Stuttgart, Hamburg, Uccle, and Upsala.

May 25d. Readings also at 0h. (Honolulu, near Medan, and Manila), 2h. (Andijan), 3h. (Balboa Heights), 6h. (Kodaikanal and near Manila), 9h. (near Triest and Rome), 11h. (near Wellington), 12h. (Almata, Tchimkent, Tashkent, Frunse, and Andijan), 13h. (Tiflis), 14h. (Edinburgh), 17h. (Toledo), 20h. (near Williamstown), 21h. (Mizusawa and Balboa Heights), 22h. (Mizusawa).

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May 26d. 9h. 40m. 31s. Epicentre 53°·0N. 109°·0E.

$A = -\cdot1968$, $B = +\cdot5715$, $C = +\cdot7967$; $\delta = +7$; $h = -7$;
$D = +\cdot946$, $E = +\cdot326$; $G = -\cdot259$, $H = +\cdot753$, $K = -\cdot604$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		3·0	256	i 0 55	P*	i 1 37	S_g	i 1 1	P_g	—
Semipalatinsk		18·0	273	4 12	− 1	7 29	− 3	—	—	—
Zinsen		19·8	135	4 43	+ 8	8 32	+19	—	—	—
Almata		23·2	259	5 22	+13	9 31	+13	—	—	—
Zi-ka-wei	z.	23·6	151	e 5 26	+13	9 59	SS	i 5 34	PP	—
Hamada		24·4	128	5 31	+10	—	—	—	—	—
Frunse		24·9	260	e 5 29	+ 3	e 9 59	+12	—	—	—
Osaka		26·3	123	5 53	PP	10 7	− 4	—	—	—
Andijan		27·6	259	e 6 14	PP	—	—	—	—	—
Sverdlovsk		27·6	298	i 5 49	− 2	i 10 29	− 3	i 15 5	L_q	i 17·3
Tchimkent		28·3	264	e 6 26	PP	—	—	—	—	—
Hong Kong		30·9	170	11 59	S	(11 59)	+35	—	—	16·8
Samarkand		31·4	262	e 6 29	+ 4	—	—	—	—	—
Phu-Lien		32·2	184	—	—	e 14 34	SSS	—	—	17·5
Calcutta	N.	34·3	215	e 7 0	+10	e 12 40	+23	e 14 41	SSS	e 17·2
Agra	E.	34·6	234	e 6 58	+ 5	12 32	+10	e 8 19	PP	—
Manila		39·5	161	e 7 22	−12	13 53	+16	—	—	21·1
Moscow		40·0	304	7 35	− 3	13 39	− 5	—	—	21·6
Baku		41·3	277	e 7 53	+ 4	e 14 8	+ 4	—	—	—
Pulkovo		41·6	312	e 7 50	− 1	e 14 2	− 6	—	—	e 18·8
Grozny		42·0	284	e 7 34	−20	e 16 39	SS	e 9 21	PP	—
Hyderabad	N.	42·8	225	e 8 10	+ 9	e 14 49	+23	—	—	—
Tiflis		43·5	282	8 7	0	i 14 37	+ 1	e 10 0	PP	e 23·7
Bombay		44·1	233	e 8 18	+ 6	i 14 54	+ 9	—	—	e 24·1
Upsala		47·1	317	e 14 0	?	e 17 55	?	—	—	e 26·4
College		48·6	34	e 8 45	− 2	e 15 48	− 1	e 10 40	PP	e 19·5
Kodaikanal	E.	49·6	223	e 10 27	PP	—	—	—	—	26·7
Medan		50·0	194	9 35	+37	—	—	—	—	e 27·9
Cernauti		50·1	300	e 10 54	PP	19 54	SS	—	—	25·5
Copenhagen		51·9	315	e 9 11	− 1	16 29	− 6	20 11	SS	—
Istanbul		53·1	292	9 18	− 3	20 45	SS	—	—	—
Ksara		54·0	280	i 9 30a	+ 2	17 9	+ 6	e 11 34	PP	—
Hamburg		54·3	314	e 11 35	PP	e 17 5	− 2	e 21 35	SS	e 25·1
Collmberg		54·5	311	e 9 29	− 3	20 47	SS	e 11 36	PP	e 27·0
Prague		54·7	308	e 12 47	PPP	e 21 25	SS	—	—	e 27·5
Heligoland	E.	54·8	315	—	—	e 16 53	−21	—	—	—
Sofia		55·1	296	e 8 47	−49	e 17 29?	+11	—	—	e 25·5
Belgrade		55·2	300	e 6 46k	?	—	—	—	—	e 24·9
Jena		55·4	309	e 9 29	− 9	—	—	e 12 53	PPP	e 24·5
Cheb		55·6	310	e 13 29?	PPP	e 17 29?	+ 4	e 21 17	SS	e 34·5
Göttingen		55·7	302	—	—	—	—	e 22 29?	SSS	—
Edinburgh		58·0	322	—	—	e 20 54	?	—	—	e 31·5
Stuttgart		58·0	310	e 9 55	− 2	e 17 52	− 5	e 13 34	PP	e 33·5
Triest		58·1	305	9 59	+ 1	i 17 55	− 3	i 13 35	PP	—
Durham	N.	58·3	320	i 11 0	+61	—	—	—	—	—
Sitka		58·4	35	e 9 50	−10	e 18 2	0	—	—	e 24·7
Strasbourg		58·8	311	e 10 1	− 1	e 21 57	SS	e 13 32	PP	—
Uccle		58·8	315	e 10 0	− 2	e 22 5	SS	—	—	—
Batavia		59·0	182	e 10 9	+ 5	18 23	+13	—	—	—
Helwan		59·5	280	i 10 8k	+ 1	e 18 19	+ 3	e 19 59	?	—
Basle		59·7	309	e 10 6	− 3	—	—	—	—	—
Bidston		59·7	320	—	—	e 18 18	− 1	—	—	e 35·4
Kew		60·2	317	e 10 11	− 1	e 18 20	− 5	e 12 29	PP	e 37·5
Paris		61·0	314	e 10 26	+ 8	—	—	—	—	e 32·4
Rome		61·4	302	e 14 9	PPP	i 18 40	0	e 25 10	SSS	i 33·1
Moncalieri		61·5	308	—	—	e 26 14	?	—	—	i 32·7
Jersey		62·7	318	—	—	e 18 54	− 3	—	—	e 32·5
Clermont Ferrand		63·1	311	—	—	e 23 29?	SSS	—	—	—
Toledo		70·9	311	e 11 21	0	—	—	—	—	e 33·4
Almeria		72·6	308	11 42	+11	—	—	—	—	32·3

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Fernando		74·7	311	—	—	e 29 20	SSS	—	—	43·5
Butte		75·2	28	e 11 44	− 2	e 20 44	−41	e 26 25	SS	e 35·7
Bozeman		75·9	27	e 11 44	− 6	e 21 36	+ 4	—	—	e 34·6
Tinemaha		81·3	37	e 12 20	0	—	—	—	—	—
Haiwee		82·3	37	e 12 30	+ 5	—	—	—	—	—
Mount Wilson		84·0	37	i 12 33	0	—	—	—	—	—
Pasadena		84·0	37	e 12 35	+ 2	—	—	—	—	e 45·5
Harvard	N.	84·9	0	—	—	e 22 58	[− 2]	—	—	49·5
Tucson		88·3	33	i 12 56	+ 1	—	—	16 1	PP	e 47·0
La Paz	Z.	143·5	355	19 49	[+12]	—	—	i 23 24	PKS	80·5

Additional readings :—
Zi-ka-wei iZ = +12m.9s., +13m.34s., +13m.59s., +14m.26s., +14m.59s., and +15m.29s.
Hong Kong +14m.12s., S? = +15m.22s.
Tiflis ePPPE = +10m.21s., eSSE = +17m.36s., SSZ = +17m.48s., SSN = +17m.53s., eSSSE = +18m.17s., eN = +18m.55s., eZ = +18m.58s.
Copenhagen i = +9m.17s.
Ksara SS = +20m.51s.
Collmberg i = +9m.37s., e = +10m.28s., +10m.50s., +11m.41s., +12m.19s., +12m.33s., +13m.20s., +21m.29s., +24m.23s., +26m.17s.
Heligoland eE = +24m.29s.
Belgrade e = +10m.4s.
Jena eN = +9m.45s.
Cheb e = +28m.41s.
Stuttgart eSS = +21m.57s., e = +24m.23s., eN = +28m.59s., e = +29m.29s. and +30m.7s.
Bidston e = +25m.19s.
Kew eP_cPE = +10m.55s., $ePPPZ$ = +13m.58s., eZ = +31m.8s., iSSZ = +32m.46s., iZ = +34m.48s., eSSSEZ = +35m.0s., eL_qEN = +35m.29s.
Rome eZ = +28m.49s.
Jersey e = +28m.29s.? and +30m.19s.
Butte eSSS = +29m.34s.
Long waves were also recorded at Hukuoka, Tokyo, Rathfarnham Castle, Stonyhurst, Kecskemet, De Bilt, Aberdeen, Bergen, and East Machias.

May 26d. 17h. 50m. 22s. Epicentre 3°·7S. 140°·3E.

A = −·7678, B = +·6375, C = −·0641 ; δ = +3 ; h = +7 ;
D = +·639, E = +·769 ; G = +·049, H = −·041, K = −·998.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		26·4	314	e 5 35a	− 5	10 12	0	—	—	13·0
Brisbane	N.	26·6	155	i 5 38	− 4	i 10 20	+ 4	—	—	—
Adelaide		31·1	183	i 6 20	− 2	i 11 26	− 2	i 7 0	PP	14·6
Riverview		31·6	164	—	—	i 13 52	SSS	—	—	e 14·5
Sydney		31·7	164	—	—	e 11 41	+ 4	—	—	16·5
Batavia		33·4	263	6 42	0	—	—	i 8 23	PPP	e 13·6
Melbourne		34·2	174	—	—	i 12 25	+ 9	—	—	14·1
Hong Kong		36·3	317	(7 12)	+ 5	7 12	P	—	—	—
Miyazaki		36·4	348	7 4	− 4	12 47	− 3	—	—	—
Koti		37·6	352	7 13	− 5	13 7	− 1	—	—	—
Hukuoka		38·2	347	7 21	− 2	13 11	− 6	—	—	19·1
Kameyama		38·5	358	7 25	− 1	—	—	—	—	—
Kobe		38·5	354	7 22	− 4	—	—	—	—	—
Zi-ka-wei	Z.	39·1	334	e 7 26	− 5	—	—	—	—	16·6
Tokyo		39·2	359	7 28	− 3	13 26	− 6	—	—	—
Nagano		40·2	358	7 43	+ 3	—	—	—	—	—
Phu-Lien		41·0	309	e 7 38	− 8	—	—	—	—	—
Sendai		41·8	2	7 55	+ 2	—	—	—	—	—
Medan		42·2	281	7 58	+ 2	i 14 30	+13	—	—	—
Mizusawa	E.	42·6	1	(8 4)	+ 5	8 4	P	—	—	—
Zinsen		42·9	344	7 56	− 6	—	—	—	—	—
Akita		43·2	0	8 9	+ 5	—	—	—	—	—
Sapporo		46·6	1	8 33	+ 1	—	—	—	—	—
Arapuni		47·0	142	—	—	15 44	+18	—	—	22·6
Wellington		48·5	146	8 47	+ 1	i 15 48	0	—	—	19·8

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		48·9	149	i 8 51a	+ 1	i 15 57	+ 4	19 14	SS	25·5
Calcutta	N.	57·0	301	e 8 56	−54	i 17 43	0	—	—	—
Colombo	E.	61·2	280	10 20	+ 1	18 36	− 2	—	—	30·0
Kodaikanal		64·1	284	i 10 39k	+ 1	e 19 8	− 6	23 22	SS	30·4
Hyderabad		64·5	292	e 9 57	−44	19 10	− 9	—	—	30·8
Honolulu		65·5	65	e 10 54	+ 7	e 19 30	− 2	e 26 32	SSS	e 26·9
Agra	E.	67·4	302	10 49	−10	19 44	−11	e 13 20	PPP	—
Bombay		70·1	292	11 13	− 3	i 20 21	− 6	i 14 7	PP	—
Frunse		75·0	317	e 11 54	+ 9	—	—	—	—	—
Andijan		75·9	314	e 12 20	+30	—	—	—	—	—
Tashkent		78·3	314	11 56	− 7	i 21 49	−10	—	—	e 37·6
Tchimkent		78·4	315	12 13	+ 9	i 22 13	+13	—	—	—
College		85·7	24	—	—	e 23 4	[− 2]	—	—	—
Sverdlovsk		87·4	328	12 45	− 5	23 25	− 5	i 16 30	PP	37·6
Sitka		90·0	33	13 4	+ 1	e 23 34	[+ 1]	e 29 11	SS	e 36·5
Baku		92·7	311	e 13 18	+ 3	e 24 22	+ 4	e 31 8	SS	46·6
Grozny		95·8	313	e 13 36	+ 7	—	—	e 16 32	PP	—
Tiflis		96·6	311	e 13 25	− 8	e 24 8	[− 2]	e 17 26	PP	e 46·6
Victoria		97·0	41	13 44	+ 9	24 8	[− 4]	26 14	PS	e 44·6
Ukiah		97·4	51	e 17 44	PP	e 24 8	[− 6]	e 26 28	PS	e 43·9
Berkeley		98·1	52	—	—	e 24 10	[− 7]	i 25 56	PS	e 46·8
Santa Clara		98·4	52	e 18 12	PP	e 26 55	PPS	—	—	e 48·5
Moscow		100·2	325	e 13 51	+ 2	26 41	PS	e 17 50	PP	e 50·1
Pasadena		101·6	55	i 13 54	− 2	i 24 34	[− 1]	e 17 51	PP	e 46·5
Mount Wilson	Z.	101·7	55	i 13 53	− 3	—	—	e 18 3	PP	—
Riverside		102·3	55	i 13 56	− 3	—	—	—	—	—
Pulkovo		103·2	331	e 14 6	+ 3	24 40	[− 2]	18 8	PP	e 38·9
Ksara		104·0	303	e 14 10	+ 4	e 27 34	PS	e 18 23	PP	—
Butte		104·5	43	e 18 40	PP	e 24 47	[− 1]	—	—	e 39·7
Salt Lake City		105·5	49	—	—	e 24 56	[+ 3]	—	—	49·2
Bozeman		105·6	43	e 18 48	PP	e 24 50	[− 3]	e 27 33	PS	e 42·4
Tucson		107·9	58	e 18 34	PKP	i 25 10	[+ 7]	19 0	PP	44·0
Istanbul		108·4	312	i 18 38?	PKP	—	—	—	—	—
Scoresby Sund		111·9	354	—	—	28 55	PS	—	—	—
Cape Town		113·7	230	—	—	e 29 17	PS	—	—	54·6
Collmberg	Z.	115·4	327	e 18 45	[+ 1]	e 29 26	PS	e 19 55	PP	e 60·3
Hamburg		115·9	330	e 20 1	PP	e 31 2	PPS	—	—	e 59·6
Cheb		116·4	326	e 19 38?	PP	e 29 38?	PS	—	—	e 58·6
Lincoln		117·0	44	—	—	e 29 45	PS	e 35 50	SS	e 56·1
Stuttgart		118·8	325	e 20 8	PP	e 29 54	PS	e 22 44	PPP	e 64·6
Aberdeen		119·0	337	—	—	e 30 10	PS	e 36 42	SS	e 59·0
De Bilt		119·1	330	e 20 7	PP	—	—	36 38?	SS	55·6
Strasbourg		119·7	326	e 20 13	PP	e 29 57	PS	—	—	e 61·6
Rome		120·0	316	e 16 0	P	e 29 58	PS	e 20 23	PP	—
Edinburgh		120·3	337	—	—	e 30 32	PS	—	—	e 55·6
Uccle		120·3	329	e 20 22	PP	e 30 8	PS	—	—	e 55·6
Durham		120·5	336	—	—	e 30 21	PS	—	—	—
Bidston		122·1	336	—	—	e 30 27	PS	—	—	e 56·6
Kew		122·2	332	e 20 31	PP	e 27 37	{+ 9}	e 30 30	PS	e 56·6
Florissant		122·3	45	i 20 43	PP	e 30 27	PS	e 31 52	PPS	53·6
Paris		122·5	328	e 20 38?	PP	e 30 38?	PS	—	—	64·6
Chicago		122·8	41	e 30 28	PS	e 37 4	SS	—	—	e 59·6
Clermont Ferrand		123·9	325	e 20 38?	PP	—	—	—	—	e 63·6
Ottawa		127·9	31	e 21 26	PP	e 28 8	{+ 2}	—	—	57·6
Vermont		129·8	30	e 22 38	PKS	e 39 13	SSP	—	—	e 60·1
Williamstown		131·0	31	e 21 25	PP	—	—	—	—	e 62·7
Columbia		131·2	46	e 22 39	PKS	e 27 45	{−42}	e 38 51	SS	e 59·5
Philadelphia		131·7	36	e 21 33	PP	e 31 38	PS	i 23 16	PKS	e 59·1
Toledo		131·7	323	e 22 9	PP	—	—	—	—	67·1
Fordham		131·9	34	e 21 49	PP	e 31 45	PS	e 39 7	SS	—
Harvard	N.	132·1	31	e 22 45	?	e 28 33	{ 0}	e 31 38	PS	e 66·6
East Machias		132·6	26	e 16 2	P	e 31 58	PS	e 21 41	PP	e 48·0
San Fernando		135·1	321	e 22 55	PKS	—	—	—	—	69·6
Huancayo		141·3	114	e 19 33	[0]	e 40 6	SS	e 22 38	PP	e 55·3
Bermuda		143·0	36	e 20 14	[+38]	—	—	—	—	e 60·6
La Paz	Z.	145·5	126	i 19 42a	[+ 2]	—	—	23 6	PKS	70·6
San Juan		150·3	58	e 19 51	[+ 3]	30 18	{− 2}	e 48 47	SSS	—

For Notes see next page.

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NOTES TO MAY 26d. 17h. 50m. 22s.

Additional readings :—
Adelaide i = +14m.0s.
Batavia iE = +8m.33s.
Zi-ka-wei iZ = +7m.48s.
Medan iN = +8m.9s. and +14m.20s.
Christchurch i = +20m.14s.
Sverdlovsk SS = +29m.14s.
Sitka iS = +23m.56s., eSSS = +33m.46s.
Tiflis eE = +24m.55s., ePPSZ = +26m.19s., eN = +26m.46s., eSSNZ = +30m.34s., eSSSZ = +35m.38s.?
Victoria SKKS = +24m.34s., SS = +31m.38s. ?
Ukiah eSS = +31m.43s.
Berkeley eE = +32m.0s., e = +44m.50s.
Moscow e = +22m.8s.
Pulkovo eS = +25m.44s., PS = +27m.17s., SS = +32m.44s.
Bozeman eSS = +33m.17s.
Tucson iPP = +19m.24s., iS = +26m.0s., iPS = +28m.11s., iPPS = +29m.22s., iSS = +34m.3s., iSSS = +38m.14s.
Collmberg iZ = +23m.30s., e = +33m.14s.
Lincoln eSSS = +40m.30s.
Stuttgart e = +37m.13s., eSS = +41m.56s., eL_q = +56·6m.
Rome eZ = +22m.57s., eSSZ = +35m.38s., eE = +37m.20s.
Kew eZ = +47m.1s.
Columbia eSKSP = +31m.48s.
Philadelphia eSS = +39m.7s.
Fordham iZ = +12m.43s., iE = +39m.35s.
East Machias eSS = +39m.50s.
Huancayo ePPS = +34m.40s.
La Paz $iPKP_gZ$ = +20m.10s., PPZ = +23m.40s.
San Juan eSS = +33m.17s.
Long waves were also recorded at Belgrade, Prague, Göttingen, Upsala, La Plata, Apia, Tananarive, Bergen, Stonyhurst, Jersey, and Jena.

May 26d. Readings also at 2h. (Ksara and Samarkand), 3h. (Balboa Heights), 4h. (Andijan, Frunse, Almata, Medan, and La Paz), 5h. (Toledo), 6h. (Mizusawa), 9h. (Mizusawa and La Paz), 10h. (near Wellington), 11h. (Mizusawa), 12h. (Mizusawa, Tiflis, Sverdlovsk, La Jolla, Haiwee, Tinemaha, Irkutsk, Pasadena, Mount Wilson, Riverside, Tucson, and Collmberg), 13h. (La Paz), 15h. (Harvard), 17h. (Williamstown, Melbourne, Sydney, Riverview, and Perth), 18h. (Mizusawa), 19h. (Collmberg, Riverside, and Mount Wilson), 20h. (Harvard, Fordham, Batavia, Manila, Mizusawa, Pasadena, Medan, Collmberg, Riverside, and Mount Wilson), 21h. (Tucson), 22h. (Irkutsk).

May 27d. 3h. 45m. 37s. Epicentre 24°·3N. 94°·1E.

Intensity VII at Silchar, V at Shillong, at Gauhati, and at Tezpur, at Barpeta (Assam), Jamalpur (East Bengal). Damage at Shillong, Imphal (Manipur), Aijal, and Jorhat.

Epicentre 25°·5N. 94°·3E. (Bombay).

S. K. Banerji.

Seismological Bulletin, Meteorological Department of the Government of India, April-June, 1939, p. 51.

Pasadena suggests depth 70kms.

A = −·0652, B = +·9101, C = +·4092 ; δ = −2 ; h = +4 ;
D = +·997, E = +·071 ; G = −·029, H = +·408, K = −·912.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta		5·6	252	i 1 30k	+ 3	i 2 38	+ 5	i 1 40	P*	—
Phu-Lien		12·1	102	i 2 59a	+ 2	5 23	+ 9	5 45	SS	6·4
Agra		14·8	285	3 26	− 6	e 5 53	−25	—	—	—
Dehra Dun	N.	15·5	296	e 2 58	−44	i 5 36	−59	—	—	i 7·5
Hyderabad		16·1	248	3 43	− 6	6 29	−20	—	—	7·0
Hong Kong		18·5	93	4 22	+ 3	7 52	+ 8	8 23	SS	10·0
Bombay		20·5	260	i 4 41	− 1	i 8 11	−16	i 5 4	PP	i 9·5
Kodaikanal	E.	21·1	233	i 4 51k	+ 3	i 8 39	0	5 5	PP	10·6
Medan		21·1	168	4 51	+ 3	i 8 49	+10	—	—	—
Colombo	E.	22·0	221	4 57	− 1	8 56	0	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		23·6	329	5 14	+ 1	8 12	−73	—	—	—
Andijan		24·5	317	5 22	0	9 42	+ 2	—	—	—
Frunse		24·6	324	5 23	0	9 43	+ 1	—	—	—
Taihoku		24·9	82	e 5 20	− 6	e 9 51	+ 4	—	—	—
Zi-ka-wei		25·1	68	i 5 25k	− 3	9 41	−10	5 57	PP	—
Tashkent		26·7	316	5 39	− 4	10 10	− 7	i 5 55	pP	e 14·4
Manila		27·1	106	e 5 45a	− 1	i 11 37	SS	—	—	i 16·8
Samarkand		27·5	310	e 5 49	− 1	—	—	—	—	—
Irkutsk		29·0	13	i 6 4	0	i 10 54	0	6 32	sP	16·0
Batavia		32·7	156	6 34	− 2	11 52	0	—	—	i 17·3
Yakusima		32·8	71	6 36	− 1	—	—	—	—	—
Miyazaki		33·7	69	6 52	+ 7	14 11	SS	—	—	—
Kobe		37·0	64	7 12	− 1	12 54	− 5	—	—	—
Osaka		37·3	64	7 15	− 1	12 54	−10	—	—	—
Nagoya		38·5	63	7 26	0	13 16	− 6	—	—	—
Toyama		38·8	61	7 28	0	13 16	−10	—	—	—
Kohu		39·8	63	7 31	− 5	13 26	−16	—	—	—
Misima		40·1	64	7 42	+ 3	—	—	—	—	—
Baku		40·2	305	e 7 43	+ 3	i 13 45	− 3	7 59	pP	e 24·4
Sverdlovsk		40·5	333	i 7 41	− 1	i 13 44	− 8	i 7 56	pP	—
Sendai		41·9	60	7 51	− 3	14 2	−11	—	—	—
Mizusawa		42·2	58	e 7 57	+ 1	14 9	− 8	—	—	—
Sapporo		42·9	52	8 0	− 2	14 20	− 7	—	—	—
Grozny		43·8	309	7 51	−18	e 14 5	−35	—	—	—
Tiflis		44·2	306	e 8 11	− 1	e 14 23	−23	e 9 20	PP	—
Erevan		44·3	304	e 9 32	PP	—	—	—	—	—
Sotchi		48·1	309	e 8 59	+16	—	—	—	—	—
Ksara		51·2	295	e 9 8	+ 1	e 16 37	+12	i 9 23	pP	—
Moscow		51·5	324	i 9 7	− 2	i 16 19	−10	9 23	pP	29·9
Helwan		55·6	291	9 39	− 1	i 17 39	+14	12 14	PP	—
Istanbul		56·0	305	9 38	− 5	17 35	+ 5	12 0	PP	—
Pulkovo		56·2	328	i 9 41	− 3	e 17 23	−10	—	—	e 26·4
Cernauti		57·9	314	e 9 52	− 4	e 17 45	−10	e 13 6	PPP	—
Sofia		60·1	307	e 10 18	+ 7	e 18 17	− 7	e 18 42	PS	—
Belgrade		61·9	310	i 10 39k	+15	i 18 39	− 8	i 13 4	PP	e 32·6
Kecskemet	z.	62·2	313	e 10 41	+15	e 19 23	PPS	e 12 54	PP	e 22·9
Upsala		62·5	328	e 10 22	− 6	i 18 45	− 9	e 19 13	PS	—
Budapest		62·6	313	10 43	+15	i 19 19	PS	—	—	—
Prague		65·3	317	e 10 52	+ 6	e 19 19	−10	e 13 3	PP	e 32·4
Copenhagen		65·6	323	i 10 46	− 2	19 26	− 7	i 11 3	pP	38·4
Collmberg	z.	66·0	319	i 10 56k	+ 6	e 19 28	−10	e 19 57	PS	e 35·1
Cheb		66·6	317	e 11 0	+ 6	i 19 39	− 6	—	—	e 37·4
Jena		66·9	318	e 10 57	+ 1	e 20 7	PS	i 11 13	pP	—
Hamburg		67·4	322	e 10 54	− 5	e 19 45	−10	i 20 20	PS	e 43·4
Göttingen		67·8	320	e 11 0	− 2	e 20 23	+23	—	—	e 37·4
Rome		68·2	308	e 11 7	+ 3	i 20 14	+10	i 13 45	PP	e 35·4
Bergen		68·6	329	—	—	e 20 23?	+14	—	—	—
Stuttgart		68·9	316	e 11 6a	− 3	i 20 5	− 8	e 13 50	PP	e 39·4
Chur		69·1	315	e 11 7	− 3	e 20 2	−13	—	—	—
Strasbourg	z.	69·8	316	e 11 13	− 1	e 20 36	+13	i 11 31	P_cP	—
Basle		70·2	315	e 11 22	+ 5	e 20 17	−11	—	—	—
De Bilt		70·6	321	e 11 22	+ 3	e 20 27	− 6	i 11 35	PP	28·7
Moncalieri		70·8	313	e 12 33	+73	i 20 50	+15	—	—	—
Neuchatel		70·8	315	e 11 19	− 1	—	—	—	—	—
Uccle		71·4	319	e 11 29	+ 5	i 20 33	− 9	i 14 13	PP	e 34·4
Paris		73·1	317	e 11 50	+16	e 20 54	− 7	e 21 24	PS	40·4
Aberdeen		73·2	326	i 11 36	+ 1	i 20 55	− 7	e 25 48	SS	e 35·9
Clermont-Ferrand		73·7	314	e 11 54	+16	e 20 59	− 9	—	—	—
Durham		73·7	324	i 11 52	+14	e 21 0	− 8	i 21 27	PS	—
Kew		74·0	321	i 11 37	− 2	i 21 1	−10	i 11 55	pP	e 37·0

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Edinburgh		74·2	325	—	—	i 21 35	+21	i 21 53	PS	—
Stonyhurst		74·5	323	—	—	i 21 13	− 4	i 21 43	PS	e 36·4
Bidston		75·0	323	—	—	i 21 12	−11	i 21 41	pS	e 37·1
Scoresby Sund		75·5	343	i 12 6	+18	i 21 24	− 4	14 38	PP	—
Jersey		75·9	320	e 12 4	+14	e 21 23	− 9	e 14 36	PP	e 38·4
Melbourne		78·1	142	—	—	i 21 55	− 1	i 27 36	SS	39·4
College		79·2	23	e 12 27	+19	·22 1	− 7	e 26 49	SS	e 31·9
Toledo		80·6	310	e 12 15	− 1	e 22 39	+16	i 15 35	PP	e 32·9
Almeria		80·7	307	12 13	− 3	i 22 11	−13	12 31	P_eP	41·4
Granada		81·4	308	i 13 21	+61	i 23 20	PS	28 43	SS	e 54·3
San Fernando		83·6	308	—	—	e 22 58	+ 2	e 23 66	PPS	—
Sitka		88·9	25	e 12 55	− 3	e 23 20	[− 6]	e 16 52	PP	e 34·4
Cape Town		92·3	235	—	—	23 37	[− 9]	24 37	S	44·1
Honolulu		96·7	63	e 13 55	+22	e 23 34	[−36]	e 17 6	PP	e 39·6
Victoria		100·2	24	—	—	e 24 23	[− 5]	—	—	48·4
Butte		106·0	18	e 18 39	PP	e 24 48	[− 7]	e 27 50	PS	e 40·9
Bozeman		106·7	18	e 19 4	PP	e 24 27	[−31]	e 27 49	PS	e 41·8
Harvard		112·2	349	e 18 35	[− 2]	e 28 35	PS	—	—	e 64·4
Williamstown		112·2	350	e 18 36	[− 1]	e 28 48	PS	—	—	e 62·0
Tinemaha	z.	112·4	27	e 18 39	[+ 1]	—	—	—	—	—
Fordham		114·2	349	—	—	e 25 25	[− 4]	e 35 23	SS	—
Pasadena		114·3	29	e 18 42	[0]	—	—	i 19 45	PP	e 50·4
Lincoln		114·8	8	—	—	e 25 21	[−10]	e 34 51	?	e 43·7
Philadelphia		115·3	350	—	—	e 27 53	{+71}	e 29 23	PS	e 51·2
St. Louis	N.	117·3	3	—	—	e 29 27	PS	—	—	e 57·4
Tucson		118·9	24	i 18 52	[+ 2]	i 25 44	[− 2]	i 20 24	PP	i 62·3
Bermuda		120·2	338	e 20 15	PP	e 25 43	[− 7]	e 36 52	SS	e 55·4
San Juan		133·4	333	e 20 0	[+42]	e 39 47	SS	e 22 40	PKS	e 54·6
Balboa Heights		146·4	348	e 19 42	[+ 1]	—	—	—	—	—
La Paz	z.	161·6	291	20 6	[+ 4]	—	—	i 24 49	PP	83·4
Huancayo		164·2	318	e 20 11	[+ 6]	e 31 31	{− 3}	e 25 48	PP	e 58·3

Additional readings :—
Calcutta iN = +1m.50s., iEN = +2m.24s. and +2m.49s.
Hyderabad PN = +3m.47s.
Bombay iEN = +4m.56s. and +5m.16s., iN = +8m.34s., iSSEN = +8m.56s.
Kodaikanal SSE = +9m.1s.
Zi-ka-wei iZ = +5m.51s., iE = +6m.11s., iZ = +6m.29s. and +7m.13s., iN = +9m.53s., iZ = +10m.15s., +10m.31s., +10m.37s., and +11m.9s.
Batavia iE = +11m.46s. and +12m.8s.
Grozny i = +7m.56s. and +8m.1s.
Tiflis iPEZ = +8m.20s., eZ = +8m.40s., PPPZ = +10m.14s., iE = +15m.13s. and +16m.5s., iSSSE = +18m.26s.
Ksara ePP = +11m.7s.
Helwan iZ = +9m.53s. and +11m.58s., SE = +18m.38s., PSE = +19m.13s., eE = +19m.48s.
Sofia eN = +10m.27s. and +18m.48s.
Belgrade i = +11m.0s., iSNW = +19m.4s., iNW = +22m.15s.
Kecskemet eP_eSZ = +15m.35s., eS_eSZ = +20m.37s., eSSZ = +22m.33s.
Upsala eSE = +18m.49s., iE = +19m.16s.
Prague ePPP = +15m.4s., ePS = +19m.43s.
Copenhagen PP = +13m.23s., PPP = +15m.19s., eN = +19m.54s., iE = +20m.0s., e = +20m.59s. and +23m.41s., eN = +24m.9s., eE = +24m.18s., SSS = +27m.17s.
Collmberg iZ = +11m.5s., +11m.10s., +11m.14s., +11m.19s., +11m.26s., +11m.34s., +11m.44s., +11m.57s., +12m.8s., and +12m.21s., eZ = +12m.42s. and +12m.57s., i = +13m.13s., +13m.30s., +13m.43s., +13m.50s., and +14m.42s., eZ = +14m.59s., +15m.16s., +15m.19s., and +20m.7s., e = +21m.35s., +25m.53s., +26m.59s., and +32m.53s.
Göttingen i = +11m.17s.
Rome iZ = +11m.15s. and +11m.34s., iN = +19m.53s. and +20m.17s., iE = +21m.23s., iN = +22m.27s., iSSN = +24m.50s.
Stuttgart iPEZ = +11m.25s., eEZ = +12m.19s., ePPP = +15m.37s., iPS = +20m.29s., eSS = +24m.30s., eSSS = +27m.59s., eL_q = +36·4m.
Strasbourg iPPZ = +14m.0s., iSE = +20m.41s.
De Bilt esS = +20m.59s.
Uccle iPS = +21m.5s., SSN = +25m.8s.
Aberdeen iN = +11m.52s., +12m.11s., and +21m.23s., iE = +21m.27s., iEN = +25m.45s.
Durham iEN = +21m.32s., iN = +22m.10s.
Kew isPN = +12m.8s., eZ = +12m.48s., ipSN = +21m.34s., isSE = +21m.38s., iPSN = +21m.49s., eEN = +22m.17s., eSS = +26m.18s., eSSSEN = +29m.52s., eZ = +32m.44s.

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Edinburgh i = +21m.42s. and +30m.1s.
Stonyhurst i = +21m.35s.
Bidston iPS = +21m.58s., e = +22m.31s., eSSS = +29m.59s.
Scoresby Sund i = +21m.55s. and +26m.36s.
Jersey e = +30m.11s.
College eSSS = +30m.9s.
Toledo iP = +12m.33s., e = +22m.50s.
Almeria PPP = +17m.15s., S_cS = +22m.47s.
Granada i = +16m.56s.
Sitka iS = +23m.41s., eSS = +29m.1s., eSSS = +33m.2s.
Honolulu ePPP = +18m.33s., eS = +24m.54s., ePPS = +26m.41s., eSS = +32m.19s.
Butte eS = +25m.34s., eSS = +33m.37s.
Bozeman eS = +25m.29s., eSS = +33m.35s.
Williamstown i = +29m.27s.
Fordham iPSZ = +29m.5s., iZ = +29m.39s.
Pasadena iPKKPZ = +29m.42s.
Lincoln eSSS = +39m.52s.
Philadelphia eSS = +35m.49s., eSSS = +40m.18s.
Tucson iPPP = +22m.21s., S = +28m.16s., iPS = +29m.28s., SS = +36m.34s., SSS = +39m.45s., e = +45m.28s.
La Paz PKP_2 = +20m.43s.
Huancayo ePPS = +38m.40s., eSS = +45m.25s., eSSS = +51m.41s.

May 27d. Readings also at 1h. (La Paz), 3h. (Ottawa), 4h. (Rome), 5h. (Tiflis), 12h. (Riverview and Melbourne), 13h. (Hukuoka), 14h. (Stuttgart, Sverdlovsk, Irkutsk, near Manila, and Mizusawa), 15h. (La Paz), 16h. (Balboa Heights), 17h. (Andijan and near Medan), 19h. (Tucson), 20h. (Tchimkent, Tucson, Andijan (2), and Frunse), 21h. (Christchurch, Wellington, New Plymouth, Tacubaya, Manzanillo, and Tucson), 23h. (Mizusawa (2)).

May 28d. 2h. 31m. 44s. Epicentre 5°·0N. 82°·5W. (as on 1938 Dec. 18d.).

A = +·1300, B = −·9877, C = +·0866; δ = −5; h = +7;
D = −·991, E = −·131; G = +·011, H = −·086, K = −·996.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		4·9	35	i 1 18	+ 1	i 1 48	−27	—	—	e 3·2
Huancayo		18·7	157	4 20	− 2	7 56	+ 8	—	—	e 9·2
San Juan		20·8	48	e 4 45	0	e 8 44	+11	—	—	e 10·4
Tacubaya		21·7	314	e 4 49	− 6	i 11 32	L	—	—	(i 11·5)
Fort de France		23·1	65	e 5 12	+ 4	—	—	—	—	—
La Paz	z.	25·7	146	5 36a	+ 3	10 53	+52	—	—	14·3
Columbia		28·9	4	—	—	e 10 52	− 1	—	—	—
Bermuda		31·8	31	e 6 35	+ 7	e 12 1	+23	—	—	e 15·3
Philadelphia		35·4	9	—	—	e 12 31	− 3	—	—	e 14·8
Tucson		37·9	319	i 7 21a	+ 1	i 13 19	+ 6	i 8 53	PP	15·9
Riverside		43·3	316	e 8 4	− 1	—	—	—	—	—
Mount Wilson		43·9	316	i 8 10a	0	—	—	—	—	—
Pasadena		44·0	316	i 8 11a	0	—	—	—	—	—
Salt Lake City		44·3	328	—	—	14 52	+ 4	—	—	e 22·0
Tinemaha		45·7	319	e 8 26	+ 2	—	—	—	—	18·0
Rio de Janeiro		47·3	127	—	—	e 15 35	+ 4	—	—	—
Uccle	E.	84·2	40	—	—	e 23 4	+ 5	—	—	e 24·8
Stuttgart		87·4	42	—	—	e 24 34	PS	—	—	e 40·3
Rome		90·4	48	—	—	e 23 39	[+4]	—	—	e 43·3
Sverdlovsk		111·5	21	—	—	e 28 49	PS	—	—	38·5
										45·3

Additional readings :—
Tucson iPPP = +9m.18s.
Long waves were also recorded at Chicago and Tashkent.

May 28d. Readings also at 2h. (Balboa Heights), 4h. (Batavia, Manila, Medan, Irkutsk, Sverdlovsk, and Tashkent), 5h. (Ksara, Upsala, and Tucson), 11h. (La Paz, Tucson, and near Balboa Heights), 15h. (Collmberg), 17h. (Andijan and near Samarkand), 18h. (Ksara), 21h. (Tucson), 22h. (Fresno, San Francisco, near Berkeley, near Branner, and Lick),

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May 29d. Readings at 0h. (Sverdlovsk, Tashkent, Mizusawa, Calcutta, Mount Wilson, Ksara, and Pasadena), 3h. (Tucson), 5h. (Tucson and Collmberg), 6h. (Tucson (3), Mount Wilson (3), Pasadena (3), La Jolla (2), Tinemaha, Haiwee, and Riverside), 9h. (Tucson), 11h. (Tucson, Strasbourg, Christchurch, Wellington, Stuttgart, Ksara, Mount Wilson, and Collmberg), 13h. (Tucson), 17h. (Osaka and Nagoya), 18h. (Toledo), 20h. (Tucson), 21h. (Frunse, Almata, Tchimkent, and Andijan), 22h. (Tucson).

May 30d. 0h. 52m. 43s. Epicentre 39°·4N. 76°·3E. (as given by stations of Central Asia).

$A = +\cdot1835$, $B = +\cdot7528$, $C = +\cdot6322$; $\delta = +6$; $h = -1$;
$D = +\cdot972$, $E = -\cdot237$; $G = +\cdot150$, $H = +\cdot614$, $K = -\cdot775$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		3·3	294	0 59	P*	i 1 46	S*	1 9	P_g	—
Frunse		3·7	342	1 16	P_g	e 1 29	−16	—	—	—
Almata		3·9	8	1 17	P_g	e 1 33	−17	—	—	—
Tashkent		5·7	292	e 1 37	P*	i 2 42	+ 7	i 1 54	P_g	i 3·2
Tchimkent		5·8	302	1 34	+ 5	e 3 11	S_g	—	—	—
Samarkand		7·2	275	e 1 49	0	e 3 29	S*	e 2 10	P*	—
Agra	E.	12·3	173	e 2 50	− 9	4 46	−32	—	—	6·1
Baku		20·2	282	—	—	e 8 31	+10	—	—	e 11·4
Sverdlovsk		20·2	335	4 51	+12	8 45	SS	—	—	11·1
Bombay		20·7	189	—	—	e 8 22	− 9	i 9 1	SS	e 10·3
Grozny		23·2	290	e 4 56	−13	e 8·58	−20	—	—	e 13·1
Irkutsk		23·2	46	—	—	e 9 17?	− 1	—	—	e 12·3
Tiflis		24·0	286	e 5 19	+ 2	e 9 37	+ 5	—	—	e 13·8
Kodaikanal	E.	29·1	178	—	—	e 11 17?	+21	—	—	—
Collmberg	Z.	44·7	307	e 8 17	+ 1	—	—	e 10 5	PP	—

Additional readings :—
Andijan i = +1m.13s., S_g = +1m.56s.
Frunse eP* = +1m.24s., e = +1m.27s., iS_g = +2m.23s., i = +2m.25s., iSS = +2m.33s.
Almata P* = +1m.27s., S_g = +2m.25s.
Tashkent i = +1m.48s., iS = +3m.3s.
Tchimkent e$S_g$$S_g$ = +3m.26s.
Grozny e = +5m.22s.
Long waves were also recorded at Stuttgart, De Bilt, Kew, Edinburgh, and Pulkovo.

May 30d. 10h. 7m. 1s. Epicentre 39°·2N. 70°·7E.

$A = +\cdot2568$, $B = +\cdot7334$, $C = +\cdot6295$; $\delta = +9$; $h = -2$;
$D = +\cdot944$, $E = -\cdot331$; $G = +\cdot208$, $H = +\cdot594$, $K = -\cdot777$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		2·0	39	i 0 45	P_g	i 1 19	+17	—	—	—
Tashkent		2·4	333	i 0 43	+ 2	i 1 15	+ 3	—	—	i 1·4
Samarkand		2·9	279	i 0 49	+ 1	i 1 30	S*	i 0 52	P*	—
Tchimkent		3·1	345	—	—	i 1 45	S_g	—	—	—
Frunse		4·7	38	1 22	P*	i 2 26	S_g	i 1 35	P_g	—
Almata		6·2	47	1 40	+ 5	e 2 43	− 5	i 2 7	P_g	—
Dehra Dun	N.	10·7	144	—	—	e 5 8	SSS	—	—	e 6·7
Semipalatinsk		13·1	28	3 12	+ 2	e 5 20	−18	—	—	—
Agra	E.	13·5	151	e 3 7	− 8	e 5 28	−19	5 56	SS	—
Baku		16·0	281	3 48	0	6 48	+ 2	—	—	9·0
Sverdlovsk		18·9	343	i 4 23	− 1	i 7 50	− 3	—	—	10·3
Grozny		19·2	290	4 33	+ 5	8 18	+19	e 4 55	PP	—
Tiflis	E.	19·8	285	i 4 30	− 5	i 8 16	+ 3	i 4 53	PP	—
Erevan		20·2	281	4 42	+ 3	8 31	+10	—	—	—
Bombay		20·3	175	e 4 33	− 7	i 8 23	0	i 4 58	PP	10·7
Calcutta	N.	22·4	133	i 5 14a	+12	i 9 11	+ 7	i 10 0	SS	e 10·9
Hyderabad		22·7	161	5 2	− 2	9 2	− 7	—	—	11·1
Sotchi		23·6	290	4 48	−25	8 38	−47	—	—	—
Irkutsk		26·6	49	e 5 41	− 1	e 10 27	+11	—	—	15·0
Moscow		27·5	318	5 50	0	10 27	− 3	—	—	14·8

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		28·4	269	e 5 59	+ 1	e 10 53	+ 8	16 49	S_eS	—
Kodaikanal		29·5	167	—	—	i 10 49	−13	i 13 29	SSS	14·5
Pulkovo		32·6	322	e 6 36	+ 1	e 11 49	− 2	—	—	e 17·1
Bucharest		33·2	294	e 8 9	PPP	13 7	+67	—	—	15·3
Cernauti	N.	33·2	301	e 6 42	+ 2	e 11 59?	− 1	—	—	21·0
Colombo	E.	33·2	164	—	—	e 11 39	−21	13 50	SS	17·5
Helwan		33·5	266	6 41	− 2	e 12 5	0	(e 13 47)	SS	—
Sofia		35·6	291	e 7 11	+10	e 12 59?	+21	—	—	e 18·0
Belgrade	N.W.	37·3	295	—	—	e 13 6	+ 2	i 17 47	?	24·2
Upsala		38·8	320	i 8 49	PP	e 13 22	− 4	(15 50)	SS	—
Prague		40·6	305	—	—	e 15 18	+84	—	—	—
Collmberg		41·4	308	i 7 49a	− 1	e 16 35	SS	e 9 14	PP	e 23·2
Copenhagen		41·4	314	e 7 50	0	14 5	0	9 31	PP	—
Triest		41·8	298	—	—	e 16 22	SS	—	—	—
Cheb		41·9	305	e 9 37	PP	e 17 34	SSS	—	—	e 23·0
Jena		42·7	306	e 7 57	− 3	—	—	—	—	e 16·0
Hamburg		43·0	311	e 8 8	+ 5	e 17 43	SS	e 9 47	PP	e 23·8
Göttingen		43·2	308	e 9 59?	PP	—	—	—	—	—
Rome		43·6	293	8 7	− 1	14 36	− 2	9 48	PP	—
Stuttgart		44·2	304	e 8 12	0	e 14 46	0	e 10 2	PP	e 25·0
Bergen		45·0	321	—	—	e 17 59?	SS	—	—	—
Strasbourg		45·1	304	e 8 21	+ 1	e 15 3	+ 4	e 10 6	PP	—
Basle		45·5	302	e 8 22	− 1	—	—	e 10 10	PP	—
De Bilt		46·0	309	—	—	i 15 13	+ 1	e 18 10	SS	e 26·0
Uccle		46·8	308	e 8 33	0	e 15 24	0	e 10 23	PP	e 27·0
Paris		48·5	305	e 8 51	+ 5	e 18 47	SS	e 11 17	PPP	28·0
Durham		49·5	314	—	—	e 16 1	− 1	e 19 26	SS	—
Kew		49·5	309	—	—	e 15 59	− 3	e 19 39	SS	e 26·9
Oxford		50·0	310	—	—	i 16 2	− 7	e 19 56	SS	e 28·1
Edinburgh		50·1	315	—	—	e 14 29	?	e 19 39	SS	—
Stonyhurst		50·2	312	—	—	e 16 4	− 7	e 19 39	SS	e 33·0
Manila		50·3	105	9 3	+ 3	16 19	+ 6	—	—	—
Bidston		50·6	312	—	—	e 16 19	+ 2	e 19 44	SS	e 27·1
Jersey		51·3	308	e 7 14	?	e 20 11	SSS	—	—	e 27·9
Rathfarnham Castle		52·5	313	—	—	i 16 46	+ 3	e 20 26	SS	—
Toledo		56·0	296	e 9 41	− 2	—	—	—	—	—
Almeria		56·2	293	9 40	− 4	—	—	10 1	P_cP	—

Additional readings :—
Andijan i = +47s. and +54s.
Tchimkent e = +1m.50s.
Frunse iP_g = +1m.41s., i = +1m.59s.
Almata S = +2m.59s., e = +3m.19s.
Agra eN = +5m.49s.
Tiflis iE = +9m.13s. and +9m.53s.
Bombay P = +4m.37s., eE = +8m.20s., iEN = +8m.31s. and +10m.1s.
Hyderabad SSE = +9m.16s.
Bucharest eN = +8m.30s., eE = +8m.43s., SN = +13m.12s.
Helwan eE = +13m.11s., SS is given as SE.
Prague e = +16m.23s.
Collmberg eZ = +9m.21s., iZ = +9m.27s., +9m.38s., +9m.44s., +9m.57s., eZ = +10m.24s., e = +16m.59s., eZ = +18m.35s., e = +20m.5s.
Copenhagen i = +9m.37s., SS = +16m.53s.
Cheb e = +18m.30s.
Jena eZ = +8m.59s., eN = +9m.35s.
Hamburg eN = +17m.13s.
Rome iE = +14m.58s. and +18m.3s.
Stuttgart eSS = +18m.7s.
Strasbourg eSS = +18m.18s.
De Bilt iZ = +15m.18s.
Uccle eSSN = +18m.47s.
Durham eN = +16m.24s.
Kew eN = +18m.43s.
Oxford i = +20m.7s.
Stonyhurst e = +29m.59s. and +31m.44s.
Bidston e = +20m.4s.
Rathfarnham Castle i = +19m.11s.
Long waves were also recorded at Aberdeen, Zi-ka-wei, San Fernando, and Harvard.

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May 30d. Readings also at 0h. (Tiflis, Grozny, Almata, Piatigorsk, and Tucson (2)), 2h. (near Ksara), 3h. (Tucson), 4h. (Tucson and La Paz), 5h. (Honolulu and Tucson (2)), 7h. (Sverdlovsk), 9h. (Tucson, Tinemaha, Mount Wilson, Pasadena, and Haiwee), 10h. (Hukuoka, Osaka, and Tucson), 11h. (Samarkand), 12h. (Andijan and Tucson), 13h. (near San Fernando, Almeria, Toledo, Strasbourg, near Granada, and Stuttgart), 14h. (Oaxaca, Puebla, Tacubaya, Tucson, Mount Wilson, and Riverside), 15h. (La Paz and Riverside), 16h. (Malabar and Tucson (2)), 17h. (Tashkent, Manila, Mizusawa, Tucson, Riverside, La Paz, Santa Barbara, Haiwee, Pasadena, Tinemaha, Sverdlovsk, and Ksara), 18h. (Stuttgart and Tiflis), 19h. (Sverdlovsk).

May 31d. 0h. 24m. 5s. Epicentre 37°·8N. 22°·1E.

Intensity VIII at Kalacryka, felt strongly at Patras.

Epicentre 37°·8N. 22°·1E. (Athens).

See Annales de l'Institut de Physique du Globe de Strasbourg, tome IV, 2e partie, 1939, p. 43.

$A = +\cdot7340$, $B = +\cdot2980$, $C = +\cdot6103$; $\delta = +3$; $h = -1$;
$D = +\cdot376$, $E = -\cdot927$; $G = +\cdot565$, $H = +\cdot230$, $K = -\cdot792$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		5·0	11	e 0 58	−20	i 3 1	S_g	—	—	—
Istanbul		6·3	57	1 45	P*	2 48	− 2	—	—	—
Belgrade		7·1	351	i 1 47k	− 1	i 3 20	+10	—	—	—
Bucharest		7·2	24	e 1 50	+ 1	3 51	S_g	e 2 23	P_g	—
Rome		8·5	302	1 55?	−12	3 55?	+10	—	—	—
Szeged		8·6	351	i 2 4	− 5	i 4 8	S*	—	—	e 4·9
Kecskemet	z.	9·3	350	e 2 9	− 8	—	—	e 3 11	?	e 4·5
Triest		10·0	324	e 2 34	+ 7	e 4 35	+13	i 5 37	S_g	—
Helwan		11·0	133	e 2 41	− 1	e 4 43	− 4	—	—	—
Ksara		11·9	105	e 2 58	+ 4	e 6 12	L	7 43	P_cP	(6·2)
Chur		13·0	318	e 2 51	−18	—	—	—	—	—
Prague		13·4	339	e 4 7	+53	—	—	—	—	e 7·1
Cheb		14·1	334	—	—	e 5 55?	− 7	—	—	e 7·7
Basle		14·4	317	e 3 16	−11	e 5 51	−18	—	—	—
Neuchatel		14·4	314	e 2 59	−28	—	—	—	—	—
Stuttgart		14·4	324	e 3 25	− 2	e 6 16	+ 7	—	—	e 7·9
Collmberg	z.	15·0	337	e 3 20	−15	—	—	—	—	e 7·6
Strasbourg		15·0	321	e 3 35	0	e 6 17	− 6	—	—	e 7·4
Jena		15·1	334	e 3 44	+ 8	e 6 37	SS	—	—	e 8·1
Göttingen		16·2	334	e 3 55?	+ 5	—	—	—	—	—
Hamburg		17·8	336	e 3 59	−12	—	—	—	—	e 9·0
Tiflis		17·9	71	e 4 10	− 2	e 7 23	− 7	e 4 19	PP	e 9·9
Paris		18·0	315	e 4 12	− 1	—	—	—	—	11·9
Uccle		18·1	322	e 4 13	− 1	e 7 36	+ 1	—	—	e 9·9
De Bilt		18·6	328	e 4 12	− 9	e 7 34	−12	i 4 23	PP	e 10·1
Grozny		18·8	66	e 3 58	−25	e 7 22	−28	4 28	PP	—
Copenhagen		19·0	245	e 4 28	+ 2	7 42	−13	—	—	9·9
Toledo		20·4	284	e 4 39	− 2	—	—	e 5 37	PPP	—
Moscow		20·8	26	4 47	+ 2	8 30	− 3	—	—	12·4
Jersey		20·8	312	e 4 10	−35	e 8 12	−21	—	—	e 12·9
Kew		20·9	320	—	—	e 8 24	−11	—	—	i 11·7
Pulkovo		22·6	12	e 5 11	+ 8	e 9 7	0	—	—	e 10·7
Stonyhurst		23·3	323	—	—	e 9 20	0	—	—	e 13·0
Bidston		23·4	321	—	—	e 8 16	−65	—	—	e 12·8
Edinburgh		24·8	326	—	—	i 10 3	+17	—	—	—
Rathfarnham Castle		25·0	318	—	—	i 10 7	+18	i 10 49	SS	e 13·9
Aberdeen		25·1	329	—	—	i 9 35	−16	—	—	—
Sverdlovsk		31·7	41	6 27	0	11 29	− 8	—	—	14·9

For Notes see next page.

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NOTES TO MAY 31d. 0h. 24m. 5s.

Additional readings :—
Istanbul PS = +4m.4s., e? = +5m.1s.
Belgrade iZ = +2m.4s. and +2m.12s., iNW = +2m.21s.
Bucharest eE = +2m.0s., eSN = +3m.55s., iE = +4m.7s. and +4m.27s.
Jena eN = +3m.25s.
Szeged ePP = +2m.50s., eN = +3m.8s., iZ = +3m.27s., ePPS = +3m.30s., eZ = +3m.36s. and +3m.42s., iZ = +3m.52s., eZ = +4m.19s. and +4m.40s.
Tiflis PEZ = +4m.14s., eS = +7m.27s., iEZ = +7m.43s.
Copenhagen +7m.55s. and +8m.1s.
Bidston e = +11m.32s.
Aberdeen iN = +10m.5s.
Long waves were also recorded at Upsala and Tashkent.

May 31d. 10h. 0m. 56s. Epicentre 36°·2N. 140°·0E. (as on 1938, April 29d.).

Tokyo Imperial University gives epicentre 36°·11N. 139°·98E.

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

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tukubasan	0·1	—	0 14	+ 6	0 21	+ 8
Tokyo Imp. Univ.	0·5	200	0 16	+ 2	0 23	0
Komaba	0·6	200	0 14	− 1	0 22	− 4
Mitaka	0·6	214	0 14	− 1	0 24	− 2
Titibu	0·8	254	0 23	+ 5	0 33	+ 2
Kamakura	1·0	202	0 14	− 7	0 29	− 7
Kiyosumi	1·1	172	0 23	+ 1	0 38	− 1
Koyama	1·2	224	0 23	− 1	0 36	− 5
Yosiwara	1·5	226	0 23	− 5	0 45	− 4
Susaki	1·7	208	0 28	− 3	0 47	− 7
Mizusawa	3·1	17	e 0 54	+ 3	e 1 27	− 2
Osaka	4·0	248	1 14	P_g	1 59	S*

May 31d. Readings also at 0h. (Samarkand and Andijan), 1h. (Belgrade, De Bilt, Cheb, Triest, Stuttgart, Sofia, and Bucharest), 2h. (Fresno, near Berkeley, San Francisco, Branner, near Lick, and Stuttgart), 3h. (Puebla, Oaxaca, and Fort de France), 6h. (Frunse, Samarkand, Andijan, and Almata), 7h. (Tiflis), 10h. (Tucson), 11h. (Mizusawa), 12h. (Tucson), 15h. (Christchurch and near Manila), 16h. (Wellington and Ksara), 17h. (Andijan, Samarkand, Tchimkent, Tucson, and Williamstown), 18h. (near Cernauti, La Paz, Riverside, Tinemaha, Pasadena, Manila, Mizusawa, Tucson (2), near Sofia, and near Bucharest), 19h. (Kew, Rome, Stuttgart, and Ksara), 20h. (Ksara), 21h. (Almata).

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June 1d. 1h. 11m. 21s. Epicentre 43°·2N. 20°·2E.

Intensity VI at Novipazar, Dugapoljana and Sjenica, etc.

Epicentre 43° 15′ ±10′N.; 20°·2 ±0°·1E.

J. Mihailovic.
Annuaire microseismique et macroseismique, année XIX, 1939, Beograd, 1940, pp. 98-100.

$A = +\cdot6863$, $B = +\cdot2525$, $C = +\cdot6821$; $\delta = +2$; $h = -3$!
$D = +\cdot345$, $E = -\cdot938$; $G = +\cdot640$, $H = +\cdot236$, $K = -\cdot731$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sarajevo	1·5	298	e 0 29	+ 1	i 0 46	− 3	—	—	—
Belgrade	1·6	6	i 0 29	− 1	i 0 51	0	i 0 34	P_g	—
Sofia	2·4	102	e 0 44	P*	i 1 14	+ 2	—	—	—
Szeged	3·1	359	e 0 55	P*	e 1 24	− 5	e 1 7	P_g	e 2·2
Budapest	4·4	350	1 7	− 3	—	—	i 1 30	P_g	e 2·4
Triest	5·2	300	e 1 42	P_g	2 32	S*	2 54	S_g	—
Rome	5·8	259	—	—	e 2 53	S*	i 3 10	S_g	e 3·4
Chur	8·4	299	e 2 5	− 1	e 4 2	S*	—	—	—
Cheb	8·7	325	—	—	e 3 39?	−11	—	—	—
Stuttgart	9·5	310	e 2 33	+13	e 4 27	+17	—	—	e 5·4
Jena	9·7	325	e 3 33	+71	e 4 38	SS	—	—	—
Basle	9·9	300	e 2 21	− 4	e 5 4	S*	—	—	—
Neuchatel	10·1	296	e 2 30	+ 2	—	—	—	—	—
Strasbourg	10·2	306	—	—	e 3 57	−30	—	—	5·6
Ksara	15·3	123	e 3 21	−18	—	—	—	—	—

Additional readings:—
Sarajevo i = +39s.
Belgrade i = +37s., iS_g = +46s.
Szeged eE = +1m.11s., e = +1m.41s.
Triest e = +1m.51s.
Jena eE = +3m.39s.
Long waves were also recorded at De Bilt, Kew, Uccle, and Bidston.

June 1d. Readings also at 0h. (Mizusawa and near Tananarive), 1h. (Honolulu), 4h. (near Wellington and Mizusawa), 5h. (Mizusawa), 7h. (St. Louis, Williamstown, and Tucson), 9h. (Agra), 11h. (Colombo, Medan, Mizusawa, and Sverdlovsk), 12h. (near Fort de France, Guadalajara, Oaxaca, Puebla, Tacubaya, Butte, Bozeman (2), Pasadena, Tinemaha, Haiwee, Williamstown, Tucson (2), and Riverside (2)), 13h. (Balboa Heights, La Paz, Huancayo, and Stuttgart), 14h. (near Harvard, Williamstown, Tucson, and Riverside), 16h. (Manila, near Taihoku, Tashkent, Tucson, and Sverdlovsk), 17h. (Stuttgart and Mizusawa), 18h. (Samarkand, near Tananarive, and Andijan), 19h. (Vladivostok and Sverdlovsk), 21h. (Andijan, Stuttgart, Triest, Sofia, Bucharest, Istanbul, Frunse, and near Tchimkent).

June 2d. 3h. 33m. 23s. Epicentre 5°·0N. 126°·8E. (as on 1939, March 5d.).

Mindanao and Sulu. Centre in Netherlands East Indies. Intensity IV at Jolo and Davao II-III in Zampoanga, Port Lamon, and Butuan.

Epicentre 5°·3N. 127°·6E. (Strasbourg).
4°·4N. 126°·2E. (U.S.C.G.S.).

W. C. Repetti.
Seismological Bulletin for 1939, Manila Central Observatory, Manila, 1940, p. 23.

$A = -\cdot5967$, $B = +\cdot7977$, $C = +\cdot0866$; $\delta = -12$; $h = +7$;
$D = +\cdot801$, $E = +\cdot599$; $G = -\cdot519$, $H = +\cdot693$, $K = -\cdot996$.

Tables for depth of focus 0·010 have been used.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau	8·0	72	1 54	− 1	3 46	SS	—	—	—
Manila	11·1	329	i 2 41a	+ 4	4 57	SS	—	—	—
Taihoku	20·6	347	4 32	− 1	8 20	+ 7	—	—	—
Hong Kong	21·1	327	4 37	− 1	8 27	+ 5	4 53	PP	10·3
Malabar	22·7	238	e 4 47	− 7	8 32	−19	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		22·8	241	i 4 49a	− 6	i 8 37	−16	i 9 46	SS	e 14·6
Phu-Lien		25·1	311	i 5 14a	− 3	9 31	− 1	—	—	—
Yakusimà		25·5	9	5 24	+ 3	9 43	+ 4	—	—	—
Zi-ka-wei	Z.	26·5	351	i 5 31k	+ 1	9 31	−24	6 3	PP	13·5
Miyazaki		27·1	10	5 40	+ 4	—	—	—	—	—
Nagasaki		27·8	6	5 45	+ 3	10 21	+ 5	—	—	—
Medan		28·1	269	i 5 44	− 1	i 10 17	− 4	—	—	—
Hukuoka		28·6	7	5 52	+ 3	10 55	+26	16 27	SS	18·9
Koti		29·1	11	5 57	+ 3	10 43	+ 6	—	—	—
Hamada		30·2	9	6 9	+ 6	10 57	+ 3	—	—	—
Kobe		30·6	14	6 11	+ 4	11 23	+23	—	—	—
Osaka		30·6	14	6 15	+ 8	11 23	+23	7 28	PP	17·4
Toyooka		31·3	13	6 22	+ 9	11 24	+12	—	—	—
Nagoya		31·5	17	6 19	+ 4	11 20	+ 5	—	—	—
Zinsen		32·3	359	6 26	+ 4	11 36	+ 9	—	—	—
Toyama		33·0	15	6 30	+ 2	—	—	—	—	—
Mito		33·7	19	6 35	+ 1	—	—	—	—	—
Sendai		35·5	20	6 52	+ 3	12 22	+ 5	—	—	—
Mizusawa		36·4	19	e 7 1	+ 4	e 12 35	+ 5	—	—	—
Akita		36·6	18	7 5	+ 7	—	—	—	—	—
Vladivostok		38·2	6	e 7 15	+ 3	i 13 2	+ 4	—	—	16·5
Sapporo		40·0	16	7 32	+ 5	13 32	+ 7	—	—	—
Calcutta	N.	41·0	299	i 7 36a	+ 1	i 13 40	0	e 8 55	PP	e 18·9
Brisbane		41·1	143	i 7 31	− 5	e 13 19	−22	i 9 7	PP	16·7
Adelaide		41·2	165	i 7 33	− 3	i 13 37	− 6	i 9 6	PP	18·7
Nemuro		41·6	21	7 43	+ 3	13 52	+ 4	—	—	—
Riverview		45·0	150	i 8 5	− 2	i 14 37	− 1	9 51	PP	e 24·0
Sydney		45·0	150	e 8 4	− 3	e 14 37	− 1	e 17 55	SS	—
Melbourne		45·9	159	i 8 12	− 2	14 47	− 4	9 56	PP	21·6
Colombo	E.	46·7	275	8 14	− 7	14 56	− 6	—	—	22·9
Hyderabad		48·9	289	8 34	− 4	15 31	− 2	10 23	PP	22·7
Kodaikanal	E.	49·1	280	i 8 46?a	+ 7	i 15 34	− 2	—	—	24·2
Irkutsk		50·7	342	i 8 52	0	i 16 1	+ 3	—	—	26·6
Agra	E.	51·4	301	i 8 52a	− 5	i 16 3	− 5	10 53	PP	24·8
Dehra Dun	N.	52·3	305	e 9 18	+14	i 16 24	+ 4	—	—	e 24·2
Bombay		54·4	289	9 15	− 4	i 16 46	− 2	e 11 33	PP	e 25·9
Almata		58·1	319	e 9 44	− 2	—	—	—	—	—
Frunse		59·5	317	e 9 55	0	—	—	—	—	—
Semipalatinsk		59·7	328	e 9 51	− 6	—	—	—	—	—
Andijan		60·2	314	e 10 0	0	18 6	+ 2	—	—	—
Arapuni		62·3	138	—	—	18 37	+ 6	—	—	24·1
Tchimkent		62·7	316	10 7	−10	18 28	− 8	—	—	—
Christchurch		63·5	144	i 10 20k	− 2	i 18 46	0	i 12 48	PP	e 30·0
Wellington		63·5	142	e 10 12	−10	18 39	− 7	18 54	PS	27·3
Samarkand		63·8	312	10 20	− 4	18 47	− 3	—	—	—
Chatham Ils.		70·4	141	—	—	e 19 37?	−32	e 24 37?	SS	—
Sverdlovsk		72·9	329	i 11 20	0	i 20 36	− 2	—	—	—
Honolulu		74·6	69	11 32	+ 2	e 21 0	+ 4	e 29 54	SSS	e 30·4
Baku		76·8	310	i 11 43	0	i 21 26	+ 5	—	—	36·6
Grozny		80·1	313	11 57	− 4	21 50	− 6	i 12 21	pP	—
Tiflis		80·7	311	i 12 5	+ 1	i 21 59	− 3	—	—	—
Erevan		80·9	310	12 7	+ 2	e 22 6	+ 2	—	—	—
Tananarive		81·5	250	11 6	−62	22 6	− 4	27 16	SS	38·6
Piatigorsk		82·0	315	e 12 9	− 2	e 22 12	− 3	—	—	—
College		83·5	25	—	—	22 32	+ 2	e 27 49	SS	—
Moscow		85·5	325	i 12 27	− 1	22 43	− 7	—	—	43·1
Ksara		88·0	303	i 12 40a	0	23 20	+ 6	i 13 11	pP	—
Pulkovo		89·0	330	i 12 45	0	e 23 5	[+ 1]	e 24 16	PS	e 41·7
Sitka		90·1	33	e 12 50	0	e 23 10	[0]	e 17 17	sPP	e 36·2
Helwan		92·3	300	i 13 1k	+ 1	23 25	[+ 2]	i 13 29	pP	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		92·6	311	12 22	−40	23 31	[+ 7]	16 5	PP	—
Cernauti	N.	93·5	319	e 13 5	− 1	23 30	[+ 2]	—	—	46·6
Bucharest		94·1	315	e 13 10	+ 1	23 37	[+ 6]	—	—	—
Upsala		95·4	332	e 13 22	+ 7	23 39	[− 1]	i 24 14	S	e 42·6
Sofia		96·5	314	e 13 28	+ 8	e 23 54	[+ 8]	—	—	—
Belgrade		98·0	317	e 13 25k	− 1	i 23 53	[− 1]	e 17 27	PP	e 37·1
Copenhagen		99·3	328	e 13 32	0	24 52	0	17 34	PP	—
Victoria		99·3	40	e 17 7	PP	i 24 0	[0]	e 26 37?	PS	31·6
Prague		100·3	323	e 13 43	+ 6	e 24 12	[+ 7]	e 25 1	S	e 45·6
Collmberg		100·7	325	i 13 38a	− 1	e 24 7	[0]	i 17 38	PP	e 47·6
Cheb		101·5	323	e 17 56	PP	e 24 14	[+ 3]	e 27 23	PS	e 49·6
Hamburg		101·5	327	e 13 41	− 1	24 15	[+ 4]	—	—	e 50·6
Jena		101·6	324	e 13 37	− 6	e 24 7	[− 5]	—	—	e 40·6
Scoresby Sund		101·8	350	17 56	PP	24 20	[+ 7]	25 16	S	38·6
Triest		102·2	319	e 13 44	− 1	i 24 16	[+ 1]	i 18 1	PP	e 47·6
Ukiah		102·2	49	—	—	e 24 18	[+ 3]	e 33 6	SS	e 43·2
Göttingen		102·3	326	e 13 44	− 2	e 24 13	[− 2]	e 18 2	PP	e 50·6
Heligoland		102·3	328	—	—	e 24 16	[+ 1]	e 33 13	SS	49·6
Berkeley		103·2	50	e 22 4	?	i 24 23	[+ 4]	e 37 1	SSS	e 47·0
Santa Clara		103·6	50	—	—	e 25 42	+14	—	—	e 57·6
Stuttgart		103·9	323	i 13 53a	0	e 24 22	[0]	e 18 13	PP	e 53·6
Rome		104·4	314	e 13 53	P	i 24 26	[+ 1]	e 17 59	PP	e 51·5
Chur		104·5	321	e 13 55	P	e 24 25	[0]	—	—	—
De Bilt		104·7	327	e 13 52	P	i 24 28	[+ 2]	e 17 58	PKP	e 41·6
Strasbourg		104·9	323	i 13 56a	P	e 24 31	[+ 4]	e 18 19	PP	e 51·6
Basle		105·4	323	e 13 59	P	e 24 30	[+ 1]	e 18 25	PP	—
Aberdeen		105·6	334	e 17 49	PKP	i 24 31	[+ 1]	i 33 10	SS	e 49·9
Uccle		105·8	326	i 14 1a	P	e 24 42	[+11]	e 18 21	PP	e 49·6
Neuchatel		106·0	322	e 14 2	P	—	—	—	—	—
Santa Barbara	Z.	106·2	52	e 14 14	P	—	—	—	—	—
Edinburgh		106·8	333	e 18 44	PP	i 24 46	[+11]	i 28 19	PPS	e 49·6
Pasadena		107·5	51	e 14 12	P	i 24 46	[+ 8]	e 18 46	PP	e 48·7
Mount Wilson	Z.	107·6	51	e 14 17	P	—	—	e 18 23	PP	—
Stonyhurst		107·7	331	—	—	e 24 52	[+13]	i 25 37	S	e 50·6
Paris		107·9	325	i 14 9	P	24 42	[+ 2]	18 42	PP	52·6
Cape Town	E.	108·0	236	e 17 23	PKP	24 45	[+ 4]	e 18 48	PP	—
Kew		108·0	328	e 18 37?	PP	e 24 32	[− 9]	e 28 30	PS	e 50·6
Bozeman		108·1	38	e 18 17	PKP	e 24 53	[+12]	27 52	PS	e 44·7
Bidston		108·3	332	i 18 37?	PP	e 24 33	[− 9]	e 28 2	PS	e 50·6
Clermont Ferrand		109·1	322	e 17 0	?	i 24 47	[+ 2]	i 18 49	PP	e 51·6
Salt Lake City		109·7	44	e 21 33	PPP	e 24 54	[+ 7]	—	—	45·1
Rathfarnham Castle		109·8	333	i 14 25	P	i 26 43	?	i 19 10	PP	—
Jersey		110·2	328	—	—	e 25 52	SKKS	e 28 37?	PS	e 53·6
Tucson		114·0	51	e 14 48	P	25 44	SKKS	e 18 26	PKP	e 48·7
Toledo		116·5	319	e 19 5	PP	e 29 13	PS	—	—	53·5
Almeria		117·0	317	e 18 56	[+22]	—	—	i 19 28	PP	64·3
Granada		117·6	318	e 19 5	[+30]	29 13	PS	—	—	64·1
San Fernando		119·8	318	e 20 2	PP	e 29 34	PS	—	—	58·6
Chicago		123·8	31	—	—	e 28 22	?	e 30 23	PS	—
St. Louis		124·0	35	e 18 58	[+10]	(e 24 37?)	[−63]	e 21 16	PP	e 24·6
Ottawa		125·9	20	e 18 52	[+ 2]	—	—	(21 37?)	PP	21·6
East Machias		128·8	13	—	—	32 7	PPS	e 38 41	SS	—
Williamstown		129·1	18	e 18 59	[+ 2]	—	—	i 19 31	pPKP	—
Harvard		129·9	16	i 19 1k	[+ 2]	e 38 37?	SS	i 19 28	pPKP	—
Fordham		130·6	19	e 19 2	[+ 2]	e 31 39	PS	i 21 29	PP	—
Philadelphia		130·9	21	e 22 56	PKS	e 28 8	SKKS	e 38 56	SS	e 63·7
Columbia		133·1	32	e 18 58	[− 7]	—	—	e 21 31	PP	—
Bermuda		141·3	15	e 19 52	pPKP	e 40 45	SS	e 23 0	PP	e 67·2
Balboa Heights		150·3	62	e 19 49	[+15]	—	—	e 24 19	pPP	—
San Juan		153·5	27	e 19 54	[+15]	e 30 17	SKKS	e 24 56	sPP	—
Huancayo		157·0	110	e 23 58	PP	34 12	?	43 52	SS	—
Fort de France		158·9	22	e 22 7	?	—	—	—	—	—
Rio de Janeiro		159·6	208	e 20 28	[+41]	e 30 39	SKKS	—	—	44·0
La Paz		161·4	130	19 58	[+ 9]	i 30 47	SKKS	i 24 19	PP	76·6

For Notes see next page.

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NOTES TO JUNE 2d. 3h. 33m. 23s.

Additional readings :—
Hong Kong SS = +9m.20s.
Malabar iPEN = +4m.53s.
Batavia SN = +8m.40s.
Zi-ka-wei iZ = +5m.41s., PPPZ = +6m.7s., iZ = +6m.47s., iN = +10m.17s., SSZ = +10m.23s., SSSZ = +10m.43s., SSSSZ = +11m.3s., iZ = +11m.31s.
Osaka P_cP = +8m.47s., S_cS = +14m.12s.
Mizusawa eSN = +12m.38s.
Calcutta N. ePPP = +9m.22s., eP_cP = +9m.48s., eSS = +16m.1s., eSSS = +16m.36s., i = +17m.6s.
Brisbane iPPE = +9m.13s., iP_cPE = +9m.49s., iE = +11m.1s. iSN = +13m.25s., eSSE = +15m.37s., iSSN = +16m.13s.
Adelaide e = +13m.9s., i = +14m.4s., e = +16m.17s., i = +16m.33s. and +16m.48s.
Riverview iEN = +8m.9s., iSE = +14m.41s., iS_cSEN = +17m.58s.
Melbourne SS = +17m.50s.
Hyderabad S_cSN = +18m.17s.
Agra E. sP = +9m.13s., i = +11m.24s., S_cP = +14m.3s., sS = +16m.25s., S_cS = +18m.38s., SS = +19m.32s., SSS = +20m.57s.
Bombay iE = eN = +9m.43s., iPPE = +11m.36s., iEN = +17m.21s., iSSE = +20m.23s., iN = +21m.7s.
Arapuni i = +19m.1s.
Christchurch i = +10m.27s., iZ = +10m.46s., iEZ = +11m.48s., iS_cS = +20m.10s., iSSN = +22m.53s., eL_qN = +26m.0s.
Wellington iZ = +10m.19s., P_cP = +10m.45s., iZ = +12m.40s., P_cS? = +14m.19s., i = +19m.34s., S_cS = +20m.5s., SS = +22m.44s., L_q = +24m.16s.
Honolulu iS = +21m.4s.
Grozny i = +12m.1s.
Tananarive SE = +21m.2s.
Ksara sP = +13m.22s., pPP = +16m.48s., sS = +24m.16s.
Pulkovo eS = +23m.9s.
Sitka SKKS = +23m.24s., iS = +23m.42s., ipS = +24m.5s., sS = +24m.29s., eSS = +29m.42s., sSS = +30m.19s., eSSS = +33m.36s., SSS = +33m.48s.
Helwan PPZ = +16m.39s., SKKS = +23m.52s., eN = +24m.57s., iE = +30m.1s.
Copenhagen +24m.7s., eZ = +26m.18s.
Victoria e = +24m.55s.
Collmberg i = +13m.50s., +13m.57s., and +14m.3s., e = +14m.12s., +14m.31s., +16m.33s., +16m.47s., +16m.50s., and +16m.53s., i = +17m.14s., +17m.28s., and +17m.49s., e = +18m.25s., +18m.55s., and +19m.8s., ePPP = +19m.43s., e = +21m.27s., eS = +25m.5s., eZ = +25m.43s., ePS = +26m.15s., e = +26m.36s., ePPS = +27m.18s., e = +30m.31s., eSS = +31m.43s., e = +36m.49s. and +41m.7s.
Hamburg eN = +23m.57s.
Jena eE = +24m.13s., e = +25m.13s.
Triest iSKKS = +25m.8s., PS = +27m.17s.
Ukiah eS = +25m.25s.
Göttingen e = +25m.19s.
Berkeley eN = +32m.33s. and +37m.1s.
Stuttgart ePPP = +20m.47s., SKKS = +25m.36s., eS = +26m.30s., ePS = +27m.49s., ePPS = +28m.49s., eL_q = +50·6m.
Rome iE = +18m.3s., ePPPEZ = +20m.28s., ePPSE = +27m.44s., iSSN = +33m.13s.
De Bilt iPZ = +13m.56s.
Strasbourg ePPPZ = +20m.55s., iSN = +25m.45s., PPS?N = +27m.52s.
Aberdeen iEN = +18m.23s., +25m.23s., and +37m.54s., eN = +42m.54s.
Uccle ePPPZ = +21m.0s., eS = +25m.54s., PPS = +28m.11s.
Edinburgh i = +25m.58s.
Pasadena iZ = +18m.21s., ePKKPZ = +29m.44s.
Mount Wilson iZ = +19m.13s., ePKKPZ = +29m.40s.
Paris S = +26m.8s.
Cape Town eN = +26m.8s., eE = +27m.53s.
Kew eEN = +25m.34s., eE = +26m.21s. and +29m.22s.
Bozeman esPP = +19m.58s., esSP = +29m.14s., eSS = +34m.25s.
Bidston e = +25m.37s. and +26m.13s.
Rathfarnham Castle iPPP = +21m.1s., iPS = +28m.22s.
Tucson ePKP = +18m.32s., epPKP = +19m.1s., PPP = +22m.7s., iSP = +28m.54s.
Toledo e = +22m.13s.
Chicago eSS = +36m.34s., esSS = +37m.54s.
East Machias esSS = +39m.30s.
Williamstown i = +21m.35s. and +22m.13s.
Harvard eZ = +21m.17s., iZ = +21m.38s. and +22m.15s.
Fordham iZ = +22m.16s., eZ = +23m.7s.
Philadelphia eSKSP = +31m.15s.
Columbia esPKP = +19m.47s., epPP = +22m.19s.
San Juan ePKP$_2$ = +20m.46s., eSKSP = +33m.50s., eSS = +42m.34s., esSS = +44m.44s.
La Paz iZ = +20m.13s., iPKP$_2$ = +20m.30s., iSKPZ = +23m.17s., SKSP = +34m.40s., PPS = +37m.55s., SSN = +44m.47s.
Long waves were also recorded at Bergen and Moncalieri.

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June 2d. 14h. 11m. 29s. Epicentre 37°·8N. 22°·1E. (as on 1939 May 31d.).

$A = +\cdot7340$, $B = +\cdot2980$, $C = +\cdot6103$; $\delta = +3$; $h = -1$;
$D = +\cdot376$, $E = -\cdot927$; $G = +\cdot565$, $H = +\cdot230$, $K = -\cdot792$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		5·0	11	e 1 19	+ 1	e 3 16	?	—	—	—
Belgrade	Z.	7·1	351	e 2 9a	P*	e 3 6	− 4	—	—	—
Bucharest		7·2	24	e 1 47	− 2	e 3 17	+ 4	e 2 19	P_g	—
Rome		8·5	302	e 2 4	− 3	e 4 12	S*	e 4 31	S_g	—
Szeged	E.	8·6	351	e 2 44	P*	e 4 33	S_g	—	—	e 5·8
	N.	8·6	351	e 2 41	P*	e 4 31	S_g	—	—	e 5·9
Kecskemet	Z.	9·3	350	e 3 11	+54	e 5 26	S_g	—	—	—
Triest		10·0	324	e 2 36	PP	4 40	SS	5 51	SSS	—
Ksara		11·9	105	e 3 5	PP	e 6 11	L	—	—	(6·2)
Moncalieri		13·0	308	e 3 7	− 2	—	—	—	—	6·5
Prague		13·4	339	e 4 49	?	e 5 37	− 8	—	—	—
Cheb		14·1	334	—	—	e 6 31?	+29	—	—	e 7·6
Basle		14·4	317	e 3 25	− 2	e 6 7	− 2	—	—	—
Stuttgart		14·4	324	e 3 24	− 3	e 6 16	+ 7	—	—	e 8·3
Collmberg		15·0	337	e 3 35	0	e 5 43	−40	—	—	e 8·1
Strasbourg	E.	15·0	321	e 3 49	PP	e 6 58	SSS	—	—	—
Clermont Ferrand		16·2	305	e 3 32	−18	—	—	—	—	—
Tiflis		17·9	71	4 9	− 3	e 7 37	+ 7	—	—	e 10·0
Paris		18·0	315	e 4 8	− 5	—	—	—	—	11·5
De Bilt		18·6	328	i 4 9	−12	e 7 46	0	—	—	—
Moscow		20·8	26	e 5 34	+49	e 9 23	SSS	—	—	13·0
Pulkovo		22·6	12	e 6 12	?	e 9 12	+ 5	—	—	—
Sverdlovsk		31·7	41	e 6 36	+ 9	e 11 45	+ 8	e 14 0	SSS	15·5

Additional readings :—
Belgrade iNE = +3m.3s. and +4m.4s.
Bucharest S? = +3m.31s., iEN = +3m.59s., iE = +4m.28s. and +4m.37s.
Szeged eE = +3m.35s., eN = +3m.55s.
Triest e = +3m.9s. and +4m.5s.
Strasbourg eE = +4m.15s. and +4m.55s.
Long waves recorded at Hamburg and Tashkent.

June 2d. Readings also at 0h. (Tucson), 4h. (Tucson, La Paz, and Fort de France), 5h. (La Paz, Fort de France, Tucson (2), and Mount Wilson), 6h. (Fort de France and near Manila), 7h. (La Paz), 14h. (Triest, Rome, Sofia, and Stuttgart), 15h. (near Malabar), 16h. (Pasadena, Mount Wilson, Tucson, Tinemaha, and Riverside), 17h. (Tucson (2), Strasbourg, Basle, Triest, Stuttgart, Sofia, Rome, and Collmberg), 18h. (Agra), 19h. (Tiflis, Ksara, Baku, and Tashkent), 21h. (Collmberg), 22h. (Balboa Heights), 23h. (Andijan).

June 3d. Readings at 1h. (Andijan, Samarkand, Balboa Heights, and La Paz), 2h. (near Osaka), 4h. (Balboa Heights and Tucson), 5h. (near Manila), 6h. (Malabar), 7h. (Fort de France, Ksara, Tucson, Mount Wilson, and Pasadena), 8h. (Tashkent and Sverdlovsk), 9h. (Balboa Heights and Mizusawa), 10h. (Hong Kong), 11h. (Tucson and Samarkand), 12h. (Agra), 13h. (Samarkand and Toledo), 14h. (La Plata, La Jolla, Tinemaha, Riverside, Santa Barbara, Tucson, Mount Wilson (2), Pasadena (2), and La Paz), 15h. (near Tananarive, Tucson, Mizusawa, and Ottawa), 16h. (Ottawa and Rathfarnham Castle), 17h. (Manila and near Rome), 18h. (Tucson), 20h. (Tucson and Tacubaya), 22h. (Rome), 23h. (Florissant and Tucson)

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June 4d. 0h. 23m. 56s. Epicentre 8°·7S. 123°·0E.

Damage at Flores. Epicentre 8°·5S. 122°·0E. (Strasbourg).

See Annales de l'Institut de Physique du Globe de Strasbourg, tome IV, 2e partie, 1939, p. 44.

Pasadena suggests depth 100kms.

A = −·5384, B = +·8291, C = −·1503; δ = −13; h = +7;
D = +·839, E = +·545; G = +·082, H = −·126, K = −·989.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Malabar		15·3	275	—	—	6 40	+10	—	—	i 15·8
Batavia		16·2	278	3 55	+ 5	7 3	+12	—	—	i 8·6
Palau		19·6	36	4 34	+ 2	8 13	+ 5	—	—	—
Manila		23·2	355	e 5 12a	+ 3	9 30	+12	—	—	—
Medan		27·1	296	5 52	+ 6	10 43	+19	i 11 35	SS	—
Adelaide		29·8	154	i 7 15	PP	i 10 36	−31	i 11 54	SS	—
Koshun		30·6	357	6 24	+ 6	—	—	—	—	—
Hong Kong		32·0	345	6 30	0	11 41	− 1	—	—	—
Phu-Lien		33·5	332	e 6 44	+ 1	—	—	—	—	—
Melbourne		35·2	149	—	—	e 12 20	−11	i 14 57	SS	—
Riverview		36·0	138	—	—	e 11 46	−58	—	—	i 20·2
Zi-ka-wei	z.	39·7	359	e 7 38	+ 2	—	—	—	—	—
Kobe		44·7	16	8 16	0	—	—	—	—	—
Nagoya		45·6	18	8 28	+ 4	—	—	—	—	—
Colombo	E.	45·7	288	e 7 34	−50	—	—	—	—	—
Calcutta	N.	46·0	313	e 8 15	−12	—	—	—	—	—
Tokyo		46·9	19	12 38	?	20 15	SSS	—	—	—
Nagano		47·3	16	8 36	− 1	15 24	− 7	—	—	—
Kodaikanal		49·1	292	—	—	i 16 4	+ 8	—	—	—
Christchurch		55·3	137	—	—	17 30	+ 9	25 36	L_q	35·6
Agra	E.	56·3	312	9 40	− 5	17 19	−15	22 47	SSS	—
Bombay		56·6	300	e 10 9	+22	i 17 27	−11	i 11 42	PP	—
Irkutsk		62·8	347	10 28	− 2	i 18 54	− 4	—	—	e 31·1
Almata		66·5	326	e 10 55	+ 1	—	—	—	—	—
Frunse		67·6	324	11 1	0	—	—	—	—	—
Andijan		67·8	321	—	—	19 55	− 5	—	—	—
Tashkent		70·0	320	i 11 12	− 3	i 20 14	−12	11 31	pP	e 28·6
Tchimkent		70·3	321	e 11 14	− 3	e 20 21	− 8	—	—	—
Sverdlovsk		82·1	331	i 12 24	0	i 22 34	− 4	i 12 47	pP	38·1
Baku		83·0	313	12 30	+ 2	22 43	− 4	—	—	43·1
Grozny		86·2	315	e 12 27	−17	e 22 44	[−25]	—	—	—
Erevan		86·9	311	e 11 34	−74	e 21 44	?	—	—	—
Tiflis		87·0	313	12 49	+ 1	i 23 6	[− 8]	24 1	PS	e 46·1
Ksara		92·4	303	e 13 20	+ 6	e 24 25	+ 9	e 13 42	pP	—
Moscow		94·6	326	e 13 21	− 3	24 37	+ 2	13 44	pP	—
Pulkovo		98·8	330	e 17 59	PP	e 23 59	[−22]	26 25	SP	—
Collmberg		109·2	322	e 17 52	?	—	—	e 19 8	PP	—
Triest		109·6	316	e 19 27	PP	e 25 1	[− 9]	e 28 50	PS	e 61·0
Rome		111·0	311	e 19 10	PP	e 26 4	{− 8}	e 22 21	PPP	—
Stuttgart		112·1	320	e 19 24	PP	e 29 4	PS	e 20 4	P_cP	e 62·1
Strasbourg		113·1	320	e 19 26	PP	e 29 4	PS	e 22 8	PPP	—
De Bilt		113·8	324	e 19 28	PP	e 29 0	PS	—	—	e 63·1
Uccle	z.	114·6	323	e 19 48	PP	e 29 6	PS	—	—	—
Paris		116·4	321	e 20 4	PP	e 29 23	PS	—	—	63·1
Clermont-Ferrand		116·9	317	20 5	PP	—	—	—	—	—
Edinburgh		116·9	330	—	—	e 25 4?	[−35]	—	—	—
Kew	z.	117·2	324	e 20 1	PP	e 29 26	PS	—	—	—
Santa Barbara	z.	117·3	55	i 18 48	[+ 1]	—	—	i 19 11	PP	—
Haiwee		118·5	53	e 18 50	[0]	—	—	—	—	—
Pasadena		118·6	55	i 18 48	[− 2]	—	—	i 19 13	PP	—
Mount Wilson		118·7	55	i 18 47	[− 3]	—	—	i 19 13	PP	—
Tucson		125·0	56	19 0k	[− 2]	—	—	e 20 56	PP	—
Williamstown		143·3	18	i 19 25	[−11]	—	—	i 23 3	PP	i 70·0
Harvard		144·0	17	i 19 32	[− 5]	—	—	—	—	e 71·1
Fordham		144·7	22	i 19 34a	[− 5]	—	—	e 23 9	PP	i 70·5
La Paz	z.	152·6	156	20 0	[+ 9]	—	—	—	—	—

For Notes see next page.

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NOTES TO JUNE 4d. 0h. 23m. 56s.

Additional readings :—
Batavia PEN = +3m.58s., iE = +4m.2s., iN = +5m.57s.
Medan iE = +12m.17s., iEN = +12m.55s.
Hong Kong S = +10m.20s.
Melbourne i = +14m.9s. and +15m.39s.
Riverview iE = +13m.8s., eN = +15m.59s., iE = +17m.26s., iN = +17m.45s.
Bombay iE = +14m.9s., iN = +14m.56s., iEN = +19m.23s.
Tashkent pPP = +14m.19s., sS = +20m.57s.
Sverdlovsk PP = +15m.42s., isS = +23m.23s.
Tiflis e = +12m.53s., eN = +12m.57s., iSEN = +23m.22s.
Moscow SKS = +23m.49s.
Pulkovo eS = +25m.4s.
Collmberg e = +18m.20s. and +20m.28s.
Rome e = +28m.31s. and +42m.23s.?
Stuttgart ePP = +22m.7s., eEN = +26m.10s., ePSZ = +29m.48s.
Strasbourg eE = +29m.29s.
Pasadena iZ = +22m.17s.
Mount Wilson iZ = +22m.18s.
Tucson i = +19m.12s. and +19m.23s., e = +20m.23s., i = +20m.30s. and +20m.39s.
Fordham iZ = +19m.47s.
Long waves were also recorded at Wellington.

June 4d. 1h. Undetermined shock.

Tucson iP = 19m.43s. and 19m.55s., iS = 20m.16s., iL = 22·9m.
Riverside ePEN = 21m.0s., eSN = 23m.7s.
Pasadena ePZ = 21m.5s., eSNZ = 23m.22s., iLE = 24·2m.
Tinemaha ePEN = 21m.22s., eSEN = 23m.50s.
Salt Lake City eS = 23m.2s., eL = 23m.52s.
Fresno eN = 24m.19s.
Columbia eP = 24m.27s. and 24m.36s., eS = 28m.15s. and 28m.20s., eL = 30·9m.
Bozeman eS = 24m.40s. and 24m.45s., eL = 25·8m.
Florissant eSN = 27m.17s., iSZ = 27m.23s., iN = 27m.30s., iE = 27m.40s.
St. Louis eSEN = 27m.18s., iEN = 27m.24s., iN = 27m.47s., iE = 28m.8s. and 28m.47s.
Santa Clara ePE = 25m.29s., eE = 26m.14s.
Long waves were also recorded at other American stations.

June 4d. 11h. Undetermined South Pacific quake. Apia gives distance $\Delta = 7°·9$.

Apia ePN = 59m.14s., eE = 59m.30s., iN = 60m.37s., iSN = 60m.57s.
Christchurch eP = 61m.38s., eS = 67m.13s., iE = 67m.21s., eL_q = 69m.11s., L = 71·4m.
Wellington eP? = 61m.42s., e = 68m.7s., L_q = 69·0m.
Sydney e = 65m.0s., 69m.57s., L = 74·0m.
Brisbane iN = 66m.24s., eN = 71m.24s. and 73m.0s.?
Honolulu eP = 66m.47s., eL = 75·3m.
Manila PZ = 69m.4s., S?EN = 79m.0s.
Santa Barbara eP = 69m.15s.
La Jolla eP = 69m.18s.
Pasadena eP = 69m.19s.
Berkeley ePZ = 69m.20s., eEN = 90m.24s., eEZ = 97m.54s.
Mount Wilson iP = 69m.20s.
Riverside eP = 69m.21s.
Haiwee ePNZ = 69m.28s.
Tinemaha ePEN = 69m.29s.
Tucson iP = 69m.40s.a and 69m.59s., iPP = 72m.42s., iS_cS = 79m.50s., iL = 94·6m.
College eP = 70m.22s., eS = 80m.45s., eL = 96·3m.
Sverdlovsk e = 76m.37s., 78m.29s., and 86m.37s., L = 107·0m.
Moscow e = 76m.57s., 79m.41s., and 80m.8s., eL = 145·5m.
Tiflis ePKPZ = 76m.58s., ePPZ = 80m.8s., eSKPEZ = 80m.42s., ePSKSZ = 89m.49s., ePPSZ = 92m.15s., eSSZ = 98m.36s., eL = 125·0m.
Baku e = 77m.0s., 79m.45s., 80m.40s., 83m.28s., and 88m.35s., eL = 122·0m.
Copenhagen = 77m.7s.
Adelaide i = 77m.11s., eL = 80·2m.
Collmberg eZ = 77m.14s., i = 77m.18s., e = 77m.28s., and 77m.40s., i = 78m.1s.
Hamburg iZ = 77m.14s.
De Bilt eZ = 77m.15s., eL = 142·0m.
Kew eZ = 77m.16s., eL = 144·0m.
Uccle ePKP = 77m.17s.

Continued on next page.

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Ksara ePKP = 77m.18s., ePP = 81m.0s., SKKS = 87m.36s., SKSP = 91m.21s., PPS = 94m.24s., SS = 104m.32s.
Paris e = 77m.21s. and 78m.3s., L = 142·0m.
Stuttgart ePKPNZ = 77m.21s., eZ = 81m.42s., e = 91m.48s., eL = 148·0m.
Rome eZ = 77m.28s. and 86m.9s., eL = 128·3m.
Strasbourg ePKP = 77m.37s., ePKP$_2$Z = 78m.47s., eL = 145·0m.
Triest e = 77m.42s., 81m.16s., and 84m.50s.
Huancayo eSKS = 81m.20s., eL = 100·4m.
Chicago eSKS = 81m.50s., eS = 82m.53s., ePS = 84m.19s., eL = 109·1m.
Aberdeen eE = 84m.30s., eLE = 140·2m.
Philadelphia ePS = 85m.50s., eL = 111·4m.
Long waves were also recorded at Santa Clara, Bidston, Sitka, Bermuda, San Fernando, Clermont-Ferrand, Salt Lake City, Columbia, East Machias, La Paz, Harvard, Edinburgh, Irkutsk, Riverview, and Melbourne.

June 4d. 15h. Probably near New Guinea.

Manila eP = 21m.12s., SEN = 27m.9s., LN = 31m.20s.
Brisbane iN = 22m.24s. and 27m.12s.
Zi-ka-wei eZ = 24m.8s., LZ = 36m.24s.
Medan ePEN = 24m.44s., S?EN = 30m.51s.
Vladivostok e = 25m.10s. and 32m.11s., L = 35m.48s.
Sydney e = 25m.40s., eL = 33m.18s.
Irkutsk eP = 27m.13s., S = 35m.31s., L = 49m.
Adelaide e = 29m.33s. and 31m.52s., i = 32m.30s., 33m.20s., and 33m.37s.
Sverdlovsk e = 30m.24s., 40m.2s., and 41m.1s., L = 56m.
Mount Wilson iPZ = 30m.35s.
Riverside ePZ = 30m.35s.
Christchurch ePEZ = 30m.52s., SNZ = 37m.9s., L_q = 40m.10s., LZ = 43m.14s.
Wellington eP? = 30m.58s., S = 37m.20s., L_q = 40m.25s., L = 43m.40s.
Riverview eZ = 32m.14s., eE = 33m.15s., iE = 33m.56s., eLE = 34m.18s.
Tiflis eEZ = 34m.29s., eE = 40m.8s., eL = 63m.
Ksara e = 34m.41s., e = 44m.17s., L = 74m.
Colombo eE = 35m.
Agra iE = 36m.25s.
La Paz iPKPZ = 36m.23s.
Rome e = 44m.19s. and 52m.29s.
Tashkent e = 52m.13s., eL = 55·0m.
Pulkovo e = 57m.39s. and 64m.9s., eL = 70m.42s.
Long waves were also recorded at Melbourne, Harvard, East Machias, Philadelphia, and other European and Russian stations.

June 4d. 20h. Undetermined shock.

Santa Barbara eP = 29m.40s., eEZ = 31m.26s.
Pasadena iP = 29m.44s., iZ = 31m.26s.
Mount Wilson iPZ = 29m.46s., iZ = 31m.26s.
Riverside iPZ = 29m.47s., eZ = 31m.29s.
Haiwee ePEN = 29m.53s.
Tinemaha iP = 29m.55s.
Tucson iP = 30m.7s.k, i = 30m.12s., 30m.25s., 31m.48s., 31m.51s., 32m.15s., 32m.23s., 32m.41s., i = 37m.25s.
Sverdlovsk eP = 36m.33s., i = 38m.24s., L = 51·0m.
Tiflis eZ = 37m.2s., eE = 37m.7s. and 39m.47s., iZ = 39m.54s.
Copenhagen iP = 37m.10s.
Hamburg iZ = 37m.12s.
Collmberg eZ = 37m.17s., iZ = 37m.22s., eZ = 37m.37s., 39m.12s., iZ = 39m.17s.
Ksara ePKP = 37m.19s., ipPKP = 39m.12s., PP = 39m.58s.
Jena eNZ = 37m.22s., iN = 37m.24s.
Stuttgart ePKPZ = 37m.22s. and 37m.30s.
Paris e = 37m.24s., L = 46·0m.
Strasbourg ePZ = 37m.25s., eZ = 39m.31s.
Uccle iPZ = 37m.26s.
Helwan iZ = 37m.30s., 37m.42s., and 39m.24s., eZ = 41m.15s.
Zurich eP = 37m.31s.
Rome e = 38m.6s., 41m.40s., and 61m.54s.
Moscow e = 39m.22s.
Tashkent e = 69m.48s.

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June 4d. 22h. 36m. 0s. Epicentre 28°·5N. 86°·5E.

Intensity IV at Nepal. Moderate at Darjeeling and Kishangang.

S. K. Banerji.
Seismological Bulletin of the Meteorological Department of the Government of India, April-June, 1939, p. 51.

$A = +·0537$, $B = +·8786$, $C = +·4747$; $\delta = +16$; $h = +2$;
$D = +·998$, $E = -·061$; $G = +·030$, $H = +·474$, $K = -·880$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	6·2	164	e 1 39	+ 4	i 2 39	− 9	e 1 50	P*	—
Agra	E.	7·6	262	e 1 58	+ 3	3 21	− 2	2 51	?	—
Bombay	N.	15·7	236	e 4 49	+65	—	—	—	—	—
Andijan		16·8	319	e 4 5	+ 7	e 6 57	− 8	e 7 14	SS	—
Frunse		17·3	329	e 4 21	PP	—	—	—	—	—
Tashkent		19·0	318	e 4 25	− 1	e 7 42	−13	4 55	PPP	e 9·7
Tchimkent		19·4	321	e 4 30	0	e 8 32	+28	—	—	—
Samarkand		19·6	310	4 36	+ 4	e 7 55	−13	—	—	—
Sverdlovsk		33·7	334	e 6 43	− 2	—	—	(8 0)	PP	8·0
Mizusawa	E.	46·0	62	(e 8 30)	+ 3	e 8 30	P	—	—	—

Additional readings :—
Calcutta N $eP_g = +2$m.2s., $iS^* = +2$m.56s., $eS = +3$m.8s.
Tashkent $e = +4$m.30s., $i = +6$m.16s.
Long waves were also recorded at Rome, Tiflis, and Stuttgart.

June 4d. Readings also at 0h. (Christchurch and Tucson), 1h. (Tucson (3)), 2h. (Tucson (3)), 3h. (Tucson, Manila, Rome, and Stuttgart), 4h. (Tucson), 6h. (Frunse, near Rome, and Andijan), 7h. (Tashkent, Almata, Irkutsk, Vladivostok, and Sverdlovsk), 8h. (Tinemaha, Pasadena, Mount Wilson, Baku, Moscow, Pulkovo, Rome, and Stuttgart), 9h. (Tucson), 11h. (Tucson), 13h. (Tucson and Rome), 16h. (Tiflis and Grozny), 17h. (Tucson (2)), 19h. (Andijan and Samarkand), 20h. (Tucson (2)), 22h. (Tucson).

June 5d. 23h. 3m. 27s. Epicentre 35°·1N. 34°·6W.

$A = +·6750$, $B = -·4656$, $C = +·5724$; $\delta = +5$; $h = 0$;
$D = -·568$, $E = -·823$; $G = +·472$, $H = -·323$, $K = -·820$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Fernando	23·0	78	e 5 14	+ 7	e 9 33	+19	—	—	11·5
Toledo	24·6	71	i 5 24	+ 1	e 9 41	− 1	—	—	11·7
Granada	25·1	77	5 30	+ 2	10 8	+17	6 14	PP	—
Almeria	26·0	77	5 45	+ 9	10 5	− 1	6 20	PP	13·5
East Machias	26·8	302	e 5 36	− 8	e 10 35	+16	e 6 18	PP	—
Ivigtut	27·5	346	5 54	+ 4	10 27	− 3	—	—	—
Jersey	27·7	48	e 6 36	PP	e 12 48	SSS	—	—	—
Bidston	28·7	41	—	—	e 12 56	SSS	—	—	e 14·2
Stonyhurst	29·2	41	—	—	e 11 11	+13	—	—	e 14·9
Kew	29·5	46	i 6 6	− 2	e 13 11	SSS	—	—	e 15·3
Harvard	29·6	297	i 6 7k	− 2	e 11 5	+ 1	—	—	e 13·5
Edinburgh	29·9	37	—	—	e 13 57	SSS	—	—	i 15·2
Clermont-Ferrand	30·3	58	e 6 22	+ 7	i 10 59	−16	—	—	—
Paris	30·5	53	i 6 16	− 1	11 10	− 8	—	—	13·5
Williamstown	30·8	297	i 6 18	− 2	—	—	—	—	—
Aberdeen	31·0	35	e 9 47	?	i 13 46	SSS	—	—	i 17·7
Fordham	31·3	293	e 6 29	+ 5	e 11 31	0	—	—	—
Uccle	32·1	48	i 6 29	− 2	e 11 45	+ 2	—	—	14·2
Philadelphia	32·3	290	e 6 32	− 1	e 11 47	+ 1	e 7 31	PP	e 13·1
San Juan	32·5	248	e 6 32	− 2	e 11 55	+ 6	—	—	e 13·5

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa		32·7	302	e 6 33	− 3	e 11 57	+ 5	13 51	SS	15·6
De Bilt		32·9	46	e 6 36	− 2	—	—	—	—	e 14·6
Neuchatel		33·1	56	e 6 39	− 1	—	—	—	—	—
Basle		33·6	55	e 6 32	−12	—	—	—	—	—
Strasbourg		33·9	53	i 6 45	− 2	e 12 9	− 2	i 7 46	PP	—
Zurich		34·3	56	e 6 48a	− 2	—	—	—	—	—
Stuttgart		34·8	53	e 6 53	− 1	e 12 26	+ 1	e 7 59	PP	e 15·5
Chur		34·9	56	e 6 53	− 2	—	—	—	—	—
Göttingen		35·7	48	e 7 3	+ 1	—	—	—	—	—
Hamburg	Z.	36·1	45	e 7 1	− 4	—	—	—	—	—
Scoresby Sund		36·1	7	7 2	− 3	12 43	− 2	—	—	15·5
Cheb		37·0	52	—	—	e 12 33?	−26	—	—	e 20·6
Rome		37·1	66	i 7 14a	0	i 13 1	0	i 8 19	PP	16·4
Collmberg	Z.	37·6	49	e 7 14	− 4	—	—	e 8 31	PP	—
Triest		37·8	59	e 7 23	+ 3	13 13	+ 2	e 8 43	PP	e 19·1
Columbia		38·0	283	e 8 37	PP	e 13 14	0	—	—	e 15·6
Copenhagen		38·0	42	e 7 25	+ 4	—	—	—	—	—
Prague		38·4	52	e 7 26	+ 1	e 13 31	+11	—	—	e 16·5
Florissant		44·1	292	i 8 4	− 8	e 14 40	− 5	i 10 1	PP	20·7
St. Louis	E.	44·1	292	e 8 11	− 1	—	—	e 9 55	PP	—
Pulkovo		48·0	39	—	—	e 15 39	− 2	—	—	e 22·4
Moscow		52·1	43	e 9 12	− 2	—	—	—	—	e 28.0
Helwan		55·0	76	9 33	− 2	e 17 21	+ 4	—	—	—
Ksara		57·0	70	i 9 51	+ 1	e 17 56	+13	e 12 3	PP	—
Bozeman		57·1	307	e 9 49	− 1	e 17 42	− 3	—	—	—
Butte		58·0	307	—	—	e 17 55	− 2	e 19 46	S_cS	e 25·7
Salt Lake City		59·3	302	e 10 11	+ 5	e 18 2	−12	e 22 20	SS	30·2
La Paz	Z.	60·4	218	i 10 17k	+ 4	—	—	—	—	33·0
Grozny		60·5	56	e 9 55	−19	e 18 13	−16	—	—	—
Tiflis		60·5	58	i 10 14	0	e 18 34	+ 5	—	—	e 28·5
Tucson		62·0	293	e 10 23	− 1	e 18 36	−12	e 23 26	SS	e 34·0
Victoria		64·0	313	—	—	e 19 3	−10	—	—	29·5
Sverdlovsk		64·1	37	—	—	e 19 12	− 2	—	—	29·5
Tinemaha	E.	65·4	299	e 10 45	− 2	—	—	—	—	—
Haiwee		65·6	298	e 10 51	+ 3	—	—	—	—	—
Riverside	Z.	66·2	297	e 10 48	− 4	—	—	—	—	—
Pasadena	Z.	66·7	297	e 10 53	− 2	—	—	—	—	e 34·7
Sitka		66·7	325	—	—	e 24 16	SS	e 13 36	PP	e 33·3
Tashkent		76·8	49	e 11 52	− 3	i 21 44	+ 2	—	—	e 36·4
Irkutsk		85·9	24	e 12 33?	−10	e 22 33?	[−34]	e 15 33?	PP	e 40·5

Additional readings :—
Granada P_cP = +8m.28s., SS = +11m.35s.
Almeria PPP = +6m.39s., SS = +11m.50s.
Jersey e = +8m.30s.
Kew eEN = +14m.26s.
Philadelphia eP = +7m.23s.
Strasbourg ePPPZ = +8m.0s.
Stuttgart eP_cP = +8m.51s., eSSN = +14m.41s.
Rome iZ = +7m.23s., e = +14m.19s., iN = +15m.45s.
Triest e = +7m.32s.
St. Louis eE = +8m.36s.
Ksara eP_cP = +10m.47s., ePS = +18m.29s.
Tiflis iZ = +10m.23s.
Tashkent i = +12m.0s.
Long waves were also recorded at Bermuda and Tananarive.

June 5d. Readings also at 0h. (Ksara, Tiflis, and Zurich), 5h. (Tucson, Medan, Christchurch, and near Wellington), 7h. (near Mizusawa), 8h. (Balboa Heights), 9h. (Mount Wilson, Haiwee, Collmberg, Tucson, Riverside, and Pasadena), 10h. (Oaxaca and Tacubaya), 11h. (Samarkand), 12h. (Riverview, near Adelaide, and Williamstown), 13h. (near Mizusawa), 15h. (Tacubaya, College, New Plymouth, Pasadena, Riverside, Tucson, and Wellington), 16h. (Manila), 18h. (Medan), 19h. (Andijan and near Mizusawa), 20h. (near Mizusawa).

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June 6d. 1h. 22m. 27s. Epicentre 35°·9N. 70°·0E. (as given by stations of Central Asia).

$A = +\cdot2777$, $B = +\cdot7630$, $C = +\cdot5838$; $\delta = +11$; $h = 0$;
$D = +\cdot940$, $E = -\cdot342$; $G = +\cdot200$, $H = +\cdot549$, $K = -\cdot812$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Samarkand		4·5	329	1 13	+ 2	2 8	+ 3	1 26	P_g	—
Andijan		5·2	21	1 23	+ 2	2 27	+ 5	1 31	P*	—
Tashkent		5·4	358	i 1 23	− 1	i 2 28	0	—	—	2·7
Tchimkent		6·4	0	1 36	− 2	2 53	0	—	—	—
Frunse		7·8	26	2 0	+ 2	e 3 35	+ 7	e 2 29	P_g	—
Dehra Dun	N.	8·7	128	e 4 24	S*	—	—	—	—	e 5·4
Almata		9·1	34	e 2 15	+ 1	e 3 55	− 5	e 4 35	S*	—
Agra	E.	11·1	139	e 3 7	PPP	—	—	—	—	—
Baku		16·4	292	—	—	e 7 57	SSS	—	—	e 10·0
Bombay	E.	17·1	173	—	—	e 8 4	SSS	—	—	i 11·1
Grozny		20·0	299	4 30	− 7	e 8 11	− 6	—	—	e 11·8
Tiflis		20·4	295	e 4 53	+12	e 8 42	+17	e 8 54	SS	—
Calcutta	N.	20·8	126	—	—	i 9 20	SSS	—	—	i 12·0
Sverdlovsk		21·9	347	e 5 0	+ 3	i 8 49	− 5	11 27	L_q	13·0
Kodaikanal	E.	26·4	164	—	—	e 10 33?	+21	—	—	—
Ksara		28·0	275	e 11 23	S	(e 11 23)	+45	—	—	e 15·8
Irkutsk		29·2	45	e 6 33?	+28	—	—	—	—	14·5
Moscow		29·6	323	e 7 14	PPP	e 11 50	+46	—	—	e 16·0
Collmberg	Z.	42·9	309	e 8 11	+ 9	i 18 28	SSS	9 48	PP	e 20·8

Additional readings :—
Samarkand $P_g = +1$m.33s.
Andijan e$P_g = +1$m.38s., e $= +2$m.4s. and $+2$m.15s.
Frunse e $= +2$m.44s., $+3$m.15s., and $+3$m.47s.
Collmberg iZ $= +8$m.14s., eZ $= +9$m.53s. and $+18$m.34s.
Long waves were also recorded at Stuttgart, Pulkovo, and Strasbourg.

June 6d. Readings also at 0h. (Piatigorsk, Grozny, and Tiflis), 1h. (near Mizusawa, Pasadena, Mount Wilson, and Tucson), 2h. (Tiflis), 4h. (near Algiers), 5h. (near Algiers), 6h. (near Fort de France, Tiflis, Grozny, Piatigorsk, and Manila), 7h. (Tiflis), 8h. (Manila), 9h. (Tucson, Mount Wilson, Pasadena, La Paz (2), and Riverside), 12h. (Piatigorsk), 14h. (La Paz), 15h. (Tucson, Williamstown, Tacubaya, and St. Louis), 16h. (Ksara, Tchimkent, Fordham, near Mizusawa, Samarkand, Andijan, Tashkent, Frunse, and Sverdlovsk), 19h. (Huancayo, Frunse, Andijan, Samarkand, and Mizusawa), 20h. (Vladivostok, near Mizusawa, Tashkent, Tucson, La Paz, Riverside, Pasadena, and Mount Wilson), 21h. (Tashkent, Sverdlovsk, and near Williamstown).

June 7d. 1h. Undetermined shock in Indian Ocean.

Batavia ePZ $= 4$m.38s., S?EN $= 10$m.56s.
Medan P?E $= 5$m.23s., SEN $= 12$m.17s.
Perth i $= 7$m.40s., 9m.0s., and 9m.30s.
Adelaide e $= 8$m.17s., i $= 10$m.40s., e $= 12$m.23s. and 15m.23s., i $= 17$m.25s.
Andijan e $= 9$m.0s.
Samarkand e $= 9$m.5s.
Ksara eP $= 9$m.11s., eS $= 19$m.45s., ePS $= 20$m.34s., eSS $= 25$m.30s.
Tananarive eE $= 9$m.15s., L $= 11\cdot7$m.
Helwan ePZ $= 9$m.18s., iSE $= 19$m.24s.
Tashkent P $= 9$m.38s., iS $= 19$m.13s., eL $= 36\cdot0$m.
Tiflis ePZ $= 9$m.38s., e $= 20$m.16s. and 21m.16s., eL $= 34\cdot0$m.
Cape Town iE $= 12$m.17s., L $= 17\cdot4$m.
Melbourne i $= 12$m.22s., L $= 19\cdot5$m.
Colombo eE $= 12$m.30s.
Irkutsk e $= 13$m. and 21m., eL $= 39$m.
Hyderabad SN $= 14$m.33s.
Bombay eE $= 15$m.2s.
Calcutta e?N $= 15$m.59s.
Sverdlovsk e $= 16$m.3s., 20m.48s., 28m.40s., 38m.5s., and 38m.40s., L $= 43\cdot0$m.
Riverside eZ $= 16$m.38s.
Tucson e $= 16$m.38s.
Agra eE $= 16$m.39s.

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Mount Wilson eZ = 16m.49s.
Kodaikanal E = 21m.36s.
Christchurch eEN = 24m.27s., eZ = 26m.31s. and 30m.17s.
Rome e = 24m.57s. and 29m.34s., eL = 37·1m.
Stuttgart eZ? = 25m.0s., eL = 56·0m.
Uccle eEN = 31m.44s., eL = 56·0m.
Long waves were also recorded at Phu-Lien, Brisbane, Riverview, Sydney, and other European and Russian stations.

June 7d. 14h. Local Japanese shock. Tokyo Imperial University gives Epicentre 35°·91N. 139°·81E.

Tokyo Imp. Univ. P = 34m.48s., S = 34m.53s.
Komaba P = 34m.49s., S = 34m.54s.
Kamakura P = 34m.51s., S = 35m.0s.
Kiyosumi P = 34m.51s., S = 35m.3s.
Mitaka P = 34m.51s., S = 34m.56s.
Titibu P = 34m.51s., S = 34m.59s.
Tukubasan P = 34m.51s., S = 34m.58s.

June 7d. Readings also at 1h. (Riverside, Tinemaha, Hiawee, Mount Wilson, Tucson, and Pasadena), 4h. (Samarkand, Andijan, Oaxaca, Tchimkent, Almata, Frunse (2), and near Manila), 5h. (Andijan, Samarkand, Sverdlovsk, Tashkent, and near Mizusawa), 6h. (near Balboa Heights, Tashkent, Andijan, Sverdlovsk, Samarkand, Almata, Tchimkent, and Frunse), 7h. (near Mizusawa), 10h. (Hukuoka), 11h. (near Fordham, and Oaxaca), 12h. (Frunse (2), Tchimkent, Almata (2), Andijan (2), Samarkand, Sverdlovsk, and Tashkent), 13h. (Andijan (2), Samarkand (2), Tchimkent, and Frunse), 14h. (Jena and Toledo), 15h. (Branner, Berkeley, near San Francisco, La Paz, Pasadena, Tucson, Mount Wilson, and Lick), 16h. (Medan and near Almeria), 18h. (Collmberg, Frunse, and Almata), 19h. (Cape Town, Rio de Janeiro, and Sverdlovsk), 20h. (Kew, Bidston, Edinburgh, Strasbourg, Paris, Uccle, Stuttgart, Tiflis, Ksara, and Tashkent), 22h. (Tucson and near Balboa Heights).

June 8d. 1h. 56m. 50s. Epicentre 0·0 25°·0W. (as on 1938 Oct. 2d.).

$A = +·9063$, $B = -·4226$, $C = ·0000$; $\delta = -3$; $h = +3$;
$D = -·423$, $E = -·906$; $G = ·000$, $H = ·000$, $K = -1·000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rio de Janeiro	N.	28·9	217	—	—	e 11 10	+17	—	—	—
La Paz	Z.	45·6	246	8 56	+32	—	—	—	—	24·2
Clermont-Ferrand		51·8	25	—	—	e 16 35	+ 2	—	—	—
Rome		53·7	34	e 9 25	− 4	e 16 56	− 3	e 11 22	PP	e 25·2
Paris		54·1	22	e 9 29	0	e 17 8	+ 3	—	—	27·2
Strasbourg		56·1	25	e 9 43	0	e 17 29	− 3	—	—	e 24·2
Bidston		56·3	15	—	—	e 17 32	− 2	—	—	e 24·2
Uccle		56·4	21	—	—	e 17 30	− 6	—	—	e 24·2
Stuttgart		56·8	26	e 9 49	+ 1	e 17 32	− 9	e 13 12	PPP	e 30·2
Triest		56·8	31	e 9 46	− 2	17 41	0	—	—	—
Ksara		66·1	53	e 10 56	+ 5	e 19 24	−15	e 20 40	PPS	34·2
Tiflis		75·0	47	e 11 50	+ 5	e 21 28	+ 5	e 21 56	PS	e 39·2
Sverdlovsk		87·3	33	e 12 42	− 8	e 23 25	− 4	—	—	36·2

Additional readings :—
Rome ePPP = +12m.31s., eSS = +20m.13s.
Stuttgart $eL_q = +27·2$m.
Long waves were also recorded at Pulkovo, Algiers, and other European stations.

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June 8d. 9h. 17m. 43s. Epicentre 16°·3N. 98°·6W. (as on 1938 June 10d.).

Tacubaya gives Epicentre 16°14′N. 98°45′W.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya	N.	3·1	350	0 52	+ 1	—	—	—	—	—
Vera Cruz	N.	3·7	39	1 2	+ 2	—	—	—	—	—
Guadalajara	N.	6·3	315	1 31?	− 5	—	—	—	—	—
Tucson		19·4	328	i 4 28k	− 2	—	—	i 4 55	PP	i 9·8
St. Louis		23·4	16	—	—	e 9 35	+14	—	—	e 14·1
La Jolla		23·6	318	e 5 13	0	—	—	—	—	—
Riverside		24·4	321	i 5 20	− 1	—	—	—	—	—
Mount Wilson		25·0	321	i 5 27k	0	—	—	—	—	—
Pasadena		25·0	321	i 5 27	0	i 16 7	S_0S	i 6 29	PPP	e 13·9
Haiwee		26·2	324	e 5 39	+ 1	—	—	—	—	—
Tinemaha		27·1	324	e 5 48	+ 2	—	—	—	—	—
Bozeman		31·1	344	—	—	e 11 26	− 2	—	—	—
Philadelphia		31·2	36	—	—	e 11 42	+13	—	—	—

Additional readings:—
Tucson i = +4m.35s., +5m.30s., +5m.41s., +6m.26s., +9m.6s., and +9m.22s.
Long waves were also recorded at Butte, Salt Lake City, and Puebla.

June 8d. 15h. 23m. 51s. Epicentre 6°·7S. 153°·8E. (as on 1937 Oct. 6d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·7	182	i 4 51	+ 7	i 8 45	+14	—	—	11·2
Riverview		27·1	184	e 8 35	?	e 10 52	+28	—	—	e 14·4
Sydney		27·1	184	e 8 9	?	—	—	—	—	e 11·0
Adelaide		31·4	204	e 6 29	+ 4	i 11 29	− 3	i 7 18	PP	16·5
Melbourne		32·0	193	—	—	i 11 36	− 6	i 15 19	SSS	18·9
Manila		38·8	303	e 8 6	+38	12 44	−42	—	—	15·6
Wellington		39·2	155	—	—	e 14 14	+42	—	—	e 17·2
Christchurch		40·2	159	e 7 37	− 3	e 14 19	+31	18 29	L_Q	e 21·9
Perth		43·4	230	—	—	i 16 42	SS	—	—	i 22·0
Mizusawa		47·1	348	(e 8 24)	−11	e 8 24	P	—	—	—
Zi-ka-wei	z.	48·8	323	e 8 29	−20	—	—	—	—	22·9
Vladivostok		53·4	341	e 9 6	−18	e 16 48	− 7	—	—	20·5
Irkutsk		72·2	331	e 11 28	− 1	e 20 9?	−42	—	—	33·1
Sitka		85·4	32	—	—	e 22 29	[−34]	—	—	—
Victoria		90·3	42	—	—	e 24 9	+12	—	—	38·1
Samarkand		91·8	310	e 14 14	+63	—	—	—	—	—
Pasadena		92·1	56	e 13 22	+10	—	—	—	—	e 43·7
Mount Wilson	z.	92·2	56	e 13 22	+ 9	—	—	—	—	—
Riverside	z.	92·7	56	e 13 23	+ 8	—	—	—	—	—
Sverdlovsk		97·3	327	—	—	e 24 33	−25	e 31 7	SS	40·2
Tiflis		108·6	311	e 18 35	PP	e 27 53	PS	e 29 1	PPS	e 51·2
Moscow		110·1	327	—	—	e 36 32	?	—	—	e 57·6
Pulkovo		112·2	332	e 19 2	PP	—	—	—	—	—
Ksara		116·8	303	e 17 43	?	e 30 53	PPS	—	—	61·6
Stuttgart		128·5	330	e 20 28	PP	e 32 26	PPS	—	—	e 66·1
Strasbourg		129·3	331	e 21 3	PP	—	—	—	—	e 61·1
Paris		131·5	334	e 21 9	?	—	—	—	—	69·1
La Paz	z.	132·5	120	23 10	PPP	—	—	—	—	—

Additional readings:—
Adelaide e = +11m.9s.
Melbourne i = +16m.19s.
Long waves were also recorded at Philadelphia, Chicago, Bozeman, Tucson, Harvard, Rome, Tashkent, Baku, San Fernando, Clermont Ferrand, Uccle, Kew, De Bilt, Hamburg, Bidston, Stonyhurst, Edinburgh, Aberdeen, and Cape Town,

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June 8d. 20h. 46m. 56s. Epicentre 15°·6S. 173°·6W.

$A = -\cdot 9576$, $B = -\cdot 1074$, $C = -\cdot 2673$; $\delta = -2$; $h = +6$;
$D = -\cdot 111$, $E = +\cdot 994$; $G = +\cdot 266$, $H = +\cdot 030$, $K = -\cdot 964$.

Tables for depth of focus 0·010 have been used.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·5	45	i 0 40a	0	i 1 8	− 2	—	—	—
Arapuni		24·3	201	—	—	9 34	+16	i 11 10	SSS	11·9
Wellington		27·5	200	i 5 38	− 1	10 6	− 5	6 12	PP	—
Chatham Ils.		28·4	185	—	—	e 11 4?	pS	e 12 16	SSS	—
Christchurch		30·2	200	i 6 2a	− 1	i 10 34	−20	i 6 42	PP	—
Brisbane	N.	33·1	245	i 6 28	− 1	i 10 58	+18	e 7 52	PP	—
Riverview		36·5	235	i 6 57a	− 1	i 12 29	− 3	e 8 27	PP	e 15·4
Sydney		36·5	235	e 7 58	+60	(e 13 4)	+32	—	—	e 13·1
Honolulu		39·8	24	e 7 25	0	i 13 26	+ 4	e 7 50	pP	e 15·2
Melbourne		42·7	231	i 7 50	+ 1	i 14 37	SS	i 9 33	PP	i 18·4
Adelaide		46·8	238	i 8 22	0	i 14 57	− 7	i 18 5	SS	e 20·7
Palau		56·2	291	9 32	0	—	—	—	—	—
Titizima		60·4	316	9 59	− 2	—	—	—	—	—
Perth		65·6	242	11 2	pP	20 4	sS	13 47	PP	32·5
Tokyo Cen. Met. Ob.		67·5	321	10 46	− 2	19 24	−11	—	—	—
Siomisaki		68·6	317	10 52	− 2	—	—	—	—	—
Mizusawa		68·9	325	10 55	− 1	19 50	− 2	—	—	—
Nagoya		68·9	320	10 59	+ 3	—	—	—	—	—
Nagano		69·1	321	10 57	− 1	19 53	− 1	—	—	—
Kobe		69·8	318	11 2	0	20 45	PS	—	—	—
Akita		69·9	325	11 6	+ 4	—	—	—	—	—
Miyazaki		70·7	313	11 10	+ 3	—	—	—	—	—
Santa Clara		71·1	42	i 11 19	+ 9	i 20 32	+15	—	—	e 29·9
Manila		71·3	293	i 11 10a	− 1	i 20 52	sS	—	—	34·6
Mori		71·3	327	11 11	0	20 18	− 1	—	—	—
Branner		71·5	42	e 11 16a	+ 4	e 20 25	+ 3	—	—	—
Sapporo		71·5	328	11 12	0	20 23	+ 1	—	—	—
San Francisco		71·6	42	e 11 15	+ 2	—	—	—	—	—
Kumamoto		71·7	313	11 12	− 1	—	—	—	—	—
Berkeley		71·8	42	i 11 14k	0	i 20 29	+ 4	i 11 38	pP	—
Lick		71·8	42	e 11 17a	+ 3	e 21 33	PPS	—	—	—
Ukiah		72·0	40	e 11 18	+ 3	20 33	+ 6	e 11 48	pP	e 31·4
La Jolla		72·2	48	i 11 18	+ 2	e 20 36	+ 6	—	—	—
Pasadena		72·3	46	i 11 18k	+ 1	e 20 30	− 1	i 11 44	pP	—
Mount Wilson		72·4	46	i 11 19k	+ 2	e 20 38	+ 6	—	—	—
Fresno	N.	72·7	43	e 11 20k	+ 1	e 20 40	+ 5	—	—	—
Riverside		72·8	46	e 11 20	0	e 20 40	+ 4	i 11 46	pP	—
Haiwee		73·5	45	i 11 27	+ 3	e 20 51	+ 7	—	—	—
Tinemaha		73·9	44	i 11 28k	+ 2	e 20 55	+ 6	—	—	—
Kosyun		74·4	300	11 26	− 3	—	—	—	—	—
Tucson		76·6	51	11 44k	+ 2	i 22 8	PS	i 12 10	pP	e 30·7
Vladivostok		76·8	323	i 11 43	0	i 21 22	+ 1	i 12 12	pP	32·3
Zinsen		77·1	316	11 45	+ 1	—	—	—	—	—
Guadalajara	N.	77·8	65	e 11 40	− 8	—	—	—	—	—
Seattle		77·8	34	e 12 59	+71	—	—	—	—	—
Victoria		77·8	33	i 11 42	− 6	i 21 26	− 5	e 12 10	pP	32·1
Zi-ka-wei	Z.	77·8	308	i 11 52	+ 4	—	—	i 12 32	pP	—
Batavia		78·3	268	i 11 49	− 2	21 37	0	i 12 35	pP	—
Sitka		79·1	21	11 54a	− 1	i 21 46	+ 1	e 12 24	pP	e 32·8
Hong Kong		80·1	297	12 2	+ 1	22 50	PS	12 44	pP	—
Salt Lake City		80·1	43	e 12 2	+ 1	22 0	+ 4	e 12 28	pP	e 33·0
Tacubaya	N.	81·0	68	i 12 7	+ 1	—	—	—	—	—
Butte		82·3	38	e 12 12	0	i 22 21	+ 3	i 12 42	pP	e 34·0
College		82·6	11	e 12 13a	− 1	22 20	− 1	e 22 59	sS	e 33·6
Bozeman		83·1	39	12 19a	+ 3	i 22 29	+ 3	e 12 44	pP	e 34·2

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz	N.	83·7	69	i 12 1	−18	—	—	—	—	—
Denver		84·2	47	e 12 52	pP	—	—	—	—	—
Medan		88·7	275	12 47	+ 3	23 17	− 3	—	—	—
Saskatoon		88·7	35	e 13 4?	pP	e 24 4?	PS	—	—	—
Florissant		94·5	52	e 13 10	0	i 23 38	[+ 5]	e 13 37	pP	—
St. Louis		94·5	52	i 13 7	− 3	i 23 33	[0]	e 13 33	pP	—
Balboa Heights		96·2	83	—	—	23 4?	[−41]	—	—	—
Chicago		97·3	49	e 13 25	+ 2	e 23 52	[+ 2]	e 13 52	pP	e 39·3
Irkutsk		97·4	322	13 24	0	23 53	[+ 2]	17 3	PP	42·1
La Paz	Z.	99·9	110	e 13 41	+ 6	i 24 2	[− 1]	i 14 9	pP	46·6
Columbia		100·6	58	e 14 9	pP	24 13	[+ 6]	e 17 24	PP	e 41·5
La Plata		101·0	131	13 46	+ 6	24 9	[0]	17 44	PP	40·1
Calcutta	N.	103·1	290	e 18 6	PP	e 25 21	SKKS	—	—	—
Toronto		103·6	48	e 14 16	pP	e 24 22	[+ 1]	—	—	47·1
Ottawa		106·4	47	e 14 34	pP	e 24 34	[+ 1]	e 18 58	PP	45·1
Philadelphia		107·2	53	e 14 30	pP	i 24 32	[− 5]	e 18 29	PP	e 47·7
Fordham		107·3	52	e 18 38	PP	e 25 36	sSKS	i 27 51	PS	—
Colombo	E.	107·7	273	18 35	PP	e 28 5	PS	—	—	57·4
Williamstown		108·0	50	e 14 13	P	e 27 52	PS	i 14 39	pP	e 50·3
Harvard		109·2	50	e 14 38	P	e 24 50	[+ 5]	e 18 47	PP	e 54·1
Kodaikanal	E.	110·8	276	i 19 1	PP	i 28 30	PS	—	—	—
San Juan		111·0	76	e 14 53	pP	i 24 54	[+ 1]	29 1	sPS	—
Hyderabad	E.	111·7	283	18 46	PP	25 55	SKKS	28 34	PS	—
East Machias		112·3	47	e 18 28	[+ 4]	25 3	[+ 5]	e 14 55	pP	e 45·2
Agra	E.	113·1	294	i 19 14	PP	i 25 51	sSKS	26 57	SKKS	—
Bermuda		113·9	61	e 19 9	PP	e 25 11	[+ 7]	e 35 14	SS	e 53·4
Almata		114·7	312	e 18 54	PP	—	—	—	—	—
Frunse		116·4	311	e 18 54	[+21]	—	—	—	—	—
Bombay		116·8	284	19 18	PP	i 25 18	[+ 3]	i 29 19	PS	—
Andijan		118·2	309	e 18 57	[+21]	—	—	—	—	—
Rio de Janeiro		118·2	127	e 20 1	PP	e 29 33	PS	—	—	e 43·6
Tchimkent		120·1	311	e 18 38	[− 2]	—	—	—	—	—
Ivigtut		120·3	27	18 42	[+ 2]	25 31	[+ 3]	i 20 6	PP	—
Tashkent		120·4	310	e 14 58	P	25 6	[−22]	18 42	PKP	—
Samarkand		122·4	308	e 18 59	[+15]	—	—	—	—	—
Scoresby Sund		122·5	11	18 46	[+ 1]	25 41	[+ 6]	26 32	SKKS	—
Tananarive		126·9	231	20 50	PP	38 38	SS	30 56	PS	66·6
Cape Town		129·4	193	22 12	SKP	26 20	[+23]	31 48	PS	66·6
Pulkovo		132·5	345	19 5	[+ 1]	26 52	sSKS	19 36	pPKP	62·6
Moscow		133·4	336	19 6	[+ 1]	31 23	PS	19 37	pPKP	57·6
Upsala		135·1	353	e 19 4	[− 4]	i 22 37	PKS	e 21 41	PP	—
Bergen	Z.	135·3	2	i 19 14	[+ 6]	—	—	i 23 30	?	—
Grozny		136·7	318	e 18 56	[−15]	—	—	—	—	—
Tiflis		137·8	317	e 19 3	[−10]	32 26	PS	19 37	pPKP	e 59·1
Aberdeen		138·0	8	i 19 18	[+ 4]	i 32 11	PS	i 22 6	PP	e 56·7
Piatigorsk		138·0	321	e 19 14	[0]	—	—	e 19 56	pPKP	—
Erevan		138·8	314	e 21 24	PP	—	—	—	—	—
Edinburgh		139·1	9	e 20 4?	pPKP	i 40 18	SS	i 41 8	SSP	e 59·1
Copenhagen		139·7	354	e 19 9	[− 8]	e 32 22	PS	22 11	PP	—
Durham		140·4	7	e 19 22	[+ 4]	i 26 15	[− 1]	i 22 16	PP	—
Rathfarnham Castle		141·1	12	i 19 22	[+ 3]	—	—	i 19 59	pP	e 65·0
Stonyhurst		141·2	8	e 19 29	[+10]	—	—	e 23 34	?	e 66·1
Bidston		141·6	10	e 19 25	[+ 5]	e 26 0	[−18]	e 23 0	PKS	e 64·1
Hamburg		142·0	357	e 19 16k	[− 5]	e 33 25	PS	—	—	e 68·1
Oxford		143·4	8	i 19 19	[− 4]	—	—	i 23 4	PKS	—
De Bilt		143·6	1	i 19 23a	[0]	i 41 24	SS	i 19 48	pPKP	61·1
Cernauti	N.	143·7	339	e 19 24	[+ 1]	—	—	—	—	—
Kew		143·8	6	i 19 21a	[− 2]	e 26 13	[− 8]	e 22 38	PP	e 65·1
Collmberg		144·0	354	e 19 24	[0]	e 27 22	sSKS	e 32 46	PS	—
Jena		144·5	355	i 19 23	[− 2]	—	—	i 22 43	PP	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Uccle		144·9	3	i 19 26a	[0]	41 26	SS	i 19 56 pPKP	—
Prague		145·0	352	i 19 26	[0]	e 30 20	SKKS	— —	—
Cheb		145·3	354	e 19 28	[+ 2]	e 28 30	?	— —	e 41·1
Jersey		145·8	10	e 19 30	[+ 3]	e 41 24	SS	e 22 43 PP	74·6
Paris		146·7	5	i 19 32a	[+ 3]	—	—	20 1 pPKP	—
Bucharest		146·8	335	e 19 34	[+ 5]	(42 4?)	SS	e 20 4 pPKP	42·1
Stuttgart		146·8	357	i 19 32a	[+ 3]	e 30 26	SKKS	i 20 0 pPKP	e 68·1
Kecskemet	z.	146·9	345	e 19 30	[+ 1]	—	—	i 20 2 pPKP	—
Strasbourg		147·1	358	i 19 33a	[+ 3]	i 42 8	SS	i 20 5 pPKP	e 71·1
Ksara		147·8	310	i 19 32a	[+ 2]	42 18	SS	i 20 7 pPKP	—
Istanbul		147·9	329	i 19 35	[+ 4]	—	—	— —	—
Basle		148·1	0	e 19 33	[+ 2]	—	—	e 21 19 ?	—
Zurich		148·3	359	e 19 34a	[+ 3]	—	—	i 20 7 pPKP	—
Belgrade		148·5	341	i 19 34k	[+ 2]	e 30 13	SKKS	i 20 8 pPKP	e 79·8
Chur		148·7	358	i 19 33	[+ 1]	—	—	— —	→
Sofia		149·3	336	e 19 39	[+ 6]	e 30 18	SKKS	— —	—
Triest		149·4	351	i 19 35	[+ 2]	26 28	[− 2]	i 20 8 pPKP	e 70·1
Clermont-Ferrand		149·8	5	i 19 38	[+ 5]	i 42 32	SS	— —	—
Moncalieri		150·7	0	i 19 47	[+12]	—	—	— —	—
Helwan		153·0	307	i 19 40k	[+ 1]	26 21	[−14]	20 28 pPKP	—
Rome		153·3	350	i 19 42a	[+ 3]	i 31 8	PSKS	i 43 11 SS	e 64·5
Toledo		154·1	19	i 19 44	[+ 4]	—	—	i 23 41 PP	—
San Fernando		156·5	27	e 19 50	[+ 7]	e 44 0	SS	e 24 44 pPP	—
Granada		156·7	21	i 19 45	[+ 2]	26 2	[−36]	20 11 pPKP	—
Almeria		157·4	18	19 46	[+ 2]	—	—	i 20 17 pPKP	76·8
Algiers		158·7	6	19 49	[+ 3]	—	—	i 20 26 pPKP	—

Additional readings :—
Wellington iZ = +7m.20s., P_cP? = +8m.59s., iZ = +9m.21s., L_q = +12m.9s., P_cS = +12m.37s., i = +13m.7s., iS_cS = +16m.17s., sS_cS? = +18m.8s.
Christchurch iZ = +7m.20s., i = +11m.30s., L_qE = +11m.44s., P_cS = +12m.19s., iE = +12m.24s. and +13m.59s., eZ = +15m.22s., iS_cSEZ = +16m.11s.
Brisbane iN = +6m.46s., +11m.34s., and +12m.22s., eN = +13m.58s.
Riverview iN = +8m.53s., iE = +12m.42s. and +13m.1s., eN = +13m.12s., iS_cS = +17m.10s.
Honolulu P = +7m.28s.
Melbourne i = +8m.34s. and +17m.47s.
Adelaide i = +15m.48s. and +19m.33s.
Perth PPP = +15m.34s., PS = +20m.29s., SS = +25m.7s., SSS = +27m.32s., i = +29m.44s.
Berkeley iSN = +20m.33s., eE = +30m.52s.
Ukiah eSSS = +28m.23s.
Tucson iP_cP = +11m.52s., i = +11m.55s., isP = +12m.15s., iPP = +14m.37s., epPP = +14m.57s., sPP = +15m.21s., iPPP = +16m.26s., iS_cS = +21m.24s., eSS = +26m.30s., sSS = +27m.9s.
Vladivostok sP = +12m.22s., ePP = +14m.34s., sS = +22m.14s.
Victoria PS = +22m.10s., SS = +26m.28s.
Zi-ka-wei SZ = +15m.0s., iZ = +15m.20s., +17m.8s., +17m.54s., and +23m.8s.
Batavia iPEN = +11m.52s., iE = +19m.9s., iEN = +22m.5s.
Sitka ePP = +14m.56s., epPP = +15m.13s., eSS = +26m.27s.
Hong Kong P_cP = +15m.36s., S = +16m.22s., SS = +17m.13s.
Salt Lake City esP = +12m.43s.
Butte pPP = +15m.51s.
College eSSS = +30m.33s.
Bozeman eSS = +27m.56s., eSSS = +30m.57s.
Denver iE = +13m.22s.
Medan iN = +20m.11s., iE = +21m.19s., +23m.2s. and +24m.24s.,
Florissant isSE = +24m.20s.
St. Louis ipPPE = +16m.54s., iSEN = +24m.14s., eSS = +31m.20s., eSSS = +35m.9s.
Chicago ePP = +17m.16s., eS = +24m.35s., ePS = +26m.7s.
Irkutsk S = +24m.43s., sS = +25m.28s., sPS = +26m.51s.
La Paz iPPZ = +17m.45s., iSZ = +24m.58s., iZ = +26m.36s. and +27m.44s.
Columbia epPP = +18m.14s., S = +25m.6s., esS = +25m.56s., eSS = +32m.4s.
La Plata PS = +26m.40s., SS = +32m.16s., SSS = +35m.58s.
Calcutta ePPP?N = +21m.14s., eN = +22m.27s., ?N = +29m.13s.
Toronto e = +25m.4s.
Ottawa e = +25m.34s. and +33m.16s.
Philadelphia ePKP = +18m.7s., iSKKS = +25m.17s., eSP = +27m.42s., ePS = +27m.52s., eSSS = +37m.12s.
Fordham ePZ = +14m.6s., ipPZ = +14m.38s., iSN = +26m.7s., isSN = +26m.55s,

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Williamstown ePKP = +18m.7s., iPP = +18m.38s., ePPS = +28m.44s., eSS = +32m.38s.
Harvard eSKKSE = +25m.33s., iSN = +26m.23s., iPSEZ = +28m.7s., epSPZ = +28m.42s., eSSN = +34m.4s.
San Juan epPP = +19m.34s., SKKS = +25m.48s.
Hyderabad ?E = +29m.7s., SS?E = +34m.22s., SSS?E = +39m.58s.
East Machias ePP = +19m.13s., ePPP = +22m.0s., epPPP = +22m.28s., eS = +26m.44s. SP = +28m.37s., eSS = +34m.50s., eSSS = +39m.8s.
Agra iE = +19m.54s., PPPE = +22m.10s., iE = +24m.58s., iE = +28m.46s. and +29m.27s.
Bermuda eSPP = +29m.54s.
Bombay iPPE = +20m.18s., iPPN = +20m.26s., iE = +22m.25s., iSKSEN = +26m.33s., iEN = +29m.27s., iPSN = +29m.59s., iPSE = +30m.2s., iEN = +31m.2s., eEN = +34m.42s.
Ivigtut +20m.32s.
Tashkent PP = +19m.58s., pPP = +20m.27s., SKKS = +26m.28s., eS = +27m.48s., sS = +28m.45s., PS = +29m.58s., SSS = +40m.28s.
Scoresby Sund +19m.16s., i = +20m.21s. and +28m.12s., SS = +36m.46s., SSS = +39m.57s.
Cape Town SKPE = +22m.24s., iSE? = +28m.27s., SSSE = +43m.21s.
Pulkovo PP = +21m.25s., PKS = +22m.30s., pPKS = +23m.2s., sPPP = +25m.1s., sS = +28m.59s., pPS = +31m.49s.
Moscow PP = +21m.30s., sPP = +22m.7s., PKS = +22m.34s., pPKS = +23m.1s., PPP = +24m.7s., sPS = +32m.40s.
Tiflis iPKP = +19m.16s., sPKP = +19m.51s., eZ = +20m.41s., iPPEZ = +22m.1s., ipPPEZ = +22m.40s. and +22m.46s., iEZ = +23m.37s., iE = +23m.47s. and +24m.27s., eZ = +24m.40s., ipPPPEZ = +25m.41s., eZ = +26m.43s., eSKSPE = +31m.56s., eSPN = +32m.23s., eE = +34m.12s. and +34m.49s., iZ = +34m.54s., eSSE = +40m.20s., eSSN = +40m.56s., eSSSE = +45m.1s., eE = +56m.51s.
Aberdeen iE = +19m.29s. and +22m.18s., iN = +22m.51s., +23m.20s., +25m.21s., +34m.10s., and +39m.24s., iE = +40m.4s.
Piatigorsk e = +22m.31s.
Edinburgh i = +42m.7s.
Copenhagen e = +19m.14s., iZ = +19m.19s. and +19m.50s., iEN = +22m.56s., e = +23m.28s., +23m.40s., +28m.35s., +29m.52s., +30m.40s., and +34m.22s., eE = +35m.45s. and +40m.21s.
Durham eEN = +19m.36s., iEN = +22m.44s., iN = +23m.27s., and +25m.52s., iE = +40m.28s. and +41m.14s.
Rathfarnham Castle i = +23m.2s. and +23m.34s.
Bidston e = +19m.45s., +22m.28s., +22m.52s., +23m.32s., +24m.20s., +25m.45s., and +29m.45s., eSS = +41m.17s.
Hamburg eN = +23m.25s., iE = +23m.31s.
Oxford i = +23m.21s.
De Bilt iPN = +19m.26s.
Kew eEN = +19m.41s., iZ = +19m.53s., eEN = +22m.51s., eZ = +22m.58s., ePKSN = +23m.5s., eZ = +23m.14s., eEN = +23m.33s. and +23m.59s., eN = +24m.24s., ePPPE = +25m.53s., eN = +30m.21s., eSSEN = +41m.19s., ePSSE = +41m.59s., eE = +43m.25s., eSSSE = +47m.15s.
Collmberg e = +21m.47s., +23m.4s., and +30m.10s.
Jena iN = +19m.26s., iNZ = +19m.51s.
Uccle iZ = +20m.47s., iPKSZ = +22m.45s., iZ = +23m.19s. and +23m.49s., eN = +27m.10s.
Jersey e = +20m.5s. and +21m.29s.
Paris ePP = +23m.11s.
Bucharest eE = +21m.20s., eN = +21m.42s.
Stuttgart ipPKP = +20m.3s., e = +20m.23s. and +20m.35s., eEZ = +20m.50s., eNZ = +21m.40s. and +22m.9s., e = +22m.56s., ePKS = +23m.35s., ePPZ = +24m.34s., ePPPNZ = +27m.21s., eZ = +30m.56s., eEZ = +31m.25s., eNZ = +33m.7s., eSKSP = +34m.14s., ePS = +36m.4s., ePPS = +37m.46s., eSSE = +42m.4s., eSSSE = +47m.22s.
Kecskemet eZ = +20m.31s., eLZ = +23m.34s.
Strasbourg iPKP$_2$ = +19m.45s., iPP(SKP) = +23m.12s., eL$_q$ = +61·6m.
Ksara SPKP = +20m.22s., ipPP = +23m.44s.
Basle i = +19m.38s., e = +25m.36s.
Belgrade iZ = +19m.39s., iNE = +20m.49s., eNE = +22m.24s. and +25m.18s.
Chur i = +19m.39s.
Sofia eE = +28m.20s.
Triest SKP = +23m.16s., SKKS = +29m.59s., PSKS = +33m.24s.
Helwan iZ = +22m.7s., SKP = +23m.7s., iZ = +23m.32s., PPZ = +24m.4s., i = +33m.46s., PSKSEN = +34m.28s., SSE = +44m.19s.
Rome iPKP$_2$Z = +19m.50s., iZ = +23m.33s., ePPS = +34m.27s., e = +38m.39s., i = +41m.15s., eSSSE = +44m.56s.
San Fernando ePSN = +32m.22s.
Granada PP = +24m.2s., pPP = +24m.44s., SKKS = +30m.35s., SSSN = +49m.34s.
Almeria PP = +24m.0s., PPP = +27m.10s.
Algiers e = +24m.4s.? and +42m.4s.?

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June 8d. Readings also at 0h. (Mizusawa), 1h. (Sitka), 3h. (Tinemaha, Pasadena, Mount Wilson, Riverside, and Tucson), 4h. (Grozny, Tiflis, and Erevan), 11h. (Göttingen), 13h. (Almata, Semipalatinsk, Sverdlovsk, Tashkent, Tchimkent, Frunse, Andijan, and Samarkand), 15h. (Frunse, Andijan, and Rome), 17h. (Tacubaya, Oaxaca, and Tucson), 18h. (Tacubaya (3), Oaxaca (2) and Tucson), 19h. (near Tananarive), 20h. (Huancayo, Tacubaya, Oaxaca, near Tchimkent, and Samarkand), 21h. (Tucson and Rome), 22h. (Jena, Stuttgart, Basle, Zurich, La Paz, Clermont-Ferrand, Göttingen, and Strasbourg).

June 9d. 0h. 15m. 27s. Epicentre 14°·8N. 98°·0W.

A = −·1346, B = −·9578, C = +·2538; δ = −9; h = +6;
D = −·990, E = +·139; G = −·035, H = −·251, K = −·967.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	N.	2·5	28	0 48	P_g	—	—	—	—	—
Puebla	N.	4·2	354	1 5	− 2	—	—	—	—	—
Tacubaya	N.	4·7	345	1 10	− 4	—	—	—	—	—
Vera Cruz	N.	4·7	21	1 13	− 1	—	—	—	—	—
Guadalajara	N.	7·8	320	1 54	− 4	—	—	—	—	—
Balboa Heights		19·0	105	e 4 33?	+ 7	—	—	—	—	—
Tucson		21·0	330	i 4 47a	0	e 8 35	− 2	—	—	e 10·0
Columbia		24·5	35	e 5 23	+ 1	e 9 45	+ 5	—	—	e 11·6
St. Louis		24·7	15	e 5 18	− 6	i 9 38	− 6	e 10 55	SSS	—
Florissant		24·8	15	i 5 24	− 1	e 9 45	− 1	—	—	—
La Jolla		25·1	320	e 5 33	+ 5	—	—	e 6 7	PP	—
Denver		25·5	348	—	—	e 11 43	SSS	—	—	e 12·8
Lincoln		25·9	5	e 5 21	−14	e 10 3	− 1	e 6 9	PP	e 13·7
Riverside		25·9	321	i 5 56	+21	—	—	—	—	—
Mount Wilson	z.	26·5	321	i 5 43	+ 2	—	—	—	—	—
Pasadena		26·5	321	e 5 41	0	i 10 45	+31	—	—	e 13·4
Haiwee		27·8	325	e 6 1	+ 8	—	—	—	—	—
Chicago		28·5	16	e 5 57	− 2	e 10 42	− 4	—	—	e 16·0
Salt Lake City		28·5	338	—	—	10 51	+ 5	—	—	e 11·8
Tinemaha		28·6	325	e 6 2	+ 2	—	—	—	—	—
San Juan		30·7	79	—	—	e 11 22	+ 1	—	—	e 17·0
Philadelphia		32·1	36	i 6 33	+ 2	e 11 43	0	—	—	e 14·3
Bozeman		32·7	344	e 6 30	− 6	11 53	+ 1	—	—	e 15·4
Ukiah		32·8	323	e 6 36	− 1	e 12 3	+ 9	e 7 58	PPP	e 13·7
Butte		33·4	343	e 6 43	+ 1	e 11 58	− 5	—	—	e 16·0
Fordham		33·4	34	e 6 42	0	e 12 2	− 1	—	—	e 26·2
Huancayo		34·9	138	e 7 38	+43	12 54	+27	—	—	15·7
Williamstown		35·0	33	i 6 58	+ 2	e 12 34	+ 6	—	—	—
Harvard		35·8	34	e 7 1	− 2	e 12 41	0	e 20 33	L_q	e 24·6
Ottawa		35·8	27	e 7 3	0	e 12 45	+ 4	—	—	21·6
Seattle		38·5	334	e 7 21	− 5	—	—	—	—	e 20·5
Victoria		39·5	334	e 6 39	−55	13 39	+ 2	9 9	PP	e 19·5
East Machias		39·6	35	e 7 35	0	e 13 39	+ 1	e 9 1	PP	16·7
Sitka		50·7	335	e 9 0	− 3	—	—	e 11 12	PP	e 20·3
Granada		84·6	53	i 13 28k	+52	—	—	i 15 51	PP	e 36·1
Paris		85·8	41	i 12 48	+ 6	—	—	—	—	44·5
Uccle	z.	86·3	38	e 12 51	+ 6	—	—	—	—	—
Strasbourg		89·2	39	e 13 5	+ 6	e 23 51	+ 4	e 16 33	PP	e 44·5
Stuttgart	z.	90·0	39	e 13 7	+ 4	e 24 0	+ 5	e 16 36	PP	e 46·5
Triest		94·0	40	e 13 13	− 8	e 24 6	[+10]	—	—	—
Rome		94·8	44	—	—	e 24 10	[+10]	—	—	e 46·8
Tiflis		114·1	30	—	—	e 29 13	PS	—	—	—

Additional readings:—
Tucson iP = +4m.57s., eS = +8m.17s.
Florissant iSN = +9m.48s.
Sitka eP = +9m.7s.
Tiflis eEN = +29m.17s.
Long waves were also recorded at Berkeley, Edinburgh, College, La Paz, Santa Clara, Kew, and Bidston.

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June 9d. 0h. 51m. 3s. Epicentre 14°·8N. 98°·0W. (as at 0h. 15m.).

$A = -\cdot1346$, $B = -\cdot9578$, $C = +\cdot2538$; $\delta = -9$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	N.	2·5	28	0 46	+ 3	—	—	—	—	—
Puebla	N.	4·2	354	1 2?	− 5	—	—	—	—	—
Tacubaya	N.	4·7	345	1 12	− 2	—	—	—	—	—
Vera Cruz	Z.	4·7	21	1 12	− 2	—	—	—	—	—
Balboa Heights		19·0	105	e 3 57?	−29	—	—	—	—	—
Tucson		21·0	330	e 4 45	− 2	e 8 43	+ 6	i 5 10	PP	e 10·3
St. Louis		24·7	15	e 5 17	− 7	e 9 37	− 7	—	—	—
Florissant		24·8	15	e 5 21	− 4	i 9 48	+ 2	—	—	—
Denver		25·5	348	e 7 57	?	e 10 35	SS	—	—	e 12·9
Lincoln		25·9	5	—	—	e 7 40	?	—	—	e 14·1
Riverside		25·9	321	i 5 54	+19	—	—	—	—	—
Mount Wilson	Z.	26·5	321	e 5 46	+ 5	—	—	—	—	—
Pasadena		26·5	321	i 5 48	+ 7	e 10 41	+27	—	—	e 14·6
Haiwee		27·8	325	e 5 59	+ 6	—	—	—	—	—
Tinemaha	Z.	28·6	325	e 5 59	− 1	—	—	—	—	—
San Juan		30·7	79	e 4 25	?	—	—	—	—	—
Bozeman		32·7	344	e 6 38	+ 2	—	—	—	—	e 11·8
Ukiah		32·8	323	e 6 24	−13	e 11 29	−25	—	—	e 13·0
Butte		33·4	343	e 6 41	− 1	—	—	—	—	e 12·0
Williamstown		35·0	33	i 6 57	+ 1	e 12 26	− 2	—	—	—
Harvard		35·8	34	—	—	e 12 39	− 2	—	—	e 23·9
East Machias		39·6	35	e 5 8	?	—	—	—	—	e 12·0
Sitka		50·7	335	e 9 43	P_cP	—	—	—	—	e 25·3

Additional readings:—
Tucson P = +4m.48s., iP = +4m.55s.
St. Louis eE = +5m.19s., eN = +9m.41s.
Denver eE = +12m.37s.
Long waves were also recorded at Salt Lake City, Chicago, Columbia, and Guadalajara.

June 9d. 19h. 8m. 49s. Epicentre 4°·5S. 137°·0E.

$A = -\cdot7291$, $B = +\cdot6799$, $C = -\cdot0779$; $\delta = -1$; $h = +7$;
$D = +\cdot682$, $E = +\cdot731$; $G = +\cdot057$, $H = -\cdot053$, $K = -\cdot997$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		12·0	348	2 56	+ 1	—	—	—	—	—
Manila		24·7	320	i 5 20a	− 4	i 9 36	− 8	—	—	—
Brisbane	N.	27·5	148	—	—	e 10 59	+29	—	—	e 14·7
Batavia		30·1	266	e 6 14	+ 1	11 7	− 5	—	—	—
Adelaide		30·3	177	e 6 16	+ 1	i 11 13	− 2	i 7 15	PP	i 15·4
Riverview		32·0	157	—	—	e 12 7	+25	—	—	19·5
Sydney		32·2	157	e 10 29	?	—	—	—	—	16·5
Perth		33·8	213	6 43	− 3	i 12 1	− 9	7 49	PP	16·7
Melbourne		34·0	168	—	—	12 21	+ 8	14 56	SSS	18·0
Hong Kong		34·7	321	6 51	− 3	12 13	−11	15 8	SSS	—
Zi-ka-wei	Z.	38·5	339	e 7 25	− 1	i 16 12	SS	i 9 3	PP	—
Osaka		38·9	359	7 46	+17	—	—	—	—	—
Kobe		39·0	359	8 37	+67	16 25	SS	—	—	—
Medan		39·1	281	7 29	− 2	13 42	+11	—	—	—
Tokyo Cen. Met. Ob.		40·0	5	6 56	−42	—	—	—	—	—
Hukusima		42·1	6	7 58	+ 3	—	—	—	—	—
Vladivostok		47·6	355	e 8 41	+ 2	e 15 39	+ 4	—	—	20·5
Wellington		49·8	142	—	—	e 16 21	+15	21 11?	L_q	26·2
Christchurch		50·0	146	e 9 10a	+12	e 16 45	PS	21 45	L_q	26·0
Calcutta	N.	54·6	302	e 8 54	−38	e 17 6	− 5	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		63·0	338	e 10 31	0	e 18 51	−10	—	—	29·2
Frunse		73·3	317	e 11 32	− 3	—	—	—	—	—
Andijan		74·1	314	e 11 38	− 2	e 22 10	PPS	—	—	—
Tashkent		76·5	314	i 11 48	− 6	21 29	−10	—	—	e 36·7
Tchimkent		76·6	315	e 11 50	− 4	—	—	—	—	—
Samarkand		77·7	311	e 11 48	−12	—	—	—	—	—
Sverdlovsk		86·3	327	i 12 43	− 2	24 8	PS	e 16 4	PP	38·2
Baku		90·7	310	e 13 12	+ 6	e 24 0	− 1	—	—	44·2
Tiflis		94·6	312	e 13 23	− 1	i 24 4	[+ 5]	—	—	e 51·2
Moscow		99·0	326	13 41	− 3	24 25	[+ 3]	17 44	PP	e 52·0
Ksara		101·7	303	e 13 56	0	e 27 11	PS	e 18 0	PP	56·2
Pulkovo		102·2	331	e 13 56	− 2	24 32	[− 6]	e 18 11	PP	e 46·7
Bozeman		108·5	43	e 11 57	?	—	—	—	—	—
Stuttgart		117·6	325	e 19 55	PP	e 29 36	PS	e 22 32	PPP	e 59·2
Rome		118·3	316	e 20 2	PP	e 25 49	[+ 5]	e 29 51	PS	—
Strasbourg		118·5	325	e 19 59	PP	e 27 31	{+28}	e 35 27	SS	e 65·2
Uccle		119·3	328	e 20 13	PP	—	—	—	—	e 67·2
Paris		121·4	327	e 10 19	?	—	—	—	—	69·2
Fordham		134·4	32	e 19 26	[+ 6]	—	—	e 21 58	PP	—
Harvard	z.	134·5	29	e 22 53	?	—	—	—	—	e 68·2
Balboa Heights		143·5	80	e 19 11?	[−26]	—	—	—	—	—
La Paz	z.	147·6	131	i 19 57a	[+13]	—	—	—	—	78·2

Additional readings :—
Batavia iE = +10m.52s., iSE = +11m.23s.
Adelaide i = +11m.55s., eP_2? = +13m.35s.
Riverview eE = +14m.31s., eN = +15m.4s., eZ = +15m.38s., eE = +16m.34s., eN = +16m.49s., iEN = +17m.42s.
Sydney eS = +14m.47s., e = +16m.17s.
Perth PPP = +8m.9s., i = +9m.4s., +10m.14s., +11m.29s., +12m.46s., +13m.48s., +14m.31s., +14m.46s., +14m.54s., and +15m.21s.
Melbourne i = +16m.14s.
Tiflis eEZ = +20m.54s., eN = +21m.11s., eSE = +24m.33s., eSN = +24m.40s., eSE = +24m.49s.
Ksara PPS = +28m.0s.
Strasbourg eN = +28m.58s., eZ = +29m.47s. and +31m.37s., eE = +34m.3s., eN = +34m.10s.
Fordham e = +23m.0s.
Long waves were also recorded at Kew, Bidston, Edinburgh, Upsala, Cheb, Pasadena, De Bilt, Phu-Lien, Aberdeen, Cape Town.

June 9d. Readings also at 1h. (Guadalajara, Vera Cruz (2), Tacubaya (3), Puebla (2), Oaxaca (3), and Tucson), 3h. (near Mizusawa), 5h. (near Manila), 8h. (Stuttgart), 9h. (Tucson), 15h. (Toledo and Medan), 16h. (Stuttgart), 17h. (Almata, Sverdlovsk, Medan, Samarkand, Irkutsk, Tashkent, and Calcutta), 19h. (Fordham), 21h. (Stuttgart).

June 10d. 8h. 36m. 39s. Epicentre 33°·0N. 58°·0E. (as given by U.S.S.R.).

A = +·4453, B = +·7126, C = +·5421; δ = −4; h = +1;
D = +·848, E = −·530; G = +·287, H = +·460, K = −·840.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Samarkand		9·8	45	2 26	+ 2	—	—	—	—	e 5·8
Tashkent		12·2	44	i 2 58	0	i 5 19	+ 3	—	—	e 6·5
Erevan		13·0	306	e 2 34	−35	—	—	—	—	—
Tchimkent		13·0	41	e 3 19	+10	—	—	—	—	e 8·2
Tiflis		13·6	314	3 3	−14	e 5 55	+ 5	—	—	e 6·5
Andijan		13·8	52	e 3 25	+ 6	—	—	—	—	e 8·0
Grozny		14·1	321	2 59	−24	e 5 34	−28	—	—	—
Frunse		16·4	48	e 3 59	+ 6	—	—	—	—	—
Agra	E.	18·3	103	4 16	− 1	7 57	SS	—	—	—
Ksara		18·5	277	i 4 12	− 7	7 43	− 1	—	—	10·2

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		19·3	132	i 4 49	PP	e 8 37	SSS	—	—	e 12·9
Helwan		22·9	269	5 6	0	9 9	− 4	5 30	PP	—
Semipalatinsk		23·9	37	e 5 21	+ 5	—	—	—	—	—
Sverdlovsk		23·9	4	i 5 13	− 3	9 29	− 1	12 45	L_q	14·4
Moscow		26·8	334	5 37	− 7	e 10 18	− 1	—	—	15·9
Bucharest		27·2	304	e 5 47	0	10 29	+ 4	e 11 3	SS	16·4
Sofia		28·9	300	e 5 21?	−42	e 10 59	+ 6	—	—	—
Calcutta	N.	29·9	103	—	—	i 11 14	+ 5	—	—	—
Pulkovo		32·4	334	—	—	e 11 43	− 5	—	—	—
Triest		36·0	304	e 8 21	PP	e 12 31	−13	—	—	—
Rome		36·8	298	e 7 6	− 5	—	—	—	—	—
Collmberg	Z.	37·4	315	e 7 10	− 6	—	—	—	—	—
Irkutsk		38·3	46	e 7 31	+ 7	e 13 26	+ 7	—	—	20·3
Stuttgart		39·4	309	e 9 3	PP	—	—	—	—	e 23·3
Strasbourg		40·3	308	e 9 1	PP	—	—	—	—	e 18·9
Granada		49·8	293	i 8 47	− 9	—	—	—	—	—

Additional readings :—
Tiflis ePEN = +3m.10s., eSZ = +5m.59s.
Grozny e = +4m.51s.
Helwan PPPZ = +5m.42s.
Collmberg iZ = +7m.20s., eZ = +7m.23s.
Long waves were also recorded at Colombo, Kodaikanal, Cape Town, and other European stations.

June 10d. Readings also at 0h. (Frunse, Andijan, Samarkand, and Tacubaya), 2h. (near Balboa Heights), 6h. (Strasbourg, Stuttgart, Rome, Triest, and Sofia), 7h. (near Manila), 9h. (Manila, Frunse, Adelaide, Perth, Brisbane, Riverview, Melbourne, Sydney, and Sverdlovsk), 10h. (La Paz and Collmberg), 11h. (Mizusawa), 14h. (near Mizusawa), 15h. (Ottawa), 17h. (Collmberg), 19h. (near Taihoku), 22h. (Tucson and near Fort de France), 23h. (Tucson, Andijan, and Samarkand).

June 11d. Readings at 0h. (Tiflis), 3h. (Huancayo and La Paz), 4h. (Fort de France), 5h. (Almata), 6h. (La Paz and near Mizusawa), 7h. (Riverside, Phu-Lien, Calcutta, Medan, Sitka, Philadelphia, Columbia, Butte, Bozeman, Haiwee, Mount Wilson, Tucson, Pasadena, Tinemaha, and Harvard), 8h. (Tinemaha, Pasadena, Tucson, and Mount Wilson), 9h. (Ksara), 10h. (Tchimkent, Samarkand, and Andijan), 11h. (Manila and near Mizusawa), 16h. (Harvard), 17h. (Frunse, Andijan (2), and Samarkand), 18h. (Mizusawa), 19h. (near Mizusawa), 20h. (Tucson), 21h. (Sofia and Bucharest).

June 12d. 4h. 5m. 9s. Epicentre 20°·5N. 66°·0W.

A further revision of this earthquake gives epicentre 20°·6N. 65°·8W. Strongly felt by ships at sea, north of Porto-Rico. Slight at San Juan. Epicentre 21°·8N. 66°·0W.

R. Bodle.

United States Earthquakes, 1939, Washington, 1940, p. 30.

$A = +·3813$, $B = -·8564$, $C = +·3481$; $\delta = -2$; $h = +5$;
$D = -·914$, $E = -·407$; $G = +·142$, $H = -·318$, $K = -·937$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan	2·1	183	e 0 37	0	—	—	0 41	P_g	—
Bermuda	11·8	5	e 2 46	− 7	i 4 39	−27	—	—	e 5·0
Balboa Heights	17·4	231	e 4 12	+ 6	e 7 15	− 4	e 4 52	PPP	—
Columbia	18·9	320	4 21	− 3	e 7 58	+ 5	—	—	e 8·9
Philadelphia	20·9	342	i 4 45a	− 1	i 8 19	−16	e 5 5	PP	i 9·2
Fordham	21·4	345	i 4 48a	− 3	i 8 45	0	i 4 59	PP	i 10·6
Harvard	22·4	351	i 5 2k	0	i 9 2	− 2	i 5 16	PP	—
Williamstown	23·0	348	e 5 6	− 1	e 9 7	− 7	i 10 0	SS	e 10·7
Halifax	24·1	5	i 5 23	+ 5	i 9 42	+ 8	11 21	SSS	e 13·3
East Machias	24·3	358	e 5 22	+ 2	e 9 35	− 2	—	—	i 10·5

Continued on next page.

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cincinnati	24·5	324	i 5 22	0	i 9 50	+10	i 5 51	PP	e 12·3
Vermont	24·6	348	i 5 24a	+ 1	i 9 49	+ 7	i 5 50	PP	i 10·6
Toronto	25·7	338	i 5 33	0	10 9	+ 8	12 9	SS	14·4
Ottawa	26·1	345	5 38	+ 1	10 9	+ 2	i 6 6	PP	e 12·8
Shawinigan Falls	26·6	351	5 43	+ 1	e 10 31	+15	6 17	PP	e 13·3
Florissant	27·3	316	e 5 51	+ 3	i 10 34	+ 7	i 6 31	PP	—
St. Louis	27·3	316	i 5 49	+ 1	i 10 32	+ 5	i 6 29	PP	i 13·8
Huancayo	33·6	197	e 6 48	+ 4	e 12 1	− 5	—	—	13·9
La Paz	36·8	183	i 7 9k	− 2	i 12 56	0	i 8 33	PP	16·4
Tucson	41·6	297	i 7 53a	+ 2	i 14 11	+ 3	i 9 29	PP	16·9
Ivigtut	42·5	13	7 57	− 2	14 21	− 1	9 43	PP	—
Salt Lake City	43·8	308	e 8 10	+ 1	14 38	− 2	9 53	PP	18·1
Bozeman	44·6	315	e 8 15	− 1	e 14 50	− 2	e 18 11	SS	e 19·9
Saskatoon	44·6	325	—	—	e 17 51?	SS	—	—	e 23·9
Butte	45·7	316	8 26	+ 2	15 7	− 1	18 17	SS	20·3
La Jolla	47·0	297	i 8 39	+ 4	—	—	—	—	—
Riverside	47·2	299	e 8 39	+ 3	e 15 33	+ 4	—	—	—
Mount Wilson	47·7	299	i 8 41	+ 1	e 15 41	+ 5	—	—	—
Haiwee	47·8	301	i 8 44	+ 3	e 15 43	+ 5	—	—	—
Pasadena	47·8	299	i 8 43a	+ 2	i 15 41	+ 3	e 10 35	PP	e 25·3
Tinemaha	48·1	302	i 8 45	+ 2	e 15 47	+ 5	i 9 51	?	—
Santa Clara	51·1	303	i 9 14	+ 8	e 16 33	+ 9	—	—	e 28·6
Berkeley	51·3	303	i 9 7a	− 1	i 16 24	− 2	e 18 3	S_cS	e 24·8
Ukiah	52·2	305	e 9 11	− 4	e 16 37	− 2	e 19 0	S_cS	e 21·1
Victoria	53·4	316	9 15	− 9	16 45	−10	—	—	e 24·9
San Fernando	54·1	59	e 9 34	+ 5	i 17 5	0	—	—	24·9
La Plata	55·6	172	9 39	− 1	17 0	−25	—	—	28·4
Toledo	55·8	55	i 9 41	0	e 17 27	− 1	—	—	e 23·0
Granada	56·2	58	i 9 38k	− 6	e 17 25	− 8	10 26	P_cP	i 24·8
Scoresby Sund	56·3	16	9 43k	− 2	17 33	− 1	11 58	PP	23·9
Almeria	57·1	59	i 9 55	+ 5	17 44	− 1	12 11	PP	26·4
Bidston	57·7	39	—	—	e 18 44	PPS	e 22 31	SS	e 25·9
Jersey	57·8	43	e 9 53	− 2	e 17 52	− 2	e 19 51?	S_cS	e 25·9
Edinburgh	58·1	36	i 10 3	+ 5	i 17 57	− 1	i 18 15	PS	e 25·9
Stonyhurst	58·1	38	i 10 0	+ 2	e 17 52	− 6	—	—	26·9
Durham E.	58·8	37	10 2	0	18 10	+ 3	18 31	PPS	—
Aberdeen	58·9	34	i 10 0	− 3	i 18 1	− 7	i 19 53	S_cS	e 27·0
Kew	59·2	41	i 10 3	− 2	e 18 7	− 5	e 11 2	P_cP	e 26·9
Paris	60·8	44	i 10 13	− 3	e 18 30	− 3	—	—	27·9
Clermont-Ferrand	61·1	48	i 10 18	0	i 18 42	+ 5	—	—	i 28·3
Algiers	61·5	58	e 10 22	+ 1	e 18 42	0	—	—	e 29·9
Sitka	61·8	325	e 10 21	− 2	e 18 46	0	e 12 56	PP	e 25·8
Uccle	62·0	42	10 23	− 1	i 18 45	− 3	—	—	e 27·9
De Bilt	62·6	41	i 10 26a	− 2	18 54	− 2	—	—	29·4
Bergen	63·2	31	e 10 31	− 1	—	—	—	—	e 29·9
Neuchatel	63·8	46	e 10 35	− 1	—	—	—	—	—
Basle	64·2	45	e 10 36	− 3	e 19 15	− 1	—	—	—
Heligoland	64·2	39	—	—	e 19 15	− 1	—	—	e 27·9
Strasbourg	64·3	44	i 10 37a	− 2	e 19 15	− 2	e 13 0	PP	i 29·9
Zurich	64·9	46	e 10 41a	− 2	e 19 19	− 5	—	—	—
Stuttgart	65·2	44	i 10 44a	− 1	e 19 25	− 3	e 13 20	PP	e 30·4
Hamburg	65·5	39	e 10 46	− 1	e 19 27	− 5	—	—	e 28·9
Chur	65·6	46	e 10 47	− 1	e 19 31	− 2	—	—	—
Göttingen	65·6	41	e 10 44	− 4	—	—	—	—	e 30·9
Jena	66·6	42	e 10 51	− 3	e 19 42	− 3	—	—	e 29·9
Copenhagen	66·8	36	i 10 55	− 1	19 46	− 2	13 28	PP	31·9
Cheb	67·2	43	e 11 5	+ 7	e 20 6	+14	—	—	e 30·9
Collmberg	67·5	41	e 10 58	− 2	e 19 57	+ 1	e 13 37	PP	e 30·9
College	68·2	334	e 11 5	+ 1	e 19 57	− 7	e 24 16	SS	e 27·7
Rome	68·2	52	i 11 3	− 1	i 20 2	− 2	i 13 33	PP	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		68·5	43	e 11 1	− 5	e 20 5	− 3	—	—	e 29·9
Triest		68·6	47	11 7	0	20 8	− 1	—	—	e 31·6
Upsala		69·3	32	e 11 15	+ 4	20 15	− 2	—	—	e 32·8
Belgrade		73·4	48	e 11 36a	0	e 21 5	0	—	—	e 42·1
Pulkovo		75·6	31	i 11 48	0	e 21 26	− 3	—	—	e 35·5
Sofia		75·9	49	e 11 58	+ 8	e 21 34	+ 2	—	—	—
Istanbul		80·5	50	12 19	+ 4	22 24	+ 2	—	—	—
Moscow		80·6	34	e 12 16	0	e 22 19	− 4	—	—	39·1
Helwan		86·1	59	i 12 47a	+ 3	23 15	− 3	12 56	P_cP	—
Ksara		88·2	55	i 12 55	+ 1	e 24 39	PS	e 16 25	PP	42·4
Grozny		90·9	43	e 13 0	− 7	—	—	—	—	—
Sverdlovsk		91·0	26	i 13 7	0	23 34	[− 5]	16 46	PP	36·9
Baku		95·1	44	e 13 39	+13	24 6	[+ 5]	—	—	42·9
Cape Town		96·8	123	—	—	25 1	+ 7	—	—	32·3
Tashkent		105·8	33	e 14 15	P	24 42	[−12]	18 42	PP	e 47·0
Irkutsk		107·1	6	e 18 45	PP	e 24 1	[−59]	e 33 26	SS	48·9
Vladivostok		114·6	345	i 19 38	PP	—	—	—	—	58·7
Agra	E.	121·2	37	e 20 26	PP	—	—	—	—	—
Zi-ka-wei	Z.	128·1	352	e 21 9	PP	—	—	—	—	64·3
Manila		144·5	349	e 19 30	[− 8]	29 21?	{−26}	23 22	SKP	73·9
Amboina		158·3	318	i 24 3	PP	—	—	—	—	—
Batavia	E.	164·2	27	22 9	?	i 26 21	[−47]	—	—	—

Additional readings :—
San Juan iP = +45s.
Balboa Heights eE = +5m.4s.
Columbia eS = +7m.38s.
Philadelphia iP = +4m.55s., ePPP = +5m.35s.
Fordham iE = +8m.59s.
Harvard iEN = +8m.46s.
Williamstown iP = +5m.9s., i = +9m.19s.
East Machias iS = +9m.53s.
Cincinnati i = +5m.36s. and +6m.12s., iSSS = +10m.31s., i = +11m.1s.
Vermont iS = +10m.2s. and +10m.12s., i = +10m.29s.
Toronto e = +8m.21s.
Ottawa i = +10m.39s.
Shawinigan Falls i = +10m.38s. and +10m.53s.
Florissant iPEN = +5m.54s., iE = +10m.37s., iN = +11m.21s.
St. Louis iE = +11m.16s., iSSEN = +11m.33s.
Huancayo S = +12m.6s.
La Paz SSZ = +15m.24s., iZ = +15m.43s.
Tucson iP = +8m.34s., iPPP = +10m.4s.
Saskatoon e = +21m.21s.
Ukiah S = +16m.41s., eSS = +20m.11s.
Granada ePP = +12m.23s., ePPPE = +13m.21s., iPS = +17m.38s.
Scoresby Sund +13m.1s.
Almeria P_cP = +10m.55s., PPP = +13m.10s., PS = +18m.12s.
Bidston eS_cS = +19m.40s.
Durham ?E = +10m.22s.
Kew eZ = +11m.26s., eP_cSE = +15m.1s., eS_cSEN = +20m.2s., eSSEN = +22m.11s., eSSSE = +24m.11s.
Sitka eP = 10m.31s., ePPP = +14m.18s., eS_cS = +20m.11s., eSS = +22m.51s.
Strasbourg iZ = +13m.3s., iE = +19m.20s., iZ = +19m.27s., PSZ = +19m.51s., SSN = +23m.33s.
Stuttgart eL_qEN = +26m.51s.
Hamburg eSE = +19m.37s.
Copenhagen i = +11m.3s. and +12m.9s., e = +15m.1s. and +20m.57s.
Collmberg iZ = +11m.5s., i = +11m.13s. and +11m.25s., eZ = +11m.48s., +12m.1s., and +13m.27s.
Rome iN = +12m.9s., iPPP = +14m.55s., eSSN = +24m.29s.
Upsala eSE = +20m.21s.
Belgrade iZ = +11m.41s.
Helwan S_cSN = +23m.30s., PSE = +24m.1s.
Ksara eSS = +29m.45s.
Sverdlovsk S = +24m.3s.
Tashkent PPS = +28m.38s.
Irkutsk e = +39m.51s.
Manila iE = +36m.29s., S? = +40m.51s. ?
Long waves were also recorded at Kodaikanal, Colombo, Bombay, Cernauti, and Phu-Lien.

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June 12d. Readings also at 1h. (Andijan and Samarkand), 4h. (Amboina and Tucson (2)), 5h. (Christchurch, near Wellington, and New Plymouth), 6h. (near Malabar and Batavia), 7h. (Andijan and Samarkand), 8h. (near Irkutsk and Almata), 9h. (La Plata and Tashkent), 10h. (Sverdlovsk and Batavia), 11h. (Honolulu), 13h. (near Tananarive and Manila), 15h. (Salt Lake City, Bozeman, College, Sitka (2), Tinemaha, Pasadena, Haiwee, Mount Wilson, Riverside, Santa Clara, Butte, and Tucson), 16h. (East Machias, Vermont, St. Louis, Fordham, Chicago, Ottawa, Columbia, and Tucson), 18h. (Fresno (3), Lick (3), and Tucson (2)), 19h. (Frunse, near Bagnères, Almata, and Andijan), 20h. (Tucson and Collmberg), 21h. (Columbia), 22h. (Tucson), 23h. (near Mizusawa).

June 13d. 17h. 15m. 30s. Epicentre 37°·0N. 117°·2W. (as given by Pasadena).

$A = -\cdot3660$, $B = -\cdot7120$, $C = +\cdot5992$; $\delta = -6$; $h = 1$;
$D = -\cdot889$, $E = +\cdot457$; $G = -\cdot274$, $H = -\cdot533$, $K = -\cdot801$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		0·8	277	i 0 17	− 1	i 0 29	− 2	—	—	—
Haiwee		1·1	215	i 0 22	0	i 0 37	− 2	—	—	—
Fresno	N.	2·1	263	e 0 37	0	i 1 5	+ 1	i 0 40	P_g	—
Mount Wilson		2·9	194	i 0 49	+ 1	i 1 33	S_g	—	—	—
Pasadena		3·0	195	e 0 50	0	i 1 37	S_g	—	—	—
Riverside		3·0	183	i 0 50	0	i 1 35	S*	—	—	—
Lick		3·6	279	e 0 58	0	i 1 52	S*	e 1 3	P*	—
Santa Clara		3·8	276	i 1 19	P_g	i 2 8	S_g	—	—	—
Branner		4·0	278	e 1 9	P*	i 2 5	S*	i 1 18	P_g	—
Berkeley		4·1	282	e 1 9	+ 4	e 1 55	0	e 1 14	P*	—
La Jolla		4·1	182	i 1 7	+ 2	i 1 48	− 7	—	—	—
San Francisco		4·2	281	e 1 12	P*	i 2 5	S*	2 12	S_g	—
Tucson		7·1	130	i 1 48	0	i 3 10	0	i 2 6	P*	i 4·2
Bozeman		9·9	26	—	—	e 5 5	S*	—	—	—

Additional readings :—
Lick iN = +1m.57s.
Branner ePN = +1m.12s.
Berkeley eN = +1m.20s., iN = +2m.10s., iZ = +2m.53s.
Tucson iS = +3m.47s., iS_g = +3m.53s.
Long waves were also recorded at Fordham, Ukiah, Philadelphia, and Chicago.

June 13d. 20h. 39m. 54s. Epicentre 0°·2N. 125°·2E.

Felt at Menado (N.E. Celebes) and at Laboeha (Batjan).

Epicentre 0°·7N. 125°·2E. (Amboina).

See Annales de l'Institut de Physique du Globe de Strasbourg, tome IV, 2e partie, 1939, p. 48.

$A = -\cdot5764$, $B = +\cdot8171$, $C = +\cdot0035$; $\delta = -10$; $h = +7$;
$D = +\cdot817$, $E = +\cdot576$; $G = -\cdot002$, $H = +\cdot003$, $K = -1\cdot000$.

Tables for depth of focus 0·010 have been used.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Amboina	4·9	142	i 1 7a	− 6	i 2 2	− 7	i 1 53	PPP	—
Palau	11·7	52	3 39	+54	—	—	—	—	—
Manila	14·9	344	i 3 24k	− 3	7 25	?	—	—	—
Batavia	19·4	251	i 4 21	0	i 7 55	+ 5	i 4 28	pP	—
Kosyun	22·1	350	4 47	− 1	8 42	+ 2	—	—	—
Hong Kong	24·5	335	5 8	− 3	9 22	0	5 29	PP	—
Medan	26·7	278	i 5 34	+ 2	10 5	+ 7	i 11 46	SS	—
Phu-Lien	27·4	320	5 35	− 3	e 10 8	− 2	—	—	—
Nake	28·3	9	5 48	+ 2	10 40	sS	—	—	—
Perth	33·2	195	i 6 59	pP	11 46	+ 5	12 41	SS	14·2

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Izuka		33·7	8	6 26	− 8	11 44	− 5	—	—	—
Koti		34·1	12	6 40	+ 3	11 52	− 3	—	—	—
Kobe		35·6	15	6 51	+ 1	12 2	−16	—	—	—
Osaka		35·6	15	6 54	+ 4	14 0	SS	8 9	PP	—
Nagoya		36·5	16	7 0	+ 2	12 30	− 2	—	—	—
Adelaide		37·1	163	i 7 5	+ 2	i 12 41	0	—	—	i 21·4
Zinsen		37·1	2	7 21	pP	12 42	+ 1	—	—	—
Tokyo, Cen. Met. Ob.		37·8	19	7 11	+ 3	12 43	− 9	—	—	—
Oiwake		38·0	17	7 12	+ 2	12 54	− 1	—	—	—
Toyama		38·0	15	7 7	− 3	12 36	−19	—	—	—
Brisbane		38·4	138	i 7 12	− 1	i 12 54	− 7	i 8 42	PP	—
Wazima		38·5	15	7 9	− 5	12 58	− 4	—	—	—
Sendai		40·5	19	7 35	+ 4	13 32	0	—	—	—
Mizusawa		41·4	19	e 7 42	+ 4	i 13 43	− 3	—	—	—
Riverview		41·7	147	i 7 41a	0	e 13 56	+ 6	—	—	e 27·9
Sydney		41·8	147	e 7 21	−20	e 13 39	−13	e 9 57	PPP	17·1
Melbourne		42·0	156	e 7 46	+ 3	i 13 50	− 4	e 8 52	PP	17·1
Calcutta	N.	42·2	305	e 7 56	+11	i 14 1	+ 4	e 9 15	PP	e 19·3
Vladivostok		43·2	7	i 7 56	+ 3	i 14 10	− 2	—	—	19·2
Sapporo		45·1	16	8 12	+ 4	14 37	− 2	—	—	—
Colombo	E.	45·7	279	8 11	− 2	14 51	+ 3	—	—	26·6
Agra	E.	52·6	305	9 3	− 3	i 16 25	+ 1	e 9 21	pP	24·4
Bombay		54·6	293	—	—	i 16 53	+ 2	i 21 36	SSS	—
Irkutsk		54·8	345	9 20	− 2	16 50	− 4	—	—	28·1
Almata		60·7	322	10 1	− 2	—	—	—	—	—
Frunse		62·0	320	10 16	+ 4	e 18 24	− 3	—	—	—
Andijan		62·5	317	10 16	0	e 18 38	+ 4	—	—	—
Tashkent		64·9	317	i 10 31	0	i 19 6?	+ 3	—	—	e 29·7
Tchimkent		65·1	318	10 30	− 2	19 6	0	—	—	—
Samarkand		65·9	314	e 10 39	+ 1	—	—	—	—	—
Sverdlovsk		76·3	330	i 11 37	− 3	i 21 10	− 5	—	—	31·1
Baku		78·7	312	i 11 55	+ 2	21 50	+ 9	—	—	40·1
Grozny		82·2	314	12 14	+ 2	22 16	− 1	—	—	—
Tiflis		82·7	312	i 12 14	0	i 22 28	+ 6	15 28	PP	e 43·1
Erevan		82·8	310	12 18	+ 3	e 22 29	+ 6	—	—	—
Piatigorsk		84·2	314	12 16	− 6	e 22 38	+ 1	—	—	—
Moscow		88·5	326	e 12 41	− 2	e 23 2	[+ 1]	—	—	—
Ksara		89·3	304	i 12 48a	+ 2	24 46	PS	i 13 1	pP	43·1
Pulkovo		92·3	330	e 12 58	− 2	23 23	[0]	16 27	PP	e 34·5
Helwan		93·3	300	i 13 6a	+ 1	23 31	[+ 3]	16 51	PP	—
Bucharest		96·4	315	e 13 19	0	23 51	[+ 5]	e 13 38	pP	—
Sofia		98·6	313	e 13 6?	−23	—	—	e 17 36	PP	—
Copenhagen		102·5	328	e 13 46	− 1	24 22	[+ 6]	18 1	PP	51·1
Hamburg		104·6	327	—	—	e 24 6?	[−20]	—	—	e 52·1
Triest		104·7	318	e 18 19	PP	e 25 39	+ 2	—	—	—
Rome		106·4	314	e 18 29	PP	e 24 34	[+ 1]	e 28 22	PPS	—
Stuttgart		106·7	322	e 18 34a	PP	e 25 58	+ 4	e 20 55	PPP	e 60·1
Strasbourg		107·7	323	e 18 40	PP	26 9	S	e 29 21	PPS	e 38·6
Uccle		108·8	325	e 18 49	PP	26 18	S	e 28 25	PS	e 50·1
Edinburgh		110·3	332	—	—	e 26 6?	?	—	—	e 56·1
Paris		110·8	324	e 19 6	PP	—	—	—	—	63·1
Kew		111·1	327	e 18 6?	[−16]	e 28 6?	PS	—	—	e 56·1
Pasadena	z.	111·7	53	i 18 32	[+ 9]	—	—	e 28 23	SP	e 56·9
Mount Wilson	z.	111·8	53	i 18 32	[+ 9]	—	—	e 19 39	PP	—
Riverside		112·4	53	i 18 34	[+10]	—	—	i 19 24	PP	—
Tucson		118·1	52	18 38	[+ 2]	i 29 3	PS	19 54	PP	e 47·2
Williamstown		134·2	18	i 19 8	[+ 1]	—	—	i 22 30	PP	—
Harvard	z.	134·9	17	i 19 9k	[+ 2]	—	—	i 22 32	PP	—
Fordham	z.	135·6	21	e 22 2	PP	—	—	i 22 36	pPP	—
La Paz	z.	159·1	139	e 19 56	[+ 9]	—	—	—	—	—

Additional readings :—
Batavia iEN = +8m.14s.
Hong Kong SS = +10m.7s., SSS? = +11m.5s., S_cS = +16m.8s.
Medan iE = +11m.9s., iN = +11m.22s.

Continued on next page.

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Perth iP = +7m.34s., PP = +7m.53s., PPP = +8m.6s., P_cP = +11m.6s., SSS = +12m.51s., i = +14m.1s.
Osaka PPP = +9m.35s., S_cS = +16m.50s.
Adelaide i = +17m.8s.
Brisbane iEN = +15m.48s.
Riverview iE = +19m.57s.
Melbourne i = +10m.56s. and +14m.46s.
Calcutta N. ePPP = +9m.32s., eSS = +16m.23s., eSSS = +16m.58s., iS_cS = +18m.4s.
Agra PPPE = +12m.11s., S_cPE = +14m.6s., eE = +16m.45s., S_cSE = +18m.43s., SSE = +20m.9s., eE = +20m.31s.
Bombay iEN = +19m.0s., iN = +21m.44s.
Tiflis eN = +22m.24s., eE = +23m.0s., ePS = +23m.24s.
Moscow eS = +23m.18s.
Ksara PP = +16m.20s.
Pulkovo eS = +23m.48s., SS = +30m.24s.
Helwan SKKSE = +24m.6s., PSE = +25m.31s.
Bucharest eEN = +24m.6s.
Copenhagen +26m.58s.
Stuttgart eSKKSEN = +28m.6s., eL_qN = +53m.6s.
Strasbourg eN = +29m.36s.
Tucson iPKP = +18m.45s., ePPP = +21m.52s., ePSPS = +36m.15s.
Harvard iZ = +19m.15s.
Long waves were also recorded at Upsala, De Bilt, Cheb, and Aberdeen.

June 13d. Readings also at 0h. (Mizusawa and Tucson), 1h. (near Mizusawa), 2h. (Andijan, Samarkand, Fresno, near Lick, and Branner), 5h. (near Balboa Heights), 6h. (Fresno, near Lick, Branner, and Bidston), 8h. (Edinburgh), 9h. (Ksara, Pulkovo, Helwan, Stuttgart, Sofia, Sverdlovsk, and Tiflis), 11h. (near Tiflis), 13h. (near Balboa Heights, Samarkand, and Andijan), 14h. (Andijan, Frunse, and Sofia), 15h. (Sofia), 16h. (Kew, Tashkent, Frunse, and Andijan), 17h. (Sverdlovsk), 19h. (near Tananarive), 20h. (Riverside, Pasadena, Mount Wilson, La Plata, La Paz, Tucson, Williamstown, and Harvard), 21h. (Tiflis, near Williamstown, and Frunse), 22h. (near Florissant).

June 14d. 11h. Local Japanese shock. Tokyo Imperial University gives Epicentre 36°·23N. 140°·04E.

Tokyo Imp. Univ. P = 9m.46s., S = 9m.53s.
Kiyosumi P = 9m.47s., S = 10m.2s.
Komaba P = 9m.47s., S = 9m.55s.
Titibu P = 9m.47s., S = 9m.57s.
Yosiwara P = 9m.47s., S = 10m.9s.
Mitaka P = 9m.48s., S = 9m.57s.
Tukubasan P = 9m.48s., S = 9m.54s.
Susaki P = 10m.2s., S = 10m.21s.
Mizusawa ePE = 10m.58s., SE = 11m.18s.

June 14d. Readings also at 0h. (Pasadena, Rome, Mount Wilson, Tinemaha, Sverdlovsk, Tashkent, Ksara, Riverside, and Tucson), 2h. (near Tiflis), 3h. (Stuttgart, Bucharest, Collmberg, Pulkovo, Tashkent, and Sverdlovsk), 4h. (near Almeria, Granada, and Moscow), 5h. (near Belgrade), 7h. (Sotchi and Tiflis), 8h. (Tiflis, Tucson, Sofia, and Toledo), 9h. (Sofia), 11h. (Osaka), 12h. (Triest and Tucson), 13h. (Andijan), 14h. (Ksara), 15h. (Tananarive, Andijan, and Tucson), 17h. (near Balboa Heights), 18h. (Tucson and Riverside), 20h. (Tashkent, Frunse, Tchimkent, Samarkand, and Andijan).

June 15d. Readings at 3h. (near Almeria and near Manila), 5h. (near Balboa Heights), 14h. (Manila, Collmberg, Göttingen, Strasbourg (2), near Mizusawa, Piatigorsk, Vladivostok, Sverdlovsk, Tashkent, Jena, Irkutsk, Tiflis, and Stuttgart (2)), 17h. (near Mizusawa), 19h. (Collmberg, Riverside, Tucson, Ottawa, near Fordham, and Tinemaha), 21h. (Riverside and Tucson), 22h. (near Mizusawa (2)).

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June 16d. 7h. Epicentre Tibet ?

Almata P = 37m.35s., eS = 39m.54s.
Frunse eP = 37m.50s., e = 38m.18s. and 40m.3s., S = 40m.22s.
Andijan eP = 37m.58s., e = 38m.54s., eS = 40m.35s.
Tchimkent e = 38m.40s. and 42m.36s.
Samarkand e = 39m.5s. and 42m.41s.
Tashkent iP = 39m.34s., iS = 43m.0s., eL = 43m.48s.
Irkutsk e = 40m. and 44m., L = 47m.
Sverdlovsk eP = 40m.57s., eS = 45m.33s., L_q = 49m.12s., L_r = 51m.42s.
Agra iE = 41m.42s.
Moscow e = 42m.35s., 53m.47s., and 55m.13s., eL = 58m.30s.
Ksara e = 44m.12s.
Tiflis eZ = 48m.36s., eN = 53m.34s., eL = 54m.
Pulkovo e = 52m.9s.
Long waves were also recorded at Baku and Stuttgart.

June 16d. 21h. 32m. 43s. Epicentre 23°·0N. 142°·5E. (as on 1939 May 17d.).

A = −·7310, B = +·5609, C = +·3885; δ = −10; h = +4;
D = +·609, E = +·793; G = −·308, H = +·237, K = −·921.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tokyo Cen. Met. Ob.		12·9	350	6 0	SSS	—	—	—	—	—
Nagoya		13·1	339	3 6	− 4	—	—	—	—	—
Osaka		13·1	334	3 5	− 5	—	—	—	—	—
Oiwake		13·7	346	3 24	PP	—	—	—	—	—
Vladivostok		21·9	339	e 5 2	+ 5	8 40	−14	—	—	9·4
Manila		22·0	251	e 5 0a	+ 2	i 8 59	+ 3	—	—	i 10·7
Irkutsk		41·3	325	e 7 44	− 5	e 13 36	−28	—	—	17·3
Tashkent		62·8	306	e 10 22	− 8	e 18 13	−45	—	—	—
Sverdlovsk		66·7	325	e 10 51	− 4	—	—	—	—	32·3
Baku		77·4	309	e 12 40	+42	e 22 46	PPS	—	—	e 38·3
Moscow		79·3	327	—	—	e 24 25	?	—	—	e 44·8
Tiflis		80·5	312	e 12 8	− 7	—	—	—	—	e 42·3
Pulkovo		80·8	332	—	—	e 32 8	?	—	—	—
Tinemaha		83·4	53	e 12 32	+ 2	—	—	—	—	—
Pasadena		84·7	55	e 12 39	+ 2	—	—	—	—	—
Riverside	z.	85·3	55	e 12 42	+ 2	—	—	—	—	—
Ksara		90·2	307	e 13 9	+ 5	e 23 36	[+ 3]	24 25	PS	64·3

Additional readings :—
Sverdlovsk e = +17m.52s.
Ksara ; 11 minutes have been added to these readings.
Long waves were also recorded at Kew, Cheb, Stuttgart, and Rome.

June 16d. Readings also at 0h. (La Paz and near Malabar), 3h. (Vladivostok, Rome, Stuttgart, Sverdlovsk, and Tashkent), 3h. (Rome, Sofia, Belgrade, Triest, Ksara, and Strasbourg), 4h. (Tacubaya), 5h. (Wellington, Christchurch, Irkutsk, Zi-ka-wei, near Osaka, Manila, Mizusawa, Ksara, Rome, Sverdlovsk, Tashkent, Vladivostok, Riverview, Tiflis, Pulkovo, Moscow, and Baku), 6h. (Uccle, De Bilt, Strasbourg, Stuttgart, and Melbourne), 7h. (Rome), 10h. (Tucson), 11h. (Adelaide, Melbourne, Riverview, Triest, and Collmberg), 12h. (near Batavia and Malabar), 14h. (Honolulu), 16h. (La Paz), 17h. (Bucharest, Sofia, and Fort de France), 18h. (Grozny, Collmberg, Triest, Belgrade, Stuttgart, near Rome, Baku, Moscow, Tiflis, Sverdlovsk, Ksara, and Pulkovo), 23h. (near Fort de France).

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June 17d. 12h. 2m. 49s. Epicentre 15°·6S. 173°·6W. (as on 1939 June 8d.).

$A = -\cdot 9576$, $B = -\cdot 1074$, $C = -\cdot 2673$; $\delta = -2$; $h = +6$.

Depth of focus 0·010.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·5	45	i 0 15k	−25	i 1 5	± 5	(i 0 36)	P_g	—
Wellington		27·5	200	e 5 36	− 3	10 18	+ 7	—	—	e 13·2
Christchurch		30·2	200	i 9 20	?	i 13 58	?	—	—	e 15·4
Brisbane	E.	33·1	245	i 7 59	PPP	e 11 47	+ 7	—	—	—
Riverview		36·5	235	e 8 39	PP	e 15 41	SSS	—	—	e 18·4
Sydney		36·5	235	e 7 9	+11	e 12 26	− 6	—	—	e 18·8
Honolulu		39·8	24	e 7 24	− 1	e 13 26	+ 4	—	—	e 15·8
Melbourne		42·7	231	—	—	e 14 37	+32	—	—	22·0
Adelaide		46·8	238	—	—	e 18 4	SS	—	—	e 23·6
Manila		71·3	293	e 11 16	+ 5	20 59	PS	—	—	34·2
Pasadena	Z.	72·3	46	i 11 16	− 1	—	—	—	—	—
Mount Wilson	Z.	72·4	46	e 11 12	− 5	—	—	—	—	—
Riverside		72·8	46	e 11 18	− 2	—	—	—	—	—
Tucson		76·6	51	11 37	− 5	—	—	—	—	i 34·6
Victoria		77·8	33	—	—	21 23	− 8	—	—	33·2
College		82·6	11	e 12 14	0	e 22 23	+ 2	—	—	e 34·2
Huancayo		94·6	104	—	—	e 24 5	− 7	25 1	PS	45·5
Irkutsk		97·4	322	e 13 25	+ 1	e 23 40	[−11]	e 25 3	PS	e 43·2
Bermuda		113·9	61	—	—	e 28 59	PS	—	—	e 57·2
Tashkent		120·4	310	—	—	e 30 30	PS	e 40 21	SSS	—
Sverdlovsk		122·2	328	e 23 48	PPP	e 25 17	[−18]	—	—	65·2
Pulkovo		132·5	345	e 21 27	PP	—	—	—	—	—
Moscow		133·4	336	e 21 30	PP	—	—	—	—	—
Baku		134·9	313	e 22 46	?	e 32 22	PS	e 33 58	PPS	64·2
Tiflis		137·8	317	e 18 56	[−18]	—	—	e 22 3	PP	e 67·2
Uccle		144·9	3	e 19 24	[− 2]	—	—	—	—	e 75·2
Paris		146·7	5	i 19 30	[+ 1]	—	—	—	—	79·2
Stuttgart		146·8	357	e 19 29	[− 1]	—	—	e 24 21	PPP	e 79·2
Strasbourg		147·1	358	e 19 27	[− 3]	—	—	—	—	e 77·2
Ksara		147·8	310	i 19 35a	[+ 4]	—	—	e 23 7	PP	78·2
Basle		148·1	0	e 19 34	[+ 3]	—	—	—	—	—
Zurich		148·3	359	e 19 51	[+19]	—	—	—	—	—
Triest		149·4	351	e 19 38	[+ 5]	—	—	e 23 29	PP	—
Helwan		153·0	307	e 19 44	[+ 5]	—	—	e 23 35	PP	—
Rome		153·3	350	e 19 40	[+ 1]	—	—	e 23 38	PP	e 76·0

Additional readings :—
Apia iP*? = +18s., i = +44s.
Melbourne e = +17m.53s.
Pasadena iZ = +11m.40s.
Tucson iP = +11m.40s.
Huancayo eSS = +30m.45s.
Irkutsk eSS = +20m.59s.
Tashkent e = +50m.7s. and +56m.19s.
Sverdlovsk e = +23m.56s. and +42m.6s.
Moscow e = +22m.22s.
Tiflis eN = +22m.51s.
Stuttgart ePKPZ = +19m.54s., e = +28m.23s.
Strasbourg iZ = +19m.33s.
Helwan iZ = +19m.55s., eE = +33m.47s.
Long waves were also recorded at Kew, Bidston, Williamstown, Edinburgh, La Paz, De Bilt, East Machias, and Rio de Janeiro.

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June 17d. 18h. 40m. 2s. Epicentre 38°·6N. 142°·5E.

(As given by Central Meteorological Observatory, Tokyo).

$A = -\cdot6216$, $B = +\cdot4770$, $C = +\cdot6213$; $\delta = -7$; $h = -1$;
$D = +\cdot609$, $E = +\cdot793$, $G = -\cdot493$, $H = +\cdot378$, $K = -\cdot784$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Miyako		1·1	339	0 22k	0	0 37	− 2	—
Mizusawa		1·2	297	0 25	+ 1	0 44	+ 3	—
Sendai		1·3	255	0 27k	+ 2	0 45	+ 1	—
Hukusima		1·8	242	0 34k	+ 2	0 59	+ 3	—
Hatinohe		2·1	339	0 32a	− 5	0 57	− 7	—
Onahama		2·1	217	0 37	0	1 3	− 1	—
Akita		2·2	300	0 39	+ 1	1 9	+ 3	—
Aomori		2·6	329	0 45	+ 1	1 14	− 3	—
Mito		2·8	216	0 44	− 3	1 19	− 3	—
Utunomiya		2·9	226	0 48	0	1 24	0	—
Kumagaya		3·5	227	0 57	0	1 37	− 3	—
Maebasi		3·5	233	0 59	+ 2	1 43	+ 3	—
Tokyo, Cen. Met. Ob.		3·6	219	0 58	0	1 42	0	—
Mori		3·8	338	1 3	+ 2	2 22	?	—
Yokohama		3·9	217	1 2	0	1 49	− 1	—
Nagano		3·9	242	1 5	+ 3	—	—	—
Hunatu		4·3	225	1 9	+ 1	1 59	− 1	—
Mera		4·3	211	1 7	− 1	1 55	− 5	—
Sapporo		4·5	349	1 7	− 4	1 57	− 8	—
Osima		4·6	214	1 11	− 1	2 1	− 6	—
Wazima		4·6	257	1 24	P*	—	—	—
Nemuro		5·3	25	1 9	−13	2 0	−25	—
Osaka		6·8	237	1 28	−16	—	—	—
Sverdlovsk		54·6	318	—	—	e 14 24	?	32·0
Collmberg	z.	80·2	331	i 12 4a	−10	—	—	—

Long waves were also recorded by Baku and Irkutsk.

June 17d. Readings also at 3h. (Sofia and Bucharest (2)), 8h. (near Mizusawa (2)), 9h. (Bozeman and Manila), 11h. (Rome and Mizusawa), 13h. (Berkeley, near Lick, Branner, and San Francisco), 16h. (near Mizusawa), 19h. (Pasadena, Mount Wilson, Riverside, Tucson, Tashkent, Sverdlovsk, Baku, Tiflis, Ksara, Collmberg, Haiwee, Fordham, La Jolla, and near Mizusawa), 20h. (near Neuchatel, Zurich, Basle, and Strasbourg), 22h. (near Batavia, Malabar, and Collmberg).

June 18d. 3h. 51m. 54s. Epicentre 23°·7N. 120°·5E. (as on 1937, April 11d.).

$A = -\cdot4652$, $B = +\cdot7898$, $C = +\cdot3996$; $\delta = -12$; $h = +4$;
$D = +\cdot862$, $E = +\cdot508$; $G = -\cdot203$, $H = +\cdot344$, $K = -\cdot917$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Taihoku		1·6	35	e 0 34	P_g	0 59	+ 8	—	—	—
Hong Kong		6·0	258	2 11	P_g	2 50	+ 7	(2 59)	S*	3·4
Zi-ka-wei	z.	7·5	6	e 1 32	−21	—	—	—	—	—
Manila		9·0	177	e 2 11	− 2	i 4 20	S*	—	—	—
Vladivostok		21·6	23	e 4 54	0	i 8 53	+ 4	—	—	11·6
Irkutsk		31·1	340	e 7 6?	+44	—	—	—	—	17·1
Andijan		43·6	304	e 8 10	+ 2	—	—	—	—	—
Tashkent		46·0	305	—	—	e 19 26	SSS	—	—	e 26·2
Moscow		66·8	322	e 10 57	+ 1	—	—	e 16 9	?	e 34·7
Ksara		73·0	299	e 11 49	+16	e 22 53	PPS	—	—	—
Copenhagen		80·3	327	i 12 14	0	—	—	—	—	42·1
Collmberg	z.	82·1	324	i 12 21a	− 3	—	—	—	—	—
Tucson		105·8	44	e 18 30	PP	—	—	—	—	—

Additional readings :—
Taihoku i = +39s. and +1m.8s.
Collmberg iZ = +12m.30s., +12m.39s., and +13m.10s.
Long waves were also recorded at Calcutta, Colombo, Phu-Lien, Agra, Aberdeen, Kew, Paris, Uccle, De Bilt, Edinburgh, Strasbourg, Hamburg, Stuttgart, Cheb, Rome, Pulkovo, Sverdlovsk, Baku, and Bidston.

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June 18d. 12h. 23m. 57s. Epicentre 42°·5N. 82°·5E. (as on 1939 March 20d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		4·2	284	1 7	0	1 58	+ 1	1 18	P_g	—
Frunse		5·8	266	1 25	− 4	3 3	S_g	—		—
Andijan		7·8	260	e 2 23	P*	—	—	e 4 5	S_g	—
Semipalatinsk		8·1	351	4 3	S_g	—	—	—		—
Tchimkent		9·6	275	e 2 27	+ 6	—	—	e 5 0	S*	—
Tashkent		9·9	265	i 3 10	?	i 4 54	S_g	—	—	i 5·2
Samarkand		12·0	263	e 4 19	?	—	—	—	—	—
Dehra Dun	N.	12·6	197	e 4 40?	S	e 6 19	?	—	—	e 7·9
Agra	E.	15·8	195	e 4 5	+20	—	—	—	—	—
Irkutsk		17·7	49	e 4 13	+ 3	e 7 39	+13	—	—	9·6
Sverdlovsk		20·0	325	e 4 37	0	e 8 20	+ 3	10 9	L_q	11·8
Calcutta	N.	20·5	164	(e 4 37)	− 5	i 8 24	− 3	e 9 25	SS	e 11·2
Baku		24·5	277	e 5 20	− 2	10 12	+32	—	—	14·4
Bombay		24·9	202	i 5 34	+ 8	i 9 53	+ 6	—	—	i 12·7
Grozny		26·8	285	e 5 44	0	e 9 51	−28	—	—	e 13·7
Moscow		31·6	311	e 6 24	− 2	e 13 41	?	—	—	—
Pulkovo		35·9	318	e 7 2	− 2	e 12 49	+ 7	—	—	e 17·4
Ksara		37·3	272	e 7 15	− 1	—	—	—	—	e 15·6
Upsala	N.	42·3	318	e 17 15	?	e 19 52	?	—	—	—
Manila		43·2	119	10 35	SS	11 13	?	—	—	—
Mizusawa	E.	43·7	74	4 43	?	7 29	?	—	—	—
Copenhagen		45·8	313	e 8 24	− 1	—	—	—	—	—
Collmberg	Z.	46·6	307	i 8 29	− 3	—	—	—	—	e 24·1

Additional readings :—
Almata e = +1m.52s.
Frunse e = +1m.44s. and +2m.12s.
Semipalatinsk i = +5m.36s., +5m.54s., and +6m.30s.
Calcutta eP?N = +3m.45s., ePPN = +4m.22s. The reading taken as P is given as ePPP.
Collmberg iZ = +8m.36s., eZ = +9m.32s.
Long waves were also recorded at Colombo and other European stations.

June 18d. 16h. 45m. 58s. Epicentre 9°·7N. 83°·7W.
Intensity VII at Costa Rica.

Epicentre 9°·3N. 84°·0W. (U.S.C.G.S.).

See Seismological Notes, Bulletin of the Seismological Society of America, vol. 29, Berkeley, 1939, p. 563.

$A = +·1082$, $B = -·9799$, $C = +·1674$; $\delta = -7$; $h = +7$;
$D = -·994$, $E = -·110$; $G = +·018$, $H = -·166$, $K = -·986$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		4·2	100	e 1 26	P_g	—	—	—	—	—
San Juan		19·1	61	e 4 27	0	8 16	SS	i 8 52	SSS	—
Fort de France		22·6	76	e 5 6	+ 3	—	—	—	—	—
Huancayo		23·1	158	e 5 7	− 1	e 9 19	+ 3	9 32	SS	e 11·2
Columbia		24·3	6	e 5 17	− 3	9 39	+ 2	i 8 28	P_cP	e 12·8
Bermuda		28·5	36	e 6 0	+ 1	e 10 49	+ 3	e 11 43	sS	e 12·8
St. Louis		29·4	350	i 6 5	− 2	i 10 53	− 8	i 6 57	PP	—
Florissant		29·6	350	i 6 7	− 2	i 10 55	− 9	i 6 56	PP	14·8
La Paz	Z.	30·3	148	e 6 14	− 1	i 12 40	SS	7 32	PPP	17·0
Philadelphia		31·1	14	e 6 24	+ 2	e 11 20	− 8	7 20	PP	i 13·1
Fordham		32·2	16	e 6 32	0	i 11 40	− 5	i 7 34	PP	e 15·9
Chicago		32·3	355	e 6 26	− 7	e 11 22	−24	e 7 56	PP	e 13·3
Lincoln		33·1	344	e 6 10	−30	11 47	−12	e 6 43	pP	e 13·4
Tucson		33·7	317	6 41	− 4	—	—	i 7 58	PP	13·3
Toronto		34·0	7	e 6 44	− 4	12 2	−11	8 2	PP	e 16·0

Continued on next page,

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Williamstown		34·2	15	i 6 50	+ 1	e 13 16	+60	—	—	e 16·0
Harvard		34·4	17	i 6 49a	− 2	i 12 13	− 6	e 8 6	PcP	e 17·0
Ottawa		36·2	10	7 6	0	12 44	− 3	8 26	PP	18·0
East Machias		37·7	19	e 7 34	+15	13 11	+ 1	e 7 59	pP	e 15·9
La Jolla		38·6	313	i 7 26	0	—	—	—	—	—
Riverside		39·2	314	i 7 31	0	—	—	i 9 38	PcP	—
Mount Wilson		39·8	314	i 7 35	− 1	—	—	—	—	—
Pasadena		39·9	314	i 7 35	− 2	—	—	i 9 42	PcP	—
Haiwee		40·7	317	e 7 46	+ 2	—	—	—	—	—
Bozeman		42·8	332	e 7 59	− 2	e 14 30	+ 4	e 9 49	PP	e 17·6
Ukiah		45·8	317	e 8 57	+32	e 15 7	− 2	e 10 10	PP	—
Victoria		50·9	328	e 9 8	+ 3	e 16 8	−13	e 18 44	?	e 24·0
Rio de Janeiro	N.	51·2	129	e 9 20	+13	e 16 22	− 3	—	—	—
Sitka		61·7	332	—	—	e 20 6	?	e 24 16	SSS	—
Scoresby Sund		71·7	18	—	—	20 37	− 8	21 18	PS	30·0
Toledo		75·9	51	i 11 51	+ 1	e 21 32	0	—	—	—
Granada		76·3	54	i 12 7k	+15	i 21 43	+ 6	22 44	ScS	—
Bidston		76·7	37	—	—	e 21 37	− 4	—	—	e 37·0
Edinburgh		76·7	35	—	—	i 21 37	− 4	—	—	—
Kew		78·4	39	i 12 4	0	e 21 54	− 6	—	—	e 38·0
Paris		80·3	42	i 12 26	+12	e 22 14	− 6	—	—	38·0
Clermont-Ferrand		80·9	45	e 12 18	+ 1	—	—	—	—	e 38·2
Uccle		81·3	40	e 12 20	0	e 22 25	− 5	—	—	e 34·0
De Bilt		81·7	38	e 12 26	+ 4	—	—	—	—	e 34·0
Basle		83·8	43	e 12 31	− 1	—	—	—	—	—
Strasbourg		83·8	42	e 12 44	+12	e 22 47	− 8	—	—	e 36·0
Hamburg		84·5	37	e 12 34	− 2	e 23 54	PS	—	—	e 41·0
Zurich		84·5	43	e 12 26	−10	—	—	—	—	—
Stuttgart		84·7	42	e 12 36	− 1	e 22 57	− 7	12 50	PcP	e 40·0
Göttingen		84·8	38	e 12 2?	−35	—	—	—	—	—
Copenhagen		85·5	34	i 12 41	0	23 0	[− 4]	—	—	38·0
Jena	E.	85·9	40	e 12 41	− 2	—	—	—	—	—
Cheb		86·5	40	e 12 2?	−44	e 23 6	[− 5]	—	—	e 43·0
Collmberg	Z.	86·7	39	i 12 32a	−15	—	—	—	—	—
Prague		87·8	39	e 13 8	+16	e 23 29	− 5	—	—	—
Rome		88·2	48	e 12 48	− 6	e 23 14	[− 8]	e 15 49	PP	—
Triest		88·3	44	i 13 11	+16	e 23 18	[− 4]	e 24 6	PS	e 42·1
Pulkovo		93·4	28	—	—	e 23 45	[− 7]	e 28 15	?	—
Moscow		98·7	29	e 17 44	PP	e 24 13	[− 7]	e 26 29	PS	—
Sverdlovsk		107·5	19	—	—	24 54	[− 7]	—	—	45·0
Baku		114·3	37	e 19 53	PP	e 29 35	PS	—	—	e 48·0
Ksara		108·2	50	e 16 19	?	e 28 57	PS	e 19 23	PP	—
Tiflis		110·4	39	e 19 14	PP	e 25 12	[− 2]	28 40	PS	51·0
Tashkent		123·5	24	—	—	i 25 56	[− 5]	i 27 45	SKKS	e 62·2
Manila		145·6	314	i 19 40k	[0]	—	—	i 21 12	?	—

Additional readings :—
San Juan P = +4m.34s.
Fort de France e = +5m.20s. and +6m.12s.
Huancayo eP = +5m.11s.
Columbia eP = +5m.36s., pP = +5m.59s., sS = +10m.17s., PcS = +12m.14s.
St. Louis iN = +6m.18s.
Florissant iNZ = +6m.20s., eN = +9m.54s.
La Paz iPZ = +6m.27s., iZ = 13m.58s., iSSZ = +15m.24s.
Philadelphia iP = +6m.36s., iS = +11m.24s.
Fordham eZ = +6m.46s.
Chicago esP = +7m.25s., eS = +11m.35s.
Lincoln ePP = +7m.59s.
Tucson sP = +7m.41s., iPP = +8m.9s., SPP = +8m.46s., iPcP = +9m.23s., ScP = +12m.26s.
Williamstown i = +7m.4s., +8m.8s., and +9m.40s.
Ottawa e = +15m.50s.
East Machias ePP = +8m.54s., eScS = +17m.1s.
La Jolla iZ = +7m.45s.
Riverside iZ = +9m.55s.

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Mount Wilson iZ = +7m.55s.
Pasadena iZ = +7m.56s. and +9m.57s.
Bozeman epPP = +10m.0s., esPP = +10m.30s.
Ukiah epPP = +10m.49s., eSS = +18m.12s.
Sitka i = +24m.59s.
Kew iZ = +12m.18s.
De Bilt iZ = +12m.36s.
Hamburg iZ = +12m.49s.
Stuttgart ePPEZ = +16m.6s., ePS = +23m.27s.
Copenhagen i = +12m.55s.
Jena eE = +13m.49s.
Collmberg iZ = +13m.0s., eZ = +13m.11s.
Rome i = +13m.7s., e = +16m.30s. and +16m.44s., ePPP = +17m.40s. and +17m.46s.
Triest i = +23m.37s.
Pulkovo e = +24m.17s.
Moscow e = +18m.4s. and +21m.0s.
Ksara PPS = +29m.55s.
Tiflis eN = +19m.22s.
Tashkent e = +51m.34s.
Long waves were also recorded at Vladivostok.

June 18d. Readings also at 0h. (Grozny, Tchimkent, Almata, near Andijan, Frunse, Samarkand, Tashkent, and near Mizusawa), 2h. (La Paz and Ottawa), 3h. (Bozeman and Honolulu), 4h. (Andijan), 10h. (Malabar), 11h. (Lincoln and near Agra), 12h. (Almata, Frunse, and near Samarkand), 17h. (Fort de France), 20h. (Balboa Heights), 22h. (Istanbul).

June 19d. 0h. 42m. 38s. Epicentre 37°·1N. 71°·2E. (as on 1938, October 31d.).

Felt intensity VI at Srinagar.

S. K. Banerji.

Seismological Bulletin of the Meteorological Department of the Government of India, April-June, 1939, p. 51.

$A = +\cdot2577$, $B = +\cdot7569$, $C = +\cdot6006$; $\delta = +3$; $h = -1$;
$D = +\cdot947$, $E = -\cdot322$; $G = +\cdot194$, $H = +\cdot569$, $K = -\cdot800$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		3·8	13	1 1	0	i 1 42	− 5	i 1 6	P*	—
Samarkand		4·2	309	1 14	P*	2 5	S*	e 1 27	P_g	—
Tashkent		4·5	341	i 1 9	− 2	i 1 59	− 6	—	—	2·4
Frunse		6·3	22	1 36	0	2 47	− 3	i 1 50	P*	—
Almata		7·5	34	e 1 52	− 1	i 3 21	+ 1	i 2 35	P_g	—
Dehra Dun	N.	8·9	138	e 2 45	PPP	i 3 47	− 8	—	—	—
Agra		11·5	148	2 41	− 7	4 39	−20	e 3 19	PPP	—
Semipalatinsk		14·8	23	e 3 24	− 8	6 18	0	—	—	—
Baku		16·9	287	i 4 2	+ 3	i 7 11	+ 4	—	—	—
Bombay		18·2	176	e 4 13	− 3	i 7 36	− 1	i 4 23	PP	i 9·6
Grozny		20·3	296	e 4 40	0	e 8 34	+11	e 5 12	PPP	—
Tiflis		20·9	292	i 4 43	− 3	e 8 25	−10	i 5 6	PP	—
Erevan		21·0	287	e 4 50	+ 3	e 8 45	+ 8	—	—	—
Sverdlovsk		21·0	345	4 40	− 7	e 8 25	−12	—	—	10·7
Kodaikanal	E.	27·3	168	—	—	e 10 22?	− 5	—	—	—
Irkutsk		27·7	46	e 6 1	+ 9	e 9 22?	−71	—	—	11·4
Ksara		28·8	274	i 6 1	− 1	e 10 15	−36	e 17 4	S_eS	—
Moscow		29·3	321	6 24	+18	e 11 25	+26	—	—	17·9
Helwan		33·8	270	e 6 46	0	12 2	− 8	8 4	PPP	—
Pulkovo		34·5	325	e 7 10	+18	e 12 47	+27	—	—	e 17·3

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bucharest	N.	34·6	298	7 14	+21	15 10	SSS	—	—	—
Collmberg	Z.	42·9	311	i 7 57	− 5	—	—	e 9 38	PP	—
Copenhagen		43·1	316	e 7 59	− 5	—	—	—	—	—
Triest		43·1	302	e 8 23	+19	e 17 45	SS	e 9 59	PP	—
Jena		43·9	308	e 8 8	− 2	—	—	e 10 22	PPP	—
Hamburg		44·6	313	e 8 35	+19	—	—	—	—	e 26·4
Rome		44·8	297	—	—	e 14 25	−10	e 17 55	SS	—
Strasbourg		46·6	306	e 8 52	+20	—	—	e 10 35	PP	—
Toledo		57·3	298	e 9 46	− 6	—	—	—	—	—

Additional readings :—
Andijan e = +1m.14s., iP_g = +1m.16s., i = +1m.19s., iS_g = +2m.6s.
Samarkand i = +2m.37s.
Frunse i = +1m.43s. and +2m.22s.
Almata i = +3m.24s., +3m.34s., and +3m.59s.
Dehra Dun iN = +3m.32s.
Agra sPE? = +3m.41s.
Bombay iEN = +4m.48s., iN = +4m.59s., eE = +5m.18s. and +7m.30s., iE = +7m.50s., iN = +8m.8s., iEN = +8m.15s., +8m.27s., and +8m.48s.
Tiflis iPPPE = +5m.18s., eN = +8m.22s., iSN = +8m.30s., e = +8m.34s., iZ = +9m.26s.
Collmberg iZ = +8m.0s. and +8m.22s., eZ = +8m.33s. and +10m.3s.
Copenhagen i = +8m.4s. and +8m.24s.
Jena eE = +8m.29s., eN = +8m.34s.
Toledo e = +10m.11s.
Long waves were also recorded at Vladivostok and Upsala.

June 19d. 21h. 56m. 47s. Epicentre 23°·3N. 93°·4E.

S. K. Banerji.

Seismological Bulletin of the Meteorological Department of the Government of India, April-June, 1939, p. 51.

Epicentre South of Manipur 24°·0N. 94°·0E. (Bombay).

A = −·0545, B = +·9178, C = +·3933 ; δ = +1 ; h = +4 ;
D = +·998, E = +·059 ; G = −·023, H = +·393, K = −·919.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	4·7	262	i 1 25a	P*	i 2 21	S*	i 1 46	P_g	—
Phu-Lien		12·5	99	e 3 30	PPP	e 5 32	SS	—	—	—
Agra		14·4	288	3 22	− 5	5 57	−12	i 3 39	PP	—
Hyderabad		15·2	249	e 3 34	− 4	e 6 48	SS	—	—	8·5
Dehra Dun	N.	15·4	300	e 5 32	?	6 33	+ 1	—	—	e 7·5
Hong Kong		19·2	90	8 7	S	(8 7)	+ 8	9 54	?	10·7
Bombay		19·7	261	4 36	+ 2	i 8 24	+14	i 5 13	PPP	e 10·6
Kodaikanal	E.	20·0	234	i 4 35	− 2	i 8 23	+ 6	—	—	10·2
Medan		20·3	166	e 4 39	− 1	8 25	+ 2	—	—	i 12·9
Colombo	E.	20·8	221	—	—	e 8 20	−13	—	—	—
Almata		24·1	331	e 5 21	+ 3	—	—	—	—	—
Andijan		24·8	320	5 25	0	9 58	+12	—	—	14·2
Frunse		25·0	326	e 5 28	+ 1	—	—	—	—	10·0
Zi-ka-wei	Z.	26·1	66	e 5 37	0	11 7	+60	—	—	i 14·5
Tashkent		27·0	318	i 5 43	− 2	i 10 33	+11	—	—	13·1
Manila		27·5	104	e 6 24	PP	11 22	SS	—	—	15·0
Samarkand		27·7	312	5 51	− 1	10 48	+15	—	—	—
Irkutsk		30·1	13	e 6 14	+ 1	e 11 0	−12	—	—	16·9
Batavia		32·1	154	i 6 13	−18	i 15 49	SSS	i 8 11	PP	20·2
Vladivostok		37·4	49	e 8 54	PP	e 13 5	0	—	—	e 16·1
Baku		40·2	306	e 8 11	+31	e 16 43	SS	e 9 39	PP	23·5
Sverdlovsk		41·1	334	7 48	+ 1	e 14 1	0	—	—	21·6
Grozny		43·9	309	e 8 11	+ 1	e 14 45	+ 3	—	—	18·2
Tiflis		44·3	307	e 8 14	+ 1	e 14 46	− 2	e 18 2	SS	e 25·2
Ksara		51·0	295	e 8 46	−20	e 16 5	−17	e 16 41	PS	—
Moscow		51·9	325	9 10	− 2	16 37	+ 2	—	—	27·7
Helwan		55·3	292	e 9 37	− 1	e 17 33	+12	13 43	PPP	—
Pulkovo		56·7	328	9 35	−13	17 28	−12	—	—	27·7
Collmberg	Z.	66·3	319	e 10 48	− 4	—	—	e 13 11	PP	—
Triest		67·3	312	e 11 9	+10	e 19 53	− 1	—	—	e 37·9

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome	68·3	308	—	—	e 20 4	− 2	e 27 50	SSS	—
Stuttgart	69·1	316	e 11 8	− 2	e 20 13	− 2	e 36 43	L_g	e 40·2
Strasbourg	70·1	316	e 11 18	+ 2	e 20 18	− 9	e 28 13?	SSS	—
Uccle	71·7	320	—	—	e 20 43	− 2	—	—	e 36·2
Aberdeen	73·6	327	—	—	e 29 53	?	—	—	e 37·5
Kew	74·4	320	e 11 41	− 1	—	—	—	—	e 37·2

Additional readings :—
Calcutta N iP* = +1m.35s., iS* = +2m.37s., iS_g = +2m.48s., iP_gP = +8m.50s.
Bombay iE = +6m.41s. and +8m.53s., iSSEN = +9m.19s., iEN = +9m.54s.
Medan PEN = +4m.45s., iSEN = +8m.29s., iN = +9m.32s.
Colombo iS?E = +8m.40s.
Batavia PZ = +5m.20s.
Tiflis ePEN = +8m.18s., eSEZ = +14m.52s., eSSZ = +18m.6s.
Helwan eE = +19m.33s.
Collmberg eZ = +10m.58s., +11m.6s., and +11m.15s.
Triest e = +11m.24s.
Long waves were also recorded at Clermont-Ferrand, Edinburgh, Upsala, Hamburg, Göttingen, Cheb, Belgrade, Cape Town, Bidston, De Bilt, and Paris.

June 19d. Readings also at 0h. (Zurich), 2h. (near Baku and Batavia), 5h. (Tucson), 7h. (Tucson, Oaxaca, and Tacubaya), 8h. (Lincoln), 12h. (Williamstown and Mizusawa), 13h. (Manila), 15h. (Ottawa), 16h. (Tashkent, Samarkand, near Osaka, Andijan, Frunse, and Almata), 19h. (Andijan, Frunse, and Almata), 21h. (Tucson, Ottawa, Lincoln, Shawinigan Falls, Fordham, St. Louis, Bozeman, Chicago, Williamstown, Harvard, Florissant, Butte, Philadelphia, and Salt Lake City), 22h. (Tinemaha, Haiwee, La Jolla, Pasadena, Riverside, Mount Wilson, Sitka, College, Tucson, Kobe, Zinsen, and Kosyun), 23h. (Helwan and Collmberg).

June 20d. Readings at 5h. (Manila, near Taihoku, near Hong Kong, Rome, and Toledo), 6h. (Stuttgart, Baku, Tashkent, Sverdlovsk, Collmberg (2), De Bilt, Rome, Tinemaha, Mount Wilson, Tucson, Ksara, Tiflis, and Riverside), 11h. (near Mizusawa), 12h. (La Plata, Uccle, Ksara, Rio de Janeiro, Paris, La Jolla, Huancayo, Pasadena, Riverside, Tucson, Toledo, Mount Wilson, San Juan, and La Paz), 13h. (Kew and Tiflis), 15h. (Toledo), 16h. (Andijan and Frunse), 17h. (Andijan, Samarkand, and near Wellington), 18h. (San Juan and Tucson), 20h. (near New Plymouth, Christchurch, and Wellington), 21h. (East Machias and La Paz), 23h. (Andijan and Frunse).

June 21d. 11h. 28m. 32s. Epicentre 38°·6N. 117°·8W. (as on 1939, May 11d.).

A = −·3654, B = −·6931, C = +·6213 ; δ = −8 ; h = −1 ;
D = −·885, E = +·466 ; G = −·290, H = −·550, = −·784.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		1·5	194	i 0 26	− 2	i 0 42	− 7	—	—	—
Fresno	N.	2·5	220	e 0 41	− 2	i 1 14	0	—	—	—
Haiwee		2·5	183	e 0 42	− 1	i 1 9	− 5	—	—	—
Lick		3·3	247	e 0 58	P*	i 1 38	+ 3	i 1 43	S*	—
San Francisco		3·8	259	e 1 10	P*	e 1 53	S*	e 1 22	P_g	—
Mount Wilson		4·3	183	i 1 12	+ 4	e 2 9	S*	—	—	—
Pasadena		4·5	185	i 1 14	+ 3	i 2 13	S*	—	—	—
Riverside		4·6	176	i 1 9	− 3	i 2 18	S*	—	—	—
Tucson		8·5	136	2 5	− 2	3 36	− 9	i 4 49	S_g	i 5·2

Additional readings :—
Tucson iP = +2m.8s., P_g = +2m.46s., S = +4m.33s.
Long waves were also recorded at Bozeman.

June 21d. Readings also at 0h. (Mizusawa), 2h. (Medan), 3h. (Mizusawa), 4h. (Guadalajara, Mizusawa, Fordham, La Paz, and Tucson), 5h. (Baku, Sverdlovsk, Ksara, Kodaikanal), 6h. (La Paz), 7h. (near Hukuoka), 11h. (Branner), 12h. (Kew and Batavia), 13h. (Tucson), 15h. (near Tananarive and Tiflis), 16h. (Ferndale), 17h. (Fordham and Tiflis), 18h. (Mizusawa), 19h. (Andijan), 20h. (Harvard, Williamstown, and Fordham), 21h. (near Mizusawa and Medan), 22h. (Irkutsk), 23h. (near Basle and Zurich).

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June 22d. 4h. 50m. 17s. Epicentre 46°·4N. 14°·2E.

Intensity IV-V in the Julien Alps at Mrzli, Jesenica, etc.

Epicentre 46°21′N. 14°11′E. (Belgrade).

J. Mihailovic.

Annuaire microseismique et macroseismique, annee XIX, 1939, Beograd, 1940, p. 100.

$A = +\cdot6710$, $B = +\cdot1698$, $C = +\cdot7218$; $\delta = +7$; $h = -4$;
$D = +\cdot245$, $E = -\cdot969$; $G = +\cdot700$, $H = +\cdot177$, $K = -\cdot692$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Laibach		0·4	148	i 0 18	+ 5	i 0 26	+ 5	—	—	—
Triest		0·8	203	i 0 14	− 4	i 0 24	− 7	—	—	—
Stuttgart		4·0	306	e 1 14	P*	e 1 53	+ 1	e 2 13	S_g	—
Zurich		4·0	285	e 1 2	− 2	e 1 58	S*	e 1 19	P_g	—
Basle		4·6	285	e 1 21	P*	e 2 27	S_g	—	—	—
Rome		4·6	194	—	—	e 2 22	S*	—	—	—
Jena		4·8	340	e 1 13	− 2	—	—	—	—	—
Strasbourg		4·8	300	e 1 33	P_g	e 2 33	S*	e 2 39	S_g	—
Collmberg	z.	5·0	349	e 1 21	+ 3	i 2 20	+ 2	i 1 38	P_g	e 2·8
Göttingen		5·9	333	e 1 55	P_g	—	—	—	—	—

Additional readings :—
Laibach i = +21s.
Stuttgart e = +1m.34s. and +2m.10s., i = +2m.16s.
Rome e = +2m.58s.
Strasbourg eE = +1m.56s., +2m.44s., and +2m.47s., iE = +2m.51s. and +2m.55s., eE = +3m.1s., i = +3m.13s.
Collmberg iZ = +1m.33s., iP_gZ = +1m.44s., eZ = +2m.13s., iZ = +2m.30s., eZ = +2m.37s., iZ = +2m.43s.

June 22d. 17h. 2m. 46s. Epicentre 39°·3N. 69°·4E. (as given by stations of Central Asia).

$A = +\cdot2730$, $B = +\cdot7264$, $C = +\cdot6308$; $\delta = +9$; $h = -1$;
$D = +\cdot936$, $E = -\cdot352$; $G = +\cdot222$, $H = +\cdot590$, $K = -\cdot776$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Samarkand	1·9	281	0 27	− 7	0 45	−14	—	—	—
Tashkent	2·0	357	i 0 36	+ 1	i 1 10	S_g	—	—	i 1·2
Andijan	2·7	57	P_g		e 1 15	− 4	e 1 31	S_g	—
Tchimkent	3·0	3	0 51	+ 1	i 1 34	S_g	i 1 0	P_g	—
Frunse	5·3	46	e 1 30	P*	e 2 37	S*	—	—	—
Almata	6·9	53	e 1 56	P*	e 3 40	S_g	—	—	—
Grozny	18·2	290	e 4 4	−12	—	—	—	—	e 9·4
Sverdlovsk	18·5	344	e 4 13	− 6	e 7 56	+12	9 50	L_q	11·5

Additional readings :—
Samarkand iP_g = +30s., S_g = +54s.
Andijan P_g = +59s., S_g = +1m.37s.
Tchimkent i = +1m.44s., iS_g = +1m.47s.
Frunse i = +2m.44s.
Almata e = +4m.8s.
Long waves were also recorded at Moscow and Irkutsk.

June 22d. 17h. Local Japanese shock.

Tokyo Imperial University gives epicentre 36°·30N. 140°·45E.

Komaba P = 19m.2s., S = 19m.18s.
Tokyo Imp. Univ. P = 19m.3s., S = 19m.17s.
Kamakura P = 19m.4s., S = 19m.25s.
Kiyosumi P = 19m.4s., S = 19m.22s.
Koyama P = 19m.4s., S = 19m.26s.
Mitaka P = 19m.4s., S = 19m.20s.
Titibu P = 19m.4s., S = 19m.20s.
Tukubasan P = 19m.4s., S = 19m.11s.
Mizusawa PE = 19m.27s., S = 19m.58s.
Osaka P = 20m.2s., S = 21m.1s.

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June 22d. 19h. 19m. 26s. Epicentre 5°·2N. 0°·1W.

Intensity IX at Aplaku, Nyanyanu, and Tokuse; VIII at Accra. Felt over a surface area of 300,000 sq. miles. Macroseismic radius 600-700km.

N. R. Junner, D. A. Bates, E. Tillotson, and C. S. Deakin.

"The Accra Earthquake of 22nd June, 1939," Gold Coast Geological Survey Bulletin No. 13, 72 pp., London, 1941. Macroseismic chart and photographs.

L. Welter.

Les seismes en A.O.F.—memento du Service Meteorologique de l'A.O.F., No. 9, pp. 78-79, 2 cartes isoseistes, Rufisque, 1943.

Epicentre 25 miles south of Accra, 5°11′ ±2′N., 0°08′ ±2′W.

$A = +\cdot9959$, $B = -\cdot0017$, $C = +\cdot0901$; $\delta = -6$; $h = +7$;
$D = -\cdot002$, $E = -1\cdot000$; $G = +\cdot090$, $H = \cdot000$, $K = -\cdot996$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Algiers		31·6	4	i 6 26	0	e 12 19	+44	—	—	—
Almeria		31·6	356	6 21	− 5	10 58	−37	7 7	PP	13·7
San Fernando		31·6	350	6 25	− 1	i 11 37	+ 2	7 15	PP	16·1
Granada		32·0	355	i 6 29a	− 1	i 11 35	− 7	i 7 28	PP	15·4
Toledo		34·7	355	e 6 51	− 3	e 12 27	+ 3	e 7 53	PP	—
Bagnères		37·7	1	i 7 20	+ 1	e 13 7	− 3	e 8 47	PP	e 19·4
Marseilles		38·2	7	e 7 27	+ 4	e 13 24	+ 7	e 15 50	SS	—
Rome		38·2	15	i 7 24k	+ 1	i 13 22	+ 5	i 9 0	PP	17·8
Helwan		38·5	46	i 7 28a	+ 2	13 54	+32	8 58	PP	20·6
Grenoble		40·1	6	e 7 48	+ 9	i 13 54	+ 8	e 16 58	SS	21·1
Moncalieri		40·2	6	i 7 37	− 3	13 50	+ 2	—	—	20·0
Clermont-Ferrand		40·5	3	i 7 42	0	e 13 59	+ 7	i 16 49	SS	—
Johannesburg	E.	41·5	140	e 7 33	−17	e 14 19	+12	—	—	e 19·6
Neuchatel		42·1	6	e 7 54	− 1	e 14 12	− 4	—	—	—
Triest		42·1	13	7 55	0	14 14	− 2	9 17	PP	e 21·4
Besançon		42·2	5	i 8 4	+ 8	i 17 43	SS	e 9 40	PP	—
Chur		42·5	8	e 7 56	− 3	e 14 15	− 7	—	—	—
Laibach		42·6	14	e 8 2	+ 3	e 17 57	SS	—	—	—
Basle		42·7	6	e 7 59	− 1	e 14 25	+ 1	—	—	—
Cape Town		42·7	157	e 8 12	+12	e 14 34	+10	9 45	PP	21·3
Sofia		42·7	25	e 8 2	+ 2	e 14 34	+10	e 17 46	SSS	25·6
Zurich		42·7	7	e 7 58k	− 2	e 14 20	− 4	—	—	—
Belgrade		43·4	21	i 8 6a	0	i 14 46	+11	i 9 53	PP	24·5
Paris		43·5	2	i 8 7	0	14 49	+13	9 51	PP	21·6
Strasbourg		43·7	6	i 8 9k	+ 1	e 14 42	+ 3	e 9 46	PP	e 20·7
Jersey		43·9	356	e 8 52	+42	e 14 39	− 3	e 17 49	SS	e 22·1
Ksara		43·9	45	i 8 11k	+ 1	14 58	+16	i 9 55	PP	22·1
Stuttgart		44·1	8	i 8 10k	− 2	i 14 48	+ 3	9 53	PP	22·8
Istanbul		44·2	30	8 12	0	14 50	+ 4	9 56	PP	—
Kecskemet	Z.	44·9	18	e 8 20	+ 2	e 15 21	PS	e 10 2	PP	e 25·6
Budapest		45·2	18	8 21	+ 1	15 5	+ 4	18 25	S_cS	26·1
Bucharest		45·3	26	e 8 25a	+ 4	e 15 8	+ 6	10 28	P_cP	26·7
Uccle		45·6	2	e 8 22k	− 2	i 15 7	+ 1	e 10 9	PP	20·6
Cheb		45·9	10	e 9 25	+59	e 18 30	SS	—	—	e 24·6
Kew		46·1	0	i 8 26	− 2	i 15 18	+ 4	i 10 15	PP	e 21·9
Prague		46·3	12	i 8 30k	+ 1	15 20	+ 4	e 10 17	PP	e 20·6
Oxford		46·4	358	i 8 28	− 2	e 15 15	− 3	i 10 13	PP	—
Jena		46·6	10	e 8 25	− 7	e 15 13	− 8	e 10 21	PP	e 20·6
Göttingen		46·9	7	e 8 32k	− 2	e 15 29	+ 4	e 10 26	PP	e 23·6
De Bilt		47·0	4	i 8 34k	− 1	15 18	− 8	i 10 24	PP	21·2
Collmberg	Z.	47·2	11	i 8 36k	0	e 15 42	+13	i 10 35	PP	e 24·6
Bidston		48·1	357	i 8 36	− 7	i 15 34	− 8	i 10 10	PP	—
Cernauti	N.	48·3	22	e 8 44	− 1	15 49	+ 4	10 40	PP	28·6
Stonyhurst		48·5	358	—	—	15 43	− 5	19 24	SS	24·6
Hamburg		48·9	6	e 8 47	− 3	e 15 52	− 1	e 10 34	PP	e 24·1

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Heligoland		49·3	4	e 8 52	− 1	e 15 59	0	e 10 45	PP	e 22·8
Durham		49·4	358	i 8 50	− 3	i 15 56	− 4	i 10 48	PP	—
Edinburgh		50·6	357	e 7 59	−63	i 16 15	− 2	—	—	24·6
Copenhagen		51·3	8	i 9 7k	− 1	16 36	+10	11 6	PP	24·6
Aberdeen		51·8	359	i 9 8	− 4	i 16 35	+ 2	—	—	26·5
Tananarive		52·4	118	e 9 29	+13	e 17 5	+23	17 32	PS	e 27·3
Erevan		53·1	42	e 9 24	+ 3	—	—	—	—	—
Tiflis		54·0	41	i 9 27	− 1	i 17 10	+ 7	17 41	PS	e 27·6
Grozny		55·4	39	e 9 43	+ 5	e 17 15	− 7	—	—	—
Upsala		56·2	9	e 9 39	− 5	e 17 32	− 1	—	—	e 26·6
Baku		56·8	44	e 9 57	+ 9	e 17 53	+12	—	—	28·6
Moscow		58·7	24	i 10 1	− 1	18 9	+ 3	—	—	32·9
Pulkovo		59·2	17	10 2	− 3	18 12	0	—	—	e 29·3
Fort de France		60·7	283	e 10 15	0	e 18 36	+ 4	—	—	e 28·2
San Juan		65·6	288	e 10 44	− 4	e 19 29	− 4	23 35	SS	e 27·1
Bermuda		65·9	303	e 10 56	+ 6	e 19 32	− 5	—	—	e 27·1
Ivigtut		66·4	337	i 10 49a	− 4	19 39	− 4	—	—	28·6
Scoresby Sund		66·7	351	10 53a	− 2	19 50	+ 4	13 16	PP	—
La Plata		67·4	229	11 2	+ 3	19 58	+ 3	—	—	34·6
Halifax		67·6	317	e 10 34?	−27	e 18 34?	?	—	—	32·6
Sverdlovsk		69·9	30	i 11 14	− 1	20 21	− 3	34 40	L_g	44·8
East Machias		70·3	316	e 11 17	0	20 30	+ 1	e 13 50	PP	e 27·6
La Paz		70·6	250	11 22	+ 3	20 51	+18	—	—	33·1
Tashkent		71·1	48	i 11 23	+ 1	i 20 40	+ 2	—	—	e 32·6
Tchimkent		71·5	47	e 11 21	− 3	—	—	—	—	—
Bombay		72·2	71	i 11 33	+ 4	i 20 56	+ 5	i 16 1	PPP	25·7
Harvard		72·8	313	i 11 32k	0	e 20 59	+ 1	e 14 16	PP	e 29·1
Andijan		73·3	49	e 11 40	+ 5	e 21 15	+11	—	—	—
Williamstown		74·1	313	i 11 40	0	e 21 18	+ 6	i 14 18	PP	e 33·5
Fordham		74·3	311	i 11 41a	0	e 21 16	+ 1	e 14 28	PP	e 34·2
Vermont		74·3	314	e 11 44	+ 3	e 21 17	+ 2	e 25 41	SS	e 34·8
Philadelphia		75·4	310	i 11 47	0	e 21 22	− 5	e 14 25	PP	e 32·7
Ottawa		76·2	315	11 52	0	21 34	− 2	—	—	e 34·6
Georgetown		76·6	309	i 11 56	+ 2	i 21 46	+ 6	—	—	—
Huancayo		76·7	256	e 12 0	+ 5	e 21 42	+ 1	—	—	e 30·7
Kodaikanal	E.	76·9	80	i 12 3a	+ 7	i 21 59	+16	22 32	PS	37·5
Dehra Dun	N.	77·2	59	—	—	20 48	−59	e 30 10?	SSS	e 41·2
Toronto		78·7	314	e 12 4	− 2	e 21 46	−17	—	—	36·6
Colombo	E.	79·4	84	—	—	22 20	+10	—	—	37·4
Columbia		79·6	304	e 12 8	− 2	e 22 2	−10	e 22 15	S_eS	e 32·2
Chicago		84·7	312	e 12 36	− 1	e 22 56	− 8	e 15 41	PP	e 34·0
Calcutta	N.	86·6	67	—	—	i 23 32	+ 9	—	—	—
St. Louis		86·9	308	e 12 47	− 1	e 23 20	− 6	i 24 27	PS	—
Florissant		87·0	308	e 12 42	− 6	e 23 10	[− 4]	i 24 25	PS	—
Lincoln		91·6	311	—	—	e 23 36	[− 6]	30 36	SS	e 37·7
Irkutsk		94·7	37	13 25	+ 1	23 53	[− 6]	e 16 21	?	50·6
Bozeman		100·7	318	e 13 50	− 2	e 24 35	[+ 5]	e 27 5	PS	e 39·1
Butte		101·6	319	e 18 9	PP	e 24 46	[+11]	e 32 49	SS	e 39·4
Salt Lake City		102·8	314	e 14 11	+10	e 24 41	[+ 1]	—	—	e 40·8
Tucson		104·5	306	e 13 50	−18	e 24 54	[+ 6]	i 18 26	PP	i 43·6
College		106·2	347	e 18 47	PP	e 25 2	[+ 6]	e 27 44	PS	e 41·0
Victoria		107·2	325	14 16	P	24 46	[−14]	18 46	PP	e 47·6
Sitka		108·1	337	e 15 3	P	e 25 15	[+11]	e 18 56	PP	—
Tinemaha	Z.	108·8	312	e 18 37	PP	—	—	e 29 59	PKKP	—
Riverside	Z.	109·2	309	e 19 0	PP	—	—	e 29 58	PKKP	—
Mount Wilson	Z.	109·7	309	e 29 55	PKKP	—	—	—	—	—
Pasadena		109·8	309	e 19 5	PP	—	—	e 29 58	PKKP	e 50·1
Santa Clara		111·4	314	e 19 41	PP	e 29 10	PS	—	—	e 53·7
Ukiah		111·5	316	—	—	e 28 43	PS	e 39 9	SSS	e 43·8
Zi-ka-wei	Z.	113·6	53	e 19 18	PP	—	—	—	—	64·4
Vladivostok		115·3	37	e 17 48	?	—	—	i 19 54	PP	57·7
Manila		118·6	70	20 15	PP	—	—	—	—	63·6
Adelaide		131·8	134	e 10 54	?	e 46 7	?	e 22 52	PKS	e 63·3
Riverview		140·8	142	—	—	—	—	e 42 58	SSP	e 71·2
Christchurch		141·3	172	e 16 52a	?	e 27 46	[+65]	e 40 4	SS	e 69·2
Wellington		143·8	174	19 39	[+ 2]	e 42 34?	SSP	i 24 22	PP	e 69·6

For Notes see next page.

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NOTES TO JUNE 22d. 19h. 19m. 26s.

Additional readings :—
Algiers SS = +14m.39s.
San Fernando SSE = +12m.50s.
Granada P_cP = +8m.43s., SS = +13m.54s., SSS = +14m.22s.
Toledo ePPP = +8m.11s., i = +12m.13s.
Bagnères ePPPE = +9m.13s., iSE = +13m.17s., iN = +13m.23s., eSSN = +15m.27s., eSSSN = +15m.54s.
Rome PPP = +9m.32s., iEN = +9m.57s., i = +10m.32s., iSS = +15m.18s., i = +16m.12s. and +17m.32s.
Helwan iZ = +13m.34s., L_qN = +18m.36s.
Grenoble e = +7m.52s., eS = +14m.5s.
Triest SS = +17m.22s.
Cape Town PPP = +10m.41s., eSN = +14m.40s., SSN = +17m.29s., SSE = +17m.33s., SSSE = +18m.18s.
Sofia eN = +21m.50s., eE = +22m.4s.
Belgrade iZ = +8m.12s., eNW = +8m.33s., iPPPNW = +10m.26s., iSSNW = +18m.3s., iNW = +20m.48s.
Paris SS = +17m.57s.
Strasbourg iZ = +9m.53s., iE = +14m.48s., iSSE = +17m.49s.
Ksara SS = +18m.5s.
Stuttgart eP = +8m.28s., e = +9m.3s., eNZ = +10m.14s. and +11m.8s., eP_cSN = +13m.58s., iSZ = +14m.57s., iN = +15m.38s., eSS = +17m.57s., e = +19m.47s., eL_q = +20·6m.
Istanbul SS = +17m.58s., SSS = +20m.24s.
Kecskemet eZ = +8m.56s. and +10m.37s., eP_cSZ = +14m.25s., eSSZ = +18m.23s.
Budapest e = +9m.5s., P_cPN = +9m.47s.
Bucharest eE = +9m.30s., PP = +10m.24s., eE = +10m.50s., eN = +11m.18s., e = +12m.8s., SE = +15m.14s., SN = +15m.18s., SSN = +18m.28s., SSE = +18m.34s.
Uccle eE = +17m.41s., iEN = +18m.24s.
Kew eZ = +9m.52s., eP_cSNZ = +13m.56s., iPSN = +15m.22s., iS_cSE = +18m.9s., eEN = +18m.26s., eSSEZ = +18m.44s., eL_qEZ = +19m.50s.
Prague eSS = +18m.40s.
Oxford i = +12m.8s., +13m.19s., +15m.28s., e = +18m.24s.
Jena eP = +8m.34s., eSN = +15m.25s., e = +18m.34s.
Göttingen eSS = +18m.52s.
De Bilt i = +18m.50s.
Collmberg iZ = +8m.42s., iP_cPZ = +9m.39s., iZ = +9m.42s., +10m.7s., +10m.14s., +10m.18s., iPPP = +11m.26s., iZ = +13m.24s., eZ = +13m.49s., eSS = +19m.16s.
Bidston eSS = +18m.56s.
Hamburg eSE = +15m.56s., eSSEN = +19m.35s.
Heligoland eSN = +16m.4s., eSSN = +19m.52s.
Durham iEN = +10m.56s., +16m.12s., and +19m.37s.
Edinburgh i = +16m.24s.
Copenhagen +20m.2s.
Aberdeen iN = +14m.29s., iSSEN = +20m.23s., iE = +24m.7s., iN = +24m.54s.
Tiflis eZ = +9m.56s., eNZ = +10m.12s., PPPZ = +12m.33s.
Scoresby Sund +24m.4s.
East Machias eS = +19m.42s., eSS = +24m.29s.
La Paz eN = +19m.52s.
Harvard eZ = +15m.37s.
Fordham eSSE = +25m.26s.
Vermont eSSS = +29m.7s.
Williamstown iPPP = +16m.11s., eSS = +26m.16s.
Philadelphia ePPP = +16m.25s., iS = +21m.26s., eS_cS = +21m.52s., eSS = +26m.6s., eSSS = +29m.23s.
Huancayo eP = +12m.8s.
Kodaikanal SSE = +27m.4s.
Chicago eS = +23m.2s., eSSS = +31m.38s.
St. Louis eSS = +29m.21s., eSSS = +32m.27s.
Florissant iS = +23m.16s. and +23m.20s.
Lincoln S = +24m.15s., eSSS = +33m.46s.
Irkutsk SS = +30m.10s.
Bozeman eS = +25m.35s., eSS = +32m.21s., ePSPS = +32m.38s,, eSSS = +36m.26s.
Salt Lake City eS = +25m.48s., S = +25m.55s.
Tucson P = +14m.16s., PPP = +20m.56s., SKKS = +25m.8s., eS = +25m.44s., S = +26m.14s., ePPS = +27m.52s., SS = +32m.14s., PSPS = +33m.14s., eSSS = +37m.6s., $ePKP_1PKP$ = +38m.17s.
College eS = +25m.58s.
Sitka ePS = +28m.12s., eSS = +33m.48s., eSSS = +37m.42s.
Victoria PS = +28m.4s., PPS = +28m.58s.
Ukiah ePSPS = +34m.52s.
Christchurch $ePKP_2$? = +17m.5s., eZ = +19m.44s., e = +20m.30s., ePP = +20m.52s., e = +24m.9s., ePPP = +24m.19s., eEZ = +41m.4s., SSSEN = +46m.6s., L_qE = +59m.7s.
Long waves were also recorded at Rio de Janeiro, Honolulu, Seattle, and Melbourne.

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June 22d. Readings also at 2h. (Tucson), 3h. (Sverdlovsk and Irkutsk), 8h. (Tucson, Mizusawa, La Jolla, Pasadena, Mount Wilson, Riverside, and Tinemaha), 11h. (Tucson, near Fort de France, near Wellington, and New Plymouth), 12h. (Ksara, near Andijan, and near Batavia), 14h. (Upsala and Apia), 15h. (Haiwee, Santa Barbara, Tucson, Tinemaha, Riverside, Mount Wilson, Pasadena, and La Jolla), 18h. (Branner, near Ferndale, Berkeley, Lick, near Mizusawa, Pasadena, Mount Wilson, Riverside, and Tinemaha), 19h. (Vladivostok, Manila, Moscow, Andijan, Batavia, Amboina, Sverdlovsk, Irkutsk, and near Mizusawa), 20h. (Honolulu), 21h. (near Amboina), 22h. (Amboina).

June 23d. 23h. Undetermined shock.

Apia eP = 14m.9s., iS = 14m.40s., i = 14m.49s.
Christchurch eP = 21m.11s.a, S = 26m.3s., eL_q = 27m.19s., eL = 29·1m.
Wellington eP = 21m.23s., eS = 25m.58s., eL = 27·0m.
Santa Barbara ePZ = 24m.51s.
Mount Wilson ePZ = 24m.53s.
Pasadena ePZ = 24m.54s.
Riverside ePZ = 25m.1s.
Tinemaha eP = 25m.6s.
Tucson e = 25m.20s.a.
Sitka e = 26m.43s.
Uccle ePKPZ = 33m.9s.
Strasbourg ePKPZ = 33m.10s., eZ = 33m.24s. and 33m.44s., ePPZ = 36m.17s., eSKSZ = 40m.20s., eL = 94m.
Stuttgart PKPZ = 33m.18s. and 33m.43s., e = 34m.8s., eL_q = 101m.
Paris eZ = 33m.19s., L = 98m.
Ksara ePKP = 33m.27s., ePP = 36m.59s., PSKS = 47m.17s.
Tiflis eZ = 36m.32s., eL = 77m.
Rome e = 45m.55s.
Victoria e = 47m.0s., eL = 66·0m.

June 23d. 23h. 55m. 56s. **Epicentre 23°·0N. 109°·0W.** (as on 1937, October 5d.)

Pasadena gives approximate epicentre 23°·0N. 108°·0W.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		9·4	350	2 8	−10	i 3 53	−14	i 2 43	PPP	i 4·5
Tacubaya	N.	9·8	109	e 3 11	+47	—	—	—	—	—
La Jolla		12·2	325	e 2 56	− 2	—	—	—	—	—
Riverside		13·2	328	e 3 7	− 4	—	—	—	—	—
Mount Wilson	Z.	13·7	327	i 3 14	− 4	—	—	—	—	—
Pasadena		13·7	327	i 3 15	− 3	e 5 55	+ 3	—	—	e 8·6
Santa Barbara		14·8	323	e 3 30	− 2	—	—	—	—	—
Haiwee		15·2	331	i 3 44	+ 6	—	—	—	—	—
Tinemaha		16·2	332	i 3 47	− 3	—	—	—	—	—
Fresno	N.	16·6	328	e 3 53	− 3	—	—	—	—	—
Salt Lake City		17·9	353	e 4 8	− 4	e 7 27	− 3	—	—	e 8·4
Santa Clara	E.	18·1	325	e 4 29	PP	—	—	—	—	e 9·0
Berkeley		18·7	325	e 4 17	− 5	e 8 16	SS	—	—	—
Ukiah		20·1	326	e 4 42	+ 4	e 8 11	− 8	—	—	—
Lincoln		20·6	28	e 4 46	+ 3	e 8 20	− 9	—	—	e 10·4
Florissant	E.	22·4	40	e 5 10	+ 8	e 9 7	+ 3	5 21	PP	i 11·1
St. Louis		22·4	40	i 5 9	+ 7	e 9 1	− 3	—	—	e 10·6
Bozeman		22·7	356	e 5 7	+ 3	e 9 1	− 8	—	—	e 11·0
Butte		23·1	354	e 5 10	+ 2	e 9 16	0	—	—	e 12·0
Chicago		26·0	36	—	—	e 10 6	0	—	—	e 12·7
Columbia		26·8	58	e 6 11	PP	e 10 33	+14	—	—	e 12·8
Ottawa		35·0	41	i 7 13	+17	e 12 34	+ 6	—	—	e 18·1
Williamstown		35·6	48	e 7 19	+18	—	—	—	—	e 18·4
Harvard		36·6	48	e 9 18	?	e 16 35	?	15 39	SSS	e 19·0
Sitka		39·0	337	e 9 24	PPP	e 13 18	−11	—	—	e 16·4
Bermuda		40·0	66	e 6 40	−58	—	—	—	—	—
Rome		95·8	40	—	—	e 31 32	SS	—	—	47·7
Baku		114·0	17	—	—	e 35 26	SS	—	—	e 59·1

For Notes see next page.

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NOTES TO JUNE 23d. 23h. 55m. 56s.

Additional readings :—
Tucson iS = +3m.29s.
Florissant eE = +5m.14s.
St. Louis iN = +5m.20s., eN = +8m.49s., iEN = +9m.5s., eE = +10m.12s.
Columbia eS = +10m.50s.
Ottawa e = +16m.34s.
Sitka eS = +13m.29s.
Rome e = +45m.17s.
Long waves were also recorded at Guadalajara, Tashkent, Sverdlovsk, East Machias, Fordham, College, Vermont, Philadelphia, and other European stations.

June 23d. Readings also at 0h. (Tucson, Mount Wilson, and Riverside), 6h. (near Fort de France), 7h. (near Tiflis), 10h. (Ottawa), 11h. (Moncalieri), 13h. (near Tananarive (3)), 14h. (near Harvard), 15h. (near Tananarive), 16h. (Uccle, Strasbourg, Stuttgart, Sofia, Istanbul, Bucharest, Belgrade, Collmberg, Pulkovo, Sverdlovsk, Salt Lake City, Rome, and Triest), 17h. (Huancayo, Lick, La Paz (2), Branner, Berkeley, Fresno, and Rio de Janeiro), 18h. (Triest and Rome), 20h. (Fresno, Tucson, and Butte), 21h. (Philadelphia).

June 24d. 1h. Local Japanese shock.

Tokyo Imperial University gives Epicentre 35°·71N. 140°·06E.

Kiyosumi P =14m.40s., S =14m.50s.
Koyama P =14m.40s., S =14m.52s.
Titibu P =14m.40s., S =14m.53s.
Yosiwara P =14m.40s., S =14m.55s.
Kamakura P =14m.50s., S =14m.59s.
Komaba P =14m.50s., S =14m.58s.
Tokyo Imp. Univ. P =14m.51s., S =14m.59s.
Susaki P =15m.0s., S =15m.17s.

June 24d. 4h. 22m. 16s. Epicentre 12°·0S. 70°·5W. (as on 1937, July 9d.).

Pomacanchis, Peru, reported left in ruins by earthquakes which started on June 23d. The villages of San Juan and Santa Lucia cut off.

Seismological Notes, Bulletin of the Seismological Society of America, vol. 29 (1939), Berkeley, pp. 563-564.

Epicentre (U.S.C.G.S.) approximately 12°·5S. 72°·0W.

$A = +\cdot3266$, $B = -\cdot9223$, $C = -\cdot2066$; $\delta = -1$; $h = +6$;
$D = -\cdot942$, $E = -\cdot334$; $G = -069$, $H = +\cdot195$, $K = -\cdot978$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		4·7	269	e 1 4	−10	e 1 39	P_g	—	—	e 2·1
La Paz	z.	5·0	155	1 14	− 4	i 2 26	+ 8	i 1 44	P_g	2·9
La Plata		25·5	155	5 38	+ 6	10 2	+ 5	—	—	13·6
Rio de Janeiro	E.	28·1	115	—	—	e 11 4	+24	—	—	e 15·2
San Juan		30·5	9	e 8 48	PPP	—	—	—	—	e 14·0
Bermuda		44·4	9	—	—	e 15 38	+49	—	—	e 19·2
St. Louis		53·6	342	e 8 50	−35	e 17 39	+41	—	—	—
East Machias		56·6	4	e 10 46	+59	e 18 32	+54	—	—	e 28·1
Tucson		58·5	321	e 10 4	+ 4	—	—	—	—	—
Riverside	z.	63·9	318	e 10 40	+ 3	—	—	—	—	—
Mount Wilson	z.	64·4	318	e 10 44	+ 4	—	—	—	—	—
Pasadena	z.	64·5	318	e 11 8	+27	—	—	—	—	—
Tinemaha	z.	66·3	320	e 10 57	+ 5	—	—	—	—	—
Rome		92·8	48	—	—	e 25 2	?	—	—	46·7
Ksara		110·1	59	e 18 7	[−26]	e 27 57	?	—	—	56·7

Additional readings :—
St. Louis eN = +9m.30s., iN = +9m.55s., eN = +9m.59s., eE = +19m.58s.
Tucson eP = +10m.26s.
Riverside eZ = +11m.4s.
Mount Wilson eZ = +11m.9s.
Ksara e = +29m.9s.
Long waves were also recorded at Fort de France, Williamstown, Sverdlovsk, Tashkent, Tiflis, and other European stations.

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June 24d. 13h. 1m. 54s. Epicentre 36°·4N. 121°·0W.

Intensity VII 10 miles south of Hollister.
Epicentre 4 miles west of Tres Pinos 36°·4N. 121°·0W.

Macroseismic area 10,000 sq. miles.

R. Bodle.

United States Earthquakes, 1939, Washington, 1941, p. 16, chart p. 63.

$A = -\cdot4155$, $B = -\cdot6916$, $C = +\cdot5908$; $\delta = 0$; $h = 0$;
$D = -\cdot857$, $E = +\cdot515$; $G = -\cdot304$, $H = -\cdot506$, $K = -\cdot807$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fresno	N.	1·0	71	e 0 26	+ 5	i 0 35	− 1	—	—	—
Lick		1·1	331	i 0 13	− 9	i 0 22	P*	—	—	—
Santa Clara	Z.	1·2	321	i 0 27	+ 3	i 0 38	− 3	—	—	—
Branner		1·4	317	e 0 17k	−10	—	—	—	—	—
Berkeley		1·8	325	i 0 21k	−11	i 0 45	−11	—	—	—
San Francisco		1·8	320	i 0 22	−10	—	—	—	—	—
Santa Barbara		2·2	152	i 0 45	P_g	i 1 31	?	—	—	—
Tinemaha		2·3	72	i 0 45	P_g	i 1 31	+22	—	—	—
Haiwee		2·5	96	i 0 50	P_g	i 1 33	+19	—	—	—
Mount Wilson		3·2	132	i 0 59	P*	i 1 48	S_g	—	—	—
Pasadena		3·2	134	i 0 59	P*	i 1 44	S_g	—	—	—
Ukiah		3·2	327	e 1 4	P_g	e 1 41	S*	—	—	—
Riverside		3·8	127	e 1 7	P*	—	—	—	—	—
Ferndale		4·9	330	—	—	e 2 6?	− 9	—	—	—
Tucson		9·4	113	e 2 24	+ 6	i 4 31	+24	—	—	i 5·3
Butte		11·5	31	—	—	e 5 10	SS	—	—	e 6·1
Bozeman		11·9	36	—	—	e 5 28	SS	—	—	6·5
Sitka		22·8	340	—	—	e 9 16	+ 5	—	—	—
Florissant	E.	24·3	75	—	—	e 9 55	+18	—	—	—
St. Louis		24·5	75	—	—	e 9 55	+15	—	—	e 12·6
Chicago		26·3	68	e 6 23	PP	e 10 50	+39	—	—	e 13·6
Ksara		106·9	20	e 21 52	PPP	—	—	—	—	—

Additional readings :—
Fresno iN = +28s. and +45s.
Branner iE = +21s.
Berkeley iZ = +24s.
San Francisco i = +27s.
Tucson P = +2m.32s., iP = +2m.38s.
St. Louis eN = +11m.26s.
Long waves were also recorded at Harvard, Strasbourg, Paris, Stuttgart, Tiflis, Uccle, De Bilt, Philadelphia, Vermont, East Machias, Fordham, Sverdlovsk, Baku, Bermuda, and Lincoln.

June 24d. 16h. 27m. 21s. Epicentre 31°·5N. 117°·5W. (as on 1939, May 3d.).

Felt in Mexico in San Diego county; 32°·0′N. 117°30′W.

R. Bodle.

United States Earthquakes, 1939, Washington 1941, p.17.

$A = -\cdot3944$, $B = -\cdot7577$, $C = +\cdot5199$; $\delta = -4$; $h = +1$;
$D = -\cdot887$, $E = +\cdot462$; $G = -\cdot240$, $H = -\cdot461$, $K = -\cdot854$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla	1·4	9	i 0 23	− 4	—	—	—	—	—
Riverside	2·5	2	i 0 41	− 2	i 1 10	− 4	—	—	—
Pasadena	2·7	348	i 0 44	− 1	i 1 18	− 1	—	—	—
Mount Wilson	2·8	350	e 0 43	− 4	i 1 19	− 3	—	—	—
Santa Barbara	3·4	329	e 0 57	+ 2	i 1 38	+ 1	—	—	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		4·6	356	i 1 12	0	i 2 18	S*	—	—	—
Fresno	N.	5·5	343	e 1 24	− 1	—	—	i 1 49	P_g	—
Tinemaha	Z.	5·6	355	i 1 25	− 2	—	—	—	—	—
Tucson		5·7	84	1 30	+ 2	2 28	− 7	i 1 43	P*	i 3·0
Lick		6·8	331	e 1 48	+ 4	—	—	—	—	—
Santa Clara		6·9	329	e 2 22	P_g	e 4 1	S_g	—	—	—
Branner		7·1	328	e 1 51	+ 3	—	—	—	—	—
Berkeley		7·5	330	e 2 8	P*	e 3 42	S*	—	—	—
Ukiah		8·9	330	—	—	e 3 59	+ 4	—	—	e 4·3
Denver		13·1	48	—	—	e 5 39	+ 1	i 5 53	SS	—
Bozeman		15·0	18	3 42	+ 7	e 6 31	+ 8	—	—	e 7·8
Butte		15·0	15	e 3 35	0	e 6 42	SS	—	—	e 8·0
Victoria		17·5	347	e 3 39?	−28	—	—	—	—	e 8·6
Lincoln		19·2	55	e 4 29	+ 1	e 8 10	+11	—	—	e 9·2
Florissant		23·3	65	e 5 17	+ 7	e 9 28	+ 8	e 5 31	PP	11·5
St. Louis		23·4	65	e 5 13	+ 2	e 9 25	+ 4	—	—	e 11·2
Chicago		26·0	58	e 5 46	+10	e 10 29	+23	—	—	e 13·2
Sitka		28·4	341	e 5 46	−12	e 10 49	+ 4	e 6 47	PP	e 12·1
Columbia		30·7	74	e 8 59	P_cP	e 11 50	+29	—	—	e 12·5
Philadelphia		35·0	64	—	—	e 12 41	+13	—	—	e 15·4
Honolulu		37·3	264	e 7 59	+43	e 13 23	+19	—	—	e 15·5
East Machias		41·0	56	e 9 17	PP	e 14 11	+12	—	—	e 19·3

Additional readings :—
Tucson iS = +2m.38s. and +2m.49s.
Lick ePE = +1m.51s.
Berkeley eEN = +2m.44s.
Denver iN = +6m.7s., iEN = +6m.19s.
Florissant eE = +9m.32s.
Sitka eS = +10m.54s.
Long waves were also recorded at other American, European, and Russian stations.

June 24d. Readings also at 1h. (Tucson), 2h. (Strasbourg), 3h. (Bucharest, Sofia, Rome, and Triest), 4h. (La Paz), 5h. (Andijan, La Paz, and near Fort de France), 6h. (2) and 7h. (La Paz), 8h. (Guadalajara, Tacubaya, Tucson, Bozeman, Salt Lake City, Haiwee, Mount Wilson, Pasadena, Riverside, and Tinemaha), 9h. (Tiflis), 10h. (Tchimkent and near Balboa Heights), 11h. (St. Louis, Williamstown, Harvard (2), Fordham, Shawinigan Falls, College, Sitka, Bozeman, Butte, near Florissant, and La Paz), 12h. (Vermont, Fordham, Harvard, Williamstown, St. Louis, Philadelphia, Chicago, Lincoln, East Machias, and La Paz (3)), 13h. and 14h. (La Paz), 15h. (Harvard, Williamstown, La Paz, and near Fordham), 17h. (near Harvard, Williamstown, Ottawa, Fordham, near Shawinigan Falls, and near Mizusawa), 18h. (St. Louis), 19h. (Baku, Tashkent, and Ksara), 20h. (Salt Lake City).

June 25d. Readings at 0h. (Almata, Andijan (2), Samarkand, Frunse, and Tchimkent), 1h. (Tucson (2)), 2h. (Medan, Tiflis, Agra, Sverdlovsk, Tashkent, Ksara, Amboina, Batavia, Manila, and near Triest), 3h. (Fordham), 4h. (Tacubaya), 5h. (Sverdlovsk, Tashkent, La Paz, Medan, Tchimkent, Frunse, Samarkand, Andijan, and Almata), 8h. (near Tucson), 11h. (Salt Lake City), 12h. (La Paz), 13h. (Salt Lake City and near Tiflis), 14h. (La Paz and near Piatigorsk), 15h. (near Branner), 20h. (Lick, Berkeley, Fresno, near Mizusawa, and Branner), 21h. (La Paz), 23h. (Tucson, Columbia, New Plymouth, and near Wellington).

June 26d. Readings at 1h. (near Mizusawa), 5h. (Tucson (2), Amboina, Riverside, Tinemaha, Pasadena, Mount Wilson, and Haiwee), 6h. (Tucson (2)), 7h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, Riverside, Irkutsk, Manila, Tashkent, and Sverdlovsk), 8h. (near Tananarive), 9h. (Phu-Lien, Bombay, Calcutta, Tashkent, Ksara, Sverdlovsk, and La Paz), 10h. (Amboina, Batavia, and La Paz), 12h. (Strasbourg), 13h. (Branner, Osaka, Lick, Ksara, Vladivostok, Collmberg, Tashkent, Sverdlovsk, Moscow, La Paz, Irkutsk, Hukuoka, and near Mizusawa), 14h. (Ottawa, Rome, Uccle, Paris, Strasbourg, Baku, Stuttgart, and Tiflis), 16h. (College, Irkutsk, and Sverdlovsk), 18h. (near Almeria), 20h. (Grozny (2), Erevan, Sverdlovsk, Piatigorsk, Sotchi, Hamburg, Pulkovo, Baku, Ksara, Stuttgart, near Tiflis, Moscow, and Tashkent), 22h. (near Mizusawa), 23h. (Malabar, Medan, Batavia, near Manila, and Tucson).

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June 27d. 23h. 4m. 20s. Epicentre 7°·5N. 126°·7E.

Mindanao and eastern Visayan Islands. Centre in the Philippine Deep. Intensity V in Butan, IV at Port Lamon, Dapa, Cagayan, Baganga, and Davao. Felt slightly in other parts of Mindanao, southern Leyte, southern Samar, and in Cebu at a distance of 460km. from the epicentre.

Epicentre : 7°30′N. 127°0′E. (Manila).
8°·4N. 128°·2E. (Strasbourg).

W. C. Repetti.

Seismological Bulletin for 1939. Manila Central Observatory, Manila, 1940, p. 23.

$A = -\cdot5926$, $B = +\cdot7950$, $C = +\cdot1297$; $\delta = +2$; $h = +7$;
$D = +\cdot802$, $E = +\cdot598$; $G = -\cdot078$, $H = +\cdot104$, $K = -\cdot992$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		7·7	90	1 3	−53	2 24	−61	—	—	—
Manila		9·0	322	i 2 19a	+ 6	i 4 6	+ 8	—	—	—
Amboina		11·2	172	2 54	+10	5 ·7	SS	—	—	6·7
Kosyun		15·5	339	4 1	PPP	6 47	SS	—	—	—
Taihoku		18·1	345	e 4 50	PPP	—	—	—	—	—
Hong Kong		19·0	323	4 25	− 1	8 9	+14	8 35	SS	9·1
Yakusima		23·1	8	5 8	0	9 10	− 6	—	—	—
Phu-Lien		23·5	307	5 12	0	i 9 26	+ 3	—	—	—
Batavia		24·0	236	5 16	− 1	i 9 33	+ 1	—	—	e 14·7
Malabar		24·0	233	e 5 20	+ 3	e 9 30	− 2	—	—	14·7
Zi-ka-wei	Z.	24·1	350	i 5 18k	0	i 9 40	+ 6	5 50	PP	13·1
Titizima		24·4	36	5 20	− 1	—	—	—	—	—
Miyazaki		24·7	10	5 27	+ 3	9 48	+ 4	—	—	—
Nagasaki		25·3	6	5 31	+ 1	—	—	—	—	—
Hukuoka		26·2	7	e 5 25	−13	10 10	+ 1	—	—	12·7
Siomisaki		27·2	16	5 46	− 1	9 15	−70	—	—	—
Kobe		28·2	15	5·43	−13	10 11	−30	—	—	—
Medan		28·2	265	i 6 2	+ 6	i 10 41	0	i 11 58	SS	—
Nagoya		29·1	18	6 6	+ 2	10 58	+ 2	—	—	—
Keizyo		29·9	0	6 0	−12	10 54	−15	—	—	—
Tokyo Cen. Met. Ob.		30·5	21	6 19	+ 2	13 12	SSS	—	—	—
Wazima		31·2	16	6 23	0	—	—	—	—	—
Sendai		33·2	20	6 29	−11	—	—	—	—	—
Mizusawa	E.	34·1	19	e 6 50	+ 2	e 12 13	− 1	—	—	17·2
	N.	34·1	19	e 6 46	− 2	e 12 5	− 9	—	—	16·6
Vladivostok		35·8	6	i 6 57	− 6	i 12 32	− 9	—	—	15·2
Sapporo		37·7	17	7 19	0	13 16	+ 6	—	—	—
Calcutta	N.	39·7	297	e 7 37	+ 1	i 13 43	+ 3	i 8 56	PP	e 19·1
Perth		40·6	194	—	—	13 40	−14	—	—	17·5
Brisbane		43·1	144	i 7 58	− 6	i 14 16	−14	i 17 28	SS	—
Adelaide		43·7	166	i 8 7	− 1	i 14 25	−14	i 10 5	PPP	20·8
Colombo	E.	46·4	272	i 8 32	+ 2	15 16	− 2	—	—	20·9
Riverview		47·2	152	e 7 46	−50	i 15 20	− 9	i 18 45	SS	e 23·7
Sydney		47·3	152	e 8 10	−27	e 18 10	SS	e 11 10	PPP	—
Hyderabad		48·0	287	8 42	− 1	15 37	− 4	10 39	PP	22·6
Kodaikanal	E.	48·7	278	i 8 46a	− 2	i 15 43	− 7	10 43	PP	24·3
Agra	E.	50·0	300	i 9 8a	+10	i 16 8	− 1	i 11 2	PP	—
Dehra Dun	N.	50·8	304	e 9 38?	+34	e 16 53?	+33	i 20 57	SSS	e 27·3
Bombay		53·5	288	i 9 22	− 2	e 16 48	− 9	i 11 11	PP	24·5
Almata		56·2	319	9 42	− 2	—	—	—	—	31·2
Semipalatinsk		57·5	328	e 15 14	?	—	—	—	—	—
Frunse		57·6	317	9 55	+ 1	e 17 51	0	—	—	30·7
Andijan		58·4	313	9 57	− 3	e 18 0	− 2	—	—	32·7
Tashkent		60·8	313	i 10 12	− 4	i 18 27	− 6	—	—	e 26·3
Tchimkent		60·9	315	e 10 3	−14	—	—	—	—	—
Samarkand		62·1	311	e 10 28	+ 3	e 18 55	+ 6	—	—	—
Apia		64·6	109	—	—	19 19	− 2	—	—	31·2
Wellington		65·5	142	e 10 51	+ 4	e 19 20	−12	12 55	PP	24·2
Christchurch		65·6	145	i 10 55a	+ 7	i 19 26	− 7	i 20 10	PS	31·9
Sverdlovsk		70·8	328	i 11 18	− 2	i 20 27	− 8	—	—	30·2

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Honolulu		73·8	70	11 42	+ 4	i 21 10	+ 1	e 14 11	PP	e 30·6
Baku		75·1	310	i 11 45	− 1	i 21 22	− 2	—	—	36·7
Grozny		78·3	313	12 4	+ 1	21 54	− 5	e 12 48	PP	—
Tiflis		79·0	311	i 12 6	− 1	i 22 1	− 5	15 16	PP	e 40·7
Erevan		79·3	310	12 10	+ 1	e 22 7	− 2	—	—	—
College		80·7	26	e 12 17	+ 1	e 22 24	0	e 23 17	PS	e 33·7
Tananarive		82·3	250	12 23	− 2	22 30	−10	15 23	PP	e 40·2
Moscow		83·4	326	12 28	− 2	22 41	−10	15 52	PP	40·4
Ksara		86·6	303	i 12 46a	0	23 26	+ 3	16 11	PP	49·3
Pulkovo		86·8	330	e 12 45	− 2	i 23 19	− 6	16 13	PP	e 40·7
Sitka		88·1	33	12 47	− 7	e 23 20	[− 1]	16 15	PP	e 38·6
Istanbul		90·8	311	12 52	−14	23 50	−12	18 22	PPP	—
Helwan		90·9	300	i 13 5k	− 2	23 58	− 5	16 40	PP	38·9
Bucharest		92·3	316	e 13 15	+ 2	23 41	[− 5]	16 26	PP	46·7
Upsala		93·0	332	e 13 9	− 8	e 23 38	[−12]	i 24 13	S	e 40·7
Sofia		94·7	314	e 13 26	+ 2	—	—	—	—	—
Copenhagen		97·1	329	e 13 35	0	—	—	17 34	PP	43·7
Victoria		97·4	39	13 28	− 9	24 4	[−10]	17 20	PP	40·7
Prague		98·2	323	e 13 58	+18	e 25 7	+ 2	e 27 40?	PPS	e 44·7
Bergen	Z.	98·3	335	e 13 58	+17	—	—	—	—	—
Collmberg	Z.	98·6	325	e 13 39	− 3	—	—	e 18 9	PP	—
Hamburg		99·3	328	e 13 45	0	e 24 17	[− 7]	e 17 44	PP	e 49·7
Laibach		99·3	319	e 13 30k	−15	e 26 20	PS	e 32 27	SS	e 49·6
Cheb		99·4	324	e 13 50?	+ 4	e 24 28	[+ 4]	e 17 13	PP	e 51·7
Scoresby Sund		99·4	351	13 44	− 2	24 25	[+ 1]	17 50	PP	—
Jena		99·5	324	e 13 44	− 2	e 25 17	+ 1	—	—	e 35·7
Heligoland		100·1	329	e 17 55	PP	e 24 22	[− 5]	e 32 25	SS	e 49·7
Göttingen		100·2	326	e 13 49	0	e 25 20	− 2	—	—	47·7
Triest		100·3	319	13 48	− 2	24 28	[0]	17 58	PP	47·2
Ukiah		100·6	48	e 13 53	+ 2	e 24 30	[0]	e 17 58	PP	e 41·9
Berkeley		101·7	49	e 18 6	PP	e 25 40	+ 5	—	—	—
Stuttgart		101·9	323	i 13 55a	− 2	e 24 25	[−11]	e 18 8	PP	e 50·7
Santa Clara		102·1	49	e 14 3	+ 5	e 24 45	[+ 8]	e 27 32	PS	e 45·6
De Bilt		102·6	327	e 13 58	− 2	i 24 44	[+ 5]	i 18 15	PP	33·7
Rome		102·6	316	i 13 56a	− 4	24 38	[− 1]	e 18 14	PP	49·7
Strasbourg		102·8	324	i 13 58a	− 3	i 25 43	− 1	e 18 10	PP	e 48·9
Zurich		102·9	323	e 14 36	+35	—	—	—	—	—
Aberdeen	N.	103·3	334	e 18 21	PP	i 24 50	[+ 7]	i 27 38	PS	43·7
Basle		103·3	323	e 14 3	0	—	—	e 18 0	PP	25·8
Uccle		103·3	327	i 14 2a	− 1	e 24 48	[+ 5]	18 20	PP	46·7
Neuchatel		104·0	323	e 26 3	S	(e26 3)	+ 9	—	—	—
Durham		104·5	332	i 18 28	PP	i 24 53	[+ 5]	e 27 27	PS	—
Edinburgh		104·5	333	e 14 10	+ 2	e 24 50	[+ 2]	e 18 28	PP	e 41·7
Tinemaha	Z.	104·9	48	e 14 11	+ 1	—	—	e 30 9	PKKP	—
Haiwee		105·5	49	e 14 17	P	e 24 51	[− 2]	—	—	—
Paris		105·7	325	e 14 3	P	24 37	[−17]	18 38	PP	48·7
Kew		105·8	329	e 14 13	P	e 24 54	[0]	e 18 38	PP	e 49·7
Mount Wilson	Z.	106·1	51	e 14 14	P	—	—	e 18 28	PP	—
Pasadena		106·1	51	e 14 14	P	e 24 54	[− 1]	e 18 38	PP	e 43·7
Bozeman		106·2	38	e 14 18	P	—	—	e 18 33	PP	—
Riverside	Z.	106·7	51	e 14 19	P	—	—	e 18 22	PP	—
Clermont-Ferrand		107·0	323	e 14 43	P	e 25 40	[+41]	—	—	—
La Jolla		107·2	52	e 18 33	PP	e 25 1	[+ 1]	i 30 0	PKKP	—
Jersey		108·0	329	—	—	e 26 55	?	e 28 30	PS	e 52·7
Salt Lake City		108·0	42	e 18 48	PP	e 25 3	[− 1]	e 28 12	PS	e 44·9
Cape Town	E.	109·3	237	18 59·	PP	i 25 8	[− 1]	28 15	PS	51·7
Ivigtut		111·4	357	19 17	PP	28 50	PS	—	—	—
Tucson		112·5	50	e 18 14	[−24]	e 25 16	[− 6]	i 19 23	PP	e 45·7
Toledo		114·5	320	e 19 38	PP	e 28 56	PS	e 29 23	PPS	—
Almeria		115·1	316	19 50	PP	28 59	PS	e 23 10	PKS	55·0

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Granada		115·7	317	e 19 56	PP	36 8	SSP	39 42	SSS	59·8
San Fernando	E.	117·9	318	e 20 2	PP	e 29 35	PS	e 36 2	SS	55·7
Chicago		121·7	29	e 15 1	P	e 25 52	[− 4]	e 20 28	PP	e 49·0
Florissant		122·5	34	e 18 59	[+ 1]	e 37 40	SS	i 20 32	PP	—
St. Louis		122·7	34	e 18 58	[0]	i 30 15	PS	e 20 30	PP	—
Ottawa		123·6	18	e 18 59	[− 1]	e 30 40?	PS	e 20 40	PP	37·7
Toronto		123·8	22	e 21 22	PP	e 31 22	PPS	—	—	52·7
East Machias		126·4	12	e 19 1	[− 4]	e 26 28	[+18]	e 21 0	PP	e 51·6
Williamstown		126·8	17	i 19 5	[− 1]	—	—	i 22 17	?	e 58·7
Halifax		127·3	8	e 21 10	PP	—	—	—	—	61·7
Harvard		127·5	15	i 19 5k	[− 2]	—	—	e 21 5	PP	e 55·7
Fordham		128·3	19	i 19 10	[+ 1]	e 31 14	PS	i 21 10	PP	—
Philadelphia		128·6	20	e 21 0	PP	e 31 4	PS	e 22 23	PKS	e 56·9
Georgetown		128·8	23	i 19 13	[+ 3]	i 22 25	SKP	i 21 18	PP	—
Columbia		131·1	30	e 21 30	PP	e 31 28	PS	e 22 36	PKS	e 52·9
Bermuda		138·9	15	e 19 28	[0]	e 45 56	SSS	e 22 16	PP	e 65·4
Balboa Heights		149·1	58	e 19 40?	[− 6]	—	—	—	—	—
San Juan		151·3	25	e 19 50	[+ 1]	e 33 42	SKSP	e 24 11	PP	e 60·2
Fort de France		156·6	18	e 19 57	[+ 1]	e 26 0	[−61]	e 24 4	PP	—
Huancayo		157·8	103	e 20 3	[+ 5]	—	—	—	—	e 64·7
Rio de Janeiro		161·9	212	e 20 10	[+ 7]	—	—	—	—	—
La Paz	Z.	163·0	123	i 20 5a	[+ 1]	i 30 5	?	45 8	SS	77·7

Additional readings :—

Hong Kong S_cS = +15m.27s.
Batavia iP = +5m.20s.k
Malabar PEN = +5m.24s., SEN = +9m.37s.
Zi-ka-wei PPPZ = +6m.0s., iZ = +8m.0s., SZ = +8m.50s., SSZ = +10m.2s., SSSZ = +10m.18s.
Calcutta N. eP_cP = +9m.47s., eSS = +16m.5s., iSSS = +16m.41s., eS_cS = +17m.46s.
Perth PS = +13m.58s.
Brisbane ePE = +8m.4s., iN = +8m.16s., iE = +8m.22s.
Adelaide i = +17m.36s.
Riverview eEN = +8m.38s., iSE = +15m.26s.
Hyderabad S_cSE = +18m.28s., SSE = +19m.15s.
Kodaikanal SSE = +19m.24s.
Agra SSE = +19m.50s.
Bombay EN = +10m.8s., ePPN = +11m.24s., iE = +12m.17s., iN = +13m.6s., iSE = +16m.52s., iE = +17m.25s. and +18m.3s., iN = +18m.6s., iS_cSEN = +19m.9s., iSSE = +20m.40s., iSSN = +20m.47s., iEN = +21m.5s. and +23m.3s., iE = +24m.9s.
Wellington iZ = +11m.6s., eZ = +12m.0s., e = +21m.40s.
Christchurch iS_cSEN = +20m.44s., iSSN = +23m.47s., iSSE = +24m.12s., SSSN = +26m.12s., L_q = +27m.26s.
Honolulu ePPP = +16m.22s., eSS = +25m.15s., eSSS = +29m.16s.
Tiflis iPN = +12m.9s., iE = +12m.57s., iNZ = +13m.41s., PPZ = +15m.19s., PPPNZ = +17m.11s., iE = +22m.17s., eN = +22m.29s., ePSZ = +22m.38s., iPSE = +22m.41s., iZ = +23m.8s., iN = +23m.33s., eSSN = +26m.39s., eSSZ = +27m.7s., eZ = +30m.7s., eSSS?EZ = +31m.8s., eL_qN = +35·7m.
College eSS = +27m.44s., eSSS = +30m.58s.
Tananarive PS = +23m.24s., SS = +27m.56s., E = +29m.11s.
Ksara PS = +24m.22s.
Pulkovo PS = +24m.22s., SS = +29m.16s.
Sitka ePPP = +18m.9s., iS = +23m.38s., eSS = +28m.48s.
Istanbul PKP = +16m.42s., PPS = +30m.6s.
Helwan eZ = +16m.13s., iE = +23m.40s., PSE = +25m.10s., PPS = +25m.40s., SSE = +30m.25s., SSSE = +34m.20s.
Bucharest eE = +17m.2s., eN = +18m.54s., eE = +19m.0s., SE = +23m.50s., eEN = +24m.13s., PSN = +24m.42s., eE = +25m.36s., eN = +25m.41s.
Copenhagen +18m.9s.
Victoria PPPE = +19m.40s., PS = +26m.16s.
Collmberg eZ = +13m.50s.
Hamburg eN = +22m.18s. and +25m.3s., eE = +31m.20s.
Laibach ePKPZ = +17m.26s.
Cheb eSS? = +32m.40s.?
Scoresby Sund +26m.58s. and +32m.4s.
Triest e = +25m.19s., SS = +31m.22s., e = +33m.7s., eSSS = +35m.29s.
Ukiah eS = +24m.55s., ePS = +26m.59s., eSS = +32m.10s.
Berkeley eN = +24m.16s., eZ = +41m.16s.
Stuttgart eEZ = +16m.56s., e = +19m.56s., eSKKSEN = +25m.34s., e = +26m.56s, +31m.16s., eSS = +32m.58s., eSSS = +37m.46s., eL_qN = +46·7m.
Santa Clara iZ = +18m.15s.

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De Bilt iPZ = +14m.1s., iZ = +27m.8s.
Rome iEZ = +22m.10s., iPS = +27m.12s., SS = +33m.2s., SSS = +37m.5s.
Strasbourg iZ = +18m.14s., ePPPZ = +20m.18s., eSSN = +32m.54s.
Aberdeen iN = +25m.15s., +26m.2s., and +33m.6s.
Uccle eN = +22m.25s., eSKKSN = +25m.48s., ePSEN = +27m.42s.
Edinburgh i = +25m.53s.
Paris S = +25m.8s.
Kew eZ = +19m.18s. and +20m.55s., eEN = +26m.26s., e = +27m.37s., eZ = +28m.40s., eEZ = +29m.18s. and +29m.54s., eZ = +33m.55s., eE = +34m.26s. and +35m.0s., eZ = +45m.38s.
Pasadena eZ = +17m.42s. and +18m.24s., ePSE = +28m.0s., iPKKPZ = +30m.5s.
Riverside eZ = +17m.43s., iPKKPZ = +30m.3s.
Salt Lake City eSKKS = +25m.28s.
Cape Town S_cPP_cSE = +26m.0s., SSSE = +37m.39s.
Tucson ePPP = +21m.3s., eSKKS = +25m.48s., eS = +26m.51s., iPS = +28m.50s., PPS = +29m.56s., PSPS = +35m.21s., eSSS = +38m.59s., SSS = +39m.20s.
Granada ePPE = +20m.48s., ePPPE = +23m.32s.
Chicago ePKP = +19m.18s., ePP = +23m.1s., eSKKS = +27m.18s., ePS = +30m.18s., ePPS = +31m.46s., eSS = +35m.55s., eSSS = +40m.53s.
Florissant eN = +30m.16s., iPSN = +30m.26s.
St. Louis iPPE = +20m.34s., ePSN = +30m.26s.
East Machias eP = +15m.44s., ePPP = +23m.48s., ePS = +31m.13s., ePPS = +32m.40s., ePSPS = +38m.43s.
Williamstown $iPKP_2$? = +21m.4s.
Harvard eZ = +23m.31s., ePSN = +30m.59s.
Fordham iEN = +22m.28s., eSSN = +38m.34s.
Philadelphia ePP = +21m.13s., eSS = +28m.11s.
Columbia eSS = +38m.42s., eSSS = +43m.10s.
Bermuda ePPS = +34m.8s.
San Juan eSS = +42m.31s.
La Paz iZ = +20m.58s. and +32m.20s.
Long waves were also recorded at Budapest.

June 27d. Readings also at 0h. (Malabar and Batavia), 2h. (Lick and Branner), 5h. (near Osaka), 8h. (Grozny), 9h. (Tchimkent, Frunse, Andijan, Tashkent, Samarkand, and Sverdlovsk), 10h. (Pasadena, Tinemaha, and Riverside), 13h. (near Fort de France), 14h. (Mizusawa), 15h. (Riverside (2), Sverdlovsk, Tashkent, and Tucson (2)), 16h. (Moncalieri, Tacubaya, and near Malabar (2)), 18h. (New Plymouth), 20h. (Piatigorsk), 21h. (Tucson), 23h. (Malabar, Frunse, Andijan, and Samarkand).

June 28d. 4h. 36m. 32s. Epicentre 36°·4N. 140°·6E. (as on 1937 Sept. 7d.).

$A = -\cdot6235$, $B = +\cdot5121$, $C = +\cdot5908$; $\delta = +4$; $h = 0$;
$D = +\cdot635$, $E = +\cdot773$; $G = -\cdot457$, $H = +\cdot375$, $K = -\cdot807$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Okiziku	0·4	219	0 26	+13	0 35	+14	—
Tukubasan	0·5	246	0 26	+12	0 35	+12	—
Tokyo Imp. Univ.	1·0	224	0 19	− 2	0 36	0	—
Komaba	1·1	225	0 20	− 2	0 37	− 2	—
Mitaka	1·1	229	0 26	+ 4	0 43	+ 4	—
Kamakura	1·3	218	0 26	+ 1	0 47	+ 3	—
Kiyozumi	1·3	195	0 26	+ 1	0 44	0	—
Titibu	1·3	251	0 26	+ 1	0 45	+ 1	—
Koyama	1·7	231	0 26	− 5	0 49	− 5	—
Yosiwara	2·0	232	0 26	− 9	0 53	− 9	—
Susaki	2·1	217	0 31	− 6	1 4	0	—
Mizusawa	2·8	9	e 0 42	− 5	1 15	− 7	—
Vladivostok	9·5	318	e 2 22	+ 2	—	—	4·4

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

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June 28d. 11h. 32m. 14s. Epicentre 29°·0S. 46°·5W.

Florianapolis (27°·7S. 48°·6W.) and a large section of the State of Santa Catherina were shaken by an earthquake which caused damage to property, but apparently no casualities.

Epicentre 27°·5S. 48°·5W. (Gutenberg).

See Seismological Notes, Bulletin of the Seismological Society of America, Vol. 29 (1939), Berkeley, 1939, p. 564.

$A = +\cdot6030$, $B = -\cdot6354$, $C = -\cdot4823$; $\delta = -4$; $h = +2$;
$D = -\cdot725$, $E = -\cdot688$; $G = -\cdot332$, $H = +\cdot350$, $K = -\cdot876$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rio de Janeiro		6·7	26	i 1 46	+ 4	—	—	—	—	i 2·3
La Plata		11·3	236	2 46	0	4 46	− 8	—	—	6·0
La Paz	Z.	23·5	298	i 5 8k	− 4	i 9 32	+ 9	—	—	13·1
Huancayo		31·7	296	e 6 31	+ 4	e 11 29	− 8	e 12 10	?	e 15·3
San Juan		50·8	336	—	—	e 18 50	S_cS	—	—	e 22·0
Williamstown		75·5	341	e 11 46	− 2	—	—	—	—	e 41·3
Tucson		86·2	310	12 43a	− 1	—	—	—	—	—
Rome		89·1	40	—	—	e 36 44	?	—	—	—
Strasbourg		91·2	33	—	—	e 24 16	+11	—	—	e 48·3
Stuttgart		92·0	33	e 13 26	+14	e 24 21	+ 9	e 50 46	L_q	e 55·8
Christchurch		99·4	207	—	—	e 23 18	?	—	—	—
Ksara		99·8	57	e 21 16	?	—	—	e 32 6	SS	—
Wellington		100·3	210	—	—	e 23 46?	[−42]	—	—	—
Tiflis	Z.	109·5	53	e 19 8	PP	e 29 10	PPS	e 34 46	SS	e 59·8
Riverview	N.	115·3	196	e 18 8	[−36]	—	—	—	—	e 23·0
Sydney		115·3	196	e 17 16	?	—	—	e 21 28	PPP	—
Adelaide		116·2	185	i 17 27	?	—	—	e 19 40	PP	20·4
Brisbane		120·8	200	e 19 16	[+22]	—	—	i 23 46	PPP	i 26·8
Sverdlovsk		123·2	39	—	—	e 44 40	?	—	—	54·8
Tashkent		127·2	58	—	—	e 38 39	SS	e 42 13	SSS	68·3
Irkutsk		148·3	35	e 19 46?	[+ 2]	—	—	—	—	e 76·8

Additional readings :—
Tucson iP = +12m.52s.
Christchurch iEN = +23m.25s. and +24m.23s., eZ = +24m.46s.
Ksara e = +30m.48s.
Long waves were also recorded at Kodaikanal, Bombay, De Bilt, Paris, Cape Town, San Fernando, and Baku.

June 28d. Readings also at 1h. (near Mizusawa and Amboina), 3h. (La Paz), 4h. (Tucson, Tacubaya, and Oaxaca), 5h. (Hukuoka), 6h. (Tacubaya), 8h. (Pasadena, Tinemaha, Riverside, La Plata, Rio de Janeiro, Tucson, La Paz, and Mount Wilson), 9h. (La Paz), 15h. (Amboina, Andijan, and Samarkand), 16h. (Lick, Branner, and Amboina), 17h. (La Paz and near Mizusawa), 19h. (La Paz, Mizusawa, and near Amboina (2)), 23h. (Tucson).

June 29d. 21h. 5m. 45s. Epicentre 44°·0N. 93°·0E. (Very doubtful).

$A = -\cdot0378$, $B = +\cdot7207$, $C = +\cdot6922$; $\delta = -2$; $h = -3$;
$D = +\cdot999$, $E = +\cdot052$; $G = -\cdot036$, $H = +\cdot691$, $K = -\cdot722$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Semipalatinsk		10·8	312	2 36	− 3	5 8	SSS	—	—	i 5·5
Irkutsk		11·2	38	2 49	+ 5	—	—	—	—	i 5·0
Almata		11·7	272	2 55	+ 4	5 44	+40	—	—	e 6·5
Frunse		13·4	273	e 3 27	PP	e 6 31	SSS	—	—	—
Andijan		15·6	264	e 3 43	0	7 5	SSS	—	—	e 7·9
Tashkent		17·6	268	4 11	+ 3	i 7 41	SS	—	—	i 10·0
Samarkand		19·8	267	e 4 45	+10	e 8 35	SS	—	—	—
Agra	E.	20·7	219	e 5 0	PP	9 9	SSS	—	—	—
Calcutta	N.	21·8	191	i 5 18	PP	i 9 20	SSS	—	—	e 14·5
Sverdlovsk		24·0	314	e 5 6	−11	9 21	−11	—	—	12·1

Continued on next page.

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	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay	30·2	220	—	—	e 12 1	+48	e 13 4	SS	e 19·7
Baku	31·9	280	—	—	e 11 56	+16	e 14 19	SSS	e 17·2
Grozny	33·8	286	e 6 45	− 1	—	—	—	—	—
Tiflis	35·0	284	e 6 37	−19	e 12 35	+ 7	e 8 11	PP	e 16·2
Moscow	36·6	309	e 7 4	− 6	e 12 38	−15	—	—	e 18·4
Pulkovo	40·1	316	e 8 53	PP	e 16 45	SS	—	—	e 20·0
Ksara	44·8	277	e 10 9	PP	e 18 9	SS	e 18 33	SSS	—
Collmberg	51·9	309	i 9 11	− 1	—	—	e 10 13	PP	e 27·1
Cheb	52·8	307	—	—	e 24 15?	?	—	—	e 27·2
Rome	56·7	298	—	—	i 22 18	SS	—	—	29·4

Additional readings :—
Bombay iE = +14m.10s.
Grozny e = +9m.5s.
Tiflis eE = +7m.43s.
Pulkovo e = +11m.43s
Collmberg e = +5m.45s., i = +5m.48s., e = +6m.1s., i = +9m.3s. and +9m.14s.
Long waves were also recorded at Stuttgart, Hamburg, Vladivostok, Kew, Prague, Paris, De Bilt, Göttingen, Strasbourg, and Uccle.

June 29d. Readings also at 0h. (Tucson), 2h. (Tashkent, Helwan, Ksara, Tiflis, Grozny, and Baku), 3h. (Sverdlovsk), 6h. (Andijan (5)), 7h. (Andijan (2)), 8h. (Andijan), 9h. (Tucson, Mount Wilson, Pasadena, Tinemaha, and Salt Lake City), 10h. (Lincoln and Philadelphia), 11h. (Hukuoka), 13h. (Algiers), 14h. (Sverdlovsk, Tashkent, and near Hukuoka), 16h. (Medan, Rome, and Collmberg), 18h. (Tucson), 20h. (near Mizusawa), 23h. (La Paz and Columbia).

June 30d. 0h. 1m. 43s. Epicentre 34°·2N. 56°·6E.

A = +·4563, B = +·6920, C = +·5595 ; δ = +11 ; h = 0 ;
D = +·835, E = −·550 ; G = +·308, H = +·467, K = −·829.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		8·2	321	e 2 19	P*	e 4 33	S_g	—	—	e 6·3
Samarkand		9·9	53	2 26	+ 1	5 1	S*	—	—	—
Erevan		11·3	306	e 2 58	PP	—	—	—	—	—
Tiflis		11·9	313	e 2 48	− 6	e 6 34	?	e 3 3	PP	e 7·6
Tashkent		12·3	51	e 2 37	−22	e 4 36	−42	—	—	e 7·3
Grozny		12·4	318	e 2 57	− 4	e 5 28	+ 7	—	—	—
Andijan		14·1	58	e 2 51	−32	—	—	—	—	—
Ksara		17·2	274	i 4 6	+ 3	i 7 35	SS	9 59	?	—
Agra	E.	19·7	104	e 4 6	−28	7 56	−14	—	—	—
Bombay		21·0	132	e 5 49	PPP	i 8 36	− 1	—	—	e 12·3
Helwan		21·8	265	e 4 56	0	e 9 2	+10	—	—	—
Sverdlovsk		22·8	7	5 4	− 1	8 58	−13	11 29	L_q	13·8
Moscow		25·2	335	e 5 26	− 3	e 9 51	− 1	—	—	e 14·8
Calcutta	N.	30·1	104	—	—	e 11 30	+18	—	—	—
Pulkovo		30·8	335	e 6 14	− 6	e 11 17	− 6	—	—	14·3
Colombo	E.	34·6	137	—	—	e 13 17?	+55	—	—	—
Collmberg	Z.	35·7	312	e 6 57	− 5	—	—	e 8 17	PP	—

Additional readings :—
Tiflis PN = +2m.57s.
Grozny e = +4m.55s.
Long waves were also recorded at Stuttgart, Uccle, Strasbourg, Irkutsk, Rome, and Hamburg.

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June 30d. 2h. 46m. 12s. Epicentre 36°·2N. 139°·9E. (as on 1938 May 9d.).

Tokyo Imperial University gives Epicentre 36°·11N. 139°·91E.

$A = -\cdot6187$, $B = +\cdot5210$, $C = +\cdot5880$; $\delta = -3$; $h = 0$;
$D = +\cdot644$, $E = +\cdot765$; $G = -\cdot450$, $H = +\cdot379$, $K = -\cdot809$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tukubasan	0·2	84	0 15	+ 5	0 21	+ 5
Okiziku	0·3	117	0 23	+12	0 30	+12
Tokyo Imp. Univ.	0·5	192	0 14	0	0 22	− 1
Komaba	0·6	198	0 14	− 1	0 22	− 4
Mitaka	0·6	208	0 15	0	0 24	− 2
Titibu	0·7	252	0 23	+ 6	0 32	+ 4
Kamakura	0·9	198	0 15	− 5	0 27	− 7
Kiyozumi	1·1	168	0 23	+ 1	0 38	− 1
Koyama	1·1	221	0 23	+ 1	0 36	− 3
Susaki	1·7	206	0 26	− 5	—	—
Mizusawa	3·1	18	e 0 56	+ 5	e 1 32	+ 3

June 30d. Readings also at 1h. (Collmberg), 2h. (La Plata and La Paz), 7h. (Tucson), 11h. (La Paz), 12h. (Cernauti and near Bucharest), 15h. (Collmberg), 16h. (near Sofia, Ksara, and Bucharest), 17h. (Triest), 18h. (La Paz and Tananarive), 19h. (Mount Wilson, Riverside, and Tinemaha), 20h. (La Paz), 21h. (Almata, Semipalatinsk, Triest, and Frunse), 23h. (Tiflis, Erevan, and Ksara).